VEGETABLE ACCEPTANCE BY PRESCHOOL CHILDREN FROM THREE SOCIOECONOMIC LEVELS FOLLOWING AN EDUCATION PROGRAM

A THESIS

SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR

THE DEGREE OF MASTER OF SCIENCE IN FOOD AND NUTRITION

IN THE GRADUATE SCHOOL OF THE

TEXAS WOMAN'S UNIVERSITY

COLLEGE OF

HOUSEHOLD ARTS AND SCIENCES

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DENTON, TEXAS
DECEMBER, 1971

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Denton, Texas

December 6, 19 71

We hereby recommend that the thesis prepared under our supervision by Patricia V. Turk entitled Vegetable Acceptance by Preschool Children from Three Socioeconomic Levels Following an Education Program

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A C K N O W L E D G M E N T S

Sincere appreciation is expressed by the author to the following persons who have contributed to the course of the study and the completion of the thesis:

To Dr. Wilma A. Brown, Professor of Foods and Nutrition, for professional interest and guidance in the development of the study, for direction in the analysis of data and completion of the thesis, for personal friendship and generous giving of time and energy contributing to the success of the study;

To Dr. Betty Alford, Assistant Professor of Nutrition Research, for assistance in the formulation of the study, encouragement during the study, and suggestions during the writing of the thesis;

To Dr. Jessie W. Bateman, Professor of Home Economics Education, for assistance in securing a study group, and helpful suggestions during the completion of the thesis;

To the Directors of East Dallas Head Start Kindergarten, White Rock United Methodist Weekday School, and

The Montessori School of Dallas, for permitting the study to be carried out in these schools;

To the teachers of East Dallas Head Start Kindergarten, White Rock United Methodist Weekday School, and The Montessori School of Dallas, for releasing class time for the study and offering helpful suggestions for its success;

To the children of the East Dallas Head Start Kindergarten, White Rock United Methodist Weekday School, and The Montessori School of Dallas, for their enthusiasm and cooperation during the study;

To Clara J. Bridges, for lending personal interest and encouragement, during the study and assistance during the writing of the thesis;

To her family, for interest, encouragement, and assistance given during all phases of the study.

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I N T R O D U C T I O N

Man's nutritional goal should be the consumption of an adequate and varied diet. The nutritionist strives to help man select an adequate and varied diet relative to his socioeconomic circumstances. Research studies have investigated characteristics of different socioeconomic groups in order to develop a better understanding of eating habits and the factors influencing eating patterns.

The 1965 household study conducted by the United States Department of Agriculture revealed income and the quality of the diet to be closely related. LeBovit and Clark, in the 1969 edition of The Yearbook of Agriculture (14), emphasized the finding that families with low incomes and with many children tend to have difficulty obtaining a well balanced diet. Aldrich (1) has pointed out that: "Socioeconomic class is substantially related to nearly everything in a man's life." Thus, socioeconomic class must be regarded as a dominant factor in the selection of a diet.

Since socioeconomic class influences the selection of a diet, it is of interest to determine whether this factor influences food preferences and, if so, in what manner. Does socioeconomic class influence man's diet to the extent that the diet is more or less amenable to change? This study investigated the premise that the influence of socioeconomic class may make a child's diet more or less amenable to change. The author attempted to determine the effectiveness of an education program on vegetables conducted with three groups of preschool children from different socioeconomic backgrounds. Primarily, this study focused on the preschool child and his vegetable preferences as influenced by socioeconomic background.

NEED FOR STUDY

To help man select a varied and adequate diet, a daily food plan called the Essentials of an Adequate Diet was devised by the United States Department of Agriculture in 1956 (16). This plan replaced the 1943 Basic Seven Food Groups and placed the major food components into four groups: milk and milk products; fruits and vegetables; meat, fish, poultry, and eggs; and cereal and cereal products. The four-group plan is a simple arrangement of foods, each group of which contains foods similar in nutritional contributions. If the correct amount of food from each group is consumed daily, 75 per cent of the recommended

daily allowances of all nutrients will be met. No single food contributes all nutrients in the amounts needed for good health. By utilizing the four-group plan, a mixture of plant and animal products, man is able to obtain a varied and adequate diet.

Man's attitude is favorable to a majority of the foods outlined in the Essentials of an Adequate Diet. The four-group plan includes the recommendation that the diet contain four servings of fruits and vegetables (16, 35). According to Martin (26), vegetables, particularly cooked vegetables, are the most unpopular food group. Negative attitudes toward vegetables exist for people of all age groups, but are particularly pronounced among children. For purposes of this study, the focus was on vegetables.

Poor acceptance of vegetables among children was reported by Breckenridge (5) in 1959. The food attitudes of 51 children from predominantly upper middle class homes were investigated, and cooked vegetables of all kinds comprised the largest number of food dislikes for children. In order to determine the food likes and dislikes of children, Van Duyne (44) obtained food histories from parents. Data from this study indicated that vegetables were checked more often than other foods as either being refused by the children or never served to the children.

Poor acceptance of vegetables, however, has not been limited to children of one socioeconomic class. Litman, Cooney, and Stief (24) investigated the food preferences of 1,039 children from families of varying socioeconomic levels. Analysis of the nutrient adequacy of the diets revealed that children from all socioeconomic classes had an inadequate intake of green and yellow vegetables.

Mirone, Torrance, and Roughton (31), in an effort to determine the quantity of individual foods consumed at the noon meal by 21 preschool children, found poor acceptance of vegetables. The plate waste for vegetables was high, revealing a need for stressing the role of vegetables in good nutrition at an early age.

Seven-day diet records, maintained on 385 children by Potgieter and Everitt (40), revealed similar deficiencies in the consumption of vegetables by the children. The greatest degree of deficiency was found to be in cereal products, vegetables, vitamin C, and milk.

A general dislike of vegetables is not limited to children. In a study of the food likes and dislikes of fathers and children, conducted by Bryan and Lowenberg (6), vegetables were reported as the food least liked by both study groups.

Many studies have revealed negative attitudes toward vegetables and have indicated a need for increasing the young child's knowledge and acceptance of a wide variety of vegetables. Eating habits begin in infancy and early childhood. Infants are born into the world without established patterns of eating behavior, but these patterns are soon formed and develop very early into lifetime practices. Therefore, the time to begin changing poor eating habits is in early childhood. The child's nutritional needs change as he grows older; thus, food practices and preferences must adapt to these changing needs. The greater the variety of foods the child accepts, the easier the adaptation to changing nutritional demands.

The socioeconomic level of the parents can make this adaptation more difficult. If the child from a low income family eats primarily low cost foods, variety is limited and these foods may or may not be adequate nutritionally. Conversely, the child of a wealthy family may be presented a wider variety of foods and, consequently, is exposed to a more nutritionally adequate diet. In the wealthy family, the child's diet is not limited by cost, and the opportunity for variety in the diet is greater. However, choices are not always nutritionally sound.

REVIEW OF LITERATURE

The Essentials of an Adequate Diet is a diet plan composed of four major food groups. As recommended by the United States Department of Agriculture, the four-group plan replaced the complex seven-group plan, combining the three fruit and vegetable categories into one group and entirely eliminating the fat group (16).

Importance of Vegetables in the Diet

This study focused on vegetables; therefore, the review of literature is primarily concerned with the vegetable group. Research indicates the contribution of vegetables to the diet is indisputable. Vegetables are diverse in physical structure and nutritional value, and may be consumed in the form of roots, stems, leaves, or flowers. A well balanced diet includes two to three servings of vegetables daily. Vegetables provide vitamins, minerals, and bulk in the diet, as well as color and variety.

Wohl and Goodhart (49) state that vitamins and most of the minerals play an important part in the enzyme systems of the body, without which metabolism of proteins, carbohydrates, and fats could not proceed. The Nutrition Handbook for Family Food Counseling (35), in relating the important functions of vitamins and minerals, states that vitamins and minerals take part in specialized functions other than in

enzyme systems. For example, vitamin A is part of the pigment in the eye necessary for vision, iron is part of the hemoglobin molecule which carries oxygen to the cells, and iodine is part of the hormone thyroxine.

Vegetables are necessary if the diet is to meet the Recommended Daily Allowances for vitamin A and vitamin C. Vitamin A can be stored in the body, but ascorbic acid must be supplied daily. Deficiencies of vitamin A may include night blindness, xerophthalmia, and lesions of the skin. Vitamin A itself is found only in foods of animal origin, but beta-carotene, the precursor of vitamin A, is found in plant tissues. Beta-carotene is converted into vitamin A in the body, this conversion taking place largely in the walls of the small intestines. As stated by Wohl and Goodhart (49): "The ultimate source of vitamin A is the carotenoid pigments in the green leaves of plants such as broccoli and spinach, and in certain storage tissues such as yellow tubers (carrots) and in fruits."

Many vegetables contain ascorbic acid in abundance, but losses in cooking and preparation may be great. Wohl and Goodhart (49) state that the functions of ascorbic acid are currently being investigated at length, but it is known that ascorbic acid is needed for the rapid synthesis of new collagen producing connective tissue, and this vitamin probably aids in the healing of wounds and broken bones.

The Nutrition Handbook for Family Food Counseling (35) lists tomatoes, cabbage, broccoli, asparagus, greens, and potatoes as being a few of the commonly served vegetables rich in vitamin C.

Wohl and Goodhart (49) state that calcium and iron are the most important mineral contributions of vegetables to the diet. Certain factors, however, influence the absorption of calcium in the body. It is reasonable to assume that a diet rich in green leafy vegetables is also rich in calcium, and that most of this calcium is available for growth. Because of the tendency to form insoluble salts, absorption of calcium may be inhibited by the presence of phytic acid and oxalic acid in the diet. Absorption of iron may be inhibited by large amounts of phosphate in the diet, making the iron unavailable for absorption. Iron is more easily absorbed in the ferrous (Fe^{++}) form than the ferric (Fe^{+++}) form. Ascorbic acid increases the absorption of iron by reducing the pH in the intestinal lumen (49). Since both ascorbic acid and iron are present in many vegetables, absorption of iron does not appear to be a problem. Martin (26) lists mustard and turnip greens, green peas, spinach, collards, kale, and broccoli as being important sources of calcium and iron.

Vegetables do not contribute much energy to the body. Davidson, Passmore, and Orr (8) point out that most

vegetables provide only 10 to 50 calories per 100 grams. All vegetables, however, contain cellulose fiber which is indigestible and therefore contributes bulk to the diet.

Table I lists the average contribution of vegetables to the nutrient supplies available for civilian consumption from 1957-59 as compared to 1970. These data were provided by the March, 1971 issue of the Monthly Supply Letter published by the United Fresh Fruit and Vegetable Association (32). This table illustrates that the contribution of vegetables to the nutrient supplies available to the population in the 1950's and in 1970 were remarkably similar. However, vegetables were providing less vitamin C in 1970 than in 1959, and a little less vitamin A.

Also noted in Table I is the fact that vegetables supply a considerable percentage of the vitamin B_6, magnesium, and phosphorus available in the food supply. Vitamin B_6, or pyridoxine, plays a decisive role in the metabolism of amino acids. Magnesium is present in all human tissues, but the greatest amount is present in the bones. Maintaining adequate levels of magnesium is not a problem except in cases of severe diarrhea when cellular reserves are depleted. Phosphorus is present in the bones in combination with calcium, and in the cells where it is involved in many chemical reactions.

TABLE I

AVERAGE PERCENTAGE CONTRIBUTION OF VEGETABLES TO THE NUTRIENT SUPPLIES AVAILABLE FOR CIVILIAN CONSUMPTION IN THE UNITED STATES[1]

Nutrients	Vegetables							
	Potatoes and Sweet Potatoes		Dark Green and Deep Yellow Vegetables		Other Vegetables, Tomatoes		Dry Beans and Peas[2]	
	1957 to 1959	1970	1957 to 1959	1970	1957 to 1959	1970	1957 to 1959	1970
	Per Cent	Per Cent	Per Cent	Per Cent	Per Cent	Per Cent	Per Cent	Per Cent
Food energy	2.8	2.8	0.3	0.2	2.3	2.4	2.9	2.9
Protein	2.4	2.4	0.5	0.4	3.3	3.2	5.2	5.0
Fat	0.1	0.1	*	*	0.4	0.4	3.2	3.5
Carbohydrate	5.3	5.5	0.5	0.5	4.2	4.5	2.3	2.1
Calcium	1.0	1.0	1.6	1.5	4.6	4.8	2.6	2.7
Phosphorus	3.9	4.0	0.7	0.6	4.7	4.8	5.7	5.7
Iron	4.3	4.6	1.9	1.6	9.1	9.2	7.4	6.4
Magnesium	7.2	7.3	2.3	2.0	10.2	10.2	10.8	10.9
Vitamin A	8.3	5.7	20.7	20.8	13.8	15.3	*	*
Thiamin	6.4	6.6	0.9	0.9	6.9	7.0	6.0	5.6
Riboflavin	1.9	1.8	1.2	1.0	4.4	4.5	1.9	1.8
Niacin	7.6	7.4	0.7	0.6	6.2	5.9	6.3	6.8
Vitamin B_6	13.6	12.0	2.0	1.7	9.9	9.2	4.7	4.2
Vitamin C	20.6	20.3	9.2	8.4	30.8	29.2	*	*

[1] Monthly Supply Letter, March, 1971. (32)

[2] This group included nuts and soya flour.

* Less than 0.05 per cent.

Poor Acceptance of Vegetables

Pilgrim (39) relates that food likes and dislikes are predictable, especially among children; therefore, it is of particular concern that, in general, the food group least liked by children is vegetables. This poor acceptance has been well documented. Martin (26) commented that "Vegetables, particularly cooked vegetables, are the most unpopular food group," and that "Strong-juice vegetables, especially those green or yellow in color, are more disliked than others."

Food attitudes of 51 children, ages five to 12 years, were investigated by Breckenridge (5) in 1959. Information on food preferences was obtained by the use of questionnaires. The largest number of dislikes was recorded for cooked vegetables of all kinds. Among the disliked foods were 20 vegetables, with carrots and cabbage mentioned most often. Raw vegetables were also poorly accepted by this group of children. The study group came from predominantly upper middle class homes.

Litman, Cooney, and Stief (24) examined the attitudes of 1,039 children toward food. The results indicated that the intake of green and yellow vegetables was markedly inadequate. Among the group of liked vegetables, carrots, corn, peas, and beans were mentioned most often. The green

and yellow vegetables, such as spinach, cabbage, lettuce, and celery, were poorly accepted. This study attempted to determine what factors might be associated with the attitudes of the children toward food. Vegetables was found to be the food group most likely to elicit praise from the parents. "Praise foods" were usually foods over which there has been some source of conflict. There would be no need to praise a child for eating a food unless a problem had been encountered concerning that particular food.

Acceptance of foods by preschool children was examined by Van Duyne (44), using 43 food history forms completed by the parents. Data from these histories revealed vegetables, liver, fresh fish, and cottage cheese were the foods most often checked as being refused. Corn on the cob, whole kernel corn, and raw carrots were liked by over 60 per cent of the children, but most vegetables were less well liked than other foods. The results of this study confirmed the belief that preschool children prefer simply prepared foods.

In a study of the food consumed by 21 nursery school children during the noon meal, Mirone, Torrance, and Roughton (31) noted poor acceptance of vegetables. Except for Irish and sweet potatoes, plate waste in vegetables was high, "indicating the need for stressing the role of

vegetables in good nutrition and early formation of good food habits through educational programs for parents."

Factors Influencing Vegetable Acceptance

One approach to the problem of changing poor eating habits, as described by Margaret Mead (34), is to investigate the ways in which food habits are established in the growing child. This approach involves an investigation of all the factors affecting the child's acceptance of certain foods, including the influence of parents and siblings, the methods by which vegetables are prepared and served, and the ways in which new foods are introduced. The environment and socioeconomic class into which the child is born, combined with the above-named factors, are interrelated in determining the child's food habits and preferences.

Research studies concerning food preferences of young children have indicated that parents and other family members play an important role in the acceptance of certain foods over that of other foods. Schmidt (43) indicated that a "child so soon becomes a little slave to imitation," and that "he (the child) wants to be exactly like father, mother, or big sister Sue and will respond to food according to the example which has been set for him." Pilgrim (38) found the most important controlling factor in food preferences to be experiences during the early years of

life. Imitation of the eating habits of those around him begins at a very early age. The real attitudes of family members toward food are soon recognized by the young child. Therefore, the role of parents and siblings cannot be ignored.

Many studies relating the food preferences of children to the food preferences of the other family members have been conducted. A study comparing the food preferences of 103 children to that of their mothers and fathers was carried out by Metheny and others (30). The children were found to have fewer likes and were familiar with fewer foods than the parents. However, the mothers had fewer food dislikes than either the fathers or the children. Most foods disliked by both parents were either disliked by the child or were unfamiliar to him. This finding indicated the controlling influence of the parents over the development of food attitudes by the child.

