

A STUDY TO DETERMINE THE EFFECTS OF A NUTRITION
EDUCATION UNIT ON KNOWLEDGE AND DIETARY
HABITS OF SIXTH GRADE STUDENTS

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BY
AUDREY BROWN WASHINGTON, B.S.N.

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We hereby recommend that the thesis prepared under
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Committee:

Ruth E. Tandy
Chairman, Department of
Health Education

Ruth E. Tandy
Chairman

Jane A. Mott
Dean, College of Health,
Physical Education,
Recreation, and Dance

Don Merki
Mary Merki

Accepted:

[Signature]
Provost of the Graduate School

This thesis is lovingly dedicated to the memory of Mr. Henry J. and Mrs. Velma B. Brown, my parents, who were both master teachers and practitioners in basic nutritional habits. Their spirit has motivated and sustained me in this effort.

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TABLE OF CONTENTS

	Page
DEDICATION	iii
ACKNOWLEDGMENTS	iv
TABLE OF CONTENTS	v
LIST OF TABLES	vii

Chapter

1.	INTRODUCTION	1
	Rationale	1
	Purpose	3
	Statement of the Problem	3
	Subproblems	4
	Hypotheses	5
	Assumptions	5
	Limitations	6
	Delimitations	6
	Definition of Terms	7
2.	REVIEW OF THE LITERATURE	8
	Studies on Nutrition Education	8
	Studies on Dietary Habits	20
3.	METHODOLOGY	30
	Design	30
	Study Population	31
	Criteria for Selection of Study Population	31
	Selection of the Study Population	32
	Curriculum	32
	Criteria for Selection of Curriculum	32
	Curriculum Selected for the Study	33

	Page
Instruments	34
Criteria for Selection of Instruments	34
Instruments Selected for the Study	35
Preliminary Procedures for the Study	38
Procedures for Data Collection	39
Treatment of the Data	40
 4. RESULTS OF THE STUDY	 41
Profile of the Study Population . . .	41
Analyses of Data	42
 5. SUMMARY, RESULTS, DISCUSSION, CONCLUSION, AND RECOMMENDATIONS	 53
Summary	53
Results	54
Test of Hypotheses	54
Discussion	55
Conclusion	59
Recommendations	59
 APPENDIX A	 63
APPENDIX B	70
APPENDIX C	72
APPENDIX D	74
APPENDIX E	76
APPENDIX F	78
REFERENCES	80

LIST OF TABLES

Table	Page
1. Study Population	43
2. Pretest and Posttest Means and Standard Deviation for the Nutrition Achieve- ment Test	45
3. Analysis of Variance of Two Nutrition Education Programs	46
4. Analysis of Covariance of Two Nutrition Education Programs	48
5. Chi-Square Analysis of Dietary Recall Records of Subjects in Group 1 and Group 2	49
6. Mark Twain Elementary Chi-Square Analysis of Dietary Recall Records	50
7. Stults Road Elementary Chi-Square Analysis of Dietary Recall Records	50

CHAPTER 1

THE PROBLEM

Rationale

The importance of nutrition education is evidenced by the many studies and research done in the area (Boysen & Ahrens, 1972; McDonald, Bruin, & Esserman, 1981; Smith & James, 1980). According to the White House Conference on Food, Nutrition, and Health (1970), "the objective of nutrition education is to promote optimum health through food and thus contribute to an individual's potential for achieving his life goal" (p. 24).

The need for nutrition education is universal regardless of income, culture, social or economic patterns, or level of education. Todhunter (1969) stated, "there is no instinct that guides man to select those foods which meet the nutritional needs of the body; a knowledge is not inherited" (p. 9). In order to meet this need, it is essential that children be taught what foods to select and why, and how foods affect health, both now and in the future.

Attempts have been made to address the need for providing nutrition education to the public and school

age youth, however, there is still much work to be done in nutrition education. The White House Conference on Food, Nutrition, and Health (1970) reported that

the poor nutritional status and eating habits of large numbers of people at all levels and in all socio-economic strata provide ample evidence that there are serious inadequacies in the total nutritional education effort to date. (p. 25)

The results of a study done by O'Rourke and Koizumi (1982) showed a widespread lack of the nutrition knowledge of Illinois school-aged youth. The findings from the study indicated the need for nutrition education for the school-aged child.

Authorities in the field of nutrition (Todhunter, 1969) pointed to the importance of introducing nutrition education to children at an early age and suggested that this educational process be ongoing. As stated in the report of the White House Conference on Food, Nutrition, and Health (1970):

A dynamic nutrition education program that begins in early childhood and continues through the elementary and secondary schools can help older children assume responsibility for their

own food selection and prepare them for adult and parental responsibility. (p. 24)

Elementary students are at a crucial time in their lives in regard to nutrition. Also, today's children exercise more control over their food choices and food consumption patterns than in the past. Thus, it is important that elementary school children experience a valid nutrition education program.

The intent of this study was to provide sixth grade students with the necessary information regarding food choices and the vital role it plays in their lives. This knowledge and the application of such knowledge will be an asset in helping students develop a healthy life style that will be rewarding to them both now and in the future.

Purpose

The purpose of this study was to determine the influence of two selected education programs upon the nutrition knowledge and dietary habits of sixth grade students.

Statement of the Problem

The problem of this investigation was to determine whether the nutrition education program "Daily Food

Choices Secrets of Success" was more effective in changing sixth grade students' knowledge level and dietary habits than the nutrition education program "Better Education about Nutrition." This study was conducted during the academic year 1982-83 at two elementary schools in the Richardson Independent School District (RISD), Richardson, Texas. Four sixth-grade classes participated in the experimental pretest-posttest study. Students in the four classes took a pretest to determine their knowledge of nutrition. A 3-day dietary recall was used to determine students' dietary habits. The students in each school were divided in two groups (Group 1 and Group 2). Students in Group 1 received instruction in nutrition education using "Daily Food Choices Secrets of Success." Students in Group 2 received instruction in nutrition education using the program "Better Education about Nutrition" (BEAN).

Subproblems

Subproblem One. The first subproblem was the implementation of the nutrition program.

Subproblem Two. The second subproblem was to determine the nutritional knowledge of the subjects in the study.

Subproblem Three. The third subproblem was to determine the dietary habits of the subjects in the study.

Hypotheses

The following hypotheses were tested:

Hypothesis One. There will be no significant difference in nutrition knowledge between Group 1 and Group 2.

Hypothesis Two. There will be no significant difference between the dietary habits of Group 1 and Group 2.

Assumptions

The following assumptions were made concerning the study:

1. The instructors would be able to teach the nutrition education unit.
2. The students would be able to respond honestly on the instruments.
3. It was assumed that nutrition knowledge is affected by nutrition education.

Limitations

This study was subject to the following limitations:

1. A lack of specific training for the instructors using the "Better Education about Nutrition" program.
2. The degree of commitment of the instructor to the particular nutrition program.
3. The time allotted for the instruction.
4. Ability of the students to accurately recall information about diets.
5. The degree of accuracy of the pretest/posttest instruments in reflecting the needed data.
6. Lack of reinforcement of the information presented by other school components or the parents of the subjects.

Delimitations

This study was subject to the following delimitations:

1. The study involved students in the sixth grade from two elementary schools in RISD.
2. The study measured only the effectiveness of a nutrition education program on students' knowledge and dietary habits.

3. The study was confined to a 9-day period of nutrition education.

Definition of Terms

For the purpose of clarification, the following definition of terms was established for use in the study:

1. Dietary habits--maintaining presently desirable habits and forming new habits necessary to individual needs (Todhunter, 1969).

