FACTORS DIFFERENTIATING PARTICIPANTS AND NON-PARTICIPANTS OF THE SCHOOL LUNCH PROGRAM

by

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INTRODUCTION

Nutrition education is becoming a matter of increasing national concern. In recent years, the United States Congress has shown greater interest in nutrition and nutrition education as revealed in congressional support of food assistance and nutrition-related programs and of nutritional status surveys of Americans (1).

The teenage population is a group inclined to develop poor eating habits which may affect their future health and the health of their future families. The intent of the National School Lunch Act in 1946 was to establish the school foodservice as a program designed to protect youth against malnutrition. The Type A lunch pattern, specified in child nutrition legislation, provides the adolescent with one-third of the recommended daily allowances (2). The participation of high school students in the lunch program is often low and irregular, however, which is a concern of those interested in students' nutritional status (3).

The National School Lunch Program (NSLP) is one of the largest foodservice programs in the United States. The program's availability in schools has increased greatly over the years. In 1950 only 54,000 schools participated. By 1975, however, the program had grown to include nearly 89,000 schools with a combined enrollment of 44.8 million students, serving approximately 81 per cent of the nation's schools and available to 88 per cent of the school children (4). Hiemstra (5) reported that the number of students participating in the NSLP in 1976 was 25.5 million and, of this number, 10.8 million received free or reduced price lunches. In a statistical report on the NSLP prepared by the United States

Department of Agriculture (USDA)/ Food and Nutrition Service (FNS), it was reported that in 1978 92,840 schools were participating in the NSLP. The average daily attendance for the schools was 41 million and, of this number 29.6 million students were participating in the NSLP (6). Martin (7) stated that in 1978 the school lunch program was available to over 90 per cent of all children enrolled in elementary and secondary schools.

Because of the nutritional benefits of the school lunch program to dietary intakes of children, participation in school lunch has been the objective of several projects (8, 9). Doucette (10) reported that low participation is a key problem of the school lunch program. Therefore, identification of the factors affecting participation is an important topic for study.

The objective of this research was to investigate factors which differentiate secondary students who participate in the school lunch program from those who do not participate. The study sample included male and female students at the tenth and eleventh grade levels. More specifically the objectives were:

1. To identify characteristics that differentiate secondary school students who participate in the school lunch program from those who are non-participants;

2. To compare a nutrient analysis of the participants and non-participants of the school lunch using a twenty-four hour dietary recall;

3. To study attitudes and opinions of sophomore and junior-level high school students related to issues pertaining to the school lunch program.

The review of literature will include the historical background of school foodservice, legislative developments, nutritional contributions

of school lunch, student participation in school lunch programs, food habits and attitudes of adolescents, food preferences, nutritional status and nutrient intake of adolescents, methods of assessing food acceptance and nutrient intake, and calculation and interpretation of dietary information.

REVIEW OF LITERATURE

Historical Background

The school lunch program has grown from a small beginning to one in which over 93,000 schools nationwide now participate (7). Bard (11) stated that it was the sight of the hungry child that gave impetus to the school lunch movement.

The school lunch program had its beginning in 1790 when Count Rumford invited undernourished school children to eat in a municipal soup kitchen set up in Munich, Germany for unemployed workmen (12, 13). In France in 1849, canteens were opened with surplus national guard funds to provide meals for needy school children (11).

Holland became the first country to adopt national legislation specifically to provide school lunches. In 1900, a royal decree authorized municipalities to supply food and clothing to needy school children (12, 13).

By a National Order in 1903, municipalities in Switzerland were directed to furnish food and clothing to children in need (13). The program grew rapidly and in 1906, cities were given permission to use state funds to provide school lunches for all children (13). It was in the same year that England's Provision of Meals Act transferred school feeding from charities to educational authorities (11, 14).

School feeding spread through Europe by the early 1900's (13). School lunch programs were under development in Italy, Austria, Belgium, Denmark, Finland, Norway, and Sweden before World War I (11).

In 1853, the Children's Aid Society of New York initiated the first school feeding program in the United States. This organization served meals free of charge to students who attended vocational schools (12, 13, 15). In 1894, Ellen H. Richards, a pioneer in the American Home Economics Movement, was credited with starting school feeding in Boston (14).

Bard stated (11) that in America the roots of school lunch were private charity. Parent-Teacher Associations, civic clubs, and volunteer fire departments were early sponsors of the programs.

The initial federal assistance to school lunch programs occurred during the depression years of 1930 (14). Garvue et al. (16) stated that the first financial aid to school foodservice was provided in 1933 when the Reconstruction Finance Corporation made loans to several towns in Missouri to pay for labor. In 1935, the National Youth Administration (NYA) and the Work Project Administration (WPA) provided assistance in the form of employment in the school lunch program.

Surplus agricultural products that were purchased by the government and distributed to school lunch operators provided assistance to the school lunch program. In 1935, the 74th Congress made it possible for the federal government to provide additional assistance in the form of donated commodities (11, 14, 15). Needy families and the school lunch program became constructive outlets for surplus commodities by the USDA (12).

In 1943, wartime food demands had nearly exhausted commodities for the schools. Action was taken by the 78th Congress to eliminate the problem. Assistance was provided in the form of cash reimbursement to school lunch sponsors for the purchase of food for the program (12).

Child Nutrition Legislation

Legislative Background

In 1946, the National School Lunch Act, or Public Law (P.L.) 396, was passed by Congress (17). The National School Lunch Act authorized a grant-in-aid program to states and placed responsibility for further expansion and improvements of school lunch programs in the educational agency in each state (18). The purposes of the law were: (a) to safeguard the health of the nation's children and (b) to encourage the domestic consumption of nutritious agricultural commodities and other food (17). The following school lunch policies or standards (19) were developed for implementation of the National School Lunch Act:

1. The program should be non-profit.
2. Lunches served should meet nutritional requirements.
3. Free or reduced price lunches should be served to children unable to pay the full lunch price.

Schools were required to follow the policies or standards in return for federal cash and commodity assistance.

From 1946 to 1966, the basic structure of the school nutrition program remained static. In the early sixties, however, the nation developed an awareness of the nutritional needs of children and of the need for more than school lunch as a national child nutrition program (7). In 1962, a major amendment to the National School Lunch Act (20) was passed by Congress seeking to make the school lunch program more effective in reaching needy children with a free or reduced price lunch. A program that provided for special assistance in the form of cash reimbursement for meals served free or at substantially reduced prices to needy children was authorized. The formula for appropriation of federal funds to the

states was revised. The formula rewarded those states making the greatest effort toward increasing participation (12, 20). Although this program was authorized in 1962, it was not funded until 1966 (18).

A new dimension was added to school foodservice when the 89th Congress passed the Child Nutrition Act of 1966. This Act provided funds for a pilot breakfast program and for federal assistance for equipment (12, 21). Under the provisions of this Act, the Special Milk Program which had been functioning since 1954 was made a part of the Child Nutrition programs (12).

The 91st Congress took action to accomplish the recommendations of the President and of the White House Conference on Food, Nutrition and Health. The conference was designed to focus national attention on the nation's nutrition problems (22). P.L. 91-248 grew out of congressional action recommendations of the conference (23). The legislation strengthened the child nutrition programs in several aspects, increased emphasis upon the well being of children and gave greater assistance to the needy child. The law stated that every child from a low income home should be served a meal at school. The law established minimum eligibility standards for free and reduced price meals based on family income (12, 23).

In 1973, P.L. 93-150 provided additional federal financial assistance (24). In this amendment, the national average payment was increased from eight to ten cents per lunch with a forty-five cent reimbursement for free lunches and ten cents less for reduced price lunches. An escalator clause was included to require the USDA to review rising food costs periodically and to assign reimbursement in relation to higher costs.

P.L. 94-105 was enacted in 1975 to help decrease food waste in school lunch programs (25). The law included a provision that senior high school students not be required to accept offered foods which they did not intend to consume, a provision commonly referred to as "offer versus serve." Regulations specified that students served a Type A lunch are required to select only three of the five components of the meal (26). The lunch, however, continued to be priced as a unit whether the student selected a complete or partial Type A meal (25, 27). Additional amendments to P.L. 94-105 included the exclusion of margarine as a required component of the Type A meal and mandated the services of reduced price lunches to eligible children from families with incomes below 195 per cent of the poverty level (18, 25).

Recent Legislation

In 1977, P.L. 95-166 authorized the Secretary of Agriculture to carry out a program of nutrition information and education as part of foodservice programs for children (28). Greig (29) stated that this law offered the first federally funded opportunity for state educational agencies to develop programs for teaching nutrition to teachers, students, and foodservice employees. The legislation amended the National School Lunch Act and the Child Nutrition Act of 1966 (28). The amendments revised the summer food program to make it more effective and contained a number of other improvements to the regular school lunch and breakfast program. The basic purpose of this amendment was to strengthen the administration of the program, achieve greater accountability for program funds, and eliminate abuses of the program. An additional amendment to P.L. 95-166 made the "offer versus serve" provision optional for service in junior high schools.

Public Law 95-166 also gave the Secretary of Agriculture the authority to regulate the sale of competitive foods in the schools (28). In 1972, P.L. 92-433 first placed the authority for regulation of competitive foods with state agencies and school food authorities (30).

USDA proposed regulations to implement P.L. 95-166 that specified prohibition of the sale of soda water, frozen desserts, candy, and chewing gum to children on school premises until after the last lunch period (31). During the open public comment period, USDA received over 2,100 comments. In view of the questions raised, USDA determined that it was necessary to provide for additional opportunity for public participation (31). As of January 1979, the comment period had been extended and a new proposal had not been finalized (32).

Public Law 95-627 was enacted in 1978 to expand non-profit foodservice programs for children in institutions providing child care (33). In this amendment, the reimbursement rate was changed for reduced price meals. This law also authorized the Secretary to conduct a study to determine the cost and feasibility of requiring schools to offer a choice of menu items within the required meal patterns. The amendment stated that the study must include different needs and capabilities of elementary and secondary schools for such a requirement.

Martin (7) stated that outside of the nation's capital the most significant force to influence school nutrition programs has been the American School Food Service Association (ASFSA). During the seventies, legislation which promoted rapid program expansion of the NSLP was influenced extensively by the ASFSA.

Nutritional Contribution of the School Lunch Program

Type A Lunch Pattern

The Type A lunch for the national school lunch program was designed to meet one-third or more of the recommended dietary allowances (RDA) of a child ten to twelve years of age (2, 34). By making some adjustments, this meal pattern can be adapted to meet the nutritional requirements for students of all ages. In order to meet the nutritional goal, it is recommended that a vitamin C food be included each day, a vitamin A food be included twice a week, and a food rich in iron be included frequently. To meet the requirement of the NSLP, as stated in the 1974 A Menu Planning Guide for Type A Lunches (2), the Type A lunch must contain:

1. Two ounces of meat or meat alternate
2. Three-fourths cup serving from two or more sources of fruits and/or vegetables
3. One serving whole-wheat or enriched bread
4. One teaspoon butter or fortified margarine
5. One-half pint fluid milk

Modifications in Type A Pattern

The Type A pattern has been reviewed and evaluated each time the RDA's have been revised by the Food and Nutrition Board of the National Research Council, National Academy of Sciences. The pattern has also been reviewed when new information from studies of children's food consumption and food preferences and studies of the nutritive value of school lunches have become available. Since the Type A pattern was introduced in 1946, there have been a number of revisions. Several of these revisions have been major changes, but none has altered the

essential framework of the Type A pattern. The revisions are outlined as follows (35, 36):

1958 - A change called for the meat or meat alternate requirement to be served in the main dish, or in the main dish and one other menu item. Another change called for schools to serve two or more vegetables or fruits, or a combination of both. The revision limited the amount of full-strength vegetable juice schools could serve to meet the fruit/vegetable requirement.

1963 - Guidelines were issued placing additional emphasis on serving vitamin A, vitamin C, and iron-rich foods. Also the reference for the pattern was changed from the nine to twelve year old child to the ten to twelve year old boy or girl.

1969 - This revision reduced the butter or margarine requirement from two teaspoons to one teaspoon.

1971 - Guidelines were issued recommending the amounts of food to meet nutritional needs of children of specified ages.

1973 - The program authorized all types of fluid milk rather than only fluid whole milk.

1974 - Guidelines were issued defining and expanding bread and bread alternates.

1976 - The "offer versus serve" legislation was implemented. This allowed senior high school students to select as few as three of the five food items included in the Type A lunch. Also the butter/margarine component was removed from the requirements.

The USDA has encouraged schools to serve younger children lesser amounts of selected foods than the amounts specified in the meal pattern. Also, schools have been encouraged to serve children older than twelve years of age larger amounts of selected foods to meet the increased RDA specified for them. The USDA in 1970 issued guidelines on the amount of foods to serve boys and girls of specified ages (37).

Proposed New Meal Patterns for Type A

As of October 1977, the latest review of the Type A pattern was carried out by the Consumer and Food Economics Institute of the Agricultural Research Service and the USDA/FNS (35). As a result of the review, USDA proposed revised school lunch patterns in 1977. The major purposes of the proposed changes are to meet more accurately the needs of children of varying ages and to bring the lunch requirements into conformance with the 1974 revisions of the RDA.

Lunch patterns have been proposed for five age groups. The groups are classified as: Group I--preschool children (ages one and two); Group II--preschool children including kindergarten (ages three, four, and five); Group III--school grades one through three (ages six, seven, and eight); Group IV--school grades four through six (ages nine, ten, and eleven); and Group V--school grades seven through twelve (ages twelve and above) (35). The USDA authorized school food authorities to field test the new lunch patterns between August 1978 and February 1979 (38).

The latest USDA guidelines (35) recommended that the serving sizes of Type A lunch for secondary schools be increased to:

1. Three ounces of meat or meat alternate
2. One to one and one-half cup serving from two or more sources of fruits and/or vegetables
3. One to three slices of whole-wheat or enriched bread
4. One to two teaspoons butter or fortified margarine
5. One-half pint fluid milk or approved alternate

Analyses of Type A

Various research studies have evaluated the nutritional contribution of the Type A lunch. In a study by Meyer et al. (39), lunches were

collected from fifteen schools in seven states to determine their nutritive values. Chemical analysis of the lunches determined that for calories, fat, protein, riboflavin, calcium, and ascorbic acid the majority of the lunches met at least one-third of the RDA's. Only one-third of the lunches met the RDA for thiamine.

Murphy et al. (40) reported on the nutrient content of lunches served to sixth graders in a nationwide sample of 300 schools in the United States in the fall of 1966. Nutrient values were determined by laboratory analyses. The lunches on an average exceeded the nutritional goal of one-third of the 1968 recommended allowances for vitamin A, thiamine, riboflavin, niacin, vitamin D, and vitamin B_{12} for children ten to twelve years of age. Vitamin B_6, vitamin A, vitamin D, and thiamine were most often short of the goals. As part of the nationwide study of the nutrient content of Type A lunches, Murphy et al. (41) also evaluated total fat, fatty acids, and total sterols. The lunches contained an average of 31.8 grams of fat, which provided 39 per cent of the calories. Laboratory analyses of mineral content indicated that on the average, lunches were adequate for calcium, phosphorus, sodium, and potassium (42). Less than 10 per cent of the lunches met the goal of iron for girls, but about 80 per cent of the lunches provided the required iron for boys. Magnesium was found to be less than the goal. For trace minerals, Murphy et al. (43) found marginal or low amounts of chromium and copper, adequate amounts of manganese, and adequate amounts for zinc. Caloric value of the lunches was found to be related to the levels of several minerals and vitamins. Lunches low in calories tended also to be low in one or more of the vitamins, usually thiamine and vitamin B_6 (40).

Head et al. (44) collected meals from twenty-three Type A lunch lines. The meals were analyzed for protein, fat, calories, vitamin A, ascorbic acid, thiamine, riboflavin, iron, and calcium. Relative to the Type A goal of one-third of the RDA's for nutrients, all meals were inadequate in calories and a high proportion were low in ascorbic acid and iron.

Nutrient Standard Menus

Frey et al. (45) stated that the Type A pattern, based on the four food groups, approximates but does not assure that the nutritional goal of the meal will be met. A nutrient standard which would require minimum levels of nutrients to be present in the meal could offer several advantages. Frey et al. noted the following advantages of the nutrient standard menus over the Type A pattern: (a) greater menu planning flexibility, (b) increased menu acceptability and less waste, (c) crediting nutrient content in both regular and fortified foods, (d) greater assurance that menus meet nutrient requirements, and (e) reduced cost. Because of these advantages, the USDA/FNS contracted with Colorado State University to develop nutrient standard menu (NSM) planning (45, 46).

In 1974, Harper et al. (47) collected data to compare the management functions associated with planning and serving Type A and NSM. Twenty-nine school lunch menu planners compared the NSM with Type A planning. Sixty per cent preferred NSM due to its nutrient assurance, flexibility, and potential for nutrition education.

A continuation of the comparison of Type A and NSM for school lunch was conducted by Jansen et al. (48). Results noted that menus planned by both methods were low in calories, iron, and thiamine. The number of

schools where the lunches furnished less than 60 per cent of the standard for calories, iron, and thiamine was significantly less for NSM than for Type A.

Student Participation in the School Lunch Program

Factors Affecting Participation

In a report on the evaluation of Child Nutrition Programs (18) it was stated that participation in the NSLP is lower than it should be or could be. As a result, considerable effort has been expended in both understanding the nature of the factors associated with participation, and in increasing the level of participation. Because of the nutritional benefits of the school lunch program to dietary intakes of children, participation in school lunch has been the objective of several projects (49, 50). Doucette (10) reported that low participation is a key problem of the school lunch program. Therefore, identification of the factors affecting participation is necessary.

The factors associated with participation include: availability of the NSLP in local schools and the frequency of student participation in schools where the NSLP is in effect. In a paper prepared by the USDA/FNS Economic Analysis and Program Evaluation Staff on the evaluation of child nutrition programs (18), the factors affecting participation were identified as:

1. Attitudes of school administrators, teachers, school lunch workers, and parents regarding the importance of school food-service.
2. The opportunity to walk home for lunch.
3. Institutional factors such as split sessions, open vs. closed campus, length of lunch period, and decor in the lunch room.

4. Prices charged for meals.

5. Competition from a la carte meals in school, vending machines, fast food restaurants, and bag lunches from home.

6. Lack of physical facilities to prepare or serve meals at school.

7. Proportions of students receiving free or reduced price lunches.

8. Regional location and grade composition of students.

Hundrup (51) determined the influence of certain factors on participation of students in the school lunch program in Utah high schools. Those factors found to be related significantly to percentage of student participation in the school lunch were: grades included in the high school, other eating facilities on campus or near campus, lunchroom capacity, choice versus serve in menu selection, and price of the lunch.

In a similar study, Printiss (9) investigated the influence of various factors on participation. Six factors were identified as having a significant relationship to the participation rate in the school lunch. The factor showing the greatest significance was the effect of a closed campus policy on participation. A closed campus policy prohibits students from leaving the school grounds during the lunch period. Schools with a closed campus were found to have a higher rate of participation than schools with an open campus. She reported that the number of free lunches served affected participation. As the number of free lunches served increased, so did participation. Also, as both the manager's opinion of the extent of acceptance of school lunch and the principal's opinion of the food served became more positive, participation in the school lunch program increased. The study indicated that two physical aspects were related to the rate of participation. They were the use of

plastic table service and the age of the kitchen and dining room. When the use of plastic table service increased and as the age of the kitchen and dining room increased, participation decreased.

Menu Choice and Quality. Grant (3) evaluated the usual lunch habits of 464 tenth graders participating in a study in Louisiana high schools. She found that schools which offered a menu choice had slightly higher participation in the school foodservice and fewer students missed eating lunch than in schools where only one menu was offered. The USDA study (52) on high school participation in child nutrition programs also identified menu variety and choice as factors affecting attitudes and participation. The study indicated that school foodservice personnel seemed hesitant to offer choices on Type A lunches because of additional labor and cost.

In Grant's study (3), a larger number of students said they participated in schools offering a menu choice because the food was prepared well than in schools where only one Type A lunch was offered. The reasons given most often by those who ate elsewhere were that the food was better and they wanted a choice. The quality of food was of prime importance to students. Bachemin (53) found that more students in high participation schools than in low participation schools considered the food the right temperature, the milk cold, and the appearance of the food appetizing.

Closed Campus. The closed campus has been identified as an important factor in school lunch participation. In Grant's research in Louisiana schools (3), the main reasons given by students for eating the

school lunch were: they could not leave the school grounds, their friends ate in the cafeteria, and their parents wanted them to eat at school.

In a report of the USDA study (52) on high school participation, results indicated that while it had been thought that closed campus was the answer to high participation, most of the low participation schools in the study had a closed campus. Seventy per cent of both high and low participation schools surveyed operated within a "closed campus" setting, in which students were not allowed to leave school grounds during the lunch period. The high participation schools with open campus were in rural areas with no attractions to draw the students away from school.

Bachemin's study (53) in Louisiana indicated closed campuses were an influential factor in high participation schools. In a paper by Law et al. (54), reporting the Bachemin (53) and Grant (3) studies, it was reported that students most often reported eating the school lunch because of a closed campus policy.

Price of the School Lunch. In a critical report on the NSLP prepared for Congress by the United States Comptroller General (4), commonly referred to as the GAO report, it was reported that while the number of schools serving the school lunch has increased in recent years, there has not been a proportionate increase in the number of participating students. The participation of regular-price students has declined; however, since the number of children eligible for free and reduced-price meals has increased, overall participation levels have tended to remain constant.

In Bachemin's study (53) the price of the school lunch did not appear to affect participation. West and Hoppe reported that a 4 to 6

per cent average drop in participation has been associated with a 10 per cent increase in "real" prices (about five cents at current price levels) (55). Braley's study (56) suggested that the 6 per cent decrease in participation may be more accurate. In the USDA study (52) on high school participation in child nutrition programs, two-thirds of the students indicated that they felt the price of the lunch was "about right."

Robin (57) reported that a major factor in low participation in the school lunch program was the price of the school lunch. Robin reported that comments from various state school lunch directors indicated that price increases affected overall participation markedly.

Additional Factors. In a paper by Law et al. (54) reporting the Bachemin (53) and Grant (3) studies, the principal reasons given by students for not eating lunch at school were waiting in line and not eating lunch at all. Menu prices, serving size, food dislikes, and effect of menu choices also were cited. Bachemin (53) stated that cheerful appearance of the school dining room and well prepared foods were influential factors in high participation schools. Law et al. (54) stated that when students were asked what they disliked about eating at school, waiting in line was listed more often than any other factor. Other reasons given by students were: insufficient time for eating, crowded and cramped conditions, and small servings. The most frequent reason for leaving food on the plate was that students disliked the preparation and the second most common reply was the food was disliked.

The results of the USDA study on high school participation (52) indicated that half of the low participation schools were on a system of

either module or split-shift scheduling. A module was comprised of twenty minutes. A class period was formed by combining two or more modules. Split-shift scheduling involved students attending classes for a morning or an afternoon session only. Module scheduling automatically assured the loss of 50 per cent of the students as 25 per cent of the students had a free period before the scheduled lunch period and 25 per cent had a free period after lunch. The results of the study also indicated that the length of the lunch period had an effect on school lunch participation.

Koskie (58) stated that parental wish had a positive influence on participation. One-fifth of the students surveyed indicated their positive or negative participation in the school lunch program was influenced by their peers.

In a report on the evaluation of Child Nutrition Programs (18), it was stated that there are seasonal differences in participation in the NSLP. The USDA/FNS Economic Analysis and Program Evaluation Staff reported that from September, when schools open, participation increases gradually until it reaches a December peak. It gradually decreases as the end of the school year approaches.

The National Advisory Council on Child Nutrition (1) stressed the importance of upgrading skills of school foodservice personnel. The Council contended that upgrading skills could have a direct effect on increasing school lunch participation.

Factors Differentiating Participants from Non-Participants

McManus (8) administered a questionnaire to 771 high school students to determine factors differentiating students who participated in the

school lunch program from those who did not. Seventy-eight per cent of the subjects participated in the school lunch program and 22 per cent did not participate. Sixty-five per cent of the non-participants did not like the food, 36 per cent would rather use their money for other things, and 7 per cent stated they had no lunch period. Other significant results of the study included: more boys participated in school lunch than girls, the eleventh grade had the largest percentage of participation, and more athletes than non-athletes participated in the lunch program.

In the GAO report (4), noneconomic factors were identified as having an important influence on daily participation levels. Some of the more important factors identified were: the availability of alternative food sources, attitudes of school administrators, limited menu variety and choice, poor food preparation, and "average" food quality. The factors identified as characterizing nonparticipating students were: those who live in urban areas, those who are economically non-needy, and those who attend secondary schools.

Student Involvement

Chegwidden (59) and Kinzell (60) stated that involving students in the school foodservice program had a direct relationship with participation in school lunch. Students can be involved in a variety of ways. In 1973, the American School Food Service Association (ASFSA) initiated a program at the national level with an advisory committee composed of seven high school students, one from each ASFSA Region (61). The committee represented all students, those eating school lunch and those nct participating. The committee was designed to function in several ways:

as advisors in nutrition education programs, as spokesman before Congress, and in other phases where improvements or changes are needed for the program to better meet the student needs.

From 1973 to 1975, national youth councils were enacted and were operating successfully (62). Before they had a chance to fully catch on, however, they were dropped due to lack of funds. In 1978, the ASFSA again initiated youth advisory councils (YAC) with the help of an ad hoc youth advisory committee. The national YAC consists of regional representatives; state and local ASFSA groups are encouraged to initiate YAC groups, as well. YACs are interested groups of students and concerned foodservice personnel working together in an effort to share ideas that will increase participation in the lunch program while at the same time provide nutrition education to the students.

Several studies reported effective methods to get students involved in the foodservice program. Methods cited were: training programs for students in foodservice, student advisory committees, and parent-teacher involvement (59, 61, 63, 64).

Another approach to improving participation in school lunch has been to involve the student in menu planning. Garrett's study (65) revealed that involvement of sixth grade students in menu planning and individualizing the program to the preferences of the children in particular schools had a positive effect on participation.

Roepke (66) stated that a means to increase student participation in the NSLP is for the school manager and the director to work with principals to set up Student Nutrition Advisory Councils (SNAC). The SNAC assists foodservice by becoming active participants and well informed about foodservice. Another means to increase participation has been for

the director of school foodservice to visit classrooms to inform students about the Type A school lunch and the part it plays in good health. Roepke indicated that one of the most effective means of entry into the classroom has been to involve students in menu planning. After the menu has been planned as a class project, it is published as their menu and served to the school district.

Evans (67) studied the influence of involving junior and senior high school students in foodservice advisory councils on student participation in the Type A lunch program and attitudes toward foodservice. Overall assessment of responses of the total student population at the target schools to the implementation of advisory councils did not reflect measurable positive changes. Data from the project revealed a more positive attitude at the junior high level than at the senior high. Evans reported the students involved in the advisory councils had positive reactions about foodservice involvement activities and were interested in continuing the activities.

Food Habits and Attitudes of Adolescents

Influence of Personal and Social Factors

Hodges and Krehl (68) stated that the adolescent is not willing to accept the admonition of parents that certain foods or certain meals must be eaten. Therefore, teenagers exhibit individualism and social rebellion which are carried into their eating habits.