The mother is the real controlling factor in what is served to the child. The mother is also the authority over food behavior. Litman, Cooney, and Stief (24) observed the food attitudes of 1,039 children. In over 90 per cent of the participating families the children related that the consumption of vegetables was more likely to elicit praise from the mother than the consumption of any other food group. On the whole, the management of food behavior

in this study appeared to be a family-centered activity. Although the father was considered to be the head of the house in most matters, in the matter of food behavior, the mother was the main influence.

To interest a young child in a particular food is difficult if the father objects to the particular food. In a study by Bryan and Lowenberg (6), the father's influence on the young child's preferences appeared to be in the limitation of the variety of foods served to the child. The mothers did not serve foods the father disliked or served these foods infrequently. Vegetables were the least favored of the food groups among the 61 children and their fathers.

The influence of parental food preferences on those of the child was explored by Metheny and others (29). This particular study related food acceptance and nutritional intake of 103 children to diet histories, mealtime patterns, the child's attitudes toward food, the mother's interest in nutrition, and the parents' food preferences. The basis for this study was the recognized relationship between early feeding experiences and later eating practices. The degree of acceptance of 35 specific foods by the child was checked by the mother. All the foods unfamiliar to the child, and in most instances, foods disliked by both parents, were either disliked by the child or were unfamiliar to him.

This study also revealed the control of the mother over the foods offered to the child in the home.

Another study, comparing the vegetables liked by the child to those liked by the parents, was carried out by Hunt, Patton, and Carver (20). The study revealed that the specific vegetables liked by the parents and the child were those vegetables most frequently served in the home and were those with which the child was most familiar.

The home environment influences the food preferences of children in other ways. A study by Baldwin (4) related eating habits to family behavioral patterns. The homes of children with good appetites were characterized by strict discipline, praise for conformity, and love and acceptance by the parents. The children with poor appetites were often products of coercive homes with too many restrictions. An abundance of affection and attention seemed to be the most successful method of encouraging the child to eat a wide variety of foods.

Socioeconomic class is another factor affecting food selection, and its influence begins in early childhood. The individual learns the culturally approved responses for the role he is to play. The class concepts of the parents determine methods of child rearing, and these values are consciously or subconsciously implanted in the children.

Kohn (21) states that it is not known how the environment of class shapes and affects personality and attitudes, but authorities agree that it does. Human behavior, therefore, varies somewhat according to status. Combined with the learned differences among people of various ethnic groups are the status variables, such as education of the parents and source of income.

Education of the parents, family income, the number of family members, the occupation of the mother outside the home, the family residence, the occupation of the father--all are variables that determine the socioeconomic classification of the family. These socioeconomic variables are difficult to isolate in dealing with large groups of people and are often deep rooted, making attempts at dietary change difficult.

Family income and quality of the diet are closely related. Data from a household survey conducted in 1965 by the United States Department of Agriculture (14) give evidence that as income increases the percentage of households with good diets also increases. Of the families with an annual income below $3,000, over one-third, or 37 per cent had good diets; whereas, 63 per cent of the families with annual incomes above $10,000 had diets rated as good. In this survey about one-third (36 per cent) of the families with annual income below $3,000 had poor diets. As the

annual income increased the percentage of families with poor diets decreased. Only 9 per cent of the families with an annual income above $10,000 had diets rated as poor.

A 1962 study conducted by Metheny and others (30) related the dietary patterns of 104 preschool children to the income level of the family. The greatest percentage of diets low in nutrient content was observed among the children from families of the lowest income group. The diets were best in the $5,500 to $7,250 income group which was considered by the authors as the upper middle income group. It would have been interesting if this study had been carried out with incomes higher than $7,250. Based on the results of this study, the authors stated that high income does not assure good diets for family members.

Hendel, Burk, and Lund (18) studied the socioeconomic factors that influence children's diets, especially the foods containing vitamins A and C. The adequacy of the intake of vitamins A and C in the children's diets showed a direct correlation with family income levels. At high income levels there was a higher percentage of diets adequate in vitamins A and C. The socioeconomic factors considered in this study were education of the mother, urbanization, and income level. The types of foods high in vitamins A and C consumed by the three groups were similar, but the quantities consumed differed with income level.

The chief sources of vitamin C in the diets of the higher income group were citrus juices, tomatoes, and tomato juice; the low income group consumed citrus fruits, potatoes and apples. All income groups ate less green and yellow vegetables, yellow fruits, eggs, and margarine than is recommended for adequate daily consumption.

Wilhelmy, Young, and Pitcher (18) examined the nutrient intake of families residing in Groton Township, New York, both in rural and non-rural areas, and related nutritive value to such socioeconomic factors as composition of the family, education of each individual, family income, and occupation of the parents. Data provided by this study indicated that the nutritive value of the diet of the average family participating in the survey was a reflection of the dollar-value of the food consumed. As family size increased, less money was spent per person for food. There was some tendency toward an increase in nutrient intake as the weekly income increased.

A study of the nutritional status of city children from different socioeconomic groups was carried out by Hardy and others (17) in 1941. These authors examined 7,363 children for physical signs suggestive of nutritional inadequacies. The children ranged in age from two to eighteen years and represented different national and racial groups. There was evidence of a relationship between

nutritional adequacy of the diets of the children and the socioeconomic level of the family. Differences in the general health of the children from different socioeconomic groups were large and statistically significant. The two lower socioeconomic groups had twice as many children in poor general physical health as the two upper socioeconomic groups.

These authors were of the opinion that since food consumption and nutritional status are interrelated, dietary information was essential for the study. The dietary information obtained revealed wide differences in the dietary patterns of white, Negro, and Mexican-American children. Only 11 per cent of the Negro and 7 per cent of the Mexican-American children "were getting even a minimum adequate diet." Most of the diets of white children were considered adequate, but less than 50 per cent of any national or racial group had adequate diets. These inadequacies were reflected in all groups. Adequate diets were more frequently found in the upper socioeconomic groups than in the lower groups. The authors concluded that "The need for improvement of the dietary was widespread and progressively more in evidence as the economic status of the family became lower." Of interest, was the finding that there were racial differences in the consumption patterns in each socioeconomic group, and that these were more marked at the

upper levels. That is, even though income level rose, the adequacy of the diets of Negro and Mexican-American children still remained below that of white children.

An examination of the diets with respect to food groups showed that dietary inadequacies were most often noted in fruits and vegetables. There was a positive relationship between purchasing power and fruit and vegetable consumption. Only in the highest income group did fruit and vegetable consumption approach the recommended intake. This finding is in agreement with the 1969 report of the United States Department of Agriculture (14) which stated that higher income families consume more fruits and vegetables than do lower income families.

Twenty families from low income groups were studied by Hootman and others (19) to determine the relationship between low income and dietary status of the children. No real association was found between income and either the diet or physical development of the children. Only about half of the children in this small sampling had "good" diets, and the nutrient intakes which were most frequently in short supply were ascorbic acid, calcium, and iron.

An observation included in the study by Methany and others (29), relating dietary patterns and socioeconomic factors, was that the diets of children of working mothers

rated a little better than those of mothers who were not employed. The 1959 Yearbook of the United States Department of Agriculture (13) reported that whether or not the mother was employed outside the home made very little difference in the quality of the diet provided for the children. The working mother planned somewhat different menus, but the nutrient level in the food prepared was about the same as that prepared by the mother who was not employed.

An article in the 1959 Yearbook of the United States Department of Agriculture (13) emphasized the effect of education of the homemaker on the nutritive quality of the family diet.

> Among city families with incomes over $4,000 a year, wives with high school education provided slightly better diets than those with only elementary education; those who had gone to college did the best. When income was lower, the college-educated wives did least well.

There are other factors that affect the acceptance of vegetables by children. One of these is the method of preparation. Observations of food consumption by Pilgrim (39) led to the conclusion that the greater the amount of preparation applied to a food, the less well-liked the food. This fact has been well documented by Breckenridge (5) and Van Duyne (44) who stated that children like their vegetables raw and simply prepared.

Schmidt (43) emphasized the importance of food preparation stating that the reaction or response the child gives to a food is influenced by the association connected with the child's first experiences with the particular food. If the condition of the food is unpleasant to the child, whether by taste, smell, or appearance, a prejudice may be built up against this food by the child. Schmidt, too, emphasized the importance of feeding small children simply prepared foods.

Breckenridge (5) found that the reasons given for changing attitudes toward certain foods were "learned to like," and "preferred the way it was prepared." Reasons given for disliking foods included "the foods were new to them" or "preparation was different from that at home." These reasons point out the importance of the method of preparation as it influences vegetable acceptance by children.

Dudley, Moore, and Sunderlin (10) investigated the influence of the method of preparation on children's attitudes toward food. This study included 53 preschool children from different backgrounds. Green beans, asparagus, carrots, and rutabagas were served four different ways. Data obtained included the order of choices, the number of choices, and the amount eaten. The results indicated much variation in the children's preferences for vegetable preparations. Caution was urged in making definite statements

that children prefer certain food preparations over others. Preference is probably an individual matter.

In 1959 Van Duyne (44) conducted a study to determine if changing the method of preparing a frequently refused food increased the acceptance of that food. Data were obtained from 43 food history forms. Of the foods checked most often as being refused or never served, 16 were chosen for the study. All but three of the 16 foods were vegetables. Three methods of preparation were chosen for each food and acceptance was measured by recording how many children liked, accepted, or refused a food, and by noting the order in which the food was finished. Results confirmed the opinion that preschool children like simply prepared foods. Boiling and buttering was the choice method for nine of the 12 cooked vegetables included in the study. Changing the preparation method made six of these nine vegetables more acceptable. Vegetables was the most unpopular food group among the children studied. The most frequently listed vegetables that the children refused to eat were spinach, squash, asparagus, sweet potatoes, and lima beans. The vegetables most liked were the mild flavored ones such as beets and corn.

The Merrill-Palmer School in Detroit conducted several outstanding studies on methods of feeding small children. In reporting one of these studies, Wagner (46)

discussed some of the more important points to apply when feeding this age group. The way food is prepared and presented to the child will influence its acceptance or rejection. A wide variety of foods should be introduced in a relaxed and casual atmosphere. Limited self-selection of the diet, self-help, elimination of moral values attributed to acceptance or rejection of food, and the proper introduction of new foods will help to avoid eating problems. According to Wagner, the proper introduction of new foods includes serving the new food in small amounts and accompanying the new food with a well-liked, familiar food.

The social influence of other children is an important factor to be considered when trying to change a child's eating habits. Duncker (11) showed that some children modify their choice of foods under the immediate influence of a group of other children. Marinho (25) continued this work and found that under certain conditions the leader of the group can modify an individual's food habits and this modification can be lasting.

These studies indicate that the influence of the peer group is strong enough to discourage taste testing of children as a group if an accurate individual response is to be obtained. Social influence can alter a child's responses. Social influence can work to the child's advantage, however, when introducing new foods. Often

children will eat without question if allowed to sit together in a small group, especially if one of the children in the group is a good eater.

Another important factor affecting the acceptance of vegetables by children is familiarity. Pilgrim (39) reported that food attitudes are a "reflection of previously established experience." Wagner (46) reinforced this statement by commenting that "a food habit results from repetition of experiences with specific foods and the establishment of a preference for those to which one is accustomed."

The importance of familiarity to vegetable acceptance among children was documented by Hunt, Patton, and Carver (20). These authors found that the vegetables liked by the children were also the ones served most often in the home. Familiarity was the most important factor in the acceptance of broccoli, rutabaga, squash, and wax beans; acceptance of these vegetables tended to improve with familiarity.

Dudley, Moore, and Sunderlin (10) also found familiarity to be a factor in food acceptance when investigating the importance of the method of preparation to food acceptance among 53 nursery school children. Four vegetables were prepared four different ways and acceptance by each child recorded. The results of this study indicated that "the child's familiarity with each vegetable may have had some influence on the choices of preparations made and

consistency of choices as well as on the amount of vegetable preparation eaten."

Schmidt (43) stated that the sensations of taste and smell become specialized and sensitive through experience. The development of food likes and dislikes, therefore, is largely a matter of training and responses become habitual. Repetition with good responses can influence a child in forming good eating habits or in correcting poor eating habits.

McLaughlin and others (28) studied 28 preschool children during mealtime for a two-week period and obtained data regarding verbal responses to the vegetables served, the quantity of vegetables eaten, and the order in which the vegetables were eaten. Learning to like a food seemed to develop slowly but the children did learn to like new foods. Repeated observations of the 28 children showed that "young children like vegetables to which they have become accustomed."

Changing Food Habits

Familiarity can be utilized when feeding young children by introducing new foods along with well-liked, familiar foods. If a child's previous experience with a food is pleasant, there is a greater probability for acceptance of the new food (46).

Whitehead (47), in discussing some principles of nutrition education, stated that, "To be effective, nutrition education must be based on the needs, interests and problems of the children . . . and it must be suited to the abilities of the children at different grade levels." The aim of nutrition education is to establish and maintain desirable food habits. The problem-solving approach appears to be more effective than the subject-matter approach in influencing eating behavior.

Venable (45) comments that nutrition education is most effective when the students become actively involved. Changing poor food habits is a long term process and nutritionists should not attempt to "break a poor eating habit" but rather "to give the child a substitute for the undesirable habit."

One method applied to improve food habits is the food acceptance improvement program. The food acceptance program may utilize diet surveys, tasting parties, food preference check lists, and school lunch situations. Hunt, Patton, and Carver (20) comment: "Food acceptance improvement programs . . . can serve a twofold purpose; first, in increasing the variety of foods familiar to the children and second, in increasing the nutritional benefits derived by children from the school lunch by stimulating their interest in food and cultivating better attitudes toward it."

Diet surveys, such as the ones used by Potgieter and Everitt (40) to study children's eating habits, can be a very effective tool in teaching nutrition. The children who participate in studies of this type have the opportunity to learn the names of new foods, the spelling of the names, the various food groups, the importance of each food group to the diet, and the daily food requirements for good nutrition.

An example of a food acceptance program may be seen in a vegetable acceptance study conducted in the Fall of 1957 by Hunt, Patton, and Carver (20). New vegetables were introduced to 28 fourth grade students by means of an education program which included tasting parties. Upon completion of the study, a questionnaire was sent to the parents of the students to determine the effectiveness of the program. In the Spring of 1958, the vegetable preference study was repeated with the same students, and the results of the two studies were compared. The results of this study indicated that the education program and vegetable tasting parties were successful in improving vegetable acceptance among these fourth grade students.

The young child can become involved in the total experience of nutrition education by utilizing some of the principles suggested by Wagner (46): the need for self-help, limited self-selection of the diet, elimination of

morality of eating behavior, and proper introduction of new foods. Changing poor eating habits in a young child is largely a question of replacing a poor eating habit with a better one, and this change requires patience, perseverance, and confidence on the part of the adult.

An investigation of the ways in which food habits are established is of value only if this information leads the way to improving poor food habits. McLaughlin and others (28) pointed out that as the child grows, vegetable consumption should increase, for vegetables rich in minerals and vitamins are needed for growth and the regulation of body processes. The challenge lies in convincing the child that good food is important to growth and health. Education and observation can provide the motivation necessary in changing food habits.

PURPOSES OF THE STUDY

This study attempted to investigate the effectiveness of an education program designed to increase the acceptance of nine vegetables. Preschool children participating in this study were from families of three different socioeconomic levels.

The present study was designed to meet the following objectives:

1) to acquaint the participating children with a a variety of vegetables
2) to increase the acceptance of nine specific vegetables
3) to determine the effectiveness of an education program specifically related to vegetables
4) to determine if socioeconomic class makes young children more or less amenable to change.

CHAPTER II

P L A N O F P R O D E C U R E

The general purpose of this study was to measure the effectiveness of an education program designed to increase the acceptance of vegetables in the diets of preschool children. The children participating in this study were from families of low, middle, and high socioeconomic levels.

The study was carried out in the spring of 1971 in Dallas, Texas, the eighth largest city in the United States, according to the 1970 census. Dallas has a population of 836,121 and covers an area of 254 square miles (41). All major ethnic groups and socioeconomic levels are represented in Dallas.

