Impact of Teacher In-Service on Use of a Nutrition Education Program

Cathrene Drews Voelzke

Follow this and additional works at: https://openprairie.sdstate.edu/etd

Recommended Citation
Voelzke, Cathrene Drews, "Impact of Teacher In-Service on Use of a Nutrition Education Program" (1988). Electronic Theses and Dissertations. 4553.
https://openprairie.sdstate.edu/etd/4553
IMPACT OF TEACHER IN-SERVICE ON USE
OF A NUTRITION EDUCATION PROGRAM

BY
CATHRENE DREWS VOELZKE

A thesis submitted in partial fulfillment of the requirements for the degree
Master of Science
Major in Home Economics Education
South Dakota State University
1988
IMPACT OF TEACHER IN-SERVICE ON USE
OF A NUTRITION EDUCATION PROGRAM

This thesis is approved as a creditable and independent investigation
by a candidate for the degree, Master of Science, and is acceptable
for meeting the thesis requirements for this degree. Acceptance of
this thesis does not imply that the conclusions reached by the
candidate are necessarily the conclusions of the major department.

Dr. Virginia L. Clark
Thesis Advisor and
Head, Home Economics Education

                      Date

Dr. Edna Page Anderson
Major Advisor and
Dean, College of Home Economics

                      Date
ACKNOWLEDGEMENTS

I wish to express my appreciation to all who have offered encouragement and helped make completion of this study possible. A special thank-you is extended to:

Dr. Virginia L. Clark, thesis advisor, for her valuable assistance and ever present vitality and encouragement throughout the time I spent working on my thesis;

Dr. Edna Page Anderson, major advisor, for her patient guidance and encouragement to finish my graduate study;

Dr. John Parsons and Dr. Joye Billow for their interest in this study and willingness to serve on my committee;

Patty DeZeeuw for her help with the statistical analysis;

Gina Lynch and Jodi Grosz for their computer assistance;

The elementary teachers for completing the questionnaire;

My friends and colleagues at Dairy Council of South Dakota for their assistance, enthusiasm, and support;

My parents, Helen Drews and the late Claus Drews, for teaching me the importance of an education;

My husband, Vern, and daughter, Gina, for loving and tolerating me during this past year, during most of which I have been compulsively preoccupied.
IMPACT OF TEACHER IN-SERVICE ON USE
OF A NUTRITION EDUCATION PROGRAM

Abstract

Cathrene Drews Voelzke

The purpose of this study was to determine if the methods used to place nutrition education materials with elementary teachers affected the use of the materials in the nutrition curriculum. Data were collected in March and April, 1988 from a 36 percent random sample of the elementary teachers in South Dakota who received the Food...Your Choice, 1-6 (FYC) nutrition education materials during the Fall of 1987. Demographic, background and usage information was obtained from a survey instrument designed by the researcher.

Instruments were sent to 396 teachers who had participated in one of two different types of in-service training or in a third self-directed study group who served as the control; a total of 312 teachers completed and returned the survey instrument. Analysis of variance and Pearson Product-Moment Correlation technique were used to detect significant relationships between demographic and descriptive variables and the use of the FYC program. The data demonstrated a positive overall effect of in-service training on the use of FYC.
Significant relationships were found between in-service training and implementation of program, hours and lessons taught and reported ease of use. No statistical differences were detected between in-service training and school size, grade level, teachers' nutrition background, or principal's support for nutrition education.
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>CHAPTER</th>
<th>TITLE</th>
<th>PAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>TITLE PAGE</td>
<td></td>
<td>i</td>
</tr>
<tr>
<td>APPROVAL PAGE</td>
<td></td>
<td>ii</td>
</tr>
<tr>
<td>ACKNOWLEDGEMENTS</td>
<td></td>
<td>iii</td>
</tr>
<tr>
<td>ABSTRACT</td>
<td></td>
<td>iv</td>
</tr>
<tr>
<td>TABLE OF CONTENTS</td>
<td></td>
<td>vi</td>
</tr>
<tr>
<td>LIST OF TABLES</td>
<td></td>
<td>viii</td>
</tr>
<tr>
<td>CHAPTER</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Introduction</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Statement of Problem</td>
<td></td>
<td>4</td>
</tr>
<tr>
<td>Statement of Purpose</td>
<td></td>
<td>5</td>
</tr>
<tr>
<td>Definition of Terms</td>
<td></td>
<td>6</td>
</tr>
<tr>
<td>2. Review of Literature</td>
<td></td>
<td>9</td>
</tr>
<tr>
<td>Nutrition Background of Elementary Teachers</td>
<td></td>
<td>9</td>
</tr>
<tr>
<td>Nutrition in Elementary Classrooms</td>
<td></td>
<td>12</td>
</tr>
<tr>
<td>Teacher Introduction to Nutrition Materials</td>
<td></td>
<td>16</td>
</tr>
<tr>
<td>In-service by Consultants/Specialists</td>
<td></td>
<td>17</td>
</tr>
<tr>
<td>Training by Other Teachers</td>
<td></td>
<td>22</td>
</tr>
<tr>
<td>Self Instruction</td>
<td></td>
<td>24</td>
</tr>
<tr>
<td>Administrative Support</td>
<td></td>
<td>25</td>
</tr>
<tr>
<td>Characteristics of Rural Schools</td>
<td></td>
<td>27</td>
</tr>
<tr>
<td>Summary</td>
<td></td>
<td>31</td>
</tr>
<tr>
<td>3. Methods and Procedures</td>
<td></td>
<td>33</td>
</tr>
<tr>
<td>Chapter</td>
<td>Page</td>
<td></td>
</tr>
<tr>
<td>---------</td>
<td>------</td>
<td></td>
</tr>
<tr>
<td>Population and Sample</td>
<td>33</td>
<td></td>
</tr>
<tr>
<td>Treatment</td>
<td>36</td>
<td></td>
</tr>
<tr>
<td>Instrument Development</td>
<td>37</td>
<td></td>
</tr>
<tr>
<td>Data Collection and Analysis</td>
<td>38</td>
<td></td>
</tr>
<tr>
<td>Null Hypotheses</td>
<td>40</td>
<td></td>
</tr>
<tr>
<td>4. Results and Discussion</td>
<td>42</td>
<td></td>
</tr>
<tr>
<td>Background and Description of the Subjects</td>
<td>42</td>
<td></td>
</tr>
<tr>
<td>Statistical Findings</td>
<td>60</td>
<td></td>
</tr>
<tr>
<td>Testing of the Hypotheses</td>
<td>60</td>
<td></td>
</tr>
<tr>
<td>Summary of Hypotheses Testing</td>
<td>69</td>
<td></td>
</tr>
<tr>
<td>5. Summary, Recommendations, and Implications</td>
<td>70</td>
<td></td>
</tr>
<tr>
<td>Summary</td>
<td>70</td>
<td></td>
</tr>
<tr>
<td>Recommendations</td>
<td>71</td>
<td></td>
</tr>
<tr>
<td>Implications</td>
<td>74</td>
<td></td>
</tr>
<tr>
<td>LITERATURE CITED</td>
<td>78</td>
<td></td>
</tr>
<tr>
<td>APPENDIX - A. RESEARCH PROPOSAL TO SCHOOL DISTRICT</td>
<td>85</td>
<td></td>
</tr>
<tr>
<td>APPENDIX - B. PARTICIPATION AGREEMENT</td>
<td>90</td>
<td></td>
</tr>
<tr>
<td>APPENDIX - C. PERMISSION REQUEST LETTER</td>
<td>92</td>
<td></td>
</tr>
<tr>
<td>APPENDIX - D. INSTRUMENT</td>
<td>94</td>
<td></td>
</tr>
<tr>
<td>APPENDIX - E. TEACHER IN-SERVICE TRAINING AGENDA</td>
<td>99</td>
<td></td>
</tr>
<tr>
<td>APPENDIX - F. LETTERS OF TRANSMITTAL</td>
<td>101</td>
<td></td>
</tr>
<tr>
<td>APPENDIX - G. FOLLOW-UP LETTER</td>
<td>104</td>
<td></td>
</tr>
<tr>
<td>APPENDIX - H. FOLLOW-UP POSTCARD</td>
<td>106</td>
<td></td>
</tr>
</tbody>
</table>
# LIST OF TABLES

<table>
<thead>
<tr>
<th>TABLE</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Description of Teachers: School Size</td>
<td>43</td>
</tr>
<tr>
<td>2. Description of Teachers: Grades Taught</td>
<td>45</td>
</tr>
<tr>
<td>3. Description of Teachers: Years of Teaching Experience</td>
<td>47</td>
</tr>
<tr>
<td>4. Elementary Teachers’ Major Sources of Nutrition Information</td>
<td>50</td>
</tr>
<tr>
<td>5. Description of Teachers: Class Size</td>
<td>52</td>
</tr>
<tr>
<td>6. Elementary Teachers’ Perception of Principal’s Support for Nutrition Education</td>
<td>53</td>
</tr>
<tr>
<td>7. A Comparison of the Number of FYC Lessons Taught and the Teachers’ Indication of Interest in Nutrition</td>
<td>54</td>
</tr>
<tr>
<td>8. Level of Use of FYC Program by Teachers</td>
<td>57</td>
</tr>
<tr>
<td>9. Description of Teachers: Hours of Nutrition Taught</td>
<td>59</td>
</tr>
<tr>
<td>10. Pearson’s Product Correlation Coefficients for Hours of Nutrition Education Taught and Value of In-service Training and Number of FYC Lessons Taught</td>
<td>61</td>
</tr>
<tr>
<td>11. Comparison of Teachers’ Rating of the Value of Nutrition In-service Training by Delivery Method</td>
<td>64</td>
</tr>
<tr>
<td>12. Analysis of Variance for Age with Value of Nutrition Education In-service Training</td>
<td>66</td>
</tr>
<tr>
<td>13. Analysis of Variance for Type of In-service Training in Relation to Ease of Use</td>
<td>68</td>
</tr>
</tbody>
</table>

viii
Chapter 1

Introduction

The final report of the 1969 White House Conference on Food, Nutrition, and Health called for a National Nutrition Policy which recommended establishing "a comprehensive and sequential program in nutrition education ... as an integral part of the curriculum of every school in the United States" (Johnson & Butler, 1975, p. 20). The United States Congress also identified the need for nutrition education with the passage of the Nutrition Education and Training Act (Public Law 95-166, November 10, 1977). This bill assigned major responsibility for the nutrition education of school children to teachers and food service personnel. However, even with these major emphases on improvement of health through nutrition education, fewer than one-third of the states mandated elementary health instruction (Walberg, Connell, Turner, & Olsen, 1986).

The establishment of the Nutrition Education and Training (NET) program placed further emphasis on nutrition education. Each state was authorized to expend $0.50 per school age child in federal funds for nutrition education and training in public and private non-profit schools and child-care institutions throughout the United States. Twenty-six million, two hundred thousand dollars was appropriated for the NET program during the 1978 and 1979 fiscal years. After the initial implementation period, funding was reduced to $5 million by 1982 according to the Omnibus Reconciliation Act of 1981 (Public Law 97-35, August 13, 1981). Presently, state grants with a
minimum amount of $50 thousand are provided by the Agriculture Appropriation Act of 1982 (Public Law 97-370, December 18, 1982).

South Dakota first participated in the NEI program in 1982 and now receives the minimum state grant amount of $50 thousand. These program funds provide for the administration and implementation of nutrition education programs and materials in approximately 25 schools annually (L. L. Lamp, personal communication, December 31, 1987).

In 1979, an additional thrust for nutrition education was provided by the Surgeon General of the United States in the release of the 1990 Health Objectives for a Nation. This initiative included nutrition as a major content area and specified that "By 1990, all States should include nutrition education as part of required comprehensive school health education at elementary and secondary levels" (Allensworth & Wolford, 1988, p. 7). Legislative and government emphasis created a need for sequentially developed nutrition education materials for the nation's schools.

In response, National Dairy Council (NDC) developed a comprehensive nutrition learning system for kindergarten through high school, Food...Your Choice™ (FYC). The first components, Food...Your Choice, Level 1, 2, & 3 for elementary grades, were introduced in August, 1977. The kindergarten program, Food...Early Choices, and junior-senior high school program, Food...Your Choice, Level 4 with four distinct programs, one each for science, home economics, health, and social studies were
introduced shortly after that time. By 1980, over 310,166 sets of materials had been placed in schools throughout the United States (J. Conner, personal communication, December 5, 1980).

As is the case with all curricular materials, revisions of FYC were necessary to provide current information. After extensive evaluation and development, NDC introduced the revised Food...Your Choice, Grades 1-6 in 1987. During the first year of implementation, 72,962 sets of materials were placed in elementary schools throughout the United States (Carsky, 1988). During the initial implementation period from August, 1987 through December, 1987, more than 900 elementary teachers (25 percent of teachers in grades 1 through 6) in South Dakota received FYC, Grades 1-6 for use in their classrooms.

Although the FYC materials for teaching nutrition are available to South Dakota teachers, the presence of these resources is not an indication that nutrition education programs are implemented. The extent to which the FYC program is being used in South Dakota schools is not known. Therefore, a survey of the elementary teachers having the new FYC program can determine if they are using the materials and the changes needed in the methods used for placement of materials to enhance their use. The extent to which the teachers who have received the FYC materials are actually using the program can provide information about the current status of nutrition education in South Dakota.
Statement of Problem

One of the major thrusts of nutrition education programs for school-age children has been to provide students with the knowledge and decision making skills necessary for making rational food choices (Wilkosz, 1983). Recent studies addressing the complexities of nutrition education have focused on identifying factors which influence knowledge acquisition, attitude development and behavioral change (Johnson & Johnson, 1985).

Research findings indicate that through quality nutrition education programs, elementary teachers are in a position to influence students' food choices (Tinsley, Houtkooper, Engle, & Gibbs, 1985). While many studies (Shannon, Marbach, Graves, & Sims, 1981; Banta, Cunningham, Jozwiak, McCabe, & Skinner, 1985b; McDonald, Brun, & Esserman, 1981) support the value of nutrition education in the elementary classroom, few studies address the factors which influence teachers to use available nutrition education materials. Nutrition educators who are directly involved with teacher in-service training need to know if current strategies for placing nutrition education programs in the schools motivate teachers to use the programs.

"How well are we doing?" is the question often asked in the area of nutrition education research. A critical evaluation of implementation and use of nutrition education materials could provide valuable information about the effectiveness of present strategies for introducing nutrition education materials in South
Dakota, a sparsely populated state with a diverse group of teachers. This information may also provide a basis for broad generalizations about the impact of methods for introducing educational materials or the actual use of materials by teachers.