2. Knowledge--the awareness of and acquisition of principles of good nutrition and the importance and application of these in daily life.

3. Nutrition--the science that relates the health and well-being of an organism to the food it consumes (Grawunder & Steinmann, 1980).

4. Nutrition education--the process by which beliefs, attitudes, environmental influences, and understandings about food lead to practices that are scientifically sound, practical, and consistent with individual needs and available food resources ("Position paper on the scope and thrust of nutrition education," 1978).

CHAPTER 2

REVIEW OF THE LITERATURE

Nutrition education for children began in the early 1900s, however, it was not until the 1920s that progress in this area was made. Ongoing research in nutrition education has continued to build on earlier work completed in the field of nutrition. Many of the early studies employed the traditional approach to teaching nutrition education; however, newer approaches to teaching nutrition education are now being used. The following review of literature included studies on nutrition education and studies on dietary habits of school-aged children.

Studies on Nutrition Education

Lovett, Barker, and Marcus (1970) conducted a study to determine the effectiveness of the Dairy Council of California's nutrition education program and to evaluate teacher nutrition attitudes and the nutrition teaching

environment. Three areas of concern were investigated in the study:

1. A survey of second-grade California teachers to determine the status of the education environment in which nutrition is taught.
2. A special teacher training program in nutrition and teaching by behavioral objectives in Popham's (1970) Instructional Model.
3. A comprehensive test-teach-test student program based on nutrition and the application of nutrition knowledge.

The first part of the study dealt with the nutrition teaching environment. A sample of 306 second-grade teachers was surveyed using a 12-page questionnaire. The teachers were asked questions about nutrition, nutrition teaching materials and methods, media read, and interest in nutrition. Results showed that: 97.4% felt teaching food and nutrition was a part of their jobs, approximately 75% had received nutrition education materials from the Dairy Council; and approximately 50% had previous personal contact with the Council.

The second part of the study concentrated on a teacher training program. Trained nutrition educators--members of the Dairy Council of California staff--taught

nutrition to a randomly selected group of teachers with a teaching style that included behavioral objectives. Twenty-three second-grade teachers attended the workshop. Teacher pretesting and posttesting showed high training achievement. These teachers were used in the student test-teach-test program to staff the major experimental study group.

The third part of the study was the implementation of the student nutrition-program in the Los Angeles metropolitan area. The study involved 1,720 second-grade students. Three student groups were established to test knowledge of nutrition and the ability to apply nutrition knowledge in making a balanced meal selection. The students of 71 participating schools were divided into three groups: (a) the experimental group--a group in which teachers were trained by the nutrition educators and equipped with materials; (b) the semi-control group--a group in which teachers were supplied with the same material and general objectives; (c) the control group--a group in which teachers were supplied with general objectives only.

The students were pretested, taught a nutrition course for approximately 1 hour each day for 3 weeks,

and then posttested. The results of the study showed that classes of students taught by the trained teachers improved significantly in their knowledge of nutrition and in demonstrating their ability to select a balanced meal.

The investigators concluded that students who were taught nutrition by trained teachers using prepared material showed marked improvement over classes taught with just the materials taken from the state text. This was true for basic nutrition knowledge and ability to apply nutrition knowledge in selecting a balanced meal.

Alford and Tibbets (1971) conducted a study to determine the effectiveness of a nutrition education program concerned with vegetable-eating practices in a group feeding situation. A camp for diabetic children at Gainesville, Texas, was the setting. An experimental group and control group design was used in the study.

The camp populations were composed of male and female subjects aged from 6 to 17 with a variety of social, economic, ethnic, and regional backgrounds. In the first camp session, 71 children (experimental group) were observed for vegetable eating practices and given an educational program on the selection of

vegetables. During the second camp session, 80 children (control group) did not receive the educational program.

The findings indicated that vegetable consumption increased significantly in the experimental group and did not increase in the control group. The investigators concluded that for the children in the experimental group education was an important factor in the vegetable consumption.

Baker (1972) conducted a study to determine the influence of a specially prepared program on knowledge of nutrition, diet, and related factors on fourth and fifth grade pupils. Approximately 200 children participated in the study. The results of the study revealed that nutrition test scores were significantly higher for the experimental classes than for the control classes. No significant changes in diet were observed.

Boysen and Ahrens (1972) designed and conducted a study with second grade students. A program was based on the knowledge and use of the four food groups, lunch surveys, and a parent questionnaire answered by parents of children of the experimental group to determine the effect of the nutrition education program at

home. The findings indicated that nutrition education improved the nutrition knowledge of the experimental group.

The parent survey revealed some improvements in eating habits at home. However, the school lunch survey did not support dietary improvements. Boysen and Ahrens concluded that nutrition education in the school is vitally needed as a first step toward improving the food habits of children, but the home is the major influence on younger children.

Head (1974) conducted a study to determine whether nutrition education for elementary, junior, and/or senior high school students would contribute to any changes in food habits or acceptability of the foods served in the school lunchroom. The results of the study were mixed. Students in the fifth-grade classes significantly improved their knowledge of nutrition. Three-day dietary recall showed that diets of seventh-graders improved significantly after nutrition education. Acceptability ratings of school-served food increased among fifth-grader experimental groups more than other groups.

Meyers and Jansen (1977) employed a nutrient approach in their study on nutrition education. The

study was done to determine whether a nutrient approach to teaching nutrition was more effective than the food group approach. Four fifth-grade classes from two Fort Collins, Colorado elementary schools participated. Results of the study indicated that exposure to a nutrition unit increased the students' nutrition knowledge. The effectiveness of the nutrient approach was seen in the students' understanding of why certain food choices and combination of foods are better than others. The researchers felt this approach awakened the students' interests and encouraged initiative and decision-making.

Brown, Wyse, and Hansen (1979) developed a nutrient density-nutrition education program for kindergarten through sixth-grade students. A major purpose of the study was to test whether the nutrient density concept could be used as a basis for nutrition education in elementary schools. Twenty-seven classrooms in nine schools in Utah and Idaho were selected for evaluation of the program. The results of nutrient density-nutrition education revealed that elementary school children are capable of learning the nutrient concept. An increased acceptance of food having high nutrient density values

and a decreased acceptance of foods having low nutrient density values was indicated. The investigators felt additional research was needed to compare this approach to nutrition education with other more traditional approaches.

Smith and Justice (1979) designed a study to measure the influence of a student nutrition education program, a parent nutrition education program, and the effects of a combination of these two programs on the comprehension and application of nutrition knowledge of third-grade students. Two nutrition programs were prepared, one for the students entitled "More Vegetables, Please," and one for the parents. The parent education program consisted of a series of six different one-page letters based on the behavioral objectives that had been formulated. Students in twelve third-grade classrooms in five elementary schools participated in the study. Four classrooms of students were used in the development of the evaluation instruments. The remaining eight classrooms provided the control and experimental groups. The final evaluation instruments included:

1. a nutrition knowledge pretest and posttest.
2. a vegetable preference rating scale.
3. a lunch questionnaire.

The results of the study showed no significant improvements in the mean test scores on the cognitive nutrition test in any of the groups. There was a trend, although not significant, to a better acceptance of vegetables by the experimental groups over the control groups as measured by the vegetable preference rating scale. The experimental groups had greater participation in the school lunch program than the control group. Parents' response to the program was positive. The investigators concluded that having the researcher teach the nutrition lessons ruled out any classroom teacher bias. However, other studies have shown that students can learn more about nutrition from the classroom teacher. If the classroom teacher included nutrition education in weekly lesson plans, then concepts of good nutrition could be reinforced throughout the school year.