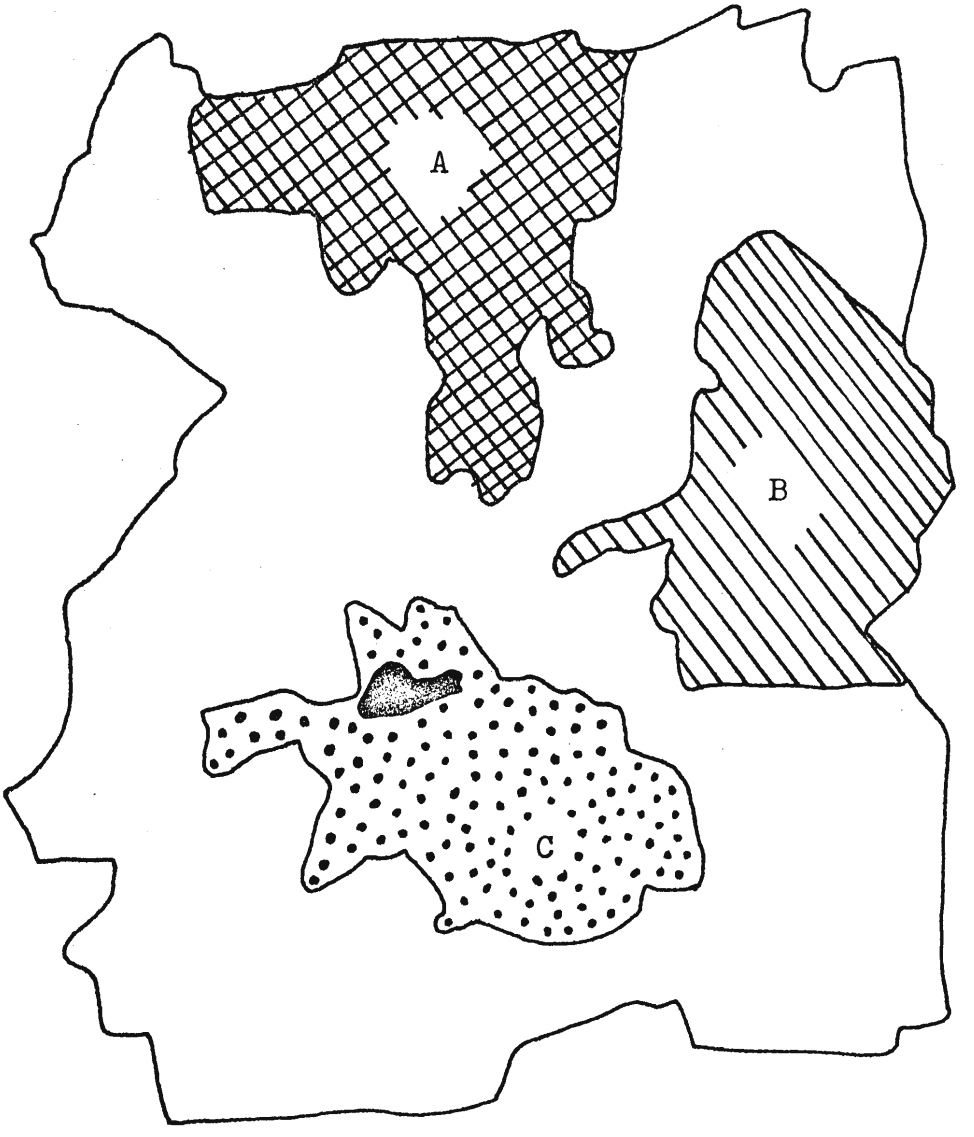
THE STUDY GROUP

Three kindergartens were chosen as representative of three socioeconomic levels--low, middle, and high. The three kindergartens were East Dallas Head Start Kindergarten, the White Rock United Methodist Weekday School, and the Montessori School of Dallas. A map showing the location of the three schools within the city of Dallas is shown as

Figure 1 on page 34. The three shaded areas indicate the average income level of the families residing within each area. The dotted area included families in the low income group ($2,000-$3,000 per year income). The striped area included families in the middle income group ($7,000-$9,999 per year income), and the diamond shaded area included families in a high income group ($10,000-$25,000 per year income). This map was reproduced from the Family Income Data Map of the Dallas Chamber of Commerce (7). The small black shaded area near the center of the map indicates downtown Dallas.

The East Dallas Head Start Kindergarten was located in the inner city, near downtown Dallas. The school was government funded through the United States Department of Health, Education, and Welfare, and attendance requirements were based on family size and annual income. At the time of the study, a family with one child had a maximum allowable annual income of $1,900; with two children, $2,500; with three children, $3,100; and for each additional child the maximum allowable annual income was increased $600. The children who attended this school were Negro, Mexican, and Anglo-American. This group of children usually ate breakfast and lunch at the school.

The White Rock United Methodist Weekday School was located in East Dallas in a middle income area. This school



A Montessori School of Dallas

B White Rock United Methodist School

C East Dallas Head Start Kindergarten

Figure 1

Map of Dallas Showing Areas In Which Participating Schools Were Located

is a private kindergarten with a moderate tuition and operates under the auspices of the White Rock United Methodist Church. The children who attended this school lived in the surrounding area. The children were all Anglo-American except for one child whose parents were from Cuba. The children ate no meals at school.

The Montessori School of Dallas was located in North Dallas, in an upper income area. The school was a private school with a comparatively high tuition. The children who attended this school lived in the surrounding area and were Anglo-American and Negro. The children ate no meals at school, and ate breakfast and lunch at home.

In order to place subjects in subclasses of the sample populations for behavior research, it is useful to apply an index for biological differences, cultural patterns, social characteristics, and psychological attributes, all of which are indices useful in determining social status. The families involved in this study, consequently, were placed in socioeconomic classifications by application of The Measurement of Social Status, an instrument developed by Carson McGuire and George D. White (27). This instrument included several indices for classifying families into social class, but the one used by this investigator was the modified index of social status, or the Index of Social Status, Short Form (ISS). This index used information

obtained regarding the occupation of the parents, the source(s) of family income, and the education of the parents.

Each of the items was rated on a scale ranging from one to seven and then multiplied by the appropriate weight (determined from previous studies measuring social status), as seen below:

O...Occupation.....Rate 1 to 7 on Occupation Scale

S...Source of Income...Rate 1 to 7 on Source of Income Scale

E...Education.....Rate 1 to 7 on Education Scale

The occupation index listed categories of professionals, proprietors, businessmen, white collar, blue collar, service, and farm people. The source of income index consisted of seven categories: inherited money; earned wealth; profits, fees and royalties; salary; commissions; regular income, wages on hourly basis, piece-work; income from "odd jobs"; private relief, public relief, or charity. The seven categories used for educational attainment were: completed graduate work, college graduate, attended college for two or more years, high school graduate, attended high school, completed the ninth grade, and left elementary or junior high school before completing the eighth grade.

The products of the occupation index, the source of income index, and the education index were then added to obtain a total index score. The total index score was used to determine status level from the General Conversion Table for Status Indices. An example of the calculation for one family is seen below:

Factor	Scale Rating	x	Weighted Value	Index Score	Social Status Classification
Occupational index	3	x	5	15	
Source of Income index	4	x	4	16	
Education index	2	x	3	6	
Total				37	Upper Middle

The highest possible social class had a total index score of 12. The lowest possible social class had a total index score of 84. As the social class increases from one level to the next, the total index score decreases. For purposes of this study the families classified as upper or upper-middle class as determined by the above procedure were placed in a group and categorized as the upper class. The families classified as lower-middle and upper-lower classes were combined to form a group called the middle class, and the lower class included all those families rated as lower-lower on the General Conversion Table for Status Indices. Table II on page 38 shows the classification of the families of the children from the three schools participating in the study.

TABLE II

SOCIOECONOMIC CLASSIFICATION OF 43 PARTICIPATING FAMILIES ACCORDING TO SCHOOL ATTENDED BY THE CHILD

Schools	Socioeconomic Class					Total
	Low	Middle		Upper		
	Lower-Lower	Upper-Lower	Lower-Middle	Upper-Middle	Upper	
	Number	Number	Number	Number	Number	Number
East Dallas Head Start	14					14
White Rock Methodist	2	1	7	6	1	17
Montessori School		2	1	6	3	12
Total	16	3	8	12	4	43
Combined Total	16	11		16		43

SURVEY OF EATING PRACTICES AND PATTERNS OF PRESCHOOL CHILDREN WITH SPECIAL EMPHASIS ON VEGETABLES

A questionnaire was sent home the first day of the study to be completed and returned to the teacher. This questionnaire was designed to obtain information concerning vegetable preferences of the child and the parents, dietary history of the child, family food practices and eating habits, and family background information. The instrument was developed by reviewing current literature (29, 30, 23) and by modifying the questionnaire used by Emara (12). The questionnaire used by this investigator was entitled "Survey of Eating Practices and Patterns of Preschool Children, with Special Emphasis on Vegetables." The survey included five parts: Part I, Vegetable Preference Check List for Child; Part II, Vegetable Preference Check List for Parents; Part III, Dietary History of the Nursery School Child; Part IV, Family Food Purchasing Practices and Eating Habits; and Part V, Inventory of Family Background.

Part I, Vegetable Preference Check List for Child

The purpose of this portion of the instrument was to obtain useful information from the parents as to the vegetable likes and dislikes of the child. This part of the instrument was used as a pre-test. Four categories of

responses used for each vegetable were accept, like, dislike and never served in the home. Each of these terms was defined for the parents to avoid errors in the completion of the questionnaire.

Part II, Vegetable Preference
Check List for Parents

The purpose of this part of the instrument was to determine if the vegetable likes and dislikes of the child corresponded to the vegetable likes and dislikes of the parents. This information was necessary to determine the possible influence of the parent's likes and dislikes on the child's likes and dislikes.

Part III, Dietary History
of the Preschool Child

This portion of the instrument was designed to obtain useful dietary information which might have influenced the present likes and dislikes of the child. Information regarding early feeding practices and eating habits was considered important in understanding the present eating habits.

Part IV, Family Food Purchasing
Practices and Eating Habits

This part of the instrument was designed to obtain information on how the family bought food and what forms of

vegetables were purchased. This information was expected to show wide differences in purchasing practices and eating habits of the three study groups.

Part V, Inventory of Family Background

Information obtained from this part of the questionnaire was to be used primarily to determine socioeconomic class by supplying the necessary information to apply The Measurement of Social Status (27) discussed previously.

The data were analyzed statistically to determine the significance of certain factors which may influence vegetable preferences. Socioeconomic class was determined by the previously mentioned index.

A letter accompanied each questionnaire which explained the study and asked for the parent's permission to use his child in the study. A copy of the letter and the questionnaire follows.

April 5, 1971

Dear Parent,

The _____ Kindergarten is co-operating with the Food and Nutrition Department of Texas Woman's University in a vegetable preference study of five-year-olds. We would like to include your child in this study.

This study will attempt to find out how effective a nutrition education program can be in influencing vegetable choices of children. From time to time during this study forms will be sent home for you to complete and return to the kindergarten. It is very important for the success of this study that every question on the questionnaires be answered. During the course of this vegetable preference study, your child will enjoy tasting parties and a brief nutrition education program with emphasis on vegetables.

The sole purpose of the questionnaires is to gather information pertinent to the study. At no time during the study will your name be used in connection with the study. It is hoped that our study will generate a positive attitude on the part of the parents toward eating vegetables, thereby ensuring a positive attitude on the part of the children.

Sincerely,

Patricia V. Turk

SURVEY OF EATING PRACTICES AND PATTERNS OF PRESCHOOL CHILDREN WITH SPECIAL EMPHASIS ON VEGETABLES

PART I: VEGETABLE PREFERENCE CHECK LIST FOR CHILD (Child's first name)

Directions: Check only one column for each vegetable. The terms used are defined as follows:

Accept: Vegetables which the child will eat, but may have no feeling for, one way or the other.

Like: Vegetables the child definitely likes.

Dislike: Vegetables the child refuses to eat.

Never Served: Vegetables which are never served to the child.

COOKED VEGETABLES	ACCEPT	LIKE	DISLIKE	NEVER SERVED
Asparagus				
Beets				
Broccoli				
Brussels sprouts				
Cabbage				
Carrots				
Cauliflower				
Corn				
Eggplant				
Dried beans				
Green beans				

COOKED VEGETABLES	ACCEPT	LIKE	DISLIKE	NEVER SERVED
Greens: Beet				
Collard				
Mustard				
Turnip				
Kale				
Kohlrabi				
Lima beans				
Okra				
Onions				
Peas: Green				
Black-eyed				
Peppers, green				
Potatoes: Au gratin				
Baked				
French fried				
Mashed				
Scalloped				
Pumpkin				
Rutabaga				
Spinach				
Squash				
Sweet Potatoes				
Tomatoes				
Turnips				
Wax beans				

*Please note that the following vegetables are raw.

RAW VEGETABLES	ACCEPT	LIKE	DISLIKE	NEVER SERVED
Cabbage				
Carrots				
Celery				
Cucumber				
Endive				
Lettuce				
Onions				
Parsley				
Peppers, green				
Radishes				
Red cabbage				
Spinach				
Tomatoes				

PART II: VEGETABLE PREFERENCE CHECK LIST FOR PARENTS

Directions: Check only one column for each vegetable. The terms used are defined as follows:

Accept: Vegetables which you will eat, but may have no feeling for, one way or the other.

Like: Vegetables that are definitely liked.

Dislike: Vegetables that are definitely disliked.

Never Tasted: Vegetables which you have never tasted.

	FATHER				MOTHER			
COOKED VEGETABLES	ACCEPT	LIKE	DIS-LIKE	NEVER TASTED	ACCEPT	LIKE	DIS-LIKE	NEVER TASTED
Asparagus								
Beets								
Broccoli								
Brussels sprouts								
Cabbage								
Carrots								
Cauliflower								
Corn								
Eggplant								
Dried beans								
Green beans								
Greens: Beet								
Collard								
Mustard								
Turnip								

	FATHER				MOTHER			
COOKED VEGETABLES	ACCEPT	LIKE	DIS-LIKE	NEVER TASTED	ACCEPT	LIKE	DIS-LIKE	NEVER TASTED
Kale								
Kohlrabi								
Lima beans								
Okra								
Onions								
Peas: Green								
Black-eyed								
Peppers, green								
Potatoes: Au gratin								
Baked								
French fried								
Mashed								
Scalloped								
Pumpkin								
Rutabaga								
Spinach								
Squash								
Sweet Potatoes								
Tomatoes								
Turnips								
Wax Beans								

*Please note that the following vegetables are raw.

	FATHER				MOTHER			
RAW VEGETABLES	ACCEPT	LIKE	DIS-LIKE	NEVER TASTED	ACCEPT	LIKE	DIS-LIKE	NEVER TASTED
Cabbage								
Carrots								
Celery								
Cucumber								
Endive								
Lettuce								
Onions								
Parsley								
Pepper, green								
Radishes								
Red cabbage								
Spinach								
Tomatoes								

PART III: DIETARY HISTORY OF THE PRESCHOOL CHILD

Date of birth_____Birth Weight?_____Full Term?____Premature?____

1. At what age did you begin feeding: Strained vegetables?_____
   Chopped junior vegetables?_____Table vegetables?_____

2. Which of the following best described your child's present attitude toward vegetables?

   Enjoys_____ Indifferent_____

   Attitude varies_____ Presents eating problem_____

   Has to be urged to eat_____

3. Do you encourage your child to eat vegetables?_____

4. If yes, what methods do you usually use to encourage your child to eat?

   Give rewards_____ Remind child to eat_____

   Coaxing_____ Let child serve his own plate?_____

   Restrict or withhold pleasures_____ Other_____

5. Do you ever let your child choose the vegetables to be served at home?

   Frequently_____Sometimes_____Seldom or never_____

6. List the three favorite vegetables of:

   Father_____ Mother_____ Child_____

   _____ _____ _____

   _____ _____ _____

7. How does your child accept new foods?

   Willingly_____Reluctantly_____Not at all_____

8. List the persons with whom the child usually eats his meals.

	Mother	Father	Children	All Family Members
Breakfast	_____	_____	_____	_____
Lunch	_____	_____	_____	_____
Dinner	_____	_____	_____	_____

PART IV: FAMILY FOOD PURCHASING PRACTICES AND EATING HABITS

1. How often do you shop for groceries?_____

   How often do you shop for fresh vegetables?_____

2. The following vegetables can be obtained in the fresh, frozen, and canned forms. If you buy the following vegetables, check (x) the form you usually buy.

VEGETABLES	FRESH	FROZEN	CANNED
Carrots			
Green beans			
Green peas			
Spinach			
Corn			
Potatoes, Irish			
Potatoes, sweet			
Turnip greens			

3. Do you usually take your child with you to the grocery store?
   _____Yes _____No

4. Does your child ever request the purchase of certain vegetables?_____Yes_____No. If so, what vegetables?
   _____, _____, _____.