**Statement of Purpose**

The primary objective of this research was to determine if the method used to place nutrition education materials with teachers affected the use of these materials and the inclusion of nutrition education in the curriculum. Teachers in schools in South Dakota that had recently received the newly revised *Food...Your Choice, Grades 1-6* program served as the population for this study. The findings of this research can assist nutrition educators in the development of future programs by providing a representative picture of the extent the *Food...Your Choice, Grades 1-6* program is being used in these schools. Information about factors affecting teachers' decisions to include the FYC nutrition program in school curricula was also gathered.

The major questions of this study included:

1. Does the delivery system for nutrition education materials affect teachers' use of the materials in the classroom?

2. Does the type of delivery system affect the perceived value of the in-service training and the use of nutrition education materials?
3. Is there a relationship between the use of the nutrition education materials and teacher perception of principal's support for nutrition education?

4. Is there a relationship between how prepared a teacher feels to teach nutrition and number of FYC lessons taught?

5. Is there a relationship between the delivery system and the years of teaching experience?

6. Is implementation of nutrition education programs in rural elementary schools with one or two teachers per school different than implementation in schools with one or more teachers per grade?

7. Is teacher variation in implementation related to delivery system and the reported ease of use with the nutrition education materials?

**Definition of Terms**

Throughout this paper the following terms will be used according to the definitions provided:

- **Administrators**—The superintendent, principals and curriculum directors within a school district.

- **Delivery System**—The type of in-service training method by which teachers are introduced to new nutrition education curriculum materials.

- **Elementary Teacher**—A person certified by the South Dakota
State Department of Elementary and Secondary Education
to teach kindergarten through the eighth grade.

FOOD...Your Choice (FYC) Nutrition Learning System for
Grades 1-6—A set of nutrition education materials
developed in 1987 by National Dairy Council.

Implementation—the point when one or more features of a new
program are put into action by the users.

In-service Training—An orientation program designed to
introduce teachers to new educational materials.

Large School District—A school district which offers
educational training in grades K - 12 and has an
enrollment of over 801 students.

Medium School District—A school district which offers
educational training in grades K - 12 and has an
enrollment of 351 to 800 students.

National Dairy Council (NDC)—The non-profit nutrition
education-nutrition research branch of the dairy
industry.

Nutrition Background—A teacher’s knowledge and use of
nutrition information based on previous formal training
in school, use of available nutrition resources and
lifetime experiences.

Nutrition Education—The teaching of validated, correct
nutrition knowledge to the public in ways that promote
the development and maintenance of positive attitudes.
toward, and actual behavioral habits of eating nutritious foods that contribute to the maintenance of personal health, well-being and productivity (Johnson & Johnson, 1985, p. 9).

Nutrition Educator—A professional who is trained in the fundamental principles of human nutrition, learning theory and educational methods including behavior change strategies.

Rural School—A small K - 6 or K - 8 school with one or two teachers who teach multiple grades.

Small School District—A school district which offers educational training in grades K - 12 and has a student enrollment of 350 or less.

TM—A symbol which denotes materials that have a registered trademark.

Workshop—A one-hour seminar designed to introduce elementary teachers to new nutrition education materials and motivate them to use the materials in their classrooms.
Chapter 2

Literature Review

The purpose of this study was to determine if the methods used to place nutrition education materials with teachers affects the use of these materials and the inclusion of nutrition education materials in the curriculum. Teachers are the focus of this study because they are ultimately responsible for nutrition education in their classrooms.

Literature reviewed for this study focused on the teaching of nutrition education in the elementary classroom, the nutrition background of elementary teachers, teacher introduction to nutrition education materials, the effect of administrative support on the implementation of nutrition education programs, and characteristics of the small rural schools that constitute nearly 15 percent of the sample population receiving nutrition education materials in this study. Each of these topics has application in assessing the effectiveness of methods used for the placement of nutrition education programs in South Dakota elementary schools.

Nutrition Background of Elementary Teachers

Throughout the years, formal training in nutrition has been quite uncommon in the pre-service training for elementary teachers. However, recent studies (Olson, Frongillo, Jr., & Schardt, 1986; Neafsey, Jensen, & Burklund, 1985) indicate that elementary teachers may be receiving more nutrition training.
In a recent study on status of nutrition education, Olson, Frongillo, Jr., and Schardt (1986) found that 50 percent of the teachers they surveyed had taken a foods and nutrition course in high school, 38 percent had taken a foods and nutrition course in college and 15 percent had done so in the post college period. Similarly, of the elementary teachers participating in a Connecticut NET sponsored college nutrition course, 41 percent reported previous training in nutrition (Neafsey, Jensen & Burklund, 1985). The findings of these two more recent studies may be an indication that teachers now are receiving more nutrition education training.

In contrast, earlier studies show that few elementary teachers had received formal nutrition training. The majority of elementary teachers (83 percent) selected in a random sample of graduates from Pennsylvania State University for a nutrition knowledge test validation study indicated that they had no formal coursework in nutrition. The study showed that the scores of elementary teachers who had no nutrition coursework were significantly lower than the teachers whose required coursework included nutrition. These results indicate that college training in nutrition may increase mastery of nutrition subject-matter and that the elementary teachers who are often responsible for teaching nutrition need more training in nutrition (Byrd-Bredbenner, 1981).

Similar information was obtained in a statewide study of high-school teachers in Pennsylvania. Results of a mail-survey indicated that only 22 percent of the respondents had college
training in nutrition and only 11 percent had post-college nutrition courses. The group that had training was comprised primarily of home economics teachers, health/physical education teachers and life science teachers, respectively. Teachers with a nutrition background held the strongest belief that nutrition education should be included in their classroom teaching (Marr, Shannon, & Spanier, 1980).

According to the findings of a study on the nutrition knowledge of elementary teachers in South Dakota, most teachers have had minimal training in the area of nutrition. Only seven percent of the teachers reported having taken a college-level nutrition course, while almost 43 percent indicated that nutrition was included as part of the curriculum in another class. Fifty percent of the teachers said they had no nutrition education in college (Pearson, 1978). Contrary to the information Bryd-Bredbenner (1981) reported, Pearson’s study found that there was no significant difference between the scores of teachers who had nutrition training in college and those who did not.

South Dakota teachers reported reading nutrition related materials and attending workshops as their main sources of nutrition information. The nutrition information materials they read were divided nearly equal between professional and non-professional sources, and there was no significant relationship between their preference of materials and nutrition knowledge scores (Pearson, 1978).
Nutrition Education in the Elementary Classroom

The school system is a logical location for nutrition education because school children are in the process of acquiring lifetime knowledge and skills. Although not limited to the classroom, nutrition education is largely the responsibility of teachers and is influenced by the policies that exist in the schools.

The first nationwide attempt to assess nutrition education in schools, *A Needs Assessment of Nutrition Education* (Eash & Rasher, 1976), was sponsored by the National Dairy Council and conducted by the University of Illinois at Chicago Circle. The study found that nutrition education as it existed had a tremendous amount of diversity in curriculum content and that there was an overall lack of quality nutrition education materials. The participating teachers and administrators said that more time should be devoted to teaching nutrition and that a better, more sequentially organized program was needed.

The ultimate goal of nutrition education is to develop knowledgeable consumers who value good nutrition and consume nutritious foods throughout life (Contento, 1980). To accomplish this goal, nutrition education programs must help develop knowledge of the value of good nutrition, create positive attitudes toward good nutrition and provide the motivation necessary for people to establish or change their diet and food choice behaviors. For this reason, most nutrition education programs are designed to help
students acquire the knowledge and skills necessary to make intelligent food choices, thereby enabling them to be self-reliant in providing nourishing food for themselves and others (Schwartz, 1983; Wilkosz, 1983 December). Ideally, nutrition education programs should be taught throughout the life-cycle, beginning with a comprehensive program in the elementary school and continuing with adult education programs in the community and at the worksite (American Dietetic Association, 1985; Schwartz, 1985). This position was further supported by the recent first Surgeon General's Report on Nutrition and Health, (1988) which calls for educating the public, beginning in the primary grades, about the health benefits of wise food choices and regular exercise in the prevention of disease.

A review of the literature about teachers attitudes toward including nutrition in the school curricula is important in examining the extent in which nutrition is taught. A study by Olson, Frongillo, Jr., and Schardt (1986) indicated that virtually all the public elementary school teachers (96 percent) in both the urban and rural schools surveyed in New York State and northern New Jersey believed their schools should be teaching foods and nutrition to students. These findings were consistent with an earlier nationwide needs assessment of nutrition education (Eash & Rasher, 1976).

Nutrition background may also influence the teachers attitude toward inclusion of nutrition education in the curriculum.
In a study by Marr, Shannon, and Spanier (1980), the teachers with less background in nutrition scored lower on attitude scales than those reporting nutrition coursework. Data from Neafsey, Jensen, and Burklund (1985) indicated that previous experience in teaching nutrition may affect the degree to which teachers implement lessons after taking a nutrition education course. Davis (1978) observed a positive relationship between South Dakota teachers' nutrition knowledge and their attitude toward nutrition education and teaching nutrition. Teachers who taught nutrition in the classroom had higher attitude scores than those who did not, and the teachers who taught nutrition as a separate unit had higher scores than the teachers who integrated nutrition into existing curricula.

Olson, Frongillo, Jr., & Schacht, (1986) found that the major reasons teachers included nutrition were (a) students needed to learn about the subject, (b) elementary schools should be teaching foods and nutrition, and (c) they wanted to teach it. "Teachers saw themselves as as the most influential person in their schools in choosing a foods and nutrition teaching plan" (p. 50).

The same researchers also reported that the proportion of teachers who taught foods and nutrition did not change significantly between 1975 and 1981. Sixty-eight percent of the teachers who responded taught nutrition during the 1980-1981 school year, and the subject was taught an average 16.3 hours.

Instructional time pressures frequently forced teachers to give nutrition education a lower priority when they were faced with
the problem of finding time for the basic subjects (Gillespie, 1984; Weiss & Kien, 1987). Soliah, Newell, Vaden, and Dayton (1983) found that nearly all the teachers surveyed (90 percent) believed nutrition should be taught in elementary school, but only half of the teachers reported not teaching nutrition due to insufficient time.

Because nutrition generally is not considered part of a child's basic education it competes with many other subjects for a limited amount of instructional time after basic skills are taught. Weiss and Kien (1987) recommended teachers learn how nutrition can be "integrated into the curriculum to support acquisition of basic skills rather than competing with them" (p. 10). Nutrition was not viewed to be as important in everyday life as language and math skills (Weiss & Kien, 1987).

A study by Brown and Park (1986) further explains that some teachers will choose to teach nutrition as a single unit and others will incorporate nutrition concepts throughout the year depending on their teaching styles and their students' learning styles. Of the teachers in the study by Olson, Prongillo, Jr., & Schardt (1986), approximately one-third of the teachers reported teaching nutrition as a separate subject, one-third of the teachers integrated nutrition with other subjects, and one-third of the teachers taught nutrition both as an integrated subject and as a separate subject.

Those who taught the concept both separately and as an integrated subject spent more time teaching nutrition than those who
only taught it separately. Earlier studies in Nebraska and West Virginia also reported a large number of teachers integrating nutrition education with other instruction (Weiss & Kien, 1987).

Teachers frequently encounter difficulty in finding nutrition education materials that can be integrated with other subjects in the school curricula (Weiss & Kien, 1987). The interdisciplinary charts in the Food...Your Choice nutrition education program were reported as being useful in incorporating nutrition in mathematics, language arts and social studies by more than one-third of the teachers in the Olson, Frongillo, Jr., & Schardt (1986) study.

According to Olson, Frongillo, Jr., and Schardt (1983), it is important that elementary school teachers be successfully introduced to nutrition education programs in order to use the materials as they are designed to be used. Teachers must also have the program available to them, they must use the program in their teaching and be motivated to continue to use it over the years.

Several methods may be used to introduce educational materials. An in-service training session conducted by a consultant/specialist or other teacher/administrator is a frequent method of delivering information to classroom teachers.

Teacher Introduction to Nutrition Education Materials

Methods which introduce teachers to nutrition education materials may have an impact on the selection and use of the materials. Information gathered from a study on implementation of a
school health program indicated that teachers who were fully trained to use the program taught more of the program than teachers who received minimal training. In addition, trained teachers reported greater adherence to teaching the program the way it was designed to be taught (Walberg, Connell, Turner, & Olsen, 1986).

In 1986, Olson, Frongillo, Jr., and Schardt reported that of the respondents in their status of nutrition education survey (N = 1,804), 23 percent had attended at least one foods and nutrition in-service workshop that introduced them to a teaching program in the previous five years. Approximately 52 percent of the workshops were conducted by Dairy Council, local districts conducted 23 percent and several different government agencies had conducted the balance.

It is difficult to compare the results of different delivery systems for introducing educational materials due to differences in such key variables as method (format) of teacher training, length of time the workshop was held, curriculum content, types of nutrition education materials placed, and different evaluation methods utilized. However, several assumptions can be made based on the research that is available.

In-service workshops by consultants/specialists. The most popular method of teacher in-service training as indicated by the literature reviewed was teacher in-service workshops by consultants. Although no data were available to confirm the exact percentage, the
majority of the nutrition education training sessions were conducted by nutrition specialists.

Research on the influence of teacher training in basic nutrition and instructional strategies demonstrates that the training is associated with increased amounts of time that teachers spend teaching nutrition in the classroom (Shannon, Marbach, Graves, & Sims, 1981). In a 1977 study, Cook, Eiler, & Kaminaka reported that teachers attending nutrition education workshops taught nutrition 2.8 hours per annum more than teachers who did not participate in teacher training workshops. In another study, teachers who received little direction or in-service training in nutrition education tended to teach more food related activities rather than lessons that enhanced students understanding of nutrition. Teachers who received more in-depth training taught nutrition lessons that enhanced students understanding (Nicely, Jr., & Bell, 1983).

A study evaluating three different methods of teacher in-service by nutrition consultants indicated that on the average, the type of in-service did not affect the time trained teachers spent implementing the nutrition-fitness curriculum in the classroom; however, student scores indicated the type of in-service probably reflected the degree to which the curriculum was taught. In this study by Tinsley, Hoakooper, Engle & Gibbs (1985), all the teachers received a 1-hour orientation; one group received only the 1-hour orientation, one group had an additional 3 hours of
nutrition-fitness training and 12 hours of consultation over a 4-month time period, and one group had an additional 15 hours of nutrition-fitness training in a workshop format. There were no significant differences among students' knowledge-test and attitude-scale mean scores in the three treatment groups. Although all student scores were positive, there was a significant difference in the scores between the treatment group and the control group (Tinsley, Houtkooper, Engle, & Gibbs, 1985).