Smith and James (1980) designed a study in which the major objective was to evaluate the effect of a specially designed nutrition curriculum, using the school lunch program as a resource, on fourth graders' nutrition knowledge, attitudes, and practices. All 63

fourth-grade students in a small town elementary school in Wisconsin participated in the study.

A school lunch survey program was designed to serve as a teaching tool and self-evaluation instrument for the students. A change in the percentage of students drinking milk for lunch was one discernible behavior change in the study. Pretest scores indicated that the students had little knowledge about the four food groups or about categorizing the foods they ate into those groups. Posttest scores indicated significant increases in all segments of the examination and in total scores. The researchers found that fourth graders are at an excellent age for a classroom lunchroom education project.

Mangham and Vickery (1981) conducted a study to determine the effectiveness of a nutrition education program. Approximately 357 students from two junior high schools in Tuscaloosa, Alabama, participated in a pretest-posttest design study. A significant increase in nutrition knowledge of the junior high students followed the short-term nutrition education series. The investigators concluded that nutrition education should be instituted in early childhood rather than

delaying it until adolescence; but the educational process must begin somewhere and until the process can be implemented at an early age, every opportunity must be taken to reach students.

The investigation by McDonald et al. (1981) conducted studies using in-home interviews to examine the extent to which children actually apply information derived from a school nutrition education program. The first study in 1978 compared food choices, attitudes toward nutrition, and nutrition knowledge of children exposed for 1 year to the "Food . . . Your Choice" learning system to the behaviors, attitudes, and knowledge of children not exposed to a school-wide nutrition education curriculum. In the second study in 1979, the experimental group had been exposed to the curriculum under evaluation for 2 years, whereas the control group included children exposed to other nutrition curricula as well as children not exposed to nutrition education.

Professional interviewers trained to work with children conducted in-home interviews with 1,431 children and 312 mothers. Interviewing began near each school and spiraled outward until the appropriate age and sex quotas were met. The results of the study showed

children exposed to the nutrition program reported increased consumption of a variety of desirable foods and nutrients; expressed more positive attitudes toward consumption of fruits and vegetables, and displayed improved ability to apply nutrition knowledge in making food choices. The findings provided evidence that in-school nutrition education influences children's reported food behaviors outside the classroom.

Contento (1981) designed a study to provide a description of how children from the preoperational and concrete operational years think about food and snacks, the changes food undergoes, and the effects of food on their bodies. Thirty-four children, ranging in age from 5 to 11 years, were interviewed. The children lived in an urban setting and represented a variety of ethnic groups. The results of the study indicated that the children had difficulty conceptualizing the changes food undergoes in the body and its consequent effects on them. The study found that preoperational children were not able to distinguish, but that concrete operational children did distinguish between foods and snacks, and that almost all children chose to eat the less nutritional snacks. The investigator

recommended that nutrition educators explore ways of teaching about foods and nutrition that take into account how children actually conceptualize the changes food undergoes to bring its effects on the body. Nutrition educators should include information and experiences from the real world which will help children distinguish between which food and snacks to eat and which foods to avoid.

Studies on Dietary Habits

Breckenridge (1959) used 51 children attending the Merrill-Palmer Camp to gain information about their food preferences during middle childhood and to ascertain the effect of camp experience on these preferences. Interviews were held with each child at the beginning of camp and again after an interval of 5 weeks. A questionnaire was answered by one of the children's parents.

No specific group changes in food preferences occurred. A significant difference for preferred foods and foods to which the children were indifferent was found between the scores of parents and their children. Breckenridge suggested further research in food preferences of children between ages 5 and 12 and the need for

a longitudinal research on food attitudes. The investigator felt the methodology of studying food attitudes also needed further investigation.

Hinton, Eppright, Chadderon, and Wolins (1963) conducted a study to determine the relationship of certain physiological, sociological, and psychological factors to eating behavior and the selection of a diet which approximates the Recommended Dietary Allowances. Approximately 140 girls, 12 to 14 years of age, from Iowa, participated in the study. An equal number of girls who had and who had not reached menarche for each of the three age groups was divided among three social status categories. The investigators were concerned with maturation, values considered important in food selection, food enjoyment, knowledge of nutrition, and psychologic adjustment. Social status in the study was based on the prestige rank of the father's occupation and the educational level of both parents. The results of the study indicated that eating practices of girls were related to their knowledge of nutrition and their values, maturation, weight-for-age, age, social status, psychological adjustment, and family relations. The investigator concluded that nutrition education, in order

to be effective, must consider complex interrelationships, in addition to increasing nutrition knowledge.

Litman, Cooney, and Stief (1964) conducted a study to ascertain how students in the public schools in Austin, Minnesota, viewed foods and to determine what factors might be associated with their attitudes toward food. The sample population was composed of 1,039 students between fourth grade and junior college. The students were asked to keep 3-day records of their eating habits and snacking patterns. In addition, each student was given the Lewin Food Anchorage test and a nutrition information questionnaire in class.

The results of the study revealed a fairly extensive endorsement of milk, potatoes, bread, meat, butter, and eggs as everyday foods. A majority of the students felt they were most likely to be scolded for eating sweets and confectionary goods, while the consumption of vegetables and dairy products would be looked on favorably. The sanctioning of food habits and behavior appeared to be essentially a family-centered activity. The mother in the majority of the families was the authority figure in this area of family life. The selection of the "ideal meal," "praise" foods, and

"scold" foods was done on the basis of health or nutrition. Personal preference and taste were also important factors in the selection of foods.

The investigators felt that because of the strong influence of the mother, consideration of an adult education program directed toward the homemaker was worth exploration. Also, the apparently low status of green and yellow vegetables posed a real problem for those persons charged with the responsibility of improving children's food habits.

The study conducted by Gassie and Jones (1972) attempted to answer the question, "when changes in behavior result from an educational program, how long are these changes sustained after the program is discontinued?" (p. 19). The study involved 240 subjects from rural and urban communities in Louisiana. A survey of the subjects was conducted before the nutrition education program, immediately after the program, and 4 months later. The results of the study showed definite positive changes in both knowledge levels and in practice of nutrition. Many of these changes were sustained 4 months after the respondents had completed the educational program. The study

further revealed that the percentage of individuals with "minimum adequate diets" after 4 months was the same as before the program began. These findings seemed to indicate a need for extensive educational programs which would provide repeated learning experiences.

Bell and Lamb (1972) designed a study to determine the influence of nutrition education on the eating practices of fifth-grade students. A second purpose was to ascertain the effect of nutrition education on the scores achieved on a written test designed to measure students' learning, including the knowledge, comprehension, and application levels. The study involved 1,913 fifth-grade students, randomly divided into control and experimental groups by classrooms. Findings revealed that students who had been taught a nutrition module for 6 weeks increased their cognitive learning about nutrition much more than did students who had not been taught. The experimental students did not, however, change their behavior significantly.

Beyer and Morris (1974) conducted a study in which the food likes and dislikes and snacking patterns of 44

children were examined during the preschool years, and again during the early elementary school grades. Home interviews with mothers revealed the children's diets to be nutritionally adequate and the eating habits of the children were constant from preschool to school age. The study pointed out the importance of teaching the foundations of good nutritional practices early in life and illustrates that nutrition education should be aimed at the whole family.

