

## INFORMATION TO USERS

This reproduction was made from a copy of a document sent to us for microfilming. While the most advanced technology has been used to photograph and reproduce this document, the quality of the reproduction is heavily dependent upon the quality of the material submitted.

The following explanation of techniques is provided to help clarify markings or notations which may appear on this reproduction.

1. The sign or "target" for pages apparently lacking from the document photographed is "Missing Page(s)". If it was possible to obtain the missing page(s) or section, they are spliced into the film along with adjacent pages. This may have necessitated cutting through an image and duplicating adjacent pages to assure complete continuity.
2. When an image on the film is obliterated with a round black mark, it is an indication of either blurred copy because of movement during exposure, duplicate copy, or copyrighted materials that should not have been filmed. For blurred pages, a good image of the page can be found in the adjacent frame. If copyrighted materials were deleted, a target note will appear listing the pages in the adjacent frame.
3. When a map, drawing or chart, etc., is part of the material being photographed, a definite method of "sectioning" the material has been followed. It is customary to begin filming at the upper left hand corner of a large sheet and to continue from left to right in equal sections with small overlaps. If necessary, sectioning is continued again—beginning below the first row and continuing on until complete.
4. For illustrations that cannot be satisfactorily reproduced by xerographic means, photographic prints can be purchased at additional cost and inserted into your xerographic copy. These prints are available upon request from the Dissertations Customer Services Department.
5. Some pages in any document may have indistinct print. In all cases the best available copy has been filmed.

**University  
Microfilms  
International**

300 N. Zeeb Road  
Ann Arbor, MI 48106



1321382

FISCHER, KELLYENE LEE

ELEMENTARY SCHOOL TEACHERS' ATTITUDES TOWARD NUTRITION, PHYSICAL  
FITNESS, AND THE SCHOOL LUNCH PROGRAM

THE UNIVERSITY OF ARIZONA

M.S. 1983

University  
Microfilms  
International 300 N. Zeeb Road, Ann Arbor, MI 48106

Copyright 1983

by

FISCHER, KELLYENE LEE  
All Rights Reserved



ELEMENTARY SCHOOL TEACHERS' ATTITUDES TOWARD  
NUTRITION, PHYSICAL FITNESS, AND THE  
SCHOOL LUNCH PROGRAM

by

Kellyene Lee Fischer

---

A Thesis Submitted to the Faculty of the  
NUTRITION AND FOOD SCIENCE DEPARTMENT  
In Partial Fulfillment of the Requirements  
For the Degree of  
MASTER OF SCIENCE  
In the Graduate College  
THE UNIVERSITY OF ARIZONA

1 9 8 3

Copyright 1983 Kellyene Lee Fischer

STATEMENT BY AUTHOR

This thesis has been submitted in partial fulfillment of requirements for an advanced degree at The University of Arizona and is deposited in the University Library to be made available to borrowers under rules of the Library.

Brief quotations from this thesis are allowable without special permission, provided that accurate acknowledgment of source is made. Requests for permission for extended quotation from or reproduction of this manuscript in whole or in part may be granted by the copyright holder.

SIGNED: Kelbyne Lee Trachsel

APPROVAL BY THESIS DIRECTOR

This thesis has been approved on the date shown below:

Ann Tinsley  
Ann Tinsley  
Assistant Professor of Nutrition and  
Food Science

7/19/83  
Date

## DEDICATIONS

This work is dedicated in memory of my mother, Sandra Lee Stuart, my grandfather, James H. Pollack, and in honor of my dear grandmother, Carita M. Pollack.

## ACKNOWLEDGMENTS

The author expresses her sincere thanks and gratitude to Dr. Ann Tinsley for her support, motivation, and guidance throughout my graduate program.

I also offer my appreciation to Dr. James Berry and Dr. Jack Wilmore for their encouragement and direction throughout this investigation.

Grateful acknowledgment is also made to the Department of Nutrition and Food Science for providing financial support throughout the pursuit of my studies.

## TABLE OF CONTENTS

	Page
LIST OF TABLES. . . . .	vii
ABSTRACT. . . . .	viii
1. INTRODUCTION. . . . .	1
Problem Statement . . . . .	5
Null Hypothesis . . . . .	6
Alternative Hypothesis. . . . .	6
Assumptions . . . . .	7
Limitations . . . . .	8
Definitions . . . . .	9
2. REVIEW OF LITERATURE. . . . .	11
Section I . . . . .	11
Definitions of Attitude . . . . .	11
Instruments Used to Measure Attitudes . . . . .	13
Evaluation of Instruments . . . . .	14
Section II. . . . .	15
Teachers' Attitudes Toward Nutrition, Nutrition Education, the School Lunch Program, and Physical Fitness . . . . .	15
3. METHODS AND PROCEDURES. . . . .	25
Description of Research . . . . .	25
Sample. . . . .	25
Instrument Construction . . . . .	26
Data Sheet. . . . .	26
Attitude Instrument . . . . .	26
Data Collection . . . . .	28
Data Analysis . . . . .	29
4. RESULTS AND DISCUSSION. . . . .	30
Reliability . . . . .	30
Statistical Data. . . . .	31
Descriptive Data. . . . .	49
Subjective Evaluation . . . . .	63

TABLE OF CONTENTS--Continued

	Page
5. SUMMARY, CONCLUSIONS AND RECOMMENDATIONS. . . . .	68
Summary . . . . .	68
Conclusions . . . . .	70
Recommendations . . . . .	73
APPENDIX A: PHYSICAL FITNESS, NUTRITION, AND THE SCHOOL LUNCH PROGRAM ATTITUDINAL SCALES . . . . .	76
APPENDIX B: DATA SHEET AND FREE RESPONSE SECTION . . . . .	82
APPENDIX C: COVER LETTERS TO TEACHERS IN THE TREATMENT (NSS) GROUP. . . . .	84
APPENDIX D: COVER LETTERS TO PRINCIPALS OF TEACHERS IN THE COMPARISON/CONTROL (C/C) GROUP . . . . .	87
APPENDIX E: COVER LETTERS TO TEACHERS IN THE COMPARISON/CONTROL (C/C) GROUP . . . . .	90
REFERENCES. . . . .	93

LIST OF TABLES

Table	Page
1. Cronbach Alpha Coefficient Values for the Attitudinal Scales. . . . .	32
2. Mann-Whitney Test Results for the Three Attitudinal Scales. . . . .	32
3. Spearman Correlation Coefficient Values for the Three Attitudinal Scales. . . . .	35
4. Range of Scores for the Three Attitudinal Scales. . . . .	35
5. Mean Scores and Mann-Whitney Test Results for the Three Attitudinal Scales. . . . .	39
6. Percent of Male and Female Subjects . . . . .	50
7. Age of Subjects . . . . .	50
8. Ethnic Distribution of Subjects . . . . .	51
9. School Zone-Geographic Distribution of Teachers in Arizona . . . . .	52
10. Teachers' Educational Degrees . . . . .	54
11. Grade Level the Subjects were Currently Teaching. . . . .	54
12. Number of Years the Subjects Had Been Teaching Elementary, Middle School, or Junior High Classes . . . . .	56
13. Percent of Subjects Who Taught Nutrition and/or Fitness During 1980-81 and 1981-82. . . . .	58
14. Types of Resources Used to Teach Nutrition and Fitness . . . . .	59
15. Number of Nutrition and/or Fitness Workshops and College-Level Nutrition Courses Teachers Completed. . . . .	61

## ABSTRACT

A mail survey involving 31 teachers in the Treatment (NSS) group and 18 teachers in the Comparison/Control (C/C) group was conducted to determine if teachers who utilized a team-approach to teach a combined nutrition-fitness curriculum, Nutrition Super Stars, had more positive attitudes toward nutrition, physical fitness, and the school lunch program than teachers who did not use this curriculum. Instruments were developed to assess attitudes and opinions of teachers. Cronbach's alpha coefficient for the nutrition, physical fitness, and school lunch scales were .74, .71 and .33, respectively. The NSS group had significantly more positive attitudes toward nutrition than the C/C group. Significant positive relationships were found between the C/C group's attitude toward nutrition and their attitude toward physical fitness, and between the NSS group's attitude toward nutrition and their attitude toward the school lunch program.

## CHAPTER 1

### INTRODUCTION

Research findings demonstrate that a proper diet and regular physical activity are necessary to develop and maintain an optimal health status throughout the life cycle. Children must learn to make wise food and activity choices that will promote optimal health.

The Ten State Nutrition Survey reported dental caries, obesity, and anemia as the most common health problems of school age children (1). Children were also reported to be consuming inadequate intakes of Vitamin A and ascorbic acid. Thus children's health problems are related to their food and activity patterns.

The Franklinton (2) survey reported that children had inadequate intakes of iron, calcium, and Vitamin A. Excessive animal protein intakes contributed to a high saturated fat intake, and a low poly-unsaturated:saturated fatty acid ratio in the diet. Children's diets were similar to the average diet of an adult living in the United States. Carbohydrates contributed 46 percent of the total calories, fat 42 percent, and protein 11-12 percent. The Committee on Dietary Allowances (3, pg. 36), recommends that in diets of less than 2000 kcalories, dietary fat intake should not be more than 35 percent of total calories.

As far as obesity is concerned, Jean Mayer (4), stated, "no single factor is more frequently responsible for the development of obesity in adolescents than the lack of physical activity". Common

physical complaints associated with childhood obesity, and closely related to the child's inactivity are clumsiness, shortness of breath, skin irritation due to friction and heat discomfort (5). Obesity is a risk factor for coronary artery disease, hypertension, and diabetes (6,7). Other medical problems and diseases associated with obesity are abnormal plasma lipids and lipoprotein concentrations (6), gallstones, gout, carcinoma, respiratory insufficiency, phlebitis, and congestive heart failure. These medical disorders are related to obesity, and usually become clinically apparent during adulthood. Proper diet and physical activity patterns must be promoted during childhood to prevent the development of obesity. Obese children should be treated by appropriate methods to prevent a possible life long struggle with dietary treatments and medical disorders associated with their obese condition.

Iron deficiency anemia is another common diet-related health problem in school age children. The individual with anemia is unable to mentally and physically perform at his optimal levels. The blood's oxygen carrying capacity is greatly reduced; therefore, the capacity for aerobic physical activity is reduced. Typical symptoms of anemia are pallor, apathy, and lethargy. These symptoms closely resemble those of early stages of learning and growth impairment in children consuming an inadequate diet i.e., restlessness, a shortened attention span, lethargy, and confused thought patterns (8). Anemia may limit the physiological and intellectual growth patterns of school age children.

Pathological studies suggest that coronary heart disease has its origins during childhood. Holman et al. (9) found fatty streaks in

the aortas of children. Advanced stages of cardiovascular disease were found in young adults who died in combat during the Korean and Vietnam wars (10,11). Although children and adolescents may have fatty streaks, atheromatous alterations in coronary vessels, and the presence of heart disease risk factors, the clinical manifestations of the disease do not usually appear until adulthood.

The Muscatine (12) study and the Bogalusa Heart Study (13) revealed that groups of school age children had coronary heart disease risk factors such as hypertension, hyperlipidemia, and obesity. These are a sample of risk factors which are predictive of increased risk for premature coronary heart disease in adults. Reduction of risk factors may slow the progression of the disease. Serum cholesterol levels have been demonstrated to decrease with low cholesterol and low fat intakes. Hypertension can be controlled by restricting sodium intake, reducing body weight, increasing physical activity, or by adhering to appropriate pharmacological therapy. Changing children's dietary and physical activity patterns may reduce the prevalence of obesity, anemia, and cardiovascular risk factors in the population.

Nutrition education programs for children aim to change their nutrition-fitness related knowledge, attitudes, and behaviors with the long range goal of improving the nutritional status and the health status of the children. In the school environment, important subsystems in the nutrition education programs are teachers, administrators, food-service personnel, and peers (14). The teacher is most likely to be the first significant adult outside of the family who serves as an image model, and who may influence the child's attitude towards food (15).

With the passage of Public Law 95-166, teachers have been given more responsibility to implement nutrition-fitness curricula. The teacher now has a direct effect on the child's nutrition experiences in the classroom and an indirect effect through the school lunch program.

Teachers' attitudes and beliefs toward nutrition and nutrition education may be as important or more important than their nutrition knowledge in influencing their effectiveness as nutrition educators (16). Recommendations derived from successful attitude studies can foster the understanding of the relationship between nutrition-fitness knowledge and actual behavior. Knowledge of nutrition, physical fitness, and school lunch program attitudes are of value to nutritionists in designing objectives and techniques for nutrition education programs, and for improving the school lunch program.

Research findings demonstrate that teacher attitudes toward nutrition education in schools are significantly and favorably changed by teaching a nutrition curriculum (17,18). However, a favorable attitude toward nutrition education in schools is not always accompanied by a strong commitment to, or interest in, actually teaching nutrition (17). Conversely, a study conducted by Shannon (18), demonstrated that teachers who taught a nutrition curriculum had higher gain scores in cognitive knowledge, and on the attitude scales "Favors Nutrition Education in Schools", and "Commitment to Teaching Nutrition", than teachers who did not teach a nutrition curriculum to their students.

No known studies have been conducted to determine if teachers who have taught a combined nutrition-physical fitness curriculum, using a team approach, have different attitudes towards nutrition, physical

fitness, and the school lunch program than teachers who have not taught such a curriculum. Although nutrition and physical fitness are a logical combination in a curriculum, they have only recently received attention in this aspect. The Nutrition Super Stars Curriculum Kit was developed in 1979-1980 as a team based nutrition-fitness program for fifth and sixth grade students and now includes seventh and eighth grade students and respective team members i.e., teachers, school foodservice directors, and school nurses.

This curriculum aims to change students' cognitive knowledge of nutrition and physical fitness with the long range goal of changing students' attitudes and health behaviors. Teacher attitudes toward nutrition, physical fitness, and the school lunch program may influence the effectiveness of the Nutrition Super Stars curriculum.

#### Problem Statement

This study was designed for two primary and two secondary purposes. The first primary objective was to determine if teachers who have taught a combined nutrition-physical fitness curriculum, "Nutrition Super Stars", had more positive attitudes toward nutrition, physical fitness, and the school lunch program than teachers who did not use this curriculum. The second primary objective was to determine if a relationship exists between the three attitude constructs: nutrition, physical fitness, and the school lunch program. Secondary objectives were to determine if teachers believe that nutrition education is important, and to collect biographic, demographic, and educational data on the teachers involved in this study.