The School Health Evaluation Survey reported that the effectiveness of health education curricula (non-nutrition) was related to teacher in-service training (Connell, Turner, & Mason, 1985). Teachers who received in-service training completed a greater portion of the curriculum and selected learning activities that followed the curriculum more closely than the teachers who did not receive in-service training (Connell, Turner, & Mason, 1985; Walberg, Connell, Turner, & Olsen, 1986).

Howison, Niedermyer, and Shortridge (1988) indicated that an orientation session lasting one hour was an adequate length of time for introducing a product-based program where instructional materials and procedures were provided with the materials; however, Pepple's study (1986) indicated that the more in-service training a teacher received, the higher degree of implementation.

A Canadian study (McEwen & Kieren, 1984) which included urban and rural elementary teachers also indicated that in-service to instruct teachers in material use increased the use of these
materials in the classrooms. Teachers participating in the study were supportive of teaching nutritional concepts. A pre-implementation workshop and food sample program offered by Alberta Agriculture home economists acted as motivators to encourage teacher participation (McEwen & Kieren, 1984).

A similar study conducted in a rural school district in New York State by Brown and Park (1986) indicated that during a year-long teacher in-service program, participating teachers "more than doubled both the variety of supplemental materials used and the average amount of instructional hours devoted to nutrition education" (p. 74D).

Results from a 1986 study by Pepple on the influence of in-service instruction on curriculum implementation in agriculture indicated that the more in-service training a teacher received, the higher the degree of implementation. Based on mean scores, teachers who received no in-service training reported using materials only a little, while teachers who participated in an in-service training (either a two-hour training session or a five-day training session) reported using materials to some degree or higher. The respondents who participated in a workshop reported a higher mean use-rate than respondents who had no in-service instruction; however none of the teachers, regardless of the type of in-service, reported a very high level of implementation (Pepple, 1986). Although findings in this study are consistent with previous studies cited, caution should be noted because the subjects were a self-selected group and
voluntarily participated in either of the two workshops. The no in-service group purchased materials without attending a workshop.

In New York state, researchers found that participation in an in-service workshop was slightly related to the extent foods and nutrition was taught in elementary schools, but was more positively related to whether foods and nutrition was included in the curriculum. "Thus, in-service training appears to provide impetus for teachers to teach foods and nutrition" (Olson, Frongillo, Jr., & Schardt, 1986, p. 52). A study by Tinsley, Houtkooper, Engle, & Gibbs (1985) reaffirmed the importance of in-service training. When nutrition consultants met with teachers on a three hours per month basis teachers reported being more motivated to implement nutrition-fitness curricula.

In-service training of teachers appears to have some effect on knowledge scores of students as well as degree of implementation. Students of K-6 grade teachers who received in-service training achieved higher knowledge scores on a self-report measure of nutrition beliefs than did their peers in comparison schools (Banta, Cunningham, Jozwiak, McCabe, & Skinner, 1985a). This study also indicates improvement in students' attitude scores toward nutrition in treatment schools (Banta, Cunningham, Jozwiak, McCabe, & Skinner, 1985b). This effect of teacher in-service training on student nutrition knowledge was further substantiated in the evaluation of the nutrition component of a junior-senior high health curriculum by Bryd-Bredbenner, O'Connell, Shannon, & Eddy (1984).
According to Grossnickle (1987) one of the biggest problems with one-shot teacher in-service programs was the failure of school leaders to follow-up with activities and assistance to encourage long-term implementation. Workshops which involved teachers in the pre-planning, implementation, and follow-up activities were found to produce more successful programs than workshops that did not involve teachers throughout the process (Grossnickle, 1987). Most implementation problems arose when the teacher returned to the classroom and used the program in actual teaching. Continuing contact with teachers was recognized as influential in long-term implementation (Olson, Frongillo, Jr., & Schardt, 1983). One method which offers the opportunity for continual support is involvement of local staff members in the training of teachers.

Training by other teachers. A model of staff development that continues to prove effective is teachers teaching teachers. A report by Bouley (1984) on a teacher training course attributed the success of the program to administrative support, commitment to improvement of students' learning, a workshop taught by teachers in the school, and a salary credit incentive for teacher involvement.

Daresh (1987) stated that when teachers are involved in preparing programs for other teachers, there is less resistance to the programs than if they are developed entirely by administrators. Innovations and new program ideas are often initiated by teachers who are recognized as opinion leaders. The opinion leaders are
trained and then involved in training other teachers (Johnson &
Johnson, 1985).

Johnson and Johnson (1985) also recommend that teachers
observe successful nutrition implementation programs in other
classrooms or schools and that teachers receive ongoing
encouragement and assistance from peers and resource personnel
throughout the school year. Local resource personnel (peers and
administrative staff) can provide valuable assistance and advice to
teachers in solving immediate problems.

Stallings (1987) encouraged using teachers who have
expertise in an area for staff development programs. A
collaborative approach where the teacher-expert served more as a
facilitator rather than a teacher proved to be successful. Teachers
did not like to be taught by their peers but were receptive to a
collaborative approach through support groups.

The Rand Corporation Study indicated that educational
programs which involved local teachers in the development were more
likely to succeed than programs developed entirely outside the
school system. Involvement could range from reorganizing materials
to total program development. This process appeared to foster a
commitment to the program (Berman and McLaughlin, 1975).

Peer-education has also been successful with the elderly.
Senior citizens reported that trained, volunteer peer-educators were
useful sources of nutrition information at senior centers (Shannon,
Smiciklas-Wright, Davis, & Lewis, 1983).
Self instruction. Reading instructions or participating in short introductory workshops does not appear to motivate teachers to implement programs. Workshops alone were not enough preparation; training needed to be provided throughout the school year (Johnson & Johnson, 1985). Furthermore, teachers who received little direction tended to select learning activities that emphasized food manipulation rather than nutrition understanding (Nicely, Jr., & Bell, 1983).

Tinsley, Houtkooper, Engle, & Gibbs (1985) found that the students of teachers who did not receive some type of orientation did not perform as well on a knowledge-test nor improve on an attitude-scale as the students of teachers who had received previous training. An earlier study (Nicely, Jr. & Bell, 1983) revealed that teachers in a naturalistic setting, that is, one in which the teachers typically receive no instruction on the use of new curriculum materials, tended to have some difficulty understanding the organization of the instructional materials. These teachers also tended to use only the resources that were readily available, and indicated the need for an in-service training in the use of the curriculum piece used in the study.

Other factors which affected the use of nutrition education materials appeared to be such practical considerations as the attractiveness of the materials, the ease of use, and the appropriateness for the grade level. McEwen and Kieren (1984) recommend encouraging teachers to participate in nutrition education
workshops through use of materials and activities that are appealing, require little preparation and class time, are easily implemented, and act as motivators to continue teaching nutrition. McEwen and Kieren (1984) suggested that more emphasis should be given, at the teacher workshops, to the variety of teaching activities that are possible and ways to incorporate them into daily lesson plans with minimal preparation. However, elementary teachers in New York indicated a preference for the in-service training to focus on specific skills and teaching strategies for a behavior change program, rather than presentations on nutrition content (Weiss & Kien, 1987).

Although teacher in-service training appears to be influential in the degree teachers reported implementing nutrition education programs in their classrooms, another area that deserves review is the influence of school administrators. Administrative support for nutrition education may also increase program implementation and effectiveness.

Administrative Support

Nutrition educators are keenly aware of the influence that school administrators have on the inclusion of nutrition concepts in the school curriculum (Olson, Frohillo, Jr., & Schardt, 1986). Weiss and Kien (1987) identified administrative support as a necessary component for implementation of comprehensive nutrition education programs. Reasons cited for administrative influence included: (a) administrators were the ones who set priorities for
instruction time and the type of new instructional materials purchased and (b) administrators are the ones to recognize outstanding individual efforts by teachers. Johnson and Johnson (1985) stated that the participation of school administrators in nutrition education programs is vital to the success of the program. Administrators who have the knowledge and skills that enable them to help teachers with program objectives and to show teachers that their efforts are supported were identified as being influential in the time teachers spent teaching nutrition in their classrooms.

A 1985 study on implementation of a nutrition-fitness curriculum indicated that the majority of administrators who were included in the evaluation of the project were positive about the program and nearly all supported incorporating the program in the school curriculum. This same study showed that teacher training was significantly related to higher student scores (Tinsley, Houtkooper, Engle, & Gibbs, 1985). When administrators support nutrition education, more teacher training is likely to occur, which may have a more positive effect on student learning. Similarly, Davis (1978) found that principals who perceived that teachers in their school supported the teaching of nutrition had higher attitude scores than those who perceived that teachers did not want to teach nutrition.

In a Kansas survey, the lack of administrative support was a major reason for not teaching nutrition (Soliah, Newell, Vaden, & Dayton, 1983). However, in a study by Olson, Frongillo, Jr., and
Schardt (1986) teachers did not rate their principal as influential in the decision to teach nutrition.

Teacher perception of administrative support may vary according to the location of the school. Some one or two teacher rural schools are geographically isolated from the district office. The administrator may leave curriculum implementation decisions for the rural teacher to make dependent upon individual needs of students, grade level and number of students in each grade (Uerling, 1985). Because a small enrollment may affect the way a teacher uses nutrition education materials it is important to consider how the teacher in the small one or two teacher school differs from the traditional single grade classroom teacher.

**Characteristics of Small Rural Schools**

Not much information is available relative to the school administrators relationship with rural one or two teacher schools because most country schools are consolidated with an independent school district (K - 12). These schools are supervised by a principal who usually has a larger town school as well as one or more country schools.

A review of the literature on rural schools reveals a lack of consensus about the definition of rural schools. To illustrate the inconsistencies, DeYoung (1987) provided two definitions of rural education: The National School Board Association defined a school as rural if it had fewer than 2,500 students enrolled, or the school served primarily rural families. The National Rural
Development Institute defined a rural school as one where there were fewer than 150 residents per square mile in the district or when the district is located in a county where over half of the residents live in communities of fewer than 5000 people (cited in Helge, 1985, p. 5).

South Dakota is a sparsely populated rural state with approximately 77,047 square miles (Price, 1980, p. 159) and a population of 690,768 people in 1980 (U.S. Department of Commerce, 1983). Only a few school districts in the state would not be considered rural according to either of the definitions given above. Of the 174 K - 12 school districts in the state, 95 schools (54 percent) have K - 12 enrollments of 350 or less, and another 49 schools (28 percent) have K - 12 enrollments between 351 and 800. Only 30 schools (17 percent) have a K - 12 student enrollment of over 800. In 1988, there were 134 small one or two teacher public elementary schools open in South Dakota (South Dakota Division of Elementary and Secondary Education Directory, 1987).

Barker and Muse (1986) found that the average one-room school enrollment in America ranged from a low of eight in South Dakota and Montana to a high of seventeen in California. Nearly 50 percent of the small one or two teacher schools employed teachers with 0-3 years of teaching experience while the majority of rural schools with more than one or two teachers had teachers with over six years of experience. Although those teachers in the smallest rural schools had the least amount of teaching experience, Barker
and Muse (1986) reported that few rural school teachers were inexperienced. The average number of years of teaching experience ranged from 8.4 in Wyoming to 13.1 in Nebraska, with South Dakota teachers having an average of 11.6 years of teaching experience. Furthermore, most of the teachers had been teaching at the same school for between two and five years.

Classroom management skills are important in all schools. The large elementary schools normally found in urban areas are staffed by teachers who collectively have a breadth of expertise and at the same time have a high degree of specialization. The situation is not the same in the smaller elementary schools which serve communities in rural areas. Rural schools generally have one or two teachers that cope with the same demands on a smaller scale as that of a teacher in a larger school (Baker & Ambrose, 1985).

Although the basic curriculum in urban, suburban and rural school is similar, there are important demands in the rural educational setting which are different. Some of these are: (a) be able to teach more than one subject and more than one grade level to students with a wide range of abilities in the same classroom during the same time span, (b) be knowledgeable about a wide range of curricular materials and resources and be efficient in their management, and (c) be able to direct/supervise a variety of school activities. Frequently the small rural school teacher will have to teach different subjects in alternate years or combine pupils of more than one subject or grade in a single class. Typically these
teachers have from three to five preparations daily in different subjects for each grade (Baker & Ambrose, 1985; Barker & Beckner, 1985; Horn, Davis, & Hilt, 1985).

Rural school teachers are generally more isolated from other teachers and do not have as many opportunities to interact with professionals with similar subject-matter expertise. DeYoung's (1987) study recommended a more general college curricular preparation and/or a second specialization in small school instruction because of different demands and responsibilities placed on the rural school teacher. In recent years some colleges and universities have offered specialized pre-service teacher education for teaching in small/rural schools.

Baker and Ambrose (1985) studied in-service training for teaching science in rural elementary schools in England and reported that many small rural school teachers have confidence in their pupil relationships but expressed feelings of professional isolation. Remarks such as "I do not attend courses or conferences since I do not know anyone there and I do not feel part of the wider educational discussion" (p. 32) raised questions about the insecurity experienced by the rural school teacher.

Insecurity and the lack of professional interaction leading to the development of expertise in the subject area may limit the extent to which a teacher may teach a subject they lack confidence in teaching. It is not unusual for a rural teacher to receive
little, if any, in-service support in a subject they are not adequately prepared to teach (Barker & Beckner, 1985). Rural teachers, because of their geographic isolation, may not participate in in-service training programs such as those offered in nutrition education. Verling (1985) recommended special efforts be made to keep the rural teacher in the professional mainstream by keeping them involved through in-service activities and staff communications.

In the rural school, it is possible for new ideas about methods of teaching and curriculum to be implemented within a short time period. This is a definite advantage of the smaller school but it does require some external support. In-service programs and short courses are effective means of staff development and support for decreasing the sense of professional isolation and providing training for new curriculum innovations (Baker & Ambrose, 1985).

