

Utah State University

DigitalCommons@USU

All Graduate Theses and Dissertations

Graduate Studies

5-1975

The Influence of a Nutrition Education Program on Preschool Children

Nida Diane Houston
Utah State University

Follow this and additional works at: <https://digitalcommons.usu.edu/etd>



Part of the [Nutrition Commons](#)

Recommended Citation

Houston, Nida Diane, "The Influence of a Nutrition Education Program on Preschool Children" (1975). *All Graduate Theses and Dissertations*. 5186.

<https://digitalcommons.usu.edu/etd/5186>

This Thesis is brought to you for free and open access by the Graduate Studies at DigitalCommons@USU. It has been accepted for inclusion in All Graduate Theses and Dissertations by an authorized administrator of DigitalCommons@USU. For more information, please contact digitalcommons@usu.edu.



THE INFLUENCE OF A NUTRITION EDUCATION
PROGRAM ON PRESCHOOL CHILDREN

by

Nida Diane Houston

A thesis submitted in partial fulfillment
of the requirements for the degree

of

MASTER OF SCIENCE

in

Nutrition and Food Sciences

UTAH STATE UNIVERSITY
Logan, Utah
1975

It is one thing to know what to eat for good nutrition-- that is basic knowledge. It is another type of learning, or wisdom, to know how to influence others, particularly children, to establish the kind of eating practices that will help them all their lives.

V.W. Tinsley, 1959

ACKNOWLEDGMENTS

Appreciation is expressed to the children and student teachers from the Child Development Preschool Laboratories at Southern Utah State College involved in this study. Special thanks is extended to Karen Clark for her direction and guidance during the study. Karen's friendship and help have been invaluable to me this past year.

To Frances Taylor and Bonita Wyse I express gratitude for their assistance, not only with my thesis, but also for their direction during my graduate studies. I also thank Dr. Eldon Drake for being on my graduate committee. A very special note of appreciation goes to Flora Bardwell. Flora sparked the idea for me to attend graduate school, and gave continued help and support during my studies. A special thanks if extended to Dr. Don Sisson for his help with the statistical analysis for this study.

Members of my family have given me their support, encouragement and understanding throughout my education. To them, I express my thanks. And finally, I thank my husband for his patience, support, encouragement and understanding.

Nida Diane Houston

TABLE OF CONTENTS

	Page
ACKNOWLEDGEMENTS	iii
LIST OF TABLES	vi
LIST OF FIGURES	vii
ABSTRACT	viii
INTRODUCTION	1
Purpose of the Study	2
Objectives	2
Scope, Goals and Concepts of the Nutrition Program	3
The scope of the nutrition program	3
The major goals	4
The major concepts	4
Hypotheses	5
REVIEW OF LITERATURE	6
METHODS AND PROCEDURES	13
Pilot Study	13
Rewording questions	15
Sequence of questions	16
Arrangement of food samples	19
The Nutrition Education Study With Preschool Children	23
Sample	23
Testing sessions	24
Nutrition experience sessions	28
Organizational structure of the preschool Laboratory	29

TABLE OF CONTENTS (Continued)

	Page
General format for nutrition sessions	31
Outline of the nutrition curriculum	32
Work table set-up for food activities	35
The rug discussion	36
The small group activity	37
RESULTS	39
Presentation of Results	39
Hypothesis I	39
Hypothesis II	45
Hypothesis III	50
Summary of Results	52
DISCUSSION	54
Discussion of Findings	54
Discussion of Procedure	55
SUMMARY	59
CONCLUSIONS	61
RECOMMENDATIONS FOR FUTURE STUDIES	62
LITERATURE CITED	63
APPENDIX	67
Literature Cited, Appendix	91
VITA	92

LIST OF TABLES

Table	Page
1. Test question changes resulting from pilot study . . .	18
2. Number of children correctly naming the dairy . . .	41
3. Number of children correctly answering the nutrition concept questions N:16	43
4. Number of children correctly relating foods to nutrition concepts N:16	44
5. Number of correct answers on each nutrition concept section of the pre and post-test	45
6. Number of children indicating they had previously tasted the dairy food N:16	46
7. Number of children choosing dairy foods as their most favorite foods N:16	47
8. Number of children actually tasting dairy products during the test N:16	48
9. Number of dairy products chosen by children as favorite foods on the pre and post-test	49
10. Number of children choosing a dairy food as their favorite food	50
11. Scores of girls and boys on each section of the pre and post-test	51

LIST OF FIGURES

Figure		Page
1.	Final dairy food questionnaire used in pre and post-testing	20
2.	The four groups of foods used in the first section of the pre and post-test	27
3.	The food arrangement for the tasting section of the pre and post-test	27
4.	Preschool children making egg nog	37
5.	Preschool children eating cheese and crackers	38
6.	Preschool children making milk drink	38

ABSTRACT

The Influence of a Nutrition Education
Program on Preschool Children

by

Nida Diane Houston, Master of Science
Utah State University, 1975

Major Professor: Frances Taylor
Bonita Wyse

Department: Nutrition and Food Sciences

A study on the influence of nutrition education experiences was conducted in the Child Development Preschool Laboratory at Southern Utah State College in Cedar City, Utah, with thirty-two preschool children. Sixteen of the children were exposed to nutrition experiences through food activities and stories.

It was found that the sixteen children who were involved in the fifteen nutrition experiences significantly increased their knowledge of nutrition concepts and further modified their own personal food choices. The control group, which was not exposed to nutrition activities, made no significant change in knowledge of nutrition concepts and no modification of personal food choices.

The findings also indicated that there was no significant difference between girls and boys in their ability to learn nutrition concepts. However, there appeared to be some slight sex differences in the modification of personal food choices.

(101 pages)

INTRODUCTION

An urgent need for effective nutrition education programs was established in the late 1960's as a result of the White House Conference of Food, Nutrition and Health. Nutrition educators as well as administrators in elementary schools began to design nutrition programs to meet that need (Cortes, 1973; George, 1971; Head, 1974 and Lovett, 1970). Peterson and Kies (1972) have shown, however, that mere acquisition of nutritional facts does not improve food habits. Even when implementing nutrition programs especially designed to improve food habits researchers found that cognitive learning was modified to a much greater extent than were food patterns (Bell and Lamb, 1973). Nutrition education studies have also shown that the older the child is when enrolled in a nutrition program, the less his food patterns will be modified (Head, 1974).

During the preschool years, food patterns are developed which will guide the individual in his choice of food for the rest of his life (Chenoweth, 1972; Eppright et al., 1969; Schuck, 1961 and Smith, Powell and Ross, 1955). Since younger children's food habits are more readily modified than older children's and because lifelong food patterns are set during the preschool years, this study was developed to determine

the influence of a preschool nutrition program in two specific areas; the acquisition of food knowledge by the preschooler and the modification of the preschooler's food choices.

Purpose of the Study

The purpose of this study was threefold:

1. To determine the degree to which a sample of preschool children was familiar with nutrition concepts related to dairy foods.
2. To determine if nutrition concepts could be taught to preschool children through food experiences.
3. To determine if nutrition education would influence the subsequent food choices of preschool children.

Objectives

1. To develop a nutrition education tool which evaluated preschool children's knowledge of nutrition concepts.
2. To determine if nutrition concepts could be taught to preschool children.
3. To develop a nutrition education curriculum designed for preschool children that would develop sound concepts and understandings in nutrition.

4. To determine if a well-designed nutrition education curriculum would influence food choices of preschool children.
5. To investigate the difference of nutrition concept learning and food choices which may be influenced by the sex of the preschool child.

Scope, Goals and Concepts of
the Nutrition Program

Before a pre-test or post-test could be developed for the study, three areas needed to be defined:

1. The scope of the nutrition program.
2. The major goals of the nutrition program.
3. The major concepts to be studied.

The scope of the nutrition program

The time for involving children in the nutrition unit was limited, because preschool was held for an eight week period. The nutrition program was scheduled in the following manner:

- Week 1 - get acquainted with the children.
- Weeks 2 and 3 - pre-test.
- Weeks 4, 5 and 6 - nutrition education experiences.
- Weeks 7 and 8 - post-test.

Because of the short time involved the nutrition program was limited to concepts that could be taught in three weeks. A unit on vegetables, a

unit on fruit, and a unit on dairy products were initially considered for this study. The units on fruit and vegetables were eliminated because fresh fruits and vegetables were not readily available during the period that the pre and post-test were being developed.

The major goals

The major goals of the nutrition education program on dairy products were:

1. To acquaint children with dairy products.
2. To increase the children's nutritional understanding of dairy products.
3. To increase the children's willingness to taste dairy products.
4. To influence the children to include dairy products in their own food choices.

The major concepts

The major nutritional concepts to be discussed were:

1. Milk helps bones and teeth grow hard and strong.
2. Children should drink four glasses of milk every day.
3. Milk contains calcium.
4. Calcium is very special. Calcium helps bones and teeth grow hard and strong.
5. Dairy products are made from milk.

6. Milk, yogurt, cheddar cheese, Swiss cheese, ice cream, cottage cheese and chocolate milk are dairy products.
7. Dairy products contain calcium.
8. Dairy products help bones and teeth grow hard and strong.

Hypotheses

The following null hypotheses were statistically tested:

1. The experimental group which had the nutrition education experience, after exposure to the nutrition program, will make no significant improvement in knowledge of the nutrition concepts tested, compared to the control group which received no nutrition education experience.
2. After the nutrition experience, the experimental group will have no significant differences in personal food choices compared to the control group.
3. There will be no significant differences between the scores of girls and the scores of boys on the post-test in the experimental group.

REVIEW OF LITERATURE

In 1969 the White House Conference on Food, Nutrition and Health recognized a deterioration of dietary habits in the United States and recommended that a dynamic nutrition education program should begin in childhood and continue through elementary and secondary school training (Recommendations of White House Panels, 1970).

The downward trend in nutritional habits of Americans had been indicated earlier by nutritional ratings of household diets made by the United States Department of Agriculture (1968). Their findings indicated that in 1965, half of the households in the United States had diets rated "good" with regard to meeting recommended daily allowances of the nutrients studied. This was a decrease from the 1955 figures which showed that sixty percent of the households met the requirements for a "good" rating. In 1965 twenty-one percent of the households had diets rates as "poor," compared with fifteen percent in 1955.

The basis for the nutritional problem is lack of education rather than lack of food, according to researchers such as Briggs (1969) and Parrish (1971). These writers noted that though the United States' population is presently blessed with a plentiful supply and broad variety of nutritious foods, the general level of human health is not as

high as it should be. Todhunter (1969) said that because there is no instinct to guide man in the proper selection of his diet, nutrition education is a universal need. Bosley (1974) wrote that nutrition education is needed because nutrition facts are valuable only to the extent to which man is able to make them work for his own betterment. Stieberling (1959) indicated the high priority he felt nutrition education should have when he said, "Learning the lessons of nutritional science and making the principles a part of our lives is one of the prices Nature demands for health."