Law et al. (54) stated that during the adolescent years, boys and girls are inclined to develop poor and bizarre eating habits which may affect their health. These habits reflect the social, economic, and cultural environment of the adolescent. Young persons' adjustment to

their environment depends on peer acceptance, degree of emotional maturity, and cultural influences.

Robinson and Lawler (69) stated that teenagers have many concerns about their development such as size and shape of the body, their attractiveness, skin condition, their vitality, sexual development, and social approval by their peers. Based on a longitudinal study of gross body composition and body conformation of teenagers, Huenemann et al. (70) concluded that teenagers had a high degree of interest in their body conformation which was sustained from the ninth through the twelfth grades and that they generally were dissatisfied with their size and shape. Boys desired mainly to gain weight and/or size and girls desired to lose weight and reduce certain dimensions.

Hinton et al. (71) investigated the relationship of certain physiologic, sociologic, and psychologic factors to eating behavior and the selection of a diet which approximated the recommended dietary allowances among 140 adolescent girls in Iowa. Those factors found to have a significant relationship to the selection of a diet of good quality were maturation, overweight and concern about overweight, family relationships, psychologic adjustment, health as a value, knowledge of nutrition, and the enjoyment of food.

McElroy and Taylor (72) studied values considered to be important by tenth grade boys in making decisions involving food. Values identified were health, money, sociability, enjoyment, independence, and status. Health was rated the most important.

In an analysis of the views of Minnesota school children, Litman et al. (73) reported that foods were classified in the children's minds as either "praise" or "scold" foods. "Praise" foods seemed to be related to

foods contributing to good health while "scold" foods were looked upon with disfavor by parents and adults generally.

Hazlett (74) conducted a study with seventh and ninth grade students to identify individuals responsible for influencing food choices. Results indicated the most frequent response for individuals influencing food choices were "myself" and "parent" for both adolescent samples. Hazlett also collected data from seventh and ninth grade students concerning food preferences. The most preferred meal was dinner; and breakfast was the meal most often omitted.

Leverton (75) asserted that food was only one component of the busy lives of teenagers and could receive only a fraction of their attention. Teenagers in Spindler and Acker's study (76) indicated that parents and adults should accept responsibility for seeing that their children ate more adequate diets. Even though teens thought parents were responsible for their eating habits, adolescents recognized that being part of the teenage group was important. Most believed that teenagers knew what to eat but that they did not care. Both sexes were critical of the way teenage girls eat. They also believed that boys eat better than girls because boys on the whole are not weight conscious and physical fitness is important to them.

Meal Pattern Habits

In a study by Spindler and Acker (76), seventy-five adolescents in Illinois expressed their attitudes toward food. Teenagers were often in a hurry and did not have time to eat. When the teenager's schedule did not coincide with the rest of the family, meals were often missed. Spindler and Acker found that lunch would be omitted or shortened if, in

the students' opinion, it was scheduled too early or late, the lunch period was too short, or if the room was congested. Hinton et al. (71) stated that the main reason teenagers gave for skipping or not enjoying their noon meal was simply that the teenagers did not like the foods available. Noon and evening meals were omitted because the teenagers did not like the food or they were not hungry because of having snacks close to meal time.

Huenemann et al. (77) reported that the meal most often eaten by adolescents was dinner, while either breakfast or lunch was skipped. Reasons for this eating behavior varied, but Huenemann et al. (70) discovered that most adolescents ate dinner because there was more variety of food available and more attention was given to food preparation and the amount of food.

de Leon Valerio (78) conducted a study on food habits and preferences of participants and non-participants of the school lunch program. She reported that breakfast was the most often omitted meal and the evening meal the most frequently eaten by both participants and non-participants. The meals liked best in descending order as reported by both groups were: evening meal, noon meal, snacks, and breakfast.

Food Preferences

Pilgrim (79) reported preferences to be an important indicator of food consumption and an expression of like or dislike for a specific food item. He stated that preference not only predicts the average amount of food a person will consume in certain situations, but also the proportion of persons who will accept a food. Various researchers have shown that

what a person consumes is largely determined by their food attitudes (79-82).

Young and LaFortune (80) reported that contrary to common belief food dislikes have little influence on the adequacy of the diet because most intensely disliked foods are seldom served items. The greatest effect on the adequacy of nutrient intake is in the lack of ingestion in sufficient quantities of the "choice" food items, such as milk, bread and cereal, and eggs.

Food Preference Studies among Adolescents

Litman et al. (73) studied the views of 1,039 Minnesota school children on food. The subjects ranged in age from ten to twenty-two years of age. The Lewin Food Anchorage Test was the instrument used for the study. The instrument is an unstructured questionnaire consisting of four basic questions. The first question asked the children to write the different foods that their family might eat almost every day and the reasons for doing so. The second and third questions asked what foods someone in their family might be praised or scolded for eating. The fourth question is presented in the form of a fictionalized story in which the experiences of two boys who visited at homes of different friends over the weekend are related. In one case the meals are reported as wonderful and in the other case as terrible. By then asking the respondents to name the foods served at each house, it is possible to obtain a list of foods that are considered high in preference for taste, prestige, and also a list of the less preferred foods.

Litman et al. (73) reported that the students were asked to list foods contained in an "ideal" meal or "usually eaten" foods. Over 88 per cent listed milk as a basic component. Other items mentioned by 10 per

cent or more of the children were: potatoes, bread, meat, butter, and eggs, followed by cereals, vegetables, and fruit. Among the vegetables, carrots, corn, peas, and beans rated comparatively well. The green and yellow vegetables, such as spinach, cabbage, lettuce, and celery were mentioned less frequently. In the meat group, hamburger and steak seemed to be preferred; veal and lamb were not listed.

Bachemin (53) reported that students in grades eight through twelve in Louisiana listed main dishes, sandwiches, potatoes, rolls, desserts, and milk as foods well liked which were served on school lunch menus. Vegetables and salads were foods reported by students as being disliked.

Johnson (83) conducted a study to determine the effect of menu type on plate waste of tenth graders in sixteen Louisiana high school food-service programs. No significant differences were reported for choice and set menu types for overall plate waste. When individual foods were considered, the choice menu had a higher percentage of plate waste for vegetables. She reported that the vegetables which resulted in the largest amount of plate waste were cauliflower, cabbage, beets, green peas, carrots, and cole slaw.

Gutsch (84) studied the influence of offering choices in vegetable menu items on junior high school students' acceptance of the school lunch. Results of the research indicated that a choice of vegetables resulted in a decrease in the amount of vegetable plate waste. Corn was consistently the vegetable with the least amount left uneaten, indicating that it was the most popular vegetable in the study. Other vegetables that appeared to be the most preferred included green beans, green peas, and succotash. Less well liked vegetables included coleslaw, harvard

beets, peas and carrots, cauliflower, spinach, breaded tomatoes, brussel sprouts, and stewed tomatoes.

Gargano and Vaden (85) determined that food preferences stated by high school students were an indicator of foods selected from a cafeteria line. They concluded that other influential factors would need to be identified for a food preference survey to be a reliable predictor of consumer demand. These factors might include: merchandising of the foods on the serving lines; other menu items available; environmental conditions such as weather or the season of the year; and school activities.

Schorr et al. (86) obtained information on food preferences from 118 students in grades seven through twelve in Western New York. They reported that the teenage subjects liked a wide variety of foods. Only eight foods were considered distasteful by 10 per cent or more of the students.

Koskie (58) investigated factors which might influence high school students' attitudes toward lunch programs. Almost 4,000 students in Catholic high schools in Milwaukee, Wisconsin were given opinionnaires. The requested "popular entrees" indicated that student preferences were for the easy-to-eat and common foods. The foods most in demand were found to be hamburgers, hot dogs, pizza, sloppy joes, and pizza burgers.

Other Food Preference Studies

In a paper by Pilgrim (79) summarizing the results of a study by Peryam et al. (82), food preferences of men in the United States Armed Forces were reported. A random sample of all army installations in the United States having an enlisted strength of more than 500 men were included in the study. Food preferences were determined by a nine point

hedonic scale method. Results of the study indicated that milk was the most liked food, followed by grilled steak, ice cream, French fried potatoes, and hot biscuits. The foods most often disliked were mashed turnips, broccoli, asparagus, iced coffee, and cauliflower. Pilgrim (79) concurred that the more preparation performed on a food, like adding sauces, the less the item was accepted.

Similar results were found by Einstein and Hornstein (87) in a study during the 1966-67 school year involving 50,000 college students, representing 1 per cent of the college enrollment in the United States. Two hundred and seven food items were rated on a food preference questionnaire. Foods were ranked in terms of per cent liked, disliked, and do not know. Results of the study indicated that milk, beefsteaks, biscuits, and orange juice were the most popular foods. When foods were divided into classes, bread was the most popular class and soup the least popular.

Schuck (81) studied food preferences of 120 South Dakota State College students. The subjects were given a list of sixty-one foods and were asked to place each food under one of the four columns headed as follows: willing to eat often, willing to eat once a week, unwilling to eat, and have never tasted. Results of the study indicated that whole milk and butter were highly acceptable to both sexes. Fruits and certain meats ranked next in acceptability, followed by vegetables, lamb, and organ meats. Acceptability was higher for most foods for students from urban homes than rural homes.

Hall and Hall (88) determined food preferences of 693 students in three universities. The University of California, University of Oregon, and Western Reserve University constituted the sample. The students

were given a list of 150 foods and were instructed to check those foods which they disliked and to indicate the reason for disliking them. The most universally disliked food was buttermilk. The most cited reason for disliking a given food was that "it did not taste good." They concluded that women college students had more aversions than men college students, but were familiar with more foods than men.

Lamb et al. (89) reported the reaction of 170 women at Texas Technological College to foods frequently served in the residence hall. The subjects were given a list of 116 common foods and were asked to classify according to the following categories: "seldom or never eaten," "well liked and enjoyed," "indifferent toward the food," and "disliked." The food likes and dislikes of the group were typical of students and persons generally. The students liked milk, meats, citrus fruits, and desserts. The disliked foods were vegetables, buttermilk, and soft-cooked eggs.

In a study by Wise (90) involving students at Purdue University, 60 per cent of the students studied skipped breakfast, and their most frequently consumed snack was carbonated beverages. The foods listed as liked most were roast beef, milk, ice cream, and hamburger; those disliked the most were liver, pike or perch, dry cereal, and broccoli.

Nutritional Status and Nutrient Intake of Adolescents

Teenage Nutrition and its Relation to Health

Hodges and Krehl (68) reported that nutrition probably offers the best opportunity to improve the health of the nation as a whole. No longer are the classic deficiency syndromes encountered with any regularity in this country. Signs of rickets, scurvy, pellagra, and

thiamine deficiency are rare, and lack of protein and calcium are relatively uncommon. Iron deficiency manifested by anemia continues to be a significant problem in women.

In the United States the teenage population is most apt to display the effects of nutritional errors. Probably no group has been more widely studied than the present-day teenagers. Nutritionists throughout the United States have become increasingly concerned about the dietary patterns of adolescent boys and girls, as surveys have shown repeatedly that their food intakes were more variable and less adequate than those of either younger children or adults (71, 91).

Adolescence is a period of accelerated growth and development. It is a period when the individual advances from childhood to adulthood. Accompanying the rapid body changes during adolescence is an increase in nutritional needs as seen in the RDA's. During this period of accelerated growth, needs for energy and most other nutrients increase sharply. Teenage girls need 2100-2400 kilocalories and teenage boys need 2800-3000 kilocalories according to the recommended dietary allowances (34).

Surveys show that some teenagers do have food intakes that fail to supply the recommended dietary allowance for each of the nutrients (75, 92, 93). Several researchers have shown that an inverse relationship exists between age and adequacy of nutrient intake (94). Thus, during the time adolescents have an increased need for nutrients, they may actually decrease the adequacy of their intake.

Everson (91) stated that the dietary record of the teenager, especially for girls, is not good. She stated that some of the shortcomings in the diets of the adolescent were too little calcium because of low milk consumption; insufficient intake of green and yellow vegetables

and fruits, resulting in suboptimal supplies of vitamin A; too little ascorbic acid; and a questionable amino acid intake which will support optimal health.

Everson (91) mentioned two problems which she considered to be of some magnitude when one considers the need for improved nutrition among adolescents. One is that the incidence of tuberculosis is higher than it should be in adolescent years and is believed to occur more frequently in those who have inadequate diets. A second important medical problem associated with faulty diets of teenagers is the incidence of complications of pregnancy and the birth of defective infants among teenage mothers. During the adolescent years, stresses of various kinds have an adverse effect on nutrition. Emotional difficulties not only determine food intake but also modify nutrient utilization (69).

Nutrient Intake

The Ten State Nutrition Survey conducted in 1968 by the U.S. Department of Health, Education and Welfare (92) found through the analysis of twenty-four hour recalls that a large percentage of the ten to sixteen year old adolescents had intakes below the Ten State Nutrition Survey standard for calcium, iron, and vitamin A. In a study of 118 adolescents from western New York, Schorr et al. (86) reported these same three nutrients plus vitamin C to be lacking in the diets of boys and girls. Dietary complexity increased as intakes of calcium, iron, ascorbic acid, and vitamin A rose. The nutritive intake of adolescent males was considerably superior to that of the girls.

In a study of calorie and nutrient intakes of 122 middle income teenagers, Hampton and co-workers (93) found that the most neglected

nutrients were iron and calcium, particularly for girls. In a report concerned with the relationship of dietary iron intakes of adolescent subjects to sex, race, sex maturity ratings, and age, Gaines and Daniel (95) found that the majority of the subjects consumed less than two-thirds of the recommended allowances for iron. They concluded that sex maturity ratings were a better indicator of iron requirements in adolescence than chronologic age.

Hampton and co-workers (93) contended that the low intakes of iron are understandable because of the somewhat high recommended allowances and the limited food sources available. Bowden (96) concluded that an adequate level of iron in the diet is hard to achieve when calorie levels are kept low as is the case in many diets of adolescent girls.

A dietary survey of fourth, fifth, and sixth grade children in Phoenix was conducted by Patterson (97). Results indicated that nutrients most often below two-thirds of the RDA's, in order of decreasing frequency, were iron, vitamin A, calcium, thiamine, and ascorbic acid. Valenti (98) studied nutrients consumed in Type A lunches by high school students in sixteen Louisiana schools. Because of the amounts of nutrients served and plate waste, calories, magnesium, iodine, iron, and vitamins A, B_6, and B_{12} were not consumed in adequate amounts to meet one-third of the RDA.

Sprauve and Dodds (99) evaluated the diets of a group of eleventh and twelfth grade students in St. Thomas, Virgin Islands. Their diets provided two-thirds or more of the recommended allowances with the exception of calcium. Head and Weeks (100) determined nutrients served and nutrients in plate waste by laboratory analysis. Relative to the Type A goal, protein intake was highest and riboflavin and vitamin A values were

consumed in satisfactory amounts. Younger students consumed adequate iron and calcium, and calcium intake approached adequacy among older students.

Dietary surveys repeatedly have shown that the adolescent girl is often the least properly fed member of the family (76, 94, 101). In an investigation of the dietary intakes of girls twelve to fourteen years of age, Hinton et al. (71) found that their diets were lower in calcium, vitamin A, and ascorbic acid than are recommended.

Edwards et al. (102) used the twenty-four hour dietary recall to examine the dietary patterns of seventh, ninth, tenth, and twelfth graders in North Carolina. Seventy per cent of the students consumed the recommended two or more servings of meat daily. Although 66 per cent of the group consumed two cups or more of milk or milk products, 14 per cent had none. Consumption of deep green leafy and yellow vegetables, and of ascorbic acid-rich vegetables was very low among all students. Approximately 83 per cent of the students ate no deep green leafy vegetables on the survey day. Fifty-nine per cent ate no ascorbic acid-rich foods. Eighty-seven per cent consumed recommended amounts of foods from the bread and cereal group. The quantities of milk, green and yellow vegetables, and ascorbic acid-rich foods consumed would suggest that vitamin A, ascorbic acid, and calcium may be low in students' diets.

Many believe teenagers have atrocious food habits and are on the brink of nutritional disaster. Leverton (75), however, defended teenagers' food habits. She purported that the number of teenagers classified as having inadequate nutrient intake depends on which revision of the recommended dietary allowances have been used as the basis for

evaluation; thus Leverton concluded that the teenagers' diet does not look as atrocious as some believe.

Snacking Behavior Related to Nutrient Intake

Huenemann et al. (77) indicated that a high frequency of snacking was part of the adolescent eating pattern. Adolescents who ate regular structured meals, usually augmented by snacks, tended to have better nutrient intakes than the irregular eaters.

A study by Wharton (101) of 421 adolescents between the ages of thirteen and eighteen years in southern Illinois involved keeping three day dietary records. The dietary records revealed that food sources of iron, calcium, vitamin A, and ascorbic acid were consumed in lowest amounts, with the girls' intakes being lower than those of boys. The girls ate more snacks than boys. Over 35 per cent of the girls received more than 20 per cent of their calories as snacks compared with 19 per cent for the younger boys and 24 per cent for the older group. These snacks provided 20 to 30 per cent of total intake for all nutrients except vitamin A, thiamine, and ascorbic acid.

Hampton et al. (93) reported that "lean" girls tended to have a higher caloric and nutrient intake than "average" or "obese" girls. The "average" weight boys tended to have higher intakes of calories and nutrients than "lean" or "obese" boys. In general, a higher caloric intake was associated with a higher intake of protein, minerals, and vitamins. There was a tendency for "obese" boys and girls to eat less frequently than others, and also a tendency to skip meals more frequently. The subjects who ate less than three times a day had poorer diets than others. Those who ate frequently tended to have good diets overall.

Girls appeared to have a slight tendency to eat more frequently than boys. These findings support the popular concept of the teenager as a snacker. In a study conducted by Steele et al. (103), snacks of high school students made substantial contributions to intakes of calorie, protein, calcium, and phosphorous.

Eppright and Swanson (104) concluded that quality and quantity of snacks may play a critical role in determining nutritive value of the diet. Leverton (75) reported that the teenager is a snacker and there is no research evidence to indicate that frequent eating per se is detrimental to health. Hampton et al. (93) concluded that teenage snacking should not be maligned.

Meal Patterns Related to Nutrient Intake

Hodges and Krehl (68) concluded after observing 252 teenagers in Iowa that while the average teenager is healthy and well nourished, a significant minority have physical lesions and biochemically abnormal test results. When diets were studied, it was found that a substantial minority omit breakfast and eat diets which cannot be considered well balanced. The most common deficiency was ascorbic acid and was associated with skipping breakfast.

Steele et al. (103) studied seven-day dietary records for 181 adolescent girls and 135 adolescent boys from Maine, New York, and Rhode Island to determine the contribution of breakfast and between-meal foods to the adolescents' daily nutrient intake and to the daily allowances recommended by the National Research Council. They concluded that boys and girls who always had breakfast more nearly met the recommended allowances for their age groups than those who missed breakfast once a week or more.

Hodges and Krehl (68) reported the omission of breakfast was common, and the evening meal often consisted only of meat, potato, and dessert, although vegetables and salads were available. Lunch frequently provided the most balanced meal of the day if it was eaten at school, emphasizing the importance of a nutritious school lunch.

Nutrient Intake Related to Participation in School Lunch

A study conducted by Grettenberg (105) of 403 high school juniors evaluated nutrient intake. Nutrient intakes for students who participated in school lunch were higher in nine out of the twelve nutrients studied compared with the intake of non-participants. Mean nutrient intakes of protein, vitamin A, riboflavin, vitamin B_{12}, and vitamin C for all students were above the RDA's for boys and girls age fifteen to eighteen years. Stringfellow (106) evaluated the quantity and quality of dietary intakes of adolescents. School lunch participants had higher intakes of calories and all nutrients except vitamin A, calcium, and ascorbic acid. School lunch participants' iron intakes were lower than the RDA; whereas, non-participants of school lunch had intakes lower than the RDA in thiamine and iron.

Emmons et al. (107) conducted a study of 844 elementary school children in two rural upstate New York school districts in 1970. Results from the study indicated that the school lunch program provided significantly more protein, calcium, vitamin A, thiamine, riboflavin, niacin, and ascorbic acid than did bag lunches from home.

Callahan (108) studied the lunch patterns of Massachusetts school children to determine if children buying the Type A meal were getting a more nutritious lunch. Results of the study indicated that of the 81 per

cent of the students who had a Type A meal pattern available, one-half ate a Type A meal, one-fourth brought their lunch from home, and the remainder either bought a la carte, ate at a store, went home for lunch, or did not eat. Only 53 per cent of the students consumed a satisfactory or good lunch. These terms indicated lunches meeting Type A standards or meeting all requirements of Type A lunches except for containing only one fruit or vegetable. Of children having Type A lunch available, 64 per cent bought the lunch. Almost three-fourths of these children ate a satisfactory or good lunch. Although the record for lunch as a source of either vitamin A or C was not good in any method under study, the Type A lunch did surpass all others. Thirty-three per cent of children eating a Type A lunch received a source of vitamin A and 28 per cent consumed a source of ascorbic acid, however, of students not eating Type A, only 5 per cent consumed a source of vitamin A and 11 per cent consumed a source of ascorbic acid.

Methods of Assessing Food Acceptance and Nutrient Intake

Food Acceptability and Frequency Ratings

Pilgrim (109) reported that several components of food acceptance must be considered in predicting the acceptance of foods. The most important components were identified as physiology, sensation, and attitudes. Each of the three components contribute its own part to the perception and final acceptance of the food. Physiology is concerned with hunger and appetite. Sensation is based on food which serves as a stimulus and the organism which is the receptor. Attitudes are external factors and include all of the environmental aspects of food acceptance.

Food acceptability and food consumption per unit of time can be evaluated by using frequency ratings. Frequency ratings are used to evaluate food patterns and as an epidemiological tool (110-112).

Schuh and others (111) measured food acceptability in terms of the time interval between the repetition of a given item on the menu. The technique implies that individuals give answers to frequency rating questionnaires which correctly reflect their acceptance of menu items served at various intervals. This type of data is valuable in menu planning and indicates the maximum number of times an item can be used within a given time period. Schuh and co-workers' findings concluded that the frequency rating technique was not a valid measure of population attitude toward frequency of service of menu items.

Pilgrim (109) reported that food preferences, as expressed on a questionnaire, are a fair prediction of consumption. Preference not only predicts the average amount of food consumed but also the proportion of persons who will accept a serving of the food. Because preference, or degree of liking, does predict amounts consumed, Pilgrim defined acceptance as "consumption with pleasure." Kamen (113) devised questionnaires to establish the effect of certain variables on those who use data obtained from food consumption surveys. The first part of the questionnaire used the consumption rates of food as an index of food acceptance. The second part of the questionnaire inferred the absolute acceptability status of food.

Cosper (114) evaluated nutrient intake of adult women in Kansas by using the twenty-four hour dietary recall and the food frequency questionnaire. The food frequency questionnaire contained twenty food classifications and the subject reported how frequently each food was

eaten and the amount of food eaten. Food frequency in Cosper's study indicated daily nutrient intake based on weekly consumption of food. Cosper concluded that values obtained using food frequency would be a better indicator of what an individual would average over a period of several days or longer than the values obtained using a twenty-four hour dietary recall.

There are numerous methods used to record food frequency data. The method reported by Chassy et al. (112) determined food frequency by counting the number of times in a day each food was mentioned and adding up all frequencies of all foods in the food groups. This method evaluated the diet according to consumption within the food groups. A method used by Abramson et al. (110) recorded frequency in two ways: (a) the number of times the food was selected per week; and (b) the number of days per week.

Where simple and economical methods of detecting differences in usual diet between groups are being sought, Abramson and co-workers (110) reported that the main choice appears to lie between using the food frequency interview and the twenty-four hour recall or record. The food frequency interview is an interview of the usual intake, in terms of the frequency with which various food items are taken. The main limitation of the food frequency interview is its inability to provide data on individual nutrients. Practical points in favor of the frequency method are its simplicity. The food frequency interview can indicate if groups of subjects usual food patterns are similar, but will not indicate the nature of differences in terms of nutrients. Apart from its relative ease, the food frequency method has a possible advantage in that under certain circumstances, information about food patterns may be as useful as that about nutrients.

Dietary Survey Methods

Evaluation of individual nutritional status leading to identification of vulnerable groups within a population requires study of food actually consumed by a given individual. There are several ways of evaluating the adequacy of diets of an individual or a group. Pike and Brown (115) reported the four methods most commonly used to determine individual food consumption are: weighed intake, dietary history, food record, and estimation by recall.

The methodology used in diet surveys increasingly has come under scrutiny as to its reliability and validity. Since dietary survey methods are frequently used in the evaluation of nutritional intervention programs, it is essential to know their accuracy and limitations. The accuracy of a method is reflected by its internal validity, i.e., whether the method measures what it is intended to measure. Gersovitz et al. (116) stated that a prerequisite for testing internal validity of dietary survey methods is knowledge of what an individual has actually consumed. When food and nutritive intake derived from diet surveys is used to generate policy decisions and statements about nutritional status of groups, it is important that the sampling techniques used have a reasonable degree of accuracy and precision so erroneous conclusions are not drawn and perpetuated (117).

Dietary information can be determined through dietary interviews. Food habits, attitudes, and factors motivating an individual to eat can only be obtained through a personal interview. In considering dietary interviewing, Young (118) divided dietary interviews into two main classifications according to the circumstances under which they are conducted: those in a clinic and those in a field survey. The

questionnaire used in the field survey should be structured more carefully than the clinic survey to obtain reliable answers since time required should be held to a minimum. Both types of surveys require trained interviewers. From dietary survey data collected by seven interviewers, Church and co-workers (119) concluded that interviewers having similar backgrounds and training and working as a team are able to obtain comparable data.

Young and Trulson (120) evaluated the method of obtaining dietary data in several ways, and concluded the method used should depend upon the objective of the study and the hypothesis to be tested. Hunscher and Macy (121) reported the choice of method depends on the situation. Trulson (122) obtained dietary information from thirty-seven patients by three methods: a seven-day record, a dietary interview of food practices, and an average of three or more twenty-four hour recalls. Trulson and McCann (123) concluded it was best to use only one method in collecting data for any particular study since differences in food intake figures are possible. They stated that no one method was more reliable than another, but the interview was preferred as the method of choice for clinical studies since it might reveal long-range dietary practices.

Weighed Intake. A very accurate record of food consumption is by having a subject or trained person weigh all food consumed during a given period of time. Hunscher and Macy (121) report that the most accurate method is chemical analysis of food representing the diet actually consumed by individuals, but this is not a practical method. This method for obtaining food consumption data is expensive and time consuming and consequently is rarely used in nutrition surveys. Trulson

and McCann (123) report that in spite of the accuracy of the data obtained or quantities of food consumed, the method is limited in other ways. A major limitation of this method is that the individual may alter intake because of time and effort involved.

The weighed food intake, however, is standard procedure in a laboratory controlled metabolic study and, although a few surveys have involved weighed data, this method most often is limited to research studies. Under these circumstances, it is the researcher who is involved in the time element (115).

Dietary History. Pike and Brown (115) defined the dietary history as a tool designed to discover usual food intake patterns over a relatively long period of time and is most often obtained by interview. Various studies have indicated that no dietary history is exact (122-124). Young and co-workers (125, 126) found that the dietary history gave distinctly larger mean values than the seven-day record and the twenty-four hour recall. Young and co-workers (125) reported it is virtually impossible to predict the intake for an individual as estimated by a seven-day record from his or her dietary history with any degree of accuracy.

