INvolving parents in a nutrition education
program for preschool children

by

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ABSTRACT

Involving Parents in a Nutrition Education Program for Preschool Children

by

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Utah State University, 1980

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The primary intent of this study was to ascertain the effectiveness of parents in the role of teaching nutrition to their children. This research endeavor was an extension of refinement of a three-year program in nutrition education in the Department of Family and Human Development at Utah State University. Fifty-seven children enrolled in the Child Development Laboratory at Utah State, and their parents were involved in the study. Eighteen children were taught nutrition by their mothers. Twenty-one children were taught nutrition by their mothers and fathers, and 18 children served as the control group and received no nutrition instruction. Parents taught their children about nutrition using an eight-week curriculum based on the concept of nutrient density, which compares nutrient content of food to calorie content. Food Profile Cards, a visual representation of this concept, were the main teaching tools.

Involving parents in a nutrition education program proved an effective means of teaching children about nutrition. This was
shown by a significant increases in children's nutrition knowledge. Parents knowledge of nutrition also significantly increased as a result of their involvement in teaching nutrition to their children. A significant increase in good nutrition practices was also noted. When results were compared by treatment given, the children taught by mothers and fathers made significantly greater gains in acquiring nutrition knowledge than those taught by a single parent (mother only group). In relation to the program of the previous year, children taught by mothers, and children taught by mothers and fathers scored significantly higher on the nutrition knowledge tests than children involved in the parent-taught program of the previous year.¹

Children taught by mothers and fathers made even greater gains in nutrition knowledge scores than the children taught in the classroom last year.

CHAPTER I
INTRODUCTION

An intimate and important relationship exists between an individual's total well-being and food items selected to eat. Recent research has added additional support for this assertion. As a result of new scientific discoveries relating diet to health, an increased concern about nutrition has pervaded today's society (Cooper, Payne & Edwards, 1971; Nelson, 1976). The development of nutritional programs for young children has also been rapidly increasing. Some of the major reasons for this emphasis include:

1. The importance of an adequate diet for optimal growth and development of children is becoming generally well recognized. Raman (1975) states that nutrition is the key factor in the actualization of biological and psychological potentials. In early development there are periods of rapid growth that determine the extent of human potential. It is during this time that children are particularly susceptible to nutritional insult. The inter-relationship of nutrition and mental development is a particularly active research area (McWilliams, 1967).

2. A number of studies (Caliendo & Sanjur, 1978; Augelli & Wright, 1978; Beyer & Morris, 1974) have emphasized the importance of teaching the foundation of good nutrition early in life. In evaluating eating habits, it is believed that diet attitudes and
practices established in the early years remain unchanged throughout life (Kerry, 1968). A critical period for establishing good dietary habits and for providing the necessary nutrients for maximizing growth and development begins in the early stages of a child’s growth and development.

3. Studies indicate that attitudes and practices of nutrition acquired in childhood become fairly resistant to change. Attempts to change diet habits in adults have met with little success (Coates & Thoreson, 1978; Leon, 1976). Hill (1969) argues that it is easier to develop good food habits in young children than it is to correct bad food habits in adulthood.

For these primary reasons, a rapid increase in nutritional programs for young children has emerged. These programs have established that children at the preschool age can comprehend certain types of nutritional concepts, such as the relationship between calories and nutrients and can use this learning to evaluate foods (Feshbach, et al., 1978).

Nutritional programs for young children have proven effective in increasing children's knowledge of proper nutrition (Nelson, 1976; Smith, 1976; Feshbach, et al., 1978). However, if the fundamental task of nutritional education is directed only toward children, these programs have fallen short of their goals. Nutritional knowledge in the applied context proves valuable only to the extent that it is practiced. Most young children have few opportunities to put their knowledge into practice. An application gap exists in this area of nutritional education. This investigator
asserts that the family unit constitutes the primary resource in addressing this gap—programs should work through parents if children are to establish adequate nutritional foundations. Parental guidance proves to be an important influential factor in the development of proper nutritional habits in children (Augelli & Wright, 1978; Burt & Hertzler, 1978). The family has two persuasive factors concerning children's eating habits: (a) control of food choices and (2) instruction about eating habits (Augelli & Wright, 1978).

The importance of the parent's role in the guidance of children's choices of food cannot be overlooked. Parents exercise control over the quantity and quality of food accessible to children and in this role parents have the primary effect on the nutrition of their children. Thus, parents constitute the underlying force in the development of nutritional foundations. Data have revealed that the eating habits of children closely resemble the examples set by their parents (Emerson, 1967). Children basically imitate the family food patterns (Burkhart, 1969).

Therefore any type of nutritional program for children should include the family unit as the focus. Working with parents can improve and change the nutritional status of children.

The Problem

Food plays a central role in all societies. It functions as a socializer—playing a major role in religious and national holidays, also in family events such as weddings and birthdays. Food, a symbol of celebration and happiness, has been deeply
integrated into our culture and values (Norman, 1977). Food can also influence psychological needs in compensation of depression, loneliness, and a variety of life's problems (Marshall, 1972). In all of these aspects nutrition is usually not a priority (Van Schraick, 1964). Taste, variety, cost and convenience all affect food choices, while nutritional value is typically less important.

Another important influence in food choices is media. Children become especially vulnerable to advertising commercials that contain little nutritional value (Galst & White, 1976). Media also influences nutritional concepts of mothers (Emmons & Hayes, 1973). The nutritional education of mothers depends largely on newspapers, magazines, radio and television. Most advertising aims to sell products rather than to promote proper nutrition, thus the influence of media can be very powerful. Unfortunately, when considering nutrition, the impact of the media patronizes rather than educates this captive audience (Chetnik, 1974).

These selected influences have been briefly presented in order to conceptualize the complexity of food patterns and habits. With all these factors contributing to the development of nutritional habits, many diets in the United States remain inadequate. In assessing our nation's nutritional attitudes, many people continue to ignore the relationship between health and diet (Chetnik, 1974). Even with the increasing number of nutritional programs, national surveys show that Americans' eating habits are resistant to change (Agricultural Research Service, 1965; Martin, 1954). Studies of food consumption indicate that a significant percentage of the
United States population has inadequate intakes of important nutrients (U.S. Department of Health, Education and Welfare, 1975; U.S. Congress, 1970). The problem primarily stems from the over-consumption of calories that contain insufficient nutrients. A consensus among health professionals states that major medical problems of overweight and obesity prevail among adults and children because of improper eating habits (Augelli & Wright, 1978). This is a major concern because overweight children are likely to remain overweight throughout adulthood (Abraham & Nordsieck, 1960; Shukla, 1972). This reemphasizes the assertion that eating habits established early in life set the foundation for nutritional status (Beyer & Morris, 1974).

Concern over the development of nutritional habits and the current nutritional status of the United States has encouraged a great number of nutritional education programs, particularly for young children. These programs differ a great deal in structure and purpose. Nelson (1976) suggests the use of films, books, games, etc. for teaching nutrition to children. Other programs have implemented cooking experiences as a means of teaching good nutrition (Ferreria, 1973; Musgrave, 1974; Lee, 1979). Books have been developed on a children's reading level to promote good nutrition (Schlicks, 1976). Although none of the studies reviewed incorporated family participation in their programs, numerous studies concluded that nutritional education should be aimed at the whole family (Augelli & Wright, 1978; Burt & Hertzler, 1978; Phillips, Bass & Yetley, 1978; Beyer & Morris, 1974). Still other
educators emphasized the importance of involving mothers in teaching nutrition to young children (Caliendo & Sanjur, 1978; Emmons & Hayes, 1973).

There is a consensus that nutritional education programs for young children would be more successful if they were geared to the total family. However, programs of this type are not part of nutritional programs.

Why has there been a lack of parental involvement in nutrition education? Additionally, it is clear that opportunities for relevant nutrition education for mothers and fathers have been neglected. Data on nutritional knowledge indicate that mothers have little knowledge of nutrition (Emmons & Hayes, 1973), inspite of the fact that the overall diet of children tends to improve when mothers have increased nutritional knowledge (Eppright, 1969). A traditional line of thinking maintains that mothers have the primary influence on children's diets. Studies of the influence of the male family head on children's eating habits suggest that a vulnerable and important group may be unfairly neglected. Selected research indicates that the influence of mothers is not significantly stronger than the fathers (Burt & Hertzler, 1978). Nutritional programs need to involve both mothers and fathers in educating young children, especially in the area of nutrition.

A number of obstacles obstruct the implementation of parental involvement in a nutritional education program for young children, including:
1. Parents believe that they do not function as effectively as teachers (Gordon, 1972).

2. Priority has been given to the development of the basic academic skills. Nutritional education is considered by parents to be of secondary importance (Chethik, 1974).

3. Parents feel inadequate in teaching nutrition, they simply do not know where to begin (Emmons & Hayes, 1973).

4. Parents doubt the urgency of nutritional education because they believe that children already eat well (Eppright, 1969).

Realizing all these obstacles there is a need to develop strategies to overcome these barriers. Of primary importance is the issue of parents' attitudes toward nutrition. Attitudes and practices about food can be just as important as nutritional knowledge and it is important to stress that parents need to provide a good example. Nutritional classes for mothers have shown to improve the dietary status of their preschool children, and also to have an effect on the mother's attitude (Caliendo & Sanjur, 1978). Children's respect for good nutrition can be stimulated by parental enthusiasm and commitment (Eppright, et al., 1970).

If nutritional education for children has as its goal the establishment of good food habits which result in intelligent food selection throughout life, there emerges a need to direct nutritional education toward parents who primarily control a child's eating environment.

In short, specific attention is needed to nutritional education in general and in particular for young children in a family context,
since only intervention at this level can intervene in inter-
generational cycles.

The Purpose

The overall goal of this study is to evaluate a program for young children and parents in the hopes that better nutritional education for young children would be established. The main purpose of the study emphasizes the importance of parents as the primary educators of young children and asserts that successful nutrition education programs should educate adults (parents) as well as younger members of the family.

The specific objectives of the study are:

1. To provide a method of instruction by which parents can feel adequate in teaching their children about nutrition.

2. To have the additional benefit of helping parents increase their own nutritional knowledge as well as their children's knowledge.

3. To help parents increasingly value the concept and practice of good nutrition, through promoting good examples for their children.

Since family eating habits provide the basis for lifelong nutrition habits, it is hoped that the methods assessed in this research can be useful to families on a broad scale.
CHAPTER II
REVIEW OF LITERATURE

Food Behavior--A Perspective

A complex relationship exists between attitudes and values associated with nutrition and eating habits. Many Americans do not consider nutrition as a top priority in the selection of food. Additionally, several factors influence a family's diet and meal planning. Culturally determined values, attitudes, and beliefs form the framework within which food habits develop. Culture strongly influences eating behavior. Culture consists of habits, beliefs, and social forms shared by a group (Norman, 1977). Family and cultural food habits include both environmental and psychological factors.

There are a number of culturally determined functions that influence the role food plays in our society. It is important to explore these areas to further the understanding of nutritional habits.

Food as a means of communication. Food is a main component in socializing and practically all social occasions involve food in some way. The extent of one's hospitality or friendship is frequently determined by food gifts, and the quality of food served (Labuza, 1974). Food speaks a language of its own and thus becomes valuable as a tool of interpersonal communication: Turkey
says Thanksgiving; champagne says celebration; cake with candles says happy birthday (Marshall, 1972). Food is a universally acceptable gift for the expression of a variety of symbolic gestures.

**Food as an emotional outlet.** People frequently use food as an emotional outlet—a crutch to help them handle and live with anxiety, tension, frustration, unhappiness, irritability, disappointment, loneliness or boredom (Norman, 1977). People eat differently under stress, some eat more and some eat less. Food sometimes can be used to relieve strain.