5. What do you think prompted your child to ask for the particular vegetable or vegetables?_____

6. Do you read the newspaper for advertised specials for vegetables?_____Yes_____No

7. Do you use a list when you shop?_____Yes_____No

8. Does your child eat most of his meals at home?_____Yes_____No

9. Does your child eat the noon meal at school?_____Yes_____No

10. Where do you get your nutrition information?_____

_____

PART V: INVENTORY OF FAMILY BACKGROUND

1. Age. Please check the right age group.	HUSBAND	WIFE
Less than 20 years		
20-29 years		
30-39 years		
40-49 years		
50 years or more		
2. Circle the highest grade you completed in school.		
Grade School	1 2 3 4 5 6 7 8	1 2 3 4 5 6 7 8
High School	9 10 11 12	9 10 11 12
College	1 2 3 4	1 2 3 4
Graduate School	1 2 3 4	1 2 3 4
3. Are you now employed?		
Full time		
Part-time		
Unemployed		

4. What kind of work do you do?_____

5. Are husband and wife: Living together_____?, Separated_____?, Divorced_____?, One parent deceased_____?.

6. What is the family income (take home pay)? Check the right one.

Below $3,000_____ $11,000-$14,999_____

$3,000-$6,999_____ $15,000 or above_____

$7,000-$10,999_____

7. How many people live in your house?_____

8. How many children do you have living at home?_____ Give their ages.

   Boys_____ Ages_____

   Girls_____ Ages_____

9. Are there any other persons living in your house besides you and your children?_____ If so, how many?_____

10. Do you have any income other than your regular wages?

    Yes_____ No_____. Check (x) other sources of income.

    Children's aid_____ Welfare_____

    Pensions_____ Investments_____

    Social Security_____ Other_____

11. In what type of house do you live?

    Apartment_____ House_____

    Duplex_____ Mobile Home_____ (Trailer House)

12. How many years have you lived in your present home?_____years

13. How many rooms in your present home not counting the bathroom?

    _____rooms

14. How many bathrooms do you have?_____none _____1 _____1½

    _____2 _____2½ or more

15. Do you have a refrigerator in your home?_____Yes _____No

    Is it large enough for your family needs?_____Yes _____No

16. Do you have either a freezer or freezer space in your refrigerator for frozen vegetables?_____Yes _____No

    Is the freezer space large enough for your needs?_____Yes___No

17. Are you:

    Obtaining free rent_____? Paying on a house_____?

    Renting_____?

    Living in a mortgage free house_____?

CHAPTER III

P R E S E N T A T I O N O F D A T A

This study was designed to increase the acceptance of vegetables among preschool children. An education program with tasting parties was developed and carried out using nine vegetables. These vegetables were spinach, green beans, asparagus, broccoli, Brussels sprouts, cauliflower, eggplant, rutabaga, and acorn squash.

An education program was carried out during a period of four weeks. Each school was visited once a week for three consecutive weeks. Each week three different vegetables were introduced and tasted. During the fourth week a review of all nine vegetables was presented and the nine vegetables were tasted again. The likes and dislikes were recorded during each of the tasting periods.

BACKGROUND INFORMATION

A total of 43 families from three kindergarten groups completed the questionnaire forms designed by the author. The families were classified according to socio-economic class by means of the McGuire and White Measurement of Social Status (27).

The distribution of the preschool children by age and socioeconomic level of the parents is seen in Table III. Most of these children were scheduled to attend first grade the following September. Approximately 70 per cent of the children were in the age group of five years, six months to six years, five months.

The study group included a total of 28 fathers and 43 mothers. There were 16 mothers and seven fathers in the low socioeconomic group, 11 mothers and eight fathers in the middle socioeconomic group, and 16 mothers and 13 fathers in the high socioeconomic group. The distribution of parents according to socioeconomic level is shown below.

	Socioeconomic Level		
	Low	Middle	High
Families	16	11	16
Mothers	16	11	16
Fathers	7	8	13

The number of homes with a father present differed with the three socioeconomic groups. A lower percentage of homes with a father present was reported for the low socioeconomic group than for the middle or high socioeconomic groups. It is noted that as the socioeconomic group progresses from low to high, the percentage of homes with

TABLE III

DISTRIBUTION OF 43 PRESCHOOL CHILDREN BY AGE ACCORDING TO THE SOCIOECONOMIC LEVEL OF THE FAMILY

Age of Child	Socioeconomic Level			
	Low	Middle	High	Total
	Number	Number	Number	Number
4 yr. 6 mo. - 4 yr. 11 mo.		1		1
5 yr. - 5 yr. 5 mo.	4	2	1	7
5 yr. 6 mo. - 5 yr. 11 mo.	8	1	10	19
6 yr. - 6 yr. 5 mo.	4	6	2	12
6 yr. 6 mo. - 6 yr. 11 mo.	0	1	3	4
Total	16	11	16	43

a father present also rises. A total of 72.7 per cent of the homes in the middle socioeconomic group and 81.2 per cent of the homes in the high socioeconomic group had a father present in the home.

The mothers of the low socioeconomic group ranged in age from 20 to 39 years, with 75.0 per cent being in their twenties and 25.0 per cent in their thirties. The ages of the fathers in the low socioeconomic group ranged from 20 to 49 years. A total of 42.8 per cent were in their twenties, 28.6 per cent in their thirties, and 28.6 per cent in their forties.

In the middle socioeconomic group, the mothers ranged in age from 20 to 49 years. Responses indicated 36.4 per cent were in their twenties, 36.4 per cent in their thirties, and 27.2 per cent in their forties. The eight fathers in this group ranged in age from 20 to 49 years. One father was in his forties and one in his twenties. The remaining six fathers were in their thirties.

The 16 mothers of the high socioeconomic group ranged in age from 20 to 49 years. Of this group, 56.3 per cent of the mothers were in their thirties, 12.5 per cent in their forties and 31.2 per cent in their twenties. The 13 fathers in this group ranged in age from 20 to 49 years. The highest percentages, 69.2 per cent, were in their thirties,

15.4 per cent in their twenties, and 15.4 per cent in their forties. The age distribution of fathers and mothers in each socioeconomic group may be seen on Table IV.

Both the mothers and fathers in the low socioeconomic group tended to be younger than the parents in the other two socioeconomic groups. A high percentage of both the fathers and mothers in the middle socioeconomic group and in the high socioeconomic group were in the 30 to 39 year age bracket.

Upon examination of the marital status it was apparent that for the low socioeconomic group, only 18.8 per cent of the families included a father and mother living together in the home. This figure is in contrast to the 81.8 per cent of intact family units in the middle and the 81.4 per cent of intact families in the high socioeconomic group. An examination of the marital status explains the small number of fathers in the low socioeconomic group. The classification of the 43 mothers and 28 fathers according to marital status is shown on Table V.

The educational attainment of the parents of the three socioeconomic groups varied greatly. In the low socioeconomic group, the educational attainment of the mothers ranged from third grade to a high school graduate. The modal point for educational attainment for the mothers

TABLE IV

AGE DISTRIBUTION OF PARENTS OF 43 PRESCHOOL CHILDREN ACCORDING TO THE SOCIOECONOMIC LEVEL OF THE FAMILY

Age in Years	Socioeconomic Level											
	Low				Middle				High			
	Mothers (N=16)		Fathers (N=7)		Mothers (N=11)		Fathers (N=8)		Mothers (N=16)		Fathers (N=13)	
	Number	Per Cent	Number	Per Cent	Number	Per Cent	Number	Per Cent	Number	Per Cent	Number	Per Cent
20-29	12	75.0	3	42.8	4	36.4	1	12.5	5	31.2	2	15.4
30-39	4	25.0	2	28.6	4	36.4	6	75.0	9	56.3	9	69.2
40-49			2	28.6	3	27.2	1	12.5	2	12.5	2	15.4

TABLE V

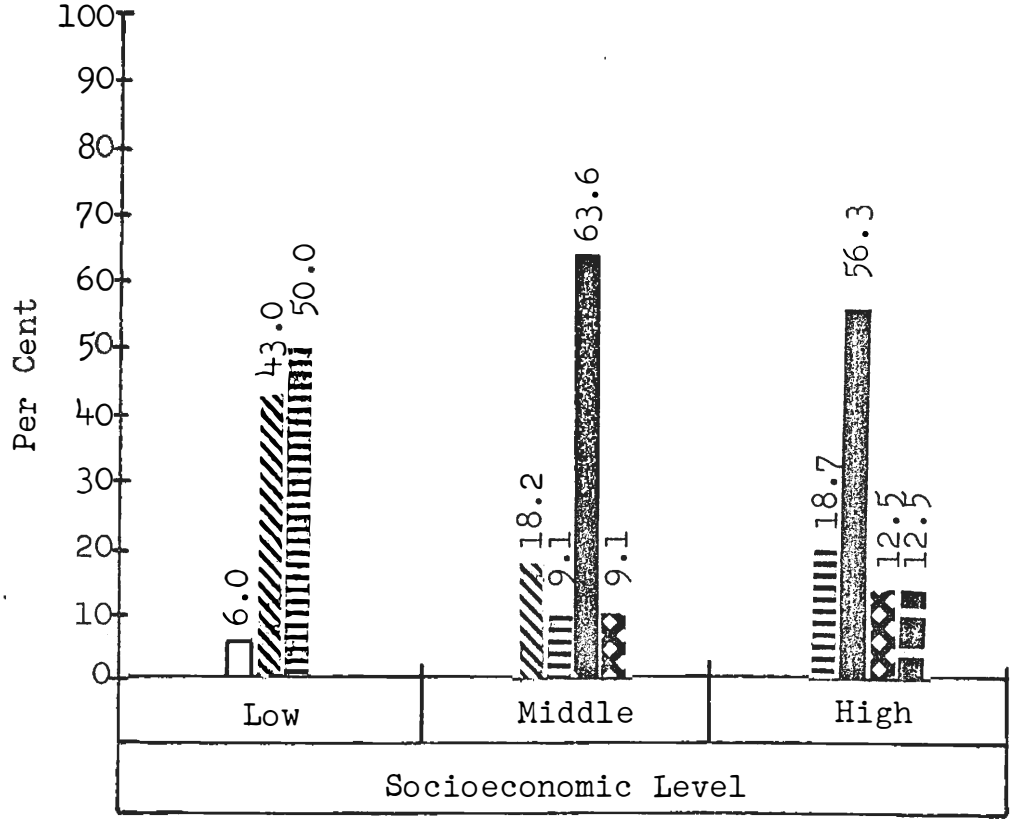
MARITAL STATUS OF PARENTS OF 43 PRESCHOOL CHILDREN ACCORDING TO THE SOCIOECONOMIC LEVEL OF THE FAMILY

Marital Status	Socioeconomic Level							
	Low (N=16)		Middle (N=11)		High (N=16)		Total (N=43)	
	Number	Per Cent	Number	Per Cent	Number	Per Cent	Number	Per Cent
Living Together	3	18.8	9	81.8	13	81.4	26	60.4
Separated	7	43.7	0	0.0	1	6.2	8	18.6
Divorced	1	6.2	1	9.1	1	6.2	3	7.0
Deceased	2	12.5	0	0.0	1	6.2	3	7.0
No Response	3	18.8	1	9.1	0	0.0	3	7.0

in this group was a high school graduate. The education of the fathers in the low socioeconomic group ranged from eighth grade to attending college. Of the seven fathers in this group only three had graduated from high school and none had completed college.

In the middle socioeconomic group, the education of the mothers ranged from tenth grade to a college graduate with 72.7 per cent of the mothers having completed high school. Eight had attended college and one of these was a college graduate. The education of the fathers in this group ranged from seventh grade to attending college. Of the eight fathers in this group, seven were high school graduates, and five of these had attended college but did not graduate.

All of the mothers in the high socioeconomic level were high school graduates. All but three had attended college, and four were college graduates. Of these four women, two had attended graduate school. The education of the fathers ranged from attending college to attending graduate school, with 10 of the group being college graduates. Seven of the fathers had attended graduate school. The educational attainment of the mothers and fathers in each of the three socioeconomic groups is shown in Figures 2 and 3.



□ < 9th Grade

Attended High School

High School Graduate

■ Attended College

College Graduate

Attended Graduate School

Figure 2

Distribution of Mothers of 43 Preschool Children According to Highest Educational Attainment and Socioeconomic Level.

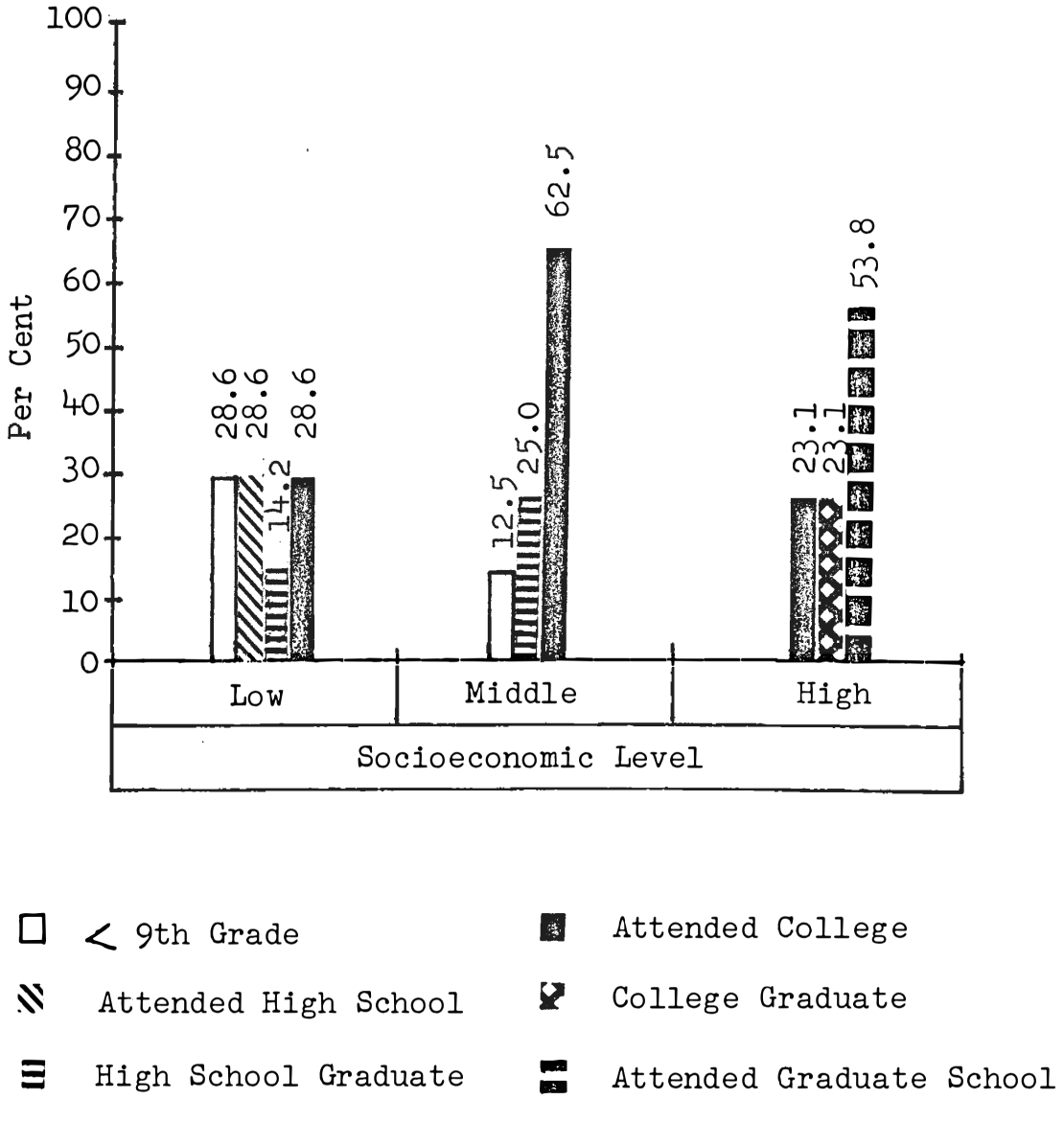


Figure 3

Distribution of Fathers of 43 Preschool Children According to Highest Educational Attainment and Socioeconomic Level.

The data reveal that for these families the higher the socioeconomic level of the family, the higher the educational attainment of the parents. The majority of the parents in the low socioeconomic group had attended high school and 11 had graduated from high school. In the middle socioeconomic group, all but three parents were high school graduates and 13 had attended college. In the high socioeconomic group, all the parents were high school graduates, and all but three had attended college, with 14 of the 29 parents being college graduates. Of interest was the finding that the mothers in the low socioeconomic group tended to have more education than the fathers. In the high socioeconomic group, most of the fathers had more education than the mothers.

The parents were requested to check their employment status and to indicate the type of employment. Only 57.1 per cent of the fathers of the low socioeconomic group were employed full time as compared to 100 per cent full time employment for fathers in the middle and high socioeconomic levels. This is understandable in view of the fact that the families of most of the children attending the Head Start School were receiving welfare support. Over 50 per cent of the mothers of all three socioeconomic levels were either unemployed or employed only part-time. A higher percentage of mothers in the high than in the middle socioeconomic group were employed, either full or part-time. The

employment classification of the 43 mothers and 28 fathers is given in Table VI.