The dietary history is often used for studies of food habits or in hospital clinics. Burke (124), however, devised a method for calculation of intake from dietary histories and for their use as research tools. The research dietary history has the disadvantage of requiring highly skilled interviewers in order to obtain useful data. It has a definite advantage over other methods, that if properly conducted, the dietary history measures food intake over a relatively long period of

time. As devised by Burke the dietary history method is rather time consuming. Young and Trulson (120) reported that dietary history and modifications of the history technique appear to be especially useful in epidemiological studies, and in studies where interest is directed toward usual food pattern over a period of several years.

Food Record. The food record or dietary record is used most often in nutritional status studies. The dietary record, the individual's written diary of all food and beverages consumed, is a common survey tool. The dietary record is kept for varying lengths of time, usually three to seven days (115, 123, 127). Quantities of food are estimated in common household measures and occasionally the subject may be asked to measure food intake. Accuracy of the method depends largely upon the diligence and integrity of the subject and, when food is not measured, upon ability to estimate quantities of food. Eppright and co-workers (127) have emphasized the need of interpreting data from dietary records in a variety of ways in order to get a true picture of the food habits of a group of children.

Trulson and McCann (123) reported that a food record kept for one week when compared with a record after an interval of time gave similar means for the group, but showed considerable variation for the individual. Young and co-workers (126) found that the seven-day record was one of the most accurate methods for studying group means. Pike and Brown (115) reported the food record to be a fairly accurate estimate of food consumption over a designated period of time.

Estimation by Recall. Recall of food intake is almost always for a twenty-four hour period only, and for this reason it is generally

designated the twenty-four hour recall. The subject is asked to recall all food consumed during the previous day and to estimate quantities in ordinary measures or servings (115, 120, 123, 128). Young and Trulson (120) reported that the greatest limitation is that of human error, which is most difficult to estimate.

The age at which a child can serve as a valid respondent is an important criterion to determine. Bosley (129) found that children nine to eleven years of age were able to recall easily the foods eaten over a twenty-four hour period and delighted in measuring the quantity of food eaten. Children below nine years of age were found to have some difficulty in remembering what they ate for supper on the preceding day. Bosley also reported that children over eleven years of age have acquired enough information about the foods they should eat to influence their reports, although it may not have influenced their food habits.

Emmons and Hayes (130) concluded from their experiments that young children can provide information on their diets as accurately or more accurately than their mothers. Emmons and Hayes further stated that with increasing age, from grades one to four, a child's ability to recall a known lunch menu improves. Children in grade one remembered an average of 60.5 per cent of the foods and children in grade four, an average of 80.6 per cent. Meredith et al. (128) interviewed students nine to eighteen years old within hours after they had consumed a known menu. They found great error in the recall of food items and quantities; however, they did recognize that the complexity and unfamiliarity of the menu, as well as an interview technique which did not distinguish colors or portions of items, might have influenced the students' responses negatively.

Frank et al. (131) incorporated in the twenty-four hour recall method improved techniques, including special training of interviewers, the use of graduated food models, and detailed probing, to obtain reproducible data from children. Both qualitative and quantitative dietary information was collected using the improved twenty-four hour dietary method (131, 132).

Young and co-workers (126) in a frequently cited study, compared twenty-four hour dietary recalls with a seven-day record and dietary history to assess the amount of variation in nutrient intake between these three dietary sampling techniques. The results indicated that none of the three gave similar values for individual intake, but a twenty-four hour recall would yield approximately the same values as the seven-day record when used with groups of fifty persons or more and when a 10 per cent error factor could be tolerated.

In a 1976 study Madden et al. (133) attempted to measure the internal validity of the twenty-four hour recall method by comparing for the same meal, nutrient values derived from weighed dietary intake to nutrient values derived from twenty-four hour recalls of elderly subjects at congregate meal sites. Madden concluded that small intakes tended to be over-reported and large intakes under-reported in twenty-four hour recalls. Campbell and Dodds' study (134) on the effect of memory on twenty-four hour recall data between institutionalized older and younger people demonstrated that the older group did recall significantly fewer calories than did the younger population group. Memory per se, however, cannot explain the simultaneous over-reporting of small amounts and under-reporting of large amounts. Madden et al. (133) characterized this phenomenon as "talking a good diet," i.e., those who eat small amounts

think that they should eat more and those who eat large amounts are well aware that they probably should eat less.

For groups, one day's diet, whether obtained by twenty-four hour recalls or food records, can provide valid information on usual nutrient intake (126, 135). Chalmers et al. (135) concluded that this is true regardless of the day the information is collected. Eppright and co-workers (127) observed that different children have different diets on different days. Therefore, one day's diet may be atypical of their usual intake. Anderson and Sandstead (136) reported that the nutritive intake of a group is better obtained through a large number of one-day records than through a smaller number of multiple-day records.

Young and Trulson (120) stated that the validity of any method is influenced by the intelligence, motivation, and cooperation of the subject; by the techniques and expertise of the investigator; and by the rapport between the subject and investigator. The choice of method depends on the time element involved, the number of subjects, the amount of money available, and the limitation of time and personnel. There are limitations in all of the methods, the greatest being the limitation of human error, which is difficult to estimate.

Calculation and Interpretation of Dietary Information

Information on the nutrient content of food since the late nineteenth century has been useful to nutritionists to estimate dietary intake, to calculate therapeutic diets, and to study various aspects of food habits. Recently, computer technology has facilitated analysis of large amounts of data for many nutrients. Hertzler and Hoover (137) stated that computerized systems offer the advantages of comprehensive

analysis of many nutrients and the option for statistical interpretation of relationships among nutrients.

After a satisfactory method for collecting the data in a dietary survey has been chosen, an appropriate means of analyzing the data must be selected. The processing of diets by different methods of analysis may yield different results. The commonly used methods of analysis include calculations from tables of food composition and chemical analysis (138).

Food composition tables have been derived from various sources and compiled by groups in government, education, and the food industry. Elvehjem (139) reported that food composition tables have been used by nutritionists in education, dietetics, public health, and medicine in planning diets, in calculating the nutritive value of food supplies, or for projects to improve the quality of foods.

Food tables in common use are constructed to report average food values. Tables of food composition have varied in number of food items, number of nutrients, and classification schemes (137). The standard reference is the United States Department of Agriculture Handbook No. 8 (138). The first edition of Agriculture Handbook No. 8, published in 1950, incorporated values for frozen and cooked foods, as well as for prepared dishes (140). The revised 1963 edition contained major changes in data for fruits, vegetables, and meats (141). The United States Department of Agriculture Handbook No. 456 (142) contained revisions to update values and substitute more appropriate data for those previously published in the revised 1963 edition of Handbook No. 8. All foods listed in Handbook No. 8 and No. 456 are provided with code numbers for use in computer calculations.

The rapid rate at which the food industry is marketing new food products and fabricated foods has complicated the task of providing an accurate, up-to-date compilation of the nutritive contribution of available foods. Much of this information is included in the most recent revision of Home and Garden Bulletin No. 72, Nutritive Value of Foods (143).

With an accurate description of the kind and amount of food eaten, it is possible to use tables to calculate the amount of various nutrients present in a diet. This method assumes that the food consumed can be represented by the food described in the table (138). Elvehjem (139) stated that food composition tables are reliable determiners of nutrients in food, but the significance and limitations of the method should be considered.

Numerous problems are associated with the use of food composition tables. Food composition may vary considerably, depending on the growing conditions. Methods of handling foods during harvesting, processing, and home storage can greatly influence nutrient composition. Also, individuals using the tables may introduce errors in calculations, because the name of a food listed in a table may differ from the local and common name, depending on geographic location (137). Among the major limitations to the analysis of diets from food records are the variations and limitations in an individual's estimate of the amount of food eaten and failure to describe the food in sufficient detail (138).

In research situations, when it is essential to know as exactly as possible the intake of a nutrient, the food intake is weighed accurately and a representative sample is saved for chemical analysis in the laboratory. This method is very costly and is not used in routine

dietary surveys. It is useful when a carefully prescribed diet is being consumed (138).

Knowledge of the nutritive content of a diet is meaningless unless it can be compared to some standard. In the United States the most commonly used standard is the Recommended Dietary Allowances prepared by the Food and Nutrition Board of the National Research Council (34). These standards were established as the result of careful evaluation of evidence of nutritional needs for various nutrients by various population groups. These standards do not represent minimum requirements, and any failure to consume the recommended amounts must not necessarily be interpreted as evidence of dietary deficiencies. Guthrie (138) stated that because of the wide variation in need for a specific nutrient, a great deal of caution must be observed in comparing the intake of an individual to that of the recommended allowances.

Unless low dietary intakes are accompanied by some clinical or biochemical abnormalities associated with a lack of nutrient, it is dangerous to assume that the intake is below the need of that individual. Guthrie (138) stated that low intakes, however, should prompt an evaluation of nutritional status. Guthrie also contended that it is important to remember that dietary intake should not be confused with nutritional status. Dietary intake does, however, contribute to the evaluation of nutritional status. Dietary data, in the evaluation of nutritional status, provides evidence that is suggestive but not diagnostic of nutritional deficiency. Only when evidence associated with a nutrient deficiency is provided by more than one approach to assessment is it likely that a nutrient inadequacy does exist.

METHODOLOGY

Site of Study

The study was conducted at a public high school with approximate enrollment of 1,325 located in a medium-size midwestern city. Enrollment of students was divided into three classes (sophomores, juniors, and seniors) with approximately equal numbers of students in each classification. The high school operates with an "open campus" policy, allowing students to leave the campus during the lunch period if they choose. Also, students in the vocational-technical curriculum leave the campus after attending morning classes at the high school.

Lunch is provided at the high school and is served Monday through Friday. Students are scheduled for lunch during two time periods. The first lunch period is from 11:20 a.m. to 12:20 p.m. and the second lunch period is from 12:20 to 1:10 p.m.

The high school offers the Type A meal pattern. The Type A lunch is available in the regular lunch line, the salad bar, or a combination of items at the snack bar. Students may select a la carte items at the snack bar, in addition to, or independent of, the Type A lunch.

The philosophy of the school lunch in the district is to consider each customer and to provide for individual needs that would contribute to optimum health and growth of the school children. Goals and objectives for the school foodservice include the following (144):

1. To provide customers with wholesome, appealing meals consisting of a wide variety of well prepared, well seasoned, and attractively served foods;

2. To establish a nutritional pattern to provide one-third to one-half of the daily requirements established by the National Research Council;
3. To maintain clean, safe working conditions for all foodservice personnel;
4. To meet requirements and maintain records by guidelines provided.

Data for this research were collected during the fall semester of 1978. Prior to collection of the data, permission to conduct the study was secured from the College of Home Economics Committee on Research Involving Human Subjects. Permission was also obtained from the District School Foodservice Director and the Principal at the high school. An assistant principal was appointed as liaison for the project.

Organization of Study

Research Design

The study consisted of two phases: I. Identification of the sample and II. Analysis of food habits and attitudes of secondary school students. The instrument for the first phase of the study was designed to identify participants and non-participants of the school lunch (Appendix A). The instrument for the second phase of the study was designed to identify students' views and attitudes on the school lunch program and factors affecting participation (Appendix B). Following the interview, a twenty-four hour dietary recall was obtained from each student to assess food intake (Appendix C).

Phase I. Identification of Sample

The questionnaire for Phase I included the following information: student classification or grade level, sex, age, means of transportation

to school, distance from home to school, and usual lunch habits during the school week. A statement on the questionnaire explained that later a selected group of students would be interviewed about their food habits and views on school lunch. The students were asked to indicate if they would be willing to be interviewed. The key purpose of the questionnaire was to identify participants and non-participants of the school lunch. The data from the questionnaire were used to select the sample for phase II of the study.

Pilot Testing of Phase I. The members of the student council at the high school were asked to complete the questionnaire before distribution to the study sample to determine if directions and questions were clearly stated. Minor changes were made in the instrument following suggestions of this group.

Selection of Sample for Phase I. Sophomores and juniors were selected as the population for the study. These classes were selected because several of the participation studies have involved only sophomores; whereas, in schools with an open noon hour, one key issue affecting participation appears to be the availability and use of the automobile which usually occurs between the sophomore and junior year of high school.

Distribution of the Instrument for Phase I. Sophomore English Composition and Practical English and junior American Literature and Practical English classes were selected to complete the questionnaire. English classes were selected since approximately 95 per cent of all students are enrolled in English. A listing of the teachers and a

schedule of classes were obtained from the assistant principal. Classes were numbered consecutively within each grade classification. A list of random numbers was generated by a computer program and classes corresponding to these numbers were selected for distribution of the questionnaire.

Initially, approximately 30 per cent of the student population (N = 873) of sophomores and juniors were selected randomly to participate in phase I of the study. Enrollment was almost equal for the two grade classifications; therefore, an equal number of classes from each classification were selected for the 30 per cent sample. The return rate of the number of students who indicated their willingness to participate in phase II did not meet the needs of the research project; therefore, additional classes were selected randomly and the questionnaire was readministered. A sufficient number of students who indicated that they were willing to be interviewed were identified after additional classes participated in completion of phase I of the study.

Before the administration of the questionnaire in phase I, notices were sent to the teachers of the selected classes introducing the study (Appendix D). A packet was delivered to each teacher prior to the date of administration of the questionnaire. The packet contained the instruments and a set of instructions for the teachers to read to the classes (Appendix E). The instructions indicated that students who did not wish to participate could return the questionnaire unanswered. After administering the questionnaire to their participating classes, the teachers were asked to return the questionnaires to the assistant principal's office in the envelopes provided. The second time the questionnaire was administered, personal contact was made with each

teacher participating in the study. Again, packets were delivered to the teachers.

Phase II. Analysis of Food Habits and Attitudes of Secondary School Students

Phase II of the study was designed to identify students' views and attitudes on the school lunch program and factors affecting participation and to assess dietary intake. An interview consisting of sixty-six open-ended questions measured student attitudes. A twenty-four hour dietary recall was obtained from each student to assess food intake.

Development of Interview Guide. The initial questions for the interview were adapted from those used by Grant (3), Bachemin (53), and Evans (67) in their studies related to school foodservice. The questions were reviewed by the Director of School Foodservice and by the faculty advisor to the project prior to being used in the interviews. The first draft of the questions was used as a guide and additional questions were added as the interviews were conducted. A selected group of twelve students were asked to participate in these initial interviews to evaluate whether or not questions were stated clearly. All interviews were tape recorded. Tapes were analyzed carefully to determine if questions met the objectives of the research. The questions were reviewed from the results of these preliminary interviews; a number of questions were added and several were revised. Also, the questions were reordered to improve the sequence. Probes were developed to assist the respondent in giving relevant answers.

The revised interview was reviewed by several authorities in the field and was tested again. Six members of the student council at the

high school participated in the second trial interviews. The tape recordings again were analyzed and additional changes were made based upon students' responses.

The final instrument was printed on three by five inch cards. Each question with the corresponding probes was printed on a separate card.

Development of the Dietary Recall Form. A twenty-four hour dietary recall form was developed from those used by Schorr et al. (86), Gaines and Daniel (95), Stringfellow (106), and Frank et al. (131) in their studies related to nutrient intake of school children. As suggested by Frank et al. (131), a list of probing questions was developed to assist in obtaining a complete recall from the students. A chart of food models was used to illustrate common portion sizes. The recall form was administered to a selected group of students before it was administered to the study sample. The recall was tape recorded and analyzed to check for accuracy. After reviewing the recalls, additional probing questions were developed to assist in obtaining a complete recall from students (Appendix F).

Selection of the Sample for Phase II. In phase II, an interview was conducted with 104 students, fifty-two sophomores and fifty-two juniors. Of the fifty-two students at each grade level, twenty-six participants of the school lunch and twenty-six non-participants and an equal number of males and females within these categories were selected using data from the questionnaire in phase I.

Students' responses from questions seven through fourteen on the phase I questionnaire provided the information necessary to classify the students as participants or non-participants. Students who indicated

that they participated in the school lunch program between three to five times per week were identified as participants of the school lunch program. This information was obtained from student responses to questions seven, eight, and ten. Students who indicated that they did not participate in the school lunch program between three to five times a week were identified as the non-participants. This information was obtained from students' responses to questions eleven through fourteen.

All students who indicated that they were willing to be interviewed and could be classified as a participant or non-participant by the specifications set were divided into classifications. The students were numbered consecutively within grade, sex, participant, and non-participant classifications. Thirteen students were selected randomly from the eight classifications: sophomore male participant, sophomore male non-participant, sophomore female participant, sophomore female non-participant, junior male participant, junior male non-participant, junior female participant, junior female non-participant. This method enabled the researcher to select an equal number of female and male participants and non-participants at the two grade classifications. The remaining students who met the defined constraints and who were willing to take part in the study served as alternates if for some reason all of the original sample of 104 could not be interviewed.

The students selected for the interview phase received a letter informing them that they had been selected as an interviewee and would be contacted by phone to set up an appointment. Midway through the phase II data collection period, an additional letter was sent to the remaining students informing them that the study was still underway and that they would be contacted soon for an appointment to be interviewed (Appendix G).

Training of Interviewers. Six university graduate students were employed to assist with the interviewing, since it was desirable to have all interviews conducted in a relatively short span of time. The researcher held three training sessions with the interviewers. The first training session was to explain the objective and methodology of the study. The importance of the interview as a tool in research was explained, as well as the role of the interviewer, and general rules of interviewing (145-148) (Appendix H).

During the second training session instructions were given for initial contact of the students (Appendix I). Also, the training session consisted of a discussion of general instructions explaining the introduction and opening statement for the interview and orienting the interviewers to the procedures to follow in an actual interview (Appendix I). An interview with the use of probes was conducted for demonstration purposes. Also, the interviewers were trained on how to use the twenty-four hour dietary recall form. The interviewers were provided with the list of probing questions to be used in obtaining a complete recall from the students (Appendix F). Before the third training session, the interviewers practiced conducting the interview, once as an interviewer and once as a respondent. The practice sessions were tape recorded. The researcher then reviewed the tapes to check quality and to see if all interviewers were ready to proceed with data collection.

The third training session was designed to answer questions the interviewers might have after practicing the interviews and to review the procedure. Also, a tour of the high school was conducted so the interviewers would be familiar with locations designated as places where interviews could be conducted.

Packets were prepared for the interviewers. The packets contained:

1. Set of interview cards (Appendix B);
2. Dietary recall forms (Appendix C);
3. List of probing questions for dietary recalls (Appendix F);
4. Chart of food models;
5. List of the high school students to be interviewed;
6. Appointment forms to be used for contacting students (Appendix I);
7. Instructions to the interviewers (Appendix I);
8. Procedure for the interview (Appendix I);
9. Forms to record tape footage during interviews (Appendix I);
10. Checklist of items needed at each interview (Appendix I);
11. Schedule of class times at the high school (Appendix I).

Interview Procedure. The interviews were conducted during the months of November and December 1978 on Tuesday through Friday so usual school lunch habits were reported on the recall form. Each student was contacted by the assigned interviewer by phone and an appointment was made to meet the student at the high school or at another convenient location.

All interviews were tape recorded; footage of the tape was recorded at intervals in the interviews to aid in accessing responses to various questions (Appendix I). Following the series of questions, the interviewer conducted a twenty-four hour dietary recall. The interviewer recorded the student's answers as the student responded on the appropriate form (Appendix C). The list of probing questions of "hidden items" such as butter on toast, dressing on salad, etc. was given to each interviewer to use in aiding the student to recall all foods consumed

(Appendix F). A chart of food models from the National Dairy Council also was used by the interviewers to help students identify portion sizes.

To maintain control of the interviews, all interviewers were supervised after they began work. After each interviewer had conducted two interviews, the tapes were reviewed to check if correct procedures were followed. The researcher continued to monitor the work of the interviewers and reviewed the tapes of the interviews periodically during the study period.

Coding the Dietary Recall. A fourth training session was conducted with the interviewers to train them to code data correctly from the dietary recalls. Food code and quantity code numbers from Home and Garden Bulletin No. 72 (143) were used. A list of foods eaten by students which were not included in the Bulletin was compiled. Food codes and quantity codes were assigned. Nutrient data for these foods were compiled from various sources (142, 149, 150). Also, a code was assigned for a vitamin supplement. Since students interviewed frequently were not aware of the brand, the value of a standard multivitamin supplement [1] was used for all students reporting use of vitamins. A handout was given to the interviewers on portion sizes of selected menu items at various fast food chains. This handout served to aid the interviewers in converting the portion sizes of menu items of fast food chains to portion sizes as stated in Home and Garden Bulletin No. 72. The interviewers also were instructed how to transcribe the information from the dietary recalls to the coding form and how to code each student's general information (Appendix J).

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[1] Miles Laboratory, "One a Day" brand.

Data Analysis

Analysis of Phase I Questionnaire Data. Data from the questionnaire distributed in Phase I were coded and key punched on eighty-column cards for electronic data processing. Frequency distributions were compiled for a description of the survey group.

Procedure for Recording Data from Phase II Interviews. Each interview was analyzed through a process of listening to the tape and recording the response to each question. Prior to the analysis of each interview, the tapes were categorized according to the eight classifications of students established earlier (e.g., junior female participants). Responses and trends from each group were tabulated.

Analysis of Dietary Recall Data. Dietary recall data, which had been coded by the interviewers as described previously, were key punched on eighty-column cards for analysis. Nutrient data from the food items not included in Home and Garden Bulletin No. 72 (143) were key punched for addition to the data base.

A program, entitled "MEALS," was developed at the Kansas State University Computer Center for conversion of food intake data into nutrient values by meals (Appendix K). A card with the nutrient intake totals was generated for each subject for each of six meals: breakfast, a.m. snack, lunch, p.m. snack, dinner, and evening snack. Also, a seventh card was generated with nutrient values of the multivitamin supplement for those students reporting use of a vitamin on the dietary recall day. This procedure permitted analysis of nutrient intake by meal and for the total day with or without the vitamin supplement.

The data base for the program was the nutrient information for all food items in Home and Garden Bulletin No. 72, with the additions noted above, for conversion of the list of foods eaten into nutrient values by meals. Data from students' dietary recalls were input for the program. The input format is specified in the coding instructions in Appendix J. The output format is described in Appendix K. Output data included the nutrient values by meals, plus additional information for use in further analysis of data; e.g., sex, source of meal, classification code.

Source of meals was tabulated for the group of students interviewed by meal. Students consuming one of the Type A lunch alternatives (regular lunch, snack bar, or salad bar Type A lunch) were classified as participants for analysis of dietary recall data. All other students were classified as non-participants.

Two-way analysis of variance, using the Statistical Analysis System general linear models procedure (151), was used to analyze nutrient data. Independent variables were: (a) group--participants and non-participants, and (b) sex--females and males. Mean intakes were computed for calories and eight nutrients (protein, calcium, iron, vitamin A, thiamine, riboflavin, niacin, and ascorbic acid) for each of the following:

1. total day's nutrient intake from food
2. total day's nutrient intake plus vitamin supplement
3. total day's intake as percentage of recommended dietary allowance (RDA) for reference male or female, 15 to 18 years of age (34)
4. total day's intake with vitamin supplement as percentage of RDA
5. nutrient intake at lunch
6. nutrient intake at lunch as percentage of RDA

7. nutrient intake from foods consumed between meals in the morning, afternoon, and evening as percentage of total day's intake.

Students' diets also were noted as excellent, good, fair, or poor using the procedure described by Cosper (114):

Excellent = consumption of 100 per cent or more of the RDA for all eight nutrients (protein, calcium, iron, vitamin A, thiamine, riboflavin, niacin, ascorbic acid)

Good = consumption of at least 66.7 per cent of the RDA for all nutrients

Fair = consumption of at least 50 per cent of the RDA for all nutrients

Poor = consumption of less than 50 per cent of the RDA for one or more nutrients.

Diets of male and female participants and non-participants were rated using these criteria. The number of students with diets in each classification were compiled using the cross tabulation option in the Statistical Package for the Social Sciences (152). The total day's intake and total day's intake with vitamin supplement were rated. Also, lunch intake was rated using one-third of the RDA as the standard for comparison. This standard was used because it is the nutrient goal of the National School Lunch Program (2).

RESULTS AND DISCUSSION

Phase I. Selection of Sample

General Information

Table 1 summarizes demographic data for the 383 students in the randomly selected classes who completed the survey questionnaire in Phase I of the study. The purpose of the first phase of the study was designed to identify participants and non-participants of the school lunch. More sophomores than juniors were in the group as described in the methods section because the first time the instrument was administered, a lower percentage of sophomores indicated they were willing to participate in

Table 1: Description of survey group

	total group	
	N[1]	%
classification:		
sophomore	232	60.6
junior	151	39.4
sex:		
female	208	54.3
male	175	45.7
age in years:		
14	7	1.9
15	210	55.1
16	130	34.1
17	32	8.4
18	2	0.5

[1]N varies slightly because of nonresponses.

the interview in Phase II. Therefore, the instrument was distributed to more sophomore classes than to junior classes to insure an adequate representation of sophomore students in the sample.

Of these students in the survey phase, 54.3 per cent were females and 45.7 per cent were males. The majority of the students were fifteen or sixteen years of age.

Lunch Habits of Students

Students were asked to indicate their usual lunch habits during the school week (Table 2). Few students ate the Type A school lunch (available in three menu choices) five times a week. Only 9.1 per cent ate the regular school lunch five times a week, 3.4 per cent ate the school lunch

Table 2: Lunch habits of survey group (N = 383)

	times per week					
	0	1	2	3	4	5
	%	%	%	%	%	%
eat the regular Type A lunch	48.0	18.5	8.4	7.6	8.4	9.1
eat the snack bar Type A lunch	66.3	13.0	8.4	5.5	3.4	3.4
eat the salad bar Type A lunch	79.6	12.5	4.7	2.1	0.8	0.3
eat a snack bar item for lunch	52.5	18.0	12.5	8.9	3.9	4.2
bring a sack lunch	90.1	3.4	1.8	1.6	1.0	2.1
go home for lunch	84.3	6.5	2.9	2.4	2.1	1.8
buy lunch off campus	40.6	24.5	10.7	9.1	6.0	9.1
do not eat lunch	75.6	12.5	5.7	1.0	2.1	3.1

combination at the snack bar, and 0.3 per cent ate the school lunch from the salad bar.

About half of the students (52.5 per cent) indicated that they never bought a snack bar item for lunch. Few students indicated they brought a lunch from home; in fact, 90.1 per cent reported they never brought a lunch from home. Also, 84.3 per cent indicated that they never go home for lunch. During the usual school week, 75.6 per cent never skipped lunch and only 6.2 per cent skipped lunch as often as three or more times per week.

Since there was an "open campus" policy, the students had the alternative of buying lunch off campus. Only 9.1 per cent of the sample bought lunch off campus five times a week. Slightly over 40 per cent of the students indicated they never bought lunch off campus. Of the 383 students in the total group, slightly less than half (42 per cent) indicated they were willing to be interviewed in Phase II, which may influence the results.

Student responses from questions seven through fourteen on the questionnaire provided the information necessary to classify the students as participants and non-participants. All students who indicated they were willing to be interviewed were classified as a participant or non-participant. The sample of 104 students was selected randomly according to the eight classifications established earlier to take part in the interview survey (e.g., sophomore female participant).