**Food as a means of self-expression.** Mothers can enjoy nurturing and pleasing their families with food. Marshall (1972) explains that hostesses can take great pleasure in creating elegant meals for guests. Eating and food preparation can function as a satisfying way to express one's individuality.

**Food as a source of pleasure.** Food can please people in many ways and add to a sense of well-being. It can make us feel cherished, accepted and important. It also can bring pleasure to the senses. The perception of food results from an accumulation of past experiences and is expressed by liking or disliking certain foods. These past experiences determine to a large extent prevailing attitudes toward food, such as the social, psychological, and ideological aspects of eating habits.

As diverse aspects of American culture have undergone change, so have food habits and values. More Americans are now eating
many meals away from home in settings such as schools, restaurants, and cafeterias.

American's hurried lifestyle has resulted in food choices that rank high in convenience. Working mothers also list convenience as a top priority in food selection (Emmons & Hayes, 1973). The changes in lifestyle coupled with the rapid pace of today have virtually eliminated breakfast from many diets.

Snacking is another fairly recent change in our eating behaviors and is part of the larger pattern of eating away from home and in a hurry. Too many popular snack foods provide mainly (empty) calories--soft drinks, cookies, potato chips and a variety of tidbits.

Influence of media. Another extremely important influence on nutritional knowledge is the mass media. This includes any means of communication that reaches large numbers of people, including the printed media, newspaper, magazines, and books, also the audio-visual media, radio, television and films. Media advertises many types of foods and television functions as a major source of information about food (Disson, 1974). Young children are especially susceptible to a variety of advertisements that generate a desire for sugared cereals and snacks (Chetnik, 1974). For the most part, these commercials contain limited information on the nutritional value of items being promoted.

It has been estimated that nursery school-age children spend over one-third of their time watching television (Stein & Friedrich,
1972). It has also been calculated that children spend more time in front of the television than in the classroom (Schramm, Lyle & Parker, 1961). Barcus (1971) observed that the majority of commercial messages on Saturday morning (about 80%) are evenly divided among toys, cereals, candy/sweets, and other food snacks. Galst and White (1976) concluded from their study that television contributed an unhealthy influence on eating habits in that television, a medium which could be a powerful educational tool to inform children of good health and nutrition, is instead at present a vehicle for unhealthy persuasion.

The influence of media on attitudes toward food also extends to the nutrition knowledge of mothers. The opportunities for formal nutritional education for most mothers are practically absent and they depend largely on newspapers, magazines, radio and television (Emmons & Hayes, 1973). Some of the available information is often misleading--by the claims of food energy without mentioning calories. Although some commercials by the dairy council, local American Dairy Association chapters, and a number of other commercial sources do try to provide some nutritional information, the positive aspect needs more attention.

Criteria for food choices often pertain to habit, customs, likes and dislikes rather than for valid nutritional reasons (Emmons & Hayes, 1973). The nutritional implications of all these factors; culture, tradition and media on eating habits are very complex. The influence of media on food choice is also very
powerful. Understanding the development of nutritional habits necessitates the consideration of all the important components.

**Current Nutritional Concerns**

**Diets in the United States.** Partially due to deficits in education, access, and resources, there is a large percentage of inadequate diets in America. Malnutrition exists in many parts of the country and is not only confined to the poor population, but also evident in the midst of plenty. Hanes study (McNutt & McNutt, n.d.) reported income level had little effect upon dietary intake for most nutrients. A nutritional survey conducted by the United States Department of Health, Education and Welfare, between 1968-1970, revealed that 10% of the inadequate diets occurred in families of the top income bracket. Overall, a high percentage of the population consumed various nutrients notably lower than the standard requirements of the Recommended Daily Allowance. Even where income is not a problem, many inadequate diets prevail (Wyse, et al., 1976). A sample survey of families conducted by the Department of Health, Education and Welfare in 1965 showed that 20% of the households had poor diets and 50% had good nutritionally balanced diets.

As previously noted, even with increased concern about nutrition, American diets have not improved greatly. Large segments of the population continue to ignore the relationship between health and diet. But as scientific information has become available to the general public, concern about the possible ill effects of
certain foods and eating practices cannot be ignored. The most common direct cause of malnutrition is food intake which is incapable of supplying the body's needs. Two major problems are: (a) over-consumption in general, and (b) the consumption of the wrong kind of food. These two problems are so widespread that they merit further discussion.

Too much food. Data indicate that obesity is a prevalent problem in our society. In the Federal Forward for Health survey for 1977-1981, it is estimated that as many as 30% of Americans may be characterized as obese. Childhood obesity has been estimated to include about 15% of all children. Winick (1974, p. 12) has termed childhood obesity "perhaps the greatest nutritional danger in our society today." This problem is particularly important because of widespread occurrence, as well as the fact that overweight children are likely to remain overweight throughout adulthood. Research has increasingly related obesity to a higher incidence in disease and mortality (Augelli and Wright, 1978).

The wrong kind of food. Consumption of food to merely satisfy hunger often results in a diet inadequate to meet the chemical needs of the body. Nutritionalists are convinced that an unbalanced diet is just as harmful as obesity or starvation. As Wilder states (1952):

The evidence is substantial that a large segment of our people are skating on thin ice nutritionally. While their intake of nutrients now is sufficient to prevent evidence of vitamin
or mineral deficiency; they have little margin of safety in their tissue stores to resist nutritional stresses, incidence to disease or to periods of temporary unbalance or shortages to their diets. (p. 56)

In the United States quality seems to be a greater problem than quantity (Martin, 1954). In sum, failure to provide needed essential nutrients results in a diet that can be inadequate.

Food and individual well being. In addition to examining the most predominant nutritional problems in the United States, the relationship between food and individual well-being is important and is emphasized in this section, in particular, the relationship of an adequate diet for optimal growth and development of children. Diet intake is recognized as being one of the environmental factors which acts upon the genetic potential of young children to affect their physical and mental development.

The cycle of ill effects of malnutrition can have a very extensive influence, particularly during periods of rapid growth. Malnutrition can interfere with children's mental ability through changes in motivation, ability to concentrate and ability to learn (Raman, 1975). Severe malnutrition has been shown to decrease significantly the number of brain cells, causing behavior disorders and mental retardation (Read, 1973).

Good nutrition is of critical importance during the early years because the brain reaches its final state of maturation in terms of structure, function and biochemistry (Lenneberg, 1969). This is a critical period for language development also. Malnutrition
affects the maturation of the organs of perception and can handicap
reading and writing skills (Cravato, 1966).

In relationship to behavior and personality, malnutrition can
increase apathy, irritability, extreme nervous tension and listlessness (Raman, 1975). A poor diet can reduce energy and limit the
exploring activities of children (Letitsky, 1976). Malnutrition
during the early years can cause a delay of mental development and
hence a disfunctioning of the neural mechanisms which control
emotions. Children can become emotionally handicapped—short
attention span, disordered behavior, social incompetence, and
impulsiveness (Cousins, 1966).

With the implementation of nutritional programs to influence
diets of children, parents should be aware of predicted behavior
changes. As their diets improved, children became happier and their
attention span was longer (Schlicks, 1976).

Research on the relationship of diet to behavior strongly
indicates that nutrition is essential for biological and psycho-
logical aspects of development. A key strategy in intervention
programs should place emphasis on the importance of nutrition to
the total development of children. The influences of food on the
proper growth of children proves the importance and need for good
nutritional foundations during childhood. Improving nutrition can
improve many aspects of children's growth and development.
Nutritional Education

As already stated, food practices, attitudes, and habits begin in the early years, as a result of culture and tradition. These habits remain relatively unchanged throughout life. The importance of good nutrition to the optimal growth and development of children has also been illustrated. It is well documented that influences during the early years have a profound and lasting effect in later life. For these reasons nutritional education stresses the importance of teaching good eating habits to young children. Research indicates that the training period for good nutrition begins in the preschool years.

The possible effects of early education on general intelligence levels of children have been confirmed (Moore, 1970; Lee, 1979). Further, nutritionists have been concerned with developing good nutritional foundations early in life as evidenced by an increasing number of programs directed toward the nutritional education of young children.

There are a variety of different types of nutritional programs that have been developed for young children. Marion (1978) emphasizes activities that foster positive attitudes about nutrition—stories, poems, and fingerplays—in the music area, songs and tapes. Smith (1976) developed classroom games to increase a child's concept of good eating habits—board spinners, large dice and cards with food stickers. Nelson (1976) suggests the use of films, books, and games for innovative health education for children—games include vegetable dominoes, snack bingo, fruit lotto and food lotto. Books
have also been developed to help preschool youngsters and their families develop good nutritional habits (Schlicks, 1976). Other programs use educational cooking (Ferreria, 1973; Musgrave, 1974). Graphics have been used to teach children about nutrition (Feshback et al., 1978; Lee, 1979). Other programs deal with the basic teaching elements (Sulby, 1973; Green, 1978; Karsch, 1977; Blank & Wilen, 1974). One program suggests using older children to teach nutrition to younger children (Chethik, 1974), while still others focus on behavior modification (Ireton & Guthrie, 1972) and changing children's food habits (Witherall, 1978; Cooper et al., 1971).

Surprisingly, none of the programs reviewed were home taught or family-oriented inspite of various studies suggesting that nutritional education should be aimed at the whole family (Augelli & Wright, 1978; Burt & Hertzler, 1978; Phillips, Bass & Yetley, 1978). The influence of family cannot be overlooked as throughout early development children are learning eating habits that will persist throughout adulthood (Abraham, 1960). Many complex factors contribute to this early development of food habits, but the family is the primary influential factor. The family can be seen as having two very persuasive influences on children's eating habits (Augelli and Wright, 1978)—parents have control over quality and quantity of food available in the home.

Children's consumption patterns are frequently those of their parents (Leon, 1976) and children imitate family food habits (Burkhart, 1969) and these frequently become their own. Therefore, it is extremely important that parents provide a good example
starting from the early years of a child's development. Hill (1969) states that it is easier to develop good food habits in young children than it is to correct poor food habits in later life. Parents need to be educated to accept the responsibility of knowing and practicing good food habits.

**Nutritional Education--Parents**

Concluding from this review of nutritional programs for children, there seems to be a serious problem of excluding family, particularly parents as primary components. If nutritional education for children has as its goal the establishment of good food habits which result in intelligent food selection, programs need to work directly with parents. Children in school settings can acquire the nutrition knowledge, but have little opportunity to practice what they have learned in their own eating habits. Family based education is the key to filling the gap in this neglected area.

Another overlooked area of importance is insufficient nutritional education for mothers. Nutritional knowledge surveys indicate that mothers have little knowledge of nutrition (Emmons & Hayes, 1973). Furthermore, the opportunities for nutritional education for mothers have been lacking. The importance of this concern is illustrated in studies that found mother's nutritional knowledge and the quality of children's diets to be positively related. Studies have shown that nutritional classes, regardless of level of the program offered were beneficial to children's
dietary quality (Schaefer & Bell, 1958). Results show that overall diet quality improves when mothers have nutritional knowledge (Eppright, 1969; Caliendo & Sanjur, 1978). Nutritionists have come to appreciate the fact that nutritional guidance to mothers may be of value not only in improving children's diets, but also in the establishment of a lifelong pattern of good eating habits (Sabry et al., 1974).

Mothers have generally been viewed as the primary parental influence on children's food habits. Under this traditional thinking, many professionals contend that mothers have more influence on children's food habits (Giffit, 1972), while others have noted that of equal importance is the influence of the father on children's food preferences. Studies of the influence of the male family head suggest that a vulnerable and important group may have been neglected in nutritional studies. Burt and Hertzler (1978) found that the mother does not influence children's food preferences significantly more than the father. It has been suggested by other studies that often family meals are planned around the likes and dislikes of the male head of the household (Moore, 1970). Nutritional educational efforts geared to children and/or the mother may lack total effectiveness until the father is also included in the education process.