Null Hypothesis

1. There will be no significant difference between the nutrition attitude test scores of teachers who used the Nutrition Super Stars curriculum, and those teachers who did not.
2. There will be no significant difference between the physical fitness attitude test scores of teachers who used the Nutrition Super Stars curriculum, and those teachers who did not.
3. There will be no significant difference between the school lunch program attitude test scores of teachers who used the Nutrition Super Stars curriculum, and those teachers who did not.
4. There will be no significant correlation between the teachers' nutrition attitude test scores and their physical fitness attitude test scores.
5. There will be no significant correlation between the teachers' nutrition attitude test scores and their school lunch attitude test scores.
6. There will be no significant correlation between the teachers' physical fitness attitude test scores and their school lunch program attitude test scores.

Alternative Hypothesis

1. Teachers who used the Nutrition Super Stars curriculum will have higher (more favorable) nutrition attitude test scores than teachers who did not use this curriculum.

2. Teachers who used the Nutrition Super Stars curriculum will have higher (more favorable) physical fitness attitude test scores than teachers who did not use this curriculum.
3. Teachers who used the Nutrition Super Stars curriculum will have higher (more favorable) school lunch program attitude test scores than teachers who did not use this curriculum.
4. There will be a significant correlation between the teachers' nutrition attitude test scores and their physical fitness attitude test scores.
5. There will be a significant correlation between the teachers' nutrition attitude test scores and their school lunch attitude test scores.
6. There will be a significant correlation between the teachers' physical fitness attitude test scores and their school lunch program attitude test scores.

#### Assumptions

In this study it was assumed that:

1. The teachers' responses were representative of their true attitudes toward nutrition, physical fitness, and the school lunch program.
2. The teachers clearly understood the meaning of each attitude statement.
3. All teachers participating in this study were exposed to media presentations about nutrition, physical fitness, and the school lunch program.

### Limitations

Certain limitations are inherent in this study, and they need to be considered when interpreting the results.

1. The sample population was limited to fifth and sixth grade teachers in southern Arizona who volunteered to participate in the mail survey.
2. The teachers in the treatment group used other nutrition and/or physical fitness curricula prior to the implementation of the Nutrition Super Stars curriculum.
3. The Comparison/Control group of teachers surveyed used nutrition and/or physical fitness curricula, although not the Nutrition Super Stars curriculum.
4. The Comparison/Control group of teachers surveyed had access to a nutrition consultant in their school district.
5. The teachers in this survey were not pretested, but were posttested.
6. The attitude instrument was pilot tested, but not field tested before it was used in this survey.
7. Since the attitude instrument was mailed to the teachers, the testing environment was not controlled.
8. The Comparison/Control group of teachers surveyed was limited to schools in Phoenix and Marana, Arizona due to time and financial limitations.

### Definitions

1. Nutritional Status - The health condition of the individual as influenced by the utilization of nutrients.
2. Fitness - The body's ability to function at its optimal level during rest through maximal exercise. Fitness is the result of diet, physical activity, and health habits. Health habits include sleep, relaxation, smoking, caffeine, alcohol, and drug intake.
3. Physical Fitness - A composite of strength, endurance, flexibility, and cardiovascular fitness.
4. Behavior - Referring in this study specifically to an individual's daily food, physical activity, and health habits.
5. Attitude - Referring in this study to the favorable or unfavorable response toward a statement about nutrition, physical fitness, or the school lunch program.
6. School Lunch Program - A federally funded program which provides a "school lunch meal pattern" at a reasonable price, a reduced price, or for free to students in participating schools.
7. School Lunch Meal Pattern - A menu pattern designated by the United States Department of Agriculture, Food and Nutrition Service (USDA-FNS) which must be followed to receive funding. The Pattern consists of: 2 oz. meat or meat alternate, 3/4 cup of fruit and/or vegetable, 8 servings of bread or bread substitute per week, and 8 oz. of milk. These are the minimal standards that must be met.

8. Nutrition Super Stars Curriculum Kit - (note: Kit is synonymous with packet). The curriculum kit is a team based nutrition-fitness education program for upper elementary school students. The team members include teacher, school foodservice director, and school nurse. The curriculum materials and learning activities focus on the interrelationship of food, nutrition, physical fitness, and their impact on health. The kit includes 20 one hour class plans, 44 student nutrition and fitness activity spirit masters, and team member training information. The Nutrition Super Stars Kit was developed in 1979-1980 and was field tested in 1979-1980. In 1980-1981 the kit was revised and field tested again by the University of Arizona, Nutrition and Food Science Department. This initial work was funded by a grant from U.S.D.A. Section 18 - Child Nutrition Act.

## CHAPTER 2

### REVIEW OF LITERATURE

The first section of this literature review will briefly cover definitions of attitude, instruments used to measure attitudes, and the evaluation of instruments. The second section will chronologically review studies about the attitudes teachers have toward nutrition, nutrition education, the school lunch program, and physical fitness.

#### Section I

##### Definitions of Attitude

One of the oldest definitions of the attitude concept is that of Allport (19), who stated that an attitude was a "mental and neural state of readiness to respond, organized through experiences exerting a directive or dynamic influence on behavior". Social psychology researchers later advanced to a multi-component definition of attitude. The three components of attitudes are: a) the cognitive component, beliefs about an object, b) the affective or feeling component which includes likes and dislikes, c) the action tendency component, which is the readiness to respond in a particular manner associated with an attitude, but does not involve the actual behavior (20,21).

Oppenheim (22) defines attitudes as a state of readiness, a tendency to act or react in a certain manner when confronted with certain stimuli. Attitudes are reinforced by belief (cognitive) and attract strong feelings (emotional component) that will lead to

forms of behavior (action tendency component). Attitudes are acquired or modified by absorbing, or reacting to, the attitudes of other people (22). Attitudes are learned, and they develop as we interact in relationships with significant others in the socialization process (20).

The success of changing an attitude depends on the ability to influence its dominant component (21). Nutrition education programs aim to change attitudes and health behaviors by several methods (14,23). In the "cognitive dissonance" theory, education is assumed to be the first phase of a three phase process from knowledge acquisition to attitude change and finally to behavior change (24). As knowledge increases, the cognitive component is altered to a state which is inconsistent with the action tendency component and the behavior in question. For example, this consistency theory would predict the following: 1) by accumulating information, the hypertensive adult will believe the negative effects of consuming a high amount of sodium; 2) he would re-evaluate his dietary behavior and would associate his high sodium intake with "unfavorable" health consequences, (he has developed an unfavorable attitude towards sodium intake); and, 3) he will notice the inconsistency between his attitude which he developed from what he knows about consuming a high amount of sodium and the fact that he still consumes a lot of sodium, and he will change his behavior to be more consistent with this new attitude.

Some theorists believe that behavior may change before attitudes, and that attitudes are very resistant to change (14,24). The cognitive dissonance theory is not always appropriate because defense mechanisms seem to invalidate it, i.e., rationalization, denial and differentiation (24). People defend their attitudes with a vengeance. The other major method which nutrition education programs use to change attitudes and behaviors is based on the theory that behaviors are easier to change than attitudes, and that attitudes need not change for behaviors to change. In this approach, a "leader" would adopt a "model" behavior and this would create a snowball effect as other people would imitate the behavior. This approach is similar to the cognitive dissonance theory in that the person would view his attitude as inconsistent with his new behavior; therefore, he would change his attitude to be more consistent with his new behavior. The person would justify his behavior by accommodating his attitudes accordingly. Knowledge is still important, but it is not the initiating factor.

#### Instruments Used to Measure Attitudes

Since attitudes cannot be observed directly, methods of data collection have evolved throughout the years. Traditionally, self reported beliefs, feelings, or intentions have been used as the focal point of inference. Since these methods have limitations, written attitude instruments have been developed to improve data collection. The most popular, and standardized methods include Thurstone's method of equally appearing intervals - paired comparison technique (22,25), Likert's method of summated ratings (22,26), Guttman's scalogram (22,25)

and Osgood's semantic differential (22,25). Each method has its limitations and advantages. The researcher must decide which method is the most applicable to the problem being studied.

The Likert scale is the most popular instrument used for nutrition education evaluations. The response patterns range from "strongly agree" to "strongly disagree". A numerical value is assigned to each of the possible response alternatives, and this value designates the extreme on the attitude continuum (26). According to Likert (26), the development of attitude statements should follow a certain criteria.

1. The statements must be expressions of desired behavior and not statements of fact.
2. Each statement must be clear, concise and straight forward.
3. Generally, each statement should be so worded that the modal reaction to it is approximately in the middle of the possible responses.
4. To avoid a response set, the statements should be randomly mixed with one half of them having a "favorable attitude extreme" and the other half having an "unfavorable attitude extreme".
5. If multiple choice statements are used, the different alternatives should involve only a single attitude variable and not several.

#### Evaluation of Instruments

Statistical analyses, especially validity and reliability measurements, are required to evaluate the attitude instrument. A valid

instrument measures with acceptable accuracy what it claims to measure. Test developers refer to three types of validity: content, criterion and construct validity (25,27). A reliable instrument is relatively free from measurement errors, and would yield similar scores upon repeated use (27). Specific analyses used to estimate reliability are the split halves method or Spearman-Brown prophecy formula, Cronbach's alpha coefficient, or the Kuder Richardson formulas. Each concept of reliability represents a different approach to the measurement of error (25,27). Other tests may be used to ascertain the reasons for poor reliability of a test instrument.

## Section II

### Teachers' Attitudes Toward Nutrition, Nutrition Education, the School Lunch Program, and Physical Fitness

From the review of the nutrition related attitude studies in the literature, it is apparent that nutrition researchers have not always defined attitudes carefully nor have they studied them properly. Research studies have been complicated by a lack of operational definitions of attitude, and a scarcity of valid, reliable attitude instruments (28). In view of this, the following papers reviewed are the core references in the literature defining the attitudes teachers have toward nutrition, nutrition education, the school lunch program, and physical fitness.

In the early 1960's nutrition education efforts were reported to be relatively ineffective in improving the dietary practices of school children. The main reasons were thought to be: a disorganized approach to the subject, the absence of administrative and parental support,

and a lack of teacher preparation in the subject (29). In O'Farrell and Kendrick's (29) study, teachers favored mandating the teaching of nutrition education. The majority of the respondents expressed the view that school programs of nutrition education would be effective in preventing poor nutrition only if the effort was supported by both the school and the community.

Petersen and Kies (30) conducted a survey of 910 Nebraska teachers of grades K-3 in 1972, evaluating nutrition knowledge, the attitudes the teachers had toward teaching nutrition as an interdisciplinary program, and the attitudes toward the school lunch program. Results revealed that attitudes toward teaching nutrition were not affected by the degree of the teacher's nutrition knowledge. Although coordinated nutrition education programs between the classroom teacher and school foodservice personnel had been suggested, the data revealed no positive significant correlation between knowledge and attitudes toward the school lunch program. Teachers' attitudes toward a team, interdisciplinary approach to nutrition education were poor; a significant negative relationship existed between nutrition knowledge, and the usefulness of a professional nutritionist to aid in formulating a coordinated nutrition education program. The authors (30) concluded that innovative programs needed to be developed to increase the effectiveness of integrated classroom teaching, especially since attitudes are an important factor in changing food consumption habits.

Cook, Eiler and Kaminaka (16) conducted a survey to provide nutrition educators with a quantitative assessment of nutrition education in public K-6 grades in New York state and northern New Jersey. Their

results indicated that most teachers thought that "nutrition is important"; however, more than half of the teachers thought nutrition could be taught most effectively at a grade other than their own. Furthermore, teachers with a high school, college or inservice nutrition course were significantly more likely to include nutrition education in their curricula than teachers with less nutrition training. The attitude of K-6 teachers toward nutrition education was positive, and significantly related to the time they spent teaching nutrition (16).

The results of the Petersen and Kies (30) study indicated that teachers' nutrition knowledge scores were unrelated to favorable attitudes toward teaching nutrition, and the majority of the teachers in this Nebraska study had poor preparation for teaching nutrition. A greater percentage of teachers in the New York/New Jersey survey (16) had formal nutrition education training through a college course or inservice workshop. The relationship between the amount of nutrition education training, and the amount of time spent teaching nutrition is only associative; other variables may be the causal factors (16). Teachers' attitudes and beliefs toward nutrition education may be as important or more important than their nutrition knowledge in influencing their effectiveness as nutrition educators (16).

Lai and Shimabukuro (31) directed a statewide assessment of the nutrition education and training needs of children, teachers, and foodservice personnel in Hawaiian schools. Preschool and lower elementary teachers participated more in nutrition education than other teachers. However, the highly involved teachers did not take nutrition

related courses as part of their educational program. This finding is in conflict with the findings of Cook et al. (16), Marr et al. (32), O'Connell (17), and Penner and Kolasa (33). The majority of the respondents in the Lai and Shimabukuro (31) survey were lacking in nutritional training as 43 percent had never taken a food or nutrition course, and 63 percent had had no inservice training in nutrition or food instruction.

At all grade levels, teachers generally believed that students were interested in nutrition. Teachers, administrators and fooservice managers believed that classroom nutrition lessons would be effective if they were coordinated with the school lunch program. Although this program coordination was considered to be necessary, it was rarely implemented. The authors (31) recommended that teachers receive training to improve their nutrition knowledge, and their teaching strategies. Support services such as school nurses and health aids trained in nutrition should be provided to encourage improvement in students' dietary habits.

During 1979-1980, Perkins, Roach and Vaden (15), conducted a survey about teachers' attitudes toward the school lunch program, and the influence that teachers' attitudes had on student school lunch participation. In general, the teachers held positive attitudes about the school luch program, and nutrition education, but they were resistant to increased participation in the program. A confounding result was the negative, significant relationship between student school lunch participation and teacher support of nutrition education. These teachers may

have perceived a greater need for nutrition education based on the lack of sensible nutrition habits of their students.

A significant positive relationship existed between teachers' perceived view of food quality and student participation. Teachers expressed positive attitudes toward the students' meals and they believed that school lunch was nutritionally adequate for the students and priced appropriately. These findings indicated that attitudes teachers have toward the food may influence their students' school lunch participation rates. Another predictor of student school lunch participation was that student participation increased as a function of how resistant teachers were to eating with their classes (15). The teachers' attitudes toward eating with the children were strongly negative. They believed that their presence did not influence students' eating habits. The teachers also believed that the excessive plate waste was caused by the students' dislike for the food served. Furthermore, teachers believed that the meal they received for lunch was adequate, but the cost for the teachers was too high. They also believed that the caloric level of their school lunch was too high, and the portion sizes were too small. Voluntary comments were that too many starchy foods were served.