Ten alternates were selected in random order to replace students in the original random selection who did not participate. Various reasons prevented participation: three students dropped out of school or moved prior to the interviews and three students decided to withdraw from the

study. The remainder were replaced with alternates if they failed to keep an appointment after three appointments were scheduled.

Phase II. Interview Survey

General Information

Phase II of the study was designed to identify students' views and attitudes on the school lunch program and factors affecting participation. All interviews were taped and analyzed according to the eight classifications of students. Interview questions were grouped into seven major categories: food habits, experience with school lunch in earlier education, lunch patterns, influence of other people on school lunch participation, evaluation of the school lunch menu, assessment of non-food related aspects of school lunch and lunch away from home, and suggestions for the program (Appendix L).

Food Habits

Evaluation of Food Habits. When students were asked to evaluate their food habits, 9.6 per cent of the participants rated their habits as excellent, while 3.9 per cent of the non-participants believed they had excellent habits (Table 3). The majority of both participants and

Table 3: Student ratings of food habits

group	excellent	good	fair	poor
	%	%	%	%
participants (N = 52)	9.6	67.3	9.6	13.5
non-participants (N = 52)	3.9	53.4	28.9	13.5

non-participants, however, believed they had good food habits, 67.3 and 53.9 per cent respectively. A larger number of the non-participants than participants (28.9 per cent) rated their food habits as fair, whereas 13.5 per cent of both the participants and non-participants stated they had poor food habits.

Friends' Food Habits. Results of the students' opinions of their friends' food habits are summarized in Table 4. Overall, the participants rated their friends' food habits higher than did the non-participants.

Table 4: Rating of friends' food habits

group	excellent	good	fair	poor	no opinion
	%	%	%	%	%
participants	--	53.8	21.2	17.3	7.7
non-participants	3.9	44.2	28.8	19.2	3.9

Changes Needed. Of the students interviewed, 50 per cent of the non-participants and 53.8 per cent of the participants stated they needed to change their food habits; whereas 50 per cent of the non-participants and 46.2 per cent of the participants believed they did not need to change their food habits. Students listed several needed changes. The most frequent response was to eat a balanced diet at regular times. Listed in order of descending frequency, other responses were: eat less "junk" food, eat fewer snacks, eat less, eat a better variety of foods, eat less sweets, eat vegetables, eat breakfast, change method of dieting, and drink more milk.

Meal Skipping. Students were asked to describe their meal skipping behavior (Table 5). This behavior differed between male and female students; 15.4 per cent of the female participants and 19.2 per cent of the female non-participants never or rarely skipped meals. However, 65.4 per cent of the male participants and 38.5 per cent of the male non-participants rarely or never skipped meals. A larger percentage of both female and male non-participants skipped lunch than did the participants. Breakfast was the most frequently omitted meal; although male non-participants skipped lunch more frequently than breakfast. Females of both participant and non-participant groups reported they skipped breakfast much more frequently than did males. The evening meal was the least frequently omitted meal. This finding is supported by de Leon Valerio's (78) study of participants and non-participants of the school lunch program. Also, the findings are supported by Huenemann et al. (77) who reported that the meal most often eaten by adolescents was dinner.

Table 5: Meal skipping behavior

group[1]	never or rarely skip meals	meals skipped			
		breakfast	lunch	dinner	2 or 3 meals
	%	%	%	%	%
female participants	15.4	42.3	15.4	11.5	15.4
female non-participants	19.2	38.5	19.2	3.9	19.2
male participants	65.4	19.2	11.5	3.9	--
male non-participants	38.5	19.2	30.8	--	11.5

[1]Each group, N = 26.

The most frequent reason given by students for skipping breakfast and lunch was not having enough time. Among the comments for skipping breakfast were these:

"I'm not hungry and don't feel like eating in the morning."

"I can't digest breakfast and I run better on an empty stomach."

"I'd rather sleep than eat."

"No energy is needed till lunch."

Students gave several reasons for skipping lunch. A few students stated that they skipped lunch because they did not like the food. This finding is supported by Hinton et al. (71) who stated that the main reason given by teenagers for skipping the noon meal was simply that they did not like the food available. Additional reasons given by students in regard to skipping lunch were: not being hungry, had to study, had errands to run, and did not have any money. Among the comments were these:

"It's the middle of the day and I can get by without it."

"I'm not hungry because I ate too many calories at breakfast."

"It's the easiest meal to skip."

Reasons given for skipping dinner were these: "it's boring," "don't have time," "don't like the food," and "ate too much at lunch." Hinton et al. (71) reported that dinner was often omitted because of dislike of the food.

Snacking Behavior. Students were questioned only in regard to their snacking behavior in the morning. Of the students interviewed, 80.8 per cent indicated they did not have a snack available to them in the morning. Of the 19.2 per cent who indicated they had access to a snack, only 30

per cent of the group actually consumed a morning snack. The students identified the snacks they consumed as "pop," potato chips, and "junk" foods.

Experience with School Lunch in Earlier Education

Frequency of Participation. The participants and non-participants reported a high level of participation in school foodservice in elementary and junior high school (Table 6). In junior high school a greater percentage of non-participants reported they did not eat the school lunch (11.5 per cent). Only 3.8 per cent of the participants reported not eating the school lunch in junior high school. School lunch was available to a large majority of the group at both levels.

Table 6: Prior participation in school lunch

group	ate lunch	did not eat lunch	no school lunch program	no response
	%	%	%	%
		elementary school		
participants	76.9	17.3	5.8	--
non-participants	80.7	11.5	5.8	2.0
		junior high		
participants	94.2	3.8	2.0	--
non-participants	88.5	11.5	--	--

Characteristics of the School Lunch Program. Fifty per cent of the participants and 44.2 per cent of the non-participants reported that the lunch was prepared at the school in elementary school. Thirty-five per

cent of the participants and 33 per cent of the non-participants believed the lunch was transported from another school. Of the total group, 16.3 per cent did not know where the lunch was prepared.

Of the participants, 92.3 per cent reported that menu choices were not offered in elementary school compared to 78 per cent of the non-participants. One individual could not recall if there were menu choices.

In junior high, 42.3 per cent of the participants and 34.7 per cent of the non-participants reported no menu choices were available to them. Choices that were mentioned by the students included: snack bar items, salad bar, choice of milk, choice of vegetable, cold cuts, sandwiches, choice of fruits, choice of the regular lunch, or the leftovers from the previous day's lunch.

Views of the Program in Elementary School. A higher percentage of non-participants (69.2 per cent) reported a more positive overall view of school lunch than did the participants (55.8 per cent). Interestingly, students expressing a dislike of school lunch included 19.2 per cent of the participants and 5.8 per cent of the non-participants. Over 15 per cent of the participants and 9.6 per cent of the non-participants had no opinion of the program at the elementary level.

Among the comments of students concerning elementary school lunch were:

> "Whenever I ate the school lunch I was excited about it, because it was different."
>
> "It was okay but we never got enough to eat."
>
> "Everything was rationed out to you."
>
> "It was something fun to do. School lunch was a real privilege to eat."

The majority of participants (58 per cent) and non-participants (65.4 per cent) believed that teachers should eat lunch with their students. Over 20 per cent of participants and non-participants disagreed that the teacher should eat with students; the remainder had no opinion. The following were typical opinions supportive of teachers eating with elementary classes:

> "It would have a positive effect on students' opinion of school lunch if they saw teachers eating it."
>
> "I only saw my teacher in class, it would have been great to have eaten with my teacher and be friends and know each other better."
>
> "You are influenced a lot by teachers, if you see them eating it and enjoying it, you'll think that's good and you'll eat it too."

Typical comments of those opposed to eating with teachers were:

> "We always had a teacher at our table and we couldn't have any fun."
>
> "My teacher used to make me eat all the food on my plate and I didn't like it, so I had to always miss recess. So I didn't like school lunch."

Other reasons given by the students for teachers eating with students included: supervision, teaching manners, and improvement of food habits. Students who did not think that teachers should eat with elementary students gave the following reasons: teachers make students nervous, teachers and students need a break from each other, and teachers would tell students what to eat.

Views of the Program in Junior High. Interestingly, a slightly higher percentage of the non-participants (48.1 per cent) reported they liked the junior high school lunch than did the participants (40.4 per cent). Over 36 per cent of the participants and 32.7 per cent of the

non-participants reported they did not like the junior high program. Only 11 per cent of the participants and 9 per cent of the non-participants stated the lunch program was not as good as in elementary school. Conversely, a small percentage of participants (5.8 per cent) and non-participants (3.8 per cent) stated the junior high lunch was better than the lunch in elementary school. The remainder expressed no opinion.

Current Opinions of the Program. Table 7 summarizes the current opinions of the participants and non-participants of the school lunch program in relation to previous experience. Over 70 per cent of the participants stated that the lunch was better at the high school while only 40.4 per cent of the non-participants expressed this belief. A greater percentage of non-participants (36.5 per cent) stated the high school lunch was not as good as it was in earlier years than did

Table 7: Current opinions of the school lunch program

opinions	participants	non-participants
	%	%
high school lunch better than elementary or junior high school	71.2	40.4
lunch not as good as elementary or junior high school	19.2	36.5
larger servings needed	1.9	5.8
appreciate lunch at high school more than in elementary or junior high	7.7	--
like to drive and go off-campus	--	13.5
price is unreasonable	--	1.9
lunchroom too crowded	--	1.9

participants (19.2 per cent). Previous studies by Garrett and Vaden (153), Evans (67), Gutsch (84), and Gargano (154) also found that frequent participants were more positive in their reactions toward school foodservice than were infrequent participants. Various opinions of the program included: larger servings are needed, students prefer to drive and leave campus over the lunch hour, the price is unreasonable, and the lunchroom is too crowded.

Only six of the 104 students interviewed could not identify any of the menu choices available at the high school. Five of the students were non-participants and one student was a participant. Over 94 per cent of the students could identify several available menu choices. One student replied, "They offer food that the FDA said was okay to serve in school lunch."

When students were asked what they knew about the National School Lunch Program (NSLP), 89 per cent said they knew nothing. This finding supports the need for nutrition education in schools. Non-participants' responses included:

> "I saw a show on 60 Minutes once about it."
>
> "They try to give you good nutrition, a proper diet, and a good lunch."

Among the comments expressed by the participants on the NSLP were as follows:

> "One day everybody eats the same food across the United States."
>
> "They have one week when it's observed."
>
> "They have to serve 25 per cent of the RDA's."
>
> "All schools in Manhattan get the same lunch."

"I'm on YAC and I know how much money is spent."

"They put posters up during National School Lunch Week."

Lunch Patterns

Frequency of School Lunch Participation. Frequency of participation in the school lunch program was analyzed in relation to participation. Over 94 per cent of the students classified as participants in Phase I indicated they ate the lunch on a regular basis (Table 8). Of the students identified as non-participants, 86.5 per cent indicated they did not eat the school lunch on a regular basis.

Table 8: Participation in the school lunch program

group	eat the school lunch on a regular basis	do not eat school lunch on a regular basis
	%	%
participants	94.2	5.8
non-participants	13.5	86.5

Students were asked to indicate the number of times per week that they ate the school lunch (Table 9). The majority of participants indicated they ate lunch at school three to four times a week. The highest percentage of non-participants (46.2 per cent) ate school lunch once or twice a week, while 38.6 per cent rarely or never ate lunch at school.

Approximately two-thirds of the participants stated they ate school lunch on special events. Over 57 per cent of the non-participants indicated they did not eat the lunch on special events.

Table 9: Frequency of participation in the school lunch program

frequency	participants	non-participants
	%	%
every day	40.4	3.9
3-4 times a week	50.0	11.5
1 or 2 times a week	5.8	46.2
rarely or never	3.8	38.6

General Factors Affecting Participation. Students were asked to indicate reasons for buying the school lunch. Responses were basically the same for participants and non-participants. About 10 per cent of the non-participants and 7 per cent of the participants indicated they liked nothing about having lunch at school.

The two most frequent reasons given by students for buying the school lunch were that they liked the food or it sounded good and they were hungry. Reasons given by participants included: "I have a lunch ticket," "lunches are cheaper than going off campus," and "it's easier than packing a lunch." One participant stated that "the meals fill me up more than going to McDonald's." Non-participants expressed the following reasons for buying a school lunch periodically:

"I don't want to go out when the weather is bad."

"I don't have a ride."

"I don't have money to go out."

"The meals are well balanced at school."

Two additional comments are typical of other student reactions. A participant stated "I like to have lunch at school because I can eat

lunch leisurely and when I go off campus I have to get my food and eat it in the car." A non-participant stated "it's nice not to have to go out and waste your gas."

Another key reason given by students for eating lunch at school was the opportunity to talk with friends. These findings are supported by Bachemin's (53) and Grant's (3) research.

Responses to the question concerning what students liked about having lunch at school were similar to those discussed above related to reasons for buying a lunch. Reasons included: "it's easier to stay at school," "don't have to worry about getting back to school on time," "it's convenient," "have more time at school," "it's fast," and "need to study."

When non-participants were asked why they did not buy the school lunch, 50 per cent of the students gave reasons relating to the food and crowded cafeteria conditions. Other reasons included: "like to eat out and get away from school," "long lunch lines," "don't have enough time," "meal tickets don't give any choice," "friends go other places," "need to study," "not hungry," and "don't like the people who work in the cafeteria." These findings are supported by Hundrup (51) who reported that other eating facilities near campus and lunchroom capacity affected participation.

Participants were asked to respond to the question of what they disliked about having lunch at school. Crowded conditions of the cafeteria was the most frequent response (54 per cent). Atmosphere of the lunchroom, long lines, taste of the food, slowness of cafeteria workers, lunch period too long, servings too small, no choice of menu items, no "pop," and not enough time were other reasons given by students. Law et al.

(54) also reported that students disliked eating at school because of waiting in line and small servings. A small percentage (11.5 per cent) of the participants did not express negative views.

Participants assessed the issue of dislike of school lunch in the following way:

> "You don't get all the time you want, there are so many people coming in and if you are just sitting around, they [supervisors] will ask you to leave."

> "The atmosphere is disgusting, it doesn't help your manners. If I had money I'd go elsewhere. I hate going back in line twice to get more food. When you are gone, someone takes your seat."

Frequency of Eating Lunch Away from School. When students were asked if they ate lunch off campus, 84.6 per cent of the participants and 92.3 per cent of the non-participants indicated they ate lunch off campus at least sometimes (Table 10). Non-participants who never ate off

Table 10: Reports of off campus lunch

group	sometimes eat lunch off campus	never eat lunch off campus
	%	%
participants	84.6	15.4
non-participants	92.3	7.7

campus either brought a sack lunch or bought snack bar items rather than a Type A alternative. Over 28 per cent of the non-participants stated that they ate lunch off campus every day (Table 11). None of the participants reported eating lunch off campus every day. Over fifty per

cent of the participants and 25 per cent of the non-participants indicated they rarely or never ate off campus.

Table 11: Frequency of eating lunch away from school

	participants	non-participants
	%	%
every day	--	28.9
3-4 times a week	3.9	34.6
1 or 2 times a week	44.2	11.5
rarely or never	51.9	25.0

Reasons for Eating Lunch Away from School. Three-fourths of the students eating lunch off campus reported fast food establishments as the place where they usually had lunch (Table 12). Other places included home or friend's home, buffet type restaurants, pizza restaurants, and outdoor areas close to the high school.

Table 12: Selection of off campus places for lunch

place	percentage of students selecting (N = 104)
fast food	75.0
home or friend's home	14.1
buffet restaurants	4.4
pizza restaurants	4.4
school grounds, park, or other outdoor area	2.2

Students were asked to indicate why they went to the places they did when they ate lunch away from school. Over 54 per cent of the non-participants and 33 per cent of the participants gave reasons related to food. Grant (3) also reported that reasons given most often by students who ate elsewhere were that the food was better and they wanted a choice. Approximately one-fourth of the students indicated they could eat quickly at the various places they went for lunch. Reasons given by both participants and non-participants included: place is close to get to, friends go there, change of atmosphere, inexpensive, work there and get a discount, and like to go out. The most frequent reason given by both groups for eating at home was that meals are free. A typical comment of a non-participant regarding lunch at home was, "Mom fixes what I want at home for lunch"; whereas eating at a fast food restaurant was considered a change. As one student explained, "I eat straight meals at home and school." A number of students carried a sack lunch to the zoo located close to the high school. Typically they commented, "I like to eat at the zoo with my friends. It's nice and quiet there." Participants expressed the following opinions concerning why they occasionally ate lunch at a fast food restaurant:

> "Everybody goes there. The food is okay and cheap. I go there on Friday's cause everyone is making plans for Friday night."
>
> "I have a 'Big Mac attack' or I get hungry for a taco."

A variety of reasons were expressed by both participants and non-participants regarding what they liked about the other places where they ate lunch. The majority of the reasons were the same as when students were asked why they frequented the places they did. Again, a high percentage (64 per cent) of responses were related to food. Among reasons

given were: tables are cleaned off, "don't have to spend money on what you don't want," school lunch is boring, less noise, nice change from the rest of the week, receive larger servings, the food is hot, better quality food, and more for the same price. Participants expressed the following statements on what they liked about the other places where they ate lunch in comparison to the school lunch and the cafeteria:

> "It's fun to go out and eat on your own with your friends."
>
> "Can get what you want without being told it's not good for you."

Among the comments of non-participants were:

> "It's what teens eat--hamburger, pizza, and junk foods. The cafeteria is where people go that don't have cars and are pretty rowdy. I don't hang around with people like that."
>
> "Nothing food wise. I prefer the school cafeteria because you get to eat off a plate and have silverware instead of having to eat out of little boxes."

During the interview, the students were asked why they believed students leave the campus for lunch. Both participants and non-participants believed the two most frequent reasons for leaving campus during lunch were to get away from the school and dislike of the food at school, 36.5 and 35.5 per cent respectively. Other reasons given by students were: to be with friends, peer group pressure, to socialize, to do other things, have cars to leave or live close to school, it is fun to drive around, more variety, too crowded at school, less noise, to relax, and to get away from supervision. To cite an example, a non-participant stated "lots of students like to smoke and they can take off at lunch to smoke." Another opinion of a non-participant was "it's kind of fun and it's the first time we've had a chance to leave the campus for lunch." One participant stated, "Students don't want to try the food because they have heard so much about it."

Usual Menu Choices at Lunch. Students were asked to indicate their usual source of lunch when they ate at school. Results of the sources of lunch are summarized in Table 13. When eating lunch at school, 53.8 per cent of the participants and 25 per cent of the non-participants indicated their usual source of lunch was the regular Type A lunch menu, rather than the Type A snack lunch or salad bar. The lunch source selected most frequently by non-participants was a snack bar item (30.8 per cent), rather than one of the Type A alternatives.

Table 13: Lunch alternative selected at school

source	participants	non-participants
	%	%
regular Type A lunch	53.8	25.0
snack bar Type A	9.6	5.8
salad bar Type A	15.4	17.3
regular Type A lunch plus snack bar item	--	7.7
regular school lunch or salad bar (same frequency)	13.5	1.9
snack bar item	7.7	30.8
never eat at school	--	11.5

Among reasons for selection of the regular school lunch included: like the food, sounds best, do not like snack bar items, it is hot, it is the most nutritious, less expensive, it is easier and quicker, more variety, and most filling. One non-participant, who ate the regular

Type A lunch on occasion, expressed the following opinion, "I don't eat breakfast and sometimes I miss supper, so I need one big meal."

The Type A school lunch combination at the snack bar was selected by students because they were able to select what they wanted (e.g., pizza instead of main entree). Other reasons included: it is the best and do not like the hot lunch.

A variety of reasons were expressed for selecting the Type A salad bar lunch: dieting, do not eat meat, it is the best, like to eat a light lunch, able to make your own, it is a good deal, and tastes better than cooked food.

The majority of students (60 per cent) selecting only a snack bar item, rather than a Type A alternative, indicated they liked it best. Other reasons included: "It's the quickest," "the safest," "enjoy it," and "only want one thing." Non-participants stated:

> "I don't have to sit in the cafeteria, I can go outside."
>
> "I go out to lunch and then come back for an ice cream cone."

Over 84 per cent of the students indicated their usual menu choice when they ate at a fast food establishment was a hamburger. Almost 50 per cent said they had french fries and a carbonated beverage in addition to a hamburger.

Approximately one-fourth of both groups indicated they never went home for lunch during the school year. The majority of the students going home for lunch indicated they usually had a sandwich or soup.

Students who brought a sack lunch usually had a sandwich, fruit, and potato chips. A large majority of both groups (74 per cent) reported they never brought a sack lunch.

Perceptions of Nutritional Content of Lunch. An equal number of participants and non-participants (82.7 per cent) stated they thought the lunches served at school were well balanced (Table 14). A small percentage (7 per cent) of the non-participants stated the nutritional content was poor; whereas, none of the participants rated the nutritional value of the school lunch as poor. One participant replied, "It's fattening but balanced." Among the comments of non-participants included:

"I don't think that much about food choices."

"It's supposed to be, but they just don't do it in a good way."

"It's supposed to be nutritious so you have to believe the government."

"Starches are overwhelming, common sense tells me I'm not getting what I should be most of the time."

Table 14: Perceptions of nutritional content of school lunch

ratings	participants	non-participants
	%	%
well balanced	82.7	82.7
fair	15.4	3.8
poor	--	7.7
no opinion	1.9	5.8

Table 15 summarizes student perceptions of the nutritional content of meals served off campus. Over 82 per cent of the participants and 42.3 per cent of the non-participants stated meals off campus had poor nutritional content. Thirty per cent of the non-participants, however,

believed the meals were well balanced. Participants expressed the following comments:

"It's mostly nutritious, except I never get milk when I eat off campus."

"Students mostly get the big hamburgers, so they probably get a lot of nutritional value."

Table 15: Perceptions of nutritional content of lunch away from school

ratings	participants	non-participants
	%	%
well balanced	3.8	30.8
fair	5.8	21.1
poor	82.7	42.3
no opinion	7.7	5.8

Influence of Other People on School Lunch Participation

Influence of Parents. Students were asked what effect their parents had on influencing them to eat the school lunch. Over 63 per cent of the participants indicated their parents had some type of influence on them compared to only 44.2 per cent of the non-participants. This finding is supported by Bachemin (53), Koskie (58), and Gargano (154). They reported parents wanted their children to eat the lunch. Among the comments of participants concerning effect of parents on eating the school lunch were:

"They give me money for a lunch ticket at school. If I eat out, I have to spend my own money."

"Mom thinks I should eat the hot lunch, she says it makes me study and think better."

"They want me to. They say it's well balanced and more nutritious."

Non-participants expressed the following concerning parents' influence:

"Very little influence--except when dad takes the car, then I'm forced to stay."

"They give me a certain allowance and say I can eat at school or out. But I can't spend more than the allowance."

"As far as the food, they don't care, but they think I should stay. They don't want me running around."

"Dad doesn't want me going out all the time because he doesn't think hamburgers and french fries are proper nutrition."

Influence of Administrators and Teachers. Students were asked their opinion of the attitude of school administrators toward school lunch. The belief that administrators had a good attitude was expressed by 23.1 per cent of the participants and 38.5 per cent of the non-participants. Less than 10 per cent of the non-participants and 5.8 per cent of the participants indicated they never saw administrators eating at school. Students in both the participant and non-participant groups stated they did not know the administrators' views on school lunch, 42.3 and 9.6 per cent respectively. Student comments concerning administrators' viewpoints on school lunch included:

"They feel it's important that there is a lunch program maintained."

"They understand it could be improved but don't know what to do."

"They are really trying to make it something so students will enjoy it."

One comment of particular interest was the following:

"It must not be very high or they would make us stay for lunch."

Students also were asked their view of teachers' attitudes toward school lunch. About one-third of the non-participants reported they believed the teachers liked school lunch; whereas only 25 per cent of the participants expressed that view. However, another one-third of the non-participants and one-fourth of the participants reported teachers had negative attitudes about school lunch. A small percentage of both groups (15 per cent of non-participants and 17 per cent of participants) did not know the teachers' attitudes on school lunch. Among the comments expressed on teachers' attitudes which reflected a perceived supportive view was the following:

> "Teachers would rather have you stay because going out causes tardies. There isn't enough time to get back."

Two statements are reflective of nonsupportive perceptions:

> "They don't expect students to stay."

> "Teachers don't like it because they have to pay more."

A large number of participants (48.1 per cent) and non-participants (55.8 per cent) reported they had heard teachers express views of school lunch. Of those students who reported they had heard teachers comment, negative opinions regarding the school lunch program were indicated by 78.6 per cent of the non-participants and 88 per cent of the participants. Participants heard more frequent negative comments because of contacts with teachers in the lunch line and in the cafeteria. Among the negative comments were:

> "Teachers put it [school lunch] down when they read the announcements."

> "They make jokes about it and say the food is terrible."

Among positive teacher comments reported by students was the following:

> "They say we need to eat school lunch because it is nutritional and we [students] will get better food habits."

Seventy-eight per cent of the students indicated that teachers had no effect on influencing them to eat the school lunch. Students expressed the following comments:

> "The coaches have a low opinion. They tell us to be careful of what we eat and to stay away from the food."
>
> "When I hear them [teachers] say it isn't good--I think about it, but still eat it."
>
> "If they [teachers] act like they don't like the food, it brushes off on students so they don't want to eat it."
>
> "Kids look up to teachers and what the teachers say, they will just accept."

Students were asked to indicate if the teachers had a separate table or dining room and if that had any effect on their opinion of school lunch. The majority of the students indicated the teachers usually sat together in the cafeteria or took their lunches back to their classrooms or to the teachers lounge. The students reported the teachers did not have a separate table or an area designated especially for them. To cite an example of a negative opinion toward teachers eating with students, one non-participant stated, "It has a terrible effect. I hate sitting by my teacher and best friend eating lunch at the same time." A participant, however, had a positive view: "It has a good effect. Students can mix with teachers, not on a student-teacher basis, but on a people-people basis."

Influence of Friends. Over 78 per cent of the participants and 38.4 per cent of the non-participants indicated their best friends ate the school lunch. Gutsch (84) also reported that frequent participants ate the school lunch because their friends did. Of the non-participants, 17.3 per cent stated their friends ate the school lunch only sometimes compared to 9.6 per cent of the participants.

When the students were asked if they were able to eat with their friends at school, 86.5 per cent indicated they were. Among the reasons given by students for not being able to eat with their friends were: "the cafeteria is crowded," "friends are in other lunch period," "they go out to eat," or "they eat with their boyfriends."

Students were asked to indicate their friends' opinions of school lunch. Of the participants, 46.2 per cent indicated their friends disliked it compared to 42.3 per cent of non-participants. Over 36 per cent of the non-participants and 42.3 per cent of participants reported their friends liked the school lunch. Other opinions given were: they would rather eat out or home, they eat school lunch only if they do not have money to go out, they can take it or leave it, and they think school lunch is boring. To cite an example one student stated, "They [friends] don't like it, but a lot haven't tried it. They have just heard about it and assume they don't like it."

A sizeable number of the students (67 per cent of the participants and 50 per cent of the non-participants) reported their friends had no influence on them regarding the school lunch program. Thirty per cent of the non-participants reported they go where their friends want to eat lunch compared to 5.8 per cent of the participants. Other reactions included:

> "They make fun of it and it makes me not want to eat it."
>
> "They say it isn't good but they haven't tried it, so I go ahead and eat it."
>
> "I go to the school lunch, because my friends can't go out."