As early as the nineteenth century, Gerrit Jan Mulder of Holland advocated that nutrition be taught in the public schools (Todhunter, 1969). Berrol (1970) claimed that the progressive impulse in the school system, which suggested that public schools extend their function to include the "whole" child, did not occur until the present century. During this progressive impulse, it was suggested that general health, and therefore nutrition studies, should be an integral part of the school curriculum. In 1922, Roberts said that better nutrition of children is a problem which every community needs to face. She further stated that the school system must be involved if the nutrition education movement was to succeed.

Experts agree that lifetime food habits are established at a very early age. Lowenberg (1959), Hill (1969), Schuck (1961), Smith (1955) and Tinsley (1959) wrote that the dietary and eating habits formed early

affect food habits throughout life. Eppright (1969) said that by the age of three many children have developed a dislike for certain foods or types of foods, notably vegetables. Because of these early established life-time food habits many writers concur that elementary and preschool teachers have a unique opportunity to significantly influence the formation of good eating habits among children. These authors include Chenoweth (1972), Eppright (1969), Hill (1969), George (1971), and Schubert (1970). Leverton (1969) wrote that facts about food and health, including the formation of good food habits and attitudes, have an important place in classroom teaching.

The prime objective of teaching nutrition is to improve eating habits, according to Bosley (1947), McDonald (1969) and Peterson and Kies (1972). These researchers agreed that good eating habits are the basis for good nutrition. Blackburn (1970) described the job of nutrition educators as combining the science of nutrition with the art of food practice.

Todhunter (1969) defined nutrition education thus:

Nutrition education for the general public is the process by which beliefs, attitudes and understandings about food lead to habits that are nutritionally sound, practical, and consistent with individual needs and available food resources. (Todhunter, 1969, p. 8)

This writer said that nutrition programs are more effective when emphasis is placed on the improvement of current food patterns, rather than on a complete change. She stated that the establishment of

good food practices entails maintaining presently desirable food habits and forming new habits necessary to meet individual nutritional needs.

Building on current food practices is a sound starting place, according to Niehoff (1968), for people tend to practice old habits because it is easier than learning new habits.

Many authors recommend that nutrition and feeding be included as a fundamental and required part of every day-care center program. Chenoweth (1972) made this recommendation, as did Harrill (1972), who said that nutrition education in the preschool program is an effective means of establishing positive attitudes toward food and good food habits. Niehoff (1968) claimed that children are always more willing than adults to try new foods, since they have not developed the biases of their own cultures with such strong emotions as have their parents. Evidence of parents' biases has been indicated in several studies, including that by Glaser (1964) who found that children actually accepted foods more readily than their parents had predicted they would. Schuck (1961) claimed that food likes and dislikes of people tend to reflect the food practices in the homes in which they grew up. Unfamiliarity was found to be one of the most frequent problems affecting the acceptance of a new food by Niehoff (1968), Schuck (1961) and Stieberling and Dries (1959). Chenoweth (1972) felt that while it is important for a child to receive familiar foods typical of his culture, he should also be introduced to foods likely to be served to him outside his home.

Ritchie (1971) agreed that to be successful any nutrition program must be based on a knowledge of the attitudes, beliefs and values of the people to be influenced. Chenoweth (1972) further stated that learning new foods increases the child's knowledge of the world around him and the likelihood that he will choose a more varied, better balanced diet. Early practice of these principles could be implemented if carried out in preschool programs as recommended by Chenoweth (1972) and Harrill (1972).

Several authors presented specific types of nutrition programs and suggested ways of implementing them. Frankle (1967) said that in a nutrition education program for preschool children, the adult is the key in establishing a climate of acceptance. He claimed that any negative comments or gestures by an adult will destroy the positive atmosphere for the food or nutrition idea. McDonald (1963) said that projects for nutrition education should be centered around "eating is fun" and designed to develop an interest and desire to eat all foods. He also recommended that lessons be short and entertaining. According to Frankle (1967) and Harrill (1972) the most successful techniques for teaching nutrition are puppet shows, songs, games and food activities in which the children can participate. When provided with attractive, nutritious foods, children eat more eagerly if they know why they need to eat the foods and how the food was prepared (Agricultural Marketing, 1970 and 1969).

A child's ever-widening curiosity and interest in the world about him naturally includes interest in finding out more about foods--where foods come from, how they are raised and distributed, their names, what they taste like, what they cost, and what they do for us. (Tinsley, 1959, p. 25)

Bluming (1972) and Juhas (1969) demonstrated that food preparation activities stimulate interest in nutrition and are used as vehicles for other learning such as language, geography, science, home economics, arithmetic, colors, shapes, sizes, spelling, health and botany. Other examples that reinforce this finding were published in *What's New in Home Economics* (1967). Briggs (1969) stated that "by schooling people in the proper utilization of one of nature's most important basic resources--food--ecology and conservation can be taught through nutrition education."

The Dairy Council of California (1970) suggested that the best approach to teaching nutrition in the primary grades is to organize studies into major concepts, set behavioral objectives, pre-test, involve children in learning experiences, and evaluate by post-testing. Lovett, Baker and Marcus (1970), using teachers trained in the Dairy Council method of instruction and using Dairy Council materials, were successful in increasing second grade students' ability to apply nutrition knowledge.

Bell and Lamb (1973) found that after a nutrition program involving fifth graders, dietary behavior was not modified as greatly as cognitive learning. Another study suggested that the older the children

were when enrolled in a nutrition program, the less their food habits were modified (Head, 1974 and Lowenberg, 1952).

In conclusion, writers and researchers stress that there is a need for modification of present food habits in the United States. They concur that since lifetime food practices are established during pre-school years and because food behavior patterns are more readily changed in younger children, the preschool child is a prime target for trained nutrition educators, if food patterns are to be positively influenced.

METHODS AND PROCEDURES

The testing of the pilot study, the pre-testing and post-testing of the experimental and control groups, and the teaching sessions for the experimental group were conducted by this writer. The pre-test and post-test, as well as the nutrition education curriculum, were also developed by the author of this study.

Pilot Study

A pilot study was needed to develop a nutrition education tool which evaluated preschool children's knowledge of nutrition concepts. This nutrition education tool also needed to indicate preschool children's personal food choices. After discussing testing techniques with preschool instructors and nutrition instructors, the following guidelines were determined for development of the nutrition education tool:

1. The test should use real food.

It was felt by nutrition instructors as well as preschool instructors that not all preschool children could relate pictures or food models to real foods.

2. The test should be given orally with answers recorded on a tape recorder.

This was intended to limit the distractions of the child taking the test. However, tape recordings did not pick up the voice of the child taking

the test above the noise of the other children playing. Therefore, use of the tape recorder was abandoned. Instead, answers were recorded on an answer sheet.

3. The test should be administered individually to each preschool child.

4. The test should not be longer than seven minutes.

It was felt that the attention span of the preschool children would not permit a longer testing period.

During the pilot study a sample evaluation test was administered individually to sixteen preschool children enrolled in the preschool laboratory at Southern Utah State College. To begin the pilot study, samples of food were randomly arranged on a table. Each child was asked questions which he could answer by short answers or by pointing to a food on the table. Later the food samples were arranged into groups of three foods. The sixteen children were divided into four sets of four children. Each child was individually asked to play the "food game." The "food game" was the evaluative test. After each set of four children had completed the evaluative test, necessary improvements included rewording questions, changing the sequence of the questions and rearranging the food samples.

Rewording questions

In rewording questions, substitutions such as the following were made:

Question 5. Should boys and girls eat dairy products?

This was changed to: Should you eat dairy products?

Question 7. Can you tell me where to find calcium?

This was changed to: Where do you find calcium?

Question 12. Pick out the dairy foods on the table.

This was changed to: Point to the dairy food in this group.

When the investigator referred to different groups of foods, words such as "first," "second," "third" and "last" confused the children. Therefore, the investigator would point to each group of foods as the direction was given to the child. For example, while pointing to the group of foods containing milk, fruit loops and a cup cake, this direction was given, "Point to the food that helps your bones and teeth grow."

Other changes consolidated some of the directions given to the child. For example, instead of the following:

Point to the food that helps your bones grow.

Point to the food that helps your bones to be strong.

Point to the food that helps your teeth grow.

Point to the food that helps your teeth to be strong.

This rewording was used: Point to the food that helps your bones and teeth grow strong.

Questions 20 - 23. If you could taste some of these foods, which would you taste?

This was changed to: Point to your most favorite food. This question had to be changed because the children would take the food and taste it. After this wording change, a special section for tasting foods was added to the test.

Sequence of questions

It was determined that the children could not answer the first two questions in the first set of questions (Table 1). As a result, the children were nervous and timid throughout the testing session. So the children could gain some confidence in their ability to play the "food game," the naming of the foods was placed first. All of the children knew the names of some of the foods. Therefore, all of the children were successful on the first part of the test. Being successful helped to make the "food game" more fun. They also responded better to the questions that followed the food naming portion of the test. As a result of the experience gained from the first trial run for the pre-test, the questions about milk were placed nearer the end of the second set of questions because some of the children pointed to the milk for the answer to each question asked subsequent to the milk questions.

A tasting section was added to the test for the second set of questions used in the pilot study. The tasting section began by having the children name the foods. Then they were asked to point to the foods they had eaten before. Finally the children could taste any of the foods on the tasting table.

For the third set of questions, the children were asked the questions about dairy foods before being directed to point to the dairy foods. It was determined during the testing session for the third set of questions that the testing would move much more rapidly if the questions and direction were given in the following sequence:

1. Naming of foods.
2. Short-answer questions.
3. Pointing directions.
4. Tasting section.

This was the order of questioning used in the fourth set of questions. When the questions were in this order, the children did not carry over the milk answer to the questions that followed. The fourth set of questions in final form comprise Figure 1, page 20.

Table 1 Test question changes resulting from pilot study

First set	Second set	Third set
Where do you find calcium?	Name the foods.	Name these foods.
What does calcium do?	Point to the dairy products.	Should you eat dairy products?
Should you drink milk?	Should you eat dairy products?	Point to the dairy products.
How much milk should you drink every day?	Where do you find calcium?	Where do you find calcium?
Point to the dairy products.	What does calcium do?	What does calcium do?
Should you eat dairy products?	Point to the food that helps your bones and teeth grow.	Point to the food that helps your bones and teeth grow.
Point to the foods that help your bones and teeth grow.	Should you drink milk?	Should you drink milk?
If you could taste any of the foods, which would you taste?	How much milk should you drink every day?	How much milk should you drink every day?
	Point to your most favorite food.	Point to your most favorite food.
	Name these foods.	Name these foods.
	Point to the foods you have tasted.	Point to the foods you have tasted.
	You may taste any of these foods.	You may taste any of these foods.

Arrangement of food samples

Actual food samples were used in the test to allow for children who might not readily identify pictures of foods. As a result, foods which were hard to keep at room temperature, like ice cream, were eliminated from the study.

Initially, when the food samples were randomly arranged on a table, the testing session averaged thirty-five minutes. This length of time was too long to keep the preschool child interested in the "food game." When the foods were randomly arranged, the children seemed confused and took a very long time to answer, if they answered at all. By arranging the food samples into groups containing three foods, the testing time was reduced. Even though the foods were arranged in groups the children had trouble identifying each group of three foods. To help the children identify the groups more easily, each group was placed on a blue block. Then the blocks were turned at forty-five degree angles to show separation of the food groupings more clearly (See Figure 2, page 27).