Cooper, Hayslip, and Foree (1977) developed a nutrition education program emphasizing weight control taught to fifth-grade students with culture endemic obesity. The purpose of the investigation was to create an awareness of the importance of nutrition beginning at the fifth-grade level. The study involved 45 subjects, who were volunteers, from two fifth-grade classes. The results of the study showed that the knowledge level of the group receiving nutrition instruction was better than the group not receiving the instruction. Dietary intakes revealed that the diets of the experimental group did not improve after nutrition instruction. The investigators did not discuss their conclusion.

Blakeway and Knickrehm (1978) designed a study to determine if a change in eating behavior attributable to a nutrition education program could be demonstrated in grades one through three in terms of reduced plate waste in the school lunch. To coordinate the study, a nutrition education coordinator was employed as liaison between the school program and the classroom. The main objective of the program was to change eating behavior. Approximately 5,000 students in grades one through three in 16 schools were included in the study. The program consisted of an instruction unit and a plate waste study before and after the nutrition unit was taught. The results of the study revealed no difference between consumption of the two groups initially. Following the instructional unit in nutrition education those subjects that received the instruction showed an increase in consumption in foods served compared to subjects who had not received the nutritional instruction. The investigators formed the following conclusions:

1. Eating patterns are more rigid and difficult to change in third grade than in first and second grade children.

2. A cooperative effort between the food service department and a nutrition department of the school system is important for improved results in nutrition education and a change in eating behavior.

3. Although significant increases in the consumption of some food were demonstrated, these gains were not always translated into sufficient consumption of the food portion.

Yperman and Vermeersch (1979) designed a study to test the association of factors from the school, home, and social environment with three food habit indicators that are frequently used to measure outcomes of nutrition education. These three indicators are food preferences, dietary complexity, and participation in the school lunch program. The study included 307 children in grades one through three at two elementary schools in northern California. The Dairy Council pre-test was used to determine nutrition knowledge and two other instruments determined menu preference and parents' attitudes.

The results of the study showed a lack of significant positive association among school lunch participation, menu preferences, and dietary complexity and

indicated that these variables are not interchangeable and should not be considered as equivalent measures of children's food habits. Of the three, the indicator with the least validity as a measure of nutrition education effects was the child's school lunch participation. The investigators' findings indicated that parental attitudes condition the child's familiarity with a variety of foods and that this variable is more important than any others in determining the child's acceptance of new foods at school.

Lamme and Lamme (1980) conducted a study to determine children's food preferences. The study was designed to answer three questions: (a) what are the food preference patterns of children, (b) how do these patterns vary by sex, and (c) how do these patterns vary by age?

Seven hundred and sixty-eight questionnaires from children ages 3 to 13 throughout the United States were used in the study. The food section of the questionnaire was a free response to seven food categories. "What is your favorite breakfast, dinner, vegetable, fruit, sandwich, beverage, and dessert?"

Responses to the questionnaire indicated that the children seemed to prefer a rather narrow range of foods. Some foods tend to be overwhelming favorites among children, regardless of sex. Foods which are very popular are preferred by both boys and girls. However, some foods moderately popular in all but one of the food categories did appear to be preferred more by one of the sexes. Boys preferred hamburgers and girls preferred chicken and spaghetti as main meals. With respect to age, the study showed younger children preferred more nutritional foods and a broader range of supper foods. Non-nutritional foods became popular with the progression of age, and with the exception of beverages, food preferences became more restricted as children got older.

The investigators concluded that additional research in the area of children's food preferences is needed. A longitudinal research design was recommended.

CHAPTER 3

METHODOLOGY

Chapter 3 contains the methodology of the study and it is divided into seven sections. The sections consist of the following: (a) design, (b) study population, (c) curriculum, (d) instruments, (e) preliminary procedures for the study, (f) procedures for data collection, and (g) treatment of the data.

Design

An experimental pretest-posttest design was used for the study. Students from two elementary schools in the Richardson Independent School District (RISD) served as the study population. Four sixth-grade classes participated in the study, with students in the two schools divided into Group 1 and Group 2. Students in both schools in Group 1 received instruction in nutrition education using "Daily Food Choices Secrets of Success." Students in Group 2 in both schools received instruction in nutrition education using the program "Better Education about Nutrition." Following the 9-day nutrition education units, 3-day dietary recall records were obtained.

Study Population

Criteria for Selection of Study Population

The study population was required to meet the following three criteria: (a) be upper elementary students in the RISD, (b) have basically the same background in nutrition education, and (c) be in schools with self-contained classrooms. The sixth-grade students in the Mark Twain Elementary School and Stults Road Elementary School met the stated criteria.

Upper elementary students were selected because students at this age are capable of being more responsible for their own behavior. This behavior includes exercising control over food choices and consumption.

The schools were selected because both schools are in the RISD and there was no indication that the students in either of the schools had been participants in any special nutritional programs. Instructors did indicate that students had previously been minimally exposed to but had not received instruction in a unit expressly devoted to nutrition.

The third criteria for the study population dealt with conducting the study in schools in which the students were in self-contained classrooms. Self-contained

classrooms were preferred because they would permit easier implementation of the study with teachers and students together as a unit. Both of the schools had self-contained classrooms.

Selection of the Study Population

The study population consisted of four groups of students from the two elementary schools who: (a) returned the parental consent form, (b) took the pretest and posttest, (c) were present during at least 8 days of the instructional unit, and (d) completed the dietary recall records. The total number of students in the study was 89. Mark Twain Elementary had 55 student participants and Stults Road Elementary had 34. Two separate sixth-grade classes in Mark Twain participated in the study and two separate sixth-grade classes in Stults Road participated in the study. The teachers were arbitrarily assigned to the nutrition education program they were to teach.

Curriculum

Criteria for Selection of Curriculum

It was decided that the nutrition education curriculum chosen for the study should be geared toward improving

the knowledge and dietary habits of the students. Principles of nutrition that are presented should encourage the students to apply good nutritional practices in selecting and eating proper foods.

In addition, the nutrition education curriculum should incorporate the following basic concepts: (a) nutrition is the science of food you eat and how the body uses it, (b) food is made up of different nutrients needed for growth and health, and (c) all persons throughout life have need for the same nutrients, but in varying amounts. Both nutrition education programs selected for use satisfied the stated criteria.

Curriculum Selected for the Study

Two different nutrition education programs were selected for use in the study: "Daily Food Choices Secrets of Success" and "Better Education about Nutrition." "Daily Food Choices Secrets of Success" is a behavior-focused nutrition education program that was developed over a 2-year period by the Dairy Council of California for intermediate level students. It was designed to teach students cognitive nutrition skills and to encourage them to improve their daily food choice behavior. The program uses visual aids (filmstrips and posters) to present the concept of good nutrition.

The second curriculum selected for use in the study, "Better Education about Nutrition," was developed by physicians and educators. The program was funded under the Nutrition Education and Training Program with a grant through the Texas Education Agency. The "Better Education about Nutrition" program was developed for intermediate level elementary students and junior high school students. The program was designed to give nutrition education a total health approach, in addition to presenting factual data concerning nutrition. The program provides students with information on good nutrition, proper food selection, choices of nutritional snacks, and understanding the nutrients.

Instruments

Criteria for Selection of Instruments

Two instruments were needed to collect data: a knowledge test and a dietary recall record to determine the effects of the nutrition education unit on students' dietary habits. In addition to ascertaining the students' knowledge and dietary habits, the instruments had to be suitable and appropriate for the study population for which they were used.