The occupations of the mothers and fathers of the three socioeconomic groups were many and varied. In the low socioeconomic group, the occupations listed were primarily "service" type, and those employed were paid either on an hourly basis or "by the job." Occupations listed included cook's helper, food server, waitress, maid, and fence builder. Several individuals stated "helper," but did not otherwise indicate the type of employment.

The occupations of the parents of the middle socioeconomic group included employment with a fixed salary, employment with pay on a commission basis, and a few jobs with pay on an hourly basis. Positions listed included salesmen, an electrician, an accountant, an actuary, a manufacturer's representative, a fireman, and an assistant manager of a company.

The high socioeconomic group reported more individuals employed in professional type occupations such as lawyers, teachers, investment brokers, certified public accountants, real estate brokers, and salesmen. These occupations may be attributed to the higher educational attainment noted previously for this group.

For purposes of the study family income was divided into five categories: below $3,000, $3,000-$6,999,

TABLE VI

EMPLOYMENT STATUS OF PARENTS OF 43 PRESCHOOL CHILDREN ACCORDING TO THE SOCIOECONOMIC LEVEL OF THE FAMILY

Employment Status	Socioeconomic Level									
	Low				Middle				High	
	Mothers (N=16)		Fathers (N=7)		Mothers (N=11)		Fathers (N=8)		Mothers (N=16)		Fathers (N=13)	
	Number	Per Cent	Number	Per Cent	Number	Per Cent	Number	Per Cent	Number	Per Cent	Number	Per Cent
Fulltime	2	12.5	4	57.1	2	18.2	8	100.0	2	12.5	13	100.0
Part-time	6	37.5			1	9.1			4	25.0		
Unemployed	6	37.5			7	63.6			9	56.3		
No Response	2	12.5	3	42.9	1	9.1			1	6.2		

$7,000-$10,999, $11,000-$14,999, and over $15,000. The respondents were requested to check the appropriate annual income for the family. One hundred per cent of the families in the low socioeconomic group reported an annual income of less than $3,000. For the middle socioeconomic group, 45.4 per cent reported incomes in the $7,000-$10,999 range; 18.1 per cent had incomes between $11,000-$14,999; and 9.0 per cent had incomes between $3,000-$6,999. Approximately 81.2 per cent of the high socioeconomic families reported an annual income of $15,000 or more; 12.5 per cent of these families had incomes between $7,000-$10,999; and 6.2 per cent of the families in the high socioeconomic level had incomes between $11,000-$14,999.

The incomes of the parents of the three socioeconomic groups are graphically depicted in Figure 4. Although the amount of income was not a factor considered in classifying the families into socioeconomic groups, an increase in income was associated with an increase in socioeconomic level.

Twenty-three of the 43 families reported income other than wages. Nineteen of these 23 families were in the low socioeconomic group and four were in the high socioeconomic group. The source of the other income was primarily welfare and children's aid for the low socioeconomic group; whereas, investments and child support

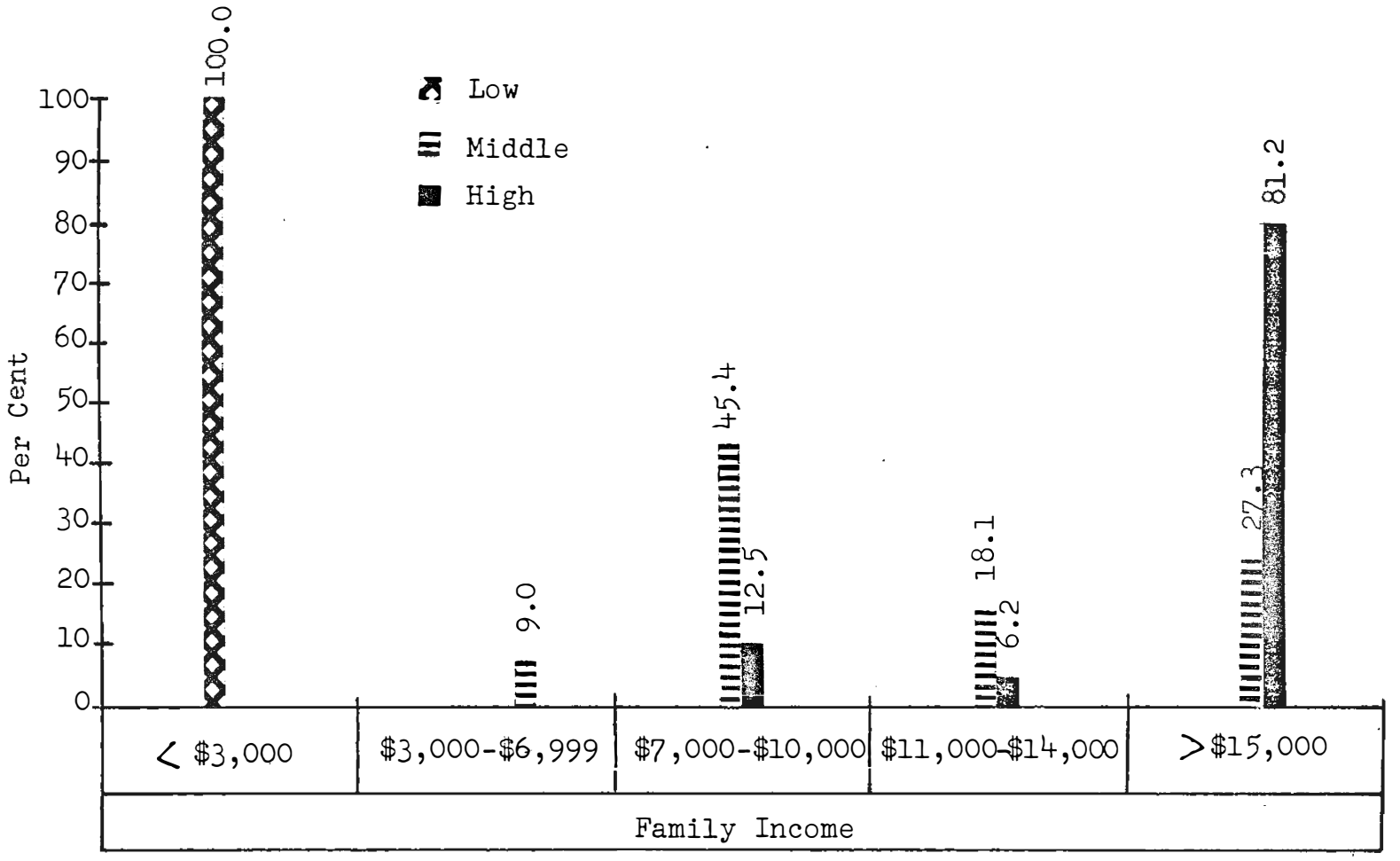


Figure 4

Distribution of Families of 43 Preschool Children According to Income and Socioeconomic Levels

were reported as the source of other income for the highest socioeconomic group.

Family size varied from two to 10 members. One family in the high socioeconomic group reported 10 family members and two families in the low socioeconomic group reported eight family members. Each of two households reported two family members and these were both in the low socioeconomic group. The total number of family members and the mean family size for each socioeconomic group were as follows:

	Family Size	
Socioeconomic Level	Total Number of Persons	Mean Family Size
Low (N=16)	78	4.81
Middle (N=11)	52	4.71
High (N=16)	77	4.81

Mean family size was remarkably similar for the three socioeconomic groups, the figures being 4.81 for the low, 4.71 for the middle, and 4.81 family members for the high socioeconomic group.

The mean number of children under 18 years of age per family forthe low socioeconomic group was 3.4. The

middle socioeconomic group reported a mean of 2.5 children per family; the high socioeconomic group had a mean of 2.8 children per family.

The 16 families of the low socioeconomic group included a total of 54 children under 18 years of age with a mean of 3.4 children per family. Over half, 59.2 per cent, of these 54 children were below six years of age, 37.0 per cent of the children for this group were from six to 12 years of age, and 3.8 per cent of the children were from 13 to 17 years of age.

The 11 families of the middle socioeconomic group had a total of 28 children under 18 years of age with a mean of 2.5 children per family. A little over one-third, 35.7 per cent, of these children were below six years of age, 5.0 per cent were from six to 12 years of age, and 14.3 per cent were from 13 to 17 years of age.

A total of 44 children below 18 years of age was reported for the high socioeconomic group. The mean number of children per family was 2.8. A total of 36.4 per cent of the children were below six years, 45.4 per cent were from six to 12 years, and 18.2 per cent were from 13 to 17 years of age. Table VII gives the distribution of children according to ages of the children and socioeconomic classification of the families.

TABLE VII

AGE DISTRIBUTION OF CHILDREN UNDER 18 YEARS IN THE 43 PARTICIPATING FAMILIES ACCORDING TO THE SOCIOECONOMIC LEVEL OF THE FAMILY

Ages of Children	Socioeconomic Level					
	Low (N=54)		Middle (N=28)		High (N=44)	
	Number	Per Cent	Number	Per Cent	Number	Per Cent
6 years	32	59.2	10	35.7	16	36.4
6 - 12 years	20	37.0	14	5.0	20	45.4
13 - 17 years	2	3.8	4	14.3	8	18.2

The mean age of the children of the low socioeconomic group was five years, six months; the mean age for the middle socioeconomic group was six years, nine months; and the mean age for the children in the high socioeconomic group was eight years. The children in the families of the high socioeconomic group tended to be older than those in the middle or low socioeconomic groups.

Ten of the 43 families reported having people other than members of the immediate family living in the home. These individuals included maids, foster children, and relatives. The relationship of the relatives was not identified.

Information concerning the type of dwelling revealed differences between socioeconomic groups. A majority, 75.0 per cent, of the low socioeconomic families lived in apartments or duplexes and only 25.0 per cent lived in houses. All 11 families of the middle socioeconomic group lived in houses. Eighty-two per cent of the families classified in the high socioeconomic group lived in houses, but with the increase in socioeconomic class there was an increase in apartment dwellers, with 18.0 per cent of these

families living in apartments or duplexes. The type of dwelling for the 43 families is given below:

Type of Dwelling	Socioeconomic Level: Low (N=16) Number	Low (N=16) Per Cent	Middle (N=11) Number	Middle (N=11) Per Cent	High (N=16) Number	High (N=16) Per Cent
Apartment	9	56.2	0	0.0	2	12.5
Duplex	3	18.8	0	0.0	1	5.5
House	4	25.0	11	100.0	13	82.0

The average home in the low socioeconomic level had 4.5 rooms and one bathroom. The smallest home in this group had three rooms and the largest home had seven rooms. None of the families in this group reported more than one bathroom.

The homes of the middle socioeconomic group had an average of 6.3 rooms and one and one-half baths. The smallest home had five rooms and the largest had nine. The families in this group reported having from one to two and one-half bathrooms.

The average home for the high socioeconomic group had 7.2 rooms and two bathrooms. The smallest home had five rooms and the largest home had 10 rooms. The house with 10 rooms was reported to have more than two and one-half bathrooms. The number of bathrooms reported for this group

ranged from one to two and one-half bathrooms or more, with an average of two bathrooms per family.

The 43 families reported how many years had been spent in the present home. The low socioeconomic group reported living in their present homes for a period of less than a year to 10 years or more. A total of 81.2 per cent of the families had lived in their present home six years or less.

The families of the middle socioeconomic group reported living in their present homes for a period of less than a year to 10 years or more. Over half, 54.6 per cent of the families, had lived in their present home six years or less. However, 36.3 per cent had lived in the present home 10 years or more.

The families of the high socioeconomic group reported living in their present homes for a period of less than a year to nine years, 11 months. Approximately one-third or 31.2 per cent of these families had lived in their present homes less than a year, indicating more mobility among the high socioeconomic group than among the middle or low socioeconomic groups.

One question of the survey form for parents inquired about the presence of a refrigerator and freezer space available in the home. A total of 42 families

reported having a refrigerator with only one family in the low socioeconomic group replying negatively. Three families reported that the refrigerator space was not large enough, and the remaining 40 families were of the opinion that the refrigerator space was adequate for the size of the family.

Thirty-seven of the 43 families reported the presence of freezer space in the home. Only six families in the low socioeconomic group had no freezer space in the home. Of the 37 families reporting freezer space, none indicated the available freezer space was inadequate.

Over half of the families, 53.5 per cent, reported currently paying on a house; 41.8 per cent were renting. All but one family in the middle socioeconomic group were paying on a house. The one family consisted of a mother and child residing in the grandparent's home and apparently obtaining free rent. The highest percentage of families renting the place of residence were from the low and high socioeconomic groups. Most of these families were apartment dwellers. The number of families in each socioeconomic

group renting, paying on a house, or obtaining free rent is seen below:

Housing	Socioeconomic Level		
	Low (N=16)	Middle (N=11)	High (N=16)
Free Rent	1	1	
Paying on a House	2	10	11
Renting	13		5

DIETARY HISTORY OF THE PRESCHOOL CHILD

Along with the dietary history of the preschool child was a request for birth weight and information as to whether the child was full term or premature. In the low socioeconomic group, 13 of the 16 children had been full term and three premature infants. In the middle socioeconomic group, nine had been full term and one a premature infant. In the high socioeconomic group, 15 children had been full term and one premature at birth. This reveals a higher percentage of premature births in the low socioeconomic group. One family did not respond to this question.

The distribution of the 42 preschool children according to socioeconomic level is seen below.

Infants	Socioeconomic Level		
	Low	Middle	High
Full Term	13	9	15
Premature	3	1	1

The birth weights of the preschool children from the three socioeconomic groups were compared to determine whether or not the differences were statistically significant. The t-test results may be seen in Table VIII. Although the results were not significant in any of the three comparisons, the children in the middle socioeconomic group showed a tendency toward a higher birth weight than those in either the high or the low socioeconomic groups. The birth weights of the children in the middle socioeconomic group ranged from 4 pounds, 13 ounces to 10 pounds, with a mean birth weight of 7 pounds, 10 ounces. The birth weights of children in the low socioeconomic group ranged from 4 pounds, 6 ounces to 9 pounds, 7 ounces, with a mean birth weight of 6 pounds, 12 ounces. The birth weights of the children in the high socioeconomic group ranged from 5 pounds, 6 ounces to 8 pounds, 2 ounces, with a mean birth weight for these children of 6 pounds, 13 ounces.

TABLE VIII

STATISTICAL ANALYSIS OF DIFFERENCES IN MEAN BIRTH WEIGHT OF 43 PRESCHOOL CHILDREN ACCORDING TO THE SOCIOECONOMIC LEVEL OF THE FAMILY

Socioeconomic Level	Mean	t-test	Level of Significance
Low (N=16)	6 lb., 12 oz.	1.477	n.s.
Middle (N=11)	7 lb., 10 oz.		
Low (N=16)	6 lb., 12 oz.	- .275	n.s.
High (N=16)	6 lb., 13 oz.		
Middle (N=11)	7 lb., 10 oz.	1.684	n.s.
High (N=16)	6 lb., 13 oz.		

n.s. - non-significant.

The early feeding habits of the 43 preschool children were investigated in order to better understand the present eating habits. The ages at which strained, junior, and table foods were introduced were recorded by the mothers.

The age range for the introduction of strained vegetables in the low socioeconomic groups was one to eight months, with a mean of 2.8 months (Table IX). The mothers in the middle socioeconomic group first introduced strained vegetables at age one to seven months, with a mean of 2.8 months. The mothers in the high socioeconomic group introduced strained vegetables at the age of one to six months, with the mean age being 2.3 months.

The mothers in the low socioeconomic group first introduced junior vegetables in the diet when the child was two to six months of age, with a mean age of 4.7 months. The mothers in the middle socioeconomic group introduced junior vegetables at four to 12 months, with a mean of 7.1 months. The children of the high socioeconomic group were first served junior vegetables at five to 15 months, with a mean age of 8.9 months.

Table foods were introduced by the mothers of the low socioeconomic group at an earlier age than by mothers of the middle and high socioeconomic groups. Mothers from the low socioeconomic level introduced table food at two to 12 months, with a mean age of 7.3 months. The mothers of

TABLE IX

AGE AT WHICH STRAINED, JUNIOR, AND TABLE VEGETABLES WERE INTRODUCED TO 43 PRESCHOOL CHILDREN ACCORDING TO THE SOCIOECONOMIC LEVEL OF THE FAMILY

Food	Socioeconomic Level		
	Low (N=16)	Middle (N=11)	High (N=16)
Strained Vegetables			
Age Range	1 - 8 mo.	1 - 7 mo.	1 - 6 mo.
Mean Age	2.8 mo.	2.8 mo.	2.3 mo.
Chopped Junior Vegetables			
Age Range	2 - 6 mo.	4 - 12 mo.	5 - 15 mo.
Mean Age	4.7 mo.	7.1 mo.	8.9 mo.
Table Foods			
Age Range	2 - 12 mo.	6 - 18 mo.	6 - 18 mo.
Mean Age	7.3 mo.	10.2 mo.	11.1 mo.

both the middle and the high socioeconomic groups began feeding table food at six months to 18 months. The mean age for introducing table foods was 10.2 months for the middle socioeconomic group, and 11.1 months for the high socioeconomic group.