Dairy Foods Questionnaire

Name _____

Name these foods. Check the foods not named.

1. milk cereal cupcake don't know no response.
2. cottage cheese juice bread don't know no response.
3. Chocolate milk soda pop saltines don't know
 no response.
4. cheese potato chips orange don't know no response.
5. Should you eat dairy products? yes no don't know
 no response.
6. Why should you eat dairy products? strong bones and teeth
 help you grow good for you don't know no response.
Other _____
7. Where do you find calcium? dairy foods milk don't know
 no response. Other _____
9. Should you drink milk? yes no don't know no response.
10. Why should you drink milk? strong bones and teeth help you
grow good for you don't know no response. Other _____
11. How many glasses of milk should you drink every day? _____
 don't know no response.

Point to the dairy foods in this group. Check the food pointed at.

12. milk cereal cup cake don't know no response.
13. cottage cheese juice bread don't know no response.

Figure 1. Final dairy food questionnaire used in pre- and post-testing.

14. chocolate milk soda pop saltines don't know
 no response.
15. cheese potato chips orange don't know no response.

Point to the food that helps your bones and teeth grow strong. Check the food pointed at.

16. milk cereal cup cake don't know no response.
17. cottage cheese juice bread don't know no response.
18. chocolate milk soda pop saltines don't know
 no response.
19. cheese potato chips orange don't know no response.

Point to your most favorite food. Check food pointed at.

20. milk cereal cup cake don't know no response.
21. cottage cheese juice bread don't know no response.
22. chocolate milk soda pop saltines don't know
 no response.
23. cheese potato chips orange don't know no response.

Name these foods. Check foods not named.

24. milk chocolate milk yogurt buttermilk.
25. Swiss cheese cottage cheese cheddar cheese
 squeeze cheese.

Figure 1. Continued

26. ___milk ___chocolate milk ___yogurt ___buttermilk.
27. ___Swiss cheese ___cottage cheese ___cheddar cheese
___squeeze cheese.

You may taste any of the foods on this table. Check foods tasted.

28. ___milk ___chocolate milk ___yogurt ___buttermilk.
29. ___Swiss cheese ___cottage cheese ___cheddar cheese
___squeeze cheese.

Figure 1. Continued.

During the pilot study the food samples were evaluated, so foods of similar preference were placed in the same grouping. For example, when in separate groups, milk, fruit loops and the cup cake were the most often chosen as favorite foods. Therefore, these three foods were grouped together. Cottage cheese, bread and juice were the foods selected least often, so they were grouped together. When the tasting section was added to the test, the food sample groups were reduced to four. As a result, foods never selected as favorite foods were eliminated from the study. Meats, celery and cauliflower are examples of the foods eliminated. The tasting section contained only dairy products as food samples. This was to determine which dairy products the children knew and which they would taste.

The Nutrition Education Study With

Preschool Children

Sample

The experimental group and the control group each contained sixteen children. The children were selected on the basis of their enrollment in the Child Development Preschool Laboratory at Southern Utah State College in Cedar City. This was to enable the investigator to include in the study a large group of children from four to five years of age. Because of this, a random sample was not drawn.

At the beginning of the study, twenty-three children were in the experimental group. Sixteen of these children completed the study. The children not selected were disqualified due to six or more absences. The control group started with twenty children, sixteen of whom completed the study. The children not selected were disqualified because of non-attendance during the post-testing week.

The children in the sample ranged from four years-two months to four years-ten months at the time of the pre-test. The parents of the children were generally employed in the Cedar City and Iron County area, although some of the parents were students at Southern Utah State College. On this basis, it was determined that the sample was drawn from a middle-class population. Information about food allergies

was gathered during the regular preschool parent-teacher interview. This was the only dietary information gathered about the children from the parents.

Testing sessions

All of the children participating in the study, both experimental and control group children, were tested twice: one pre-test prior to the experimental group nutrition experiences and one post-test following the experimental group nutrition experiences. The same testing room was used for all testing sessions. The testing room was a basement play area in the preschool laboratory. The test was given with the children facing the administrator of the test. A wall was directly behind the administrator. This arrangement was used to eliminate the presence of visual stimuli during the testing session.

Before administering the test, the administrator spent one week in the preschool laboratory getting to know the children. More important, the children were also getting acquainted with the administrator. The second and third weeks were spent in testing the children. Since the test was set up in one of the play areas, the test had to be removed after no more than thirty minutes so the children could use the play area. The test was set up for thirty minutes in the morning for the experimental group and for thirty minutes in the afternoon for the control group. Because of this time limit, no more

than three or four of the children could be tested each day. The first testing session took nearly two weeks to complete because more than forty children began the study.

The testing was done during the first thirty minutes of the regular class period. This was the children's free-play time. Each child was asked individually to go downstairs with the administrator to "play a food game." As each child was returned by the administrator to the upstairs play area, another child was asked to come downstairs to "play a food game." While working to the test area the child was engaged in conversation with the administrator, in order to reassure the child about his participation in the "food game." The first day the children were reluctant to leave their play and go downstairs to "play the food game." After the second day, however, all the children were eager for their turns to play the game. Even children previously tested wanted another turn.

The testing area was divided into two sections. In the first section were four sets of three foods each. Each set was placed on a blue block. The blocks were placed at forty-five degree angles along a narrow table (see Figure 2). The administrator sat behind the table. The child stood in front of the table facing the administrator and the wall. The second section was the tasting table (see Figure 3). Eight foods were placed in two rows on a child-size table. The administrator sat behind the table, while the child sat in front of the table facing the administrator and the wall.

After placing the child in front of the food groupings, the administrator sat down and wrote the child's name on the questionnaire. The test began as follows: "We begin the food game by having you name the foods. Start by naming the foods in this group." Then the administrator would touch the block holding the first group of foods. After completing the naming section, the administrator praised the child on his performance and assured the child that he would do well on the rest of the "game." When the test was completed, the child was again praised on his performance, thanked for "playing the food game," and then escorted back upstairs to continue playing. The same procedure used in the pre-test was repeated in the post-test.

During the post-testing session, as the child and administrator were walking downstairs to the testing area, different children would make comments such as:

"I've played this game before."

"Is this the food game we played before?"

The administrator would use this opportunity to say, "Yes, this is the food game we played before. Do you remember where you stand?"

Then the test would begin.



Figure 2. The four groups of food used in the first section of the pre- and post-test.



Figure 3. The food arrangement for the testing section of the pre- and post-test.

A pre-test was given to both the experimental and control groups for these three reasons:

1. To determine if the dairy products unit should be taught.
2. To determine if the two groups were comparable prior to the nutrition experiences.
3. To establish a basis to show any change following the nutrition experiences.

It was determined from the pre-test that the groups had no statistically significant differences in scores. Thus it was concluded that the groups were comparable in nutrition knowledge and food choices prior to the nutrition education experiences. It was also concluded that a nutrition unit on dairy products would be appropriate for the experimental group.

The post-test was a repetition of the pre-test. The questions had to be repeated twice during both testing sessions for the control group. For the experimental group, the questions needed to be repeated twice during the pre-test but only once during the post-test.

Nutrition experience sessions

The nutrition experience sessions were held during the regular preschool class time. Each day for fifteen days the nursery school children were involved in a nutrition experience. On two of the fifteen days, stories were told. The other thirteen days involved activities with dairy products.

Organizational structure
of the preschool laboratory

The organizational structure of the preschool laboratory was important because the authority of the teachers decreased with their rank. The preschool children were aware of each teachers' authority. The administrative organization of the laboratory consisted of the Child Development Laboratory Director, a Student Teacher and several Child Development Students. The authority of these three ranked from high to low respectively.

The director was in charge of the entire preschool operation. During the first few days of the nutrition experiences, the director remained in the classroom to help overcome any difficulties. When no difficulties arose, the director no longer remained during the entire nutrition experience. Often she did not come in at all during the nutrition activity.

The student teacher was present during the entire preschool class time. She was directly responsible for the daily preschool operation. The student teacher organized the daily activity plan, helped set up activities and directed activities if needed. Before the activities, the preschool children would sit in a circle on a rug and usually the student teacher would lead singing. However, child development students would sometimes lead the singing. Then the student in charge of the activity would explain the activity to the children

and demonstrate if necessary. The student teacher was also responsible for directing the child development students in their duties as nursery school teachers.

The child development students were required to spend several hours a week acting as teachers in the nursery school. Every hour a new group of child development students took their turn as nursery school teachers. Each of these students was responsible for several activities each quarter.

The nutrition instructor had about the same status as the student teacher. Because the instructor was present in the nursery school every day, as was the student teacher, the children treated the instructor as they treated the student teacher. The nutrition instructor was also responsible for setting up her own activities, with the help of the student teacher, and for instructing the child development students in their duties with the nutrition activities. As soon as the nutrition instructor learned which of the child development students would be present during the nutrition activities, she instructed that group of students in this manner: "I am conducting a nutrition education program for the preschool children. During the rug discussion, I will be talking about nutrition. When you take the children to your tables for the food activity be sure to discuss the nutrition ideas talked about at the rug. During this nutrition program, I will be introducing some new foods, or new food combinations, to the children. For the children to accept

these new foods, you who are teaching them must be enthusiastic about the foods. Any negative expressions on your faces or comments from you can reduce the children's willingness to try these new foods." The students all agreed to be enthusiastic about the foods and to discuss the nutrition ideas at their tables.

General format for nutrition sessions

After the activity was set up on the work tables, the children were called from their free play and told to sit at the rug for an activity. The children and students would sit in a circle around the rug. The instructor would also sit in the circle on the rug. The media used for the rug discussion was kept behind the instructor until time for the nutrition presentation. Nursery school songs were sung to keep the first children at the rug occupied until the last child had joined the group and was ready to listen to the rug discussion. When all the children were at the rug, the student teacher or director would introduce the instructor by saying, "Now, let's all listen very carefully while Diane tells us what we are going to do."

The discussion about the nutrition activity would follow. This discussion centered around nutrition concepts and how they related to the food activity for that day. The instructor also demonstrated the food activity so the students and children would know exactly how to make their drinks, sandwiches, etc. After the rug discussion the

children were divided into groups of four or five. A student would then take the group of children to a table and direct the children in the food activity. During the food activity the student would re-emphasize the nutrition concepts discussed in the rug discussion. The instructor would circulate among each of the four tables helping with the food activity and table discussions.