Instruments Selected for the Study

A portion of the Nutrition Achievement Test for the Elementary Grades was selected as the instrument to be used to determine the nutrition knowledge of the students. The Nutrition Achievement Test was developed by the National Dairy Council to assess and evaluate nutrition achievement of children in kindergarten through the sixth grades. Test I was developed for kindergarten through the second grades; test II was for the third and fourth grades; and test III was for the fifth and sixth grades. The tests were designed to be used in a variety of test situations. One recommended feature of the tests was their effectiveness in evaluating specific nutrition education programs by measuring the gains made by the program participants from pretest to posttest.

The Nutrition Achievement Tests were designed to measure concepts designated important in nutrition education by the 1969 White House Conference on Food, Nutrition, and Health. The concepts considered important for elementary school pupils were placed in seven categories: (a) physiological facts, (b) nutrients, (c) food handling, (d) life cycle requirements,

(e) social-psychological aspects of foods, (f) food technology, (g) nutrition and society.

The percentage of test items within each concept was based on the judgment of the importance of the concept for elementary pupils in various grades. The accuracy of the content of the test questions was verified by nutrition specialists and registered dietitians. Teachers evaluated the tests for appropriateness of the content and reading level. Students in each grade responded to the test questions and identified difficulties in understanding test direction and questions.

The final test questions were administered to approximately 240 pupils in 16 schools throughout the United States with each grade level, kindergarten through sixth grades, represented. The schools were selected from four major geographical areas and the students represented low, middle, and high socioeconomic groups.

The Nutrition Achievement Test III met the criteria established for use in the study. Test III contained 50 multiple choice questions and it was modified for the present study. Twenty multiple choice questions, selected from the seven categories, were used as the nutrition achievement test (Appendix A).

The second instrument selected for obtaining the data needed in the study was a dietary recall record (Appendix B). The intent of the dietary recall record was to ascertain the dietary practices of the students who had participated in the study. The dietary recall record employed a simple format that included the four basic food groups (meat, milk, bread, and vegetable). The students were instructed to indicate which foods from the different food groups they had eaten for breakfast, lunch, dinner, and snacks. A recording form for each day provided space for the students to compute the total number of foods eaten from each of the four groups. The recording sheets were checked for errors in placing food in the proper category and for omissions in the computation of totals for each of the food groups. This information was used to determine if the student's diet was good, adequate, or poor.

The investigator and a registered dietitian subjectively ranked each student's diet on a 3-point scale. The diet rated as poor was assessed a value of 1, the diet rated as adequate was assessed a value of 2, and the diet rated as good was assessed a value of 3.

Preliminary Procedures for
the Study

A prospectus of the proposed study was submitted to the members of the Thesis Committee for approval. Following receipt of approval from the Thesis Committee, the prospectus was filed in the office of the Dean of Graduate Studies at the Texas Woman's University.

The researcher received permission from the Human Subjects Review Committee at Texas Woman's University (Appendix C) and from the Research Committee--Department of Research and Testing of the RISD (Appendix D). Permission to conduct the study was also received from the graduate school (Appendix E).

Permission to conduct the study in two schools within the district, Mark Twain Elementary and Stults Road Elementary, was sought. The principals of both schools were willing to have the study conducted in their schools and the sixth-grade teachers in both schools agreed to teach the nutrition education unit.

Before the nutrition education unit was taught, the instructors attended an orientation session for a review of the study and a demonstration of the use of the materials to be used in the programs. Teachers using

the nutrition program, "Daily Food Choices Secrets of Success," received instruction on using the Dairy Council program from Mrs. Radora Doyle, Program Director-Head of Consumer Services for the Associated Milk Producers Incorporated of Dallas and Fort Worth. Teachers using the nutrition education program, "Better Education about Nutrition," received instruction on using the program from the investigator. Teachers in both schools received instruction on how to use the dietary recall record from the investigator. Following the orientation, plans were made for implementing the study. A schedule was given to each instructor outlining the procedures to be followed in conducting the nutrition education program.

Procedures for Data Collection

The instructors explained to their students that they would be participating in a special unit on nutrition education and the students were given parental consent forms to be read, signed by the parent/guardian, and returned to the instructor (Appendix F). A pretest, the modified Nutrition Achievement Test, was administered to all classes on October 7, 1982. The nutrition education unit was started on October 11, 1982, and concluded

on October 22, 1982. Two days after the unit had been completed, the instructors administered a posttest which was identical to the pretest. One day after the posttest, a 3-day dietary recall was obtained from each student. Student attendance was checked to verify that each subject had been present for at least 8 days of the 9-day unit.

Treatment of the Data

Two hypotheses were formulated before the study was undertaken. The first hypothesis dealt with a comparison of the scores of Group 1 and Group 2 on the Modified Nutrition Achievement Test. Data collected from Group 1 and Group 2 on the knowledge test were subjected to a one-way analysis of variance to determine if there was a significant difference between the mean scores of the two groups. Significance was established at the .05 level.

The second hypothesis dealt with determining the difference in the dietary habits of the two groups. A chi-square was the statistical procedure used to determine the difference in the dietary practices of the students in Group 1 and in Group 2.

CHAPTER 4

RESULTS OF THE STUDY

This chapter contains an analysis and interpretation of the data collected from the scores of 89 students on the Modified Nutrition Achievement Test and the Dietary Recall Record. The chapter is divided into two sections. A profile of the study population is contained in section one. The analyses of the data, presented in the second section, include: the pretest and posttest scores on the Modified Nutrition Achievement Test for Group 1 and Group 2, the analysis of variance of Group 1 and Group 2, the rankings and analysis of the dietary recall records for Group 1 and Group 2, and the interrater reliability findings.

Profile of the Study Population

The study population included 89 sixth grade students in Mark Twain Elementary and Stults Road Elementary Schools. Mark Twain had 56 students enrolled in two sixth grade classes, however, one student was absent for the posttest. Stults Road Elementary had 38 students enrolled in two sixth grade classes, but four students

did not return the parental consent form. A total of 89 students in four sixth grade classes met the criteria established for admission of data for statistical treatment. The students in each school were divided into two groups (Group 1 and Group 2) according to the nutrition education program they received. Students in Group 1 in both schools received instruction in nutrition education using the program "Daily Food Choices Secrets of Success." Students in Group 2 in both schools received instruction in nutrition education using the program "Better Education about Nutrition." Table 1 indicates the number of students in both groups from each of the schools. There was a total of 47 students in Group 1 and 42 students in Group 2. Mark Twain had 28 students enrolled in Group 1 and Stults Road had 19 students enrolled in Group 1. Group 2 had 27 students from Mark Twain and 15 students from Stults Road.

Analyses of Data

The first subproblem was the implementation of the nutrition education program. Therefore, no statistical analysis was required.

Table 1

Study Population

Curriculum	Schools participating in the study		Total
	Mark Twain	Stults Road	
1--Daily Food Choices Secrets of Success	28 (60%)	19 (40%)	47
2--Better Education about Nutrition	27 (64%)	15 (36%)	42

n = 89.

The second subproblem was to determine the nutritional knowledge of the subjects in the study. A Modified Nutrition Achievement Test containing 20 multiple choice questions was the instrument used to obtain the data. Each question was assessed a value of 1. In Group 1, the highest pretest score was 18 and the lowest pretest score was 3. On the posttest the highest score again was 18 and the lowest score was 3. In Group 2, the highest pretest score was 14 and the lowest pretest score was 3. On the posttest the highest score was 17 and the lowest score was 1.