Summary

The literature reviewed in this study provided information about the legislative and research support for nutrition education, types of teacher in-service training, the placement of nutrition education materials, and the inclusion of nutrition in the elementary curriculum of urban and rural schools. Factors which appear to influence the extent to which nutrition education materials are used in the schools include the nutrition background of the teacher, the administrative support available in the school district for nutrition education, and the method by which teachers
were introduced to new materials. Research on the influence of teacher training indicated that increased training was associated with increased amount of time the teacher spends teaching nutrition. In-service training by consultants was the preferred method; however, increased amounts of teaching has been reported with the use of peer-educators for in-service training. Self-instruction was the least influential method reviewed. Nutrition background of the teacher and administrative support for nutrition had a positive influence on the inclusion of nutrition education in the elementary curriculum. Although the needs of urban and rural school teachers are generally quite similar, research indicates that rural school teachers need to receive more encouragement for teaching nutrition from peers and administrators. They also need training in methods and techniques for teaching small-size classes.
Chapter 3

Methods and Procedures

The purpose of this research study was to determine if the method used to place nutrition education materials with teachers affects the use of these materials and the inclusion of nutrition education in the curriculum. Over 900 elementary teachers in sixty-one public school districts and eight private schools in South Dakota served as the population for this study. The teachers received the revised FOOD...Your Choice, Grades 1-6 nutrition education modules prior to December 9, 1987. An instrument was designed by the researcher to obtain feedback on how the program was being used and the reaction of teachers to FOOD...Your Choice, Grades 1-6 after the program had been in the school for three to seven months.

Population and Sample

To collect information about teacher usage of the FOOD...Your Choice, Grades 1-6 program, a listing of those teachers in grades 1-6 who had received one or more modules for their classroom was obtained from the Dairy Council of South Dakota. The list was stratified by school district as to the type of in-service training each teacher received and size of student enrollment in the school district. The first list (N = 826) included all the teachers who received an in-service training from a Dairy Council nutrition educator (direct-contract); the second list (N = 112) included all
the teachers who had received an in-service training from a
colleague or school administrator (indirect-contact). The lists
were then categorized according to enrollment guidelines established
by the South Dakota Association of School Boards. Large schools
were identified as those districts having a K-12 student
enrollment greater than 800, medium size schools had 351-800
students and small schools had 350 or fewer students. From these
lists, a stratified random sample of 338 names and addresses (271
from direct-contact list and 67 from indirect-contact list) was
drawn using a table of random numbers. The third list (N = 58)
included teachers in five schools who had not participated in an FYC
training but received the FYC modules. This group was the
self-directed group which served as the control in the study.
Because this group was smaller, all the teachers were included in
the survey. Some of the participants who were first identified as
having attended an in-service training indicated on the question-
naire that they had not participated in a training and consequently,
were later reassigned to the control group.

Initially the control group (N = 58) was composed of
teachers from one large school district, two medium size school
districts, and two small school districts. The percentage of large,
medium and small schools in this distribution closely matched the
school-size distribution in the experimental groups. One of the
schools in the control group was a private school. Thirty-six
teachers who were first identified in an experimental group were
reassigned to the self-directed or control group because they indicated on the survey that they had not participated in an in-service training.

One school district required a research proposal (Appendix A) which was presented at the school district administrator's meeting for approval prior to granting permission for the school to be one of the control schools participating in the study. Arrangements for the other control schools were made by telephoning the principal. A letter (Appendix B) which confirmed the details of the agreement was sent to each principal.

Principals in schools of the two experimental groups were sent letters (Appendix C) requesting permission to include the teachers they supervised in the random sample. Each principal was asked to contact the researcher by a specific date only if their school had a policy or set procedure for survey samples in the school or if they did not want their teachers to participate in the study. A copy of the survey instrument was sent with the permission request letter. Sixty-six schools participated in the study; one school chose not to be included in the survey. Two schools were omitted because they had participated in the pilot study of the research instrument which is later described.

The research instrument (Appendix D) was sent to 338 randomly selected teachers. Slightly over one-third of the teachers were included in the representative sample of the 938 elementary
teachers who had received the materials through an in-service training during the first five months of the 1987-1988 school year.

Questionnaires were sent to the five control schools. Principals in the control schools distributed the research instrument in the teacher’s mailboxes. Teachers returned the completed questionnaire in a sealed envelope to the principal’s office for return mailing. Due to departmentalization in two of the schools and the fact that three teachers in one school had previously participated in an FYC workshop, only 58 teachers were eligible for the control or self-directed group.

Treatment

The teachers in the two experimental groups attended a one-hour in-service training (Appendix E) conducted by either a Dairy Council nutrition educator (direct-contact) or a teacher/administrator (indirect-contact) who had attended an in-service training by a nutrition educator. The program was an adaptation of a workshop model developed by National Dairy Council. The in-service training included an overview of the Food...Your Choice, Grades 1-6 curriculum; explanation of the behavioral emphasis in the design of the materials; a 16-minute video, "Thumbs Up for Nutrition," which demonstrated teachers using the Food...Your Choice, Grades 1-6 program in their classes; viewing of the FYC materials and a discussion on how teachers saw Food...Your Choice, Grades 1-6 fitting into their school’s
curriculum. Each teacher was provided with FYC module(s) appropriate for the grade level(s) taught.

The teachers in the control group (self-directed) received the appropriate grade level module(s) without in-service training. The modules were distributed by the school administrator with instructions that the materials were to be considered the same as other new curricular materials which may have been purchased by the school. After the data were collected, nutrition educators were available to do an in-service training on implementing the FYC modules.

Instrument Development

The questionnaire was designed by the researcher and two graduate faculty advisors. It was reviewed for face validity by graduate faculty members in nutrition, home economics education, education, and dairy science. In addition, five Dairy Council of South Dakota staff members or former staff members, the president of the Dairy Council Board of Directors, two registered dietitians, two school administrators, and two elementary teachers who were not eligible to participate in the study reviewed the instrument. The questionnaire was revised based on the recommendations of these people.

The complete questionnaire (Appendix D) was pilot-tested and evaluated by fourteen elementary teachers in two schools that were eligible for the random sample. However, these schools were not included in the survey since they provided information for the pilot
The questionnaire was revised based on the responses and evaluation of the pilot test. The result of these revisions was a 31 closed-item questionnaire with space for additional comments at the end.

The instrument, a self-explanatory questionnaire (Appendix D), was developed to collect data from a stratified random sample of elementary teachers in South Dakota who had received the FYC program. The research instrument was composed of three parts: (1) items on the type of in-service the teachers participated in before using the FYC program, (2) items on how teachers implemented the FYC program in their classrooms, and (3) demographic and background information items on nutrition education awareness of the teachers and their educational preparation for teaching nutrition. Only teachers who reported having used the FYC materials in their classrooms completed the second section of the questionnaire.

**Data Collection and Analysis**

Data were collected by means of the questionnaire previously described. A cover letter (Appendix F) that requested cooperation and explained the purpose of the study, as well as an assurance of confidentiality, was sent with the questionnaire. The questionnaire, a stamped self-addressed envelope and cover letter were sent to 338 randomly selected teachers. Of these, 271 were from the group participating in an in-service workshop presented by a nutrition educator and 67 were from the group participating in an in-service workshop presented by a school administrator or
colleague. Each questionnaire was coded by school size and numbered for tracking unreturned responses. School administrators distributed questionnaires to 58 teachers who participated as the control group in the study. A separate coupon offering the participant a free gift for prompt return of the completed questionnaire was included with each survey letter.

Two follow-up mailings, consisting of a reminder letter (Appendix G) sent ten days after the initial mailing and a postcard (Appendix H) mailed two weeks after the reminder letter, were sent to those who had not returned the survey by the deadline date. Each follow-up mailing invited recipients to telephone the researcher collect at a daytime number provided if they needed another survey form. This procedure was a modification of Dillman’s survey method (Dillman, 1978).

Two hundred fifty-seven questionnaires were received from the experimental group yielding a response rate of 78.35 percent. Fifty-five questionnaires were returned from the control group yielding a response rate of 94.83 percent. Three hundred-twelve usable questionnaires were returned out of the 396 questionnaires distributed yielding a 78.79 percent return. Five teachers wrote letters or telephoned to indicate they would not be returning a survey for the following reasons: illness, not a classroom teacher, or no materials. Four questionnaires from the experimental group were not usable and were not considered in the study.
All returned questionnaires were read, coded, and recorded for computer entry. Raw data were entered in the computer and analyzed using the Statistical Analysis System (SAS) computer program.

Analysis of variance using Fisher's Least Significant Difference Test (protected t-test) and correlation coefficients (Pearson's $r$) were used to determine the significance of the relationship between the dependent variables and the descriptive and demographic data (SAS Institute, 1986). Level of significance of a .05 probability or below was selected as criteria for rejecting the null hypothesis.

**Null Hypotheses**

The following null hypotheses were developed to be tested and evaluated:

1. There is no significant relationship between the use of the FYC program in the school curriculum and teacher participation in in-service training programs.

2. There is no significant relationship among the use of the FYC program and the type of in-service training program (in-service delivered by a nutrition educator or by an administrator or teacher in the school district), and the teachers' perceived value of the in-service training program to lesson implementation.

3. There is no significant relationship between the use of nutrition education materials by teachers who perceived their
principal to be supportive and teachers who perceived their principal to be non-supportive of including nutrition education in the curriculum.

4. There is no significant relationship between the use of nutrition education materials by teachers who felt adequately prepared to teach nutrition and teachers who did not feel adequately prepared to teach nutrition.

5. There is no significant relationship between the teachers' perceived value of the nutrition education in-service training for implementing the FYC program and the age of the teachers.

6. There is no significant relationship between the use of nutrition education materials by teachers and school size.

7. There is no significant relationship between the type of teacher orientation and reported ease of use of the nutrition education materials.
Chapter 4

Results and Discussion

The purpose of this research study was to determine if the methods used to place nutrition education materials with teachers affected the use of these materials and the inclusion of nutrition education in the curriculum. This chapter explains the results of the study. A background and description of the subjects are provided as well as the findings and their statistical significance.

The data in the study resulted from a survey conducted during March and April, 1988. Three hundred twelve usable questionnaires were returned (78.79 percent), although not all teachers completed every item on the instrument. The inferences and conclusions referred to in the study are based on the responses of this group.

Background and Description of the Subjects

Background information was collected on the 312 teachers, representing approximately 36 percent of the elementary teachers in South Dakota who received the Food... Your Choice, Grades 1-6 nutrition education materials during the Fall of 1987. Tables 1-7 contain summaries of the demographic characteristics of the teachers in the study.

Teachers were categorized by school size according to the three classifications used by the School Administrators Association of South Dakota. School enrollment size was obtained from information provided by the South Dakota Division of Elementary and
Secondary Education. The largest number (35.9 percent) of the teachers responding to the survey taught in medium-size school districts (Table 1). This was followed by teachers (34.6 percent) who taught in large school districts. Teachers who taught in small schools comprised the smallest group (29.49 percent).

Table 1

Description of Teachers: School Size

<table>
<thead>
<tr>
<th>School Size</th>
<th>Teachers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Small (&lt;350 students)</td>
<td>92</td>
</tr>
<tr>
<td>Medium (351-800 students)</td>
<td>112</td>
</tr>
<tr>
<td>Large (&gt;801 students)</td>
<td>108</td>
</tr>
<tr>
<td>Total</td>
<td>312</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Teachers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number</td>
</tr>
<tr>
<td>----------</td>
</tr>
<tr>
<td>29.4</td>
</tr>
<tr>
<td>35.9</td>
</tr>
<tr>
<td>34.6</td>
</tr>
<tr>
<td>99.9&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
</tbody>
</table>

<sup>a</sup>Total does not equal 100 percent because of rounded numbers.

Teachers were asked to indicate the type of orientation they received on how to use the FYC materials. One hundred ninety-eight (63.5 percent) indicated they had participated in a workshop presented by a Dairy Council representative, and 23 teachers (7.3
percent) indicated they attended a workshop presented by a teacher or school administrator in their district. Therefore, a total of 221 attended some type of workshop; data is only available on 217 teachers because 4 teachers did not complete the entire questionnaire. Ninety-one teachers (29.2 percent) did not participate in an in-service training.

Approximately forty-five percent (n = 140) of the teachers reported first learning about the Food...Your Choice, Grades 1-6 program through their school administrator or other teachers in the school district. In addition, contact with Dairy Council representatives (n = 107, 34 percent) and participation in local and state in-service training programs (n = 62, 20 percent) were indicated as frequent first contacts with the FYC program. Other people, particularly family members and teacher friends at other schools, and publicity in professional journals and publications constituted 1 percent (n = 3) of the ways teachers first learned about the FYC program.

Teachers in the sample taught a cross-section of grade levels. The majority of the teachers (n = 266, 85 percent) taught one elementary grade; other teachers (n = 46, 14.8 percent) reported teaching more than one grade (Table 2). Of the teachers teaching more than one grade, 22 teachers (7.1 percent) taught two grades and 24 teachers (7.7 percent) reported teaching three or more grades. These responses are representative of the rural one-or-two teacher schools prevalent in sparsely populated areas of South Dakota.
Table 2

Description of Teachers: Grade(s) Taught

<table>
<thead>
<tr>
<th>Grade(s) Taught</th>
<th>Teachers</th>
<th>Number</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Multiple</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 and 2</td>
<td></td>
<td>6</td>
<td>1.9</td>
</tr>
<tr>
<td>3 and 4</td>
<td></td>
<td>3</td>
<td>1.0</td>
</tr>
<tr>
<td>5 and 6</td>
<td></td>
<td>13</td>
<td>4.2</td>
</tr>
<tr>
<td>&gt; two grades</td>
<td></td>
<td>24</td>
<td>7.7</td>
</tr>
<tr>
<td>Single</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td></td>
<td>64</td>
<td>20.5</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td>49</td>
<td>15.7</td>
</tr>
<tr>
<td>3</td>
<td></td>
<td>52</td>
<td>16.7</td>
</tr>
<tr>
<td>4</td>
<td></td>
<td>39</td>
<td>12.2</td>
</tr>
<tr>
<td>5</td>
<td></td>
<td>38</td>
<td>12.2</td>
</tr>
<tr>
<td>6</td>
<td></td>
<td>24</td>
<td>7.7</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>312</td>
<td>99.8(^a)</td>
</tr>
</tbody>
</table>

\(^a\)Total does not equal 100 percent because of rounded numbers.
Sixth grade teachers comprised the smallest number of teachers ($n = 27$, 8.6 percent) who reported teaching single grades. Some school districts in the survey have middle schools which include sixth grade, and these sixth grade teachers may not have been included in elementary school in-service programs.