Outline of the
nutrition curriculum

Day 1 Chocolate Milk Snack

Discuss: Milk

Kinds of milk

Four glasses of milk each day

Day 2 Egg Nog

Discuss: Milk helps bones grow hard and strong

Four glasses of milk each day

Day 3 Story: We all Drink Milk

Discuss: Milk helps bones grow hard and strong

Four glasses of milk each day

Day 4 Peanut Butter Chews

Discuss: We don't have to drink milk--we can eat milk

Milk helps bones grow hard and strong

Four glasses of milk each day

Day 5 Story: Timmothy Tooth

Discuss: Milk helps bones and teeth grow hard and strong

Four glasses of milk each day

Day 6 Introduce Dairy Products --Serve Yogurt

Discuss: Dairy products are made from milk

Dairy products help bones and teeth grow strong

Yogurt is a dairy product

Eat four dairy foods or drink four glasses of milk a
day

Day 7 Milk Shakes

Discuss: Ice cream is made from milk. Ice cream is a dairy
food

Milk and dairy products help bones and teeth grow
strong

Drink four glasses of milk or four dairy foods each
day

Day 8 Squeeze Cheese and Crackers

Discuss: Cheese is made from milk. Cheese is a dairy product

Milk and dairy products help bones and teeth grow
strong

Eat four dairy foods or drink four glasses of milk a
day

Day 9 Melting Cheese

Discuss: Cheese is a dairy product

Milk and dairy products contain calcium

Calcium helps bones and teeth grow hard and strong

Milk and dairy products help teeth and bones grow
strong

Eat four dairy products or drink four glasses of milk
each day

Day 10 Cottage Cheese Dip

Discuss: Calcium and related concepts

Dairy products and related concepts

Milk and related concepts

Day 11 Sculpturing with Cheese Pieces

Discuss: Calcium and related concepts

Dairy products and related concepts

Milk and related concepts

Day 12 Milk Drink

Discuss: Calcium and related concepts

Dairy products and related concepts

Milk and related concepts

Day 13 Ice Cream Cones

Discuss: Calcium and related concepts

Dairy foods and related concepts

Milk and related concepts

Day 14 Toasted Cheese Sandwiches

Discuss: Calcium and related concepts

Dairy products and related concepts

Milk and related concepts

Day 15 Cottage Cheese, Hay Stack Salads

Discuss: Calcium and related concepts

Dairy foods and related concepts

Milk and related concepts

For complete nutrition lessons, including discussions and recipes, see the Appendix.

Work table set-up for
food activities

Before the rug discussion began, all the work tables were cleaned. On each work table was placed enough food and equipment for the preschool children and the students to carry out the entire food activity. When recipes were used, the ingredients were pre-measured into individual containers and then set on the work tables. In this way each child had an opportunity to add something to the food mixture.

Mixing equipment, as well as serving equipment, was placed on each work table. Sponges, for wiping up spills, were standard equipment on each table. Extra ingredients were always on hand in case of spills or if more was wanted by the children.

The rug discussion

After being introduced, the instructor proceeded to involve the children in a nutrition experience. The discussion often began by the instructor holding up a food item and asking questions about that food. These questions were used to develop thinking along the lines of the nutrition concept to be discussed. After reviewing previously discussed nutrition concepts, the new nutrition concept was introduced. Another question-answer period followed. During the question-answer period, short responses and comments were encouraged from the children. Irrelevant comments were accepted but not encouraged. The questions and responses were intended to help the instructor determine whether the nutrition concepts were understood by the preschool children. At the completion of the rug discussion, the instructor would demonstrate the food activity to the children and students. The demonstration showed step by step exactly how the food activity was to be carried out in the small groups.

The small group activity

After the rug discussion and demonstration, the instructor assigned four or five children to a student. The students would then take their children to a sink where everyone had a turn to wash his hands. Then the group would go to a table where the food activity was set up. The student would direct the children in the food activity, but the children would actually do the "work" of the activity (Figures 4, 5 and 6). During the activity the students asked questions about the nutrition concepts presented in the rug discussion. The instructor circulated among the four tables helping with the table discussions and food activities.



Figure 4. Preschool children making egg nog.



Figure 5. Preschool children eating cheese and crackers.



Figure 6. Preschool children making milk drink.

RESULTS

Presentation of Results

Two groups of preschool children, an experimental and a control group, were tested twice. A pre-test was administered to each group prior to any nutrition education experience. The results of the pre-test indicated that there was no significant difference between the two groups in nutrition knowledge or in personal food choices. The children in the experimental group were involved in fifteen nutrition sessions. Each nutrition education session developed one nutrition concept about the milk group from the Basic Four Food Groups. The control group attended no nutrition education sessions. After the nutrition education program, both groups were retested. The results of both tests are reported under hypotheses I and II. The results of the pre and post-tests for the experimental group only are reported under hypothesis III. The statistical test used in this study was a chi square analysis.

Hypothesis I

The experimental group, which had the nutrition education experience, after exposure to the nutrition program, will make no significant improvement in knowledge of nutrition concepts tested as compared to the control group, which received no nutrition education

experience. The data for this hypothesis have been divided into three learning areas: (1) dairy foods named, (2) short answer nutrition concept questions, and (3) recognition of foods related to nutrition concepts.

Dairy foods named. The data in Table 2 indicate the number of children in each group, the experimental and the control, able to name each dairy food before and after the nutrition education experience. Although more children in the experimental group than in the control group were able to name the dairy foods after the nutrition education sessions only the naming of chocolate milk proved to be statistically significant at the .05 level.

Table 2 Number of children correctly naming the dairy product N:16.

Dairy Food	Experimental Group		Control Group	
	pre-test	post-test	pre-test	post-test
Milk	16	16	16	16
Cottage Cheese	13	15	14	13
Chocolate Milk	11	16*	15	14
Cheddar Cheese	15	15	16	15
Swiss Cheese	2	14	1	9
Yogurt	6	9	2	3
Squeeze Cheese	6	12	0	5
Buttermilk	<u>0</u>	<u>2</u>	<u>0</u>	<u>0</u>
TOTAL	69	99	64	75

*Significant .05 level

Short answer nutrition concept questions. The data in Table 3 show the number of children in each of the experimental and control groups able to correctly answer nutrition concept questions. These questions required the child to make a short statement about the nutrition concept in order to answer correctly. Table 3 includes questions 5 through 11 from the pre and post-test. Analysis showed a

significant difference between the experimental and control groups in all of the concept areas except the two questions which could be answered by yes or no. These two questions were:

5. Should you eat dairy products?
9. Should you drink milk?

The nutrition concept questions which were significant were:

6. Why should you eat dairy products?
7. Where do you find calcium?
8. What does calcium do?
10. Why should you drink milk?
11. How many glasses of milk should you drink every day?

Recognition of foods related to nutrition concepts. The data in Table 4 indicate the number of children in each of the experimental and control groups able to correctly point out one food, from a group of three foods, which correctly related to the nutrition concept direction. The first four directions told the child to point to the dairy food in four different groups of three foods. The second set of four directions told the child to point to the one food in each group that helps his bones and teeth grow. Although more children in the experimental group succeeded in choosing the correct food, only five of the eight directions were statistically significant.

Table 3 Number of children correctly answering the nutrition concept questions N:16.

Question	Experimental Group		Control Group	
	pre-test	post-test	pre-test	post-test
5	5	16	6	10
6	0	15**	0	0
7	0	16**	0	0
8	0	16**	0	0
9	15	16	16	16
10	1	16**	0	1
11	<u>2</u>	<u>15**</u>	<u>1</u>	<u>2</u>
TOTAL	23	110	23	29

**Significant .01 level

As shown in Table 5, the total score for the experimental group on the nutrition concept section of the post-test was 332; the total score on the same section for the control group on the post-test was 149.

In each of the nutrition concept learning sections, significant differences between the experimental and control groups were shown. The section on naming dairy products had one significant area (see Table 2). The section on nutrition concept questions had five significant areas (see Table 3). The section on relating nutrition concepts to foods had five significant areas (see Table 4). These findings suggest that the nutrition education experience given to the experimental group did in

fact have an effect on the performance of these preschool children on the post-test. On the other hand, the scores of the control group indicated that there was no significant improvement from the pre-test to the post-test. Hypothesis I was therefore not validated.

Table 4 Number of children correctly relating foods to nutrition concepts N:16.

Dairy Food	Experimental Group		Control Group	
	pre-test	post-test	pre-test	post-test
Milk	3	15**	7	5
Cottage Cheese	3	15	3	8
Chocolate Milk	1	16**	2	4
Cheddar Cheese	3	16**	7	3
Milk	5	15	5	9
Cottage Cheese	7	15*	6	5
Chocolate Milk	7	16*	2	3
Cheddar Cheese	7	15	2	8
TOTAL	36	123	34	45

* Significant .05 level

** Significant .01 level

Table 5 Number of correct answers on each nutrition concept section of the pre and post-test.

Test Section	Experimental Group		Control Group	
	pre-test	post-test	pre-test	post-test
Naming Dairy Foods	69	99	64	75
Nutrition Concept Questions	23	110	23	29
Relating Nutrition Concepts to Foods	<u>36</u>	<u>123</u>	<u>34</u>	<u>45</u>
TOTAL	128	332	131	149

Hypothesis II

After the nutrition experience, the experimental group will have no significant difference in personal food choices compared to the control group. The data for this hypothesis have been divided into three areas: (1) dairy foods previously tasted by the preschool children, (2) dairy foods chosen as favorite foods, and (3) dairy foods actually tasted during the test.

Dairy foods previously tasted by the preschool children. The data in Table 6 show the number of children in each group, both experimental and control, indicating they had previously tasted the dairy foods. Eight dairy foods were shown to the preschool child. While the dairy foods were in front of the child, he was asked to point to the foods he had tasted before. Even though more children in the experimental group had tasted the dairy foods after the fifteen nutrition sessions,

only the increase in the number of children having tasted Swiss cheese and squeeze cheese was statistically significant.

Table 6 Number of children indicating they had previously tasted the dairy food N:16.

Dairy Food	Experimental Group		Control Group	
	pre-test	post-test	pre-test	post-test
Milk	14	16	15	13
Swiss Cheese	4	14*	2	4
Yogurt	6	13	2	3
Chocolate Milk	11	15	11	9
Cheddar Cheese	13	16	12	9
Cottage Cheese	11	15	7	7
Squeeze Cheese	1	16**	2	4
Buttermilk	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
TOTAL	60	105	51	49

* Significant .05 level

** Significant .01 level

Table 7 Number of children choosing dairy foods as their most favorite foods N:16.

Dairy Food	Experimental Group		Control Group	
	pre-test	post-test	pre-test	post-test
Milk	1	4**	4	0
Cottage Cheese	4	9	2	1
Chocolate Milk	2	8*	2	1
Cheddar Cheese	<u>2</u>	<u>5</u>	<u>2</u>	<u>1</u>
TOTAL	9	26	10	3

*Significant .05 level

**Significant .01 level

Dairy foods chosen as favorite foods. The data in Table 7 show the number of children in each group, experimental and control, who chose a dairy food as their most favorite food. The children were shown a group of three foods and asked to pick their one favorite food from that group. There were four groups of three foods, each containing one dairy product. The number of children in the experimental group choosing dairy foods as their most favorite food increased after the fifteen nutrition sessions. The number of children in the control group choosing dairy foods as their favorite food decreased after the same period of time. However, the only statistically significant difference was in the children's choice of milk and chocolate milk.