Table IX reveals that most of the mothers of the three socioeconomic levels introduced strained vegetables to the child during the first six months. Examination of the ages at which junior vegetables were introduced revealed that as socioeconomic level increased the mean age at which junior vegetables were introduced became higher. Table foods were usually introduced at an earlier age by the mothers in the low socioeconomic level than by mothers of the middle or high socioeconomic levels. The mothers in the high socioeconomic group tended to introduce table food later than the mothers of the other socioeconomic levels.

The child's attitude toward eating was examined in order to better understand present eating habits. In the low socioeconomic group, 37.5 per cent of the mothers reported that the children had to be urged to eat; in 31.2 per cent of the homes the child's attitude toward food varied; in 12.5 per cent of the homes the children presented eating problems; and in 18.7 per cent, the children were reported to enjoy eating.

In the middle socioeconomic group, 9.1 per cent of the mothers reported that the children had to be urged to eat. In 63.6 per cent of the homes the child's attitude varied; in 9.1 per cent of the homes the children presented eating problems; and in 18.2 per cent of the homes the children enjoyed eating.

Of the mothers in the high socioeconomic group, 18.7 per cent reported that the children had to be urged to eat, and in 25.0 per cent of the homes the child's attitude toward food varied. One child was reported as being indifferent to food. In 18.7 per cent of the homes the children presented eating problems, and in 31.2 per cent of the homes the children enjoyed eating. The attitudes of the 43 children according to socioeconomic level of the parents is seen below:

Attitude of Child	Socioeconomic Level		
	Low (N=16) Per Cent	Middle (N=11) Per Cent	High (N=16) Per Cent
Enjoys eating	31.2	63.6	25.0
Attitude varies	12.5	9.1	18.7
Eating problems	18.7	18.2	32.7
Urged to eat	37.5	9.1	18.7

A higher percentage of mothers in the middle than in the low or high socioeconomic group reported that the children enjoyed eating. If the two categories, "eating problems" and "has to be urged to eat" are combined, it is clear that the children from homes in the low and high socioeconomic groups presented more eating problems than children from homes in the middle socioeconomic group. From these data it appears that the children from homes in the middle socioeconomic level had better attitudes toward eating than children from homes in the low or high socioeconomic levels.

The mothers were asked if encouragement was necessary to induce the children to eat vegetables. All but five of the 43 mothers replied in the affirmative. Of the five mothers answering negatively, two were in the low socioeconomic group and three were in the high socioeconomic group.

The mothers reported the methods used to encourage the children to eat vegetables. More than one method was reported by some mothers, but the method most commonly used to encourage vegetable eating among children in the low socioeconomic group was restricting or withholding pleasures. In the middle socioeconomic group the method most often used to encourage vegetable eating was to remind the child to eat. This was also the method most often reported by the mothers in the high socioeconomic group.

The mothers were asked if they ever allowed the children to choose the vegetables to be served at mealtime. The mothers checked one of three responses: "frequently," "sometimes" or "seldom." A tabulation of the data on the basis of socioeconomic level is shown below.

Responses	Socioeconomic Level		
	Low (N=16)	Middle (N=11)	High (N=16)
Frequently	2	4	4
Sometimes	10	4	11
Seldom	4	3	1

The responses as to how the child accepts new foods indicated that approximately half of the children accepted new foods reluctantly, as shown below:

Responses	Socioeconomic Level		
	Low (N=16)	Middle (N=11)	High (N=16)
Willingly	6	5	6
Reluctantly	9	5	10
Not at all	1	1	

Interesting to note is the fact that the low and high socio-economic groups responded in a similar manner. Responses of

the middle socioeconomic group were evenly divided between "accepts new foods willingly" and "accepts new foods reluctantly." Only two of the 43 children were reported to refuse to accept new foods.

The mealtime companions with whom the preschool child ate were reported by the 43 mothers. Responses indicated similarities among the three socioeconomic levels. In all three socioeconomic groups it was a common practice for the children to eat breakfast with the other children in the family and with the mother. Only two of the 43 families reported the father present for the breakfast meal. One of these families was in the low socioeconomic group and the other was in the high socioeconomic group.

In the low socioeconomic group, the children ate the noon meal at school in the company of other children. In the middle and high socioeconomic groups, the noon meal was usually eaten with the mother and the other children in the family. The children in these two groups ate the noon meal at home.

Thirty-four of the 43 children ate dinner with the entire family indicating this to be the trend among the three socioeconomic levels. These data indicate that most of the 43 children ate all of their meals in the company of other children. Thus, the influence of other children upon the eating habits of a child cannot be ignored.

Table X reveals the distribution of the mealtime companions of the 43 children in the low, middle and high socioeconomic groups.

In order to gain a better understanding of the child's vegetable likes and dislikes the 43 mothers were requested to list the three favorite vegetables of the father, the mother, and the child. In the low socioeconomic group the favorite vegetables of both the mothers and the fathers were greens, potatoes, and corn. Favorite vegetables of the children of this group were corn, spinach, dried beans, and potatoes.

In the middle socioeconomic group the fathers liked corn, potatoes, and tomatoes; the mothers liked green beans, potatoes, and broccoli. The children of this socioeconomic group favored corn, potatoes, and carrots over all other vegetables.

The fathers in the high socioeconomic group liked potatoes, corn, and green beans; the mothers liked potatoes, broccoli, asparagus, spinach, and green beans. The children in this group preferred corn, potatoes, and spinach over all other vegetables.

There was more agreement between the fathers, mothers, and children in the low socioeconomic group than in the other two socioeconomic groups. Potatoes were a

TABLE X

MEALTIME COMPANIONS OF 43 PRESCHOOL CHILDREN ACCORDING TO THE SOCIOECONOMIC LEVEL OF THE FAMILY

Mealtime Companions	Socioeconomic Level			
	Low (N=16)	Middle (N=11)	High (N=16)	Total (N=43)
Breakfast				
Mother	6	6	4	16
Father	1		1	2
Other Children	10	7	10	27
Entire Family		1	4	5
No Response	3			3
Lunch				
Mother	2	5	8	15
Father				
Other Children	10	6	11	27
Entire Family				
No Response	4	2	1	7
Dinner				
Mother	2	2	3	7
Father			1	1
Other Children	2		1	3
Entire Family	12	9	13	33
No Response				

common choice of all age groups for all three socioeconomic levels. Corn was also a favorite vegetable in the low socioeconomic group and a favorite of the fathers and children in the middle and high socioeconomic groups. The mothers of the middle and high socioeconomic groups showed more variety in their vegetable preferences. Socioeconomic level did not appear to be a factor in vegetable choices of family members, except for the mothers of the middle and high socioeconomic groups. This group tended to name green vegetables as favorites rather than starchy vegetables.

FAMILY FOOD PURCHASING PRACTICES AND EATING HABITS

Inquiries were made regarding the family food purchasing practices and eating habits. The family food practices were reported by the 43 mothers. When questioned regarding shopping frequency, 62.8 per cent of the 43 mothers reported once a week, 20.9 per cent shopped more than once a week, and 11.6 per cent reported shopping twice a month.

In the low socioeconomic group 68.8 per cent of the mothers shopped once a week, 18.7 per cent shopped twice a month, one mother shopped once a month, and one mother shopped more often than once a week. One mother of the low socioeconomic group reported shopping once a month when she could "afford it."

The mothers in the middle socioeconomic group reported more frequent grocery shopping than the other two groups. A total of 63.6 per cent shopped once a week and 36.3 per cent shopped more than once a week.

Over half of the mothers (56.3 per cent) in the high socioeconomic group shopped for groceries once a week, 25.0 per cent shopped more frequently than once a week, and 12.5 per cent shopped twice a month. Generally, as the socioeconomic class increased from one level to the next, the mothers were able to shop more often. Table XI reveals the shopping frequency of the mothers according to socioeconomic level.

The frequency of shopping for vegetables was very similar for all three groups. In the low socioeconomic group 56.3 per cent of the mothers shopped for vegetables once a week, 25.0 per cent shopped more often than once a week, one mother shopped for vegetables twice a month, and two mothers shopped for vegetables once a month. It is of interest to note that the mothers of this group shopped for vegetables more often than for other groceries. The vegetable shopping frequency of the 43 families from the three socioeconomic groups is shown in Table XI.

For the middle socioeconomic group, the frequency of shopping for vegetables was the same as the frequency of shopping for groceries. A total of 63.6 per cent shopped

TABLE XI

FREQUENCY OF SHOPPING FOR GROCERIES AND VEGETABLES AS REPORTED BY MOTHERS OF 43 PRESCHOOL CHILDREN ACCORDING TO THE SOCIOECONOMIC LEVEL OF THE FAMILY

Frequency of Shopping	Socioeconomic Level							
	Low (N=16)		Middle (N=11)		High (N=16)		Total (N=43)	
Groceries	Number	Per Cent	Number	Per Cent	Number	Per Cent	Number	Per Cent
More than once a week	1	6.2	4	36.3	4	25.0	9	20.9
Once a week	11	68.8	7	63.6	9	56.3	27	62.8
Twice a month	3	18.7			2	12.5	5	11.6
Once a month	1	6.2					1	2.3
No Response					1	6.2	1	2.3
Vegetables								
More than once a week	4	25.0	4	36.3	6	37.5	14	32.3
Once a week	9	56.3	7	63.6	8	50.0	24	55.8
Twice a month	1	6.2			1	6.2	2	4.7
Once a month	2	12.5					2	4.7
No Response					1	6.2	1	2.3

once a week; 36.3 per cent shopped more than once a week. The mothers in the high socioeconomic group shopped for vegetables more often than for other groceries. A total of 37.5 per cent shopped more often than once a week, and 50.0 per cent shopped once a week. One mother in this group bought vegetables twice a month.

The 43 mothers were asked to check the form in which they purchased eight vegetables commonly used in the home: carrots, green beans, green peas, spinach, corn, Irish potatoes, sweet potatoes, and turnip greens. The percentage of mothers buying these vegetables in the fresh, frozen, or canned form is seen in Table XII.

The three socioeconomic groups were in agreement as to form in which carrots were purchased, the fresh form. Green beans were purchased in the canned form in over half of the homes in each of the three socioeconomic groups. Green peas were usually purchased in the canned form by the three socioeconomic groups, but the frozen form was also liked by a substantial percentage of homemakers of the middle and high socioeconomic groups. A high percentage of homemakers in the low and middle socioeconomic groups bought spinach in the canned form, but a slightly higher percentage of the homemakers of the high socioeconomic group preferred frozen over canned spinach. Corn in the canned form was purchased by 87.5 per cent of the low socioeconomic

TABLE XII

FORM IN WHICH EIGHT VEGETABLES WERE REPORTED AS PURCHASED BY MOTHERS OF 43 PRESCHOOL CHILDREN ACCORDING TO THE SOCIOECONOMIC LEVEL OF THE FAMILY

Socio-economic Level	Carrots		Green Beans		Green Peas		Spinach		Corn		Irish Potatoes		Sweet Potatoes		Turnip Greens	
	Number	Per Cent	Number	Per Cent	Number	Per Cent	Number	Per Cent	Number	Per Cent	Number	Per Cent	Number	Per Cent	Number	Per Cent
Fresh Form																
Low	13	81.3	3	18.7	2	12.5	2	12.5	2	12.5	11	68.8	11	68.8	10	62.5
Middle	11	100.0	1	9.0	1	9.0	2	18.1	7	63.6	11	100.0	6	54.5	6	54.5
High	15	93.8	4	25.0	0	0.0	6	37.5	9	56.3	16	100.0	11	68.8	5	31.3
Frozen Form																
Low	2	12.5	2	12.5	2	12.5	5	31.3	5	31.3	2	12.5	2	12.5	2	12.5
Middle	1	9.0	3	27.2	3	27.2	2	18.1	3	27.2	3	27.2	4	36.3	1	9.0
High	2	12.5	3	18.7	4	25.0	8	50.0	6	37.5	2	12.5	0	0.0	2	12.5
Canned Form																
Low	3	18.7	9	56.3	11	68.8	10	62.5	14	87.5	1	6.2	1	6.2	1	6.2
Middle	0	0.0	9	81.8	9	81.8	7	63.6	6	54.5	1	9.0	3	27.2	3	27.2
High	0	0.0	12	75.2	12	75.0	5	31.3	7	43.1	1	6.2	3	18.7	3	18.7

families. Fresh corn was purchased by 63.6 per cent of the middle socioeconomic families, and the canned corn was purchased by 54.5 per cent of this same group. Families of the high socioeconomic group tended to purchase fresh corn (56.3 per cent) and canned corn (43.1 per cent).

Irish potatoes were bought in the fresh form by all of the middle and high socioeconomic families, and by 68.8 per cent of the families of the low socioeconomic group. The only other popular form reported for the purchase of potatoes was the frozen form, purchased by 27.2 per cent of the families in the middle socioeconomic group. Sweet potatoes were not as popular as Irish potatoes among the 43 families, but were purchased in the fresh form by over half of the homemakers in each of the socioeconomic groups. However, 36.3 per cent of the homemakers of the middle socioeconomic group bought sweet potatoes in the frozen form, and 27.2 per cent of this same group purchased the canned form.

Turnip greens were found to be popular among the low and middle socioeconomic groups but not among the high socioeconomic group. The majority of the low socioeconomic families bought turnip greens in the fresh form (62.5 per cent) as did the families from the middle socioeconomic group (54.5 per cent). Frozen turnip greens were not

popular and only families of the middle socioeconomic group purchased any appreciable amount of canned turnip greens (27.2 per cent).

The data indicate that with the exception of carrots, Irish potatoes, sweet potatoes, and turnip greens, families of the low socioeconomic group bought canned vegetables primarily. These vegetables are more likely to be cheaper in the fresh form. A majority of the middle socioeconomic families preferred the purchase of the fresh form for carrots, corn, sweet potatoes, Irish potatoes, and turnip greens. A majority of these families also purchased green beans, green peas, spinach, and corn in the canned form. The middle socioeconomic families reported the purchase of no canned carrots.

Families of the high socioeconomic group expressed more variety as to the forms in which the vegetables listed were purchased. A majority of these families purchased carrots, corn, Irish potatoes, and sweet potatoes in the fresh form, spinach in the frozen form, and green beans and green peas in the canned form. The high socioeconomic families in this study reportedly bought no fresh green peas, frozen sweet potatoes, or canned carrots.

The mothers were asked if the preschool children ever accompanied them to the grocery store. A majority, 60.4 per cent of the 43 mothers, replied in the affirmative.

The highest percentage, 72.7 per cent, reporting the child did accompany the mother to the grocery store was in the middle socioeconomic group; however, 62.5 per cent of the mothers of the high socioeconomic group took the child with them. Half of the mothers in the low socioeconomic group took their child to the store and the other half did not.

The mothers were asked if the children ever requested the purchase of vegetables. Half of the mothers in the low and high socioeconomic groups replied negatively and half affirmatively. In the middle socioeconomic group six mothers reported their children had not requested the purchase of any vegetables; whereas, four mothers replied in the affirmative.

The vegetables most often requested by the children in each socioeconomic group were listed. Corn was requested by the children in all three socioeconomic groups, as were spinach and carrots. Greens were requested by several children in both the low and the high socioeconomic groups. Greens were not requested by children in the middle socioeconomic group.

The mothers were requested to give an opinion as to what prompted the child to request a particular vegetable. The reasons given were varied but were similar for the three socioeconomic groups. The reasons given revealed the influence of advertisements on television. For example,

Popeye and the Jolly Green Giant influenced some children. Many of the children requested vegetables because they liked the particular vegetable or because the color appealed to them.

To gain further information on the marketing practices of the 43 families, the mothers were asked if they ever read the newspaper for advertised specials. A high percentage, 62.5 per cent, of the mothers in the low socioeconomic group reported not reading the newspapers for advertised specials. More of the mothers in the middle socioeconomic group than in the other two groups read the food specials in the newspaper (72.7 per cent). Of the mothers in the high socioeconomic group, 75.0 per cent reported not reading the advertised specials in the newspapers.