Programs will be most effective when parents are included in nutritional programs for children (McWilliams, 1967). Research evidence suggests that gains made by children are maintained to a
greater extent when parents are involved in early childhood programs, rather than when they are excluded (Schickedanz, 1977).

Attitudes and Practices

Attitudes and practices are primary factors that underline the need of involving parents in teaching nutrition to their children. Attitudes and practices about food may be as important as nutritional knowledge in determining diet.

Parents' attitudes about nutrition are critical factors in building successful programs and parents are often unaware of how important their nutritional habits are. For example, parents transmit their own prejudices to their children regarding certain foods. Children's respect for good nutrition is stimulated by parents' enthusiasm and commitment.

Parents' values and beliefs can be illustrated by responses to the following issues (Giff, 1972):

- Is the child taught to eat all he can, or to use self-control?
- Is discipline strict or lax in relation to food habits?
- Is a child permitted to refuse food—to develop likes and dislikes?
- Is a child coaxed or bribed to eat?
- Is food given as a reward for good behavior or withheld as punishment?

These questions help to illustrate the power parents have in influencing eating behavior of children. Parents directly influence dietary practices as they provide children with food and
nutrients by transmission of attitudes, preferences, and other environmental cues which affect children's eating patterns (Caliendo & Sanjur, 1978). It was reported that the more nervous and unhappy the mother was with her role as mother and homemaker, the lower the scores were for her child's dietary quality. Food that mothers make available in the home and the quality of the food were influenced by the mother's beliefs, attitudes, and knowledge of food and nutrition (Phillips, Bass, & Yetley, 1978).

Characteristics of mothers who relate nutrition to children included two variables—the mother's attitude toward eating habits and the mother's communication channels with the children (Caliendo & Sanjur, 1978). Children who received negative feedback from their parents did not develop to their full potential (Olson, 1976). Likewise, overweight children have been shown to receive significantly less positive feedback from parents. Menzies (1974) suggests that nutritional learning can be a result of interpersonal interactions between children and family. Research has also shown that good nutritional programs increase mother's better judgment of foods as well as increase children's nutritional knowledge (Caliendo & Sanjur, 1978).

The development of healthy attitudes toward food is an important responsibility for parents, as parental example is the basis for a lifetime of good or poor nutrition (McWilliams, 1967). To be effective in this role, parents need to review their own food preferences and practices as well as their values and attitudes about nutrition.
Parents as Teachers

It should be reemphasized that nutritional education is valuable only to the extent that it is practiced. Since young children have little opportunity to relate nutritional knowledge to eating behavior, nutritional education should incorporate parents as core components in any type of program involving children.

Parents can be viewed as primary teachers of their children (Gordon, 1972) and they play a vital role in shaping the education of their children. Parents have been shown to exert powerful influences on the food habits of children. Teaching nutrition should reach the parents as well as the children.

It is evident that parents acting as information givers, managers of environment, stage setters, and first teachers influence their young children (Gordon, 1972). Therefore, parents need to teach their children about nutrition in the formative years of their lives. White (1974) strongly advocated parent involvement in any type of preschool program. His main argument is that children start to learn long before the education system begins to concern itself with them. They soon start (or fail to start) to learn in the fundamental areas, including nutrition. He proposes a policy based on the philosophy that early experiences make important differences and parents should make a policy of doing whatever they can to make such experiences as beneficial as possible. White (1974) sees the family as the vehicle of intervention.

There are major obstacles that families face in trying to educate their children about nutrition:
1. Educators have developed an attitude that parents are not qualified teachers of their children (Gordon, 1972).

2. Priority has been given to other fundamentals. An education process has evolved in such a way that other subjects are given priority over the study of nutrition (Chetnik, 1974).

3. Parents feel inadequate in teaching nutrition (Emmons & Hayes, 1973) and there has been a lack of assistance from professionals in this area.

4. Parents doubt the urgency of nutritional education and do not fully comprehend the impact that nutrition has on the total development of children (Eppright, 1969).

Summary of Literature Review

Within the United States, our attitudes and practices toward food are impacted by culture and this may serve as a barrier in nutrition education. Educators need to be aware of these influences in incorporating family oriented programs. The family is the vehicle of transmission of many of these attitudes and practices.

Research indicates that fairly large segments of the population have inadequate diets, specifically, deficits are most notable in regard to specific nutrients. Correction of these deficits will depend in part on the modification of food consumption patterns and habits. An awareness of these needs is important for the population as a whole, but of primary concern is the improvement of nutrition for young children.
The review of literature clearly documents the significant role played by parents in the development of nutritional attitudes and practices of young children. It is curious in this context to note that researchers have failed to develop or implement nutritional programs for children taking into account the role that parents play in adequate nutritional education. Parent involvement is apparently essential to the achievement of long-term objectives, considering that the family is the primary influence on the nutritional habits of the children. In particular, the influence of the father has been neglected. Fathers have been shown to exert an important influence on family eating habits and patterns.

Parents also need to more fully understand their role in influencing children's nutritional habits and accepting the responsibility of helping their children develop good nutritional foundations. This study seeks to fill these voids and address these specific needs. The following hypotheses have been examined in relationship to these gaps and needs as reflected in the literature review.

**Hypotheses**

1. Involving parents in a nutrition education program effects significant nutrition knowledge changes in their children.
2. Involving parents in a nutrition education program increases the parent's knowledge of basic components of nutrition.
3. With parents in the primary role of teaching nutrition, a new awareness of the importance of nutrition develops.
Specifically, a significant difference in attitudes and practices concerning nutrition results from parents' involvement in a nutrition education program.

4. Involving both mothers and fathers in a nutrition education program is more effective than involving mothers only. Children taught by both parents make greater gains in acquiring nutritional knowledge than those being taught by one parent (mother).
CHAPTER III

METHOD

The current research endeavor is an extension and refinement of a three-year program in parent-child nutritional education in the Department of Family and Human Development at Utah State University. During the first year the program was initiated, Merrill (1978) found strong evidence that nutrition could be taught to preschool children through a similar curriculum used in this study and implemented in the preschool classroom. The following year, Lee (1979) further refined the classroom program and incorporated a research study involving school-taught and home-taught groups. Results further supported the notion that preschool children can learn about nutrition in the classroom and in the home setting. The present study has been undertaken to further improve the home-taught program by making material (Food Profile Cards) more readily available to parents. Last year parents had to share food profile cards among families involved in the nutrition program, this year each family was supplied with their own set of 21 Food Profile Cards.

The basic concept underlying this program, The Index of Nutritional Quality, which is the ratio of nutrients to calories in a portion of a particular food was developed by Hansen (1973), of Utah State University. It can be represented as:

\[
\text{INQ} = \frac{\text{Percent of nutrient requirement}}{\text{Percent of energy (KCa) requirement}}
\]
This graphic index, representing the nutrient density of any food, makes it possible for children to understand and see the relationship between energy and nutrients.

**Basic Concepts**

The basic concepts underlying this study parallel those established by Brown (1977), and Brown, Wyse and Hansen (1979). These basic concepts are: (a) understanding that nutrition begins with recognition of and interest in a variety of foods, (b) the food profile card indicates a food's nutritional value, (c) grouping nutritionally balanced foods is an important first step in understanding the concept of a balanced meal, (d) there is a definite relationship between the nutritional content of the foods we eat and our health.

**Parent Manual**

A manual of lesson plans of nutritional instruction was developed by the Department of Family and Human Development for use in the Child Development Laboratory. This curriculum program was tested in the Child Development Laboratory during 1977-1978 and proved to be an effective means of teaching nutrition to young children and helped them to understand the relationship between nutrients and calories.

A second manual was also developed containing a revision of lessons for parents to use in teaching their children about nutrition in the home (Lee, 1979). It also included a listing in
graphic form of the Recommended Daily Allowance of major nutrients found in certain foods. The parent manual consisted of an eight-week curriculum plan and was divided into the following weekly periods, concentrating on four basic nutrients: (a) preparation week; (b) vitamin C week; (c) calcium week; (d) iron week, (e) vitamin A week; (f) vitamin A week (continued) and review week; (g) review; (h) dinner week (Appendix B).

**Purpose and Focus**

As previously documented, (Merrill, 1978; Lee, 1979) preschool children can learn in the classroom about the basic concepts of nutrition. A home-taught program also proved successful (Lee, 1979), but in comparing the results of both studies, gains were not so substantial in the home-taught program as in the classroom program.

This project attempts to evaluate the proposition that properly trained parents can be as effective as teachers in the classroom in educating children in the basic concepts of good nutrition.

**Subjects**

The research was an experimental design involving three groups of children in the Child Development Laboratories at Utah State University and two parental groups.

The children involved in this study were enrolled in the Winter Quarter, 1980 in the Utah State University Child Development Laboratory. The children ranged in age from three-and-a-half to five years old. There was a proportionate number of both sexes,
29 males and 28 females. The children were divided into the following groups:

Group 1. This group of children received nutritional instruction from their mothers only.

Group 2. This group of children received nutritional instruction from both parents, mothers and fathers.

Group 3. This group of children served as the control group and received no nutrition instruction.

The parent groups were divided as follows:

Parent Group 1. This parent group consisted of mothers only to teach nutrition instruction to their children enrolled in the Child Development Laboratory.

Parent Group 2. This parent group involved both parents, mothers and fathers, in teaching nutrition instruction to their children.

Table 1 helps to further clarify the experimental design.

There were three sets of brothers and sisters in the sample which accounts for the unequal number of parents and children in the treatment groups. Two fathers declined participation in the program. One family in Group 2 was a one-parent family, thus only the mother participated.

The sample of parents was predominantly white, middle-class and highly educated. Most fathers were professionals and were heads of the household. Most mothers were full-time homemakers, very few worked outside the home. Almost all parents had attended
Table 1
Experimental Design: Subjects and Treatment

<table>
<thead>
<tr>
<th>Parents</th>
<th>n</th>
<th>Children</th>
<th>n</th>
<th>Pretest</th>
<th>Treatment</th>
<th>Posttest</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group 1: mothers</td>
<td>17</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Group 2: mothers</td>
<td>19</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td>fathers</td>
<td>16</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Group 1: 18</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Group 2: 21</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Group 3: 18</td>
<td>x</td>
<td></td>
<td>x</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

college. This information was obtained from background information forms completed by the parents.

Design. This project was an experimental design with four types of treatment groups and one control group. Pretests and posttests were administered to measure the effects of the nutrition education program.

Instruments

Children's nutrition knowledge. A twelve-item instrument was used to measure children's nutrition knowledge. It was composed of three items for each of the four nutrients. These included food recognition, nutrient identification and function identification
(Appendix B). This scale was developed and used in previous research projects (Merrill, 1978; Lee, 1979).

In testing parents, instruments were adapted or developed to measure three variables: nutrition knowledge, attitudes toward food and nutrition, and nutrition practices. Instruments to meet the needs of this particular project were not available. All three of the following scales are listed in Appendix B.

Nutrition knowledge. A test was derived from the parent manual to test parents on their nutrition knowledge. The basic components included questions on the four nutrients emphasized in the parent manual: vitamin C, vitamin A, iron, and calcium. The fifteen multiple choice questions dealt mainly with nutrient sources and nutrient functions. Detailed information on these nutrients was contained in the parent manual which was given to all the parents during the orientation meeting.