By 1980, a solid, positive trend toward an interdisciplinary approach to nutrition education emerged. This positive trend may have been influenced by the Public Law 95-166; the National School Lunch Act and Child Nutrition Amendments of 1977. This legislation provides funding for a team-approach of nutrition education involving students, teachers, and school foodservice employees (34).

Marr, Shannon, and Spanier (32), conducted a mail survey in Pennsylvania of junior and high school administrators and teachers to ascertain their attitudes toward nutrition education for grades 7-12. The results revealed a strong agreement among all respondents that nutrition should be taught in grades 7-12. The respondents also favored integrating nutrition education into existing courses (health, home economics, biology, and physical education) over teaching it as a separate course. However, interest scale scores indicated a low teacher interest in teaching nutrition. The teachers who had taken a prior course, preservice training, in nutrition were significantly more interested in teaching nutrition than those respondents who had not taken a similar course (32).

Penner and Kolasa (33) assessed the nutrition knowledge, attitudes, and practices of secondary teachers of physical education, health, home economics, science and social studies. Home economics teachers scored significantly higher than other teachers on the nutrition knowledge test, and they also had the most positive attitudes toward teaching nutrition. Teachers' attitudes toward their own nutrition were positive. The authors (33) recommended that teachers should have preservice training in food and nutrition. This study revealed that those teachers who taught nutrition and had taken more nutrition-related courses scored higher on the knowledge test and had more positive attitudes toward nutrition education.

A study conducted by O'Connell (17) revealed that teachers thought that nutrition was important for good health, irrespective of whether the teachers did or did not teach nutrition. Again, it was

found that teachers who taught nutrition had more favorable attitudes about implementing nutrition education in schools, than those teachers who did not teach nutrition. When nutrition education was considered in competition with other courses for class time, it received only moderate support from the teachers. Inservice training, used as a treatment in the research design, may have increased teachers' skills in nutrition education methods, but did not differentially influence the teachers' attitude scores (17).

Shannon (18) assessed nutrition knowledge, attitudes, and commitment to teaching nutrition of K-6 teachers before and after a nutrition education project in which half of the teachers taught nutrition and half did not. The teachers received one of three preparation methods for teaching nutrition. The teachers who completed a 45 hour post graduate nutrition course had the most significant gains in nutrition knowledge. The actual use of curriculum materials in classroom instruction did significantly and favorably affect teachers' nutrition knowledge scores, their scores on the attitude scale "Favors Nutrition Education in Schools", and on the "Commitment" scale. A positive change in teachers' attitudes towards favoring nutrition education in schools correlated with higher student gains in nutrition knowledge. This finding is encouraging and may be a step in understanding how teacher attitudes influence student performance. The authors concluded that an "effective, simulated nutrition teaching experience as part of teacher preparation may be beneficial in enhancing teachers' attitudes toward nutrition education" (18).

Kenyon (35,36) developed a Likert-type attitudinal instrument for use with adults and high school students. This instrument was divided into six dimensions, or subdomains, which are as follows: physical activity perceived as 1) a social experience, 2) health and fitness, 3) the pursuit of vertigo, 4) an aesthetic experience, 5) catharsis, and 6) an ascetic experience.

Tolson and Chevette (37) conducted a study with college freshman to evaluate the changes in attitudes toward physical activity as a result of individualized exercise prescription. The Kenyon Inventory for Determining Attitude Toward Physical Activity was used to assess the changes in students' attitudes. The results indicated that the individualized exercise program elicited significant increases in four of the six scales of the inventory, i.e. Catharsis, Ascetic, Vertigo, and Health/Fitness. No significant differences were observed on the Aesthetic or Social experience dimensions.

Reid (38) investigated differences in attitudes toward physical activity and personality traits of both physically active and inactive university teachers. The two groups viewed physical activity differently. Active teachers had significantly more favorable scores in the Health/Fitness, Ascetic, and Cathartic subdomains than the inactive teachers. The author (38) concluded that active teachers derived gratification from and had positive feelings toward hard physical work. Active teachers also realized the Health/Fitness benefits and the benefits from release of frustrations and emotions. Inactive teachers rated the Ascetic, Cathartic and Health/Fitness subdomains significantly lower than the active group. The inactive teachers recognized the effects of

the release of frustrations and emotions (cathartic) in physical activity, but they related it to social and aesthetic value of the physical activity.

Barrell and Holt (39) conducted a longitudinal investigation of the attitude towards physical activity of students participating in a physical education teacher training course. Results demonstrated that students' attitudes to some aspects of physical activity change during teacher training. The results suggest that change in attitude is a continuous process because there were significant differences between the first and third year students and between the second and third year students.

Several implications can be made from this review of literature. The research reveals that although populations of teachers favored nutrition education for school children, a majority of the teachers displayed a lack of personal interest in teaching nutrition. Generally, teachers who had preservice training in nutrition seemed to have more positive attitudes toward teaching nutrition, and spent more classroom time teaching nutrition than did teachers who had inservice training or no nutrition training. Positive attitudes toward nutrition may be more easily influenced by preservice training than inservice training (17). However, the research design, random assignment to treatment groups, used in the inservice study (17), may have created unfavorable attitudes which masked any improvement that may have been noted. A more recent study (18) demonstrated that teachers who had inservice training, and

who taught nutrition to their students had a more positive commitment and interest in teaching nutrition than those teachers who did not teach nutrition.

Additional research is needed to determine what factors are involved in creating positive attitudes in teachers toward nutrition, physical fitness, the school lunch program, and nutrition education. This study will attempt to investigate the combined nutrition-physical-fitness-school lunch program attitudes and determine the factors involved and the relationships that may exist between them.

## CHAPTER 3

### METHODS AND PROCEDURES

#### Description of Research

This study is a descriptive survey of the attitudes fifth and sixth grade teachers have toward nutrition, physical fitness, and the school lunch program. Two groups of fifth and sixth grade teachers were compared to determine if there were differences in attitudes between teachers who used the Nutrition Super Stars curriculum and those teachers who did not use this curriculum. Relationships between the three attitude constructs: nutrition, physical fitness, and the school lunch program, were examined statistically. Biographic, demographic, and educational information were collected from the teachers involved in this study. Free responses were subjectively evaluated to determine if teachers believed that nutrition education is important.

#### Sample

The teachers involved in this study consisted of two groups of fifth and sixth grade school teachers in southern Arizona. Group #1 consisted of 49 teachers who participated in either or both the 1979-1980 and 1980-1981 Nutrition Super Stars field tests. These teachers used the Nutrition Super Stars Curriculum Kit to teach basic concepts of nutrition and physical fitness to their students for a minimum of 20

hours from January to May, 1981. Group #2 was a Comparison/Control group of 41 teachers from Phoenix and Marana, Arizona school districts who were not involved in the Nutrition Super Stars project.

### Instrument Construction

Two instruments were developed for data collection purposes:

1) a data sheet, and 2) a 55 item, four point Likert type attitudinal scale.

#### Data Sheet

Questions on the data sheet included: age, sex, ethnic group, demographic data, highest degree obtained, grade level presently teaching, length of time teaching elementary and/or middle school, curricula used to teach nutrition and/or fitness, number of nutrition courses completed during college, number of nutrition and/or fitness workshops attended for continuing education credits. A free response section was included to elicit teachers' personal feelings and beliefs about the importance of nutrition education, and the amount of time teachers were willing to implement nutrition education.

#### Attitude Instrument

The attitude instrument consisted of three sections: 1) nutrition, 2) physical fitness, 3) school lunch program. Initially, clusters of attitude questions were developed. From the cluster sets, 110 attitude statements were constructed, approximately 35 attitude statements were included in each section. A four point modified Likert response pattern was used ranging from strongly agree to strongly disagree. The decision was to modify the Likert scale to a four point

to force the respondent to admit to an attitude. Although it was not stated on the answer sheet, any respondent truly not having an attitude could choose to leave the question unanswered. For purposes of tabulation and scoring, a numerical value was assigned to each of the possible response alternatives. Values from one to four were used to score the attitude continuum with four considered a "favorable attitude extreme" toward nutrition, physical fitness, and the school lunch program, and one considered an "unfavorable attitude extreme". To avoid a response set, the items within each section were randomly mixed with 50 percent stated negatively.

A committee of ten nutrition education and evaluation experts reviewed the attitude statements to assess content validity. The attitude statements were revised according to the review committee's recommendations. The revised instrument was pilot tested with approximately 40 subjects consisting of college students, student teachers and teachers. The instruments were given to groups of the participants to complete during their free time and were returned within ten days.

Item analysis was conducted on the returned questionnaires, and the items with the highest point-biserial correlation were chosen as the best items. The revised instrument contained 55 items divided into three sections: Section I consisted of 20, four option, forced choice Likert-type items measuring physical fitness attitudes; Section II consisted of 20, four option, forced choice Likert-type items measuring nutrition attitudes; Section III consisted of 10, four option, forced choice Likert-type items plus 5, four option opinion items measuring attitudes and opinions of the school lunch program. A sample questionnaire is illustrated in the appendix.

### Data Collection

Questionnaire packets were mailed to 41 Control/Comparison teachers, and to 49 teachers who participated in the Nutrition Super Stars project. The 41 packets for the Comparison/Control group of teachers were mailed to seven principals, at their request, for distribution to their teachers. Each packet contained a cover letter, an attitude questionnaire, a data sheet, an optical scanner answer sheet, and a stamped, self-addressed envelope. The cover letter explained the purpose of the project, and suggested an average amount of time required to complete the questionnaires. The teachers were requested to return the data sheet and the answer sheet within two (2) weeks. The questionnaires were anonymous; the answer sheets and data sheets were coded numerically.

Additional packets were mailed to non-respondents of both groups 17 days after the initial mailing, and the teachers were urged in the second cover letter to return their data sheets and answer sheets within one week. The principals of the Comparison/Control teachers were visited 25 days after the initial mailing. The purpose of the meeting was to collect completed data sheets and answer sheets, to distribute additional questionnaires if necessary, to stress the importance of their cooperation in this study, and to personally thank them for their cooperation. The non-respondents from the Nutrition Super Stars group were telephoned 21 to 25 days after the initial mailing. The teachers were strongly urged to return their completed data sheets and answer sheets.

The return rate percentage for the Comparison/Control group and the Nutrition Super Stars group was 46% and 65% respectively.

When the non-response rate was corrected for attrition, the return rate increased to 77.5% for the Nutrition Super Stars group.

#### Data Analysis

Appropriate statistical analyses were used to assess the data in this study. The items on the data sheet were analyzed using the CROSSTABS program in The Statistical Package for the Social Sciences (40, p. 230). Cronbach's alpha coefficient was used to estimate the internal consistency of the attitudinal scales (41, p. 262). The Mann-Whitney test was used to determine if there were differences in attitudes between the two groups of teachers (41, p. 232). To control for omitted responses, the group's mean score for that item was coded as the omitted score. Since omitted scores represented "no opinion" on the part of the teachers, the mean score was an appropriate substitute. Spearman's correlation coefficient was used to determine if a relationship existed between the three attitudinal constructs: nutrition, physical fitness, and the school lunch program (40, p. 288). The Kruskal-Wallis test was used to determine if differences existed between the three subgroups of teachers in the treatment group. The subgroups of teachers were exposed to three different types of preparation (inservice) during the 1980-1981 field test of the Nutrition Super Stars curriculum.

One subject from the NSS group and one subject from the C/C group were not included in the data analysis due to uncompleted questionnaires. Additionally, one subject from the NSS group returned the optical scanner answer sheet, but not the data sheet.

## CHAPTER 4

### RESULTS AND DISCUSSION

This chapter presents and discusses the findings of this study. For clarity it is divided into four sections: a) reliability of the attitudinal scales, b) statistical data relating to the six null hypotheses stated in Chapter 1, c) descriptive data which includes biographic, demographic and educational information collected from the teachers, and d) subjective evaluation of the teachers' free responses about the importance of nutrition education.

#### Reliability

Cronbach's alpha coefficient was used to assess the internal consistency of the three scales measuring attitudes toward nutrition, physical fitness, and the school lunch program. Table 1 shows the coefficient values for the three attitudinal scales. The alpha coefficient for the nutrition, physical fitness, and school lunch program scales were .74, .71 and .33, respectively. The alpha value (.33) for the school lunch scale is extremely low.

Several reasons may account for the reliability scores. The standard deviations were near 1.0 on some of the items in each of the three scales. In the school lunch scale, for example, six of ten items had standard deviation values above .76. This represents a high variety of responses for certain scale items and high standard deviations tend to decrease reliability.

Another possibility is that the items on the scales, especially the school lunch scale, may not be parallel as the items could be measuring more than one concept. The items could also be measuring attitudes unequally. The school lunch scale has only ten items which may also reduce the reliability score. Internal consistency measures need to be considered when interpreting the significance of the results of this study.

#### Statistical Data

The statistical data will be dealt with as they pertain to each hypothesis.

Null Hypothesis 1: There will be no significant difference between the nutrition attitude test scores of teachers who used the Nutrition Super Stars curriculum, and those teachers who did not.

The Mann-Whitney test showed that those teachers who used the Nutrition Super Stars curriculum had significantly higher ( $z = 1.79$ ,  $p = .03$ ) nutrition attitude test scores than those teachers who did not use this curriculum. The scores of the thirty-one teachers in the NSS group had a mean rank of 27.77 as compared with 20.22 for the C/C group of eighteen teachers. Table 2 shows the results of the Mann-Whitney test. Teachers in the NSS group had significantly more positive attitudes toward nutrition than the teachers in the C/C group. The formation of bonds through practice (42) may likely be the mechanism which influenced teachers in the NSS group to respond favorably to the nutrition attitude statements. If teachers were

TABLE 1. Cronbach Alpha Coefficient Values for the Attitudinal Scales

Scale	No. of Cases	No. of Items	Alpha
Nutrition	49	20	.74
Physical Fitness	49	20	.71
School Lunch Program	49	10	.33

TABLE 2. Mann-Whitney Test Results for the Three Attitudinal Scales

Scale	Treatment (NSS) n = 31	Comparison/Control (C/C) n = 18	z Score
	<u>Mean Rank Score</u>	<u>Mean Rank Score</u>	
Nutrition	27.77	20.22	1.79 <sup>a</sup>
Physical Fitness	27.27	21.08	1.47 <sup>b</sup>
School Lunch Program	24.65	25.61	-0.118 <sup>c</sup>

<sup>a</sup> $\rho = .03$

<sup>b</sup> $\rho = .07$

<sup>c</sup> $\rho = .40$

thinking favorable thoughts about nutrition at the same time that they were behaving (teaching) favorably toward nutrition education, this bond may have strengthened the teachers' attitudes toward nutrition.