The years of teaching experience (Table 3) were nearly equal between those who had taught ten or fewer years and those who had taught over ten years. The largest group of teachers ($n = 85$ or 27.2 percent) were in the 1 to 5 years of teaching experience range, followed closely by teachers with 6 to 10 years of teaching experience ($n = 74$ or 23.7 percent). These two groups comprised 51 percent ($n = 159$) of the total sample ($N = 312$). Forty-nine percent of the teachers had more than 10 years of teaching experience, with the group ($n = 75$, 24 percent) ranging from 16 to 25 years being the largest (note: the data represents an interval of ten years rather than the 5 year intervals reported previously). Seventeen percent of the teachers ($n = 53$) had 11 to 15 years of teaching experience and only 8 percent ($n = 25$) of the teachers had taught more than 25 years. The reported years of teaching experience ranged from 1 to 41.

There is a gradual decrease in the number of teachers as the years of teaching experience increase. Attrition of experienced teachers may be attributed to the teachers leaving South Dakota for higher salaried teaching positions in other states, leaving the
Table 3

Description of Teachers: Years of Teaching Experience

<table>
<thead>
<tr>
<th>Years of Teaching Experience</th>
<th>Number</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 to 5</td>
<td>85</td>
<td>27.2</td>
</tr>
<tr>
<td>6 to 10</td>
<td>74</td>
<td>23.7</td>
</tr>
<tr>
<td>11 to 15</td>
<td>53</td>
<td>17.0</td>
</tr>
<tr>
<td>16 to 25</td>
<td>75</td>
<td>24.0</td>
</tr>
<tr>
<td>26 to 41</td>
<td>25</td>
<td>8.0</td>
</tr>
<tr>
<td>Total</td>
<td>312</td>
<td>99.9</td>
</tr>
</tbody>
</table>

aTotal does not equal 100 percent because of rounded numbers.

...profession for other types of employment, or becoming professionally in-active.

Eighty-nine percent (n = 278) of the teachers indicated they had a bachelor's degree and the majority (n = 184, 59 percent) of the teachers had taken additional college courses after receiving their degree. Eleven percent (n = 33) of the teachers had a master's degree.
Teachers were asked to indicate their formal nutrition education training during high school, college and post-graduate period. Of the 312 teachers, 66 percent (n = 205) reported studying nutrition in high school, 35 percent (n = 109) reported studying nutrition during college, and 9 percent (n = 28) reported studying nutrition in post-graduate work. Twenty-one percent of the teachers (n = 65) reported they had no previous nutrition education training. Because teachers were instructed to indicate all responses that applied, totals do not equal 100 percent; each question should be considered separately.

Ten years ago, Pearson (1978) reported 50 percent of the elementary teachers in South Dakota had taken either a nutrition course in college or nutrition was included in their coursework, whereas only 44 percent reported similar coursework in 1988. However, the figures reported are similar to studies completed by Olson, Frongillo, Jr., and Schardt (1986), and Neafsey, Jensen, and Burklund (1985) and earlier studies which indicate between 41 and 53 percent of the elementary teachers have college training in nutrition. The findings of the research reported in this paper appear to support other studies; South Dakota teachers have similar formal nutrition training when compared with teachers in other regions of the United States.

Teachers were given a list of ten generally available sources of nutrition information (Table 4) and asked to indicate their two major sources; however, some teachers indicated more than two major
sources. Popular magazines (n = 187, 60 percent), and radio and television programs or newspaper articles (n = 122, 39 percent) were most frequently rated as major sources. Dairy Council programs and materials (n = 103, 33 percent) were rated third and when combined with in-service workshops or meetings (n = 38, 12.2 percent), which Dairy Council representatives frequently deliver, may equal a sum somewhat higher than 33 percent depending on whether or not teachers indicated only one or both responses as sources of information. Other less frequently indicated sources included school health or science curriculum materials (n = 78, 25 percent); newsletters from medical doctors and other health agencies (n = 40, 13 percent); and government sponsored nutrition education programs (n = 25, 8 percent) such as Cooperative Extension Service programs, 4-H Club involvement, participation in Special Supplemental Food Program for Women, Infants and Children (WIC) and the School Lunch Program. Commercial publications (n = 23, 7 percent), wellness programs (n = 20, 6 percent), and other sources (n = 8, 3 percent), especially weight control programs, were indicated as sources of information by some of the participants.

A study conducted by Pearson (1978) indicated that South Dakota teachers' use of professional and non-professional sources of nutrition information was equally divided. Teachers in this study indicated using more non-professional sources. This may be because of greater availability of nonprofessional sources and increased emphasis on health and nutrition by the popular press, or differences in the choices provided in the test question.
### Table 4

**Elementary Teachers' Major Sources of Nutrition Information**

<table>
<thead>
<tr>
<th>Sources</th>
<th>Number</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Popular Magazines</td>
<td>187</td>
<td>60</td>
</tr>
<tr>
<td>Television, Radio, Newspapers</td>
<td>122</td>
<td>39</td>
</tr>
<tr>
<td>Dairy Council Programs</td>
<td>103</td>
<td>33</td>
</tr>
<tr>
<td>Health/Science Curriculum</td>
<td>78</td>
<td>25</td>
</tr>
<tr>
<td>Professional Publications</td>
<td>65</td>
<td>21</td>
</tr>
<tr>
<td>Doctors and Health Agencies</td>
<td>40</td>
<td>13</td>
</tr>
<tr>
<td>In-service Training or Meetings</td>
<td>38</td>
<td>12</td>
</tr>
<tr>
<td>Government Programs</td>
<td>25</td>
<td>8</td>
</tr>
<tr>
<td>Commercial Publications</td>
<td>23</td>
<td>7</td>
</tr>
<tr>
<td>Community Wellness Programs</td>
<td>20</td>
<td>6</td>
</tr>
<tr>
<td>Other</td>
<td>8</td>
<td>3</td>
</tr>
</tbody>
</table>

\( N = 312. \)  \( \text{Number does not equal 312 because of multiple responses.} \)
\( \text{Percent does not equal 100 because of multiple responses.} \)

Teachers were asked to indicate if they felt adequately prepared to teach nutrition. Fifty-six percent \( (n = 174) \) indicated yes, while 38.9 percent \( (n = 121) \) indicated they felt to some extent prepared, and 5.1 percent \( (n = 16) \) indicated no.
Teachers were then asked to indicate the topics for nutrition education programs that would interest them. Current nutrition issues ($n = 135, 43.6$ percent), general nutrition short-course ($n = 134, 42.9$ percent), methods of teaching nutrition ($n = 111, 35.3$ percent) and a class on how to use the FYC materials ($n = 70, 22.4$ percent) were the most frequently indicated topics. Only $3.2$ percent ($n = 10$) of the teachers indicated they would not be interested in the topics offered. Because this was a multiple response question, the total percent does not equal $100$.

Class size (Table 5) was a variable which may have affected the extent to which teachers used the FYC program. Because some of the teachers in the sample were from small rural schools, the teachers were asked to indicate their class size. The majority of teachers in the survey ($n = 218, 70$ percent) averaged between $16$ and $25$ students in their classrooms. The number of smaller classes ($n = 48, 15$ percent) corresponds closely with the number of teachers teaching more than one grade. The number of classes ($n = 44, 14$ percent) averaging over $25$ students may be an indication of the large classes some elementary teachers are responsible for teaching or it could be a misunderstanding of the question. The survey asked for the average class size by grade and some teachers may have interpreted this to mean the total number of students in one grade (e.g. the second grade class).
Table 5

Description of Teachers: Class Size

<table>
<thead>
<tr>
<th>Class Size (students)</th>
<th>Teachers</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 to 15</td>
<td>48</td>
</tr>
<tr>
<td>16 to 25</td>
<td>218</td>
</tr>
<tr>
<td>Over 25</td>
<td>44</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>310(^a)</strong></td>
</tr>
</tbody>
</table>

\(^a\)Total does not equal 312 because of missing responses.

Teachers were asked to indicate the extent to which their principal supported nutrition education. Over half \((n = 162, 52.4\ \text{percent})\) of the teachers in the survey reported that their principal actively supported and encouraged teaching nutrition in the classroom (Table 6). Slightly less than half \((n = 148, 47.6\ \text{percent})\) of the teachers did not perceive their principal as being supportive or they did not know if their principal was supportive of nutrition education. Because nutrition education is not required in the South Dakota elementary curriculum, some principals may deliberately leave decisions on whether or not to teach such subjects to the teachers.
The position of these principals is not necessarily an indication of un-concern or non-support but may be an indication of their leadership style.

Table 6

Elementary Teachers Perception of Principal's Support for Nutrition Education

<table>
<thead>
<tr>
<th>Support</th>
<th>Number</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Encouragement</td>
<td>161</td>
<td>52.4</td>
</tr>
<tr>
<td>Unconcerned</td>
<td>19</td>
<td>6.2</td>
</tr>
<tr>
<td>Support unknown</td>
<td>127</td>
<td>41.4</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>305\textsuperscript{a}</td>
<td>100.0</td>
</tr>
</tbody>
</table>

\textsuperscript{a}Total does not equal 312 because of missing responses.

Syntheses of nutrition education studies by Johnson and Johnson (1985) and Weiss and Kien (1987) indicated administrative support was necessary to the implementation of nutrition education programs; however Olson, Frongillo, Jr., and Schardt (1986) reported that teachers did not rate their principal as influential in the
decision to teach nutrition. It is interesting to note that slightly over half of the teachers participating in this study knew that their administrators supported nutrition, yet school in-service training sessions in the study were coordinated through school principals and often the principal initiated the first contact with Dairy Council regarding the in-service.

Interest in nutrition may affect the extent to which a teacher teaches nutrition (Table 7). There are nine lessons in the FYC program. Teachers (n = 164) were asked to indicate the number of lessons taught by circling the appropriate number and to indicate

Table 7

A Comparison of the Number of FYC Lessons Taught and the Teachers' Indication of Interest in Nutrition$^a$

<table>
<thead>
<tr>
<th>Interest in Nutrition</th>
<th>No. of Teachers</th>
<th>Mean (percent)</th>
<th>Lessons Taught$^b$</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No. of Lessons</td>
<td>SD</td>
<td>Min.</td>
</tr>
<tr>
<td>None</td>
<td>3(1.8)</td>
<td>9.0000</td>
<td>0.0000</td>
</tr>
<tr>
<td>Somewhat</td>
<td>71(42.5)</td>
<td>6.6050</td>
<td>2.3389</td>
</tr>
<tr>
<td>Very high</td>
<td>90(53.8)</td>
<td>6.7000</td>
<td>2.5723</td>
</tr>
<tr>
<td>No response</td>
<td>3(1.8)</td>
<td>5.6666</td>
<td>2.8867</td>
</tr>
</tbody>
</table>

$^a n = 167. \quad ^b$Teachers circled the number of lessons taught.
whether they were very interested, somewhat interested, or not interested in nutrition. The mean number of lessons taught by teachers according to their level of interest in nutrition are shown for comparison. Teachers who are not interested \( (n = 3, \ 2\%\) in nutrition or only somewhat interested \( n = 71, \ 43\%\) in nutrition appear to teach as many nutrition lessons as those teachers who indicate being very highly interested \( n = 90, \ 54\%\) in nutrition.

The extent of interest a teacher has in nutrition does not appear to be a factor in the number of lessons a teacher teaches. This may not be an accurate conclusion because the no interest group is very small and it is somewhat unusual in that all of the teachers in this group indicated they had taught all nine lessons.

Of the 312 teachers participating in the survey, 287 \( (92\%\) reported having used the Food...Your Choice, Grades 1-6 materials or indicated they planned to use the materials. Only 25 teachers \( (8\%\) indicated they did not plan to use the nutrition education materials. Of these teachers, 13 \( (4\%\) said another teacher was responsible for teaching nutrition at their grade level; the remaining teachers indicated either there was not time for teaching nutrition or nutrition was not taught at their grade level.

Plans to use the materials is an important consideration in this study because teachers had received the FVC materials during the first five months of the school year (August - December), and the survey was conducted the following March and April. Consequently,
some of the teachers in the survey may have had the program only a short time prior to receiving the survey or they may have taught their nutrition unit earlier in the school year and prior to receiving the FYC materials.

One hundred sixty-six teachers (53 percent) had used the FYC program during the first seven months of the 1987-1988 school year. Of these teachers, 104 (63 percent) reported using the FYC program as a separate teaching unit; 32 (19 percent) reported integrating nutrition with course work in language arts, health, science, social studies, math or art; and 30 (18 percent) said they had used the FYC materials both as a separate unit and integrated components of the unit with other subjects. Ninety-six percent (n = 159) of the teachers who used the program said given a similar teaching situation next year, they would use FYC again to teach nutrition.

The teachers (n = 167) who had used the program were asked to indicate how many of the nine FYC lessons they taught (Table 8). Forty-one percent (n = 68) indicated they had taught all nine lessons. Over half (n = 93, 55.7 percent) of the teachers reported high use (7 - 9) of the FYC lessons in their classes, 31.7 percent (n = 53) of the teachers reported moderate use (6 - 8) and 10.2 percent (n = 17) reported low use (1 - 3) of the materials. Four teachers (2.4 percent) indicated they had used the materials but circled 0 lessons taught. Several of the teachers indicated that they were in the process of using the materials at the time of the survey and would be completing all the lessons but reported only the
Table 8
Level of Use of FYC Program by Teachers

<table>
<thead>
<tr>
<th>Level of Use</th>
<th>Number</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>High Use (7 - 9 lessons)</td>
<td>93</td>
<td>55.7</td>
</tr>
<tr>
<td>Moderate Use (4 - 6 lessons)</td>
<td>53</td>
<td>31.7</td>
</tr>
<tr>
<td>Low Use (1 - 3 lessons)</td>
<td>17</td>
<td>10.2</td>
</tr>
<tr>
<td>No use (0 lessons)</td>
<td>4</td>
<td>2.4</td>
</tr>
<tr>
<td>Total</td>
<td>167</td>
<td>100.0</td>
</tr>
</tbody>
</table>

number of lessons they had completed. In addition to using the newly introduced FYC program, 18 percent (n = 56) indicated having continued to use the older FYC materials in their classrooms as well.

In comparison, Pepple (1986) did a study on the implementation of a new agricultural curriculum program using three types of in-service training programs and found that none of the teachers reported very high use of the materials. Pepple's high use rating would be comparable to teaching seven to nine of the FYC lessons. In the FYC study, 55.7 percent (n = 93) of the teachers reported high use (using seven to nine lessons).