Dairy foods actually tasted during the test. The data in Table 8 indicate the number of children in each group who actually tasted the

eight dairy products on the tasting table. Although the total number of children in the experimental group who tasted the dairy products increased, only the tasting of the squeeze cheese was significant.

Table 8 Number of children actually tasting dairy products during the test N:16.

Dairy Food	Experimental Group		Control Group	
	pre-test	post-test	pre-test	post-test
Milk	3	6	4	1
Swiss Cheese	3	4	0	0
Yogurt	6	13	2	3
Chocolate Milk	7	8	5	1
Cheddar Cheese	6	11	1	6
Cottage Cheese	5	8	2	1
Squeeze Cheese	1	16**	4	4
Buttermilk	<u>2</u>	<u>2</u>	<u>0</u>	<u>0</u>
TOTAL	33	68	18	16

**Significant .01 level

As shown in Table 9, the total score for the experimental group on the personal food choice section of the post-test was 199; the total score on the same section for the control group on the post-test was 68.

Table 9 Number of dairy products chosen by children as favorite foods on the pre and post-test.

Test Section	Experimental Group		Control Group	
	pre-test	post-test	pre-test	post-test
Previously tasted dairy food	60	105	51	49
Dairy food chosen as favorite food	9	26	10	3
Dairy food actually tasted	<u>33</u>	<u>68</u>	<u>18</u>	<u>16</u>
TOTAL	102	199	79	68

In each of the personal food choice sections, significant differences between the experimental and the control groups were noted. The section on previously tasted dairy foods had two significant areas (see Table 6). The section on dairy foods chosen as favorite foods had two significant areas (see Table 7). The section on dairy products actually tasted during the test had one significant area (see Table 8). These findings suggest that the nutrition education experience of the experimental group did in fact have an influence on the personal food choices of these preschool children on the post-test. On the contrary, the scores of the control group indicate that there was no significant difference in the personal food choices of these children. Therefore, Hypothesis II was not validated.

Hypothesis III

There will be no significant difference between the scores of girls and the scores of boys on the post-test in the experimental group. In the pre-test the girls and boys had no significant difference in scores. There was no difference in the scores of girls and the scores of boys on the cognitive learning sections of the post-test. The only significant difference in boys' and girls' scores occurred in their choice of their favorite foods on the personal food choice section of the post-test. Table II shows that the same number of boys chose cottage cheese as their favorite food on both the pre and post-test. However, all of the girls chose cottage cheese as their favorite food on the post-test. This was significant at the .05 level.

Table 10 Number of boys and girls choosing a dairy food as their most favorite food

Dairy Food	Girls#		Boys#	
	pre-test	post-test	pre-test	post-test
Milk	1	3	0	1
Cottage Cheese	2	7*	2	2
Chocolate Milk	0	3	2	5
Cheddar Cheese	<u>1</u>	<u>2</u>	<u>1</u>	<u>3</u>
TOTAL	4	15	5	11

Participants included 7 girls and 9 boys

* Significant .05 level

As shown in Table 11, the total score for the seven girls in the experimental group on the post-test was 227; the total score for the nine boys in the experimental group on the post-test was 304.

Table 11 Scores of girls and boys on each section of the pre and post-test

Test Section	Girls#		Boys#	
	pre-test	post-test	pre-test	post-test
Naming Dairy Products	32	43	37	56
Nutrition Questions	10	48	13	62
Relating Nutrition concepts to Foods	13	51	23	72
Previously Tasted Dairy Foods	22	44	38	61
Dairy Foods Chosen as Favorite Foods	4	14	5	11
Dairy Foods Actually Tasted	<u>10</u>	<u>26</u>	<u>23</u>	<u>42</u>
TOTAL	91	227	139	304

#Participants included 7 girls and 9 boys.

No statistically significant differences between scores of girls and scores of boys were shown in the nutrition concept learning sections. Only one of the personal food choice sections showed a statistically significant difference between the scores of girls and the scores of boys. This difference was shown in the section on dairy foods chosen as favorite foods (see Table 10). These findings suggest that there is

no difference in the nutrition concept learning of girls and boys. However, the findings suggest that girls chose dairy foods as their favorite foods more readily than boys after a nutrition education experience with dairy foods. Therefore, Hypothesis III was not validated.

Summary of Results

Hypothesis I was not supported. There was a significant increase in the scores of the experimental group on the post-test compared to the scores of the control group on the same test. This suggests that the nutrition education experience was effective in teaching nutrition concepts to the preschool children involved in the experimental group in this study.

Hypothesis II was not supported. There was a significant increase in the number of dairy foods chosen in personal food choices of the children in the experimental group. This suggests that personal food choices of the preschool children in the experimental group were influenced by exposure to the nutrition education experience. The control group made no significant change in their personal food choices during the same period of time.

Hypothesis III was not entirely supported. From the findings there appears to be no difference between girls and boys in their ability to learn nutrition concepts. However, in the personal food

choice section of the post-test there was one area in which the scores of girls and the scores of boys differed significantly on one food choice.

After exposure to nutrition education experiences, the girls chose cottage cheese as a favorite food more readily than boys.

DISCUSSION

Discussion of Findings

The null hypotheses made in this study were not supported in any of the three cases. On the pre-test both the experimental and control groups were similar in performance in the nutrition concept section and in the personal food choice section. The scores of the experimental group and the control group differed significantly on both sections of the post-test. There were more significant differences in the nutrition concept section than in the personal food choice section on the post-test. This suggests that as a result of this study, the preschool children's personal food choices were not modified as greatly as their cognitive learning had been modified. Bell and Lamb (1973) also found that after a nutrition program, dietary behavior was not modified as greatly as cognitive learning.

The comparison of girls and boys in the experimental group showed that within the limits of this study there appeared to be no difference in the ability of girls and the ability of boys to learn nutrition concepts. However, on the personal food choice section of the post-test there appeared to be a significant difference in the food choices of girls and the food choices of boys in one specific area after exposure to nutrition education experiences. This area was in choice of most

favorite foods. Out of the four groups of foods in the section on choosing favorite foods, the scores of girls and the scores of boys differed significantly on only one group (see Table 10).

Discussion of Procedure

At first, children in both the experimental and control groups were reluctant to leave their play and accompany the instructor downstairs to play the "food game." When the first two children returned to their regular play after their pre-test, the "food game" became the topic of conversation. Comments such as "go play the food game," and "it's fun" were heard. Soon all the children were eager to be next to play the "food game." Toward the end of both testing sessions, children who had previously been tested wanted to "play again."

The experimental group needed no encouragement to play the food game for the post-test, while the control group's attitude toward the post-test was similar to the attitude of both groups at the start of the pre-testing session. The first one or two children were reluctant to leave their play, but after these children returned to regular play activities, all the children wanted to be next to play the "food game." Because of this difference in attitudes it took only two days to post-test the experimental group, while the post-test for the control group took five days.

During the nutrition experience sessions the experimental group was enthusiastic and cooperative. The children's interest level seemed very high regarding the food activity directed each day by the instructor. Each morning different children would ask the instructor, "What are we eating today?" The instructor would reply "Something made from milk. Why should you drink milk?" The child would answer, "To help my bones grow."

During the rug discussion the children were eager to tell the instructor what they remembered about previous nutrition sessions. Group participation was spontaneous and enthusiastic. Children were always acknowledged by name when they responded with a comment or answered a question. The children's interest level was high, but occasionally some children had to be reminded to listen so they would know what to do when they got to the tables.

The nutrition sessions were intended to be exciting and stimulating. The instructor was enthusiastic and tried to make the nutrition sessions enjoyable for the children. The nutrition sessions were successful every day but one. On that particular day the nutrition session was scheduled at a different time than usual. The session included new "teachers," child development students who had not been informed of the importance of their enthusiasm in the success of the activity. That day the children made a banana milk drink. The students verbally as well as visually showed their apprehension of the drink.

The students led the activity at three tables while the instructor led the activity at the fourth table. At the first three tables only two children tasted the drink. At the fourth table all the children tasted the drink and all but one of the children asked for more. The instructor felt that this incident showed the great importance of the attitude of the adults involved in a nutrition experience with young children. It exemplified Frankle's (1967) observation that any negative comments or gestures by an adult would destroy the positive atmosphere for the food or nutrition idea.

It was felt by the instructor that the nutrition sessions were enjoyable because of the warm, enthusiastic atmosphere of the sessions. It was also felt by the instructor that the week spent getting acquainted with the children helped to establish good rapport between the children and the instructor. This enabled the children to feel at ease with the instructor. Being involved with the children from the first day of school also gave the instructor a role of authority in the children's eyes.

In order to minimize home influence over the children's reactions to the nutrition education program, no attempt was made to detect carry-over into the children's homes of the nutrition concepts. However, six different children and their mothers stopped the instructor to visit about the food ideas the children were learning. None of these visits took place on the college campus. Several of the visits took place in a supermarket. Other visits occurred in department stores.

The children would call to the instructor on seeing her from a distance and would then introduce the instructor to their mothers as "the teacher that tells me about milk." After this introduction a brief conversation about the nutrition sessions at school ensued. The mothers assured the instructor that everyone in the family knew why they should drink milk. Four of the mothers mentioned that their children either asked for more milk than usual or no longer needed to be coaxed to drink milk.

One child had an older sister enrolled in a nutrition class at Southern Utah State College. After the nutrition class, the sister inquired of the instructor as to who was teaching nutrition to the pre-school children. Before telling her who was doing the teaching, the instructor asked why the student wanted to know. Her reply was: "You can't believe how much my little sister knows about nutrition." She told the instructor that her sister told the family to drink their milk and eat everything made from milk so their teeth would be strong. She said they had a nutrition lesson from the preschooler at every meal.

SUMMARY

The objectives of this study were to determine the level of understanding preschool children have concerning nutrition concepts related to dairy products, to determine if nutrition concepts could be taught to preschool children, and to determine if nutrition education experiences would influence the subsequent food choices of preschool children.

Thirty-two, four-year-old preschool children completed this study. Sixteen preschool children from the morning session of the Child Development Laboratory at Southern Utah State College comprised the experimental group and were involved in a nutrition education curriculum with the accompanying pre and post-test. Sixteen preschool children from the afternoon session of the Child Development Laboratory served as the control group, and were tested the same as the experimental group but received no nutrition education experience. After the completion of the post-test the two groups were compared to determine if there were any significant differences between the two groups.

The findings revealed no significant difference between the experimental group and the control group on the pre-test. However, there was a significant difference in the scores of the experimental group and the control group after the nutrition education experience.

The experimental group significantly improved its score on the nutrition concept section of the post-test and significantly increased the number of dairy foods included in personal food choices after the nutrition education experience. It appeared that the preschool children in this study learned the nutrition concepts to a much greater extent than they altered their personal food choices. The scores of girls and the scores of boys in the experimental group were compared. It was found that no significant difference occurred in the scores of girls and the scores of boys on the nutrition concept section of the study. However, in one area of the personal food choice section there appeared to be some difference, as cottage cheese was more frequently chosen as a favorite food by girls than by boys.

CONCLUSIONS

On the basis of this study the following conclusions, limited in scope to dairy foods, seem justified:

The four-year-old preschool child is capable of learning nutrition concepts as a result of participating in nutrition education experiences.