Null Hypothesis 1 is rejected.

Null Hypothesis 2: There will be no significant difference between the physical fitness attitude test scores of teachers who used the Nutrition Super Stars curriculum, and those teachers who did not.

The Mann-Whitney test showed no statistical difference ( $z = 1.47$ ,  $\rho = .07$ ) in physical fitness attitude test scores between the NSS and C/C groups. However, a trend ( $\rho < .1$ ) was apparent as the mean rank score for the NSS group 27.27 as compared with 21.08 for the C/C group as shown in Table 2.

Null Hypothesis 2 is retained.

Null Hypothesis 3: There will be no significant difference between the school lunch program attitude test scores of teachers who used the Nutrition Super Stars curriculum, and those teachers who did not.

The Mann-Whitney test showed no statistical difference ( $z = -0.118$ ,  $\rho = .40$ ) in school lunch attitude test scores between the NSS and C/C groups. The NSS group's mean rank was 24.65 as compared with the C/C group's mean rank score of 25.61 as shown in Table 2. The NSS group had a slightly more negative attitude toward school lunch than the C/C group, but statistically these scores were identical.

Null Hypothesis 3 must also be retained.

Null Hypothesis 4: There will be no significant correlation between teachers' nutrition attitude test scores and their physical fitness attitude test scores.

Spearman's correlation coefficient showed no statistical relationship ( $r_s = .31$ ,  $\rho = .08$ ) between the Nutrition Super Stars teachers' nutrition attitude test scores and their physical fitness attitude test scores, using a two-tailed test of significance. Table 3 shows the correlation coefficient for each of the three attitude constructs. A small positive correlation does exist, but this is only a trend. This group of teachers scored slightly higher on the nutrition attitude scale than on the physical fitness scale. The range of scores for the nutrition scale was 2.850 to 3.900, and the range for the physical fitness scale was 2.650 to 3.850. Table 4 shows the range of scores for the three attitudinal scales. Teachers in the NSS group implemented more nutritional lessons than physical fitness lessons as one of five lessons in the Nutrition Super Stars curriculum focused primarily on physical fitness. This may have influenced the attitudinal scores.

In the C/C group, however, Spearman's correlation coefficient showed a significant positive relationship ( $r_s = .52$ ,  $\rho = .03$ ) between the teachers' nutrition attitude test scores and their physical fitness attitude test scores, using a two-tailed test of significance, as shown in Table 3. These teachers had a wider range of scores on the nutrition attitude scale than on the physical fitness attitude scale as shown in Table 4. The range of scores for the nutrition scale was 2.20 to 3.70, and the range was 2.60 to 3.65 for the physical fitness

TABLE 3. Spearman Correlation Coefficient Values for the Three Attitudinal Scales

	Treatment (NSS) Group n = 31	
	Physical Fitness	School Lunch
Nutrition	.31	.62 <sup>a</sup>
Physical Fitness	-	.02
	Comparison/Control (C/C) Group n = 18	
	Physical Fitness	School Lunch
Nutrition	.52 <sup>b</sup>	.05
Physical Fitness	-	.45

<sup>a</sup> $\rho = .002$  (two-tailed test of significance)

<sup>b</sup> $\rho = .03$  (two-tailed test of significance)

TABLE 4. Range of Scores for the Three Attitudinal Scales

Scale	Treatment (NSS) Group (n = 31)	Comparison/Control (C/C) Group (n = 18)
	Scores <sup>a</sup>	Scores <sup>a</sup>
Nutrition	2.850 to 3.90	2.20 to 3.70
Physical Fitness	2.650 to 3.850	2.60 to 3.650
School Lunch Program	2.20 to 3.70	2.60 to 3.30

<sup>a</sup>Scale used: 4 = strongly agree; 3 = agree; 2 = disagree; 1 = strongly disagree

scale. The scores of the C/C group had a larger group variability, and were more consistent between subjects' responses on the attitudinal scales than the NSS group's scores. For example, teachers in the C/C group who scored low on the nutrition scale, also scored low on the physical fitness scale. Null Hypothesis 4 is retained when applied to the NSS group, but rejected when applied to the C/C group.

Null Hypothesis 5: There will be no significant correlation between teachers' nutrition attitude test scores and their school lunch attitude test scores.

Spearman's correlation coefficient revealed a significant positive relationship ( $r_s = .62$ ,  $\rho = .002$ ) between the Nutrition Super Stars teachers' nutrition attitude test scores and their school lunch attitude test scores, using a two-tailed test of significance, as shown in Table 3. The range of scores for the school lunch scale was lower than the range of scores for the nutrition scale as shown in Table 4. The range of scores for the school lunch scale was 2.20 to 3.70, and the range was 2.850 to 3.90 for the nutrition scale. Successful use of the Nutrition Super Stars curriculum involved a team-approach toward child nutrition. The unity between teachers, and school foodservice personnel may have influenced the relationships between teachers' attitudes in a positive manner.

No correlation ( $r_s = .05$ ,  $\rho = .84$ ) was found between the C/C group's nutrition attitude test scores and their school lunch attitude test scores, using a two-tailed test of significance, as shown in Table 3. The range of scores in the school lunch scale is narrower than the range of scores in the nutrition scale as shown in

Table 4. The range of scores for the school lunch scale was 2.60 to 3.30, and the range of scores for the nutrition scale was 2.20 to 3.70.

These teachers did not utilize a team-approach, which included school foodservice personnel, to disseminate nutritional education. A lack of unity between school foodservice personnel, and educators involved with child nutrition may have negatively influenced the relationships between teachers' attitudes. Null Hypothesis 5 is rejected when applied to the NSS group, but is retained when applied to the C/C group.

Null Hypothesis 6: There will be no significant correlation between the teachers' physical fitness attitude test scores and their school lunch attitude test scores.

Spearman's correlation coefficient revealed no relationship ( $r_s = .02$ ,  $\rho = .92$ ) between the Nutrition Super Stars teachers' physical fitness attitude test scores and their school lunch attitude test scores, using a two-tailed test of significance, as shown in Table 3. The range of scores for the school lunch scale (2.20 to 3.70) was wider and lower than the range of scores for the physical fitness scale (2.650 to 3.850), as shown in Table 4.

A positive, but nonsignificant, relationship ( $r_s = .45$ ,  $\rho = .06$ ) was found between the C/C group's physical fitness attitude scores and their school lunch attitude scores, using a two-tailed test of significance, as shown in Table 3. The range of scores for the physical fitness scale were wider (2.60 to 3.650) than the range of scores for the school lunch scale (2.60 to 3.30), as shown in Table 4. Null Hypothesis 6 is rejected when applied toward both the NSS group and the C/C group.

Although a portion of this data is statistically significant, these results may be suspect due to the low reliability (.33) of the school lunch scale.

A Kruskal-Wallis test was used to determine if there were differences in attitudes toward nutrition between the three subgroups of teachers who utilized the Nutrition Super Stars curriculum. During the 1980-81 field test, Group 1 received a four hour workshop and three hours of monthly nutrition consultant services. Group 2 received nutrition and fitness training from two eight hour workshops plus phone consultation. Group 3 received one hour Kit orientation and phone consultation (43). The Kruskal-Wallis test showed no significant ( $H = 0.552$ ,  $\rho > 1.0$ ) differences which suggests that the type of teacher preparation (inservice) did not influence teachers' attitudes toward nutrition.

Table 5 displays the mean scores and the results of the Mann-Whitney test for each item on the attitudinal scales. Four items in the physical fitness scale and two items in the nutrition scale were found to be significantly different, using the Mann-Whitney test, between the two groups of teachers. The only item in the school lunch scale which approached statistical significance ( $\rho = .052$ ) was item 44. Both groups of teachers had positive attitudes toward physical fitness. The statements in which teachers from both groups strongly responded to in a positive manner (a score of 3.5 or greater) included: 1) It is important for a person to develop a positive fitness self-concept; 2) Whenever I participate in a fitness program, I feel more confident about my fitness level; 3) My physical activity level is unrelated to

TABLE 5. Mean Scores and Mann-Whitney Test Results for the Three Attitudinal Scales

SECTION I - Physical Fitness Scale	NSS Mean Score	C/C Mean Score	NSS Mean Rank Score	C/C Mean Rank Score	z Score
1. It is important for a person to develop a positive fitness self-concept.	3.87	3.89	24.84	25.28	-0.1826
*2. When I have the time to exercise I find something else to do.	3.17	2.61	28.31	19.31	2.247 <sup>a</sup>
*3. I am unable to find the time to exercise.	3.10	3.11	24.74	25.44	-0.1837
4. Whenever I participate in a physical fitness program, I feel more confident about my fitness level.	3.50	3.67	24.13	26.50	-0.6583
*5. My physical activity level is unrelated to my health status.	3.57	3.50	26.39	22.61	1.081
6. Regular participation in a fitness program will help me feel better.	3.87	3.78	25.55	24.06	0.5256
7. Physical activity should be promoted within the family setting.	3.80	3.33	27.69	20.36	2.11 <sup>a</sup>
*8. I lack the motivation to exercise on a regular basis.	2.97	2.50	27.63	20.47	1.778 <sup>a</sup>
*9. Exercise does not increase my overall energy level.	3.72	3.39	26.68	22.11	1.295
*10. Health professionals place too much emphasis on the importance of physical fitness.	3.33	3.50	24.37	26.08	-0.456

<sup>a</sup> $p < .05$

Scale: 4=strongly agree; 3=agree; 2=disagree;  
1=strongly disagree  
\*Reversed scoring: 1=strongly agree; 2=agree;  
3=disagree; 4=strongly disagree

TABLE 5. Mean Scores and Mann-Whitney Test Results for the Three Attitudinal Scales (continued)

	NSS Mean Score	C/C Mean Score	NSS Mean Rank Score	C/C Mean Rank Score	z Score
<u>SECTION I - Physical Fitness Scale</u>					
*11. Physical activity does not help to develop healthy minds.	3.77	3.55	26.26	22.83	1.079
*12. I believe that my career matters have more priority than my physical fitness activities.	2.97	2.89	25.81	23.61	0.5509
13. To be physically active is important to me.	3.47	3.55	24.81	25.33	-0.143
14. I have a lot of motivation to be physically active.	2.97	2.44	28.03	19.78	2.043 <sup>a</sup>
*15. I do not desire to improve my fitness level.	3.53	3.44	25.74	23.72	0.556
16. Regular exercise helps people to relax.	3.67	3.39	26.98	21.58	1.477
*17. The amount of time I spend on physical activity interferes with other things I should be doing.	3.00	3.00	24.92	25.14	-0.055
18. A personal fitness program should have spiritual value.	2.39	2.35	25.10	24.83	0.065
19. Exercise decreases my appetite.	2.33	2.33	24.94	25.11	-0.044
*20. I spend more time than I need to on being physically active.	3.53	3.50	24.89	25.19	-0.083
<u>SECTION II - Nutrition Scale</u>					
21. I like trying new foods	3.37	3.22	25.55	24.06	0.385

<sup>a</sup>p < .05

Scale: 4=strongly agree; 3=agree; 2=disagree; 1=strongly disagree  
 \*Reversed scoring: 1=strongly agree; 2=agree; 3=disagree; 4=strongly disagree

TABLE 5. Mean Scores and Mann-Whitney Test Results for the Three Attitudinal Scales (continued)

SECTION II - Nutrition Scale		NSS Mean Score	C/C Mean Score	NSS Mean Rank Score	C/C Mean Rank Score	z Score
22.	I like some foods now that I did not like when I first tried them.	3.33	3.33	24.50	25.86	-0.363
*23.	If I do not like a food when I first taste it, I will never like it.	3.20	3.05	25.21	24.64	0.1608
24.	What I eat affects how healthy I am.	3.77	3.55	26.68	22.11	1.327
25.	Everyone is able to improve his diet.	3.57	3.05	28.40	19.14	2.433 <sup>b</sup>
26.	I try to choose foods that will help keep my body healthy.	3.20	2.94	25.69	23.81	0.5084
27.	Improving my diet will improve my health.	3.63	3.72	24.52	25.83	-0.388
*28.	Taking a lot of vitamins will compensate for eating low nutrient-dense foods. (Nutrient density is a ratio of the amount of nutrients per the amount of calories in a food. Example: low nutrient-dense foods have few nutrients per many Kcalories.)	3.33	3.23	25.77	23.67	0.554
*29.	I do not enjoy eating.	3.63	3.44	26.65	22.17	1.283
30.	Families should always eat together when they can.	3.53	3.28	25.77	23.67	0.5625
*31.	Children do not like to eat nutritious foods.	3.33	3.11	26.68	22.11	1.213

<sup>b</sup> $p < .01$

Scale: 4=strongly agree; 3=agree; 2=disagree; 1=strongly disagree  
 \*Reversed scoring: 1=strongly agree; 2=agree; 3=disagree; 4=strongly disagree

TABLE 5. Mean Scores and Mann-Whitney Test Results for the Three Attitudinal Scales (continued)

	<u>NSS</u> <u>Mean</u> <u>Score</u>	<u>C/C</u> <u>Mean</u> <u>Score</u>	<u>NSS</u> <u>Mean</u> <u>Rank</u> <u>Score</u>	<u>C/C</u> <u>Mean</u> <u>Rank</u> <u>Score</u>	<u>z</u> <u>Score</u>
<u>SECTION II - Nutrition Scale</u>					
32. I should always eat a nutritious breakfast	3.50	3.00	27.37	20.92	1.712 <sup>a</sup>
*33. I am too busy to eat high nutrient-dense foods.	3.30	3.22	25.02	24.97	0.0116
*34. What I eat does not effect my health.	3.67	3.50	26.37	22.64	1.115
35. High nutrient-dense foods are more appealing to me than low nutrient-dense foods.	2.63	2.28	27.26	21.11	1.572
*36. People with large appetites will eventually become overweight.	2.80	2.94	24.13	26.50	-0.619
*37. Health professionals place too much importance on nutrition	3.37	3.33	25.13	24.78	0.092
38. Vegetarians are as healthy as people who eat animal protein.	2.93	2.94	24.53	25.81	-0.332
*39. Foods bought at health food stores are more nutritious than comparable foods purchased in supermarkets.	3.30	3.00	26.58	22.28	1.095
*40. Fast food restaurants have meals as nutrient-dense as the meals I am able to prepare at home.	3.07	3.12	24.50	25.86	-0.343
<u>SECTION III - School Lunch Program Scale</u>					
<sup>c</sup> 41. Teachers should eat with their students.	2.13	1.77	27.10	21.39	1.423

<sup>a</sup>  $p < .05$

<sup>c</sup> opinion question-not included in scoring the attitudinal scale.