The use of a list when grocery shopping has been related to education of the mother. It was of interest to observe what, if any, differences were found among the three socioeconomic groups. A surprisingly high percentage, 69.8 per cent, of the entire group of 43 mothers shopped with a list. A comparison of the three socioeconomic groups revealed that 75.0 per cent of the mothers of the middle socioeconomic group, and 62.5 per cent of the mothers of the high socioeconomic group used a shopping list. As the socioeconomic level rose from one level to the next, the use of a list while grocery shopping tended to decline.

The mothers were requested to indicate where they obtained their nutrition information. There was considerable similarity among the responses of the mothers from the three socioeconomic groups. High school home economics classes were cited by a few mothers in all three groups as being a source of nutrition information. More mothers from the middle and high socioeconomic levels used books, cookbooks, and newspapers as a nutrition source than did the mothers from the low socioeconomic group. The mothers in the low socioeconomic group reportedly relied more on individuals such as friends or relatives than on reading material. The responses to this question point out the importance of including nutrition in the curriculum of the home economics classes in high schools.

When the mothers were questioned regarding where the child ate most of his meals, all of the mothers in the middle and high socioeconomic groups reported that the children ate most of their meals at home. However, in the low socioeconomic group, 56.2 per cent of the children ate most of their meals at home; whereas, 43.8 per cent did not. These latter figures may be attributed to the fact that some of the children in the Head Start school ate both breakfast and lunch at school.

VEGETABLE PREFERENCE CHECK LISTS

Information was requested from the mothers as to the vegetable likes and dislikes of the 43 children. A total of 49 vegetables were chosen for study, 36 cooked and 13 raw. The preferential categories to be checked for each vegetable included like, dislike, accept, and never served. This same information was requested from both the mothers and the fathers concerning their own vegetable likes and dislikes. The information obtained from the vegetable preference check lists were then analyzed statistically.

The "like" and "accept" categories were combined and considered as liked vegetables in analyzing these vegetable preference check lists. Twenty vegetables liked by one-half or more of the children were selected for comparison with the likes of the parents. Table XIII shows the percentage of children, mothers, and fathers liking each of these 20 vegetables.

Among the list of 20 vegetables or vegetable preparations best liked by the children were 17 cooked and three raw forms. A total of 14 different vegetables were represented. The best liked vegetables included five forms of Irish potatoes (French fried, mashed, baked, scalloped, and au gratin), carrots, green beans, corn, and green peas, all mild flavored vegetables. This list is in agreement with other studies (12, 26, 39, 44). Only two strong flavored

TABLE XIII

RANK ORDER OF VEGETABLE LIKES OF 43 PRESCHOOL CHILDREN AS COMPARED TO THE LIKES OF THEIR PARENTS

Vegetables	Family Members			
	Preschool Children (N=43)		Mothers (N=43)	Fathers (N=28)
	Rank	Per Cent Liking	Per Cent Liking	Per Cent Liking
French fried Potatoes	1	100.0	97.7	100.0
Mashed Potatoes	2	97.7	100.0	96.3
Green Beans	3	97.7	88.4	85.7
Baked Potatoes	4	90.7	100.0	92.9
Carrots (Raw)	5	90.7	86.1	89.3
Corn	6	88.4	100.0	92.9
Green Peas	7	86.1	97.7	85.7
Carrots (Cooked)	8	83.7	83.7	85.7
Dried Beans	9	83.7	86.1	89.3
Black-eyed Peas	10	81.4	93.0	82.1
Spinach	11	81.4	81.4	82.1
Lettuce	12	81.4	93.0	100.0
Tomatoes (Raw)	13	81.4	86.1	96.3
Tomatoes (Cooked)	14	79.1	86.1	92.9
Beets	15	69.8	86.1	64.3
Scalloped Potatoes	16	67.4	90.7	85.7
Sweet Potatoes	17	67.4	86.1	85.7
Cabbage (Cooked)	18	67.4	93.0	85.7
Au Gratin Potatoes	19	60.5	93.0	89.3
Onions (Cooked)	20	53.5	93.0	92.9

vegetables, cooked cabbage and cooked onions, were among the list of best liked vegetables.

In general, a higher percentage of mothers than of children liked each of the 20 favorite vegetables of the children. Two vegetables liked by all of the mothers were mashed potatoes and corn. French fried potatoes and green peas were liked by 97.7 per cent of the mothers. Over 90.0 per cent of the mothers liked black-eyed peas, lettuce, cabbage, au gratin potatoes, cooked onions, and scalloped potatoes.

All of the fathers liked French fried potatoes and lettuce. Other vegetables liked by over 90.0 per cent of the fathers were mashed potatoes, fresh tomatoes, baked potatoes, cooked tomatoes, cooked onions, and corn. There was considerable agreement as to the favorite vegetables of the mothers, fathers, and children. In general, a slightly smaller percentage of fathers than of mothers liked each of the 20 favorite vegetables of the children.

In evaluating those vegetables most disliked by the mothers, fathers, and children, raw onions ranked highest in the list of disliked vegetables for the children. A study of Table XIV reveals those vegetables most disliked were generally the strong flavored ones or vegetables that require more chewing. The vegetables most disliked by the children included onions, green peppers, cauliflower, okra,

TABLE XIV

RANK ORDER OF VEGETABLE DISLIKES OF 43 PRESCHOOL CHILDREN AS COMPARED TO THE DISLIKES OF THEIR PARENTS

Vegetables	Family Members			
	Preschool Children (N=43)		Mothers (N=43)	Fathers (N=28
	Rank	Per Cent Disliking	Per Cent Disliking	Per Cent Disliking
Onions (Raw)	1	58.1	04.7	21.4
Onions (Cooked)	2	37.3	07.0	07.1
Green Peppers (Cooked)	3	34.9	18.7	14.3
Green Peppers (Raw)	4	34.9	18.7	07.1
Cauliflower	5	32.6	18.7	35.7
Okra	6	32.6	11.6	32.1
Squash	7	27.9	11.6	28.6
Sweet Potatoes	8	27.9	09.3	10.7
Cucumbers	9	27.9	07.0	10.7
Celery	10	27.9	11.6	14.3
Asparagus	11	27.9	14.0	21.4
Broccoli	12	27.9	07.0	17.9
Lima Beans	13	25.6	09.3	10.7
Red Cabbage	14	25.6	20.9	07.1
Turnips	15	25.6	16.3	28.6
Radishes	16	23.3	04.7	17.9
Brussels Sprouts	17	23.3	14.0	35.7
Beets	18	20.9	14.0	28.6
Tomatoes (Raw)	19	20.9	04.7	0.0
Tomatoes (Cooked)	20	20.9	09.3	07.1

squash, sweet potatoes, cucumbers, celery, asparagus, broccoli, lima beans, red cabbage, and turnips. These vegetable dislikes agree with a statement by Martin (26) to the effect that preschool children dislike strong flavored vegetables.

In general, a smaller percentage of mothers than of fathers reported disliking vegetables. Cauliflower, raw and cooked green peppers, and red cabbage were the vegetables most disliked by mothers. Only one vegetable, red cabbage, was disliked by 20.0 per cent or more of the mothers.

In descending rank order, the vegetables most disliked by the fathers were cauliflower, Brussels sprouts, okra, squash, turnips, beets, raw onions, and asparagus. Each of the above named vegetables were disliked by 20.0 per cent or more of the fathers.

Table XV reveals the percentage of homes in which certain vegetables were never served to the 43 children. Many of the vegetables listed in the category of "never served" were among the list of vegetables disliked by the children. Kale and kohlrabi were never served to the children in 93.0 per cent or more of the homes. In over 53.5 per cent or more of the homes endive, rutabaga, cauliflower, red cabbage, parsley, and wax beans were vegetables never served to the children. Table XV lists 20 of the

TABLE XV

RANK ORDER OF VEGETABLES NEVER SERVED
TO 43 PRESCHOOL CHILDREN

Vegetables	Preschool Children (N=43)	
	Rank Order	Per Cent of Homes Never Serving
Kohlrabi	1	97.7
Kale	2	93.0
Endive	3	76.7
Rutabaga	4	72.1
Cauliflower	5	69.8
Red Cabbage	6	60.5
Parsley	7	58.1
Wax Beans	8	53.5
Onions (cooked)	9	46.5
Spinach	10	39.5
Pumpkin	11	37.2
Turnip Greens	12	34.9
Turnips	13	32.6
Brussels Sprouts	14	30.2
Lima Beans	15	30.2
Asparagus	16	28.0
Green Beans	17	28.0
Beet Greens	18	28.0
Collards	19	28.0
Broccoli	20	25.6

vegetables included in the questionnaire that were not served to children in one out of every four homes. The lack of variety in the choice of vegetables served in the home may influence the child's preferences for vegetables. This finding adds credence to the statement by Wagner (46) that familiarity and repetition are factors influencing food preferences of children.

Since many of the families had no father present in the home, the families were sub-divided into families with fathers and families with no father. The low socioeconomic group had seven two-parent homes and nine homes without a father. The middle socioeconomic group had eight two-parent homes and three one-parent homes. The high socioeconomic group had 13 two-parent homes and three one-parent homes as seen below:

Homes	Socioeconomic Level			
	Low	Middle	High	Total
Two-Parent	7	8	13	28
One-Parent	9	3	3	15

The total number and mean number of mothers, fathers, and children checking the accept, like, dislike, and never served categories is seen on Table XVI. Examination of

TABLE XVI

VEGETABLE ACCEPTANCE OF 43 PRESCHOOL CHILDREN AND THEIR PARENTS ACCORDING TO THE SOCIOECONOMIC LEVEL OF THE FAMILY

Socioeconomic Level	Vegetable Acceptance							
	Accept		Like		Dislike		Never Served	
	Total Number	Mean Number	Total Number	Mean Number	Total Number	Mean Number	Total Number	Mean Number
Low								
Mother (N=16)	49	6	472	60	147	19	116	15
Father (N=7)	22	6	229	67	45	13	47	14
Child (N=16)	113	14	327	42	117	15	227	29
Middle								
Mother (N=11)	66	12	393	73	29	5	51	10
Father (N=8)	75	19	234	60	45	12	38	9
Child (N=11)	115	21	167	31	97	18	160	30
High								
Mother (N=16)	117	15	541	69	57	7	69	9
Father (N=13)	112	18	350	55	123	19	52	8
Child (N=16)	135	17	297	38	168	21	184	24

the table reveals that the high socioeconomic group (fathers, mothers, and children) were acquainted with a larger variety of vegetables than were the middle and low socioeconomic groups. However, this does not mean that these families liked more vegetables than the other families. The children of the high socioeconomic group had a higher average number of dislikes than children of the middle or low socioeconomic group. The children from the low socioeconomic group had more likes and fewer dislikes for vegetables than the children of the middle or high socioeconomic group.

The number of vegetables liked by the mothers in the low socioeconomic groups ranged from 8 to 45, with the mean number of vegetable likes being 31.6. The range of vegetable likes for the fathers in the low socioeconomic group was from 24 to 46 vegetables, with a mean of 35.9. The vegetable likes of the children from families in the low socioeconomic group ranged from 13 to 40 likes, with a mean of 27.5 (Table XVII). The vegetable likes of the families in the middle socioeconomic group were tabulated as follows: the vegetable likes of the mothers ranged from 35 to 47, with a mean of 41.7; likes of the fathers ranged from 29 to 46, with a mean of 37.4; and vegetable likes of the children ranged from 10 to 39, with a mean of 25.6. The families in the high socioeconomic group listed their vegetable likes as follows: the vegetable likes of the mothers

TABLE XVII

MEAN NUMBER OF VEGETABLES LIKED AND DISLIKED BY 43 PRESCHOOL CHILDREN AND THEIR PARENTS ACCORDING TO THE SOCIOECONOMIC LEVEL OF THE FAMILY

Socioeconomic Level	Family Members		
	Mothers	Fathers	Children
Vegetable Likes			
Low	31.6	35.9	27.5
Middle	41.7	37.4	25.6
High	41.1	35.5	26.9
Vegetable Dislikes			
Low	9.2	5.9	7.6
Middle	2.6	5.6	7.8
High	3.6	8.6	11.2

ranged from 32 to 48, with a mean of 41.1; the fathers' likes ranged from 12 to 48, with a mean of 35.5; the vegetable likes of the children ranged from 15 to 41, with a mean of 26.9.

The number of dislikes of the mothers, fathers, and children in each socioeconomic group were also tabulated from the vegetable preference check lists. The number of vegetables disliked by the mothers in the low socioeconomic group ranged from one to 22, with a mean of 9.2; the dislikes of the fathers in this group ranged from none to 12, with a mean of 5.9; the dislikes of the children ranged from one to 24, with an average of 7.6 disliked vegetables. The number of vegetable dislikes of the mothers, fathers, and children of the middle socioeconomic levels were as follows: the number of dislikes for mothers ranged from one to six vegetables, with a mean of 2.6; the dislikes for fathers ranged from none to 14, with a mean of 5.6; and the dislikes of the children ranged from 2 to 17, with a mean of 7.8 disliked vegetables. The number of vegetable dislikes reported by the family members in the high socioeconomic group are as follows: dislikes for mothers ranged from none to 11, with a mean of 3.6; the number of vegetable dislikes of the fathers ranged from none to 30, with a mean of 8.6; the dislikes of the children ranged from one to 26, with an average of 11.2 disliked vegetables.

The above data suggested that the mothers from the low socioeconomic group had fewer likes and more dislikes than the mothers of the other two socioeconomic groups. With the exception of the low socioeconomic group the fathers had fewer vegetable likes and more dislikes than the mothers. In all socioeconomic groups the child had fewer likes and more dislikes than the parents; however, the children from families in the high socioeconomic group had a higher mean number of vegetable dislikes than children from the other two groups.

The number of vegetables accepted and the number liked were combined and considered as liked vegetables in the data analysis. The number of likes and dislikes of the mother and child, father and child, and mother and father for each family in the three socioeconomic levels were analyzed to determine the degree of correlation between family members. Correlation coefficients were calculated for both one-parent and two-parent homes. The correlation coefficients calculated for each socioeconomic group are seen in Table XVIII.

Correlations for vegetable likes were significant for the mothers and fathers of the low socioeconomic group. There were no other significant correlations for vegetable likes for any of the other calculations. No correlation coefficients for vegetable dislikes were significant.

TABLE XVIII

CORRELATION COEFFICIENTS FOR THE NUMBER OF VEGETABLES LIKED AND DISLIKED BY 43 PRESCHOOL CHILDREN AND THEIR PARENTS ACCORDING TO THE SOCIOECONOMIC LEVEL OF THE FAMILY

Socioeconomic Level	One-Parent Home	Two-Parent Home		
	Mother with Child	Child with Mother	Child with Father	Mother with Father
Vegetable Likes				
Low	0.270	0.541	0.332	0.805**
Middle	0.172	0.094	-0.050	-0.669
High	0.163	0.128	0.414	0.373
Vegetable Dislikes				
Low	-0.257	-0.135	-0.339	0.485
Middle	0.134	0.000	-0.276	-0.238
High	-0.263	-0.110	0.064	0.026

**Significant at the .01 level.

The mean number of shared likes of the mother and the preschool child, and the father and the preschool child, was determined for each family participating in the study. The shared likes were similar for the three family members within each socioeconomic group as shown below:

	Socioeconomic Level		
	Low	Middle	High
Mother and Child	19.19	15.45	17.75
Father and Child	19.28	14.62	16.23

A t-test was calculated to determine the differences between socioeconomic groups in the mean number of shared likes for the mother and child and for the father and child. Results of these calculations indicated no real differences between the shared likes for the three socioeconomic groups. This was true both for the comparison for the mother and child and the father and child. From these data it was concluded that the child's vegetable likes were influenced by those of both parents. This is in agreement with Pace (37) who stated that the family was a strong influence in shaping the direction of the food acceptance of a child. There were so few shared dislikes between the mother and child and the father and child that these data were not analyzed.

The teaching unit included the introduction of nine vegetables. The vegetables chosen for study were asparagus, broccoli, Brussels sprouts, cauliflower, eggplant, green beans, rutabaga, spinach, and acorn squash. The vegetable preference check lists for the children were consulted to determine whether the child liked, disliked, or had never been served the nine specific vegetables. The recorded data for each vegetable for each child was considered the initial taste test.

Three vegetables were introduced each week for three consecutive weeks. Three vegetables introduced the first week were green beans, spinach, and asparagus. These vegetables were discussed, the raw vegetables were handled by the children, and the children were given an opportunity to become familiar with each vegetable. Following the education program, the children tasted each vegetable individually and related to the investigator whether the vegetable was liked or disliked. This same procedure was followed the second week when broccoli, cauliflower and Brussels sprouts were introduced. During the third week eggplant, rutabaga, and acorn squash were introduced and the above procedure followed. The third week concluded the introduction of the nine vegetables. During the fourth week all nine vegetables were served and the children were able to taste each vegetable again for reinforcement of learning. The author had intended to use the taste responses from the fourth

week for the final taste results. However, these responses were not valid because some of the children only tasted a few of the vegetables and these results were not complete. For this reason, the recorded data from the questionnaires were considered the initial response and the results of the tasting parties were considered the final response.