The pretest and posttest means for the Modified Nutrition Achievement Test are presented in Table 2. The pretest mean for Group 1 was 10.89 and the standard deviation was 3.26. In Group 2, the pretest mean was 9.5 and the standard deviation was 2.81. The posttest mean for Group 1 was 12.00 and the standard deviation was 3.26; the posttest mean for Group 2 was 11.50 and the standard deviation was 3.68.

An analysis of variance was used to determine if there was a difference in the knowledge level of the two groups. Table 3 indicates that no significant difference existed between the groups ($p = .499$).

Table 2

Pretest and Posttest Means and Standard Deviation
for the Nutrition Achievement Test

Groups	Pretest Mean (<u>SD</u>)	Posttest Mean (<u>SD</u>)
Group 1 (<u>n</u> = 47)	10.89 (3.26)	12.00 (3.26)
Group 2 (<u>n</u> = 42)	9.5 (2.81)	11.50 (3.68)

Table 3

Analysis of Variance of Two Nutrition
Education Programs

Source of Variation	Sum of Squares	<u>df</u>	Mean Square	<u>F</u>	Significance of <u>F</u>
Main effects Groups	5.54	1	5.54	.462	0.499
Residual	1044.50	87	12.00		
Total	1050.04	88	11.93		

An additional analysis was done to determine if the pretreatment states of the two groups affected the results of the study. Table 4 presents the results of this determination. The analysis of covariance was used to eliminate the effect of the pretest. This analysis of covariance showed no significant difference in the adjusted posttest scores.

The third subproblem was to determine the dietary habits of the subjects in the study. Following the nutrition education units and the posttest, a 3-day dietary recall was obtained from each student. The dietary recall records were subjectively ranked by the investigator and a registered dietitian. The ranking and scoring of the diets were as follows: poor diet--1, adequate diet--2, and a good diet--3.

A chi-square was used to analyze the difference in the dietary practices of the two groups. The rankings of the dietary recall records and the results of the chi-square are presented in Table 5. In Group 1, 17 (36.2%) of the dietary recall records were ranked as good, 17 (36.2%) were ranked as adequate, and 13 (27.6%) were ranked as poor. In Group 2, 9 (21.4%) of the dietary recall records were ranked as good, 18 (42.8%)

Table 4
Analysis of Covariance of Two Nutrition
Education Programs

Source of Variation	Sum of Squares	<u>df</u>	Mean Squares	<u>F</u>	Significance of <u>F</u>
Covariate Pretest	413.49	1	413.49	56.319	0.001
Main Effects Groups	5.12	1	5.12	0.698	0.406
Residual	631.42	86	7.34		
Total	1050.04	88	11.93		

Table 5

Chi-Square Analysis of Dietary Recall Records
of Subjects in Group 1 and Group 2

Dietary Ranking	Groups	
	1	2
Poor	13	15
Adequate	17	18
Good	17	9

$$\chi^2 (2) = 2.36, p = .31.$$

were ranked as adequate, and 15 (35.7%) were ranked as poor. The analysis revealed that there was no significant difference between the dietary practices of the two groups.

The dietary rankings and analysis for Mark Twain Elementary School and Stults Road Elementary School are presented in Table 6 and Table 7 respectively. In Group 1 at Mark Twain, 10 (35.7%) of the 28 students' dietary recall records were ranked as good, 10 (35.7%) of the students' dietary recall records were ranked as adequate, and 8 (28.5%) of the dietary recall records were ranked as poor. Group 2 at Mark Twain consisted of 27 students. Seven (25.9%) of the dietary recall records were ranked as good, 12 (44.4%) of the students' dietary recall

Table 6
Mark Twain Elementary Chi-Square Analysis
of Dietary Recall Records

Dietary Ranking	Groups	
	1	2
Poor	8	8
Adequate	10	12
Good	10	7

$$\chi^2 (2) = .69, p = .71.$$

records were ranked as adequate, and 8 (29.6%) were ranked as poor. The spread between those that were ranked good and adequate in Group 2 was greater than the spread in the dietary rankings of Group 1.

Table 7
Stults Road Elementary Chi-Square Analysis
of Dietary Recall Records

Dietary Ranking	Groups	
	1	2
Poor	5	7
Adequate	7	6
Good	7	2

$$\chi^2 (2) = 2.76, p = .25.$$

In Group 1 at Stults Road, there were 19 students; 7 (36.8%) of the dietary recall records were ranked as good, 7 (36.8%) of the dietary recall records were ranked as adequate, and 5 (26.3%) were ranked as poor. In Group 2 at Stults Road, there were 15 students. Two (13.3%) of the dietary recall records were ranked as good, 6 (40%) of the dietary recall records were ranked as adequate, and 7 (46.6%) of the dietary recall records were ranked as poor. There was greater variability in the dietary ranking of Group 2 than any of the other groupings. The analysis showed minor differences in the rankings, however, there was no significant difference between the rankings of the groups in the two schools.

Additional analysis of the data included a test of interrater reliability. An interrater reliability was conducted to determine the relationship between the subjective rankings of the dietary recall records by the investigator and a registered dietitian. Fifteen sets of dietary recall records were selected for use by the investigator who ranked five sets of the dietary recall records as poor, five sets as adequate, and five sets of the dietary recall records were ranked as good. A

registered dietitian ranked the same group of dietary recall records with results similar to those of the investigator. The Pearson product-moment correlation coefficient was the statistical procedure used to measure the interrater reliability. The correlation coefficient found was equal to .85 which was significant at the .001 level.

CHAPTER 5

SUMMARY, RESULTS, DISCUSSION, CONCLUSION, AND RECOMMENDATIONS

Summary

The purpose of this study was to determine the influence of two selected nutrition education programs on knowledge and dietary habits. The subjects included in this investigation were sixth grade students enrolled in Mark Twain Elementary School and Stults Road Elementary School in the Richardson Independent School District.

Four sixth-grade classes, consisting of 89 students participated in an experimental pretest-posttest study. All of the students were given a pretest: the Modified Nutrition Achievement Test. Following the administration of the pretest, the four classes participated in a 9-day nutrition education unit. The students in each of the two schools were divided into two groups. The students in Group 1 were taught nutrition education using the program "Daily Food Choices Secrets of Success." The students in Group 2 were taught nutrition education using the program "Better Education about Nutrition." Upon completion of the nutrition education unit, the

students in the four classes were given a posttest which was identical to the pretest. Subsequent to taking the posttest, the students completed 3-day dietary recall records.

An analysis of variance was used as the statistical treatment for determining the effectiveness of the two nutrition education programs used in the study. Significance was established at the .05 level. Additional statistical analysis included an analysis of covariance to determine if pretreatment states of the two groups affected the results of the study. A chi-square was used to analyze the 3-day dietary recall records. An additional statistical test was conducted to assess the interrater reliability on a cross section of 15 sets of the 3-day dietary recall records used in the study. The Pearson product moment correlation coefficient was used for this determination.

Results

Test of Hypotheses

The first hypothesis. There will be no significant difference in nutrition knowledge between Group 1 and Group 2. This hypothesis was accepted.

The second hypothesis. There will be no significant difference between the dietary habits of Group 1 and Group 2. This hypothesis was accepted.

Discussion

The analysis of covariance indicated that there was no statistical difference between the two groups before the treatment and no significant difference was found, at the completion of the nutrition programs, in either knowledge or dietary habits. Thus, it appears that neither program was superior in providing nutrition education for the sixth-grade students participating in the study.

The knowledge level of both groups did improve, but mastery of all of the objectives in the units taught was not obtained. A possible explanation for the lower than expected scores on the posttest was that both programs stressed the four food groups (meat, milk, vegetable/fruit, and bread/cereal) and did not place enough emphasis on nutrients and the other concepts that were a part of the Nutrition Achievement Test.