Scale: 4=strongly agree; 3=agree; 2=disagree; 1=strongly disagree  
 \*Reversed scoring: 1=strongly agree; 2=agree; 3=disagree; 4=strongly disagree

TABLE 5. Mean Scores and Mann-Whitney Test Results for the Three Attitudinal Scales (continued)

SECTION III - School Lunch Program Scale	NSS Mean Score	C/C Mean Score	NSS Mean Rank Score	C/C Mean Rank Score	z Score
*42. I do not enjoy eating the school lunch	2.48	2.11	26.66	22.14	1.131
43. The caloric content of the school lunch meal is the correct amount for the students.	2.40	2.20	26.65	22.17	1.131
*44. One of the main reasons I do not buy school lunch is because I feel the teacher's price is too expensive.	2.62	3.11	22.63	29.08	-1.628
*45. The school lunch meal is too high in protein for the students' needs.	3.40	3.29	25.87	23.50	0.644
<sup>c</sup> 46. When I eat the school lunch, I feel I have eaten a nutritionally balanced meal.	2.45	2.22	26.16	23.00	0.796
<sup>c</sup> 47. Children want something else to eat at school, no matter how good the food is.	2.76	2.83	24.32	26.17	-0.458
<sup>c</sup> 48. The students are too rushed to enjoy school lunch.	2.60	2.27	26.52	22.39	1.012
49. The school lunch program includes foods that will help keep my body healthy.	3.03	2.94	25.34	24.42	0.268
50. I consider myself to be a good role model about proper nutrition for my students.	2.93	2.59	26.60	22.25	1.123

<sup>c</sup>Opinion question-not included in scoring the attitudinal scale.

Scale: 4=strongly agree; 3=agree; 2=disagree; 1=strongly disagree  
 \*Reversed scoring: 1=strongly agree; 2=agree; 3=disagree; 4=strongly disagree

TABLE 5. Mean Scores and Mann-Whitney Test Results for the Three Attitudinal Scales (continued)

SECTION III - School Lunch Program Scale	NSS Mean Score	C/C Mean Score	NSS Mean Rank Score	C/C Mean Rank Score	z Score
*51. The school lunch meal is more nutrient-dense than one I could bring to school to eat.	3.23	3.44	23.68	27.38	-0.9426
52. The school lunch program is an excellent source of nutrients for the students.	2.60	2.76	24.42	26.00	-0.423
*53. Sodas and candy should be available in the schools for students to buy at any time.	3.73	3.89	23.61	27.39	-1.272
<sup>c</sup> 54. The lunches students bring from home are as nutrient-dense as the food served at school.	2.27	1.94	26.69	22.08	1.172
55. Students who do not eat any lunch are less alert in the classroom.	3.36	3.35	25.26	24.56	0.183

<sup>c</sup> Opinion question-not included in scoring the attitudinal scale.

Scale: 4=strongly agree; 3=agree; 2=disagree; 1=strongly disagree  
 \*Reversed scoring: 1=strongly agree; 2=agree; 3=disagree; 4=strongly disagree

my health status (negative response); 4) Regular participation in a fitness program will help me feel better; 5) Physical activity does not help to develop healthy minds (negative response); and, 6) I spend more time than I need to on being physically active (negative response). These six statements portray the attitudes teachers had toward physical fitness as it relates to both their cognitive knowledge about fitness, and their emotional responses (affective) when participating in a fitness program.

The NSS group scored significantly higher than the C/C group on items which reflected a strong conative (action tendency) component of the attitude toward physical fitness. As determined by the Mann-Whitney test, the NSS group had more positive attitudes toward exercise ( $z = 2.24$ ,  $\rho = .012$ ), toward promoting physical activity within the family setting ( $z = 2.11$ ,  $\rho = .017$ ), and toward motivation to exercise on a regular basis ( $z = 1.77$ ,  $\rho = .037$ ). These findings suggest that the NSS group had positive attitudes in all three of the attitudinal components (cognitive, affective, and conative). The Nutrition Super Stars curriculum emphasizes the interrelationships between regular physical activity and proper nutrition to achieve optimal health. This may have influenced their responses.

As found in the study by Reid (38), active teachers had more positive attitudes toward the Health/Fitness benefits of physical activity than inactive teachers. Possibly teachers in the NSS group were more actively involved with teaching physical fitness concepts and were participating in physical activities more frequently than teachers in the C/C group. The conative (action tendency) component of

the teachers' attitude toward physical fitness may have been strengthened by active participation. The physical fitness attitudinal scale may not have been refined enough to obtain an overall significant difference between teachers' attitudes. If a greater number of conative (action tendency) components were included in the scale, a significant difference between the two groups may have been obtained.

Both groups of teachers had positive attitudes toward nutrition. The statements in which teachers from both groups strongly responded to in a positive manner (a score of 3.5 or greater) included: 1) What I eat affects how healthy I am; 2) Improving my diet will improve my health; and, 3) What I eat does not affect my health (negative response). These three statements reflect the cognizance teachers had about the interrelationships between diet and overall health.

A significant difference was found between the two groups on a few items in the nutrition attitude scale. The NSS group scored significantly higher ( $z = 2.43$ ,  $p = .007$ ) in response to the statement, "Everyone is able to improve his diet". Since both groups of teachers instructed students from varied backgrounds, including students from low-income families, the difference between the two groups is likely to be related to the curricula teachers used, and students' responses. The learning activities and lessons about practical methods to improve nutrition and physical fitness which the teachers used, may have prompted them to choose a positive response to this item.

In the Nutrition Super Stars curriculum, breakfast is stressed as the most important meal of the day. Therefore, it is not surprising that the NSS teachers had a more positive attitude toward always eating

a nutritious breakfast than the C/C group. This is another example of the positive responses teachers in the NSS group had toward attitude statements which emphasized the conative (action tendency) component of the attitude.

Although not significant, teachers in the NSS group tended to agree that high nutrient-dense foods were more appealing than low nutrient-dense foods. Teachers in the C/C group tended to disagree with this statement. This difference may be related to individual and group variations in food acceptance.

Overall, the teachers in both groups had positive attitudes toward the school lunch program, but had negative opinions about specific facets of the lunch program. Opinion questions which are not included in the scoring of the school lunch program attitudinal scale included: 1) Teachers should eat with their students; 2) When I eat the school lunch, I feel I have eaten a nutritionally balanced meal; 3) Children want something else to eat at school, no matter how good the food is; 4) The students are too rushed to enjoy school lunch; and, 5) The lunches students bring from home are as nutrient-dense as the food served at school.

Teachers disagreed with the statement that it was enjoyable to eat school lunch, and they were also resistant to eating with their students. Teachers did agree that school lunch provided an excellent source of nutrients for the students. However, educators disagreed with the statement, "When I eat the school lunch, I feel I have eaten a nutritionally balanced meal". They also disagreed with the statement that the caloric content of the school lunch meal is the correct amount

for the students. The researcher is unclear if the teachers considered the caloric value to be too high or too low. Teachers did agree that the school lunch program included foods that would help keep their bodies healthy.

Although teachers considered school lunch to be an excellent source of nutrients for students, teachers believed that they could bring a lunch from home which was more nutrient-dense than the food served at school. Teachers thought that the lunches students brought to school were not as nutrient-dense as the food served at school. This finding reflects the teachers' attitude about the inadequate nutritional situation in the students' homes. Teachers considered the school lunch meal to be a good alternative for the lunches students brought from home.

Although not statistically significant, more teachers from the C/C group agreed that one of the reasons why they do not buy school lunch meals is because the teachers' price is too expensive. Other factors such as food quality, and caloric value may be affecting teachers' participation in the school lunch program. The teachers in the C/C group considered the cost of the lunch to be more of a limiting factor in participation than did teachers in the NSS group.

Regarding the lunch meal, teachers agreed that children want something else to eat at school no matter how good the food is. This revealed that teachers believed children have negative attitudes toward the school lunch program. The general opinion of the teachers was that students are not too rushed to enjoy school lunch.

In both groups, teachers agreed that sodas and candy should not be available in the schools for children to buy. Teachers in both groups also agreed that students who do not eat any lunch are less alert in the classroom.

In summary, although teachers felt that school lunch was nutritionally inappropriate for themselves, (too high in starch/calories), they agreed that the school lunch meal was an excellent source of nutrients for the students, and that it was more nutrient-dense than the lunches students brought from home.

#### Descriptive Data

Descriptive data were collected by a data sheet which included biographic, demographic and educational information about the teachers involved in this study. One teacher in the NSS group did not return the data sheet.

The sample of teachers in this study had a broad representation of age, socioeconomic, racial and ethnic groups. Table 6, 7 and 8 report demographic information on sex, age and ethnic distribution for both groups of teachers. In the NSS and the C/C group, the majority of the teachers were between the ages of 30 to 39 (47.9%), were female (70.8%), and were White (80.4%). Approximately 13% of the teachers were Mexican-American. The remaining teachers reported their ethnic group as Black (2.2%), Oriental (2.2%), and other (2.2%).

Table 9 shows the classifications of the schools included in this study. In both groups, 16.7% of the teachers reported their school as rural, and approximately 6.5% reported their school as

TABLE 6. Percent of Male and Female Subjects

	Total n=48	Treatment (NSS) Group n=30	Comparison/Control (C/C) Group n=18
Male	29.2%	33.3%	22.2%
Female	70.8%	66.7%	77.8%

TABLE 7. Age of Subjects

Age in Years	Total n=48	Treatment (NSS) Group n=30	Comparison/Control (C/C) Group n=18
22-29	22.9%	23.3%	22.2%
30-39	47.9%	46.7%	50.0%
40-49	10.4%	10.0%	11.1%
50-59	14.6%	16.7%	11.1%
60 and over	4.2%	3.3%	5.6%

TABLE 8. Ethnic Distribution of Subjects

	Total n=46	NSS <sup>a</sup> n=28	C/C <sup>b</sup> n=18
Black	2.2%	-	5.6%
Oriental	2.2%	3.6%	-
American Indian	-	-	-
Mexican- American	13.0%	17.9%	5.6%
White	80.4%	75.0%	88.9%
Other	2.2%	3.6%	-

<sup>a</sup>Treatment (NSS) Group

<sup>b</sup>Comparison/Control (C/C) Group

TABLE 9. School Zone - Geographic Distribution of Teachers in Arizona

Geographic Area	Total n=48	NSS <sup>a</sup> n=30 <sup>c</sup>	C/C <sup>b</sup> n=18
Urban	45.8%	26.7%	77.8%
Border	12.5%	20.0%	-
Suburban	18.8%	30.0%	-
Rural	16.7%	16.7%	16.7%
Transient	6.3%	6.7%	5.0%

Urban = Phoenix, Tucson

Border = Nogales

Suburban = Tucson-outlying schools

Rural = Marana, Sierra Vista, Huachuca City, Santa Cruz

Transient = Tucson, Nogales (schools which are near mines or  
Indian Reservations)

<sup>a</sup>Treatment Group (NSS)

<sup>b</sup>Comparison/Control Group (C/C)

<sup>c</sup>In the NSS group: 3 teachers classified their school as suburban and  
and transient  
1 teacher classified his school as urban and  
transient  
1 teacher classified his school as border and rural

transient. The majority (77.8%) of the teachers in the C/C group reported their school as urban as compared with 26.7% of the teachers in the NSS group. The remaining teachers in the NSS group reported their school as border (20%) and suburban (30%). Overall, the majority of the teachers in the NSS group were from a combination of urban and suburban schools in Tucson, Arizona and outlying districts. The majority of teachers in the C/C group were from urban schools in the Phoenix #1 school district, and the remaining teachers were from rural schools in Marana, Arizona. The rural schools in the NSS group were located in Calabasas, Sierra Vista, and Huachuca City, Arizona. Nogales, Arizona was classified as a border town.

Table 10 displays the highest educational degrees the teachers have obtained. In the NSS group, approximately 53% of the teachers earned a B.A. or a B.S. degree. A greater percentage (67%) of the teachers in the C/C group earned a M.A. degree or equivalent as compared with 37% of the teachers in the NSS group.

Approximately 33% of the teachers in the NSS group taught fifth grade, 46.7% taught sixth grade, 10% taught both fifth and sixth grades and 10% were currently teaching other grade levels, although they had taught fifth or sixth grade during the NSS field test(s) (1979-1981). In the C/C group, 55.6% of the teachers taught fifth grade, 38.9% taught sixth grade and 5.6% taught both fifth and sixth grades. This information is shown on Table 11. In summary, a greater percentage of the teachers in the C/C group taught fifth grade while a greater percentage of the teachers in the NSS group taught sixth grade or a combination of fifth and sixth grades.

TABLE 10. Teachers' Educational Degrees

Degree	Total n=48	NSS <sup>a</sup> n=30	C/C <sup>b</sup> n=18
B.A. or B.S.	45.8%	53.3%	33.3%
M.A. or M.S.	47.9%	36.7%	66.7%
PhD	-	-	-
Other	6.3%	10.0%	-

<sup>a</sup>Treatment (NSS) Group

<sup>b</sup>Comparison/Control (C/C) Group

TABLE 11. Grade Level the Subjects were Currently Teaching

Grade	Total n=48	NSS <sup>a</sup> N=30	C/C <sup>b</sup> n=18
Fifth	41.7%	33.3%	55.6%
Sixth	43.8%	46.7%	38.9%
Fifth and Sixth	8.3%	10.0%	5.6%
Other	6.3%	10.0%	-

<sup>a</sup>Treatment (NSS) Group

<sup>b</sup>Comparison/Control (C/C) Group

Both groups had a similar percentage (30-40%) of teachers who had been teaching school for one to five years. Approximately 30% of the teachers in the NSS group had been teaching for six to ten years as compared with 16.7% of the teachers in the C/C group. In both groups, 13-17% of the teachers had been teaching for eleven to fifteen years, while 10-11% of the teachers had been teaching for sixteen to twenty years. Only 6.7% of the teachers in the NSS group has been instructing for twenty or more years as compared with 22.2% of the teachers from the C/C group. This information is shown on Table 12.