The teachers who used the program rated how easy or difficult it was to use the materials in their classrooms. Using a seven point
scale, over 68 percent (n = 113) of the teachers rated the materials a 7 or 6 which indicated the FYC materials as being very easy to use, 16 percent (n = 27) rated the ease of use a 5, and only 14.6 percent (n = 24) rated the ease of use "4" or below.

Teachers were asked if they had taught nutrition this year or if they planned to teach nutrition. If they planned to teach nutrition, they were to indicate how many hours they had taught or would be teaching it. If teachers did not plan to teach nutrition, they were asked to indicate reasons why they would not be teaching nutrition. Two hundred eighty-eight teachers said they had or planned to teach nutrition during the school year and 24 teachers said they did not plan to teach nutrition during the school year.

Table 9 shows the number of hours the teachers indicated they planned to spend teaching nutrition. The majority of teachers (n = 113, 39.2 percent) said they either had or planned to teach nutrition from 6 - 10 hours during the school year. Another 32.6 percent (n = 94) indicated 1 - 5 hours for nutrition, and 43 teachers (15 percent) said they included 11 hours or more of nutrition in their classes. Thirty-eight teachers (13.2 percent) who said they had taught or planned to teach nutrition did not answer the second part of this question. This omission may be due to the layout design of the questionnaire, which required a response to be written in the space to the right of the question rather than on the left-side of the page as were the other responses (Appendix D, p. 94).
Table 9

Description of Teachers: Hours of Nutrition Taught

<table>
<thead>
<tr>
<th>Hours</th>
<th>Number</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 - 5</td>
<td>94</td>
<td>32.6</td>
</tr>
<tr>
<td>6 - 10</td>
<td>113</td>
<td>39.2</td>
</tr>
<tr>
<td>11 - 15</td>
<td>23</td>
<td>8.0</td>
</tr>
<tr>
<td>16 - 20</td>
<td>8</td>
<td>2.8</td>
</tr>
<tr>
<td>&gt;21</td>
<td>12</td>
<td>4.2</td>
</tr>
<tr>
<td>No response(a)</td>
<td>38</td>
<td>13.2</td>
</tr>
</tbody>
</table>

\(\text{Total: 288, 100}\)

\(a\)The high number of no responses may be due to flaws in instrument layout design and the question was inadvertently omitted.

Of the 24 teachers not teaching nutrition (7.7 percent) during the school year, 13 (54.2 percent) indicated that another teacher taught the subject, 8 (33.3 percent) said that there was no time in their schedule for teaching nutrition and 3 (12.5 percent) said that nutrition was not included in the curriculum at their grade level.
Statistical Findings

Preliminary examination of the data consisted of frequency distributions and cross-tabulations of the variables in order to determine potentially significant relationships between the use of the FYC program and the other variables in the study. Inferential statistics were used to test the seven hypotheses.

Hypothesis Testing

Hypothesis One. There is no significant relationship between the use of the FYC program in the school curriculum and teacher participation in in-service training programs.

Teachers were asked to indicate if they taught or planned to teach nutrition during the school year, and if so, how many hours did they plan to teach it. Table 10 shows the results of the correlation of number of hours a teacher reported teaching nutrition in the classroom, value of in-service training and number of FYC lessons used. As the table indicates, there is a slight positive relationship \((r = .2184)\) between the number of hours a teacher teaches nutrition and the reported value of the FYC in-service training in helping implement the nutrition education program. However this is so at the 0.0012 level of significance. As shown, a slightly positive relationship \((r = .3074)\) also exists between the number of hours a teacher teaches nutrition and the reported number of FYC lessons a teacher teaches. This was significant at the .0001 level and is an indication that the teachers who are including
Table 10

Pearson's Product Correlation Coefficients for Hours of Nutrition Education Taught and Value of In-service Training and Number of FYC Lessons Taught

<table>
<thead>
<tr>
<th>Variable</th>
<th>Number</th>
<th>Probability</th>
<th>Coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>Value of In-service</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Training</td>
<td>217(^a)</td>
<td>.0012</td>
<td>.2183</td>
</tr>
<tr>
<td>Number of FYC Lessons</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Taught</td>
<td>167(^b)</td>
<td>.0001</td>
<td>.3073</td>
</tr>
</tbody>
</table>

\(^a\)Represents teachers who indicated the hours of nutrition taught and who participated in an in-service training.

\(^b\)Represents teachers who indicated the hours of nutrition taught and who used the FYC program prior to completing the survey.

Based on these findings, the hypothesis was rejected. These positive findings were expected since Pepple, (1986); Olson, Frongillo, Jr., and Sbardt, (1986); and Tinsley, Houtkooper, Engle and Gibbs, (1985) also reported that participation in training
programs is associated with increased amounts of time that teachers spend teaching nutrition in the classroom. Correlation between the hours spent teaching nutrition and use of the FYC materials, may be due, in part, to the teachers desire to use the new materials; however, the test does not indicate a causal effect. It is not known whether the new materials caused an increase in the number of hours nutrition was taught or if the teacher would normally teach the indicated number of hours and chose to use the FYC materials. However, it is clear that a relationship exists between participation in nutrition education training programs and number of hours teachers report teaching nutrition in their classes.

Hypothesis Two. There is no significant relationship among the use of the FYC program and the type of in-service training program (in-service delivered by a nutrition educator or by an administrator or teacher in the school district), and the teachers' perceived value of the in-service training program to lesson implementation.

Teachers were asked to respond to a question rating the value of the workshop in helping them implement the FYC program in their classrooms. Responses were rated on a 7-point scale, 7 being an excellent rating and 1 being of very little use in the classroom. In the data analysis, the scale was condensed to a 5-point scale. A rating of 6 or 7 was recoded a 5, 5 was assigned a 4, 4 was assigned a 3, 3 was assigned a 2 and ratings of 1 and 2 were assigned a 1. Data were condensed because there were no responses in the low use portion of the scale.
The initial teacher/administrator treatment group was much larger but 36 responses were reassigned to self-instructed treatment group because the teachers reported not participating in an in-service training. The records provided indicated an in-service had been conducted in their school district. The teachers may not have identified a presentation by another teacher or administrator as an in-service training but rather as some indicated, they saw a video and discussed the new materials at a teacher's meeting, or an in-service may not have been presented.

Table 11 identifies the number, the mean, the standard deviation, minimum and maximum value scores for the value of the in-service trainings delivered by a Dairy Council representative \((n = 194)\) and a teacher or principal \((n = 23)\). As can be seen, the training delivered by a Dairy Council representative had a higher mean score \((4.247)\) and smaller standard deviation \((0.992)\) than the mean score \((3.695)\) and standard deviation \((1.259)\) of the training delivered by a peer educator or principal. Although a review of the literature did not indicate previous studies comparing the effectiveness of the two delivery systems, both delivery systems are reported as effective means of staff development.

Further statistical testing using analysis of variance was done to determine if there was a significant difference between the two treatments. Mean scores showed significant \(F\) values \((p < .0032)\). Follow-up statistical testing using Student's \(t\) test \((p < .05)\) indicated that there was a significant difference between the
Table 11

Comparison of Teachers' Rating of the Value of Nutrition In-service Training by Delivery Method

<table>
<thead>
<tr>
<th>Type of Delivery</th>
<th>Number</th>
<th>Mean&lt;sup&gt;a&lt;/sup&gt;</th>
<th>SD</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dairy Council Representative</td>
<td>194&lt;sup&gt;b&lt;/sup&gt;</td>
<td>4.247</td>
<td>0.992</td>
<td>1.000</td>
<td>5.000</td>
</tr>
<tr>
<td>Peer Educator or Principal</td>
<td>23</td>
<td>3.695</td>
<td>1.259</td>
<td>1.000</td>
<td>5.000</td>
</tr>
</tbody>
</table>

<sup>a</sup>Scale values were Excellent = 5, 4, 3, 2, 1 = Little value.

<sup>b</sup>Total does not equal the total number of teachers attending a Dairy Council in-service (n = 198) because of missing responses.

perceived value of the in-service training by Dairy Council representatives and that by a peer educator or principal. Programs presented by Dairy Council representatives were perceived to be more helpful in implementing the FYC program than peer educators or principals. Based on these findings, the hypothesis was rejected.

Hypothesis Three. There is no significant difference between the use of nutrition education materials by teachers who perceived their principal supportive and teachers who perceived their principal non-supportive of including nutrition in the curriculum.
Teachers were asked to indicate the extent their principal supported nutrition education. Teachers rated their principal as being very supportive and encouraging, unconcerned, discouraging or I do not know.

Analysis of variance confirmed that there was no significant relationship between the number of nutrition lessons taught (measurement of reported use of nutrition education materials) and the teacher’s perceived support and encouragement for teaching nutrition from school principal. Based on this test, the hypothesis was accepted. This affirms findings of Olson, Frongillo and Schwartd (1986), however other studies (Johnson & Johnson, 1985, Tinsley, Houtkoper, Engle & Gibbs, 1985; Soliah, Newell, Vaden & Dayton, 1983) showed that administrative support was necessary for teaching nutrition education in the classroom.

Hypothesis Four. There is no significant difference between the use of nutrition education materials by teachers who felt adequately prepared to teach nutrition and teachers who did not feel adequately prepared to teach nutrition.

Tests using analysis of variance confirmed that there was no significant relationship between the use of the nutrition education materials by teachers who felt adequately prepared to teach nutrition and teachers who did not feel adequately prepared to teach nutrition. Based on this test, the hypothesis was accepted.

This finding may provide support for the earlier reported findings that the FYC program is easy to implement in the classroom.
The need for teachers to feel adequately prepared to teach nutrition is not an important factor in its use.

**Hypothesis Five.** There is no significant relationship between the teachers' perceived value of the nutrition education in-service training for implementing the FYC program and the age of the teachers.

Teachers were asked to indicate their age range in one of three categories, under 35 years, 36 - 50 years, and 51 years or over. Table 12 shows that there is a significant difference in the

Table 12

**Analysis of Variance for Age with Value of Nutrition Education In-service Training**

<table>
<thead>
<tr>
<th>Age</th>
<th>Lower Confidence Limit</th>
<th>Difference Between Means</th>
<th>Upper Confidence Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt; 51 and</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>36 - 50</td>
<td>-0.2440</td>
<td>0.1656</td>
<td>0.5752</td>
</tr>
<tr>
<td>&gt; 51 and</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt; 36</td>
<td>0.0683</td>
<td>0.4773</td>
<td>0.8864***</td>
</tr>
<tr>
<td>&lt; 36 and</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>36 - 50</td>
<td>0.0264</td>
<td>0.3117</td>
<td>0.5970***</td>
</tr>
</tbody>
</table>

***p < .05; DF = 196; MSE = 0.978382; C.V. of T = 1.97214.
value of the nutrition education in-service training for those teachers who are under 35 years of age and teachers who are 36 and older. This was determined at the .05 significance level. There was no statistical significance between the value of the in-service training and teachers aged 36 - 50 years and those who were over 51 years. The hypothesis was accepted.

The age appropriateness of the nutrition education in-service training sessions has not been a consideration in the literature reviewed. However, because of the design of the in-service (Appendix E), the older, more experienced master teachers may have reported the one-hour program more helpful than the younger, maturing teacher.

**Hypothesis Six.** There is no significant relationship between the use of nutrition education materials and school size.

Analysis of variance tests confirmed that there was no significant relationship between use of nutrition education materials and the size of the schools in which the teachers are assigned. Based on this test, the hypothesis was accepted.

**Hypothesis Seven.** There is no significant relationship between the type of teacher orientation and reported ease of use with the nutrition education materials.

During the in-service training, the teachers received instruction about features of the FYC program which facilitated implementation. On the survey, teachers were asked to rate the ease
of implementing the FYC program on a scale of one to seven (Table 13). The data were tested using analysis of variance. There was a

Table 13

Analysis of Variance for Type of In-service Training in Relation to Ease of Use

<table>
<thead>
<tr>
<th>In-service Training</th>
<th>Lower Confidence Limit</th>
<th>Difference Between Means</th>
<th>Upper Confidence Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peer Educator vs.</td>
<td>Peer Educator vs.</td>
<td>Peer Educator vs.</td>
<td>Peer Educator vs.</td>
</tr>
<tr>
<td>Nutrition</td>
<td>Nutrition</td>
<td>Nutrition</td>
<td>Nutrition</td>
</tr>
<tr>
<td>Educator</td>
<td>Educator</td>
<td>Educator</td>
<td>Educator</td>
</tr>
<tr>
<td>-0.3100</td>
<td>0.1798</td>
<td>0.6696</td>
<td></td>
</tr>
<tr>
<td>Self Taught</td>
<td>Self Taught</td>
<td>Self Taught</td>
<td>Self Taught</td>
</tr>
<tr>
<td>0.1025</td>
<td>0.6500</td>
<td>1.1975***</td>
<td></td>
</tr>
<tr>
<td>Nutrition</td>
<td>Nutrition</td>
<td>Nutrition</td>
<td>Nutrition</td>
</tr>
<tr>
<td>Educator vs.</td>
<td>Educator vs.</td>
<td>Educator vs.</td>
<td>Educator vs.</td>
</tr>
<tr>
<td>Self Taught</td>
<td>Self Taught</td>
<td>Self Taught</td>
<td>Self Taught</td>
</tr>
<tr>
<td>0.1289</td>
<td>0.4702</td>
<td>0.8116***</td>
<td></td>
</tr>
</tbody>
</table>

*** p < .05; DF = 136; MSE = 0.811527; C.V. of T = 1.97756.

significant relationship (p < .05) between the teachers who received in-service training by a nutrition educator or a peer educator and the control group (self-taught teachers) and the reported ease of use
of the nutrition education materials. Teachers who did not receive an in-service training (control group) were significantly different from the teachers who had participated in an in-service training. There was no significant difference noted between the ease of implementation and the two groups who received an in-service training. Based on the data collected, the hypothesis was rejected.