Evaluation of School Lunch Menu

Advance Knowledge of Daily Menu Choice. The same percentage of participants and non-participants (76.9 per cent) reported they knew what was on the school menu. Over 71 per cent of both groups heard the menu on the daily announcements at school during the third class hour. Only 25 per cent of the participants and 16 per cent of the non-participants reported that they read the school menu published in the paper. Twenty-seven per cent of the participants and 31 per cent of the non-participants reported they listened to the school lunch menu broadcasted on the radio.

Assessment of Variety, Quality, and Portion Sizes. Students were asked to evaluate variety, quality, and portion sizes of the school lunch menu. Variety was evaluated as good by 78.9 per cent of the participants and 84.6 per cent of the non-participants (Table 16). About half of the participants (55.8 per cent) and 48.1 per cent of the non-participants

Table 16: Assessment of school lunch menu

	ratings				
	excellent	good	fair	poor	no opinion
	%	%	%	%	%
participants' ratings of:					
variety	7.7	78.9	11.5	1.9	--
quality	7.7	55.8	25.0	11.5	--
non-participants' ratings of:					
variety	5.8	84.6	7.7	--	1.9
quality	5.8	48.1	34.6	11.5	--

evaluated quality as good also. Table 17 summarizes students' opinions on portion sizes of food served at school. The majority of the participants (57.7 per cent) and non-participants (51.9 per cent) indicated servings were "just right." Over 42 per cent of the participants and 40.4 per cent of the non-participants reported the servings were too small. Only a few of the non-participants (5.8 per cent) reported the servings were too large.

Table 17: Assessment of portion sizes of food served in school lunch

rating	participants	non-participants
	%	%
too small	42.3	40.4
too large	--	5.8
just right	57.7	51.9
no opinion	--	1.9

Students expressed the following evaluative type statements:

"Servings need to be larger, I eat two lunches to get filled up and then I go to the snack bar."

"It's pretty good quality considering it's mass produced."

"It's not good quality, that is why I bring my lunch."

"There is a lot of variety--but none for a vegetarian."

"It varies a lot, you hardly ever have the same thing twice."

Food Preferences Related to Menu Selections. Students were asked if they disliked the food served in the school lunch. Approximately two-thirds of the non-participants (67.3 per cent) and 34.6 per cent of the

participants stated they disliked the food or some of the food served at school. Reasons given by both groups for disliking the food were related to: quality, preparation, food preferences, variety, taste, and appearance of food. Additional reasons listed by non-participants were strange or unfamiliar food names and no foods for vegetarians. To cite an example, one student stated, "they have funny names like shrimp shapes, it makes you wonder what it is."

Table 18 summarizes students' responses to the food items they liked most which are served on school lunch menus. Pizza was the food item with the highest percentage of "like" responses (46.2 per cent). Chili and hamburgers also were preferred items. The findings are supported by Gargano and Vaden (85). They reported that pizza, hamburgers on a bun, and chili were among the most preferred items of high school students in their sample. The low percentage of like responses reported by students may be attributed to the frequency of foods served in the cafeteria.

Over 92 per cent of the participants and 88.5 per cent of the non-participants indicated foods were served on school lunch menus that they did not like. A large variety of food items served at school were reported as not liked by the students. In general vegetables were reported as being disliked most frequently. Spinach and broccoli were the vegetables listed by the largest number of students (Table 19). Gutsch (84) also found that spinach was the most disliked vegetable by secondary students in her study.

Students were asked to indicate their favorite foods never served and those they would like to see served in the school lunch. Over 40 per cent of the students indicated they had no favorite foods or that

Table 18: School lunch items rated as well liked

items listed by six or more students		items listed by one to five students			
	%		%		%
pizza	46.2	meat dishes	4.8	casseroles	1.9
hamburger	12.5	turkey	3.9	desserts	1.9
chili	10.5	mashed potatoes	3.9	cinnamon rolls	1.9
salads	9.6	lasagna	3.9	ham	1.9
burritos	9.6	fruit	3.9	holiday specials	1.9
tacos	9.6	veal cutlet	2.9	vegetables	1.9
sandwiches	9.6	hot dogs	2.9	pumpkin pie	1.0
spaghetti	9.6	taco pie	2.9	breaded beef	1.0
macaroni and cheese	6.7	Mexican foods	2.9	snacks	1.0
seafood	6.7	cold cuts	1.9	breads	1.0
fritters	6.7	milk shakes	1.9	smokies	1.0
chicken	6.7				

N = 104

Table 19: School lunch menu items rated as disliked

items listed by six or more students		items listed by one to five students			
	%		%		%
vegetables	23.1	peas	4.8	sloppy joes	1.9
spinach	19.2	sandwich	4.8	zucchini	1.0
broccoli	18.3	turkey	4.8	salad	1.0
seafood	15.4	hamburgers	4.8	goulash	1.0
macaroni and cheese	9.6	sauerkraut	4.8	asparagus	1.0
pizza	5.7	fritters	3.8	cheese	1.0
		soup	3.8	corn	1.0
		cauliflower	3.8	foods with onions	1.0
		lima beans	3.8	ravioli	1.0
		meat entrees	3.8	veal	1.0
		burritos	3.8	bread pudding	1.0
		ham	2.9	liver	1.0
		spaghetti	2.9	celery	1.0
		chili	2.9	cabbage	1.0
		hot dogs	2.9	pot pies	1.0
		mixed vegetables	2.9	margarine	1.0
		brussel sprouts	1.9	applesauce	1.0
		chicken	1.9	canned tomatoes	1.0
		stew	1.9	rice	1.0
		squash	1.9	rhubarb	1.0
		french fries	1.9	prunes	1.0
		tater tots	1.9	beets	1.0
		potatoes and gravy	1.9	turkey roll	1.0
		green beans	1.9	Mexican food	1.0
		fruit	1.9	Italian food	1.0

N = 104

favorite foods currently were being served. Table 20 summarizes the students' responses. Steak was the food item listed most frequently (16.4 per cent). The small percentage of students reporting a given item could be attributed to the fact that a large percentage of students rated the school lunch as having a good variety of food items. Of students, 87.5 per cent of participants and 93.3 per cent of non-participants indicated they would eat at school more often if the foods they indicated were served. Nine per cent of the participants indicated serving of the food items would not influence their participation.

Assessment of Non-Food Related Aspects of School Lunch and Lunch Away from School

Price. Over 80 per cent of the participants and 75 per cent of the non-participants believed the price of the school lunch was about right (Table 21). This finding is supported by the USDA study (52) on high school participation in child nutrition programs. In that study, two-thirds of the students indicated the price of lunch was "about right." Only 5.8 per cent of both groups reported the price was too low. A higher percentage of non-participants (19.2 per cent) compared to participants (13.4 per cent) indicated the price was too high.

The question regarding means of payment of lunches resulted in three categories of responses. They included: parents, students' personal money, or receive free or reduced price lunch. Results are summarized in Table 22. Over 30 per cent of the non-participants reported paying for their own lunches compared to 13.4 per cent of the participants. A higher percentage of participants (77 per cent) than non-participants (69.2 per cent) indicated their parents paid for their lunches. Only 9.6 per cent of the students received free or reduced price lunches, all of

Table 20: Student suggestions for school lunch menus

items listed by six or more students		items listed by one to five students			
	%		%		%
steak	16.4	spaghetti	3.8	candy bars	1.0
lasagna	6.7	lobster	2.9	cheese entrees	1.0
"real" hamburger	5.8	chicken	2.9	chicken fried steaks	1.0
tacos	5.8	pizza	2.9	ribs	1.0
Mexican food	5.8	drinks other than milk	2.9	liver	1.0
		Chinese food	1.9	lima beans	1.0
		meat loaf	1.9	cereal	1.0
		french fries	1.9	gourmet foods	1.0
		pie	1.9	pancakes	1.0
		green beans	1.9	eggs	1.0
		crab meat	1.9	corn dogs	1.0
		shrimp	1.9	buttered noodles	1.0
		cake	1.9	roast beef sandwiches	1.0
		pork	1.9	beef stroganoff	1.0
		tuna entrees	1.9	snack items	1.0
		variety of breads	1.9	doughnuts	1.0
		potatoes	1.9	coke	1.0
		okra	1.0	tea	1.0
		mushrooms	1.0	carrot sticks	1.0
		chocolate pudding	1.0	Italian food	1.0
		potato chips	1.0		

N = 104

Table 21: Opinions of price of the school lunch

	participants	non-participants
	%	%
too high	13.4	19.2
about right	80.8	75.0
too low	5.8	5.8

Table 22: Means of payment of lunch

source	participants	non-participants
	%	%
parents	77.0	69.2
students' personal money[1]	13.4	30.8
free or reduced price lunch	9.6	--

[1]Earnings or allowance.

whom were participants. Of the total student body at the high school, 8.4 per cent of the students qualify for free or reduced price meals. A large majority of the students who paid for their own lunch (82.7 per cent) indicated they used money earned from having a job. The remaining 17.3 per cent used allowance money to pay for their lunches.

Ninety-six per cent of the participants and 90 per cent of the non-participants indicated they could save money by eating lunch at school (Table 23). Fifty-six per cent of the participants indicated they bought only the sixty-five cent Type A lunch when eating at school. Over half

Table 23: Amount of money spent on lunch

	amount spent on lunch					
	less than 65¢	65¢[1]	70¢-99¢	$1.00-$1.49	$1.50-$2.50	over $3.00
	%	%	%	%	%	%
at school:						
participants	--	55.8	36.5	7.7	--	--
non-participants	21.2	23.1	40.4	1.5	3.8	--
off campus:						
participants	--	--	--	57.7	40.4	1.9
non-participants	3.8	--	7.7	55.8	26.9	5.8

[1]Type A lunch is 65¢.

of the non-participants reported they spent more than the price of the Type A lunch when eating at school. Other findings indicated more frequent snack bar purchases among non-participants than participants. The majority of the students (57.7 per cent of the participants and 55.7 per cent of the non-participants) indicated they spent between $1.00-1.50 when eating off campus.

Length of Lunch Period. Over 65 per cent of the participants and 38.5 per cent of the non-participants reported the length of the lunch period as "just right" (Table 24). The majority of non-participants (59.6 per cent) reported the length of the period as too short, compared to 30.8 per cent of the participants. Only a few students reported the period was too long.

Student suggestions on length of the lunch period are summarized in Table 25. Other than the students who reported the length of the lunch

Table 24: Students' assessment of length of lunch period

	participants	non-participants
	%	%
too long	3.8	1.9
just right	65.4	38.5
too short	30.8	59.6

Table 25: Students' suggestions concerning length of lunch period

suggestions	participants	non-participants
	%	%
no change	76.9	38.5
5-10 minutes shorter	--	3.8
5-15 minutes longer	15.4	34.6
more than 15 minutes longer	7.7	23.1

period did not need to be changed, the most frequent suggestion was to increase the period by five to fifteen minutes.

Approximately three-fourths of the students indicated that time was a problem when they went off campus for lunch. Reasons attributed to lack of time included: driving time, distance, problems with parking, crowds, traffic, long lines, and not enough time to eat.

All of the participants and 84.6 per cent of the non-participants indicated they had enough time to eat their lunch at school. To cite an example, a participant stated, "It's one of the best things about it.

You have time to eat and get back to class in time." Reasons given by non-participants for not having enough time for lunch included: long lines and like to eat slow and enjoy my food. Another reaction expressed by a non-participant related to length of lunch period was, "It makes me think they want us to stay there [school] because they don't give us time to go any place else."

Students were asked to indicate if they had enough time to eat their lunch at home. Of the non-participants, 40.4 per cent reported they had enough time, compared to 25 per cent of the participants. Reasons given for lack of time included: "live too far away" and "have to prepare own food."

The majority of the participants and non-participants (63.5 and 55.3 per cent respectively) reported they waited in line at school five to ten minutes (Table 26). Length of time spent eating lunch is summarized in Table 27. Few students reported they spent the full period eating lunch when they ate at school.

Table 26: Length of time spent standing in line at school

group	time periods		
	less than 5 minutes	5-10 minutes	more than 10 minutes
	%	%	%
participants	26.9	63.5	9.6
non-participants	29.8	55.3	14.9

Atmosphere of School Cafeteria. Students were asked to indicate who was in charge of keeping order in the lunchroom. Various opinions were

Table 27: Length of time spent eating lunch

	time periods		
	10-15 minutes	20-35 minutes	full lunch period[1]
	%	%	%
at school:			
participants	44.2	53.9	1.9
non-participants	31.3	60.4	8.3
away from school:			
participants	11.1	42.2	46.7
non-participants	24.0	46.0	30.0

[1] 1st lunch period = 60 minutes.
2nd lunch period = 50 minutes.

given including: administrators, teachers, college students, and cafeteria employees. Students (38.5 per cent of the participants and 46.2 per cent of the non-participants) most frequently rated the supervision of the lunchroom as good (Table 28). Others, however, rated the lunchroom supervision as fair or poor; several reported there was no supervision.

Table 28: Opinions of school cafeteria supervision

	ratings			
group	good	fair	poor	no supervision
	%	%	%	%
participants	38.5	28.8	25.0	7.7
non-participants	46.2	26.9	7.7	19.2

The school lunchroom atmosphere was rated as good by 44.3 per cent of the participants and 36.5 per cent of the non-participants (Table 29). Only 1.9 per cent of the participants rated it as excellent, compared to 3.8 per cent of the non-participants. The remaining students rated the lunchroom atmosphere as fair or poor, with a larger percentage of non-participants (38.5 per cent) than participants (26.9 per cent) rating it as poor.

Table 29: Assessment of school lunchroom atmosphere

rating	group	
	participant	non-participant
	%	%
excellent	1.9	3.8
good	44.3	36.5
fair	26.9	21.2
poor	26.9	38.5

Students were asked to indicate reasons based upon their rating of the school lunchroom atmosphere. Among the reasons given for a good to excellent rating were: friends are there, teachers are friendly, it is fun and interesting, it is relaxing, colors in the cafeteria are good, and people get along well. Among the reasons for rating the atmosphere fair to poor were: it is crowded and noisy, people throw food, needs more color or pictures, sometimes it is dirty, students have poor manners, there are long lines, and it is an uncomfortable and unfriendly place.

Student responses concerning the effect of the lunchroom atmosphere on opinion of school lunch were classified as favorable, unfavorable, and having no effect. The non-participants (57.7 per cent) most frequently responded unfavorably (Table 30). One non-participant replied, "It has a big effect. I don't like to spend any time in the cafeteria and when I do eat there, I hurry and then go somewhere else." The participants most frequently responded that the atmosphere had no effect on opinion of school lunch (46.2 per cent).

Table 30: Effect of atmosphere on opinion of school lunch

	group	
	participant	non-participant
	%	%
favorable	21.1	15.4
unfavorable	32.7	57.7
no effect	46.2	26.9

Suggestions for the Program

Student Rating of the School Lunch Program. When students were asked how other students rated the school lunch, 23.1 per cent of the participants indicated they believed students rated it good, compared to only 7.6 per cent of the non-participants (Table 31). Conversely, 21.1 per cent of the participants believed other students gave the school lunch program a poor rating compared to 46.2 per cent of the non-participants. About 50 per cent of both groups believed students generally rated the program as fair. These findings concur with those of Evans (67), who

reported that the majority of secondary students in her study rated school lunch as fair.

Table 31: Perceptions of students' overall rating of the school lunch program

rating	group	
	participant	non-participant
	%	%
good	23.1	7.6
fair	55.8	46.2
poor	21.1	46.2

Interest in Student Advisory Council. Of the participants, 69.2 per cent indicated they would be interested in joining an organization to provide suggestions for the school lunch program. Interestingly, over 65 per cent of the non-participants also expressed interest in such an organization.

Suggestions for Improvements. Participants and non-participants were asked what suggestions they had for improvements in the school lunch program. Among the suggestions were: improve the preparation of food, raise the price of lunch to cover the cost of higher quality food items, involve the students in menu planning, enlarge the cafeteria, add another lunch period to reduce the number of students in the cafeteria at one time, install a sound system, improve the problem of not enough chairs, regulate the temperature of the lunchroom in the spring and winter, and serve food choices for vegetarians. One student replied, "I don't think

anything would increase the number of students who eat lunch because by the time you are a senior, you're supposed to go out. It's just not cool to eat in the school cafeteria."

To enlarge the cafeteria was the most frequent response in relation to improvement of the school lunch program by both participants and non-participants. A non-participant assessed the issue as, "We need a bigger cafeteria--it's the smallest one I've ever been in."

Phase II. Analysis of Nutrient Intake

Following the interview in Phase II, a twenty-four hour dietary recall was obtained from each student to assess nutrient intake. Students were classified as participants or non-participants on the basis of source of lunch on the day of the recall. Students consuming a Type A lunch were classified as participants. Students who consumed a snack bar item, carried a lunch from home, ate no lunch, or ate lunch away from school were classified as non-participants. The sample for the recall consisted of fifty-three participants and fifty-one non-participants.

General Information

On the day of the recall, 21.2 per cent of the students reported not eating breakfast, 8.7 per cent did not eat lunch, and 6.7 per cent did not eat dinner (Table 32). The majority of students reported eating breakfast and dinner at home. About half of the students (50.8 per cent) reported selecting one of the Type A school lunch alternatives. The remainder reported eating a snack bar item, carrying a lunch from home, or eating away from school on the day of the recall.

Twenty students (19.2 per cent) reported taking a vitamin supplement, eleven participants and nine non-participants. More males than females

Table 32: Source of meals on day of interview

source	meals		
	breakfast	lunch	dinner
	%	%	%
no meal	21.2	8.7	6.7
home	71.2	5.8	80.7
school breakfast	4.8	n.a.	n.a.
type A school lunch	n.a.	50.8[1]	n.a.
snack bar	n.a.	8.7	n.a.
sack lunch	n.a.	2.9	n.a.
friend's home	--	3.8	n.a.
restaurant	--	17.3	12.6
other	2.8	2.0	--

[1]Group classified as participants for analysis of nutrient intake from dietary recalls; all others were classified as non-participants.

reported taking vitamin supplements (twelve versus eight students). A vitamin supplement without iron was used in nutrient analysis. This must be considered in interpreting the data, as some students may have taken a vitamin supplement with iron.

When students were asked if the recall was typical of their day's diet, 87.5 per cent reported it was normal. Slightly over 90 per cent of the females reported the recall was typical, compared to 84.6 per cent of the males. Participants (92.5 per cent) reported the recall was typical more frequently than non-participants (82.4 per cent). Two students

reported eating nothing on the day of the recall. These students were contacted a second time to obtain a typical recall.

Total Day's Nutrient Intake

Twenty-four hour dietary recalls were obtained from students on Tuesday through Friday to collect data on usual school lunch habits. Dietary intakes of calories, protein, calcium, iron, vitamin A, thiamine, riboflavin, niacin, and ascorbic acid were computed for a twenty-four hour period for female and male participants and non-participants. Data were analyzed using two-way analysis of variance in which group (participant-non-participant) and sex of students were considered simultaneously. Since none of F ratios for interactions between variables were significant, mean intakes are presented for participants and non-participants and females and males only.

The mean intakes for total day's dietary intake are presented in Table 33. The mean total day's intake for males was significantly higher than those of females for calories and all nutrients except ascorbic acid. Students participating in the school lunch consumed significantly higher intakes of calcium.

Data are presented in Table 34 for mean intakes of nutrients affected by addition of vitamin supplements. As in the first analysis, the mean intakes of males for vitamin A, thiamine, riboflavin, and niacin were significantly higher than those of females. Also, ascorbic acid intakes were significantly higher with addition of a vitamin. Other investigators (86, 93, 101) also have reported that the nutritive intake of adolescent males is generally superior to that of adolescent girls.

Table 33: Total day's nutrient intake[1]

	total group	group[2] participant	group[2] non-participant	sex[3] female	sex[3] male	F ratios[4] F_1	F ratios[4] F_2	F ratios[4] F_3
calories	2693.80	2678.29	2682.93	2242.24	3118.99	0.00	12.38*	0.14
protein, gm.	99.62	105.10	92.40	79.96	117.54	2.73	23.91*	0.45
calcium, mg	1324.21	1491.09	1065.39	1011.01	1545.47	7.43*	11.71*	3.46
iron, mg.	14.62	15.48	13.58	11.16	17.89	1.69	21.19*	0.11
vitamin A, I.U.	5681.79	5188.03	6649.36	4072.13	7765.25	0.75	4.79*	0.84
thiamine, mg.	1.33	1.38	1.29	1.04	1.63	0.45	20.73*	0.31
riboflavin, mg.	2.36	2.52	2.13	1.76	2.90	2.51	21.49*	0.48
niacin, mg.	18.49	18.20	18.69	15.85	21.03	0.08	8.57*	0.04
ascorbic acid, mg.	121.77	107.58	140.01	97.17	150.41	1.36	3.66	0.18

[1]Results of 24 hour dietary recall.

[2]Participant in Type A lunch, N = 53; Non-participant, N = 51.

[3]Females, N = 52; males, N = 52.

[4]F ratios from 2-way analysis of variance. F_1 = main effect of group; F_2 = main effect of sex; F_3 = interaction between variables.
All F_3 n.s., therefore, means given for participant, non-participant and female, male only.

* $P \leq .05$

Table 34: Total day's nutrient intake with vitamin supplement[1]

	total group	group[2]		sex[3]		F ratios[4]		
		participant	non-participant	female	male	F_1	F_2	F_3
vitamin A, I.U.	6691.39	6171.00	7722.59	4845.66	9047.93	0.81	5.93*	0.93
thiamine, mg.	1.63	1.67	1.61	1.27	2.01	0.09	13.91*	0.30
riboflavin, mg.	2.70	2.86	2.50	2.02	3.33	1.44	19.36*	0.19
niacin, mg.	22.53	22.13	22.98	18.95	26.16	0.11	7.76*	0.00
ascorbic acid, mg.	133.89	119.38	152.88	106.46	165.80	1.41	4.42*	0.22

[1]Footnotes--see Table 33.
Data shown for nutrients affected by vitamin supplement.

Total Day's Nutrient Intake as Percentage of RDA

The participants' total day's intake as a percentage of recommended dietary allowances (RDA) (34) was significantly higher than non-participants for calcium (Table 35). Results indicated that the males' total day's intakes for protein, calcium, iron, and riboflavin as a percentage of RDA were significantly higher than those of females. With the addition of a vitamin supplement, the total day's intake as a percentage of RDA was significantly higher for males than females for riboflavin and ascorbic acid (Table 36).

Also, as shown in Table 35, total day's iron intakes were below the RDA for all students interviewed; however, males' intakes were only slightly below the recommendation. Gaines and Daniel (95) found that the majority of adolescents consumed less than two-thirds of the recommended allowances for iron. The RDA's for thiamine and calcium were not met by non-participants and females. Hampton et al. (93) also reported the most neglected nutrients for girls were iron and calcium.

Nutrient Intake at Lunch

Participants and males consumed significantly higher mean nutrient intakes at lunch compared to non-participants and females (Table 37). Higher intakes were reported for protein, calcium, iron, vitamin A, thiamine, and riboflavin. Also, participants' consumed significantly higher intakes than non-participants for ascorbic acid. Males reported significantly higher intakes of calories than did females.

The nutrient goal of the school lunch program is to provide one-third or more of the RDA (2). To evaluate consumption in relation to this goal, nutrient intake at lunch was reported as a percentage of RDA. Results from the twenty-four hour dietary recalls of participants and

Table 35: Total day's intake as percentage of ROA[1]

	total group	group[2]		sex[3]		F ratios[4]		
		participant	non-participant	female	male	F_1	F_2	F_3
calories	105.90	104.95	105.79	106.77	103.97	0.01	0.08	0.14
protein, gm.	193.61	204.33	179.92	166.58	217.67	2.71	11.87*	0.34
calcium, mg.	110.35	124.26	88.78	84.25	128.79	7.43*	11.71*	3.46
iron, mg.	81.20	85.98	75.44	62.02	99.40	1.69	21.19*	0.11
vitamin A, I.U.	123.79	114.05	143.06	101.80	155.31	0.68	2.31	0.78
thiamine, mg.	100.70	105.43	97.75	94.64	108.54	0.63	2.08	0.48
riboflavin, mg.	144.55	154.89	131.54	125.53	160.91	2.47	5.66*	0.27
niacin, mg.	109.54	107.55	110.86	113.25	105.16	0.10	0.60	0.06
ascorbic acid, mg.	270.60	239.07	311.12	215.94	334.24	1.36	3.66	0.18

[1]Footnotes, see Table 33.
ROA for 15-18 year old males and females used for comparisons.

Table 36: Total day's intake with vitamin supplement as percentage of RDA[1]

	total group	group[2]		sex[3]		F ratios[4]		
		partic-ipant	non-par-ticipant	female	male	F_1	F_2	F_3
vitamin A, I.U.	145.90	135.68	166.42	121.14	180.96	0.72	2.72	0.86
thiamine, mg.	123.69	127.96	121.97	115.74	134.19	0.16	1.55	0.39
riboflavin, mg.	165.70	175.59	153.85	144.31	185.13	1.44	5.09*	0.09
niacin, mg.	133.03	130.59	135.57	135.35	130.81	0.11	0.09	0.00
ascorbic acid, mg.	297.52	265.28	339.74	236.57	368.45	1.41	4.42*	0.22

[1] Footnotes, see Table 33.
Data shown for nutrients affected by vitamin supplement.
RDA for 15-18 year old males and females used for comparisons.

Table 37: Nutrient intake at lunch[1]

	total group	group[2]		sex[3]		F ratios[4]		
		participant	non-participant	female	male	F_1	F_2	F_3
calories	755.33	836.85	683.78	634.06	886.58	2.48	6.75*	0.21
protein, gm.	30.02	35.80	23.30	25.12	33.97	13.19*	6.60*	0.50
calcium, mg.	386.13	545.24	207.24	313.10	439.39	52.40*	7.31*	0.97
iron, mg.	4.20	4.88	3.45	3.36	4.97	7.33*	9.28*	0.05
vitamin A, I.U.	1649.26	2313.32	946.48	1152.71	2107.08	15.77*	7.69*	0.02
thiamine, mg.	0.34	0.40	0.27	0.27	0.40	8.57*	7.82*	0.03
riboflavin, mg.	0.67	0.89	0.42	0.54	0.77	43.95*	10.12*	0.94
niacin, mg.	5.25	5.30	5.03	4.62	5.71	0.10	1.70	0.49
ascorbic acid, mg.	23.72	33.46	13.89	22.74	24.59	14.89*	0.13	0.03

[1]Footnotes, see Table 33.

non-participants indicated that there was no significant difference in percentage of RDA at lunch for calories (Table 38). Participants compared to non-participants consumed significantly higher intakes of all nutrients except niacin. Males consumed significantly higher intakes of calcium and iron at lunch, compared to females. These findings are supported by those of Emmons et al. (107) who found that the school lunch program provided significantly more protein, calcium, vitamin A, thiamine, riboflavin, and ascorbic acid than did bag lunches from home. The nutrient goal of one-third the RDA was met by students participating in the Type A lunch program for five of the eight nutrients evaluated. Two others (niacin and thiamine) were slightly below the goal. Also, calorie intake was adequate. Iron was the only nutrient which was notably low in these students' lunch intakes. Non-participants, however, failed to consume at least one-third of the RDA's at lunch for calories and all nutrients except protein.