Modification of personal food choices made by preschool children can occur as a result of exposure to nutrition education experiences.

Use of food activities and stories can be an effective method of teaching nutrition concepts to four-year-old children.

Some modification of personal food choices made by preschool children can result from the use of food activities and stories to teach nutrition concepts.

Although the sex of a child does not necessarily determine his ability to learn nutrition concepts, this factor may influence the child's choice of favorite foods.

RECOMMENDATIONS FOR FUTURE STUDIES

On the basis of this study, the following recommendations are made regarding future studies:

A similar study with a second post-test after a waiting period, to determine if any decrease in nutritional concept understanding or modification of personal food choices occurs with passage of time.

A similar study involving three-year-old children, to determine if younger children can learn nutrition concepts and if personal food choices of these children would be modified by exposure to nutrition experiences.

A similar study with encouragement of home involvement in the nutrition program, to determine if home involvement increases nutrition concept understanding and modification of personal food choices of the preschool child.

A similar study with encouragement of home involvement in the nutrition program, to determine if home involvement increases nutrition concept understanding and modification of food choices of the family as well as the preschool child.

A similar study involving another food group from the Basic Four Food Groups.

LITERATURE CITED

- Agricultural Marketing. 1970. Growing with Good Food Habits. 15(2):9.
- _____. 1969. Kids Eager to Eat Nutritious Food. 14(10):15.
- Bell, C.G., and M.W. Lamb. 1973. Nutrition Education and Dietary Behavior of Fifth Graders. Journal of Nutrition Education. 15(3):196.
- Berrol, S.C. 1970. Health Education and Welfare. The Progressive Impulse in the New York City Public Schools. Elementary School Journal. 71:134.
- Blackburn, M.T. 1970. Who Turns the Child "Off" to Nutrition. Journal of Nutrition Education. Fall 45 p.
- Bluming, M.C. 1972. Breakfast Program for Children's Centers. Journal of Nutrition Education. 4:177.
- Briggs, G.M. 1969. The Need for Nutrition Education. Journal of Nutrition Education. 1(1):7.
- Bosley, B. 1947. A Practical Approach to Nutrition Education for Children. Journal of the American Dietetic Association. 23 April 304-9 p.
- Chenoweth, A.D. 1972. Standards and Progress in Day Care Center Programs. Journal of the American Dietetic Association. 60:197.
- Cortes, M.P. and B.R. Standal. 1973. Nutrition Education Practices in Elementary Schools in Hawaii. Journal of Nutrition Education. 5(1):18.
- Dairy Council of California. 1970. Big Ideas: Kindergarten through Third Grade.
- Eppright, E.S., H.M. Fox, B.A. Fryer, G.H. Lamkin, and V.M. Vivian. 1969. Eating Behavior of Preschool Children. Journal of Nutrition Education. 1(1):16.

- Frankle, R.T., M.F. Senhouse, and C. Cowell. 1967. Project Head Start--a Challenge in Creativity in Community Nutrition. Journal of Home Economics. 59:24.
- George, J.C. 1971. A Nutrition Unit for a Sixth Grade. Journal of Nutrition Education. 2:11.
- Glaser, A. 1964. Nursery School Can Influence Foods Acceptance. Journal of Home Economics. 56:680.
- Harrill, I., C. Smith, and J.A. Gangener. 1972. Food Acceptance and Nutrient Intake of Preschool Children. Journal of Nutrition Education. 4:103.
- Head, M.K. 1974. A Nutrition Education Program at Three Grade Levels. Journal of Nutrition Education. 6(2):56.
- Hill, M.M. 1969. Creating Good Food Habits-Start Young, Never Quit. Yearbook of Agriculture 1969. Superintendent of Documents, Washington, D.C. 20402.
- Juhas, L. 1969. Nutrition Education and the Development of Language. Journal of Nutrition Education. 1(1):12.
- Leverton, R.M. 1969. Facts and Fallacies About Nutrition and Learning. Journal of Nutrition Education. 1(2):7.
- Lovett, R., E. Baker and B. Marcus. 1970. The Effect of Nutrition Education Program at the Second Grade Level. Journal of Nutrition Education. Fall Supplement 1.
- Lowenberg, M. 1952. Teaching Nutrition to Boys and Girls. Journal of Home Economics. 44, (December) 792-93.
- Lowenberg, M.E. 1959. Between Infancy and Adolescence. Yearbook of Agriculture 1959. U.S. Department of Agriculture, Washington, D.C.
- McDonald, S.G. 1963. Teaching Nutrition at Nursery School Level. What's New in Home Economics. 27(1):16.
- Niehoff, A. 1968. Summary of Remarks by Arthur Niehoff at the 1968 University of California Extension Symposium. Food, Science and Society. Changing Food Habits. Journal of Nutrition Education. 1(1):10, 1969.

- Parrish, J.B. 1971. Implication of Changing Food Habits for Nutrition Educators. Journal of Nutrition Education. Spring:140.
- Peterson, M.E. and C. Kies. 1972. Nutrition Knowledge and Attitudes of Early Elementary Teachers. Journal of Nutrition Education. 4:11.
- Recommendations of White House Panels on Nutrition Education, Section 4, Panel 1. 1970. Journal of Nutrition Education. 1(3):24.
- Ritchie, J.A.S. 1971. Learning Better Nutrition. United Nations FAO Nutritional Studies No. 20. 3rd printing.
- Roberts, L.J. 1922. Malnutrition-Schools Problem. Elementary School Journal. 22 (February) 457-67.
- Schubert, E.P. 1970. Nutrition Education: How Much Can or Should Our Schools Do? Journal of Nutrition Education. 2:9.
- Schuck, C. 1961. Food Preferences of South Dakota College Students. Journal of the American Dietetic Association. 39:595.
- Smith, W.I., E.K. Powell and S. Ross. 1955. Manifest Anxiety and Food Aversions: Some Additional Personality Correlated. Journal of Consulting Psychology. 19:145.
- Stieberling, H.K. 1959. Food in Our Lives. Yearbook of Agriculture 1959. U.S. Department of Agriculture. Washington, D.C. 20402.
- _____ and T.A. Dries. 1959. Habit and More. Yearbook of Agriculture 1959. U.S. Department of Agriculture. Washington, D.C. 20402.
- Tinsley, W.V. 1959. As the Twig is Bent. Yearbook of Agriculture 1959. U.S. Department of Agriculture. Washington, D.C. 20402.
- Todhunter, E.N. 1969. Approaches to Nutrition Education. Journal of Nutrition Education. 1(1):8.

U.S. Department of Agriculture. 1968. Nutritive Quality of Diets, U.S.A. Report of Committee on Aging of the U.S. House of Representatives, Washington, D.C. 20402.

What's New in Home Economics. 1967. Trained Leaders Direct Day Care Centers. 31(3):47.

White House Conference on Food, Nutrition and Health, Final Report. 1969. Superintendent of Documents, Washington, D.C. 20402.

APPENDIX

Dairy Products Unit

Day 1 Chocolate Milk Snack

Discuss: Milk, Kinds of milk, Four glasses of milk each day

(Hold up a glass of milk.)

(Ask these questions:)

What am I holding?

What do we do with milk?

When do we drink milk?

How many glasses of milk should you drink every day?

(Hold up four fingers.)

We should drink four glasses of milk every day.

Help me count to four. (Count on fingers.)

Let's count to four again.

Use your fingers to show me how many glasses of milk you should drink every day.

(Show containers of milk: evaporated, skim, whole and chocolate milk.)

What is in each container?

Milk comes in many packages. All of these different packages contain milk.

(Pour milk from each carton into a glass.)

How is each glass of milk different? color, different container

Each glass of milk looks different but each glass holds milk and milk is good for us.

How many glasses of milk should you drink every day?

I have four glasses of milk here. You should drink four glasses of milk every day.

Help me count these glasses of milk.

How many glasses of milk should you drink every day?

Today we are going to have milk for a snack.

Today at the tables you will find pitchers of milk. When you are sitting down each of you will get a turn to pour your own glass of milk.

You may drink the milk as it is or you may take one spoonful of chocolate from the bowl on the table and mix it into the milk. (Demonstrate while talking) Then drink the milk.

(Dismiss children to tables.)

Day 2 Egg Nog

Discuss: Milk helps bones grow hard and strong. Four glasses of milk each day. Yesterday we talked about milk. Today we are going to talk more about milk. How many glasses of milk should you drink every day?

That's right, you should drink four glasses of milk every day.

When do we drink milk?

Yes, we drink milk when we eat.

To drink four glasses of milk every day, we need to drink milk each time we eat.

Let's count on our fingers how many times we eat.

One glass of milk at breakfast.

One glass of milk at lunch.

One glass of milk at dinner.

That's only three glasses of milk. When should we drink one more glass of milk?

Yes, snack time is a good time for a glass of milk.

How many glasses of milk should you drink every day?

Let's count four glasses of milk on our fingers one more time.

One glass of milk at breakfast.

One glass of milk at lunch.

One glass of milk at snack time.

One glass of milk at dinner.

Now put your fingers like this and push on your wrist. (Demonstrate)

How does it feel?

That's right, your wrist feels hard.

Your wrist feels hard because your wrist has a bone in it.

This hard bone makes your wrist feel hard.

Now feel your fingers like this. (Demonstrate)

How do your fingers feel?

Yes, your fingers feel hard also. Your fingers feel hard because they have hard bones in them.

Milk helps our bones grow hard.

Milk helps us have hard, strong bones.

Can you find some more hard bones in your body? head, elbow, knee, toes.

What makes these bones hard and strong?

That's right, milk helps our bones grow hard and strong. That is why we should drink milk. We should drink milk so we will have hard, strong bones.

Why should we drink milk?

How many glasses of milk should you drink every day?

Tell me again why you should drink milk.

Now I am going to show you how to make a party drink from milk.

This party drink is named Egg Nog.

Demonstrate making Egg Nog

2 T sugar	Beat eggs, add sugar and beat.
3 eggs	Stir in milk. Pour into glasses.
3 C milk	

What makes your bones hard?

Why should you drink milk?

How many glasses of milk should you drink every day?

(Dismiss children to tables.)

Day 3 Story: We All Drink Milk

(Hold up a picture of a mare and colt.)

Tell me about this picture.

That's right, this is a picture of a mare and her colt.

Yes, the colt is smaller than the mare.

Will the colt grow to be as large as its mother?

What will the colt do to help it grow as big as its mother?

Yes, one of the things the colt will do is eat good food.

What will the colt drink to help its bones grow strong?

(Hold up a picture of a rabbit and her litter.)

Tell me about this picture.

Yes, this is a picture of a rabbit and her babies.

Will the bunnies grow to be as large as their mother?

What will help the bunnies grow to be as large as their mother?

That's right. The bunnies will eat good food and drink milk to help them grow.

(Hold up a picture of a cat with kittens and a dog and puppies.)

Tell me about this picture.

This is a picture of a dog and her pups and a cat and her kittens.

Will the kittens and puppies grow to be as large as their mothers?