The relatively low posttest knowledge scores may have resulted because insufficient time was allotted for mastery of the material contained in the nutrition

education programs. This concern, that more time was needed to cover the material in the nutrition program, was expressed by some of the instructors participating in the study.

The dietary habits of the subjects in the study were obtained by 3-day dietary recall records. The statistical analysis did not show a significant difference in the dietary habits of the students in the two groups. Several factors could be responsible for the findings: (a) failure to obtain dietary recall data before the unit was taught, (b) time allotted for the treatment phase of the study, (c) parental influence, and (d) changes in family eating patterns.

Obtaining dietary recall records from the students before the nutrition education programs were taught would have enabled the investigator to compare the dietary practices before and after the nutrition education unit. This procedure may have provided a better opportunity to note the effect of the nutrition education program on the students' dietary habits.

The 9-day nutrition education program, as previously indicated, appeared inadequate in effecting a change in knowledge. This factor may also have been responsible

for the lack of change in dietary habits. A nutrition education program that was more indepth and ongoing may have been more effective in bringing about the desired change in students' dietary habits. Does the artificial setting in the classroom lend itself to impacting on aspects of the students' real world so that behavior can be changed?

Literature in the area of nutrition education and research has shown that dietary practices are formed early in the child's life with parental influences being a strong factor in the child's developing dietary habits. This influence may be either in what the parent says or his/her attitude. Miriam E. Lowenberg in her article, "The Development of Food Patterns," (1974) stated:

During fourteen years of study and close observation of nursery school children at meals, I became convinced that attitudes toward such foods as vegetables are surely and firmly transmitted by those who guide children at meals. The adult's attitude toward vegetables is often more influential with children than his words. (p. 268)

These dietary practices become a part of the child, and the older the child gets, the more resistant he/she becomes to changing these established dietary practices. The one area where changes do take place in the dietary habits of students is seen in their snacking patterns. The older a student gets, the more popular snacking becomes; therefore, it is essential to assist students in developing good dietary habits that will enable them to make sound food choices.

Another factor to be considered in the dietary habits of students is the change in the eating patterns of the family. Whereas meals were at one time family centered affairs with all members present, the trend is changing and more families eat meals with fewer members present. This trend toward fewer family members eating meals together or children eating alone does not afford the child the opportunity to develop good dietary habits.

Overall, the sixth-grade students in this study appeared to have minimal knowledge of nutrition education. However, some students had a greater understanding of the following concepts: (a) physiological facts, (b) nutrients, (c) food handling, (d) life cycle, and

(e) social psychological aspects of food. Knowledge of these concepts was evident on the test scores and may have come from previous classes in nutrition, parental influence, and the media.

However, knowledge about dietary habits is not reflected in practice. Students frequently evidenced knowledge in both the pretest and posttest scores, but this did not evidence itself in their practices-- particularly in the area of vegetable consumption.

Conclusion

Based upon the results of this study, the following conclusion is offered:

The nutrition education program "Daily Food Choices Secrets of Success" was not found to be more effective in changing sixth-grade students' knowledge and dietary habits than the nutrition education program "Better Education about Nutrition."

Recommendations

Based on the results of this study, the following recommendations are made:

1. The nutrition education units used in the study are excellently prepared to equip students with an

adequate knowledge of nutrition. The units called for an exposure and experience which excluded the time available for maximizing their effectiveness. The 9-day period of time was insufficient to adequately cover the material and allow for mastery of the concepts. In order to maximize the effectiveness of the units, a longer period of time should be provided.

2. Literature in the field of nutrition education attests to the influence and importance of parental involvement in formulating dietary practices of children. Some of the dietary recall records showed the need for assistance beyond the classroom in helping students to practice good dietary habits. A nutrition education program that includes parental involvement in the study could be a significant factor in helping students to initiate or reinforce sound dietary practices.

3. Literature in the field of nutrition education attests to the importance of nutrition education training for teachers to better equip them for teaching nutrition. The study undertaken provided inservice time for the teachers on the material to be covered in the study, however, a more comprehensive nutrition education program (inservice) for classroom teachers would be most

beneficial. Such an inservice would provide the teacher with a broader knowledge base to more effectively teach nutrition to students.

4. A few studies have been done in the area of school lunch programs being used as a teaching tool in nutrition education. One of the major emphasis of this study was to determine the dietary habits of the students following two selected nutrition education programs offered in the classroom only. An added component in a future study would be to use the food service cafeteria offerings to provide students with some practical experience in the selection of nutritious meals. In such a study, the school lunch would serve as a learning laboratory, thus enabling the student to implement the knowledge of nutrition that was gained in the classroom.

5. Literature in the field of nutrition education attests to the need and importance of nutrition education and that to be meaningful such education should actively involve students in the learning process. Future studies could involve student and parent participation by including tasting parties as a part of the learning experience. The tasting parties could be

nutritional treats or vegetable tasting parties in which the students would be encouraged to try the foods they generally shun.

APPENDIX A

Date _____

Student Number _____

Nutrition Knowledge Test

Circle the letter of the response that best answers the question.

1. What is one source of energy in the body?
 - A. fat
 - B. minerals
 - C. vitamins
 - D. water
2. Which of the following might indicate a good diet?
 - A. hair color
 - B. peppy feeling
 - C. good hearing
 - D. mathematical ability
3. Other needed nutrients are likely to be consumed in adequate amounts if "leader" nutrients are obtained daily in:
 - A. recommended amounts
 - B. deficient amounts
 - C. the same amounts
 - D. minimum amounts
4. Protein, riboflavin, and calcium are found in large amounts in the:
 - A. meat group
 - B. vegetable group
 - C. grain group
 - D. milk group
5. A group deficient in calcium could cause:
 - A. anemia
 - B. bleeding gums
 - C. nervousness
 - D. poor bone formation

6. Which food is the best source of carbohydrates?
 - A. apple
 - B. French fries
 - C. marshmallow
 - D. lettuce
7. Which food provides good amounts of a complete protein?
 - A. oatmeal
 - B. potato
 - C. banana
 - D. chicken
8. Which food has nutrient content similar to milk?
 - A. orange juice
 - B. pork chop
 - C. cottage cheese
 - D. lima beans
9. A food is placed in the milk group because it contains large amounts of:
 - A. calcium
 - B. iodine
 - C. iron
 - D. zinc
10. How can you best apply the U.S. RDA to your everyday life?
 - A. avoid snacks
 - B. eat 3 meals a day
 - C. eat a variety of foods
 - D. get plenty of exercise
11. Here are two breakfast menus:

Breakfast A
Grapefruit half
Scrambled egg
Toast & Butter
Milk

Breakfast B
Orange juice
Ham & cheese sandwich
Milk

Which breakfast has one serving from each of the four food groups:

- A. Breakfast A
- B. Breakfast B
- C. neither breakfast
- D. either breakfast

12. Which of the following breakfasts is the most balanced?
 - A. milk, cornflakes with banana and milk
 - B. hash brown potatoes, scrambled eggs
 - C. milk, orange juice, toast, peanut butter
 - D. hot oatmeal with cream, pineapple juice
13. Which author would be most likely to write an article on nutrition which gives accurate information?
 - A. dietitian in a school system
 - B. manager of a health food store
 - C. music professor at a college
 - D. pharmacist in a drug store
14. Which snack may become spoiled during a day-long hike?
 - A. dates
 - B. jelly beans
 - C. peanut butter and crackers
 - D. chicken leg
15. Which one would you select for both nutrient content and keeping quality if you were going on a picnic?
 - A. chocolate cake and soda
 - B. peanut butter sandwich
 - C. turkey and potato salad
 - D. tuna salad with potato chips
16. Nutrients are often added to foods in order to:
 - A. enhance the flavor
 - B. preserve the product
 - C. improve the nutrient content
 - D. heighten the color
17. Eating too much protein, carbohydrate, or fat may cause:
 - A. weight gain
 - B. nervousness
 - C. night blindness
 - D. dehydration
18. Marjorie's doctor says that she must lose weight. The best way for Marjorie to lose weight is to:
 - A. take diet pills
 - B. include a grapefruit half with each meal
 - C. eliminate the grain group
 - D. eat 3 balanced, low-calorie meals every day

19. By ethnic food patterns, we mean food:
- A. served in restaurants
 - B. choices of cultural group
 - C. chosen by children
 - D. eaten at mealtime
20. "We eat with our eyes" is an old quotation. What does it mean?
- A. We eat foods that are known
 - B. We eat foods that are attractive
 - C. We eat foods that are nutritious
 - D. We eat foods that are inexpensive

Nutrition Knowledge Test

Scoring Key for Test

1. What is one source of energy in the body?
A. fat
2. Which of the following might indicate a good diet?
B. peppy feeling
3. Other needed nutrients are likely to be consumed in adequate amounts if "leader" nutrients are obtained daily in:
A. recommended amounts
4. Protein, riboflavin, and calcium are found in large amounts in the:
D. milk group
5. A diet deficient in calcium could cause:
D. poor bone formation
6. Which food is the best source of carbohydrates?
A. apples
7. Which food provides good amounts of a complete protein?
D. chicken
8. Which food has nutrient content similar to milk?
C. cottage cheese
9. A food is placed in the milk group because it contains large amounts of:
A. calcium
10. How can you best apply the U.S. RDA to your everyday life?
C. eat a variety of foods

11. Here are two breakfast menus:

Breakfast A

Grapefruit half
Scrambled egg
Toast and Butter
Milk

Breakfast B

Orange juice
Ham & Cheese sandwich
Milk

Which breakfast has one serving from each of the four food groups?

- D. either breakfast
12. Which of the following breakfasts is the most balanced?
C. milk, orange juice, toast, peanut butter
13. Which author would be most likely to write an article on nutrition which gives accurate information?
A. dietitian in a school system
14. Which snack may become spoiled during a day-long hike?
D. chicken leg
15. Which one would you select for both nutrient content and keeping quality if you were going on a picnic?
B. peanut butter sandwich
16. Nutrients are often added to foods to:
C. improve the nutrient content
17. Eating too much protein, carbohydrate, or fat may cause:
A. weight gain
18. Marjorie's doctor says that she must lose weight. The best way for Marjorie to lose weight is to:
D. eat 3 balanced, low-calorie meals every day
19. By ethnic food patterns, we mean food:
B. choices of cultural group
20. "We eat with our eyes," is an old quotation. What does it mean?
B. We eat foods that are attractive

APPENDIX B

Circle only one

#1 #2 #3

Date _____

Student Number _____

DIETARY RECALL RECORD

Directions: List all the food you ate yesterday in their correct food groups.

	Meat	Milk	Bread and Cereal	Fruit and Vegetables	Extras
Breakfast					
Lunch					
Dinner					
Snacks					
Totals					

APPENDIX C

TEXAS WOMAN'S UNIVERSITY
Box 22939, TWU Station
RESEARCH AND GRANTS ADMINISTRATION
DENTON, TEXAS 76204

HUMAN SUBJECTS REVIEW COMMITTEE

Name of Investigator: Audrey V. Washington Center: DentonAddress: 6834 Topsfield Drive Date: 8-13-82Dallas, TX 75231Dear Audrey

Your study entitled EFFECTS OF A NUTRITION EDUCATION UNIT ON
KNOWLEDGE AND DIETARY HABITS OF SIXTH GRADE STUDENTS

has been reviewed by a committee of the Human Subjects Review Committee and it appears to meet our requirements in regard to protection of the individual's rights.

Please be reminded that both the University and the Department of Health, Education, and Welfare regulations typically require that signatures indicating informed consent be obtained from all human subjects in your studies. These are to be filed with the Human Subjects Review Committee. Any exception to this requirement is noted below. Furthermore, according to DHEW regulations, another review by the Committee is required if your project changes.

Any special provisions pertaining to your study are noted below:

Add to informed consent form: No medical service or compensation is provided to subjects by the University as a result of injury from participation in research.

Add to informed consent form: I UNDERSTAND THAT THE RETURN OF MY QUESTIONNAIRE CONSTITUTES MY INFORMED CONSENT TO ACT AS A SUBJECT IN THIS RESEARCH.

The filing of signatures of subjects with the Human Subjects Review Committee is not required.

Other:

✓ No special provisions apply.

cc: Graduate School
Project Director
Director of School or
Chairman of Department

Sincerely,
Sharon J. Curtin

Chairman, Human Subjects
Review Committee

at Denton

8/10/82

APPENDIX D

Richardson Independent School District



September 20, 1982

Ms. Audrey Washington
6834 Topsfield Drive
Dallas, Tex. 75231

Dear Ms. Washington:

The RISD Research Committee met Tuesday, September 14, to consider your proposed study. Your proposal, "Effects of a Nutrition Education Unit on Knowledge and Dietary Habits of Sixth Grade Students", was approved by the committee.

Your contact person in the district will be Forrest Skaggs. Discuss your research plans with Ms. Skaggs and notify the Department of Research and Testing regarding beginning and completion dates of your research. In addition, provide this department with a final copy of your study when it is completed.

Good luck in your research. If Sherrie Southern or I may be of help to you, please contact us.

Sincerely,

Rex A. Carr
Deputy Superintendent
Planning, Development and Evaluation

fc

APPENDIX E



Texas Woman's University

P.O. Box 22479, Denton, Texas 76204 (817) 383-2302, Metro 434-1757, Tex-An 834-2133

THE GRADUATE SCHOOL

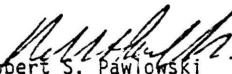
October 20, 1982

Mrs. Audrey V. Washington
6834 Topsfield Drive
Dallas, TX 75231

Dear Mrs. Washington:

I have received and approved the Prospectus for your research project. Best wishes to you in the research and writing of your project.

Sincerely yours,


Robert S. Pawlowski
Provost

ap

cc Dr. Ruth Tandy
Dr. Jane Mott

APPENDIX F

October 4, 1982

Dear Parent:

This letter is sent to inform you of a special study project in the area of nutrition education for sixth grade students that is being conducted for the partial fulfillment of a master's degree.

Your child is in a class that has been selected to be taught a special unit on nutrition. The class will be given a test before the unit is taught and a test after the unit is taught. The regularly assigned teacher will be teaching the unit as part of the health education class. The results of the tests will be the data that will be used in my academic study. The benefit to your child will be an increased knowledge of the importance of nutrition.

This information is shared with you in order to fulfill Texas Woman's University requirement that you be given information about your child's involvement with the option for you to decline your permission. I hope you the sign the letter and return it with your child, indicating your consent. I appreciate your willingness to cooperate. If you desire further information, be comfortable in giving me a telephone call at 341-1568 (home).

Respectfully yours,

Audrey V. Washington, R.N.
School Nurse
Hamilton Park Elementary School

Parent/Guardian Name

Date

Name of Student

School

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