Nutrient Intake from Snacks

Results of the percentage of total dietary intake contributed by foods consumed between meals in the morning, afternoon, and evening are summarized in Table 40. There was no significant difference between frequency of participation in school lunch and sex. Between 22 and 45 per cent of the total intake for all nutrients were provided by snacks. This finding is supported by Wharton (101) who reported that snacks provided 20 to 30 per cent of the total intake for all nutrients except vitamin A, thiamine, and ascorbic acid.

Table 38: Nutrient intake at lunch as percentage of RDA[1]

	total group	group[2]		sex[3]		F ratios[4]		
		participant	non-participant	female	male	F_1	F_2	F_3
calories	29.52	33.13	26.62	30.19	29.55	3.06	0.03	0.61
protein, gm.	58.34	69.79	45.46	52.34	62.91	13.22*	2.49	0.25
calcium, mg.	32.18	45.44	17.27	26.09	36.62	52.39*	7.31*	0.97
iron, mg.	23.31	27.10	19.17	18.67	27.60	7.33*	9.28*	0.05
vitamin A, I.U.	35.42	50.80	20.16	28.82	42.14	17.75*	3.36	0.11
thiamine, mg.	25.61	30.83	20.48	24.72	26.58	9.44*	0.30	0.08
riboflavin, mg.	40.97	55.43	25.75	38.52	42.66	43.71*	0.85	0.02
niacin, mg.	31.25	31.28	30.28	33.03	28.53	0.04	0.78	0.40
ascorbic acid, mg.	52.71	74.35	30.85	50.54	54.65	14.89*	0.13	0.03

[1]Footnotes, see Table 33.
RDA for 15-18 year old males and females used for comparisons.

Table 39: Nutrient intake from snacks as percentage of total day's intake[1]

	total group	group[2]		sex[3]		F ratios[4]		
		participant	non-participant	female	male	F_1	F_2	F_3
calories	35.17	34.92	36.43	36.54	34.81	0.16	0.21	0.81
protein, gm.	27.02	26.84	28.88	26.08	29.63	0.26	0.78	2.02
calcium, mg.	40.23	37.26	44.86	37.85	44.28	2.70	1.93	1.28
iron, mg.	28.38	27.74	29.02	27.66	29.10	0.09	0.11	0.00
vitamin A, I.U.	31.76	27.60	36.72	32.42	31.90	3.06	0.01	0.18
thiamine, mg.	35.32	33.20	38.08	34.69	36.59	1.17	0.18	0.18
riboflavin, mg.	34.77	33.28	37.21	33.33	37.15	0.84	0.80	0.50
niacin, mg.	22.42	23.08	23.45	24.07	22.46	0.01	0.14	1.81
ascorbic acid, mg.	39.16	33.21	43.95	40.12	37.03	2.50	0.21	0.50

[1]Footnotes, see Table 33.
Total nutrient value for foods consumed between meals in morning, afternoon, and evening.

Dietary Ratings

Total day's nutrient intake, total day's nutrient intake with a vitamin supplement, and total lunch intake also were rated according to the adequacy of the diet using four ratings: excellent, good, fair, and poor. Nutrients were compared to the appropriate RDA for fifteen to eighteen year olds (34). If the diet met 100 per cent or more of the RDA for each of the nutrients, it was classified as excellent. If the diet met 66.7 per cent or more of the RDA for each of the nutrients, it was classified as good. Diets that met 50 per cent or more of the RDA for each of the nutrients were classified as fair. Diets classified as poor contained less than 50 per cent of the RDA for one or more nutrients. Percentage of students with diets in each category were determined. Data were compiled for males and females according to lunch participation.

Total Diet Rating. The majority of female non-participants (75.8 per cent) had poor diets for the total diet rating compared to 42.1 per cent of the female participants with poor diets (Figure 1). The majority of female participants had fair or good diets, 31.5 and 21.1 per cent respectively. About 5 per cent of the female participants had excellent diets, whereas none of the female non-participants had excellent diets.

As shown in Figure 2, 32.4 per cent of the male participants had excellent diets, compared to only 11.1 per cent of the male non-participants. The majority of male non-participants (55.5 per cent) had a poor diet compared to 14.7 per cent of the male participants.

Rating of Total Diet with a Vitamin Supplement. With the addition of a vitamin supplement, the majority of female non-participants (72.7

Fig. 1. Ratings of total day's dietary intake for female participants and non-participants

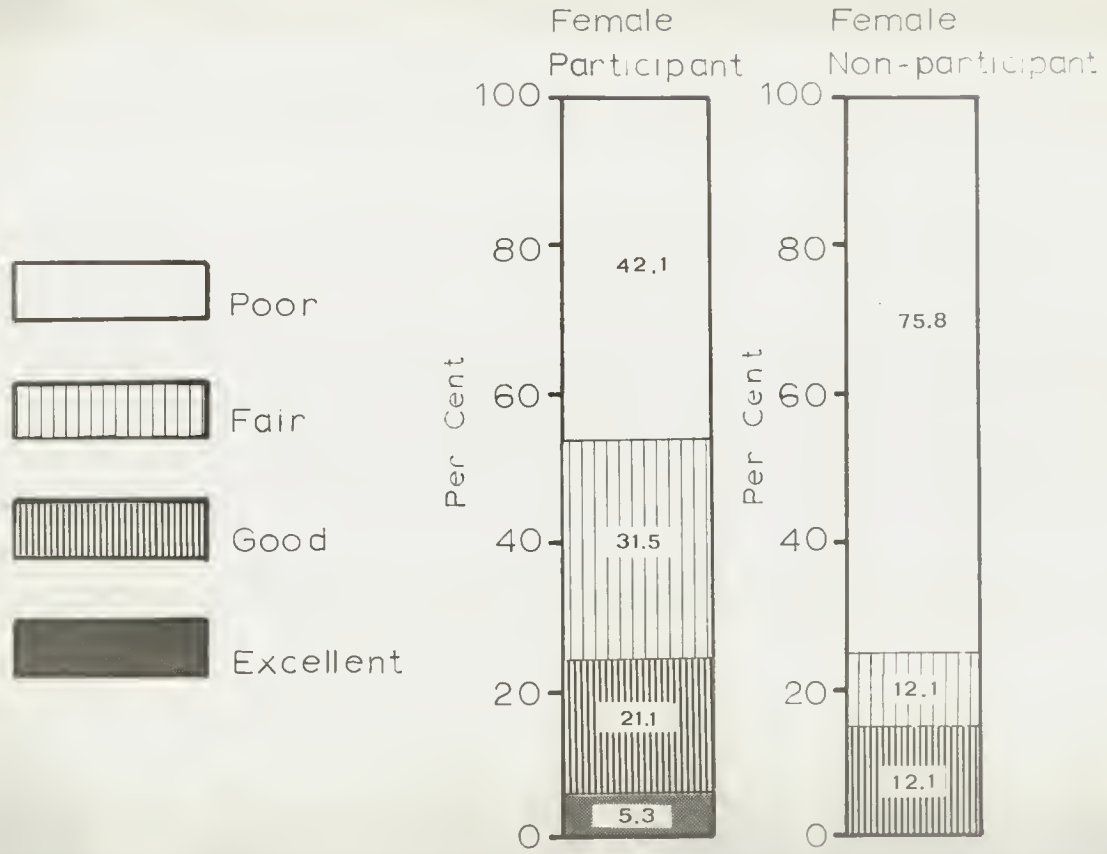
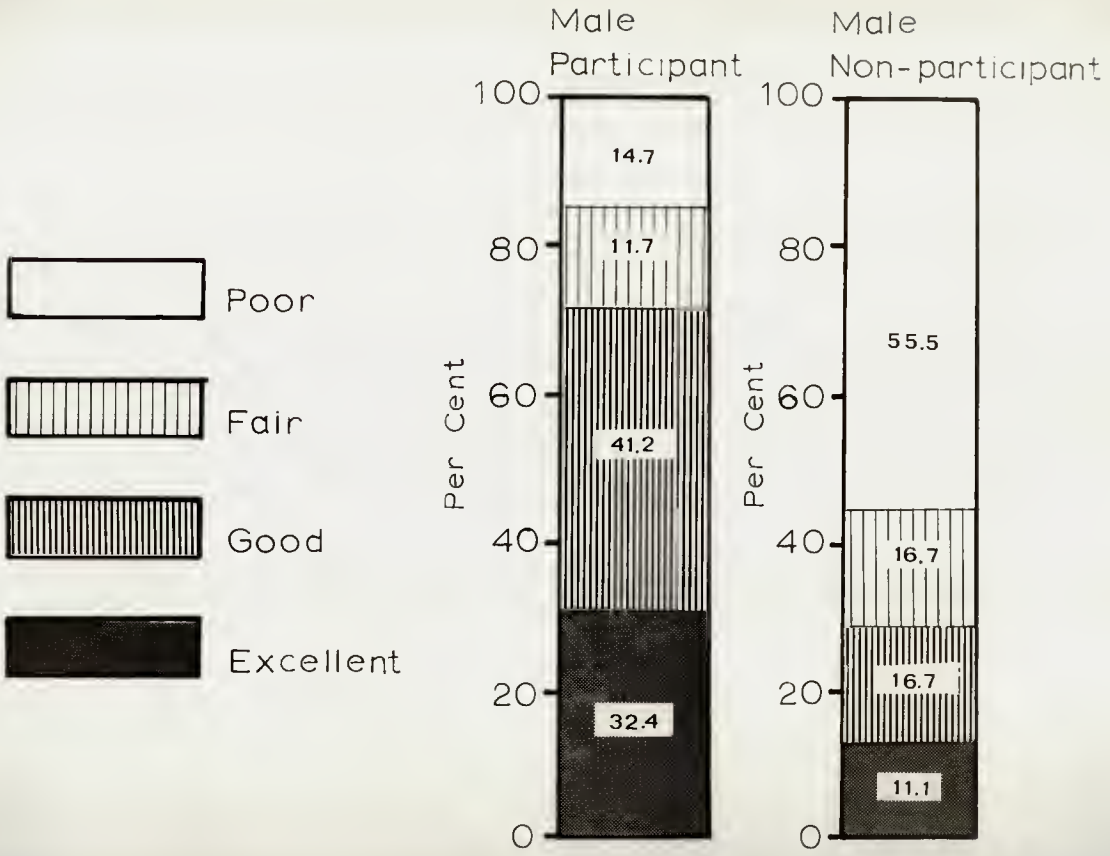

Female
Participant
Female
Non-participant
100
80
60
40
20
0
Per Cent
42.1
31.5
21.1
5.3
75.8
12.1
12.1
Poor
Fair
Good
Excellent

Fig. 2. Ratings of total day's dietary intake for male participants and non-participants


Male
Participant
Male
Non-participant
100
80
60
40
20
0
Per Cent
14.7
11.7
41.2
32.4
55.5
16.7
16.7
11.1
Poor
Fair
Good
Excellent

per cent) remained in the poor diet classification (Figure 3). The percentage of female participants within each diet rating did not change with the addition of a vitamin supplement. Only three participant females reported taking a vitamin.

The total diet rating with the addition of a vitamin supplement increased the percentage of male non-participants receiving a good or fair diet rating (Figure 4). Overall, the addition of the vitamin supplement improved the male non-participants' diet.

Lunch Rating. Over 90 per cent of the female non-participants had a poor diet at lunch compared to only 36.8 per cent of the female participants (Figure 5). Over 15 per cent of the female participants had excellent diets at lunch, whereas none of the female non-participants had excellent diets.

A larger percentage of male non-participants (77.7 per cent) had a poor diet at lunch compared to 32.4 per cent of the male participants (Figure 6). Over 17 per cent of the male participants had excellent diets; whereas, no male non-participants had excellent diets.

The results of the diet rating at lunch indicate that school lunch made a definite contribution to the students' overall nutrient intake. This finding is supported by Hodges and Krehl (68) who reported that lunch frequently provided the most balanced meal of the day if it was eaten at school.

Fig. 3. Ratings of total day's dietary intake with a vitamin supplement for female participants and non-participants

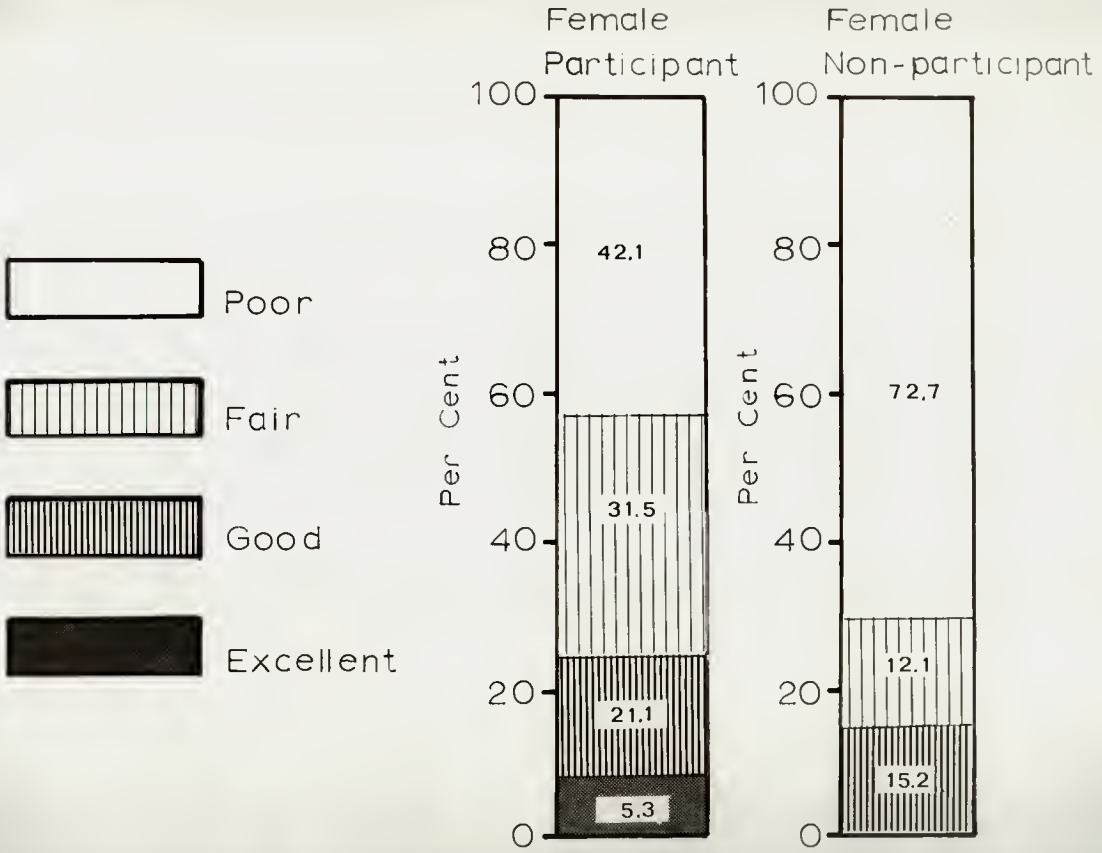

Female
Participant
Female
Non-participant
100
80
60
40
20
0
Per Cent
42.1
31.5
21.1
5.3
72.7
12.1
15.2
Poor
Fair
Good
Excellent

Fig. 4. Ratings of total day's dietary intake with a vitamin supplement for male particpants and non-participants

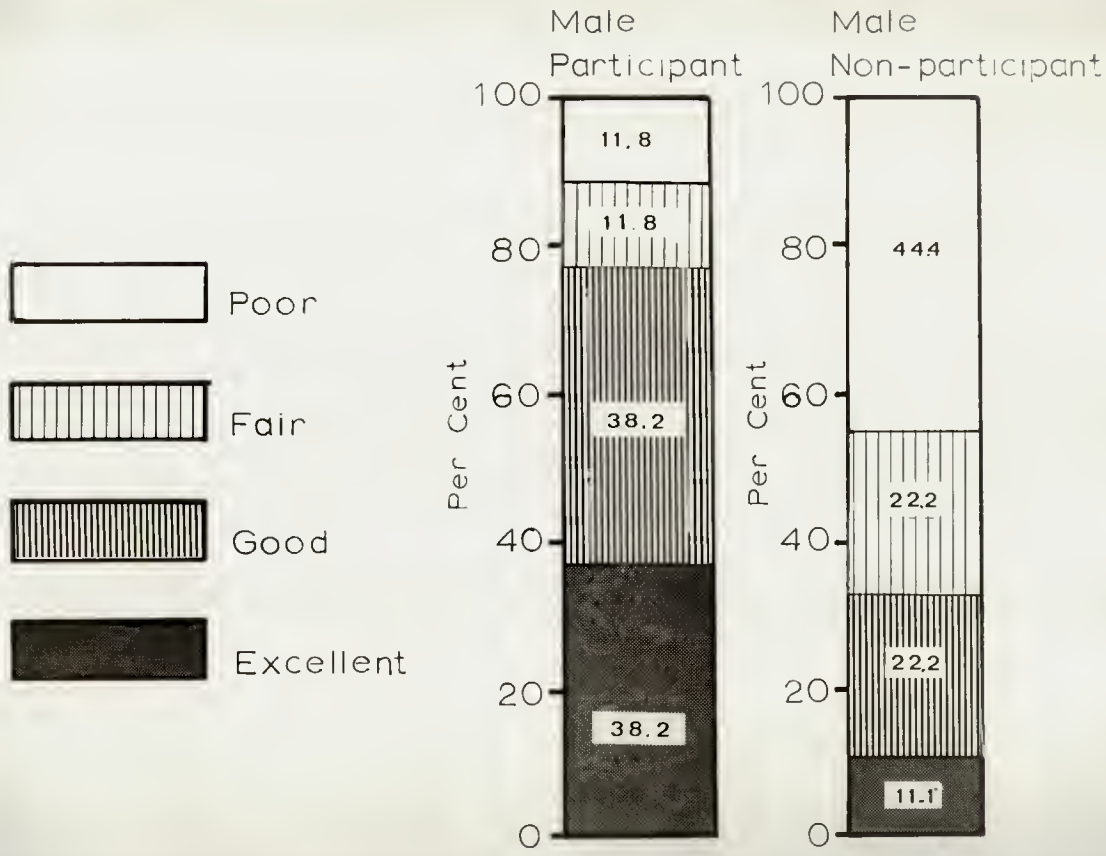

Male
Participant
Male
Non-participant
100
80
60
40
20
0
Per Cent
11.8
11.8
38.2
38.2
44.4
22.2
22.2
11.1
Poor
Fair
Good
Excellent

Fig. 5. Ratings of dietary intake at lunch for female participants and non-participants

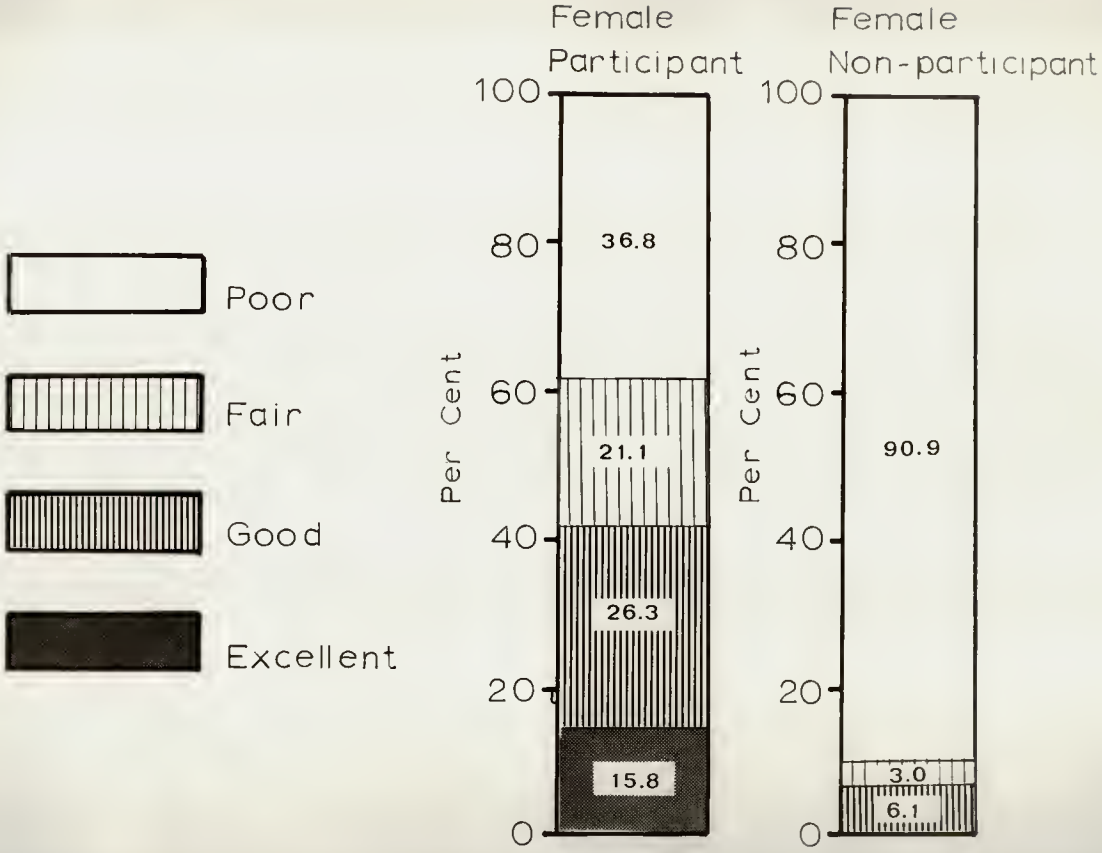
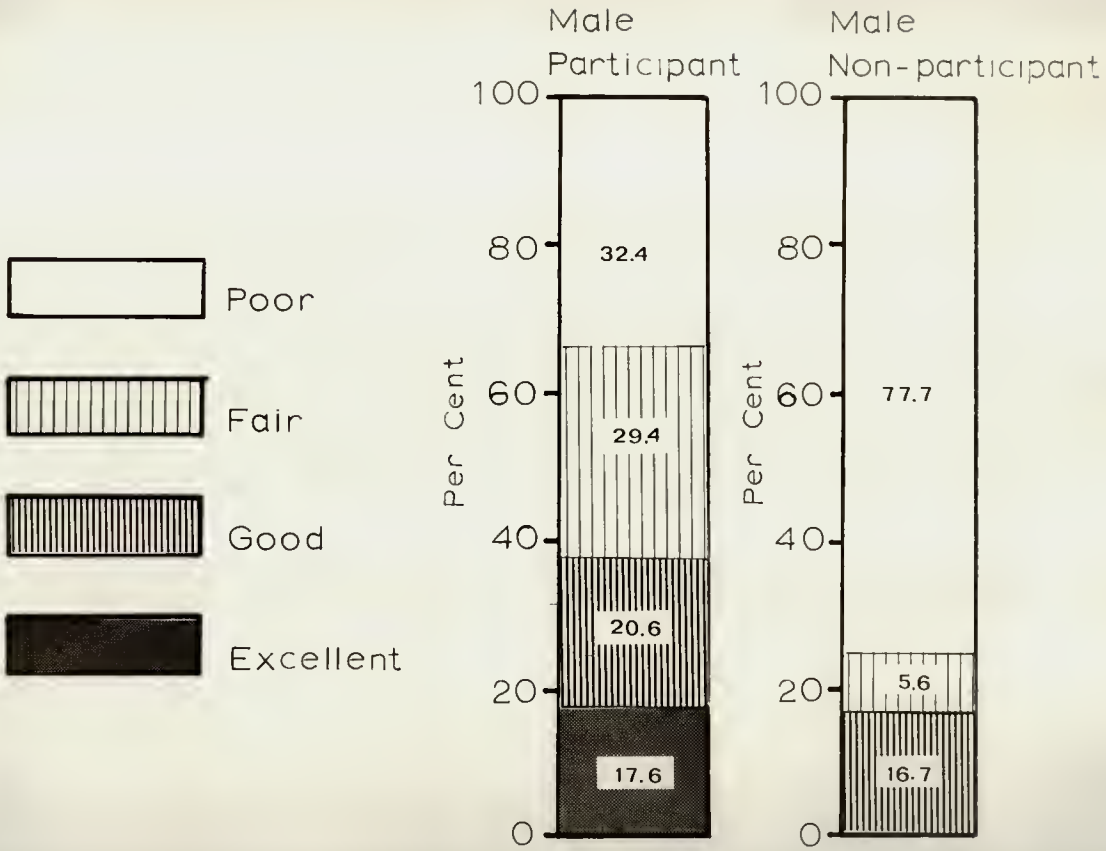

Female
Participant
Female
Non-participant
100
80
60
40
20
0
Per Cent
36.8
21.1
26.3
15.8
90.9
3.0
6.1
Poor
Fair
Good
Excellent

Fig. 6. Ratings of dietary intake at lunch for male participants and non-participants


Male
Participant
Male
Non-participant
100
80
60
40
20
0
Per Cent
32.4
29.4
20.6
17.6
77.7
5.6
16.7
Poor
Fair
Good
Excellent

SUMMARY AND CONCLUSIONS

Summary

Increasing participation in school lunch has been the objective of several projects because of the nutritional benefits to students of the school lunch program. Therefore, identification of the factors affecting participation is important. The objective of this research was to investigate factors which differentiate secondary school students who participate in the school lunch program from those who do not.

The study consisted of two phases: I. Identification of the sample and II. Analysis of food habits and attitudes of secondary school students. In phase I of the study, a questionnaire was administered to sophomore and junior high school students to identify participants and non-participants of the school lunch program. In phase II, an interview was conducted with 104 students, fifty-two sophomores and fifty-two juniors. Of the fifty-two students at the two grade levels, twenty-six were participants and twenty-six were non-participants of the school lunch and were divided equally between males and females. Following the interview, a twenty-four hour dietary recall was obtained from each student to assess nutrient intake.

Students participating in the school lunch program rated their food habits much better than non-participants. Participants, however, reported the need to change their food habits more frequently than did non-participants. In the interview survey, a large majority of students indicated they skipped meals. Lunch was reported as skipped by a larger percentage

of non-participants than participants. Reasons given by students for skipping lunch included: not enough time, dislike of the food, not being hungry, and had other things to do during the lunch hour.

Frequency of participation in the school lunch program was analyzed in relation to current opinions of the program. Participants generally had a good opinion of the school lunch program while non-participants tended to have a poor opinion of school foodservice.

Students were asked to indicate reasons for buying the school lunch. The most frequent reasons given were that the students liked the food or it sounded good, they were hungry, and they had the opportunity to talk with friends. Additional reasons given by participants for buying school lunch were that they had a lunch ticket and it was cheaper than going out to eat. Non-participants stated reasons related to no transportation to go elsewhere and insufficient funds to eat away from school.

The reasons given most often by non-participants concerning why they ate elsewhere were related to the food served on school lunch menus and the crowded cafeteria conditions. Also, crowded cafeteria conditions was the most frequent response given by participants in regard to what they disliked most about having lunch at school.

During the interview, students were asked to indicate their usual source of lunch when they ate at school. The majority of the participants ate the regular Type A meal; whereas, non-participants selected a snack bar item, rather than a Type A lunch alternative.