Overall, the majority (70%) of the teachers in the NSS group had been teaching between one to ten years. The C/C group is distributed differently with 33.3% of the teachers in the one to five year category, 22.2% in the twenty or more year category and the remaining teachers evenly distributed in the other three categories. A greater percentage of the teachers in the C/C group had more experience than the NSS group in teaching upper elementary, middle school, or junior high classes.

During 1980-1981, 100% of the NSS group taught a nutrition unit and 82.8% of the NSS group also included a fitness unit in their lessons. Approximately 73% of the teachers in the NSS group claimed that they used a structured curriculum to teach nutrition and/or fitness concepts. Since the Nutrition Super Stars curriculum is structured, according to the researcher, and all of the NSS group used this curriculum, the teachers may have been confused over the definition of "structured". Some teachers (27%) considered the Nutrition Super Stars curriculum to be unstructured.

TABLE 12. Number of Years the Subjects Had Been Teaching Elementary, Middle School, or Junior High Classes

Years			
1-5	37.5%	40.0%	33.3%
6-10	25.0%	30.0%	16.7%
11-15	14.6%	13.3%	16.7%
16-20	10.4%	10.0%	11.1%
20 or more	12.5%	6.7%	22.2%

<sup>a</sup>Treatment (NSS) Group

<sup>b</sup>Comparison/Control (C/C) Group

During 1981-1982, only 53.3% of the teachers in the NSS group taught nutrition and/or fitness. A lack of time, motivation, teacher or student interest may be some of the factors which influenced the teachers not to include nutrition and/or fitness during the 1981-1982 school year.

In the C/C group, there was a relative rise from 61.1% to 70.6% of the teachers who implemented nutrition and/or fitness education during 1980-1982. Also, approximately 71% of the teachers included a fitness unit in the curricula. Therefore, the teachers who taught nutrition concepts concurrently taught fitness concepts. Only 29.4% of the teachers claimed to have used a structured curriculum. Table 13 displays this information. The Healthy Heart program (Save a Heart) is the program which approximately 44% of the teachers in the C/C group used to teach both nutrition and fitness. Approximately 28% of the teachers in the C/C group used the Dairy Council program to teach nutrition and fitness. During 1980-1981, a greater percentage of the teachers in the NSS group taught nutrition and fitness, but in 1981-1982, a greater percentage of the teachers in the C/C group taught nutrition and fitness.

In 1980-1981, as shown in Table 14, 100% of the NSS group used the Nutrition Super Stars curriculum. During the 1980-1981 field test, the teachers were requested to use only the materials provided in the Nutrition Super Stars Kit. Since Table 14 shows that 73.3% of the teachers in the NSS group implemented combinations of resources, this data reflects the time period before and after the 1979-1980 and 1980-1981 field tests.

TABLE 13. Percent of Subjects who Taught Nutrition and/or Fitness During 1980-81 and 1981-82

	<u>Treatment (NSS) Group n=30</u>	
	<u>Yes</u>	<u>No</u>
Nutrition - 1980-81	100.0%	-
Nutrition - 1981-82	53.3%	46.7%
Fitness Unit <sup>a</sup>	82.8%	17.2%
Used a structured curriculum <sup>b</sup>	73.3%	23.3%
	<u>Comparison/Control (C/C Group n=18)</u>	
	<u>Yes</u>	<u>No</u>
Nutrition - 1980-81	61.1%	38.9%
Nutrition - 1981-82 <sup>c</sup>	70.6%	29.4%
Fitness Unit <sup>a</sup>	71.4%	28.6%
Used a structured curriculum	29.4%	70.6%

<sup>a</sup>Number of responses from: NSS Group = 29, C/C Group = 14

<sup>b</sup>Number of responses from: NSS Group = 29

<sup>c</sup>Number of responses from: C/C Group = 17

TABLE 14. Types of Resources Used to Teach Nutrition and Fitness

<u>Resource</u>	<u>NSS<sup>a</sup> n=30</u>	<u>C/C<sup>b</sup> n=18</u>
Nutrition Super Stars <u>Only</u>	26.6%	-
Dairy Council <u>Only</u>	-	27.7%
Save a Heart <u>Only</u>	-	11.1%
Health/Biology Text <u>Only</u>	-	11.1%
Other Resources <u>Only</u>	-	16.8%
Combinations of the Above	73.4%	33.3%

Other resources teachers used along or in combinations with those listed above.

4-H Mulligan Stew Series

Healthy Heart Program

Dental Programs

American Heart Association and Lung Association  
Materials and Films

<sup>a</sup>Treatment (NSS) Group

<sup>b</sup>Comparison/Control (C/C) Group

Approximately 28% of the teachers in the C/C group used the Dairy Council program as their sole resource, 11% used Save a Heart only, and 11% utilized a basic health or biology curriculum as their sole resource to teach nutrition and/or fitness. About 33% of the C/C group used combinations of resources to teach nutrition and fitness concepts. A few teachers in the C/C group used the title "Healthy Heart program" instead of "Save a Heart". The two titles are synonymous. These are shown separately on Table 14 since the original data sheet listed the program as "Save a Heart".

Other resources which both groups of teachers utilized were 4-H Mulligan Stew Series, dental programs, and the American Heart Association and Lung Association materials and films. Overall, a greater percentage (73.4%) of teachers in the NSS group used combinations of resources as compared with teachers in the C/C group (33.3%). The majority of the NSS group used two or more references. The majority of the C/C group used only one reference.

Table 15 shows the percentage of teachers who participated in nutrition and/or fitness workshops, and the percentage of teachers who completed a college-level nutrition course. Approximately 55% of the teachers in each group did not participate in a workshop. Approximately 76% of the teachers in the NSS group did not complete a nutrition course during college as compared with approximately 69% of the teachers in the C/C group.

In the NSS group, 14.3% of the teachers participated in one workshop, 25% participated in two workshops and 3.6% of the teachers participated in three or more workshops. In the C/C group, 38.5% of

TABLE 15. Number of Nutrition and/or Fitness Workshops and College-Level Nutrition Courses Teachers Completed

<u>Treatment (NSS) Group</u>		
<u>Number Completed</u>	<u>Workshops n=13</u>	<u>Courses n=13</u>
0	57.1%	75.9%
1	14.3%	24.1%
2	25.0%	-
3 or more	3.6%	-
<u>Comparison/Control (C/C) Group</u>		
<u>Number Completed</u>	<u>Workshops n=13</u>	<u>Courses n=13</u>
0	53.8%	69.2%
1	38.5%	30.8%
2	7.7%	-
3 or more	-	-

the teachers participated in one workshop and 7.7% participated in two workshops. Approximately 31% of the instructors in the C/C group completed one college-level nutrition course as compared with 24% of the instructors in the NSS group. Overall, a greater percentage of teachers in the NSS group participated in nutrition and/or fitness workshops, but a greater percentage of teachers in the C/C group completed a college-level nutrition course.

The results from the biographic, demographic and educational data collection can be summarized into eight general statements.

1. In both groups, the majority of the teachers were between the ages of 30-39, were White and were female.
2. The majority of the teachers in the NSS group were from a combination of urban and suburban schools. The majority of the teachers in the C/C group were from urban schools.
3. A greater percentage of teachers in the C/C group taught fifth grade while a greater percentage of teachers in the NSS group taught sixth grade or a combination of fifth and sixth grades.
4. A greater percentage of teachers in the C/C group earned a M.A. degree or equivalent, as compared with the teachers from the NSS group.
5. A greater percentage of teachers in the C/C group had more experience than teachers in the NSS group in teaching upper elementary, middle school, or junior high classes.
6. During 1980-1981, a greater percentage of respondents from the NSS group taught nutrition and fitness, but during

1981-1982, a greater percentage of the respondents from the C/C group taught nutrition and fitness. These results may have been biased as only those teachers (C/C) with interest may have returned completed questionnaires.

7. A greater percentage of teachers in the NSS group used combinations of resources as compared with teachers in the C/C group.
8. Overall, a greater percentage of teachers in the NSS group participated in nutrition/fitness workshops, but a slightly greater percentage of teachers in the C/C group completed a nutrition course during college.

#### Subjective Evaluation

Teachers' free responses were subjectively evaluated and summarized in this section.

The prevailing and common theme, that nutrition education is very important, was evident throughout the twenty-six responses from the NSS group, and the twelve responses from the C/C group. The responses to the question, for whom is nutrition education most important, included: 1) all ages, 2) young children, 3) students, especially those from low-income families, 4) students to teach parents, 5) parents, and 6) educators. Teachers in the NSS group strongly expressed the necessity of teaching students and parents about proper nutritional habits, but the teachers also stated that they had little or no time to implement nutrition education because of the high demand placed on math and reading skills. The intermediate grades were

also burdened with band, orchestra, and other extra-curricular subjects during class time which decreased the time allotted for basic skills.

Five teachers in the NSS group specified the amount of time they were willing to spend to implement nutrition education. Two teachers would spend one-half hour per day, one would spend two hours per week, one would spend one-half hour per week for one semester, and one would spend forty-five minutes per day. During the 1980-81 field test, the NSS teachers were required to spend a minimum of twenty hours from January to May to implement the Nutrition Super Stars curriculum.

Teachers in the C/C group did not specify how much time they would be willing to spend to implement the necessary curricula. They thought these subjects should be incorporated with the health curricula. The only teacher in this group who specified the amount of time (10-20 hours) she was willing to teach nutrition, was also the only instructor who had completed two college-level nutrition courses as well as one workshop. One teacher in the C/C group was concerned about the high prevalence of bulimia and anorexia nervosa among teenagers and young adults. This concern prompted her to spend additional time on nutrition in the classroom.

Teachers in both groups commented that nutrition education should be initiated early in the school program and should be taught all year. One instructor in the NSS group felt there was a need for a nutrition specialist that the students would see on a regular basis because the teachers either do not have the interest, or the background to put priority into nutrition education. Generally, both groups of

teachers believed there is a need for reputable nutrition education programs throughout the entire community. Parents and children would be influenced by the programs to incorporate proper nutritional standards in the home.

Both groups of teachers strongly believed that nutritional knowledge, and suitable dietary practices in the home are lacking. One teacher commented, "Nutrition education is important, but we can only teach, parents must implement. Often kids will tell parents about good nutrition, but if parents don't listen, don't care or cannot afford to buy and prepare good foods...then what?" Another educator suggested that teaching children about nutrition is worthwhile, but teaching parents how to prepare inexpensive, quick meals would be a lot more effective for changing their children's diets. Educators hope that parents will learn appropriate nutritional education from their children, and that families will retain healthful habits throughout their adult lives. One teacher in the NSS group commented that her students were educating their parents, which she found to be extremely rewarding.

Exercise is another health area which is being neglected by children. Teachers in both groups felt that students are too sedentary. Although the students have increased knowledge about physical fitness, teachers did not see a change in activity patterns. According to the respondents, thirty minutes of physical education per week is inadequate. The time allotted for physical education has decreased over the last two years, and teachers are dissatisfied with the situation.

A few educators in the NSS group observed that nutrition education made students more aware of food choices. When the children planned a party at school, they chose to serve nutrient-dense foods. Also, one teacher claimed that her students became experts in judging the school lunch program.

Teachers from both groups had negative comments about the school lunch program. Comments were that the school lunch meal is nutritionally inadequate, and too high in carbohydrates. An educator in the C/C group commented that the school lunch program's emphasis should be on nutrition rather than on money. She also stated, "Extras like cookies, doughnuts, and cake should not be available at school..."

The school lunch meal may be inappropriate for an adult female as the lunch meal is specified for the needs of growing children, and supplies approximately 900 kcalories of energy. This amount of energy is about one-half of the daily caloric requirements for an adult female. As long as children's nutritional needs are satisfied, extra foods, such as cookies, serve to provide additional calories. Problems arise when "extra", or low nutrient-dense foods are abused. The primary goal of nutrition education programs, such as the Nutrition Super Stars curriculum, is to prepare children to make wise food and activity choices in accordance with their nutritional requirements and lifestyles. Public Law 95-166 (34) mandated school foodservice systems to be a (non-profit) learning laboratory for child nutrition programs.

Building enthusiasm in teachers and administrators may be a key to successful implementation of nutrition-fitness curricula in the school system. One teacher stated, "Teaching nutrition was an important

and interesting learning process for me". Another educator commented that teaching nutrition reinforced her own opinion about nutrition. The teacher who scored the highest (3.90) of both groups on the nutrition attitude scale revealed that since she became interested in teaching nutrition, she has changed her eating patterns, and has slowly lost forty pounds.

A very interesting finding was that the teachers in the NSS group who chose not to answer the free response section, did not complete a college-level nutrition course, and did not participate in a nutrition and/or fitness workshop. This finding may show a lack of interest on the part of the teacher. In the C/C group, however, teachers who had no experience with preservice or inservice education still responded to the free response section, and commented on the importance of nutrition education. This finding also demonstrated that the responses from the C/C group may have been biased as only those teachers with interest in nutrition and/or fitness may have completed the questionnaires.

## CHAPTER 5

### SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

#### Summary

This study attempted to determine if teachers who had taught a combined nutrition-physical fitness curriculum, Nutrition Super Stars, had different attitudes toward nutrition, physical fitness, and the school lunch program than teachers who did not use this curriculum. Other objectives were to ascertain if relationships existed between the attitudinal constructs, and to determine if teachers believed that nutrition education is important.

A data sheet with a free response section, and a 55 item, forced choice, four point Likert attitudinal scale were developed for data collection purposes. Questionnaire packets were mailed to 41 C/C teachers from Marana, and Phoenix, Arizona, and to 49 teachers who participated in the Nutrition Super Stars program. The teachers in the NSS group were from rural, border, and urban sections of Arizona. A total of eighteen teachers from the C/C group, and thirty-one teachers from the NSS group returned completed questionnaires.

The nutrition and physical fitness attitudinal scales had an acceptable reliability ( $\alpha = .74$  and  $.71$ , respectively)(44,45). The school lunch scale had a low and unacceptable reliability ( $\alpha = .33$ ). Statistical analyses showed no difference between either the physical

fitness or the school lunch attitude test scores of the teachers who had used the Nutrition Super Stars curriculum, and those teachers who had not. However, the teachers who used the Nutrition Super Stars curriculum had a significantly ( $p = .03$ ) more positive attitude toward nutrition than those teachers who had not. The NSS group was also found to have a more positive attitude toward physical fitness than the C/C group, but this was only a trend ( $p = .07$ ).