What will help the kittens and puppies grow?

(Hold up a picture of a mother and her baby.)

Tell me about this picture.

Were you ever as small as the baby in this picture?

What helped you to grow as big as you are now?

Yes, eating good food and drinking milk helped you to grow.

Will you grow to be as big as your mothers?

What can you do to help you grow?

Yes, you can eat good food. By drinking milk you can help your bones grow big and strong.

How many glasses of milk should you drink every day?

Why should you drink milk?

Tomorrow we will talk more about milk and how it helps us grow.

Day 4 Peanut Butter Chews

Discuss: We don't have to drink milk--we can eat milk. Milk helps bones grow hard and strong. Four glasses of milk every day.

What did we talk about yesterday?

Yes, we talked about what helps baby animals to grow as big as their mothers.

What helps baby animals grow?

That's right. Eating good food and drinking milk helps small animals grow.

What helps you grow?

Yes, eating good food and drinking milk helps you grow.

Put your hand up to a teacher's hand, like this.

Whose hand is the bigger? The teacher's hand is the bigger.

Feel your fingers. What do you feel?

You feel a hard bone.

Now feel a teacher's fingers. Whose bones are the larger?

Yes, the teacher's bones are the larger.

What will help your bones grow as large as the teachers?

That's right. If you drink milk your bones will grow hard and strong.

Your bones will also grow larger.

How much milk should you drink every day?

Hold up a bowl of powdered milk.

What do I have in this bowl?

No it isn't flour or sugar. This is powdered milk. If you add water to this powdered milk it will look just like regular milk. (Demonstrate)

But we don't have to drink powdered milk--we can eat it.

Now I am going to show you how to make Peanut Butter Chews, with powdered milk. (Demonstrate)

1/2 C peanut butter

2/3 C powdered sugar

1/2 C corn syrup

1 C (or more) dry milk

Mix syrup and peanut butter and gradually add powdered sugar.

Stir until smooth. Then add dry milk a little at a time and mix well until mixture is stiff enough to handle.

Roll into balls or into a long roll to be cut into pieces. Recipe makes about 30 pieces. Some chopped peanuts may be added unless chunky peanut butter is used. (Utah 4-H Food and Fun Series)

Why should you drink milk?

How much milk should you drink every day?

Dismiss children to go to tables.

Day 5 Story: Timmothy Tooth

Once there was a little tooth named Timmothy. Timmothy was very unhappy. He always frowned. He was so sad. Timmothy was sad because he was so little and so weak. He just wasn't as strong and big or as beautiful as all the other teeth he met in all the smiles he saw. So Timmothy cried.

Then Timmothy decided to ask one of the big strong teeth why it was so strong. Why it could chew so well and eat everything. Timmothy asked--Mr. Big Tooth could you help me? Please tell me what makes you so big and so strong. What can I do to be big and strong like you?

Timmothy--said Mr. Big Tooth--I will be happy to tell you what makes me big and strong. Timmothy, there are many things I do to make me strong and healthy.

First, I brush my outside very well after each time I eat. This keeps me shiny and beautiful. I use these, tooth paste and a brush.

The second thing I do is go see a tooth doctor. He is called a Dentist. He fixes any cracks or crevices that might start in my shiny white enamel. I go see my dentist twice a year.

The third thing I do is eat right. I eat carrots, apples and all the good foods I can find. I stay away from candy and sweets.

But you know what makes me feel better and stronger than anything else? MILK!

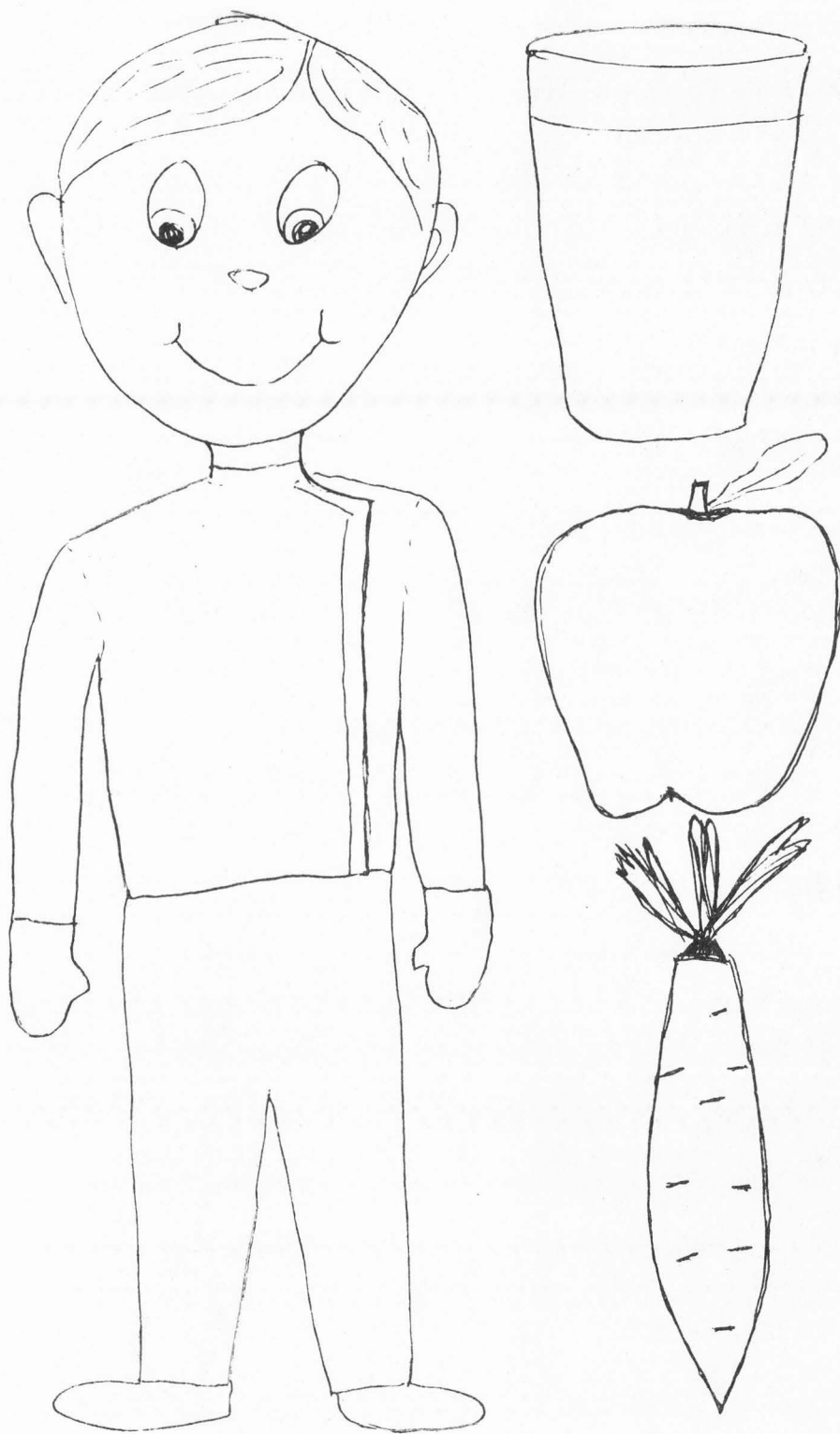
I drink lots of milk. I drink four glasses of milk every day.

Milk is what makes me strong. Milk will also help you grow

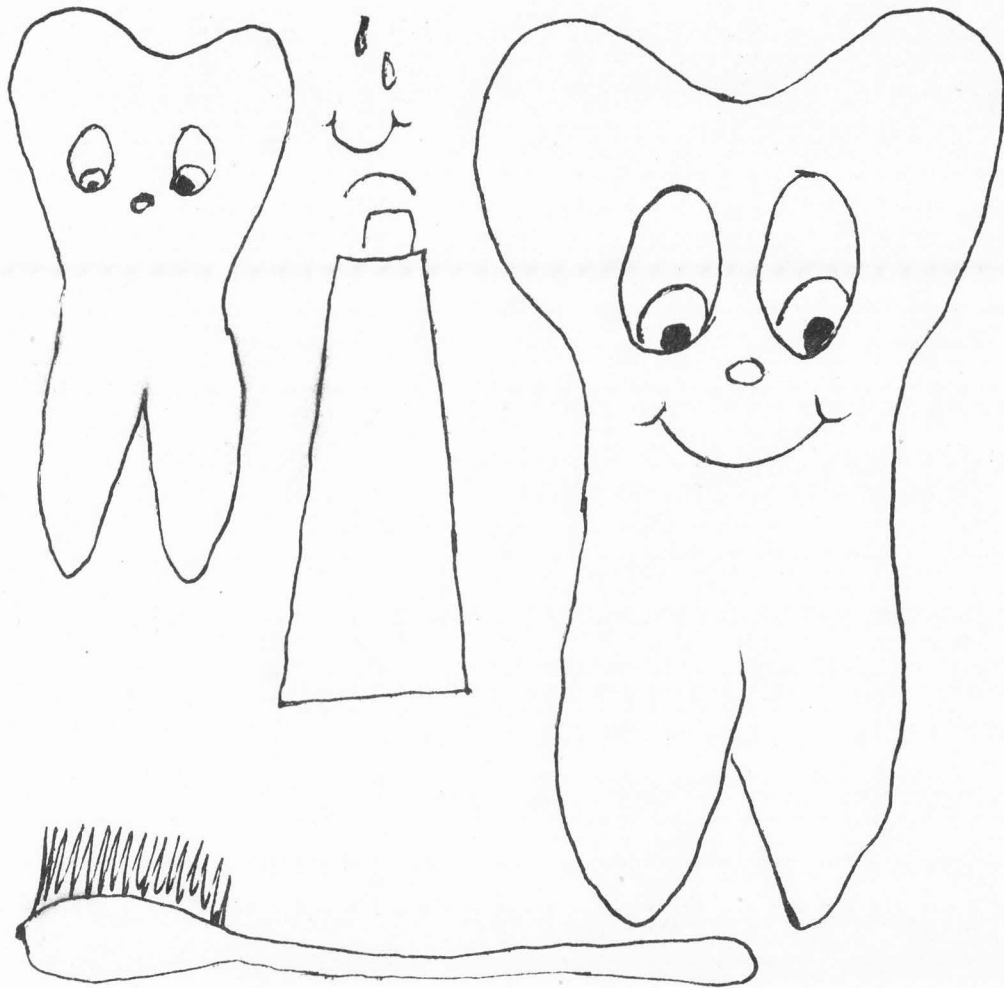
Timmothy, so you can be as big as I am.

Thank you Mr. Big Tooth. I will do all that you've told me to do. But most of all I am going to drink four glasses of milk every day.

Good-bye Mr. Big Tooth. Now I am going to go get me a glass of milk.



Flannel Board Characters for Timmothy Tooth Story. (Anne Clarke)



Flannel Board Characters for Timmothy Tooth Story. (Anne Clarke)

Day 6 Introduce Dairy Products --Serve Yogurt

Discuss: Dairy products are made from milk.

Dairy products help bones and teeth grow hard, and strong.