Summary of Hypotheses Testing

On the basis of the data studied, it is clear that teacher in-service training has an effect on the use of nutrition education materials in the classroom. Analysis of variance (p = .05) affirmed that in-service training programs helped teachers implement FYC; teachers who attended in-service training spent more hours teaching nutrition, reported teaching more FYC lessons, and indicated that FYC was easier to implement than the teachers who had received the materials without an in-service training. Teachers over the age of 36 rated the in-service more valuable than younger teachers. Inservice training sessions presented by Dairy Council representatives had a higher mean score. There was a significant difference between these in-services and those presented by peer educators or administrators. However, statistical testing showed that presentations by both Dairy Council representatives and local teachers or administrators were effective means of training the teachers about the development and use the FYC program in their classrooms.
CHAPTER 5

Summary, Recommendations, Implications

The purpose of this study was to determine if the methods used to place nutrition education materials with teachers affected the use of these materials and the inclusion of nutrition education in the curriculum. This chapter will summarize the results and findings of the study; implications of the study and recommendations for further study and action will be given.

Summary

The results of this study indicated that teachers who participated in an in-service training program prior to placement of nutrition education curriculum materials incorporated more of the materials into the curriculum than the teachers who received the materials without participating in a training session. Teachers who attended an in-service training delivered by either a nutrition educator or a local school administrator or teacher reported completing more FYC activities and taught more hours of nutrition than did the control group.

Of the 312 elementary teachers participating in the survey, 92 percent said they either had used or intended to use the nutrition education program they received at the in-service training. Teachers in the sample, on the average, taught in rural schools with less than 800 students enrolled in the district. Most of the teachers taught one grade and reported learning about the FYC program through their
school administrator. In the sample, there was nearly an equal distribution between teachers who had less than ten years of teaching experience and those who had more than ten years. The academic degree reported by the majority of teachers was a bachelor’s degree with additional college course work. Over half of the teachers reported their principal to be supportive of teaching nutrition education in the classroom.

Teachers who participated in an in-service training delivered by a Dairy Council representative reported higher mean scores on the value of the workshop in helping them implement the FYC program than did teachers who participated in an in-service training delivered by a school administrator or peer. The majority of teachers rated the FYC program as very easy to use. Personal interest in nutrition was not a indicator on whether or not a teacher teaches nutrition. Teachers in lower grades rated the workshop more helpful than teachers in the higher elementary grades.

Statistical analyses affirmed that teacher in-service training with placement of nutrition education materials is an effective means of helping teachers include nutrition education in the elementary curriculum.

Recommendations

Further research could aid in affirming the results of this study. The information was collected by survey from a randomly selected, representative sample of the teachers receiving the FYC materials during the first year of implementation. Follow-up studies
using the same format would provide additional information on how the teachers used the materials.

Teachers in South Dakota received the FYC materials at no cost to the school district. Therefore, the generalizability of the findings may be limited to elementary teachers who receive materials from agencies having similar policies as the Dairy Council of South Dakota.

The FYC, 1-6 program replaced an older FYC program from National Dairy Council which many of the teachers were accustomed to using in their classes. Name and product identity existed in many of the schools, so some of the teachers may have been influenced to use the materials through previous contacts. To determine if there may have been an effect from the previous FYC program, participants were asked on the survey if they had used the older FYC program this year. Eighteen percent (n = 56) of the teachers indicated using the older FYC. However, no significant differences were found in the statistical testing.

The survey was taken during the first year of implementation and only months after the teachers received the materials. Some of the teachers in the survey group had already taught their nutrition unit before receiving the materials and others indicated they planned to teach their nutrition unit later in the school year after the survey was completed. Teachers in either of the above situations could not complete the section on use of the FYC program. These teachers may have responded differently because they may adhere
closely to a plan of study rather than using materials as they become available.

Observational and interview data collection techniques would provide additional information about how the teacher actually uses the materials in the classroom and the degree of implementation that occurs. Further knowledge of the extent to which the teacher uses the program as it is designed would be beneficial to nutrition educators and education specialists who develop and disseminate nutrition curricula.

A longitudinal study over several years, or a follow-up study in the second or third year, is recommended to determine if there is a difference in the usage of the materials after they have been in the schools for a longer period of time. Information on the number of teachers who repeatedly use the program and the extent to which the teachers continue to use the program would be beneficial to school administrators and nutrition education professionals in the management and placement of teaching materials.

Data seem to indicate that longer in-service programs appear to be more beneficial in helping teachers implement new programs using the recommended design. The current trend is to have in-service training sessions last for a minimum of three hours to one-or-two days or a maximum of five days. There was very little data on the one-hour in-service, and in fact, some of the teachers participating in the survey did not recognize the one-hour session as an in-service training. They wrote "we had a brief introduction to
the materials and watched a video". Future studies should more clearly define terminology used on the survey instrument. In this study, an introduction or orientation to the materials may have been more appropriate terminology.

Based on the teacher's responses, the findings of this study seem to indicate that most of the teachers want more nutrition or nutrition education courses. Therefore, it is recommended that short-courses be provided to update their nutrition knowledge as well as their methods of teaching nutrition in the elementary classroom. This means that nutrition educators might collaborate with nutrition education researchers and university instructors, as well as state department of education officials to offer courses that would provide the desired information and qualify as certification renewal credits and/or graduate level courses.

Implications

This study was concerned with the effects of a teacher in-service training program on the implementation of the FYC nutrition education curriculum materials. Teachers who had received the materials were the focus of the study. Teachers in the treatment groups showed a greater use of the materials than did the control group.

The research data appear to indicate that in-service training sessions are important factors in encouraging teachers to use the nutrition education materials. However, it really does not seem to matter whether Dairy Council representatives or peer educators
present the training program. This means that it may be more cost effective to serve remote geographic areas through indirect delivery systems such as peer educators. Dairy Council personnel might be more effective if their time were spent developing additional nutrition education programs that could be delivered by interested persons in the local school district. Newsletters, individualized by grade level, with age appropriate nutrition education activities, bulletin board ideas, and nutrition information might be useful materials for the teacher. Promotional materials, including announcements for notifying teachers about the in-service training, FYC fact sheets, and posters could be used to encourage teachers' attendance and implementation of the program after the in-service. These promotional materials could be useful for the local contact person making arrangements for the in-service training.

Some of the teachers, particularly in the intermediate (4 - 6) grades, indicated there was no or little time for nutrition education. It is apparent that there will be increasing demands for the instructional time available in the classroom to teach subjects that are not required by law. This may mean that nutrition educators are going to have to spend time teaching teachers how to integrate nutrition education with basic skills classes such as language arts and math, as well as in health, science, social studies and art. Weiss and Kien, (1987) recommended teachers be taught how to integrate nutrition into the curriculum rather than competing with other subjects. Incorporating FYC in the nutrition component of the
Growing Healthy™ comprehensive health curriculum, is an example of how the program could complement rather than compete with another subject. Olson, Frongillo, Jr., and Schardt, (1986) found that teachers who integrate nutrition with other subjects teach more nutrition than those who teach it as a separate subject. Nutrition educators are going to have to decide if they are going to get more involved in the integration process. And if they are to become more involved, they may have to expand their own curriculum background as well as establish different working relationships with curriculum directors, administrators and people outside of the school district.

After the initial implementation period of the FYC program, there may be a need for continuing contact with teachers to re-stimulate their interest. The challenge to nutrition educators is to develop some effective, yet cost efficient method of providing motivational support for teaching nutrition in the classrooms. A follow-up in-service training which would provide information on how to enhance the use of the FYC program may also be beneficial to teachers, particularly the younger, less experienced teacher. This means that nutrition educators such as Dairy Council representatives would have greater contact with the teachers and be able to provide ongoing assistance and encouragement. Continual contact with teachers has been found to be an effective method of increasing the extent to which nutrition education is included in the elementary school (Johnson & Johnson, 1985; Olson, Frongillo, Jr., & Schardt, 1986; Weiss & Kien, 1987).
Over half the teachers reported popular magazines, television, newspapers and Dairy Council as their main sources of nutrition information. This might imply that Dairy Council and other nutrition educators could target teachers as one segment of the market in a manner similar to procedures for reaching other populations such as the elderly, young child-bearing families, and people from different economic levels. News releases and stories could be strategically placed to reach teachers through these common channels of mass communication.

This research study achieved its purpose, but further documentation of the impact of in-service training on how teachers use the FYC program is warranted. If nutrition education is to continue as an elective subject in the South Dakota elementary school curriculum, nutrition educators must document the effectiveness of these programs, share the results with school, legislative and community representatives and constantly seek to improve upon their training and promotional efforts.
REFERENCES


APPENDIX A

Research Proposal to School District
DATE: November 15, 1987

TO: School District School Administrators

FROM: Cathy Voelzke, Nutrition Education Consultant, Dairy Council of South Dakota

RE: Research proposal and evaluation site request for FOOD...Your Choice nutrition education system, Grades 1-6

I am in the process of completing requirements for a Master of Science degree in Home Economics with emphasis in nutrition education and request permission to include teachers from a elementary school as a control group in my research. Essentially this would mean free placement of National Dairy Council's new revised FOOD...Your Choice (FYC) program for grades 1-6 in the school with the agreement that the teachers would complete a questionnaire later this school year. Details of this request are outlined below:

I. Background and Purpose of Study

Dairy Council of South Dakota, an affiliate of National Dairy Council, began placing the FYC materials in South Dakota schools in the fall of 1987. A complete set of materials is provided at no cost to the school district when an implementation workshop on how to use the materials accompanies the placement. The implementation workshop is usually presented by a Dairy Council representative, but in an attempt to be more cost and time efficient, selected teachers or administrators have presented workshops in their schools. Other schools have chosen to purchase the materials and proceed without a workshop.

The purpose of this study is to determine if the method of placement affects the usage of nutrition education materials. This question has been expanded to include other factors which may influence a teacher's decision to use certain materials.
II. **Time Frame**

The FYC materials are scheduled for placement in the schools by December 1, 1987. The survey will be mailed to the teachers by March 15, 1988 with a return date of April 1, 1988. A workshop on development and implementation of FYC will be provided after April 1, 1988 if desired.

III. **Financial Requirements**

Dairy Council of South Dakota will provide one FYC module ($18.00 value) for each classroom teacher in the selected school. There will be no financial obligations to the _________ School District and the materials would become property of the school.

IV. **Number of Teachers and Students Involved**

Twenty to twenty-five elementary teachers (1-6) from a large school district are needed in the control group. No students would be directly involved although it is assumed that each teacher would have approximately 20-25 students in their classroom. Permission is also requested to include the names of _________ School District teachers who received the FYC materials at a workshop presented during SDEA on the master list from which 150 teachers will be randomly selected.

V. **Participation Requirements**

The school would receive the FYC nutrition education program as soon as materials are available following administrative approval to participate in the study. There would not be an implementation workshop at this time. The principal would be required to distribute the materials and perhaps monitor the return of the questionnaire. Teachers would be expected to complete a 30 item, closed-answer questionnaire during the later part of March, 1988. After the survey has been completed, a Dairy Council representative would be available for a workshop, if desired by administration or staff.
VI. Benefits to the School District

A. Teachers: This study would provide an opportunity for the School District to pilot-test a program that is currently being considered for the nutrition component of the health curriculum now under revision. Participation in the study would allow more teachers to be involved in making a nutrition curriculum recommendation.

B. Students: The Food...Your Choice program is based upon knowledge about food and diet and developing life-skills to make reasoned food choices. The program has been learner verified and nationally pilot-tested to insure that it meets the needs and is appropriate for children from all types of backgrounds.

VII. Findings and Future Implications

Information concerning the use of curriculum materials after placement in education settings provides an indication of such things as the acceptance of the materials, the success of implementation approaches, the need for materials on a particular topic and the appropriateness of materials for a particular age group.

This type of information will be valuable to professional educators who are responsible for development and implementation of new curriculum materials and planning school in-service programs.

The findings of this study will be shared with the School District as well as other state and local school districts and affiliated Dairy Council units.
December 17, 1987

Dear

Enclosed is a list of the teachers who received the FOOD...Your Choice nutrition education program materials at the 1987 SDEA conference held in Sioux Falls in August.

I had planned to contact principals prior to sending the survey instrument to the teachers. Please advise how this should be handled in the school district.

School principal, called last week. We have made arrangements to deliver the boxes so they will be ready for distribution right after the Christmas vacation. These arrangements will work fine. I am glad to have a control school from the school district. Thank you for all you did to make this possible.

Happy Holidays!

Sincerely,

Cathrene Voelzke
Nutrition Education Consultant

CV: ceh

Enclosure
APPENDIX B

Participation Agreement
November 25, 1987

Dear __________________________

This letter is to confirm our earlier telephone conversations regarding the placement of FOOD...Your Choice (FYC) nutrition learning program for grades K-6.

Dairy Council of South Dakota has provided FYC boxes for each regular K-6 classroom in the district. In return, the school will be part of a pilot study on the implementation of FYC and agree to participate in a survey on the usage of FYC.

Your teachers need to be informed that they are part of a pilot study being conducted by SDSU and Dairy Council on the implementation of FOOD...Your Choice. They are to consider the materials as if they had been purchased by the school district. The teachers are not required to use the materials as part of the study but they should proceed as they would ordinarily do when new curriculum materials become available.

Registration cards were included in the shipment. Please return the completed cards to our office.

The questionnaire pertaining to FYC will be sent in March. After the survey is completed, either __________ or I would present a one hour workshop on the development and implementation of the FYC program or be available to lead discussion on its use if you or your staff desire.

I very much appreciate your cooperation with this study. I will be contacting you in March with more details. If you have questions, please call me. Thank you and Happy Holidays!

Sincerely,

Cathrene Voelzke
Nutrition Education Consultant

CV: ceh
APPENDIX C

Permission Request Letter
Dear Principal:

Earlier last fall, Dairy Council of South Dakota placed a newly revised FOOD...Your Choice (FYC) nutrition education learning series in your elementary classrooms. Because your school was one of the first fifty schools in South Dakota to receive the program, we are asking your cooperation in helping us evaluate "how well" we are doing.

We are conducting a study centering on the effectiveness of the FYC workshop and our implementation procedures. The findings will help guide us in presenting new nutrition education materials to schools like yours.

We would like to include the names of your elementary classroom teachers who have the FYC program on the list for a representative random sample. Each teacher selected will be mailed a 36-question survey that they can complete in a short amount of time. We ask that surveys be returned by April 1, 1988. A copy has been enclosed for your reference.

If your school has a policy for conducting evaluations of this type or if you prefer that your teachers not participate, I would appreciate hearing from you before March 10, 1988. Otherwise, we will assume it is permissible to proceed with the random sample selection and mailing of the survey.

This study will help me complete my master's program at South Dakota State University as well as help us improve our service to you and your staff. A copy of the findings will be available by request from our office. Thank you for your cooperation.