Attitude. An attitude scale was developed to measure parent's perception of the importance of nutrition. Items were adapted or refined from tests developed and validated by Schwartz (1975) and Eppright (1965). The scale consisted of 41 statements reflecting attitudes towards nutrition and eating habits. It was a likert-type scale, providing for five responses from strongly agree (5) to strongly disagree (1). Scores could range from 42 to 205.

Nutrition practices. A scale of nutritional practices was compiled utilizing statements emphasized in the parent manual as
good nutritional practices. This eighteen item test was also a
likert-type scale, providing for four responses ranging from
frequently (4) to never (1). Total scores could range from 18 to 72.

Background information form. A background information form was
also used containing questions concerning demographic variables such
as parents' occupations and education level.

Time calendar. A time calendar was also used to assess the time
parents spent on the project. Parents recorded their time spent on
curriculum activities in order for the investigator to evaluate the
relationship between the time spent on the project and the
resulting test score.

Administration. The parent program was presented over the
eight-week period of the Winter Quarter, 1980. A letter was sent
home to parents participating in home-taught programs approximately
two weeks before the beginning of the winter session of the Child
Development Laboratory. These letters informed parents of their
involvement in the project and that a parent orientation meeting
would be held the week before their children started preschool.

At the orientation meeting, the parents completed a background
information form. They also completed the nutritional knowledge
test and questionnaires to assess attitudes and practices concerning
nutrition. After the forms were completed, parents were introduced
to the nutrition program. Background information on the three-year
program was given and the concept of the INQ which underlines the
program was explained. Parent manuals and Food Profile Cards were
distributed and their function explained. The importance and value
of nutrition education was emphasized throughout the meeting to
motivate parents in their role as teachers of nutrition to their
children. Parents that were unable to attend the orientation were
met on an individual basis. Appointments were arranged and the
orientation to the program was given.

To keep parents updated and to continue their motivation in
their teaching role, newsletters were distributed bi-weekly. These
newsletters contained additional nutritional information and were
utilized to further explain concepts that were unclear to the parents.
In addition, parents were phoned during mid-quarter to see if they
had any problems or questions concerning the program. Their
progress was assessed and any problems discussed.

During the first week of preschool, the children of parents
involved in the program were pretested on their nutritional knowledge.
The control group was also pretested at this time. Parents received
a letter approximately two weeks before the end of the quarter
informing them that the program was nearing completion. They were
also invited to the last parent meeting which included a dinner
given for parents involved in the program. At the last meeting,
parents were retested on their nutritional knowledge, attitudes and
practices. Parents that were unable to attend the dinner were met
on an individual basis for retesting.

The children were posttested during the last week of preschool
to assess any increased nutritional knowledge. The control group was also retested at this time.

**Analysis of the Data**

A T-test was used to measure pre- and posttest differences. Differences were assessed at the .05 level of significance. A statistical analysis was completed and one way and two way analysis of variance. Background information was analyzed with appropriate descriptive statistics. Results were computed with the SPSS program on the Burroughs computer at the Utah State University Computer Center.
CHAPTER IV
FINDINGS

Previous research with classroom teachers as the primary nutrition educators has shown that the nutrition program used in this study can be an effective tool in teaching preschool children basic concepts about nutrition. Since parents are primary teachers of their young children, this project was undertaken to assess parental effectiveness in nutrition education for children.

This section deals with the results of this specific nutrition program involving parents. A description of the sample is presented and major findings in relation to the four major hypotheses are presented. Additional findings are also cited.

Description of the Sample

Children. The children in the study were enrolled in the Utah State University Child Development Laboratory during the Winter Quarter, 1980. About forty percent of the children were returning for their second quarter, the other children were new students in the laboratory. The children ranged in age from 41 months to 60 months with a mean age of 52 months or four-years and four months. There were 28 females and 29 males in the study. Family size for these children ranged from one to eight children with a mean number of three. Seventy percent of the families in the sample had three or less children. Eighty-six percent of the children
involved were first-born, second-born, or third-born. Table 2 provides a demographic profile of the children in the study.

Table 2
Descriptive Profile of Children

<table>
<thead>
<tr>
<th>Sex</th>
<th>Age (months)</th>
<th>Birth Order</th>
<th>Family Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>n=57</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>M</td>
<td>Range</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>F</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>29</td>
<td>41-50</td>
<td>52.4</td>
<td></td>
</tr>
<tr>
<td>28</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>20</td>
<td></td>
<td>1-8</td>
</tr>
<tr>
<td>2</td>
<td>19</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>1</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Parents. Parents of children in the study were comparable in terms of occupation and education (Table 3). Thirty-six percent of the fathers were professionally employed, while sixty-three percent were employed in other areas such as farmer-rancher, businessmen, or skilled worker. Only three fathers were students, the others were all involved in their occupational pursuits. Seventy percent of all the fathers were college graduates. The sample for both mothers and fathers was dichotomized into two categories of education level—less than college and college graduate for analysis purposes.

The mothers were predominantly full-time homemakers, seventy percent of the mothers fell into this category. Of those that worked outside the home, only three cases worked full-time. Twenty-four
Table 3
Descriptive Profile of Parents of Children in Treatment Groups

<table>
<thead>
<tr>
<th>Variable</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>n of mothers</td>
<td>57</td>
<td></td>
</tr>
<tr>
<td>n of fathers</td>
<td>57</td>
<td></td>
</tr>
<tr>
<td>Occupation of father</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Professional</td>
<td>21</td>
<td>36.8</td>
</tr>
<tr>
<td>Farmer-rancher</td>
<td>8</td>
<td>14.0</td>
</tr>
<tr>
<td>Businessman</td>
<td>9</td>
<td>15.8</td>
</tr>
<tr>
<td>Skilled worker</td>
<td>16</td>
<td>28.1</td>
</tr>
<tr>
<td>Student</td>
<td>3</td>
<td>5.3</td>
</tr>
<tr>
<td>Occupation of mother</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Homemaker</td>
<td>40</td>
<td>70.2</td>
</tr>
<tr>
<td>Part-time</td>
<td>14</td>
<td>24.6</td>
</tr>
<tr>
<td>Full-time</td>
<td>3</td>
<td>5.3</td>
</tr>
<tr>
<td>Education of father</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less than college</td>
<td>17</td>
<td>29.8</td>
</tr>
<tr>
<td>College Graduate</td>
<td>40</td>
<td>70.2</td>
</tr>
<tr>
<td>Education of mother</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less than college</td>
<td>31</td>
<td>54.4</td>
</tr>
<tr>
<td>College graduate</td>
<td>26</td>
<td>45.6</td>
</tr>
</tbody>
</table>

percent (14 cases) worked part-time. Forty-five percent of the mothers were college graduates and most had attended some college.

In summary, the sample involved 57 preschool children, with a mean age of four and a half. The sample of children was equal in
terms of sex. Family size averaged three children, most of the children being first or second born. Parents involved in the study included 17 mothers from Group 1 (mother-taught group), and 19 mothers and 16 fathers from Group 2 (mother and father taught group). These parents were white, middle-class and highly educated. Fathers were predominantly the wage earners. The majority of the mothers were full-time homemakers. All but one of the families was intact, two-parent families.

**Hypothesis 1**

The first hypothesis states that involving parents in a nutrition education program effects significant knowledge change in their children. Pretest scores were compared to posttest scores on all components of the nutrition knowledge test for the combined sample of children. Table 4 illustrates that significant increases were obtained in all areas, these include food recognition, nutrient identification and function identification of all four of the major nutrients. Grapefruit (vitamin C), milk (calcium), spinach (vitamin A) and liver (iron) were the foods selected to represent the nutrients. Results were shown to be significant well beyond the .05 level in all component areas.

Table 5 shows a comparison of pretest and posttest scores of children's nutrition knowledge according to the type of instruction they received. Greatest gains were made by the group of children taught by both their mothers and fathers. The mean score for the mother-father taught group was 8.8 compared to mean score of the
## Table 4
Overall Pretest-Posttest Comparisons of Children's Nutrition Knowledge

<table>
<thead>
<tr>
<th>Dependent Variable</th>
<th>Pretest</th>
<th>Posttest</th>
<th>T-value</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>X</td>
<td>S.D.</td>
<td>X</td>
<td>S.D.</td>
</tr>
<tr>
<td><strong>Grapefruit (Vitamin C)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Food Recognition</td>
<td>0.0877</td>
<td>0.285</td>
<td>0.3509</td>
<td>0.481</td>
</tr>
<tr>
<td>Nutrient Ident.</td>
<td>0.0175</td>
<td>0.132</td>
<td>0.4035</td>
<td>0.49</td>
</tr>
<tr>
<td>Function Ident.</td>
<td>0.000</td>
<td>0.000</td>
<td>0.5263</td>
<td>0.504</td>
</tr>
<tr>
<td><strong>Milk (Calcium)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Food Recognition</td>
<td>0.8947</td>
<td>0.310</td>
<td>0.9825</td>
<td>0.132</td>
</tr>
<tr>
<td>Nutrient Ident.</td>
<td>0.0175</td>
<td>0.132</td>
<td>0.2105</td>
<td>0.411</td>
</tr>
<tr>
<td>Function Ident.</td>
<td>0.000</td>
<td>0.000</td>
<td>0.6140</td>
<td>0.491</td>
</tr>
<tr>
<td><strong>Spinach (Vitamin A)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Food Recognition</td>
<td>0.1754</td>
<td>0.051</td>
<td>0.5088</td>
<td>0.067</td>
</tr>
<tr>
<td>Nutrient Ident.</td>
<td>0.000</td>
<td>0.000</td>
<td>0.4211</td>
<td>0.066</td>
</tr>
<tr>
<td>Function Ident.</td>
<td>0.000</td>
<td>0.000</td>
<td>0.3333</td>
<td>0.063</td>
</tr>
<tr>
<td><strong>Liver (Iron)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Food Recognition</td>
<td>0.0175</td>
<td>0.018</td>
<td>0.2281</td>
<td>0.056</td>
</tr>
<tr>
<td>Nutrient Ident.</td>
<td>0.000</td>
<td>0.000</td>
<td>0.2455</td>
<td>0.058</td>
</tr>
<tr>
<td>Function Ident.</td>
<td>0.000</td>
<td>0.000</td>
<td>0.4561</td>
<td>0.067</td>
</tr>
<tr>
<td><strong>Food Recognition</strong></td>
<td>1.1754</td>
<td>0.083</td>
<td>2.0702</td>
<td>0.141</td>
</tr>
<tr>
<td><strong>Nutrient Identification</strong></td>
<td>0.0351</td>
<td>0.025</td>
<td>1.2807</td>
<td>0.197</td>
</tr>
<tr>
<td><strong>Function Identification</strong></td>
<td>0.000</td>
<td>0.000</td>
<td>1.9298</td>
<td>0.221</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>1.2105</td>
<td>0.093</td>
<td>5.2807</td>
<td>0.495</td>
</tr>
</tbody>
</table>
Table 5

Number of Correct Responses on Pretest and Posttest According to Type of Instruction

<table>
<thead>
<tr>
<th>Group</th>
<th>n</th>
<th>Pretest X</th>
<th>Posttest X</th>
<th>Diff. X</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Range</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mother Taught</td>
<td>18</td>
<td>1.5</td>
<td>3-12</td>
<td>6.0</td>
<td>4.5</td>
</tr>
<tr>
<td>Food Recognition</td>
<td></td>
<td>1.3</td>
<td>2.0</td>
<td>0.7</td>
<td>.020</td>
</tr>
<tr>
<td>Nutrient Ident.</td>
<td></td>
<td>0.2</td>
<td>1.5</td>
<td>1.3</td>
<td>.000</td>
</tr>
<tr>
<td>Function Ident.</td>
<td></td>
<td>0.0</td>
<td>2.5</td>
<td>2.5</td>
<td>.000</td>
</tr>
<tr>
<td>Mother-Father Taught</td>
<td>21</td>
<td>1.85</td>
<td>3-11</td>
<td>8.85</td>
<td>7.0</td>
</tr>
<tr>
<td>Food Recognition</td>
<td></td>
<td>1.8</td>
<td>2.4</td>
<td>1.6</td>
<td>.000</td>
</tr>
<tr>
<td>Nutrient Ident.</td>
<td></td>
<td>0.0</td>
<td>2.3</td>
<td>2.3</td>
<td>.000</td>
</tr>
<tr>
<td>Function Ident.</td>
<td></td>
<td>0.0</td>
<td>3.3</td>
<td>3.3</td>
<td>.000</td>
</tr>
<tr>
<td>Control</td>
<td>18</td>
<td>1.1</td>
<td>1-3</td>
<td>1.3</td>
<td>0.2</td>
</tr>
<tr>
<td>Food Recognition</td>
<td></td>
<td>1.1</td>
<td>1.3</td>
<td>0.2</td>
<td>.160</td>
</tr>
<tr>
<td>Nutrient Ident.</td>
<td></td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>.000</td>
</tr>
<tr>
<td>Function Ident.</td>
<td></td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>.000</td>
</tr>
</tbody>
</table>

Note: Maximum score for each complete test = 12.
      Maximum score for each subcategory of test items = 4.
mother-taught group of 6.0. In comparing treatment groups to the control group, a significant difference in scores can be attributed to the teaching effect of parents rather than a maturation of retesting effect.