The likes and dislikes for the nine vegetables were recorded for each child initially and following the education program. The t-test was used to determine the improvement, if any, in the child's vegetable likes and the level of significance of this improvement. Table XIX shows the results of the data analysis. The mean number of likes for the nine vegetables included in the study was significantly higher for both the low ($p < .01$) and the middle socioeconomic levels ($p < .05$). Although the mean number of likes was slightly higher for the children of the high socioeconomic group following the teaching unit, the difference was not significant.

The children in the low socioeconomic group showed a marked improvement in their taste for these nine specific vegetables. The children from the families in the middle socioeconomic group also showed a significant improvement in their taste for these nine vegetables. Thus the vegetable acceptance for these two groups was more amenable to change than the vegetable acceptance of children of the high socioeconomic group.

TABLE XIX

MEAN NUMBER OF EXPRESSED VEGETABLE LIKES OF 43 PRESCHOOL CHILDREN INITIALLY AND FOLLOWING THE TEACHING UNIT ANALYZED ACCORDING TO SOCIOECONOMIC LEVEL OF THE FAMILY

Socioeconomic Level	Mean	t-test	Level of Significance
Low (N=16)			
Initial Test	4.7	6.557	.01
Final Test	8.7		
Middle (N=11)			
Initial Test	5.1	2.545	.05
Final Test	7.2		
High (N=16)			
Initial Test	5.3	1.862	n.s.
Final Test	6.7		

Casual interpretation of the above results suggest that the children of the families in the low socioeconomic group were probably hungry at the time of the tasting parties, and that this explained the fact that they expressed a liking for more vegetables than the other children. However, upon closer investigation it was found that most of these children consumed a well-balanced breakfast at the school on the days the study was conducted and that these children should not have been any more hungry than the other children.

Another possible explanation of the finding that the children from families in the low socioeconomic group were more amenable to change might be the apparent lack of restrictions regarding eating and eating behavior in these families. The children from families in the middle and high socioeconomic groups showed some hesitancy toward trying new foods and were more aware of "proper" eating behavior. These fixed eating habits may have influenced their ability to change their dislikes for certain foods. It is also possible that the likes and dislikes of the children from families in the high socioeconomic group were indulged by their parents. These families were also found to serve a greater variety of vegetables in the home.

The most important fact brought out by the tasting parties and the education program was that all of the

children learned to accept a greater variety of vegetables. This finding has implications for nutrition education. The greatest improvement was evident for children from low socioeconomic families, the next greatest improvement was for children from families in the middle socioeconomic group, and the least improvement was shown by the children from families in the high socioeconomic group.

Martin (26) stated that there was no sex difference in the food preferences of young children. This investigator noticed what appeared to be a sex difference in the amount of change in vegetable likes at the time of the tasting parties. This finding was investigated statistically using the t-test (Table XX). For this test the boys from all three socioeconomic groups were combined and compared to the girls from all three socioeconomic groups. The boys improved their vegetable likes to a more marked degree than did the girls, and this improvement was highly significant. The girls also improved their vegetable likes, but this improvement was not significant.

TABLE XX

MEAN NUMBER OF EXPRESSED VEGETABLE LIKES OF 43 PRESCHOOL CHILDREN INITIALLY AND FOLLOWING THE TEACHING UNIT ANALYZED ACCORDING TO SEX OF THE CHILDREN

Sex	Mean	t-test	Level of Significance
Boys (N=25)			
Initial Test	4.84	6.644	.01
Final Test	8.8		
Girls (N=18)			
Initial Test	5.3	1.939	n.s.
Final Test	6.8		

CHAPTER IV

E D U C A T I O N U N I T O N V E G E T A B L E A C C E P T A N C E

The educational program required that the investigator introduce nine specific vegetables to three groups of preschool children and create in each child a desire to taste the vegetables. The teaching methods used were appropriate for five-year-olds, and made use of the five senses for motivational purposes.

Because of the limited time available in each classroom, the investigator attempted to introduce only a few nutritional concepts. These concepts were:

1) Vegetables are interesting because of their shape, size, texture, weight, color, smell, and taste.
2) Vegetables are plants, but not all plants are vegetables.
3) Different parts of vegetable plants are eaten.
4) Vegetables are prepared in different ways.
5) Vegetables should be eaten by growing children.
6) A variety of vegetables are needed for good health.
7) Tasting new vegetables can be fun.

Expressed in behavioral terms the objectives of the education program on vegetables included the following:

1) The child will become aware of the differences and similarities in vegetables.
2) The child will be able to identify the nine vegetables.
3) The child will be able to recognize that vegetables are plants and that different parts of plants are eaten.
4) The child will become aware of methods of vegetable preparation.
5) The child will become aware of the necessity of eating a variety of vegetables to maintain good health.
6) The child will become more interested in trying new vegetables.
7) The child will be given opportunities to express his personal vegetable preferences.
8) The child will have some enjoyable experiences and expand his knowledge.

The children were motivated by an activity which utilized the five senses. Each vegetable was placed in a box completely enclosed except for holes through which the children inserted their hands in order to feel the hidden vegetable. The children were then allowed to remove the

vegetable from the box and either identify the vegetable or have it identified by this investigator. The children were then allowed to dissect the raw vegetable and inspect it by using their senses of sight, touch, and smell. The education program continued with the display of a large diagram of each vegetable, illustrating how it grows in the ground, which part of the vegetable is eaten, and which part is discarded. The children were then allowed to taste and smell the cooked vegetable.

The procedure for introducing each of the nine vegetables was the same. The three vegetables introduced, discussed, and tasted the first week were spinach, green beans, and asparagus; the second week, broccoli, Brussels sprouts, and cauliflower; and the third week, rutabaga, eggplant, and acorn squash. The vegetables were prepared as follows:

Spinach--fresh-frozen, cooked cream style

Green beans--frozen, French-style, buttered

Asparagus--canned, buttered

Broccoli--frozen, buttered

Brussels sprouts--frozen, buttered

Cauliflower--frozen, cheese sauce

Rutagaga--fresh, boiled, and buttered

Eggplant--fresh, scalloped with buttered bread crumbs added

Acorn squash--fresh, baked with brown sugar glaze

The cooked vegetables were kept warm on serving trays. The fresh spinach was served cold with salt and pepper and a small amount of salad dressing.

The children tasted the vegetables individually, gave a verbal response to the investigator, and told whether each vegetable was liked or disliked. Each response was recorded as was the amount of the vegetable consumed. The children were allowed to have additional servings if requested. With but one exception the tasting was carried out in a room separate from the main classroom. At the East Dallas Head Start Kindergarten it was necessary to test in one corner of the classroom. Only one child was involved in tasting at a given time. While a given child tasted each vegetable, the other children were involved in making hand puppets designed to represent the nine vegetables discussed. When the education program was completed, each child had a family of nine hand puppets representing each of the nine vegetables studied.

CHAPTER V

S U M M A R Y A N D C O N C L U S I O N S

The overall purpose of the present study was to measure the effectiveness of an education program designed to increase the acceptance of nine vegetables in the diets of preschool children. The specific purposes of the investigation were:

1) to acquaint the participating children with a variety of vegetables
2) to increase the acceptance of nine specific vegetables
3) to determine the effectiveness of an education program specifically related to vegetables
4) to determine if socioeconomic class makes young children more or less amenable to change

A questionnaire, "Survey of Eating Practices and Patterns of Preschool Children with Special Emphasis on Vegetables," designed for the present study was given to the parents of the study participants. The questionnaire, consisting of five parts, obtained information on the vegetable preferences of the mother, father, and child; a dietary

history of the preschool child; family marketing practices; and family background information.

The information concerning family background provided the data needed to classify the families into socioeconomic groups. The 43 participating families were classified into socioeconomic groups by use of the McGuire and White Measurement of Social Status (27). Data collected in the present study were analyzed and interpreted according to the socioeconomic classification of the 43 families as obtained from the McGuire and White instrument.

The study group consisted of 43 families with preschool children attending three different kindergartens. Of these 43 children, 16 attended the East Dallas Head Start Kindergarten, 11 attended the White Rock United Methodist Weekday School, and 16 attended the Montessori School of Dallas.

The investigation of the ages of the 28 fathers and 43 mothers participating in the study indicated that both the mothers and fathers in the low socioeconomic group tended to be younger than the parents of the other two groups of children. The parents in the low socioeconomic group tended to be in their twenties, while the parents in the middle and high socioeconomic groups tended to be in their thirties.

Information regarding the education of the parents revealed that as the socioeconomic level rose, the amount of education of the parents also rose. The highest educational attainment for the parents in the low socioeconomic level was "attended high school;" for the middle socioeconomic group, "attended college;" and for the parents of the high socioeconomic group, "attended college" or "attended graduate school."

The information concerning the status of employment of the fathers and mothers in the three socioeconomic groups revealed that there were more mothers employed full time or part-time in the low and high socioeconomic groups than in the middle socioeconomic group. Data concerning the employment of the parents in each socioeconomic group revealed the following: unemployment to work paid on an hourly basis for the low socioeconomic group; employment with a salary or commission, and a few hourly paid jobs for the parents in the middle socioeconomic group; and more professional-type occupations for the parents in the high socioeconomic group. The income of the family, as reported in the questionnaire, also revealed that as the socioeconomic level rose, the annual income of the family also rose. From these data it was found that a rise in socioeconomic level was associated with a rise in the educational level attained by the parents, employment status, and family income.

Data concerning family size and composition revealed that the mean family size for each of the socioeconomic levels was remarkably similar, being 4.81, 4.71, and 4.81, respectively for the low, middle, and high socioeconomic groups. However, an investigation of the ages of the children in the 43 families revealed that the children from families in the high socioeconomic group tended to be older than those in families of the middle or low socioeconomic groups.

Information concerning the family dwelling revealed that most of the families in the low socioeconomic group lived in apartments or duplexes. All of the families of the middle socioeconomic group lived in houses, and most of the families of the high socioeconomic group lived in houses, with a few apartment dwellers in this group. The number of rooms in the family dwellings ranged from an average of 4.5 rooms and one bathroom for the low socioeconomic group to 6.3 rooms and one and one-half bathrooms in the middle socioeconomic group, to 7.2 rooms and two bathrooms in the high socioeconomic group. Most of the families in the low socioeconomic group reported having lived in the present dwelling for six years or less. A higher percentage of families in the high socioeconomic group than in the other two groups had lived in their homes for less than a year. This indicated more mobility among the families in the high socioeconomic group than among the middle or low

socioeconomic groups. Over half of the 43 families were paying on a house, while 41.8 per cent were renting a dwelling. Most of the families reported having sufficient refrigerator and freezer space in the home.

Information obtained from the dietary history of the preschool child revealed more premature infants in the low socioeconomic group than in the other two groups. The birth weights of the children from the middle socioeconomic group tended to be higher than those of children from the other two groups.

Table foods were introduced at an earlier age among low socioeconomic families than among the middle or high socioeconomic families. This was probably due to the fact that feeding the child table food was less expensive than purchasing strained and junior foods. Strained vegetables tended to be introduced in the first six months by families of all three socioeconomic levels. As the socioeconomic level rose, the mean age at which junior vegetables were introduced became higher.

A study of the child's attitude toward eating revealed more eating problems among children from the low and high socioeconomic families. The children from the middle socioeconomic families had better attitudes toward eating than the children from the families of the other two socioeconomic groups. When encouraging the children to

eat vegetables the parents from the middle and high socio-economic groups reminded the child to eat; whereas, more parents in the low socioeconomic group reported restricting or withholding pleasures to encourage vegetable eating.

More children from families of the low and high socioeconomic groups than from families of the middle socioeconomic group accepted new foods reluctantly. This is in agreement with the finding that children from these two groups presented eating problems.

There were similarities among the 43 families regarding the mealtime companions of the preschool children. Most of the children ate breakfast with the mother and other children in the family. The children ate the noon meal in the company of other children, and most of the children ate dinner with the entire family. The influence of other children upon the eating habits of these children is, therefore, a very important factor.

Information requested as to the favorite vegetables of the mother, father, and child in each family revealed similarities in the favorites named by family members of the three socioeconomic levels. Corn and potatoes were favored by all groups; spinach and carrots were also high on the list of favorites. One striking feature concerning the favorite vegetables was the apparent lack of variety of vegetable choices among all socioeconomic levels, with

the exception of the mothers in the middle and high socio-economic groups. Mothers of these two groups showed more variety in their vegetable choices.

Inquiries made concerning the family food purchasing practices and eating habits revealed that most of the mothers from all socioeconomic levels shopped for groceries and vegetables once a week. However, as the socioeconomic level increased from one level to the next, the mothers tended to shop for groceries and vegetables more often.

When requested to check the form on which 10 common vegetables were purchased, the data revealed that the families in the low and middle socioeconomic groups usually bought vegetables in the canned form, except for those vegetables which are frequently lower priced in the fresh form, such as turnip greens, Irish potatoes, sweet potatoes, and carrots. Families in the high socioeconomic group revealed more variety in the form in which vegetables were purchased.

More children from families in the middle and high socioeconomic groups accompanied the mother to the grocery store than did children from the low socioeconomic group. Approximately half of the 43 children had requested the purchase of vegetables at some time and it was the opinion of the mothers that these requests came as a result of

advertisements on television or because of aesthetic appeal of the vegetable.

The mothers were questioned as to whether they used a grocery list when shopping. Most of the 43 mothers (69.8 per cent) did use a list. However, a comparison of the three socioeconomic levels revealed that as the socio-economic level rose, the use of a list when shopping tended to decline. Only 25 per cent of mothers in the high socio-economic group read the newspapers for advertised specials. A higher percentage of mothers from the middle socioeconomic group read the food specials in the newspapers than did mothers in either of the other two groups.

Information obtained from the vegetable preference check lists revealed that only 20 vegetables or vegetable preparations were liked by 50.0 per cent or more of the children. Of these 20 best liked vegetables, only two were considered strong flavored ones, indicating the preference for mild flavored vegetables by preschool children. There was considerable agreement among mothers, fathers, and children as to the favorite vegetables. However, a slightly smaller percentage of fathers than of mothers liked the vegetables listed. In general, the percentage of children liking the vegetables listed tended to be lower than that of either the fathers or mothers.

Generally, the vegetables most disliked by the children were those with a strong flavor or those requiring more chewing. The fathers reportedly disliked more vegetables than the mothers. The percentage of families never serving certain vegetables to the children was interesting since it showed a lack of variety in the choice of vegetables made available to these children. This lack of variety could have influenced the child's vegetable preferences.

Although the family members in the high socioeconomic group were acquainted with more vegetables than the family members of the low or middle socioeconomic groups, the children of this group had more dislikes than the other two groups. The children in the low socioeconomic group had more vegetable likes and fewer dislikes than the children of the other two groups. In general, the fathers had more dislikes than the mothers. In all socioeconomic groups the children had more dislikes and fewer likes than the parents.

Correlation coefficients calculated for the number of vegetable likes and the number of vegetable dislikes of the father and child, the mother and child, and the father and mother, were significant only for the vegetables likes for the mothers and fathers of the low socioeconomic group. There were no other significant correlations for vegetable likes or dislikes.

A comparison of the mean number of shared likes of the mother and child and the father and child revealed similar food preferences among family members within each socioeconomic group. This finding indicates that the child's vegetable likes are influenced by those of both parents.

The data obtained following the teaching unit introducing the nine specific vegetables indicated differences among the children from the three socioeconomic groups in changing their vegetable likes. The children from families in the low socioeconomic group showed an improvement in their vegetable likes that was highly significant. The children from families in the middle socioeconomic group also improved their vegetable likes and this improvement was significant. The children from families in the high socioeconomic group showed some improvement, but this improvement was non-significant.

The above results can be partially explained. The children from families in the low socioeconomic group revealed to the investigator a lack of restraint while eating; whereas, the children from families in the high socioeconomic level were conscious of proper eating behavior and were somewhat inhibited while eating. The impression was given that the children from low socioeconomic families were not accustomed to leaving food on their plates. During the tasting parties few children in this group left any food on

the plate. The children from families of the high socio-economic level did not hesitate to taste a small portion and leave the rest on the plate.

This investigator found a sex difference in the change in vegetable acceptance of the children. After analyzing the taste responses of all the children it was noted that the boys improved their vegetable likes to a more marked degree than did the girls, and this improvement was significant. Although the girls improved their vegetable likes, this improvement was not significant.

The beneficial effects of a nutrition education program for preschool children has been observed from this study. The program was effective in increasing the vegetables acceptance of all of the children participating in the study; however, socioeconomic class did appear to be a factor in the degree of improvement noted in the children.

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