A significant positive relationship was found between the C/C group's attitude toward nutrition and their attitude toward physical fitness ( $r_s = .52$ ). Also, significant positive relationship was found between the NSS group's attitude toward nutrition and their attitude toward the school lunch program ( $r_s = .62$ ). No statistical relationship was found in either group between the teachers' attitude toward physical fitness and their attitude toward the school lunch program. Positive relationships or trends were found between the NSS group's attitude toward physical fitness and nutrition, and between the C/C group's attitude toward physical fitness and the school lunch program.

Significant differences between the two groups were also found with isolated items on the attitudinal scales. Generally, the NSS group had more positive responses to all three components of attitudes i.e., cognitive, affective, conative (action tendency). The C/C group did not have positive responses to items involving the conative component.

Both groups of teachers thought that nutrition education was very important for all sectors of the population, and that nutrition education should be included in the overall school curriculum. Free

responses portrayed teachers realization of the need to educate parents about nutrition, and to encourage families to practice healthful dietary habits.

### Conclusions

The conclusions drawn from this study are stated in terms of the following: a) teachers' attitudes toward nutrition, physical fitness, and the school lunch program, b) relationships between the three attitudinal constructs, and c) teachers' opinions about nutrition education.

Teachers in the NSS group, and the C/C group had positive attitudes about nutrition, but the NSS group had significantly more positive attitudes than the C/C group. The Kruskal-Wallis test showed no significant differences between the three subgroups of teachers in the NSS group suggesting that the type of preparation did not influence teachers' attitudes toward nutrition.

O'Connell (17) concluded that inservice training, used as a treatment in a research design, did not influence teachers' attitude scores toward nutrition education. However, the actual teaching of nutrition while using a team-approach model, the Nutrition Super Stars Kit, may have influenced the teachers' in the NSS group in this study to respond more favorably than the C/C group to the nutrition attitude statements. Shannon et al. (18), found that the actual use of curriculum materials in classroom instruction did favorably (and significantly) affect teachers' nutrition knowledge scores, their scores on the attitude scale "Favors Nutrition Education in Schools"

and on the "Commitment" scale. This present study seems to support Shannon's findings.

Since the majority of teachers in both groups had no preservice nutrition education experience, these findings support the findings of Lai and Shimabukuro (31) who concluded in their survey that highly involved teachers did not take nutrition related courses as part of their educational program.

Both groups of teachers had positive attitudes toward physical fitness, but the NSS group had more positive attitudes, although not statistically significant, than the C/C group. Significant differences were found between the two groups on individual attitudinal items, especially on the items which reflected an action tendency (conative) component. The NSS group had significantly more positive attitudes toward exercise (conative), toward promoting physical activity within the family setting (conative), and toward motivation to exercise regularly (conative). In addition, the NSS group had significantly more positive attitudes to conative statements in the nutrition attitude scale. Teachers in the NSS group, unlike the C/C group, had positive responses to attitude statements which encompass all three components of attitudes, i.e., cognitive, affective, and conative (action tendency).

Overall, both groups of teachers had positive attitudes toward the school lunch program, but held negative opinions about certain facets of the lunch program. As found in Perkins et al. (15), the teachers in this present study did not enjoy eating school lunch, thought that the cost of their own meals was too expensive, that too many starchy foods were served, and believed that they should not eat with

their students. Although teachers expressed a general dissatisfaction with the school lunch meal for themselves, they agreed that school lunch was an excellent source of nutrients for students, and that it provided more nutrient-dense foods than the lunches students brought from home.

This study found a positive significant relationship between teachers' attitudes toward nutrition, and their attitudes toward physical fitness. This relationship was significant only in the C/C group. In the NSS group, who utilized a team approach which included teachers, school nurses, and school foodservice personnel, a significant positive relationship was found between teachers' attitudes toward nutrition and their attitudes toward the school lunch program. No relationship was found in the C/C group who did not utilize a team approach to nutrition education. Involving school foodservice personnel in child nutrition programs may have influenced the relationship between the teachers' attitudes toward school lunch, and their attitudes toward nutrition. Perhaps a significant positive relationship between nutrition and physical fitness attitudes would have occurred if educators in the NSS group had cooperated intensively with physical education coaches.

Teachers in both groups believed that nutrition education is essential for all sectors of the population, and that it should be incorporated into existing curricula. Free responses indicated that teachers must have a strong personal commitment to nutrition and/or fitness for them to implement these lessons in conjunction with mounting basic skills requirements. Certain nutrition education programs, such as the Nutrition Super Stars Kit, have basic skill competencies

incorporated into lessons which are clearly designated in the teacher's guide. Although nutrition education is mandated by Public Law 95-166 (34), teachers generally are not allotting quality time to this vital and timely topic to elicit strong impacts. Community and school nutrition programs need to involve parents, and their children along with other team members in an effort to combat malnutrition practices.

This study indicated that teachers were strongly motivated and encouraged to teach nutrition when they noticed their students to have an increased awareness of food and activity choices, and an increased desire to share nutritional information with their parents. Shannon et al. (18) found that a positive change in teachers' attitudes toward favoring nutrition education in schools was correlated with higher gains in students' knowledge. The present study indicated that teachers who frequently and intensively utilized the Nutrition Super Stars curriculum, and who saw a change in their students, had more positive attitudes toward nutrition, physical fitness, and nutrition education than the C/C group.

#### Recommendations

Further study is indicated to ascertain the interrelationships among factors which influence attitudes toward nutrition, physical fitness, the school lunch program, and nutrition education. These factors may include, among others, situational, personal, and methodological. Examples of situational factors are the amount of quality time spent implementing nutrition-fitness education, the credibility of the curricula used, the amount of sharing between

teachers themselves, students, foodservice personnel, and parents. Personal factors may include the teacher, and student attitudes, the level of self-esteem, the commitment or interest in program, the desire to learn, and the amount of personal reflection, verbalization, and cooperation. Methodological factors may include the reliability and predictive validity of measuring instruments, the item difficulty, the appropriate behavioral criterions, and the evaluation environment.

Additional studies involving a team-approach toward nutrition education should be conducted. Also, inservice training utilizing a "hands on" approach to nutrition education should be available for teachers who desire to increase their self-confidence in teaching nutrition-fitness. During the inservice training, self-confidence may increase as a result of positive experiences while teaching nutrition-fitness, and from increases in cognitive knowledge.

Since the reliability coefficient (.33) for the school lunch scale was unacceptable, it is advisable to re-evaluate the scale by testing a larger sample of subjects. Factor analysis would be appropriate to identify the predominant constructs in the scale. The scale would be revised according to the clusters of interrelated variables.

When the item, "I do not enjoy eating the school lunch", was omitted from the scale, Cronbach's alpha coefficient increased to .48. The rationale for this post hoc test, based on statistical results and evaluation, was that the teachers considered school lunch to be inappropriate for themselves, but they agreed that the school lunch meal was an excellent source of nutrients for the students. The increase in the

alpha coefficient demonstrated that the school lunch program attitudinal scale was measuring at least two or more concepts i.e., the value of the school lunch meal for teachers, and the value of the school lunch meal for students.

Attitudes are considered to be one of the many factors or links related to behavior, so it is deemed necessary to continue to study attitudes along with other variables which influence behavior. The health of the U. S. population appears to be compromised as related to inappropriate dietary habits, inconsiderable amounts of vigorous physical activity, and adverse health habits. Additional studies which demonstrate methods to improve attitudes and/or behavior would be an eminent service to mankind.

APPENDIX A

PHYSICAL FITNESS, NUTRITION AND SCHOOL  
LUNCH PROGRAM ATTITUDINAL SCALES

**Directions:** Answer each question by blackening the appropriate bracket on the answer sheet. Use a No. 2 pencil only. Blacken "A" if you strongly agree; blacken "B" if you agree; blacken "C" if you disagree; blacken "D" if you strongly disagree.

**SECTION I: Physical Fitness Scale**

	SA	A	D	SD
1. It is important for a person to develop a positive fitness self-concept.	A	B	C	D
2. When I have the time to exercise I find something else to do.	A	B	C	D
3. I am unable to find the time to exercise.	A	B	C	D
4. Whenever I participate in a physical fitness program, I feel more confident about my fitness level.	A	B	C	D
5. My physical activity level is unrelated to my health status.	A	B	C	D
6. Regular participation in a fitness program will help me feel better.	A	B	C	D
7. Physical activity should be promoted within the family setting.	A	B	C	D
8. I lack the motivation to exercise on a regular basis.	A	B	C	D
9. Exercise does not increase my overall energy levels.	A	B	C	D
10. Health professionals place too much emphasis on the importance of physical fitness.	A	B	C	D
11. Physical activity does not help to develop healthy minds.	A	B	C	D
12. I believe that my career matters have more priority than my physical fitness activities.	A	B	C	D

	SA	A	D	SD
13. To be physically active is important to me.	A	B	C	D
14. I have a lot of motivation to be physically active.	A	B	C	D
15. I do not desire to improve my fitness level.	A	B	C	D
16. Regular exercise helps people to relax.	A	B	C	D
17. The amount of time I spend on physical activity interferes with other things I should be doing.	A	B	C	D
18. A personal fitness program should have spiritual value.	A	B	C	D
19. Exercise decreases my appetite.	A	B	C	D
20. I spend more time than I need to on being physically active.	A	B	C	D
<u>SECTION II: Nutrition Scale</u>				
21. I like trying new foods.	A	B	C	D
22. I like some foods now that I did not like when I first tried them.	A	B	C	D
23. If I do not like a food when I first taste it, I will never like it.	A	B	C	D
24. What I eat affects how healthy I am.	A	B	C	D
25. Everyone is able to improve his diet.	A	B	C	D
26. I try to choose foods that will help keep my body healthy.	A	B	C	D

	SA	A	D	SD
27. Improving my diet will improve my health.	A	B	C	D
28. Taking a lot of vitamins will compensate for eating low nutrient-dense foods. (Nutrient density is a ratio of the amount of nutrients per the amount of calories in a food. Example: low-nutrient-density foods have few nutrients per many Kcalories.)	A	B	C	D
29. I do not enjoy eating.	A	B	C	D
30. Families should always eat together when they can.	A	B	C	D
31. Children do not like to eat nutritious foods.	A	B	C	D
32. I should always eat a nutritious breakfast.	A	B	C	D
33. I am too busy to eat high-nutrient-dense foods.	A	B	C	D
34. What I eat does not affect my health.	A	B	C	D
35. High-nutrient-dense foods are more appealing to me than low-nutrient-dense foods.	A	B	C	D
36. People with large appetites will eventually become overweight.	A	B	C	D
37. Health professionals place too much importance on nutrition.	A	B	C	D
38. Vegetarians are as healthy as people who eat animal protein.	A	B	C	D
39. Foods bought at health food stores are more nutritious than comparable foods purchased in supermarkets.	A	B	C	D

	SA	A	D	SD
40. Fast food restaurants have meals as nutrient-dense as the meals I am able to prepare at home.	A	B	C	D
<u>SECTION III: School Lunch Program Scale</u>				
41. Teachers should eat with their students.	A	B	C	D
42. I do not enjoy eating the school lunch.	A	B	C	D
43. The calorie content of the school lunch meal is the correct amount for the students	A	B	C	D
44. One of the main reasons I do not buy school lunch is because I feel the teacher's price is too expensive.	A	B	C	D
45. The school lunch meal is too high in protein for the student's needs.	A	B	C	D
46. When I eat the school lunch, I feel I have eaten a nutritionally balanced meal.	A	B	C	D
47. Children want something else to eat at school, no matter how good the food is.	A	B	C	D
48. The students are too rushed to enjoy school lunch.	A	B	C	D
49. The school lunch program includes foods that will help keep my body healthy.	A	B	C	D
50. I consider myself to be a good role model about proper nutrition for my students.	A	B	C	D
51. The school lunch meal is more nutrient-dense than one I could bring to school to eat.	A	B	C	D

	SA	A	D	SD
52. The school lunch program is an excellent source of nutrients for the students.	A	B	C	D
53. Sodas and candy should be available in the schools for students to buy at any time.	A	B	C	D
54. The lunches students bring from home are as nutrient-dense as the foods served at school lunch.	A	B	C	D
55. Students who do not eat any lunch are less alert in the classroom.	A	B	C	D

APPENDIX B

DATA SHEET AND FREE RESPONSE SECTION



APPENDIX C

COVER LETTERS TO TEACHERS IN THE  
TREATMENT (NSS) GROUP

**THE UNIVERSITY OF ARIZONA**

TUCSON, ARIZONA 85721

COLLEGE OF AGRICULTURE

DEPARTMENT OF NUTRITION AND FOOD SCIENCE  
309 AGRICULTURAL SCIENCES BUILDING

April 29, 1982

Dear

I hope you will help me. I am trying to determine the attitudes teachers have towards nutrition and fitness. As a fifth or sixth grade teacher, I know you are a very busy person. Being a teacher, however, you are in a prime position to influence children's attitudes towards nutrition and fitness. Young children need to learn the relationship between food, fitness and health, and how to make wise nutrition and activity choices. Nutrition SuperStars is a curriculum for fifth, sixth, seventh and eighth grade students which was developed to meet this need. We are interested in determining if your being a part of this program has influenced your attitudes towards nutrition and fitness. To determine this, I am comparing Nutrition SuperStars teacher attitudes with the attitudes of a teacher control group.

Would you please complete the enclosed attitude questionnaire and data sheet. It should take only 15-20 minutes of your time. Your responses will be anonymous, and only group scores will be used in the evaluation. A stamped, self-addressed envelope is enclosed for your convenience. Please complete the data sheet and answer sheet and return them within two (2) weeks.

I want to thank you very much for taking the time to answer this questionnaire.

Sincerely,

Handwritten signature of Kellye Fischer in cursive.

KELLYE FISCHER  
Research Assistant  
Longitudinal Nutrition Education  
Evaluation Project  
Department of Nutrition and  
Food Science.

KF;jf  
Encs.



THE UNIVERSITY OF ARIZONA  
TUCSON, ARIZONA 85721

COLLEGE OF AGRICULTURE  
SCHOOL OF HOME ECONOMICS

May 12, 1982

Dear

About two weeks ago I sent you a questionnaire to fill out concerning your attitudes towards nutrition and fitness. If you have already completed and returned it, please accept my sincere thanks. If not, please do so today.