These findings clearly indicate that parents can effectively function as teachers of nutrition for their preschool children. Significant gains were made in nutrition knowledge scores in comparing pre- and posttest results. The hypothesis that working with parents to teach children about nutrition was sustained.

**Hypothesis 2**

Involving parents in a nutrition education program increases the parent's knowledge of basic components of nutrition. A comparison of pre- and posttest scores on the parents' nutritional knowledge test was done. A T-test was used to compare these means and the maximum score of 15. The mean score on the pretest was 10.4 and the posttest mean was 13.6, thus resulting in a significant difference. Since all of the questions on the parents' nutrition knowledge test dealt with the nutrients emphasized in the parent manual, parents working with their children on the nutrition program would be exposed to this nutritional information. These findings illustrate a significant increase in parents' nutrition knowledge as a result of their involvement in the nutrition program (Table 6).
Table 6
Comparison of Pretest and Posttest Scores on Parents' Test of Nutrition Knowledge

<table>
<thead>
<tr>
<th>n</th>
<th>Pretest $\bar{x}$</th>
<th>Posttest $\bar{x}$</th>
<th>Dif.</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>52</td>
<td>10.45</td>
<td>13.64</td>
<td>-3.19</td>
<td>-6.51</td>
<td>0.00</td>
</tr>
</tbody>
</table>

Hypothesis 3

The third hypothesis states that involving parents in a nutrition education program leads to a new awareness of the importance of nutrition. Specifically, a significant difference in attitudes and practices concerning nutrition results from parents' involvement in a nutrition education program.

Pretest and posttest comparisons of parents' nutrition attitudes and practices are shown in Table 7. On the nutrition attitude scale scores could theoretically range from 41 to 205. The mean score on the pretest was 149.1 and the mean score on the posttest was 149.15, thus no significant change in parents' attitudes occurred. The Guttman Split-half Technique was applied to the attitudes toward nutrition scale to assess internal consistency and to evaluate the relative reliability of the measure. This application results in a value of .52 which raises some questions about utility of this scale for this type of research and helps to document that, in fact, changes may have occurred in regard to this dimension but that measurement problems make it very difficult to determine the extent
Table 7
Comparison of Pretest and Posttest Scores on Parents' Nutrition Attitudes and Practices

<table>
<thead>
<tr>
<th></th>
<th>n=52</th>
<th>Pretest $\bar{X}$</th>
<th>Posttest $\bar{X}$</th>
<th>Diff.</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attitudes</td>
<td>149.12</td>
<td>149.15</td>
<td>-0.03</td>
<td>-0.02</td>
<td>0.982</td>
<td></td>
</tr>
<tr>
<td>Practices</td>
<td>46.421</td>
<td>50.28</td>
<td>-3.85</td>
<td>-7.13</td>
<td>0.000</td>
<td></td>
</tr>
</tbody>
</table>

of the change. A range from 18 to 72 was possible on the nutrition practice scale. Pretest mean was 46.4 and posttest mean was 50.2, resulting in a significant increase in nutritional practices.

Table 7 illustrates that there was not a significant difference on pre- and posttesting in regard to parents' attitudes. This failure to show a change could be due in part to the fact that parents' attitudes concerning nutrition at the beginning of the program were fairly high and left little room for improvement. Seventy-five of the parents had reported being satisfied with their eating habits. It can also be partially explained by the fact that research indicates that attitudes concerning nutrition are fairly resistant to change (Kerry, 1974) and that attitudes are developed early in life and remain somewhat persistent (Beyer & Morris, 1974).

In contrast, comparison of pre- and posttesting of nutrition practices reveals a significant increase in scores. As previously stated this is due to the fact that parents committed to the project would have to incorporate better nutritional practices in order to fulfill their role as effective teachers. For example,
involvement in the project would result in an increased discussion with their children about nutrition, an item cited on the nutrition practices scale.

These results indicate that parents' attitudes about nutrition did not change, but a significant increase in nutrition practices was reported due to parents' involvement in the nutrition program.

**Hypothesis 4**

Hypothesis 4 deals with the utility of involving both mothers and fathers as teachers of their children as compared to involving mothers only. Specifically, hypothesis 4 asserts that children taught by both parents, mother and father, do better than children taught by mothers only, on the posttest of nutrition knowledge.

In comparing Group 1 (mother taught) to Group 2 (mother and father taught) a T-test statistic reveals a significant difference between the groups. Group 2 obtained a significantly greater increase in nutritional knowledge in all three test components: food recognition, nutrient identification and nutrient function (Table 8). An often neglected area--involvement of fathers in nutrition education--is shown to be a significant factor in developing a more effective program.

Children taught by both parents did show a statistically significant improvement on nutrition scores in comparison to the group of children taught only by mothers. This finding indicates that involvement of both parents results in a more effective nutrition program.
Table 8
A Comparison of Group 1 and Group 2 Children on Mean Differences for the Nutrition Knowledge Test

<table>
<thead>
<tr>
<th>Test Component</th>
<th>n</th>
<th>( \bar{x} ) - Diff.</th>
<th>t-value</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Food Recognition</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Group 1</td>
<td>18</td>
<td>0.68</td>
<td>-3.76</td>
<td>0.001</td>
</tr>
<tr>
<td>Group 2</td>
<td>21</td>
<td>1.7</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Nutrient Identification</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Group 1</td>
<td>18</td>
<td>1.36</td>
<td>-2.02</td>
<td>0.050</td>
</tr>
<tr>
<td>Group 2</td>
<td>21</td>
<td>2.25</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Function Identification</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Group 1</td>
<td>18</td>
<td>2.4</td>
<td>-2.04</td>
<td>0.049</td>
</tr>
<tr>
<td>Group 2</td>
<td>21</td>
<td>3.2</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Additional Findings

A number of other variables were tested to evaluate their influence on the effectiveness of parents as teachers in the nutrition program. One way analysis of variance was used to test the different variables within each group. In comparing demographic variables to parent scores and children scores, no significant differences were found on any of the measures.

Demographic variables. Age of children was not significantly related to children's test scores. The overall mean score (4.6)
for older children (52 months or older) was slightly higher than the overall mean score (4.2) for younger children (51 months or less).

Sex of the children did not show a significant difference in scores. Although not significant, females tended to score slightly higher on all components of the nutrition knowledge test than males (Table 9).

<table>
<thead>
<tr>
<th>Table 9</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Male-Female Comparisons on Children's Nutrition Knowledge</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Males</th>
<th>Females</th>
<th>f-value</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total n = 57</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Females = 27</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Males = 28</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Food Recognition</td>
<td>0.65</td>
<td>1.14</td>
<td>1.35</td>
<td>0.06</td>
</tr>
<tr>
<td>Nutrient Ident.</td>
<td>1.13</td>
<td>1.35</td>
<td>-1.05</td>
<td>1.07</td>
</tr>
<tr>
<td>Function Ident.</td>
<td>1.89</td>
<td>1.96</td>
<td>1.07</td>
<td>0.88</td>
</tr>
</tbody>
</table>

The number of children in the family was also assessed to determine if this would influence parents' or children's scores on all measures. No significant relationship was found to exist between family size and scores of either parents or children.

Parent variables were shown to have no significant effect on parent scores or children scores. Education and occupation of parents were not significantly related to parents' effectiveness or learning on any of the measures.
In addition to these variables, information was obtained from parents concerning their nutrition information sources and the influence of significant others on their eating habits. Parents were asked to rate 1 to 5 (1 being low and 5 being high) their lifelong accumulated sources of nutrition information. Their responses are summarized in Table 10. Although none of the sources listed were rated highly, high school and college were rated highest as sources of nutrition information. In contrast, printed sources were rated lower. It is interesting to note that television was rated the lowest as a source of nutrition information. As research suggests, television could be a powerful tool for nutrition education, but many times is not very informative about nutrition (Galst and White, 1976). These results are contradictory to a 1971 nationwide survey by the Opinion Research Cooperation, in which television, newspaper, and magazines were cited as the most nutritionally informative sources (Schwartz, 1976). This contrast with the present data may be explained by the educational level of the sample or the differences in which the data were generated.

In addition to attempting to understand sources of nutrition information, the investigator also sought to determine the influence of significant others on parents' eating habits. As shown in Table 11, mothers and fathers were rated the highest in being most influential on the respondents' eating habits. Ninety-one percent ranked mothers high, significantly higher than fathers who were ranked high by 38%. This documents the assertion that parents
Table 10

Parent Responses on Their Sources of Nutrition Information

<table>
<thead>
<tr>
<th>Source</th>
<th>% Rated High</th>
<th>Frequencies Rated High</th>
<th>Rated Low</th>
<th>( \bar{X} )</th>
</tr>
</thead>
<tbody>
<tr>
<td>High School</td>
<td>43.9</td>
<td>25</td>
<td>18</td>
<td>3.1</td>
</tr>
<tr>
<td>College</td>
<td>40.4</td>
<td>25</td>
<td>13</td>
<td>2.8</td>
</tr>
<tr>
<td>Magazines</td>
<td>26.4</td>
<td>13</td>
<td>29</td>
<td>2.4</td>
</tr>
<tr>
<td>Elementary School</td>
<td>21.0</td>
<td>12</td>
<td>36</td>
<td>2.3</td>
</tr>
<tr>
<td>Newspapers</td>
<td>12.3</td>
<td>7</td>
<td>38</td>
<td>2.0</td>
</tr>
<tr>
<td>Adult Education</td>
<td>14.0</td>
<td>8</td>
<td>45</td>
<td>1.7</td>
</tr>
<tr>
<td>Television</td>
<td>8.8</td>
<td>5</td>
<td>44</td>
<td>1.7</td>
</tr>
</tbody>
</table>

Note: Rated 1-5 with 1 = low, 5 = high.