Yogurt is a dairy product.

Drink four glasses of milk or eat four dairy products every day.

Hold up a glass of milk.

What did we learn about teeth yesterday?

Yes, milk helps teeth grow big and strong.

Why should we drink milk?

We should drink milk to help our bones and teeth grow hard and strong.

We need to help our bones and teeth because they are growing.

Our bones and teeth can't grow big and strong without the right foods.

That is why we need to drink milk to help our bones and teeth grow.

How many glasses of milk should you drink every day?

(Show cheddar cheese, chocolate milk, cottage cheese, and yogurt.)

Can you tell me the names of these foods?

(Point to each food individually and say the name.)

These foods are all made from milk.

Foods made from milk are called dairy products.

Chocolate milk, cheddar cheese, cottage cheese and yogurt are dairy products.

Dairy products are made from milk.

Eating dairy products helps our body just like drinking milk.

Dairy products help our bones and teeth grow strong just like milk does.

Why should we eat dairy products?

Yes, dairy products help our bones and teeth grow hard and strong.

Why should you drink milk?

How many glasses of milk should you drink every day?

Since dairy products help our bones and teeth grow just like milk, we can sometimes eat a dairy product instead of drinking a glass of milk.

How many glasses of milk or dairy products should you eat or drink everyday?

Today I have a special snack for you. When you go to the tables you will find yogurt.

What is yogurt?

That's right. Yogurt is a dairy product.

You may serve yourself some yogurt at the table.

(Dismiss children.)

Day 7 Milk Shakes

Discuss: Ice cream is made from milk.

Ice cream is a dairy product.

Milk and dairy products help bones and teeth grow hard and strong.

Eat four dairy foods or four glasses of milk every day.

Yesterday we talked about dairy products.

What are dairy products? Foods made from milk.

Name the dairy products we saw yesterday.

Yogurt, cheddar cheese, chocolate milk, cottage cheese and milk were the dairy products we talked about.

Today I have another dairy product to tell you about.

(Hold up ice cream.)

What is this?

Ice cream is a dairy product.

Why is ice cream a dairy product?

Ice cream is a dairy product because ice cream is made from milk.

Why should you drink milk and eat dairy products?

How many glasses of milk should you drink every day?

Sometimes we can eat a dairy product instead of drinking a glass of milk.

When you eat a dairy product, what are you helping grow?

Yes, when you eat dairy products you are helping your bones and teeth grow.

What else helps your bones and teeth grow?

Today we are going to make milk shakes. Milk shakes are made from ice cream and milk. So what do milk shakes do for you?

They will help your bones and teeth grow hard and strong.

(Demonstrate: Fill blender 1/2 to 2/3 full with flavored ice cream.)

(Strawberry was used.) Add 1 C milk. Turn on blender. Pour shake into a glass.

(Dismiss children to make milk shakes.)

Day 8 Squeeze Cheese and Crackers

Discuss: Cheese is made from milk.

Cheese is a dairy product.

Milk and dairy products help bones and teeth grow hard and strong.

Drink four glasses of milk each day.

(Hold up a package of Squeeze Cheese or canned cheese.)

What am I holding?

Yes, this is cheese.

What does cheese do for your bones and teeth?

What is the name for products that help your bones and teeth grow hard and strong?

Yes, dairy products. What are dairy products made from?

Is cheese a dairy product?

Yes, cheese is a dairy product because cheese is made from milk.

How many glasses of milk should you drink every day?

Today we are going to do something very fun. We are going to squeeze cheese out onto crackers and then eat the cheese and crackers.

When cheese is put on a cracker like this it is called an Hors-d'oeuvre.

Let's all say Hors-d'oeuvre.

These special treats are often eaten at parties.

(Pass out the cheese and crackers.)

(Teachers squeeze the cheese onto the crackers because the children can't operate the cans.)

Day 9 Melting Cheese

Discuss: Cheese is a dairy product.

Milk and dairy products contain calcium.

Calcium helps bones and teeth grow hard and strong.

Milk and dairy products help teeth and bones grow hard and strong.

Drink four glasses of milk every day.

(Hold up cheese.)

What is this?

What is cheese made from?

What are foods called when they are made from milk?

How many glasses of milk should you drink every day?

Why should you eat dairy products?

Why should you drink milk?

Milk and dairy products contain something very special.

This very special thing is called calcium.

Now you say it with me, calcium. Again, calcium.

Calcium is the special thing in milk that helps your bones and teeth grow hard and strong.

Calcium is found in milk and dairy products. Calcium helps your bones and teeth grow hard and strong.

What does calcium do?

When we drink milk or eat dairy products our bodies get calcium to

help our bones and teeth grow hard and strong.

Why should you eat cheese?

What is so special in cheese that helps our bones and teeth grow?

Yes, calcium is very special.

What does calcium do?

That is right. Calcium helps our bones and teeth grow hard and strong.

Today we are going to melt cheese.

What will we have to do to the cheese to melt it?

We will have to heat the cheese won't we?

(Demonstrate:) First place slices of cheese in a pie pan. Then we'll heat the cheese in the oven. The cheese will come out of the oven like this. (Have melted cheese to show the children.) Take a fork and serve yourself some melted cheese--but have a teacher help you hold the dish because the dish is very hot.

Why should we eat cheese?

Cheese contains calcium and calcium helps our bones and teeth grow hard and strong.

(Dismiss children.)

Day 10 Cottage Cheese Dip

Discuss: Calcium and related concepts.

Dairy products and related concepts.

Milk and related concepts.

(Hold up cottage cheese.)

What is this?

What kind of product is cottage cheese?

Why should you eat dairy products?

What is so special in milk and dairy products?

What does calcium do?

How many glasses of milk should you drink every day?

Today we are going to make a snack food from cottage cheese. It is called cottage cheese dip.

(Demonstrate:) 1 C cottage cheese 2 t onion soup mix 1/2 C salad

dressing Stir the salad dressing into the cottage cheese. Add the onion soup mix and stir. Serve with crackers or vegetables.

(For the class the onion soup mix was called spices.)

Why should you eat dairy products?

What is so special in dairy products?

What does calcium do?

Day 11 Sculpturing with Cheese Pieces

Discuss: Calcium and related concepts.

Dairy products and related concepts.

Milk and related concepts.

(Show an orange, cheddar cheese, soda pop.)

Tell me which of these foods is a dairy product.

Tell me which of these foods helps your bones and teeth grow hard and strong?

What is so special in milk and dairy products?

Why is calcium so special?

How much milk should you drink every day?

What can you eat in place of milk?

Show cheddar cheese pieces.

What is this?

Yes, this is cheese. It is called cheddar cheese.

(Show Swiss cheese pieces.)

What is this?

This is cheese too. This white cheese is called Swiss Cheese.

Let's all say the names of the two kinds of cheese.

Today we are going to do something really fun with cheese.

I have toothpicks and pieces of cheese and I am going to make things from the cheese.

(Make a sail boat and a person.)

Sometimes I eat some of the cheese while I'm making things.

When you go to the tables you will find pieces of cheddar cheese, pieces of Swiss cheese and toothpicks. You may make anything you wish. You may also eat the cheese.

(Dismiss the children.)

Day 12 Milk Drink

Discuss: Calcium and related concepts.
 Dairy products and related concepts.
 Milk and related concepts.

(Show milk, a banana, and marshmallows.)

Which of these foods helps your bones and teeth grow hard and strong?

Which of these foods have calcium?

What does calcium do?

How much milk should you drink every day?

Today we are going to make a party drink from milk and bananas.

This drink is much like a milk shake.

(Demonstrate:) Mash 2 ripe bananas, mix in 1/3 C corn syrup. Stir into one quart of milk. Add instant chocolate mix if desired. (Utah 4-H Food and Fun Series)

When do we drink milk?

How many glasses of milk should you drink every day?

(Dismiss the children.)

Day 13 Ice Cream Cones

Discuss: Calcium and related concepts.
 Dairy products and related concepts.
 Milk and related concepts.

(Show ice cream, juice, and potato chips.)

Which of these foods is made from milk?

What are foods that are made from milk called?

Why should we eat dairy foods?

What is so special in dairy products?

What does calcium do?

Where do you find calcium?

Today you are going to make your own ice cream cone.

(Demonstrate scooping ice cream into a cone.)

Ice cream is a dairy product.

Why are dairy products good for you?

(Dismiss children.)

Day 14 Toasted Cheese Sandwiches

Discuss: Calcium and related concepts.

Dairy products and related concepts.

Milk and related concepts.

(Show a cup cake, bread, cheddar cheese and Swiss cheese.)

Tell me which foods have calcium.

What does calcium do?

Which foods help our bones and teeth grow hard and strong?

Which foods are dairy products?

Today we are going to make cheese sandwiches.

(Demonstrate:) Place a slice of cheddar cheese on a piece of bread.

Place small pieces of Swiss cheese on top of the cheddar cheese to

make a design. Broil the sandwich. Serve warm.

(Dismiss children to make sandwiches.)

Day 15 Cottage Cheese, Hay Stack Salads

Discuss: Calcium and related concepts.

Dairy products and related concepts.

Milk and related concepts.

(Show cottage cheese, saltines and fruit loops.)

Which of these foods is a dairy product?

What do dairy products do?

Which of these foods contains calcium?

What does calcium do?

Which of these foods is made from milk?

What does milk do?

How many glasses of milk should you drink every day?

Today we are going to make cottage cheese salads. These are special salads, they are called Hay Stack Salads.

(Demonstrate:) With an ice cream scoop, place a mound of cottage cheese on a plate. Sprinkle shredded cheddar cheese over the cottage cheese to make the hay stack.

Where do you find calcium?

What does calcium do?

Why should you eat dairy products?

Why should you drink milk?

How much milk should you drink every day?

(Dismiss children to do activity.)

Literature Cited, Appendix

Clarke, Anna. Timmothy Tooth. Story submitted to Diane Houston at Southern Utah State College, 1974.

Wadley, A.W., F. Bardwell, and A.R. Kearsley. Utah 4-H Food and Fun Series, Utah State University Extension Services, 1970.

VITA

Nida Diane Houston

Candidate for the Degree of
Master of Science

Thesis: A Study of the Influence of Nutrition Education on Preschool
Children

Major Field: Nutrition

Biographical Information:

Personal Data: Born in Price, Utah, December 14, 1949,
daughter of Douglas B. and Nida Mae Jensen; one
sister, Catherine; married John W. Houston,
June 28, 1969; no children.

Education: Attended elementary school in Salt Lake City,
Cedar City and Panguitch, Utah; attended junior high
and high school in Panguitch, Utah; graduated with honors
from Panguitch High in 1968; attended Dixie College in
St. George, Utah from 1968-69; attended College of
Southern Utah in Cedar City from 1969-71; graduated
Phi Kappa Phi from Utah State University in 1972;
received a Bachelor of Science degree in Home
Economics; completed requirements for the
Master of Science degree, specializing in nutrition
at Utah State University in 1974.

Professional Experience: 1973-74 instructor at Southern Utah
State College, Cedar City, Utah; 1972-73 graduate
assistant in Nutrition at Utah State University.