Sincerely,

Cathrene Voelzke
Nutrition Education Consultant
APPENDIX D

Instrument
SURVEY OF NUTRITION EDUCATION IN ELEMENTARY SCHOOLS

Directions: The following questions will provide information about the use of the new 1987 Food... Your Choice (FYC) Nutrition Education Program. Please answer each section as indicated.

1. This section of the survey is to provide information on how the newly revised Food... Your Choice (FYC) nutrition education program is being implemented. Select the answer(s) that most closely describes your response.

1. How did you first learn about the new FYC program?
   ____ Teacher or administrator in my school.
   ____ Dairy Council representative.
   ____ Teacher or administrator outside my school district.
   ____ Professional journal or publication.
   ____ Local or state meeting, school in-service programs.
   ____ Other, please specify

2. Did you receive any type of orientation on how to use the FYC nutrition program materials?
   ____ No orientation, (please skip questions #3 & #4).
   ____ Yes, please indicate type of orientation:
       ____ Workshop by Dairy Council representative.
       ____ Workshop by local teacher or administrator.
       ____ Other, please specify

3. The workshop I attended (check all that apply):
   ____ Provided me with necessary nutrition information.
   ____ Motivated me to use the FYC materials.
   ____ Taught me how to use the materials in my class.
   ____ Other, please specify

4. Mark an "X" on the line to indicate how you would rate the value of the workshop in helping implement FYC in the classroom?
   Excellent  /  /  /  /  /  /  /  /  Little value

5. Did your school administrator(s) attend an FYC workshop?
   ____ Yes  ____ No  ____ Do not know

6. During this school year, did you or do you plan to change the time of the year that you usually teach nutrition?
   ____ Yes  ____ No  If "yes", why did you change? Check all that apply.
       ____ New FYC materials I wanted to use.
       ____ New curriculum indicated change.
       ____ FYC materials fit with other subjects.
       ____ Administrative/staff decision.
       ____ Does not apply.
       ____ Other, please specify

7. What are your plans to use the FYC program?
   ____ Have used the FYC program.
   ____ Have not used FYC but plan to use it.
   ____ Have not decided if I will use FYC.
   ____ Have not and do not plan to use FYC.
   ____ Does not apply.
8. Did you use the older 1976 FYC Level 1, 2, or 3 program this year?
   ___Yes  ___No  If "yes", how did you use it?
      ___In combination with the new FYC program.
      ___As a separate nutrition unit.
      ___As a teaching tool in another subject area.
   ___Other, please specify__________________________

II. If you have not used the new FYC materials received in 1987, STOP here and turn to Part III. If you have used the new FYC program it is important that you complete this section. Please continue with Part II.

9. What factors influence your decision to use the FVC materials in class? Check all that apply.
   ___Ease of lesson preparation.
   ___Opportunity for active student involvement.
   ___Ease with which it could be integrated into other subject areas.
   ___High educational quality of the program.
   ___Attractiveness of the materials.
   ___Free or inexpensive program.
   ___Favorable teaching experience with earlier FYC program.
   ___Only nutrition education program available.
   ___Other, please specify__________________________

10. Put an "X" on the line below to show how easy or difficult it has been to use the new FYC materials.
    Very easy _______ _______ _______ _______ _______ _______ _______ _______ _______ Extremely difficult

11. What factors influenced your decision to use the FVC materials in class? Check all that apply.
   ___Ease of lesson preparation.
   ___Opportunity for active student involvement.
   ___Ease with which it could be integrated into other subject areas.
   ___High educational quality of the program.
   ___Attractiveness of the materials.
   ___Free or inexpensive program.
   ___Favorable teaching experience with earlier FYC program.
   ___Only nutrition education program available.
   ___Other, please specify__________________________

12. How many of the FVC lessons did you teach? Circle the appropriate number.
    0 1 2 3 4 5 6 7 8 9

13. What factors influenced your decision to use the FVC materials in class? Check all that apply.
    ___Ease of lesson preparation.
    ___Opportunity for active student involvement.
    ___Ease with which it could be integrated into other subject areas.
    ___High educational quality of the program.
    ___Attractiveness of the materials.
    ___Free or inexpensive program.
    ___Favorable teaching experience with earlier FYC program.
    ___Only nutrition education program available.
    ___Other, please specify__________________________

14. How did you teach the FVC lessons? Check one or two responses.
    ___Used as presented in the teacher's manual.
    ___Used only sections which fit my lesson plan.
    ___Incorporated some of my own ideas in most lessons.
    ___Used the food or food comparison cards without teaching FVC lessons.
    ___Used the student worksheets without teaching FVC lessons.
    ___Other, please specify__________________________

15. Given a similar teaching situation next year, would you use FVC to teach nutrition?
    ___Yes  ___No  If "no", why? Check all that apply.
    ___Duplicates science or health text.
    ___Too complicated to use.
    ___Not challenging enough for students.
    ___Did not meet class objectives.
    ___Other, please specify__________________________
16. Mark an "X" on the scale below to show how teaching with the new FYC program influenced your attitude toward teaching nutrition?

Attitude is now more favorable __1__ __2__ __3__ __4__ __5__ __6__ __7__ Attitude is now less favorable (4 = no change in attitude)

17. Would you recommend or have you recommended FYC to other teachers?
____Yes  ____No  ____Undecided

III. This section of the survey is to provide background information. Complete all the questions.

18. School District: __________________________________________

19. Grade(s) currently taught: _________________________________

20. Years of teaching experience: ______________________________

21. The average class size by grade in my school is:
____Under 10  ____10-15  ____16-20  ____21-25  ____26-30  ____over 30

22. My age range is:
____20-35 years  ____36-50 years  ____51 years or older

23. I am ____male  ____female.

24. My highest academic degree is:
____Bachelor's  ____Bachelor's, plus ____credits
____Master's  ____Master's, plus ____credits
____Doctorate  ____other degree or certificate

25. My formal nutrition education includes (check all that apply):
____Nutrition course(s) during high school.
____Nutrition course(s) during college.
____Nutrition course(s) during post-graduate period.
____None of the above.

26. How would you rate your personal interest in nutrition?
____Extremely interested.
____Somewhat interested.
____Not interested.

27. What are your two major sources of nutrition information?
____Popular magazines (i.e. Reader's Digest, Good Housekeeping, Parents, Prevention Magazine).
____Professional publications/materials (i.e. NEA Today, Instructor, Learning, subject-area publications).
____Newsletters from medical doctors and other health agencies.
____Television and radio programs or newspaper articles.
____Dairy Council programs and materials.
____Government programs and publications (i.e. Cooperative Extension Service, WIC, School Lunch Program, etc.).
____School health/science curriculum materials.
____Nutrition publications from businesses that sell products (i.e. food, food supplements, vitamins, etc.).
____In-service workshops or meetings.
____Community wellness programs.
____Other, please indicate ________________________________________________________________
28. Do you feel adequately prepared to teach nutrition?
   ___ Yes ___ No ___ To some extent

29. If the nutrition education programs listed below were offered, which topics would interest you?
   ___ General nutrition short-course.
   ___ Class on how to use the new FYC materials.
   ___ College-level course on nutrition.
   ___ Current nutrition issues workshop.
   ___ Class on methods of teaching nutrition.
   ___ Recommended reading list on nutrition education.
   ___ None of the above.
   ___ Other, please specify ________________________________

30. To what extent does your principal support nutrition education?
   ___ Actively supports and encourages teaching nutrition.
   ___ Unconcerned about the teaching of nutrition.
   ___ Discourages teaching nutrition.
   ___ I do not know.

31. Did you teach or do you plan to teach nutrition this year?
   ___ Yes  If "yes", for how many hours? ___ Hours.
   ___ No  If "no", why did you decide not to teach nutrition this year? Check all that apply.
   ___ Subject is not included in the curriculum at this grade level.
   ___ There is not time for nutrition.
   ___ Another teacher teaches the nutrition unit.
   ___ Other ________________________________

Short Response: Is there anything else you would like to add about teaching with the new FYC program? If so, please write your comments here.

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

For reasons of accuracy, it is important to have all the questions answered. Please check to see that you have not omitted questions that the directions ask you to complete.

THANK YOU for participating in this study. Your input will help us evaluate the implementation of the FOOD: . . . Your Choice Nutrition Education Program. Please return the completed questionnaire, using the accompanying prepaid envelope, to:

Elementary School Nutrition Education Survey
Home Economics Education Department — 305
College of Home Economics
South Dakota State University
Brookings, South Dakota 57007-0295

Please return your questionnaire before April 1, 1988.
APPENDIX E

Teacher In-service Training Agenda
Agenda

Food...Your Choice, Grades 1-6 Workshop

Dairy Council of South Dakota

I. Introduction
   A. Presentor
   B. Dairy Council
   C. Food...Your Choice Nutrition Education Program
   D. Introduction Activity
II. Purpose of the workshop
   A. To become familiar with FYC
   B. To learn how the program is designed
   C. To start thinking of effective ways FYC can be implemented
III. Overview of the FYC nutrition education program
   A. Grade 1 focuses on Food...Helps Me Grow
   B. Grade 2 focuses on Food...Gives Me Energy
   C. Grade 3 focuses on Food...Keeps Me Healthy
   D. Grade 4 focuses on Food...in America
   E. Grade 5 focuses on Food...and Technology
   F. Grade 6 focuses on Food...Decisions
IV. Organization of FYC Activities
   A. Nine activities per FYC program
   B. Each 30 minutes in length
   C. Sequential
   D. Interdisciplinary-support and enhance science, health and social studies as well as basic skills
V. Implementation of program
   A. Discuss development of video
   B. Show "Thumbs Up for Nutrition" a 16 minute video showing teachers using FYC in Grades 1, 3 and 6.
VI. Hand out boxes for teacher viewing for five minutes of viewing
   A. Examine teacher manual
   B. Examine support materials
VII. Key Features of Food Your Choice Activities
   A. Review of previous learning
   B. Presentation of purpose
   C. Sequence - familiar to unfamiliar
   D. Active participation type of questions
   E. Review and reinforcement of lesson
   F. Check for understanding
   G. Optional and Going Further sections
VIII. Discussion on how FYC would work best in teacher's classroom
   A. Separate nutrition unit
   B. Integrated with other subjects
IX. Summary closing
   A. Complete registration cards
   B. Answer questions
   C. Close
APPENDIX F

Letters of Transmittal
March 12, 1988

Dear Teacher,

I am conducting a study on the use of teaching materials and need your assistance by completing the enclosed questionnaire. This study will help me finish the requirements for my Masters degree at South Dakota State University and will provide information about the use of the new Food...Your Choice Nutrition Education program.

I am particularly interested in obtaining your responses because you were in one of the first school districts to receive these new nutrition materials. With your help we can identify potential problem areas and strengthen future placement programs.

The code number in the upper right corner of the survey is to help organize mailing and for identification of unreturned questionnaires. You will remain anonymous. Your name will be checked off the mailing list when your questionnaire is returned. The findings will be reported in aggregate form only.

This study is being completed under the guidance of Dr. Virginia Clark, my thesis advisor and Dr. Edna Page Anderson, my major advisor. A summary of the results will be available by request from the Dairy Council of South Dakota, 619 Fifth Avenue, Brookings, SD 57006.

Please return your completed questionnaire by April 1, 1988. Enclosed for your convenience is a self-addressed, postage-paid envelope. Thank-you for your time and assistance with this project.

Sincerely,

Cathrene Voelzke, Graduate Student
College of Home Economics
South Dakota State University
March 16, 1988

Dear

Thank you for participating in our study on the implementation and usage of the FOOD...Your Choice nutrition program. We sincerely appreciate your willingness to help us evaluate the implementation of these materials.

Enclosed are the questionnaires for your staff members to complete. I need to have all of the control group surveys returned, so prefer that you manage their distribution and return. Please ask the teachers to put their completed surveys in the enclosed large envelope for you to return. For this reason, no postage is on their individual envelopes. I would like for the surveys to be returned by April 1, 1988. If you have questions, please call me at 605-692-4812.

Also, please discuss with your staff our offer to do a Dairy Council workshop on the FOOD...Your Choice curriculum materials. Either or I would be available this spring or next fall for a program at one of your teacher’s meetings.

If you would like a summary of this study, please contact me at the above address.

Again, thank you very much for your time and assistance with this project.

Sincerely,

Cathrene Voelzke
Nutrition Education Consultant

CV: ceh
March 24, 1999

Dear [Name],

About the survey, your questionnaire and your opinion about the survey. We are still receiving feedback on the elementary education program. The questionnaire is due to be returned by April 1, 1999. We have had some recent increases in the U.S. Math scores, so we want to make sure as early in the year as we can see the significant changes without having too much data.

If you have already completed the survey, please submit it without further delay. If you have not yet completed the survey, please do so as soon as possible. It is important that we have a comprehensive picture of the feedback on the elementary education program.

If you have any questions or concerns, please call us at (800) 999-9999, and we will get back to you as soon as possible.

Sincerely,

[Your Name]

Administrative Assistant
Office of the Superintendent
State Public Schools Division
March 27, 1988

Dear Teacher,

About ten days ago a questionnaire seeking your opinion about the new FOOD...Your Choice nutrition education program for elementary grades was mailed to you. The questionnaire was to be returned by April 1, 1988. In view of the recent rate increase by the U.S. Postal Service, I am sending an early reminder so you can use the postage-paid envelope without having to add postage.

If you have already completed and returned the survey, please accept my sincere thanks. If not, please do so before leaving school for Easter vacation. Because it has been sent to only a small sample of South Dakota teachers, it is extremely important that yours be included in the study.

If by chance you did not receive the questionnaire, or it got misplaced, please call me, collect at (605) 692-4812, and I will get another one in the mail to you.

Sincerely,

Cathrene Voelzke, Graduate Student
College of Home Economics
South Dakota State University
April 11, 1988

Dear [Name],

I hope this postcard finds you well. I wanted to follow up on the subject discussed in our recent conversation. I understand the importance of delays in the production process, but I am concerned that we are not meeting our deadline.

If you could provide an estimated completion date, it would be greatly appreciated.

Thank you for your attention to this matter.

Sincerely,

APPENDIX H

Follow-up Postcard
April 15, 1988

Dear Teacher,

I would sincerely appreciate it if you would take the time to return the Nutrition Education Survey I sent to you earlier. It does not matter if you have used the Food...Your Choice program in your classes yet; but it is important that I receive the survey to complete my thesis.

If you need another copy, please call me collect at (605) 692-4812 and I will put one in the mail.

Thank-you!

Cathy Voelzke, SDSU Graduate Student
Nutrition Education Consultant