Table 11

Parent Responses on the Influence of Others on Their Eating Habits

<table>
<thead>
<tr>
<th>Source</th>
<th>% Rated High</th>
<th>Frequencies Rated High</th>
<th>Rated Low</th>
<th>( \bar{X} )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mother</td>
<td>91.2</td>
<td>52</td>
<td>3</td>
<td>4.5</td>
</tr>
<tr>
<td>Father</td>
<td>38.6</td>
<td>21</td>
<td>21</td>
<td>3.0</td>
</tr>
<tr>
<td>Children</td>
<td>31.6</td>
<td>15</td>
<td>18</td>
<td>2.6</td>
</tr>
<tr>
<td>Friends</td>
<td>23.9</td>
<td>13</td>
<td>33</td>
<td>2.4</td>
</tr>
<tr>
<td>Teachers</td>
<td>17.5</td>
<td>10</td>
<td>35</td>
<td>2.0</td>
</tr>
<tr>
<td>Brothers and Sisters</td>
<td>10.6</td>
<td>6</td>
<td>38</td>
<td>2.1</td>
</tr>
</tbody>
</table>

Note: Rated 1-5 with 1 = low, 5 = high.
should be the focus of nutrition education programs for children because of their strong influence on eating habits.

Another important variable calculated was the amount of time parents spent with their children on the program. Parents recorded, on calendars provided, the time they spent on nutrition activities with their children over the eight week period. Time was measured in two dimensions: (a) overall time spent on the project—as measured by total minutes, and (b) the number of days that parents reported doing activities for the project. Time did not show up as a significant factor in comparing it to parents' and children's scores. It should be noted that days spent on the program was a more important variable than total time spent with curriculum activities. Short periods of instruction dispersed over a greater amount of days, tended to be a more effective teaching method for the young children.

Comparison and Integration with Phase I and II

Since this is the third in a series of three consecutive studies focusing on nutrition education for young children at Utah State University, it is important that linkage be given in comparing the Lee (1979) study with the results reported in this project. As noted earlier, Lee compared children taught by teachers in a lab setting using a pre- and posttest design and also did some preliminary work in involving parents as teachers of nutrition to their children. A comparison is provided here in relationship to the parent based programs. Table 12 reveals that both groups of
<table>
<thead>
<tr>
<th>Group</th>
<th>n</th>
<th>Pretest X</th>
<th>Posttest Range</th>
<th>Posttest X</th>
<th>Dif.</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Classroom Taught (1979)</td>
<td>20</td>
<td>1.6</td>
<td>3-12</td>
<td>7.4</td>
<td>5.8</td>
<td>.0001</td>
</tr>
<tr>
<td>Home Taught (1979)</td>
<td>20</td>
<td>1.9</td>
<td>1-10</td>
<td>4.4</td>
<td>2.5</td>
<td>.0001</td>
</tr>
<tr>
<td>Control (1979)</td>
<td>20</td>
<td>1.6</td>
<td>1-5</td>
<td>2.35</td>
<td>.75</td>
<td>.004</td>
</tr>
<tr>
<td>Mother Taught (1980)</td>
<td>18</td>
<td>1.5</td>
<td>3-12</td>
<td>6.0</td>
<td>4.5</td>
<td>.0000</td>
</tr>
<tr>
<td>Mother-Father Taught (1980)</td>
<td>21</td>
<td>1.85</td>
<td>3-11</td>
<td>8.85</td>
<td>7.0</td>
<td>.0000</td>
</tr>
<tr>
<td>Control (1980)</td>
<td>18</td>
<td>1.11</td>
<td>1-3</td>
<td>1.33</td>
<td>0.22</td>
<td>.16</td>
</tr>
</tbody>
</table>

Note: Maximum score = 12.
children (Group 1 and Group 2) in the current project scored higher on the posttest comparisons than did the children in the Lee home taught group. The mother and father home taught group scored higher on the posttest than the classroom taught group of 1979.
CHAPTER V
SUMMARY AND DISCUSSION

Summary

In recent years, various types of nutrition programs have been designed and implemented for preschool children. A child can learn the basic nutrition concepts but is typically powerless to practice this knowledge, because parents control the eating environment of the young child. The missing link lies in involving parents in nutrition programs for children. The primary intent of this study was to ascertain the effectiveness of parents in the role of teaching nutrition to their children. Specific objectives included: (a) measuring the effects of a parent program in nutrition education, by assessing children's nutrition knowledge, (b) assessment of parents' knowledge, attitudes and practices concerning nutrition as a result of their involvement in a nutrition education program, and (c) a comparison of gains in children's nutrition knowledge, of children taught by mothers and fathers to children taught only by their mothers.

The nutrition program. Materials used by parents consisted of a parent manual of lesson plans for an eight week period of nutrition instruction for their children. The curriculum contained nutrition information, activities, and songs covering four basic nutrients: (a) vitamin C, (b) vitamin A, (c) calcium and (d) iron.
The manuals had an additional section, a computer printout sheet that covered the other major nutrients that foods in the manual contained. The manuals were supplemented with Food Profile Cards. These graphic representations of the basic components of foods were the main teaching tools used by parents in the program. Using these cards, children could visualize what they were being taught.

Subjects. All participating children were attending Utah State University Child Development Laboratory during the Winter Quarter, 1980. The sample included 28 males and 27 females, ranging in age from 41 to 60 months. The mean age was four and a half. Family size averaged three children. Most children were first or second born. The children were divided into three groups: Group 1 children were taught nutrition by their mothers only, Group 2 children were taught nutrition by their mothers and fathers, and Group 3 children served as the control group and received no nutrition instruction.

Parents included in the study were white, middle-class, and highly educated. Most of the fathers were professionally employed with college educations. The mothers involved with the program, were predominantly housewives and most had attended college. Parents were divided into two groups: Group 1 mothers taught nutrition to their children, and Group 2 both mothers and fathers were involved in teaching nutrition to their children.

Instruments. All children in the sample were given a pre- and posttest of their nutritional knowledge. The test consisted
of twelve questions concerning the four nutrients emphasized in the curriculum. The three main areas in the curriculum included recognizing the picture of a food on the Profile Cards, identifying the nutrient the food contained and thirdly, giving the body function of the nutrient. Each child was tested individually. Children were pretested the first week of preschool and were post-tested during the last week of preschool.

The parents were pre- and posttested on: (a) nutrition knowledge, (b) attitudes towards food and nutrition and (c) nutrition practices. The nutrition knowledge test contained 15 multiple choice questions on the four basic nutrients contained in the parent manual. The attitude scale was a likert-type scale to measure parents' perception of the importance of nutrition. The nutrition practice instrument was composed of statements emphasized in the curriculum activities as being good nutritional practice.

Administration. An orientation meeting was held for parents a week before their children started preschool. During this meeting parents were pretested on nutrition knowledge, attitudes and practices. Parents also completed a background information form. The purpose of this meeting was to introduce parents to the nutrition program. The basic concepts of the program were presented and background information on the project was given. Parent manuals containing the eight week nutrition curriculum were distributed and explained in detail. A set of 21 Food Profile Cards were given to parents and their use clarified. Calendars to record the time
spent on the program were also given to the parents. Parents were informed of the outline of the program and that contact would be continued throughout the program by use of bi-weekly newsletters and telephone calls.

A final parent meeting, a dinner given for all participating parents, was held at the end of the program. During this meeting parents were posttested on their nutritional knowledge, practices, and attitudes.

**Summary of Results**

The major findings of this study included:

1. Involving parents in a nutrition education program proved an effective means of teaching children about nutrition. This was shown by the significant increase in children's knowledge of the basic nutrition concepts.

2. Parents' knowledge of nutrition was also significantly increased as a result of their involvement in teaching their children about nutrition.

3. Although no significant difference was reported in parents' attitudes concerning nutrition before and after their involvement in the program, a significant increase in good nutrition practices was noted.

4. When results were compared by treatment given, the children taught by mothers and fathers made significantly greater gains in acquiring nutritional knowledge than those taught by a single parent (mother only group).
5. In relation to the home-taught program of the previous year, data revealed that a more effective program was initiated this year in comparison to increases in children's nutrition knowledge. Children taught by mothers and fathers, and children taught by mothers only scored significantly higher on nutrition knowledge tests than children involved in the parent-taught program last year.

6. Children taught by mothers and fathers made even greater gains in nutrition knowledge, than the classroom taught program last year.

7. Demographics such as children's age and sex, and parents' occupation, education and family size were tested for significance in relation to all measurements. None of these proved to be significant factors in making a difference in pre- and posttest scores.

Discussion

Parents function as nutrition "educators" whether they are aware of their role or not. As the most influential people in their children's lives, they cast the mold for their children's nutritional habits. This research endeavor provides strong evidence that parents can function as "effective" nutrition educators for their children. These data reveal several positive aspects of involving parents in a nutrition program for children: (a) parents can provide the basic foundation for a child's nutrition education as shown in increases in children's nutrition knowledge, (b) a
significant increase in parents' nutrition knowledge and practices was reported and (c) children taught by both their mothers and fathers score significantly higher on nutrition knowledge test than those taught only by their mothers. Not only did children's knowledge of nutrition increase, but this nutrition project has the additional benefit of helping parents as well. These multidimensional gains for both parents and children reinforces the contention that there is a need for more home-based nutrition programs.

Parent involvement. Success of the program is primarily due to parent involvement. Most parents have a genuine concern for the well-being of their children. Although a few parents were reluctant to participate, the majority were enthusiastic and eager to participate in any type of program beneficial to their children. Utilizing parents as teachers, children have a one-to-one learning experience, in contrast to the classroom situation in which a specific teacher works with many children. In a home-based program, parents can be aware of the special needs and interests of their individual children. Rapport, trust, and other factors related to open communication have already been established by parents. Parents also have frequent communication opportunities with their children. On the other hand, teachers are limited to thirty-minute intervals, four days a week as in the classroom taught program of the two previous years. A home-taught program such as nutrition can be integrated into daily activities and not restricted to a rigid classroom time schedule. Any number of activities in the home can
be incorporated into nutrition learning experiences, such as food preparation and mealtimes. Young children are more effective learners when they can relate learning activities to their own daily experiences. The home provides a wider scope for these learning opportunities. The home also provides a number of prospective teachers. Not only can parents function as teachers but siblings can also supervise learning as well. All these reasons support data that indicate that involving parents, both mothers and fathers in nutrition education can be a more effective teaching method than a classroom-teacher oriented program.

**Involvement of mothers and fathers.** Why has the involvement of mothers and fathers been shown to be the most effective teaching method for nutrition education? This hypothesis is strongly supported by data from this research project. Results show that children taught by both mothers and fathers scored significantly higher on nutrition knowledge test than children taught only by their mothers. To involve both mothers and fathers in the nutrition education process is to further enhance the home environment as an optimal setting for developing good eating habits. Inclusion of fathers integrates the entire family unit into the learning experience. Hence, nutrition experiences become more frequent if all members of the family participate and become involved. Our society places heavy emphasis on the mother's role as educator in nutrition (Gifft, 1972), but in fact, the father's likes and dislikes may actually dictate to a large degree how the
mother operates (Moore, 1978). Burt and Hertzler (1978) report that the mother is not significantly more important than the father in influencing children's eating habits, on the contrary the father may indirectly be a major influence on food selection in the home. Nutrition education programs involving mothers only may not be totally effective until the father is also included in the education process.

**Time.** A variable that was not significantly related to parents' effectiveness as nutrition educators is the time parents recorded having spent on the project. Two time measurements were employed: (a) overall time spent on the project—recorded in minutes, and (b) the number of days that parents reported doing activities for the project. It was difficult to ascertain the quality of teaching time in relation to the quantity of time spent on the program. Quality of teaching varies greatly between homes. Quantity of time spent on curriculum activities was not always a good indicator of an effective parent program. While neither of the two terms of time analysis were significantly related to children's learning, the number of days spent on the project tended to be a better indicator of an effective program than total minutes recorded. Short periods of instruction distributed over a greater number of days seemed to be a more effective teaching method. This is due in part to the fact that preschool children generally have short attention spans.
Attitudes. Parents' attitudes concerning nutrition remained relatively unchanged after their involvement in the program. As previously noted, parents' attitudes were fairly high at the onset of the project as indicated in their response that 75% were satisfied with their eating habits. Little measure of improvement could be attributed to the basically good attitudes parents had to begin with. Attitudes concerning nutrition is a difficult area to measure. Future research needs to be devoted to the development of instruments designed to assess attitudes--what they are and how to modify them.