An equal number of participants and non-participants stated the lunches served at school were well balanced. A larger percentage of participants than non-participants, however, believed the meals served off campus had a poor nutritional content.

Influence of parents, teachers, and friends had an effect on frequency of participation. Participants reported their parents encouraged them to eat school lunch more often than did non-participants. More non-participants than participants believed teachers had negative views of school lunch. More non-participants than participants reported their friends influenced them to eat lunch off campus.

Quality of the food served at school was rated as good more frequently by participants than by non-participants. No differences were reported in students' assessment of variety of food served and portion sizes.

Non-food related aspects were found to affect participation in school lunch. Non-participants reported paying for their own lunches more often than did participants. A higher percentage of participants than non-participants indicated their parents paid for their lunches. Non-participants reported the price of the school lunch was too high more frequently than did participants. Students receiving free or reduced price meals (9.6 per cent) all were participants in the school lunch program.

The majority of non-participants reported the length of the lunch period was too short. Reasons attributed to lack of time included: driving time, distance, problems with parking, long lines, and not enough time to eat. Generally, the participants believed the lunch period was adequate.

Student responses concerning the effect of the lunchroom atmosphere on opinion of school lunch were classified as favorable, unfavorable, and having no effect. The non-participants most frequent response was classified as unfavorable compared to that of participants, who reported the atmosphere had no effect on their opinions of school lunch.

The majority of non-participants reoorted students rated the lunch as fair or poor. Participants believed other students rated the lunch as fair.

Both groups expressed an interest in joining a student advisory council. Suggestions offered on improving the school lunch program included: enlarge the cafeteria, improve preparation of food, add another lunch period, involve students in menu planning, and improve the seating capacity situation.

On the day of the recall, twenty of the 104 students (19.2 per cent) reported taking a vitamin supplement. Males took a supplement more frequently than did females.

The participants consumed significantly higher intakes of calcium than did non-participants in the evaluation of the total day's diets. The males' percentage of RDA's for the total day's intakes with and without a vitamin supplement were significantly higher than those of females for protein, calcium, iron, and riboflavin.

Participants consumed significantly higher intakes of protein, calcium, iron, vitamin A, thiamine, and riboflavin at lunch than did non-participants. The same pattern was true for males compared to females. Lunch intakes of participants met or exceeded the goal of one-third of the recommended dietary allowances for calories and for all nutrients evaluated, except for iron, thiamine, and niacin. Non-participants, however, failed to consume adequate calories and nutrients in relation to the nutrient goal, with the exception of protein.

Foods consumed between meals made a significant contribution to the diets of the students. Between 22 and 44 per cent of the total day's nutrients were consumed as between meal snacks.

Students' diets were classified into four categories: excellent, good, fair, and poor. Results indicated that male and female participants had overall better diet ratings for the total day's nutrient intake with and without a vitamin supplement and for lunch compared to male and female non-participants. Also, males had considerably superior diet ratings than females.

Conclusions and Recommendations

Several conclusions can be drawn from this study. Participants of the school lunch program had considerably superior diets than non-participants. This could be attributed to participants possibly having broader food habits and greater acceptance of new and different foods. Also, males had superior diets than females based on the data from the recall. Information from the recall and the interview indicated that participants had better food habits than non-participants, thus school foodservice appears to be making a positive contribution to students' food habits and nutrient intakes.

Participants had a more positive view of school lunch program than did non-participants. The participants were more critical of the non-food related aspects of school lunch than of the food itself. A negative attitude about the environment was present throughout the interviews, among both participants and non-participants, thus indicating a need for more concern about the environment related to school foodservice.

Influence of parents and teachers affected participation. Parents of participants were more supportive overall of school foodservice than parents of non-participants as reflected by students' perceptions.

Students indicated that the negative views of teachers had an influence on their opinion of school foodservice.

Snacking was an important part of the adolescents' eating patterns and was making a definite contribution to their nutrient intakes. Quality and quantity of snacks may play a critical role in determining nutritive value of the diet.

Overall recommendations of the study involve special efforts to: (a) improve food habits of non-participants and of females particularly, (b) develop a nutrition education program which involves teenagers and helps them to develop a concern for better nutrition, (c) conduct workshops for teachers and school administrators and develop public information programs for parents to inform these groups of the nutritional contribution and importance of school lunch, (d) help teachers realize the importance of their role in influencing teenagers' opinions of school lunch, and (e) help parents realize that quality and quantity of snacks are important in determining nutritive value of teenagers' diets. Recommendaticns to increase participation involve enlarging the physical facilities of the cafeteria and providing adequate seating capacity. Sufficient serving areas are needed to reduce the amcunt of time students spend waiting in line. Involvement of students in menu planning and including the preferred popular foods on school lunch menus more frequently should have a beneficial effect on increasing participation.

The results of this study may lead to further development of factors differentiating participants from non-participants. Other researchers may wish to adapt the same methodology used in this study on a sample population of elementary students. Further analysis of differences in reactions of males and females to school foodservice would be valuable.

Also, the differences in food preferences and food acceptance of participants versus non-participants and the relationship between lunch habits and eating or not eating breakfast might provide additional insights into improvement of the school lunch program.

Two additional recommendations relate to improving the methodology of the study. Contacting teachers on an individual basis to solicit cooperation is suggested. Also, more frequent contact with students selected for the study would be beneficial to maintaining interest, especially if interviews take place over a period longer than two or three weeks.

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APPENDIXES

APPENDIX A

Questionnaire for Phase I

Department of Institutional Management
Justin Hall
Manhattan, Kansas 66506
Phone: 913 532-5521

SCHOOL LUNCH STUDY

This questionnaire is Phase I of a project to get Manhatten High School students' viewpoints of the school foodservice. All information provided will be kept fully confidential. Please follow the directions carefully and answer each question frankly and honestly. Thank you.

PLEASE CHECK THE RESPONSE THAT APPLIES TO YOU.

1. Student classification
   ___(1) Sophomore
   ___(2) Junior

2. Sex
   ___(1) Female
   ___(2) Male

3. Age
   ___(1) 14 yeers
   ___(2) 15 yeers
   ___(3) 16 yeers
   ___(4) 17 years
   ___(5) 18 years

4. Do you usually walk to school?
   ___(1) Yes
   ___(2) No

5. If your answer is NO, what is your usual means of transportation to school? (Check one.)
   ___(1) Bus
   ___(2) Bicycle
   ___(3) Ride a motorcycle
   ___(4) Drive own car (or a family car)
   ___(5) Ride with parents
   ___(6) Ride in someone else's car (including car pools)

6. Please indicate the distance in blocks or miles from your home to school.
   ___(1) Blocks
   OR
   ___(2) Miles

Below is a list of things you may do about lunch. In the blank before each statement PUT THE NUMBER OF TIMES IN THE USUAL 5 DAY SCHOOL WEEK YOU DO WHAT THE STATEMENT DESCRIBES. Answers may be chosen from 0, 1, 2, 3, 4, or 5.

7. ___I eet the regular school lunch.

8. ___I eet the school lunch combinetion at the snack bar.

9. ___I eat e sneck bar item for lunch.

10. ___I eat a school lunch from the saled bar.

11. ___I bring a seck lunch from home.

12. ___I go home for lunch.

13. ___I buy my lunch off-campus (restaurant, drive-in or other fast food, grocery).

14. ___I do not eet lunch.

Leter, e selected groue of students will be interviewed about their food habits and views on school lunch. The interview will be approximately thirty minutes and scheduled before or after school or during a free period. Particication is strictly voluntary and your responses will be kept confidential. We hope you will take part. If selected, would you be willing to be interviewed?

___Yes
___No

If your answer is YES, please sign your name and give your address and phone number.

NAME _____

ADDRESS _____

PHONE NUMBER _____

Please indicate your free period and lunch period during the school day.

FREE PERIOD _____

LUNCH PERIOD _____

Please indicate when you would prefer to be interviewed.

_____Free Period

_____Lunch Period

_____Before School

_____After School

APPENDIX B

Phase II. Interview Guide

SCHOOL LUNCH STUDY
INTERVIEW QUESTIONS

1. During the school year, do you eat the school lunch on a regular basis?

2. How many times per week do you generally eat the school lunch?

3. A. Did you eat the school lunch in elementary school?

   B. Was the food prepared at the school or was it brought in from another location?

4. Did you eat the school lunch in junior high?

5. What was your view of school lunch in elementary school?

6. What was your view of school lunch in junior high?

7. How has your view of school lunch changed during the years?

8. Was there a choice of menu items offered to you in elementary school?

9. What choices of menu items were offered to you in junior high?

10. What choices are offered at the high school?

11. A. When you do eat school lunch, what menu choice do you select?

    1. Regular school lunch
    2. School lunch combination at the snack bar
    3. Snack bar item
    4. School lunch from the salad bar

    B. Why do you select this choice most often?

12. A. When you eat lunch at school, are you able to eat with your friends?

    IF NO:

    B. Why not?

13. Do your best friends eat the school lunch?

14. What are your friends' opinions of school lunch?

15. How do your friends influence you toward the school lunch program?

16. How do you rate your food habits?

17. A. Do you believe you need to change your food habits?

    IF YES:

    B. How do you think you need to change them?

18. How do you rate your friends' food habits?

19. A. Do you ever skip a meal?

    IF YES:

    B. Which meal do you skip?

    C. Why do you skip this meal?

20. A. Is food available to you for a snack between breakfast and lunch?

    IF YES:

    B. Do you usually eat a between meal snack in the morning?

    IF YES:

    C. What is the snack?

21. A. Do you sometimes eat lunch off campus?

    IF YES:

    B. How often do you eat lunch off campus?

    C. When you eat off campus, where do you usually eat lunch?

    D. Why do you go there?

22. A. What do you like about the other places where you eat lunch in comparison to the school lunch and cafeteria?

    B. Are there any other reasons?

23. For what reasons do you believe students leave the campus for lunch?

24. What do you usually eat for lunch when you:

    eat in the school cafeteria?
    eat at home?
    eat at a fast food place (or other place)?
    bring a sack lunch?

25. A. Who pays for your lunches?

    IF YOU SPEND YOUR OWN MONEY:

    B. How do you earn your money?

26. Do you eat school lunch on scheduled special events?

27. A. Do you know what is on the school menu before lunch time?

    IF YES:

    B. How is this information transmitted?

    C. When is this information transmitted?

28. A. Do you read the school menu that is published in the paper?

    B. Do you hear the school menu broadcasted on radio station KMAN?

29. When you do eat at school, what are your reasons for buying a school lunch?

30. What do you like about having lunch at school? (other than food)

31. IF NON-PARTICIPANT:

    A. What are your reasons for not buying a school lunch?

    OR

    IF PARTICIPANT:

    B. What do you dislike about having lunch at school?

32. A. Do you dislike the food served in the school lunch program?

    IF YES:

    B. What are your reasons for disliking the food served in the school lunch?

33. What foods served in lunches at your school do you especially like?

34. What are your favorite foods that are never served in lunches at your school?

35. A. What would you like to see served in the school lunch?

    B. If these foods were served, would you eat school lunch more often?

36. A. Do they serve foods you don't like in school lunch?

    IF YES:

    B. What are these foods?

37. What is your view of the variety of foods served in the school lunch?

38. How would you rate the quality of food served in the school lunch?

39. What do you know about the National School Lunch Program?

40. A. What is your view of the attitude of school administrators toward school lunch?

    B. Of teachers' attitudes toward school lunch?

41. A. Do you hear teachers express opinions of school lunch?

    IF YES:

    B. What are they?

42. What effect do teachers have on influencing you toward school lunch?

43. A. Do the teachers who eat the school lunch have a separate table or a separate dining room?

    B. What effect, if any, does this have on your opinion of school lunch?

44. A. Do you feel students and teachers should eat lunch together in elementary school?

    B. Why do you feel this way?

45. What effect do your parents have on influencing you to eat the school lunch?

46. What is your opinion of the nutritional content of the meals served at your school?

47. What is your opinion of the nutritional content of the meals you consume when you eat lunch off campus?

48. A. Is the length of the lunch period too long, just right, or too short?

    IF TOO SHORT:

    B. How much longer should it be?

49. A. Is time a problem when you go off campus for lunch?

    IF YES:

    B. Why?

50. How long do you usually wait in line for lunch at school?

51. A. About how long does it take you to eat lunch at school? (Including time standing in line)

    B. About how long does it take you to eat lunch at places other than school?

52. A. Do you have as much time to eat your lunch as you need:

        At school?
        At a fast food or other place?
        At home?

    IF NO:

    B. Why not?

53. What effect does the length of the lunch period have on your opinion of school lunch?

54. What is your opinion of the size of servings in the school lunch?

55. Is the price of the school lunch about right, too high, or too low?

56. Can you save money by eating the school lunch compared to the cost of eating lunch off campus?

57. A. How much do you usually spend when you eat lunch at school?

    B. When you eat off campus, how much do you usually spend?

58. A. Who is in charge of keeping order in the lunchroom?

    B. What is your opinion of the supervision of the lunchroom?

59. A. How would you rate your school lunchroom atmosphere?

    B. What are your reasons for rating it like this?

60. What effect does the lunchroom atmosphere have on your opinion of school lunch?

61. How could the lunchroom environment be improved?

62. A. If the opportunity was made available, would you take part in an organization to provide student input into the school lunch program?

    IF YES:

    B. What suggestions could you offer this organization?

63. How do students in general rate the school lunch?

64. What changes might increase the number of students who eat lunch?

65. If you could do one thing to improve school lunch, what would it be?

66. Is there anything else you would like to express regarding the school lunch program?

APPENDIX C

Phase II. Twenty-four Hour Dietary Recall

Source and Where Eaten Codes
RSL -Regular School Lunch
SLSB -School Lunch at Snack Bar
SBI -Snack Bar Item
Sal.B-Salad Bar
CL -Carried Lunch from Home
H -Home
O -Other Home (Friend)
V -Vending Machine
G -Grocery
FF-Fast Food (State Name)

Student's I.D. Number_____
Interviewer's Name_____
Day of Week_____
Date_____

TWENTY-FOUR HOUR DIETARY RECALL

FOOD CODE NUMBER	FOOD ITEM OR INGREDIENTS	SIZE OF SERVINGS	AMOUNT LEFT UNEATEN	WHY FOOD WAS LEFT UNEATEN	TYPE OF PREPARATION	WHERE FOOD WAS OBTAINED
BREAKFAST						
SNACK						
LUNCH						
SNACK						
DINNER						
SNACK						

Do you take a vitamin supplement?_____ What kind _____

Does this recall represent a typical day's eating habits?_____

APPENDIX D

Correspondence to Teachers

Department of Dietetics, Restaurant
and Institutional Management
Justin Hall
Manhattan, Kansas 66506
Phone: 913 532-5521-2

DATE: October 2, 1978

TO:

FROM: Susan M. Howe
Graduate Research Assistant

Allene G. Vaden, Ph.D., R.D.
Associate Professor of
Dietetics, Restaurant and
Institutional Management

SUBJECT: Foodservice Questionnaire

The Department of Dietetics, Restaurant and Institutional Management at Kansas State University, in cooperation with the USD 383 Foodservice Division, is studying food habits of students and their views towards school lunch. Mrs. Greig, School Foodservice Director, and Dr. Rezac have approved the project. Dr. Rezac has agreed that students may be asked to participate. Mr. Sidesinger has been appointed as liaison for the project.

We are selecting an approximate thirty per cent sample of the sophomore and junior students. We have randomly selected the classrooms to participate in the study. We hope that you will be willing to assist us by distributing the questionnaires to your classes that were selected to be part of the sample. Classes selected are from sophomore English Composition and Practical English and junior American Literature and Practical English. We will bring a packet of questionnaires and the instructions to you by Thursday, October 5. Please distribute these questionnaires during the periods listed below on October 6, 1978. The completed questionnaires should be left in Mr. Sidesinger's office in the envelope provided on Friday after they have been completed by the students.

Later, a selected group of students will be interviewed about their food habits and views on school lunch. The interview will be approximately thirty minutes and will be scheduled before or after school or during the students' lunch period or free period.

Although we would like all students to participate, they are not obligated to do so and should leave the questionnaire blank if they do not wish to participate. Please encourage the students to answer each question frankly and honestly and assure them they will not be identified individually.

Thank you for your help!

Note: Your classes which were randomly selected for participation in the study are as follows:

APPENDIX E

Phase I. Instructions for Classes

Department of Dietetics, Restaurant
and Institutional Management
Justin Hall
Manhattan, Kansas 66506
Phone: 913 532-5521-2

DATE: October 4, 1978

TO: Teachers of Participating Classes

FROM: Susan M. Howe
Graduate Research Assistant

Allene G. Vaden, Ph.D., R.D.
Associate Professor of
Dietetics, Restaurant and
Institutional Management

SUBJECT: Introduction of Study

1. Please read the following explanation in introducing the study to the students. It is important that all students receive the same basic information.

"The Department of Dietetics, Restaurant and Institutional Management at Kansas State University, in cooperation with the USD 383 Foodservice Division, is studying students' food habits and views on school lunch. Mrs. Greig, School Foodservice Director, and Dr. Rezac have approved the study. Hopefully you will be willing to help them by filling out the questionnaire. They would like all students to participate, but if you do not wish to do so, you should turn your questionnaire in blank.

Later, a selected group of 100 students will be interviewed about their food habits and views on school lunch. The interview will be approximately thirty minutes and scheduled at your convenience, before or after school or during your lunch period or free period. Participation in the interview is strictly voluntary and your responses will be kept confidential. You will not be identified individually with your answers. Also, you may withdraw from the project at any time. However, the researchers hope you will be willing to take part in the interview, if selected.

If you are willing to be interviewed please sign your name and give your address and phone number. Also, please indicate your free period during the day, your lunch period, and when you prefer to be interviewed. A space for this information is provided on the questionnaire.

Mrs. Greig and the Department of Dietetics, Restaurant and Institutional Management appreciate your help. When you have completed the questionnaire, please place it in the envelope provided. When everyone is finished, all questionnaires will be collected. Susan Howe, a graduate student at Kansas State University who is working with Mrs. Greig on the project, will be glad to answer any questions or concerns about the procedure you may have. You may contact her at 532-5521 (office) or 776-5934 (home). Also, Frank Wiebe, vice-president of student council, will be glad to answer any questions you may have. You may contact him at 776-6162 (home)."

2. Please place completed questionnaires in the envelope provided which is marked for this class. The completed questionnaires should be left in Mr. Sidesinger's office. Thank you.

APPENDIX F

Probing Questions

PROBING QUESTIONS TO DETERMINE HIDDEN ITEMS

1. Was the milk: whole, two per cent, skim, or chocolate?
   If the milk was chocolate, was it whole or skim?
2. Did you have sugar on your cereal?
3. Did you have cooked cereal?
4. Was the cereal pre-sweetened?
5. What did you put on your cereal?
6. Did you have butter or margarine on your toast?
7. Did you have jelly or peanut butter on your toast?
8. Did you have honey on your toast?
9. Was your toast or bread white, whole wheat, rye, or sourdough, etc.
10. Did you have lettuce, tomato, mayonnaise, ketchup, mustard, butter, pickles, cheese, or onions on your sandwich?
11. Did you have two slices of bread for your sandwich?
12. Did you have dressing on your salad?
13. Did you have gravy or butter on your potatoes?
14. Did you have butter, margarine, jelly, or honey on your roll?
15. Did you have butter or margarine on your vegetables?
16. Did you have a sauce (white, cheese, etc.) on your vegetables?
17. Did you have sugar in your tea?
18. Did you have sugar or cream in your coffee?
19. Did you have diet pop?
20. Did you have pure or artificial orange juice?
    (Pure: Minute Maid, Scotch Treat, Dewey Fresh, etc.)
    (Artificial: Awake, Tang, Bright Day, etc.)

APPENDIX G

Phase II. Letters to Students

Department of Dietetics, Restaurant
and Institutional Management
Justin Hall
Manhattan, Kansas 66506
Phone: 913 532-5521-2

DATE:

TO:

FROM: Susan M. Howe
Graduate Research Assistant

Allene G. Vaden, Ph.D., R.D.
Associate Professor of
Dietetics, Restaurant and
Institutional Management

SUBJECT: Foodservice Interview

The Department of Dietetics, Restaurant and Institutional Management at Kansas State University, in cooperation with the USD 383 Foodservice Division is studying the food habits of students and their views of school lunch.

You are among a group of students that was randomly selected to be representative of the student body at your high school. On October 6, 1978 you took part in phase one of the project in which you completed a short questionnaire. On the questionnaire, you indicated your willingness to take part in an interview on food habits and views toward school lunch. We hope you are still willing to participate. The interview will be approximately thirty minutes and be scheduled at your convenience before or after school or during your lunch period or free period.

We will be contacting you by telephone to make an appointment to be interviewed at your convenience at the high school or at another prearranged place.

Thank you for your help in advance!

If there are any questions, please call Susan Howe at KSU, or at home:

KSU: 532-5522

Home: 776-5934

Department of Dietetics, Restaurant
and Institutional Management
Justin Hall
Manhattan, Kansas 66506
Phone: 913 532-5521-2

DATE: December 2, 1978

TO:

FROM: Susan M. Howe
Graduate Research Assistant

Allene G. Vaden, Ph.D., R.D.
Associate Professor of
Dietetics, Restaurant and
Institutional Management

SUBJECT: Foodservice Interview

The Department of Dietetics, Restaurant and Institutional Management at Kansas State University, in cooperation with the USD 383 Foodservice Division, is conducting a study of the food habits and views on school lunch of sophomores and juniors at Manhattan High School.

As you know, you are among a group of students randomly selected to be interviewed. As the study nears completion, 100 per cent participation is necessary. The deadline date for completion of the interviews has been set for December 8, 1978.

We will be contacting you by telephone during the week of December 4th to make an appointment to be interviewed at your convenience.

We need your help!

If there are any questions, please call Susan Howe at Kansas State University, or at home:

KSU: 532-5522

Home: 776-5934

APPENDIX H

Interviewer Training Session I

INTERVIEWER TRAINING SESSION I

Objective and Method of Research

The objective of this project is to investigate factors which differentiate secondary students who participate in the school lunch program from those who do not participate. Sophomores and juniors have been selected as the population for the study.

The study will consist of two phases, a questionnaire and an interview. A questionnaire will be prepared and administered to sophomores and juniors.

The questionnaire phase of the study is designed to identify participants and non-participants. Data asked for will include: student classification or grade level, sex, age, means of transportation to school, distance from home to school, and usual lunch habits during the school week. The data from the questionnaire will be used to select the sample for phase two of the study, or the interview phase.

Approximately 30 per cent of the student population (N = 873) of sophomores and juniors will be selected randomly to participate in phase one of the study. Sophomore English Composition and Practical English and junior American Literature and Practical English will be selected for the study.

A schedule of the teachers and their classes will be obtained from the assistant principal. Numbers will be assigned to the classes. Enrollment is almost equal for the two grade classifications; therefore, an equal number of classes from each classification will be selected randomly for the 30 per cent sample.

Before the administration of the questionnaire in phase one of the study, notices will be sent to the teachers of the participating classes introducing the study. A packet will be delivered to each teacher prior to the date of administration of the questionnaire. The packet will contain the instruments and a set of instructions for the teachers to read to the classes. The instructions will indicate that students who do not wish to participate may return the questionnaire unanswered. After administering the questionnaire to their participating classes, the teachers will be asked to deliver the questionnaires to the assistant principal's office in the envelopes provided.

In phase two, an interview will be conducted with approximately 100 students, fifty sophomores and fifty juniors. Of the fifty students at each grade level, twenty-five will be participants and twenty-five will be non-participants of the school lunch. The students in the study sample will be contacted by telephone to make appointments for the interview. The interview will cover various factors affecting school lunch participation and also, a twenty-four hour dietary recall will be obtained from each student.

Permission to conduct the study will be secured from the College of Home Economics Committee on Research Involving Human Subjects. The subjects will be informed that they have the right of non-participation. Phase I of the study, which asks for the student's name, address, and phone number, will be used only for the purpose of selecting the sample for phase II. The questionnaire in phase I will include a statement about the student's willingness to take part in phase II, if selected. Students will be informed that their responses will be kept confidential. Permission to conduct the study has been secured from the School

Foodservice Director and the Principal at Manhattan High School. An assistant principal has been appointed as liaison for the project.

The members of the student council at Manhattan High School will be asked to complete the questionnaire and interview before it is administered to the study sample to determine if questions are clearly stated. The pilot study will be conducted for the development of data collection techniques.

Results from the questionnaire and interview will be statistically analyzed. Appropriate analysis will be performed as advised by a statistician.

The Interview as a Tool in Research

Kerlinger (1) stated that the most important use of the interview should be to study relations and to test hypotheses. The interview is a psychological and sociological measuring instrument.

Kerlinger (1) reported that an interview can be used for three main purposes. It can be used as an exploratory device to help identify variables and to suggest hypotheses. It can be the main instrument of the research. Also, the interview can supplement other methods: follow up unexpected results, validate other methods, and go deeper into the motivations of respondents and their reasons for responding as they do.

The interview is a face-to-face interpersonal role situation in which one person, the interviewer, asks a person being interviewed, the respondent, questions designed to obtain answers pertinent to the research problem (1). Borg and Gall (2) stated that the interview as a research method in descriptive research is unique in that it involves the collection of data through direct verbal interaction between individuals.

There are two broad types of interviews: structured and unstructured or standardized and unstandardized. In the standardized interview, the questions, their sequence, and their wording are fixed. Unstandardized interviews are more flexible and open. As a measurement device, the unstandardized interview is inadequate (1, 3).

The standardized interview is composed of three types of questions: fixed-alternative, open-ended, or scale. Fixed-alternative questions offer the respondent a choice among two or more alternatives. Open-ended questions are those that supply a frame of reference for respondents' answers, but put a minimum of restraint on the answers and their expression. A scale is a set of verbal items to each of which an individual responds by expressing degrees of agreement or disagreement or some other mode of response. A combination of the three types of questions is most efficient in an interview (1).

In both questionnaires and interviews, information is obtained by asking questions. Selltiz et al. (3) reported that there are five major types of question content. Question content is aimed mainly at: (a) obtaining facts; (b) obtaining beliefs about what the facts are; (c) determining feelings about what the facts are; (d) discovering present or past behavior; and (e) determining conscious reasons for beliefs, feelings, and behavior.

Babbie (4) stated that there are three main advantages in having a questionnaire administered by an interviewer rather than by the respondent himself. First of all, interview surveys typically attain higher response rates than mail surveys. A properly designed and executed interview survey ought to achieve a completion rate of at least 80 to 85 per cent. Second, the presence of an interviewer generally decreases the

number of "don't knows" and "no answers." The interviewer can be instructed to probe for answers. Third, the interviewers can also provide a guard against confusing questionnaire items. The interviewer can help clarify matters, thereby obtaining relevant responses.

The interviewer must maintain a neutral role. It must be assumed that a questionnaire item will mean exactly the same thing to every respondent, and every given response must mean the same thing when given by different respondents. The interviewer must be a neutral medium through which questions and answers are transmitted (4).

Babbie (4) reported that there are general rules for interviewing that would apply to most if not all interviewing situations. The following rules were presented:

1. Appearance and Demeanor.
   Appearance should be fairly similar to the people being interviewed. In demeanor, the interviews should be pleasant, relaxed, and friendly. The interviewer must communicate a genuine interest in getting to know the respondent. The interviewee should be helped to feel that each question is important and significant.