This research is being conducted because teachers are in a prime position to influence children's attitudes towards nutrition and fitness. Young children need to learn the relationship between food, fitness and health, and how to make wise nutrition and activity choices. Nutrition SuperStars is a curriculum for fifth, sixth, seventh, and eighth grade students which was developed to meet this need. We are interested in determining if your being a part of this program has influenced your attitudes towards nutrition and fitness. To determine this, I am comparing Nutrition SuperStars teacher attitudes with the attitudes of a teacher comparison group.

I am writing to you again because of the significance each questionnaire has to the usefulness of this study. Since the population of teachers who participated in the Nutrition SuperStars Program is small, the return of each questionnaire is essential for the results of this study to truly represent the attitudes the Nutrition SuperStars teachers have towards nutrition and fitness.

In the event that your questionnaire has been misplaced, a replacement is enclosed.

We appreciate the cooperation and support you have given our program in the past. Your continued cooperation is greatly appreciated.

Sincerely,

A handwritten signature in cursive script that reads 'Kellye Fischer'.

KELLYE FISCHER  
Research Assistant  
Longitudinal Nutrition Education  
Evaluation Project

Department of Nutrition and  
Food Science  
University of Arizona  
Home Economics, Room 319  
626-1460 or 626-5031

APPENDIX D

COVER LETTERS TO PRINCIPALS OF TEACHERS IN  
THE COMPARISON/CONTROL (C/C) GROUP



THE UNIVERSITY OF ARIZONA  
TUCSON, ARIZONA 85721

COLLEGE OF AGRICULTURE

DEPARTMENT OF NUTRITION AND FOOD SCIENCE  
309 AGRICULTURAL SCIENCES BUILDING

April 29, 1982

Dear

Thank you for agreeing to help me with our Longitudinal Nutrition Education Evaluation Project. As we agreed during our telephone conversation on April , I am sending you packets for distribution with the fifth and/or sixth grade teachers under your direction.

Each teacher packet contains a series of bilingual newsletters with nutrition and fitness information for use by children, teachers and parents. This is our "thank you" to your teachers for participating.

For your information, I am enclosing a brochure on the Nutrition SuperStars Curriculum. If you have any further questions, please feel free to call me.

Sincerely,

A handwritten signature in cursive script that reads "Kellye Fischer".

KELLYE FISCHER  
Research Assistant  
Longitudinal Nutrition Education  
Evaluation Project

Department of Nutrition  
and Food Science  
University of Arizona  
Home Economics, Room 319  
626-5031 or 626-1460

KF;jf  
Enc.



THE UNIVERSITY OF ARIZONA

TUCSON, ARIZONA 85721

COLLEGE OF AGRICULTURE  
SCHOOL OF HOME ECONOMICS

May 12, 1982

Dear

Thank you for agreeing to help me with our Longitudinal Nutrition Education Evaluation Project. However, to this date, I have received minimal response from your school.

This research is being conducted because teachers are in a prime position to influence children's attitudes towards nutrition and fitness. Young children need to learn the relationship between food, fitness and health, and how to make wise nutrition and activity choices. Nutrition SuperStars is a curriculum for fifth, sixth, seventh and eighth grade students which was developed to meet this need. As a follow up of this program, I am investigating the attitudes (towards nutrition and fitness) of both teachers who have used this curriculum and those who have not.

Since the comparison sample of teachers we chose was small, the return of each questionnaire is essential for the results of this study to truly represent the attitudes, towards nutrition and fitness, of teachers who have not used the Nutrition SuperStars Curriculum. Because of the significance each questionnaire has to the usefulness of this study, I have enclosed additional packets for distribution to fifth and/or sixth grade teachers under your direction. It should take the teachers only 15-20 minutes of their time to complete the questionnaire and data sheet.

I will be in Phoenix on \_\_\_\_\_ and I will personally visit your school to thank you for your cooperation with our project. Also, I will pick up completed questionnaires and deliver additional packets to the teachers if necessary.

Your cooperation is greatly appreciated.

Most sincerely,

A handwritten signature in cursive script that reads "Kellye Fischer".

KELLYE FISCHER  
Research Assistant  
Longitudinal Nutrition Education  
Evaluation Project

Department of Nutrition and  
Food Science  
University of Arizona  
Home Economics, Room 319  
626-1460 or 626-5031

APPENDIX E

COVER LETTERS TO TEACHERS IN THE  
COMPARISON/CONTROL (C/C) GROUP

**THE UNIVERSITY OF ARIZONA**

TUCSON, ARIZONA 85721

COLLEGE OF AGRICULTURE

DEPARTMENT OF NUTRITION AND FOOD SCIENCE  
309 AGRICULTURAL SCIENCES BUILDING

April 29, 1982

Dear

I hope you will help me. I am trying to determine the attitudes teachers have towards nutrition and fitness. As a fifth or sixth grade teacher, I know you are a very busy person. Being a teacher, however, you are in a prime position to influence children's attitudes towards nutrition and fitness. Young children need to learn the relationship between food, fitness and health, and how to make wise nutrition and activity choices. Nutrition SuperStars is a curriculum for fifth, sixth, seventh and eighth grade students which was developed to meet this need. As a follow up of this program, I am investigating the attitudes (towards nutrition and fitness) of both teachers who have used this curriculum and those who have not.

Would you please complete the enclosed attitude questionnaire and data sheet. It should take only 15-20 minutes of your time. Your responses will be anonymous, and only group scores will be used in the evaluation. A stamped, self-addressed envelope is enclosed for your convenience. Please complete the data sheet and answer sheet and return them within two (2) weeks.

As a "thank you" for helping me, I am including some nutrition-fitness materials from the Nutrition SuperStars Project for your use. I hope you will enjoy them.

I want to thank you very much for taking the time to answer this questionnaire.

Sincerely,

*Kellye Fischer*  
KELLYE FISCHER  
Research Assistant  
Longitudinal Nutrition Education  
Evaluation Project  
Department of Nutrition and  
Food Science

KF:jf  
Encs.



THE UNIVERSITY OF ARIZONA  
TUCSON, ARIZONA 85721

COLLEGE OF AGRICULTURE  
SCHOOL OF HOME ECONOMICS

May 12, 1982

Dear

About two weeks ago I sent you a questionnaire to fill out concerning your attitudes towards nutrition and fitness. If you have already completed and returned it, please accept my sincere thanks. If not, please do so today.

This research is being conducted because teachers are in a prime position to influence children's attitudes towards nutrition and fitness. Young children need to learn the relationship between food, fitness and health, and how to make wise nutrition and activity choices. Nutrition SuperStars is a curriculum for fifth, sixth, seventh and eighth grade students which was developed to meet this need. As a follow up to this program, I am investigating the attitudes (towards nutrition and fitness) of both teachers who have used this curriculum and those who have not.

I am writing to you again because of the significance each questionnaire has to the usefulness of this study. Since the comparison sample of teachers we chose was small, the return of each questionnaire is essential for the results of this study to truly represent the attitudes towards nutrition and fitness of teachers who have not used the Nutrition SuperStars Curriculum.

In the event that your questionnaire has been misplaced, a replacement is enclosed.

Your cooperation is greatly appreciated.

Sincerely,

*Kellye Fischer*

KELLYE FISCHER  
Research Assistant  
Longitudinal Nutrition Education  
Evaluation Project

Department of Nutrition and  
Food Science  
University of Arizona  
Home Economics, Room 319  
626-1460 or 626-5031

## REFERENCES

1. Ten State Nutrition Survey, 1968-1970. v. Dietary DHEW Publication Number (HSM) 72-8134, 1972.
2. Frank, G. C., A. W. Voors, P. E. Schilling, and G. S. Bernson. Dietary studies of rural school children in a cardiovascular survey. *Journal of the American Dietetic Association* 71:31-35, 1977.
3. National Academy of Science. National Research Council. Food and Nutrition Board. Recommended Dietary Allowances. Ninth Edition. Washington, D.C.: National Academy of Sciences, 1980.
4. Meyer, J. Overweight: Causes, Cost and Control. Englewood Cliffs, New York, Prentice Hall Inc., 1968.
5. Neumann, C. G. Obesity in pediatric practice. Obesity in the preschool and school age child. *Pediatric Clinics of North America* 24:117-122, 1977.
6. Angel, A. and D. A. K. Roncari. Medical complications of obesity. *Canadian Medical Association Journal* 119:1408-1411, 1978.
7. Gordon, T. and W. B. Kannel. The effects of overweight on cardiovascular disease. *Geriatrics* 38:80-88, 1973.
8. Goldsmith, R. H. Nutrition and Learning. Phi Delta Kappa Education Foundation. Bloomington, Indiana, 1981.
9. Holman, R. L., H. C. McGill, J. P. Strong, et al. The natural history of atherosclerosis. The early aortic lesions as seen in New Orleans in the middle of the 20th century. *American Journal of Pathology* 34:209-235, 1958.
10. Enos, W. J., J. C. Beyer, and F. H. Holmes. Pathogenesis of coronary disease in American soldiers killed in Korea. *Journal of the American Medical Association* 158:912-914, 1955.
11. McNamara, J., M. A. Molot, J. F. Stremple, et al. Coronary artery disease in combat casualties in Vietnam. *Journal of the American Medical Association* 216:1185-1187, 1971.
12. Lauer, R. M., W. E. Conner, P. E. Leaverton, M. A. Reiter, and W. R. Clarke. Coronary heart disease risk factors in school children: The Muscatine study. *Journal of Pediatrics* 86:697-706, 1975.

13. Frerichs, R. R., S. R. Srinivasan, L. S. Webber, and G. S. Berenson. Serum cholesterol and triglyceride levels in 3,446 children from a biracial community. *The Bogalusa Heart Study. Circulation* 54:302-308, 1976.
14. Gillespie, A. H. A theoretical framework for studying school nutrition education programs. *Journal of Nutrition Education* 13:150-152, 1981.
15. Perkins, K. L., F. R. Roach, and A. G. Vaden. Influence of teachers' attitudes toward the school lunch program on student participation. *Journal of Nutrition Education* 12:55-60, 1980.
16. Cook, C. B., D. A. Eiler, and E. C. Kaminika. How much nutrition education in grades K-6? *Journal of Nutrition Education* 9:131-135, 1977.
17. O'Connell, L., B. Shannon, and L. Sims. Assessing nutrition related attitudes and beliefs of teachers. *Journal of Nutrition Education* 13:80-85, 1981.
18. Shannon, B., E. S. Marbach, K. Graves, and L. Sims. Nutrition knowledge, attitudes, and teaching effectiveness of K-6 teachers. *Journal of Nutrition Education* 13:145-149, 1981.
19. Allport, G. W. Attitudes. In Murchison, C., ed. Handbook of Social Psychology. Worcester, MA. Clark University Press, 1935.
20. Halloran, J. D. Attitude Formation and Change. Westport, Conn., Greenwood Press Publishers, 1967, pp. 14-47.
21. Krech, D., R. S. Crutchfield, and E. L. Ballachay. The Individual in Society. New York, McGraw Hill Book Co., 1962, pp. 137-179.
22. Oppenheim, A. N. Questionnaire Design and Attitude Measurement. New York, Basic Books, Inc., 1966, pp. 105-118.
23. St. Pierre, R. G., and V. Rezmovic. An overview of the national Nutrition Education Training Program evaluation. *Journal of Nutrition Education* 14:61-66, 1982.
24. Swanson, J. C. Second thoughts on knowledge and attitude effects on behavior. *The Journal of School Health* 42:363-365, 1972.
25. Sims, L. S. Toward an understanding of attitude assessment in nutrition research. *Journal of the American Dietetic Association* 78:460-466, 1981.

26. Likert, R. A technique for the measurement of attitudes. *Archives of Psychology* 140:1-55, 1932.
27. Talmage, H., and S. P. Rasher. Validity and reliability issues in measurement instrumentation. *Journal of Nutrition Education* 13:83-85, 1981.
28. Foley, C., A. A. Hertzler, and H. L. Anderson. Attitudes and food habits--areview. *Journal of the American Dietetic Association* 75:13-18, 1979.
29. O'Farrell, M. J., and J. C. Kendrick. Educators' attitudes toward nutrition education in Florida. *Journal of Nutrition Education* 4:15-16, 1972.
30. Petersen, M. E., and C. Kies. Nutrition knowledge and attitudes of early elementary teachers. *Journal of Nutrition Education* 14:11-15, 1972.
31. Lai, M. K., and S. K. Shimabukuro. A statewide nutrient analysis of children's diets. ERIC Document ED 217039, 1982.
32. Marr, T., B. Shannon, and G. B. Spanier. Nutrition education for grades 7-12. The perspective of Pennsylvania teachers and administrators. *Journal of Nutrition Education* 12:148-152, 1980.
33. Penner, K. P., and K. M. Kolosa. Secondary teachers' nutrition knowledge, attitudes, and practices. ERIC Document ED 212564, 1981.
34. Public Law 95-166. National School Lunch Act and Child Nutrition Amendments of 1977, Section 19: Nutrition education and training. *United States Statutes at Large* 91:1340-1346.
35. Kenyon, G. S. Six scales for assessing attitude toward physical activity. *The Research Quarterly* 39:567-574, 1967.
36. Kenyon, G. S. A conceptual model for characterizing physical activity. *The Research Quarterly* 39:96-105, 1967.
37. Tolson, H., and J. M. Chevrette. Changes in attitudes toward physical activity as a result of individualized exercise prescription. *The Journal of Psychology* 87:203-207, 1974.
38. Reid, M. Attitude and personality differences in physically active and inactive university teachers. *Perceptual and Motor Skills* 43:523-526, 1976.
39. Barrell, G. V., and D. Holt. Attitude changes of specialist students of physical education toward physical activity during teacher-training courses. *Perceptual and Motor Skills* 54:477-478, 1982.

40. Nie, N. H., C. H. Hull, J. G. Jenkins, K. Steinbrenner, and D. H. Bent. SPSS: Statistical package for the Social Sciences. Second Edition. New York, McGraw-Hill Book Co., 1975.
41. Hull, C. H., and N. H. Nie. SPSS UPDATE 7-9. New Procedures and Facilities for Releases 7-9. New York, McGraw-Hill Book Co., 1981.
42. Abelson, R. P. Are attitudes necessary? In Attitudes Conflict and Social Change. Academic Press, New York, 1972.
43. Nutrition Super Stars Interim Report. Department of Nutrition and Food Science, University of Arizona, 1982.
44. Thorndike, R. L., and E. P. Hagen. Measurement and Evaluation in Psychology and Education. New York, John Wiley and Sons, 1977.
45. Nunnally, J. C. Psychometric Theory. New York, McGraw-Hill Book Co., 1967.