Comparison of this year's program to last year's program. It is important to note the differences between this year's program in comparison to the home-based pilot programs of the previous year (Lee, 1979). Greater gains in children's nutrition scores over the previous year can be attributed to the improvement of this year's home-taught program. The main advantage of this year's program over last is that a set of 21 Food Profile Cards were distributed to each family involved in the project. Previously, parents had to share the cards among other families participating in the program. Since the Food Profile Cards are the major teaching tools for this project, parents can be more effective teachers if the cards are more readily available.

Parents were also provided with more instruction and supervision. Close contact with parents was obtained through bi-weekly newsletters and telephone calls. Parent meetings also helped to develop good, open communication between parents and investigator.
Motivation of parents was the major objective underlining all these methods. Both groups of parents were treated the same in all procedure issues throughout the study. It should be noted that the investigator did serve as supervising teacher for Group 2. There was a conscious effort on the part of the investigator to deal in a comparable way with both groups.

The concepts and directions involved in this program are simplified so that a vast knowledge of nutrition is not necessary to implement the program. Previous to the project, the investigator had a limited knowledge of nutrition, but was still capable of working with the program. The parent manuals provide nutrient information, including good and poor sources of the major nutrients, and what the different nutrients do for the body. Activities are also described that parents can do in the home with their children to teach these concepts. These manuals supplemented with the Food Profile Cards make the program fairly self-directing, after an initial orientation meeting. This type of program can be easily incorporated without the assistance of a nutrition specialist. And in the event that a similar type of nutrition program was to be constructed in the home, it should be noted that extensive knowledge in nutrition is not mandatory for parents. Parents do not have to feel inadequate in teaching nutrition to their children, if given self-directing guidelines. Knowledge of nutrition is also an on-going process whereby children and parents acquire and benefit from empirical experience as well as supplemental education materials.
Parents often feel inadequate in teaching nutrition to their children (Emmons & Hayes, 1973). Being constantly bombarded by the many forces of media, books, T.V., and magazines, a certain desperation ensues as to which path to follow. A current and timely concern is being spawned by parents genuinely interested in their family's nutrition and they are seeking ways to qualitatively improve their dietary habits.

It is the sincere intent of this investigator to present results and the analysis of this research, completed in the vital area of nutrition with its ramifications reaching out into the scope of nutrition education with emphasis on parental involvement.

In conclusion, parents hold the key in effectively teaching nutrition to their children. Involvement of both parents, mothers and fathers, further enhances the learning experience. Nutrition education needs to be aimed at the total family, children and parents, in order to improve nutrition awareness.

**Recommendations for Further Research**

The investigator recognizes that further research is essential for a more complete nutrition education program for young children. This project covers but a single dimension in the extensive process that involves nutrition education. However, its results provide an integral part of nutrition education research—the involvement of parents—that provides the base for additional studies in this vital field. Further studies might include:
1. To further investigate the effectiveness of a home-based nutrition program with a sample of more diverse economic and cultural background.

2. Follow-up studies are essential to evaluate the long-range impact of a parent-taught nutrition program.

3. Research is needed on techniques, strategies, and materials not only to teach basic concepts of nutrition but to apply this knowledge to practices, such as food selection.

4. To further explore the interrelationship of nutritional knowledge, attitudes, and practices. Instruments are needed for more accurate measurement of these variables.

5. Most importantly, this home-taught program needs to be made more available to interested parents. In particular, refinement of Food Profile Cards, so that they can be inexpensively duplicated, durable, and readily available.
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Augelli, A., & Wright, H. The case for primary prevention of overweight through the family. *Journal of Nutrition Education*, 1978, 10(2), 76-78.


Ferreira, N. Teachers' guide to educational cooking in the nursery school--an everyday affair. *Young Children*, 1973, 24, 1, 23-32.


Marion, M. Touch, taste, smell-feeding, nutrition into your program. Day Care and Early Education, 1978, 5(4), 12-14


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APPENDICES
Appendix A

Communication with Parents
January 2, 1980

Dear Parents:

According to our records, your child will be in the USU Child Development Lab for the Winter Quarter beginning January 14, 1980. We anticipate that you and your child are looking forward to this special experience.

One aspect of the Child Development Lab involves program development. This quarter, as part of a project, we have developed a program for parents to use at home to teach their children some basic concepts about nutrition. The Lab to which your child has been assigned was selected to use these materials at home and will involve both mothers and fathers in the program.

As parents, you have the greater opportunity to foster the kind of learning and development that research has found to be so crucial during the early years of life. The materials we have prepared will give you specific activities to teach your young child about nutrition. In this process, we feel your relationship with your child will also grow. Also, we think you will gain a sense of satisfaction from having participated in a project beneficial to your child.

In order to give you the home-learning materials and explain their use, a meeting is scheduled for Wednesday, January 9, from 7:00-8:00 p.m. It is very important that you be in attendance, so that you will receive the maximum benefit from the orientation and materials we have prepared. Thank you very much.

Sincerely,

Cheryl Wright

Cheryl Wright, Supervising Teacher and Graduate Student

Barbara Mason

Barbara Mason, Director, CD Lab

Jay D. Schvaneveldt, Major Professor
January 2, 1980

Dear Parent:

According to our records, your child will be in the USU Child Development Lab for the Winter Quarter beginning January 14, 1980. We anticipate that you and your child are looking forward to this special experience.

One aspect of the Child Development Lab involves program development. This quarter, as part of a project, we have developed a program for parents to use at home to teach their children some basic concepts about nutrition. The Lab to which your child has been assigned was selected to use these materials at home. This particular group will involve mothers only in the program.

As a mother, you have the greater opportunity to foster the kind of learning and development that research has found to be so crucial during the early years of life. The materials we have prepared will give you specific activities to teach your young child about nutrition. In this process, we feel that your relationship with your child will also grow. Also, we think you will gain a sense of satisfaction from having participated in a project beneficial to your child.

In order to give you the home-learning materials and explain their use, a meeting is scheduled for Wednesday, January 9, from 4:00-5:00 p.m. It is very important that you be in attendance, so that you will receive maximum benefit from the orientation and materials we have prepared. Thank you very much.

Sincerely,

Cheryl Wright, Supervising Teacher and Graduate Student

Barbara Mason, Director, CD Lab

Jay D. Schvaneveldt, Major Professor
Dear Mothers,

We hope your progress on the nutritional program is going well. You should be onto vitamin C weak at this point. We want to remind you to keep up with your calender, charting the time you spend with your child on the program.

We’re also enclosing a portion of the computer sheets to further explain its purpose. The computer sheets should be used to evaluating foods on the manual that we do not have food profile cards on. The computer sheets also supply you with further information on these foods listed on the profile cards. We hope you will find them useful.

The lab in which your child is enrolled involves mothers only in this education experience. We hope you are finding the nutrition program interesting and enjoyable. Please call if you have any questions.

Sincerely,
Cheryl Wright
Dear Parents,

This is just some additional nutrition information you might find helpful. We should be into the 2nd week of your nutrition program (Feb 4-10). We hope you are finding the program interesting and rewarding.

Cheryl Knight

**Basic Four Food Groups:**

1. **The Milk Group:**
   - Milk

2. **The Meat Group:**
   - Chicken

3. **The Fruits and Vegetables Group:**
   - Carrots
   - Apples

4. **The Cereals and Bread Group:**
   - Cereal

**Preschool Children Need:**

- 2-3 cups milk daily
- Cheese and foods made with milk can be used as part of the milk.
- 2 or more servings of meat or meat substitutes each day
  - A young child’s serving is 1-2 ounces: meat, fish, or chicken, 1/2 cup cooked dry beans or peas or 2-4 tablespoons peanut butter.
- 4 or more servings of vegetables and fruits daily
  - A young child’s serving is 3-4 tablespoons or 1/4 portion such as:
    - 1/2 banana
    - 1/2 apple
    - 1/2 orange
    - Small glass of orange juice

- 4 or more servings of bread and cereal daily
  - A young child’s serving is:
    - 1/2 slice bread or 1/2 slice hoagie
    - 1/2 cup dry cereal
    - 1/4 small cup cooked cereal, grits, macaroni, rice or spaghetti

75
A SPAGHETTI SUPPER

FOR: Parents Participating in Nutrition Program

TIME: Thursday, February 28, 6pm.

PLACE: Child Development Lab

* Now as the completion of the nutrition program is nearing, we would like to show our appreciation for your participation by inviting you to a spaghetti supper.

R.S.V.P. - Cheryl Wright 752-4028

If you are unable to attend, it will be necessary for you to make an appointment with me for Friday, February 29th, or Monday, March 3rd at any time between 10 AM and 4 PM.
Dear Parents,

I would like to thank you for participating in the nutrition program. I hope that you have found the program to be a rewarding learning experience for you and your child.

The profile cards need to be returned by this Wednesday, March 5th. The parent manual is yours to keep. I'm also enclosing an extra copy of the calendar. Time spent on the program and which parent was involved needs to be recorded. This information is essential for us to be able to evaluate and complete the project. Please return the calendar by Wednesday, also. Your cooperation is truly appreciated.

Sincerely,

Cheryl Wright
Appendix B

Instruments
GENERAL INFORMATION

1. Name ______________________________________

2. Child's name __________________________________

3. Child's age in months _______________________

4. Number of children in the family ____________

5. Birth order position of the above child: 1 2 3 4 5 6 7 8 9 10 (circle)
   Are you presently an expectant mother: _____yes _____no

6. Present occupation: Father ________________________
   Mother ______________________________________

7. If the mother is employed outside the home, how much time is involved per week?
   10 hours _________, 20 hours _________, 30 hours _________, 40 hours _________

8. Indicate the educational level of the child's parents:
   Father: Some high school _______ High school grad. _______
   High school grad. _______ Some college _______
   Some college _______ 4-yr. college _______
   4-yr. college _______ Graduate study _______
   Graduate study _______

9. How much has each of the following people influenced your eating habits?
   Rate: 1 2 3 4 5 (1 = low, 5 = high)
   Mother _______ Brothers/sisters _______
   Father _______ Children _______
   Friends _______ Teacher _______

10. Where do you feel you learned information about nutrition? Rate: 1 2 3 4 5
    (1 = low, 5 = high)
    Elementary school _______ Television _______
    High school _______ Magazines _______
    College _______ Newspaper _______
    Adult education _______ Other (please specify) _______
    Meetings _______

11. How satisfied are you with your own current eating habits?
    Very satisfied _______
    Somewhat satisfied _______
    Doesn't matter _______
    Somewhat dissatisfied _______
    Very dissatisfied _______
NUTRITIONAL KNOWLEDGE

1. Iron is important to the body because:
   a. It contributes to strong bones and teeth
   b. It is a part of hemoglobin
   c. It helps to digest foods
   d. It holds the body cells together

2. A food which is a good source of vitamin A is:
   a. Fish
   b. Broccoli
   c. Whole wheat bread
   d. Nuts

3. A nutrient dense food:
   a. Is low in its nutrients and calorie content
   b. Has a lot of calories or energy
   c. Has a high amount of nutrients compared to calories
   d. Contains a large amount of protein

4. Vitamin C is important to the body because it:
   a. Helps heal cuts
   b. Helps to improve vision at night
   c. Provides energy
   d. Is good for the circulation

5. If a diet were low in vitamin C, which of the following foods would be a good source of vitamin C:
   a. Shrimp
   b. Peas
   c. Potatoes
   d. Corn muffin