2. Familiarity with Questionnaire.
   The questionnaire must be studied carefully and must be practiced reading it aloud. The interviewer must be able to read without error.

3. Follow Question Wording Exactly.
   A slight change in the wording of a given question may lead a respondent to answer "yes" rather than "no."

4. Record Responses Exactly.
   It is very important that the interviewer record the answers exactly as given. No attempt should be made to summarize, paraphrase, or correct bad grammar.

5. Probing for Responses.
   Sometimes the respondent will respond to a question with an inappropriate answer, therefore the interviewer must probe for a correct response. Probes must be completely neutral. The probe must not in any way affect the nature of the subsequent response. Sometimes the best probe is silence, if the interviewer waits for a response, the respondent will probably fill the pause with additional comments.

References

(1) Kerlinger, F.N.: Foundations of Behavioral Research. 2nd ed. New York: Holt, Rinehart and Winston, Inc., 1973.

(2) Borg, W.R., and Gall, M.D.: Educational Research. An Introduction. 2nd ed. New York: Longman, Inc., 1971.

(3) Selltiz, C., Wrightsman, L.S., and Cook, S.W.: Research Methods in Social Relations. 3rd ed. New York: Holt, Rinehart and Winston, Inc., 1976.

(4) Babbie, E.R.: The Practice of Social Research. Belmont, Calif.: Wadsworth Publ. Co., Inc., 1975.

APPENDIX I

Interview Procedures

Department of Dietetics, Restaurant
and Institutional Management
Justin Hall
Manhattan, Kansas 66506
Phone: 913 532-5521-2

_____ Phone Number
_____ I.D. Number
_____ Free Period
_____ Lunch Period
PREFERRED TIME:
_____ Free Period
_____ Lunch Period
_____ Before School
_____ After School

Instructions for Interviewer
Making Appointments

Hello,

Is _____ there?
(Student's name)
I am _____. As you know, the Department of
(Interviewer's name)
Dietetics, Restaurant and Institutional Management at Kansas State University, in cooperation with the USD 383 Foodservice Division is conducting a study of the food habits and views on school lunch of sophomores and juniors at Manhattan High School.

You are one of the students randomly selected to be interviewed. I would like to make an appointment with you, at your convenience, before or after school, during your lunch period or free period. What time is best for you? Will _____ work into your schedule at that time?
(Date)
Where is a convenient location for us to meet? I will meet you on

_____, _____, at _____ at
(Day of week) (Date) (Time)
_____.
(Place, Room #)

Thank you.

INSTRUCTIONS FOR THE INTERVIEWER

INTRODUCTION: I am _____ (Interviewer's name). We are conducting a study of the food habits and views on school lunch of sophomores and juniors at Manhattan High School. The Department of Dietetics, Restaurant and Institutional Management at Kansas State University, in cooperation with the USD 383 Foodservice Division is conducting this study.

DETERMINE ELIGIBILITY: Ask, "Are you _____ (Student's name)?" If yes, continue the interview. If no, inquire when the right person will be there.

OPENING STATEMENT: You are among a group of students who indicated willingness to participate in a study on food habits and views on school lunch. You will be asked a series of questions for which there are no right or wrong answers. The information will be kept confidential. Your name will not be shared with any of the teachers or other students in your school. You will not be identified individually with your answers. The interview will be taped for purposes of analyzing the data. I will be recording footage of the tape periodically during the interview. This will assist us in accessing answers to specific questions later when we analyze the interviews from all 100 students participating in the study. The information obtained from you will be a valuable contribution in the analysis of sophomore and junior students' food habits and their views on school lunch.

PROCEDURE FOR THE INTERVIEW

1. Label tape with student I.D. number, date, and interviewer's name.

2. Begin tape.

3. State the student's I.D. number.
   "This is interview number _____."
   This number will correspond with the number on the student's questionnaire.

4. Proceed with interview. Use probes where necessary.

5. Turn off the tape recorder at the end of the interview (after question 66).

6. Read the following statement concerning the twenty-four hour dietary recall.

   "You will be asked to recall all foods and snacks eaten between meals as well as regular meals for the past twenty-four hours. There are no right or wrong answers and you will not be judged on your food habits. All information will be kept confidential and you will not be identified individually with your answers. The information obtained from you will be a valuable contribution in the analysis of nutrient intake of sophomore and junior students.

   Please name everything consumed in the past twenty-four hours. Start with your most recent meal or snack and work back. Indicate if the food item was at meal time or a snack, the amount or size of

serving, if any portion was left uneaten, the appropriate size of portions left uneaten (1/4, 1/2, or all), why you did not eat the food, the method of preparation, and indicate where the food was obtained. Remember to include butter used on bread, dressing on salad, and other "hidden" items. You may refer to the food models to help you recall correct portion sizes."

7. Fill out the recall form as the student responds.

8. Use list of leading questions as a guideline in determining all "hidden" items.

9. Ask the student:
   "Do you take any vitamin supplements?"
   If yes, ask:
   "What kind of supplements do you take?"
   (Probe: Get specific brand if possible.)

10. Ask the student:
    "Does this recall represent your usual or typical eating habits?"

11. Check to see that all questions have been answered.

12. Thank the participant.

13. Record appropriate information on the recall form (interviewer's name, student's I.D. number, day of week, and date).

Department of Dietetics, Restaurant and Institutional Management
Justin Hall
Manhattan, Kansas 66506
Phone: 913 532-5521-2

INTERVIEWER QUESTION FORM

Student I.D. Number _____ Date _____

DIRECTIONS: Record footage of the tape periodically during the interview.

QUESTION	RECORDER CODE	QUESTION	RECORDER CODE	QUESTION	RECORDER CODE
1		23		45	
2		24		46	
3		25		47	
4		26		48	
5		27		49	
6		28		50	
7		29		51	
8		30		52	
9		31		53	
10		32		54	
11		33		55	
12		34		56	
13		35		57	
14		36		58	
15		37		59	
16		38		60	
17		39		61	
18		40		62	
19		41		63	
20		42		64	
21		43		65	
22		44		66	

INTERVIEWER CHECKLIST

1. Tape Recorder
2. Tape (plus one extra tape)
3. Microphone
4. Adapter
5. Instructions to Interviewers
6. Procedure for Interviews
7. Interview Questions
8. Pencil/Pen
9. Interviewer Question Form
10. Recall Form
11. List of Probing Questions
12. Chart of Food Models

MANHATTAN HIGH SCHOOL
CLASS HOURS

REGULAR CLASS SCHEDULE

PERIOD	HOUR
0	7:25-8:20
1	8:25-9:20
2	9:25-10:20
3	10:25-11:20
4	11:25-1:00
5	1:05-2:00
6	2:05-3:00

ASSEMBLY CLASS SCHEDULE

PERIOD		HOUR
0		7:25-8:20
1		8:25-8:55
2	Assembly 1	9:05-9:50
	Assembly 2	10:00-10:45
3		10:50-11:20
4		11:25-1:00
5		1:05-2:00
6		2:05-3:00

APPENDIX J

Instructions for Coding the Recall

COOING DIRECTIONS FOR THE TWENTY-FOUR HOUR RECALL

Enter the necessary information on the coding form as explained below: (refer to code form)

Columns	Explanation of Input
1-3	I.D. Code: Enter the appropriate three digit I.O. number for each student.
4	Sex Code: Enter the appropriate code for the sex of the student.

Code	Sex
1	Female
2	Male

5 Classification Code: Enter the appropriate code for the grade classification of the student.

Code	Grade
1	Sophomore
2	Junior

6 Participant or Non-Participant Code: Enter the appropriate code for a participant or non-participant of the school lunch program.

Code	School Lunch Program
1	Participant
2	Non-Participant

7 Vitamin Supplement Code: Enter the appropriate code which corresponds to whether the student takes a vitamin supplement.

Code	Vitamin Supplement
1	Yes
2	No

8 Recall Code: Enter the appropriate code which corresponds to whether the recall is typical for the student.

Code	Recall
1	Yes
2	No

Columns	Explanation of Input
9	Meal Code: Enter the appropriate code for the meal consumed by the student.

Code	Meal
1	Breakfast
2	Morning Snack
3	Lunch
4	Afternoon Snack
5	Dinner
6	Evening Snack
7	Vitamin

10-11 Source and Where Eaten Code: Enter the appropriate code for where the food was obtained.

Code	Where Food Was Obtained
01	Regular school lunch
02	School lunch at the snack bar
03	Snack bar item
04	Salad bar
05	School breakfast
06	Carried lunch from home
07	Home
08	Other home (friend)
09	Vending machine
10	Grocery
11	McDonalds
12	Hardees
13	Taco Tico
14	Burger King
15	Vista
16	Taco Hut
17	A&W
18	Pizza Hut
19	Reynards
20	Raouls
21	Dairy Queen
22	Woolworths
23	Kentucky Fried Chicken
24	K-State Union
25	Sambos
26	Kreme Kup
27	Bakery
28	Other
29	Multiple Fast Foods (or other restaurants)
30	01 and 03
31	02 and 03
32	04 and 03
33	Vitamin
34	06 and 03
35	05 and 07

Columns	Explanation of Input
12-14	Food Code: Enter a three digit number from the USDA Home and Garden Bulletin for each item.
15-17	Quantity Code: Enter the quantity of food consumed as a three digit number having two decimal places in the following format: 9^99. This number should be right-justified. DO NOT LEAVE A SPACE FOR THE DECIMAL.
18-77	Continue to code the food code and the quantity code for each item contained in the meal. If additional columns are needed, continue on another card beginning with column 9. Repeat the meal and where eaten codes, then continue with the food and quantity codes.

INSTRUCTIONS FOR COOING THE RECALL

Enter necessary information on the recall form as explained below:

a. FOOD CODE - Refer to U.S.O.A. Home and Garden Bulletin No. 72 for a 3-digit code for each item. If the item is not included in the manual, select an item which is very similar; e.g., chicken may be substituted for turkey. If a reasonable facsimile cannot be found, circle the food item on the recall form in red. Also, keep a list of all circled items.

b. QUANTITY COOE - The standard portion size in the Bulletin is the basis for the quantity code. The standard portion size is equivalent to 100% or 1.00. Compare the portion size in the manual to the amount consumed and assign a code.

EXAMPLES:
1 scrambled egg = standard portion (U.S.D.A.). If the serving portion consumed were 2 eggs, the quantity code is 2.00. If a portion were 1/2 of the standard, the code would be 0.50.

3 ounces lean roast = standard portion (U.S.D.A.). If the serving portion consumed were 6 ounces, the quantity code is 2.00. If the portion consumed were 4 ounces, the quantity code would be 1.33.

12 fluid ounces cola type beverage = standard portion (U.S.O.A.). If the serving portion consumed were 14 ounces, the quantity code would be 1.16. If a portion consumed were 16 ounces, the quantity code would be 1.33. If a portion consumed were 20 ounces, the quantity code would be 1.66.

If you are not sure of the way you have coded a quantity of a food item, place a red check to the right of the quantity code.

c. Record the above information in the food code number column on the recall form. Place the food code number to the left side and the quantity code number to the right side of the column.

FAST FOOD CHAINS

PORTION SIZES FOR SELECTED MENU ITEMS

HARDEES

Food Item:	Portion Size:
Deluxe Sandwich	4 oz.
Hamburger	2 oz.
Cheeseburger	2 oz., .50 oz. cheese
Big Cheese	4 oz., .50 cheese
Big Twin	4 oz.
Roast Beef	2.5 oz.
Big Roast Beef	3.75 oz.
Small French Fries	2.5 oz.
Large French Fries	4 oz.
Beverages: Small	10 oz.
Medium	14 oz.
Large	20 oz.

McOONALDS

Food Item:	Portion Size:
Hamburger	1.6 oz.
Cheeseburger	1.6 oz., .50 oz. cheese
Quarter Pounder	4 oz.
Big Mac	3.2 oz.
Small French Fries	2.5 oz.
Large French Fries	4.5 oz.
Beverages: Small	12 oz.
Medium	16 oz.
Large	22 oz.

TACO HUT

Food Item:	Portion Size:
Taco	1.5 oz. meat, .50 oz. cheese
Burrito	1.5 oz. meat, 1 oz. beans
Beverages: Small	9 oz.
Medium	14 oz.
Large	20 oz.

BURGER KING

Food Item:	Portion Size:
Whopper	2.5 oz.
Hamburger	1.25 oz.
Cheeseburger	1.25 oz., .50 oz. cheese
Small French Fries	2.75 oz.
Large French Fries	4 oz.
Beverages: Small	11 oz.
Medium	14 oz.
Large	22 oz.

STUDENT CLASSIFICATIONS

Sophomore Female Participants I.D. Numbers	Sophomore Female Non-Participants I.D. Numbers
001	026
002	027
004	030
008	031
009	032
011	034
016	035
017	040
018	041
020	043
021	048
022	050
023	051

Sophomore Male Participants I.D. Numbers	Sophomore Male Non-Participants I.D. Numbers
053	080
059	081
060	082
061	083
062	084
064	085
069	086
070	088
072	089
074	090
075	091
077	092
079	093

Junior Female Participants I.D. Numbers	Junior Female Non-Participants I.D. Numbers
094	108
095	109
096	111
097	112
098	113
099	114
100	115
103	116
104	117
105	118
107	119
125	120
129	121

Junior Male Participants I.D. Numbers	Junior Male Non-Participants I.D. Numbers
131	144
132	146
133	147
134	149
135	150
136	152
137	153
138	154
139	155
140	156
141	157
142	158
143	159

Table 40: Nutritive values of foods[1]

food code number	food, approximate measure, and weight (in grams)			food energy	protein	fat	fatty acids			carbohydrate	calcium	iron	vitamin A value	thiamine	riboflavin	niacin	ascorbic acid
							saturated (total)	unsaturated									
								oleic	linoleic								
				cal.	gm.	gm.	gm.	gm.	gm.	gm.	mg.	mg.	I.U.	mg.	mg.	mg.	mg.
616	tortilla	1 cake	30	63	1.5	.6	-	-	-	13.5	60	.9	6	.04	.015	.3	0
617	gravy	1 tbsp.	18	41	.3	3.5	-	-	-	2.0	trace	.1	0	.01	.007	trace	-
618	mustard	1 tsp.	5	5	trace	trace	-	-	-	trace	4	.1	-	-	-	-	-
619	hash browns	1 cup	155	345	3	18	4.6	3.2	9.0	45	28	1.9	trace	.11	.03	1.6	12
620	turkey, cooked	3 oz.	85	160	27	5	1.5	1.0	1.1	0	7	1.5	-	.04	.15	6.5	-
621	chocolate milk, 2%	1 cup	250	180	8	5	3.1	1.3	.1	26	204	.6	500	.10	.42	.3	2
622	popover	1 average	50	112	4.4	4.6	-	-	.5	12.9	48	.8	165	.07	.12	.5	trace
623	vanilla wafer	1 wafer	4	10.5	.2	.6	-	-	-	3	1.6	.06	5	.01	.009	.08	0
624	donut, fried	1 donut	50	205	3	11	3.3	5.8	3.3	22	16	.6	25	.10	.10	.8	0
625	banana bread	1 slice	49	134	2.4	3.9	-	-	-	22.8	0	4	273	.06	.06	.5	0
626	malt-o-meal	3/4 cup	20	101	3.2	.2	-	-	-	21.7	6	2.0	0	.156	.094	1.1	0
627	breakfast drink	1 cup	250	290	16	9	-	-	-	35	600	4.5	1250	.3	.72	4	22.5
999	vitamin supplement (One-a-Day)	1		-	-	-	-	-	-	-	-	-	5000	1.5	1.7	20	60

[1]Items added to data base which were not included in Home and Garden Bulletin No. 72, 1970.

APPENDIX K

"MEALS": Computer Program Information for Dietary Recall Data

"MEALS"

Written by -- John Devore, Kansas State University Computing Center

Purpose -- "MEALS" converts a list of foods eaten into nutrient values. Input to "MEALS" is a list of foods eaten, by meals. Included is extra information used by subsequent programs, which is echoed on the output cards. A database contains the conversion from a given food to a list of nutrition values. "MEALS" sums and punches the nutrition information for all of the items in a given meal. The print data set contains error messages (primarily cards out of order).

Input and Output Formats -- Input format is specified in coding instructions (Appendix J). Output format is on the page following. Columns 1-11 of the output format matches that of the input format. The remainder of the output cards contains nutritional information as explained above and in the output format.

OUTPUT FORMAT

Cols.	Contents
1-3	ID Code
4-4	Sex
5-5	Classification Code
6-6	Participant or Non-Participant Code
7-7	Vitamin Supplement Code
8-8	Recall Code
9-9	Meal Code
10-11	Source and Where Eaten Code
12-16	Weight, gm. (whole no.)
17-21	Food Energy, cal. (whole no.)
22-25	Protein, gm. (whole no.)
26-29	Fat, Total Lipid, gm. (whole no.)
	Fatty Acids, gm. (whole no.)
30-33	Saturated (total)
34-37	Unsaturated, Oleic
38-41	Unsaturated, Linoleic
42-45	Carbohydrate, gm. (whole no.)
46-50	Calcium, mg. (whole no.)
51-54	Iron, mg. (1 decimal)
55-60	Vitamin A Value, international units (whole no.)
61-64	Thiamin, mg. (2 decimals)
65-68	Riboflavin, mg. (2 decimals)
69-72	Niacin, mg. (1 decimal)
73-76	Ascorbic Acid, mg. (whole no.)
77-80	blank

```
FILE:  FDDDDATA INVERTER A1          KANSAS STATE UNIVERSITY CMS V5 PLC 2

 MEALS: PROC OPTIONS(MAIN);                                          MEAJ0010
 DCL 1 CARD STATIC,                                                  MEAJ0020
       2 ID CHAR(3),                                                 MEAJ0030
       2 INFO CHAR(5),                                               MEAJ0040
       2 MEAL BIN FIXED(31),                                         MEAJ005J
       2 SOURCE CHAR(2),                                             MEAJ0060
       2 FOOD(11),                                                   MEAJ0070
         3 ITEM BIN FIXED(31),                                       MEAJ0080
         3 AMT BIN FIXED(31);                                        MEAJ0090
 DCL TABLE(630,15) BIN FIXED(31);                                    MEAJ0100
 DCL SUMS(15) BIN FIXED(31) STATIC;                                  MEAJ0110
 DCL EOF BIT(1) STATIC INIT('0'B);                                   MLAJ0120
 DCL TABFILE FILE STREAM;                                            MEAJ013D
 DCL (LAST,I,J) BIN FIXED(31) STATIC;                                MEAJ0140
 DCL CURR_ID CHAR(3) STATIC;                                         MEAJ0150
 DCL CURR_INFO CHAR(5) STATIC;                                       MEAJ0160
 DCL CURR_SOURCE CHAR(2) STATIC;                                     MEAJ0170
 ON ENDFILE(TABFILE) EOF='1'B;                                       MEAJ0180
 ON ENDFILE(SYSIN) ID='HIGH';                                        MEAJ0190
 DO I=1 BY 1 WHILE(¬EOF);                                            MEAJ0200
    GET FILE(TABFILE) EDIT(TABLE(I,*))(COL(7),F(4),X(2),F(4),6 F(3),MEAJ0210
       F(4),F(3),F(5),4 F(3));                                       MEAJ0220
 END;                                                                MEAJ0230
 LAST=I-2;                                                           MEAJ024D
 GET EDIT(CARD)(R(CARDFOR));                                         MEAJ0250
 CARDFOR: FORMAT(COL(1),A(3),A(5),F(1),A(2),22 F(3));                MEAJ0260
 CURR_ID=ID;                                                         MEAJ027D
 CURR_INFO=INFO;                                                     MEAJ0280
 DO WHILE(ID<HIGH(3));                                               MEAJ0290
    I=1;                                                             MEAJ030D
    DO WHILE(I<8);                                                   MEAJ031J
       IF ID¬=CURR_ID THEN DO;                                       MEAJ0320
          DO I=1 TO 7;                                               MEAJ0330
             PUT FILE(SYSPUNCH) EDIT(CURR_ID,CURR_INFO,I)(R(OUTPUT));MEAJ0340
 OUTPUT:     FORMAT(COL(1),2 A,F1));                                 MEAJ0350
          END;                                                       MEAJ0360
       END;                                                          MEAJ0370
       ELSE IF MEAL¬=I THEN DO;                                      MEAJ0380
          IF MEAL<1|MEAL>7 THEN DO;                                  MEAJ0390
             PUT EDIT('***ERROR***  ',CARD)(COL(1),A,R(CARDFOR));    MEAJ0400
             GET EDIT(CARD)(R(CARDFOR));                             MEAJ0410
          END;                                                       MEAJ0420
          ELSE DO I=I TO MEAL-1;                                     MEAJ043D
             PUT FILE(SYSPUNCH) EDIT(CURR_ID,CURR_INFO,I)(R(OUTPUT));MEAJ0440
          END;                                                       MEAJ0450
       END;                                                          MEAJ0460
       ELSE DO;                                                      MEAJ047J
          SUMS=0;                                                    MEAJ0480
          ID=' ';                                                    MEAJ0490
          CURR_SOURCE=SOURCE;                                        MEAJ0500
          DO WHILE(ID=' ');                                          MEAJ0510
             DO J=1 TO 11 WHILE(ITEM(J)>0);                          MEAJ0520
                IF ITEM(J)=999 THEN ITEM(J)=LAST;                    MEAJ0530
                SUMS=SUMS+TABLE(ITEM(J),*)*AMT(J);                   MEAJ0540
             END;                                                    MEAJ0550
             GET EDIT(CARD)(R(CARDFOR));                             MEAJ0560
          END;                                                       MEAJ0570
```

```
FILE:  FDDDDATA INVERTER A1          KANSAS STATE UNIVERSITY CMS V5 PLC 2

          PUT FILE(SYSPUNCH) EDIT(CURR_ID,CURR_INFO,I,CURR_SOURCE,SUMS) MEAJ0580
             (R(OUTPUT),A,2 F(5,0,-2),6 F(4,0,-2),F(5,0,-2),F(4,0,-2),MEAJ0590
             F(6,0,-2),4 F(4,0,-2));                                 MEAJ0600
          I=I+1;                                                     MEAJ0610
       END;                                                          MEAJ0620
    END;                                                             MEAJ0630
    CURR_ID=ID;                                                      MEAJ0640
    CURR_INFO=INFO;                                                  MEAJ0650
 END;                                                                MEAJ0660
 END;                                                                MEAJ0670
```

APPENDIX L

Organization of Interview Survey Results

ORGANIZATION OF INTERVIEW

Survey Results

Question No.[1]	
	1. Food Habits
16	1.1 Evaluation of food habits
18	1.2 Friends' food habits
17A, B	1.3 Changes needed
19A, B, C	1.4 Meal skipping
20A, B, C	1.5 Snacking behavior
	2. Experience with School Lunch in Earlier Education
	2.1 Frequency of participation
3A	- elementary
4	- junior high school
3B, 8, 9	2.2 Characteristics of the school lunch program
5, 44A, B	2.3 Views of program in elementary school
6	2.4 Views of program in junior high
7, 10, 39	2.5 Current opinions of program
	3. Lunch Patterns
1, 2, 26	3.1 Frequency of school lunch participation
29, 30, 31A, B	3.2 General factors affecting school lunch participation
21A, B	3.3 Frequency of eating lunch away from school
21C, D, 22A, B, 23	3.4 Reasons for eating lunch away from school
11A, B, 24	3.5 Usual menu choices at lunch
46, 47	3.6 Perceptions of nutritional content of lunch
	4. Influence of Other People on School Lunch Participation
45	4.1 Influence of parents
40A, B, 41A, B, 42, 43A, B	4.2 Influence of administrators and teachers
13, 12A, B, 14, 15	4.3 Influence of friends

[1]Refers to question number on Interview Guide (Appendix B).

Question No.	
	5. Evaluation of School Lunch Menu
27A, B, C, 28A, B	5.1 Advance knowledge of daily menu choice
37, 38, 54	5.2 Assessment of variety, quality, and portion sizes
32A, B, 33, 34, 35A, B, 36A, B	5.3 Food preferences related to menu selections
	6. Assessment of Non-Food Related Aspects of School Lunch and Lunch Away from School
55, 25A, B, 56, 57A, B	6.1 Price
48A, B, 49A, B, 52A, B, 50, 51A, B, 53	6.2 Length of lunch period
	6.3 Atmosphere of school cafeteria
58A, B	- supervision
59A, B	- atmosphere
	7. Suggestions for Program
63	7.1 Student rating of school lunch program
62A, B	7.2 Interest in Student Advisory Council
60, 61, 64, 65, 66	7.3 Suggestions for improvements

FACTORS DIFFERENTIATING PARTICIPANTS AND NON-PARTICIPANTS OF THE SCHOOL LUNCH PROGRAM

by

SUSAN M. HOWE

B.S., Kearney State College, 1975

AN ABSTRACT OF A MASTER'S THESIS

submitted in partial fulfillment of the

requirements for the degree

MASTER OF SCIENCE

Department of Dietetics, Restaurant
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KANSAS STATE UNIVERSITY
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1979

ABSTRACT

Increasing participation in school lunch has been the objective of several projects because of the nutritional benefits to students of the school lunch program. Therefore, identification of the factors affecting participation is important. The objective of this research was to investigate factors which differentiate secondary school students who participate in the school lunch program from those who do not.

In phase I of the study, a questionnaire was administered to sophomore and junior high school students to identify participants and non-participants. In phase two, an interview was conducted with 104 students, fifty-two sophomores and fifty-two juniors. Of the fifty-two students at the two grade levels, twenty-six were participants and twenty-six were non-participants of the school lunch, and were divided equally between males and females. The interview covered various factors affecting school lunch participation. Also, a twenty-four hour dietary recall was obtained from each student to assess nutrient intake.

Students' views on school lunch were found to have an effect on participation. In general, the non-participants had negative views of the school lunch program while the participants had more positive views. Reasons given by non-participants for not buying a school lunch were that they did not like the food, the cafeteria was too crowded and noisy, and that they liked to get away from school. The participants gave several reasons related to what they liked about having lunch at school. Generally they liked the food and could talk with their friends during the lunch period. Other reasons included: being able to study

while eating, having more time to enjoy lunch at school, and getting back to class on time.

Participants reported more encouragement from parents to eat the school lunch than did non-participants. A large majority of both groups reported they had heard negative comments from teachers about the school lunch program.

Participants and non-participants of the school lunch program offered several suggestions for improvement of the program. Among the suggestions were: improve the preparation of food, raise the price of lunch to cover the cost of higher quality food items, involve the students in menu planning, and enlarge the cafeteria.

The total day's nutrient intake and percentage of recommended dietary allowances (RDA) with and without a vitamin supplement was significantly higher for female and male participants than for non-participants. Both female and male participants also consumed significantly higher nutrient intakes at lunch. Also, both female and male participants met the nutrient goal of one-third of the RDA at lunch more frequently than did non-participants. Snacks provided between 20 and 40 per cent of the students' dietary intakes.

Students' diets were classified into four categories: excellent, good, fair, and poor. Results indicated that participants had overall better diet ratings for the total day's nutrient intake and lunch intake compared to non-participants. Male students had better dietary intakes than females, whether or not they consumed school lunch.