6. Vitamin A is important to the body because:
   a. It repairs body cells
   b. It is good for healthy bones
   c. It helps to improve vision at night
   d. It is good for the blood

7. Iron can be found most abundantly in which of these foods:
   a. Celery
   b. Bread
   c. Raisins
   d. Spinach
8. Calcium is important to the body because it:
   a. Provides energy
   b. Contributes to strong bones and teeth
   c. Repairs body cells
   d. Helps in food digestion

9. A food which is a good source of calcium is:
   a. Broccoli
   b. Meat
   c. Potatoes
   d. Yogurt

10. Which of the following foods would be the most nutritious:
    a. Tacos
    b. Granola
    c. Hot dog with bun
    d. Cooked cereal

11. Which of the following nutrients are most lacking in the American diet?
    a. Vitamin D, vitamin C and iron
    b. Iron, calcium, vitamin A and vitamin C
    c. Vitamin C, iron, protein and vitamin D
    d. Protein and calcium

12. What vitamin is added to the milk purchased at the grocery store:
    a. Vitamin C
    b. Vitamin E
    c. Vitamin A
    d. Vitamin D

13. Which of the following describes the best way of establishing good eating habits:
    a. eating at regular times, not snacking between meals
    b. giving up sweets and candy
    c. balancing the nutrient content and calories of foods
    d. eating low-calorie foods

14. What nutrient is milk lacking in:
    a. Iron
    b. Vitamin A
    c. Vitamin C
    d. Protein

15. Which one of the following would be most damaging if it were cut up or cooked too long:
    a. Iron
    b. Vitamin A
    c. Vitamin C
    d. Calcium
NUTRITIONAL ATTITUDES

Please circle the alternative that corresponds best with your feelings about the statement.

SA - If you strongly agree.
A - If you agree but do not feel strongly about the statement.
U - If you are undecided or neither agree nor disagree.
D - If you disagree but do not feel strongly about the statement.
SD - If you strongly disagree with the statement.

1. I find nutrition interesting........................................... SA A U D SD
2. I feel that my nutritional knowledge is adequate............... SA A U D SD
3. Achieving a thin appearance is more important to me than getting an adequate diet.................................................. SA A U D SD
4. What I know about nutrition influences what I eat................ SA A U D SD
5. If I found out I needed to eat different foods to make me more healthy, I doubt if I would change.............................. SA A U D SD
6. I usually find food preparation rewarding........................ SA A U D SD
7. I like to try new kinds of foods...................................... SA A U D SD
8. I sometimes overeat because I like the taste of a particular food................................................................. SA A U D SD
9. I am very careful to eat balanced meals............................ SA A U D SD
10. It is important to eat nutritious foods to be healthy........... SA A U D SD
11. I eat some things I don't like because they are good for me.... SA A U D SD
12. Most foods are supplemented by vitamins so I don't have to worry about the foods I select..................................... SA A U D SD
13. I would find it very difficult to give up a particular food even if I knew it wasn't good for me................................. SA A U D SD
14. I believe that your health is strongly related to what you eat... SA A U D SD
15. I don't think my health would improve if I changed my diet...... SA A U D SD
16. when eating, I often think about whether or not what I am eating is good for my health........................................... SA A U D SD
17. What I eat is only important if I am trying to lose or gain weight................................................................. SA A U D SD
18. I find it hard to change my eating habits.............................. SA A U D SD
19. Nutrition education for children is not as important as the fundamentals such as reading, writing and arithmetic........... SA A U D SD
20. Preschool children are not interested in nutritional information so nutritional education should be postponed to later......... SA A U D SD
21. Good eating habits are more important for young children than adults.............................................................. SA A U D SD
22. Healthy, active children require some concentrated sweets, such as candy for energy needs........................................ SA A U D SD
23. Nutrition should be taught early to children so that good nutritional habits will be established early in life.          SA A U D SD
24. Nutritional practices and attitudes are established in early life and are very resistant to change in adulthood.          SA A U D SD

How much would each of the following influence you to make a major change in your eating habits?

<table>
<thead>
<tr>
<th>Not At All</th>
<th>A Little</th>
<th>Quite a Bit</th>
<th>A Great Deal</th>
<th>Totally</th>
</tr>
</thead>
<tbody>
<tr>
<td>25. Gaining or losing weight</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>26. Serious illness</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>27. Sharp increase in costs of foods you buy</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>28. To find out what you eat is not good for your health</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>29. Nutrition education</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>30. Discovering foods you like better than what you are eating now</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>31. Seeing the benefit of nutrition knowledge</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

To what extent does each of the following factors influence your current eating habits?

<table>
<thead>
<tr>
<th>Not At All</th>
<th>A Little</th>
<th>Quite a Bit</th>
<th>A Great Deal</th>
<th>Totally</th>
</tr>
</thead>
<tbody>
<tr>
<td>32. Cost of food</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>33. Convenience and time</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>34. Taste of food</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>35. Nutrition</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>36. Variety</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>37. Your weight</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>38. Custom, habits</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>39. Availability</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>40. Friends and associates</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>41. Family members</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>
### NUTRITION PRACTICES

Statements concerning your personal nutrition practices are made below. Please indicate whether you carry out the specific practice "Always," "Frequently," "Sometimes," or "Never" by circling the appropriate number 1-4.

<table>
<thead>
<tr>
<th>Question</th>
<th>Always</th>
<th>Frequently</th>
<th>Sometimes</th>
<th>Never</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Do you eat nutritious food to set a good example for your children?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>2. Are you aware that your choices of food have a direct influence on your children?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>3. When preparing a meal do you consider the vitamin content of the foods to be served?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>4. In choosing your foods do you balance the nutrient content with the calorie content?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>5. Are the snacks at your house usually sweet treats?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>6. Do you involve your children in the food preparation process?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>7. Do you take your children grocery shopping?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>8. Do you discuss the nutrient value of foods with your children?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>9. If your children did not like a particular food, would you try and prepare it in a new and unusual way?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>10. Do you have nutritious snacks available for your children?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>11. Do you introduce a wide variety of nutritious foods to your children?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>12. Do you read articles concerning nutrition?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>13. Do you reward your children with food for good behavior?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>14. Is food withheld as punishment for bad behavior?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>15. Young children should be allowed to eat whatever they want.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
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<td>16. Are the snacks at your house usually vegetables or fruits?</td>
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<td>17. Do you use grocery shopping as a time to teach your children about the makeup of foods?</td>
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<td>18. Are food experiences perceived as fun by your children?</td>
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GERBER TEST

Grapefruit
1. Tell me what food this is. (Provide answer if child doesn't know)
2. Tell me what nutrient it contains that is good for us.
3. Tell me what **Vitamin C** does for our bodies. (cuts and/or gums)

Milk
1. Tell me what food this is.
2. Tell me what nutrient it contains that is good for us.
3. Tell me what **Calcium** does for our bodies. (bones and/or teeth)

Spinach
1. Tell me what food this is.
2. Tell me what nutrient it contains that is good for us.
3. Tell me what **Vitamin A** does for our bodies. (eyes and/or skin)

Liver
1. Tell me what this is.
2. Tell me what nutrient it contains that is good for us.
3. Tell me what **Iron** does for our bodies. (blood)

CODE

Score 1 for a correct response.
Mark 2 for an incorrect response.
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Appendix C

Instructional Materials
Calcium Week

Calcium is a mineral and probably one of the most important minerals for our bodies for it is found in the greatest amount. Ninety-nine percent of the calcium in our bodies is found in the bones and teeth and is what makes the bones and teeth hard and rigid. If there was no calcium present, these body parts would be soft as other parts of the body. The one percent of calcium remaining has been found to be very significant also in blood coagulation, the regulation of the heart beat, and the normal reaction of nerve stimuli. In other words, calcium helps to regulate several body processes.

The best and richest source of calcium is milk. In fact it has been stated that it would be difficult to obtain enough calcium without drinking milk. Milk can be drunk in many forms, (whole, skimmed, 2%, powdered, reconstituted, or chocolate flavored) and still provide the necessary calcium. Other good sources of calcium include:

**Calcium sources**

- Ice cream
- Cottage cheese
- Cheddar Cheese
- Yogurt
- Pudding

An adult and preschool child both need about 800 milligrams of calcium per day. One can get this much calcium from drinking 3-4 glasses of milk per day.

You've probably often noticed that the milk we buy at the grocery store has vitamin D added to it. There is a reason for this; that is, vitamin D is necessary for the proper absorption of calcium into the body. Thus, milk
producers have made sure that the calcium we intake will be properly used by our bodies. Since this has occurred, the incidence of childhood rickets (a disease caused by poor absorption of calcium into the body because of lack of vitamin D) has almost become nonexistent in the United States.

The important thing to be aware of with young children is that their bones are growing at a rapid rate and their teeth are forming. They need optimal levels of calcium intake so they will have strong bones and teeth. Calcium deficiency in young children could result in defective teeth and fragile, easily broken bones.

Home Activities

1. Help your child learn to identify the color yellow so he will be able to understand the food profile card.

2. Look at the profile cards with your child. Have him identify the yellow lines and teach him to identify good sources of calcium and poor sources of calcium through identifying cards with yellow lines longer than the black area and yellow lines shorter than the black area. (If the yellow line is longer than the black area it provides more nutrients than calories, but if it is shorter than the black area, the food provides more calories than nutrients or is a poor source of that nutrient.)

3. Teach your child what calcium does for his body -- builds strong bones and teeth. This can be done with the help of the profile card and through teaching your child the "Calcium Song."

"Calcium Song"

(Tune: I'm a Little Teapot)

If you want strong, healthy bones and teeth, Cal-ci-um is what you should eat. If you drink your milk or eat ice cream, Then you'll be getting the nutrients you need.
4. Save your milk product food cartons (ice cream, yogurt, butter, milk, etc.) and let your child play house with them. Have your child identify the different foods that the cartons represent. Tell your child that these foods contain calcium.

5. Visit the cheese factory. Talk to your child about the milk products found at the cheese factory such as butter, cheese, ice cream, etc. Talk to them about the special nutrient, calcium, that each contains.

6. Have your child make butter at home. Pour a small amount of room temperature whipping cream into a baby food jar or other small jar. Place cap on tightly. Let your child shake it until it turns to butter. Add salt and yellow food coloring if desired. Serve on crackers. Talk to your child about the nutrient found in butter and cream.

7. An unusual treat for the family is homemade frozen yogurt. If your family has an ice cream freezer you might try the following recipe for a nutritious calcium food.

   Frozen Raspberry Yogurt

   1 envelope unflavored gelatin
   1/2 cup cold water
   2 cups sugar
   6 cups plain yogurt
   2 10-ounce packages frozen raspberries, thawed

   In a small saucepan soften unflavored gelatin in cold water. Cook and stir over low heat until gelatin is dissolved. In large bowl combine sugar, 1 cup of the yogurt, the dissolved gelatin, and the raspberries; mix well. Stir in remaining yogurt. Cover and chill overnight. Pour into 4 quarts ice cream freezer; freeze according to manufacturer's directions. Makes about 2 1/2 quarts.
VITA

Cheryl Wright

Candidate for the Degree of

Master of Science

Thesis: Involving Parents in a Nutrition Education Program for
Preschool Children

Major Field: Family and Human Development

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Insights into Exploring Science, Presentation given at

Developing Creativity in Your Children, presentation to the
Weber County Extension, Program for Young Mothers, July, 1979.

Teaching Science to Children, a presentation given to

Creating a Learning Environment in the Home, given at

Presentor, Annual meeting of the Society for Nutrition
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Publications: Developing your Child's Creative Potential, a
USU Extension bulletin developed for parents.