

NUTRITION KNOWLEDGE, FOOD PRACTICES, AND FOOD  
PRESERVATION PRACTICES OF TWO SELECTED  
GROUPS OF HOMEMAKERS

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## CHAPTER I

### INTRODUCTION

The passage of the Smith-Lever Act of 1914 fostered the beginning of the Cooperative Extension Service, a part of the land-grant university in every state. This act established a nationwide system by which information could be transmitted from researchers to the people. Attention was directed toward the alleviation of nutritional problems to improve the welfare of families through educational programs in community development. The objectives of the Cooperative Extension Service were to improve the home environment and to supply educational programs for the individual and the family.

Despite the highest food production levels in the world and excellent distribution facilities, there are individuals and population groups in the United States with nutritional problems that have potentially hazardous effects on their health status. This fact has been adequately documented by the Ten-State Nutrition Survey (1972) and the preliminary findings of the First Health and Nutrition Survey, United States (HANES, 1972). Although nutritional problems exist in all age, ethnic, and economic



groups, they appear to be more prevalent in young, minority group individuals with low socioeconomic status.

The concept of health in the 1970s means more than just the absence of disease. Health has many attributes, including physical, social, mental, and emotional health. The primary responsibility for health care and prevention rests with the family. Thus, the family must provide an environment conducive to the healthy development of individual family members.

One area of concern is the poor nutritional status of the lower socioeconomic groups. Hunger, undernutrition, and malnutrition are found among these groups. Another concern is malnutrition among the affluent, in the form of obesity.

Kuvlesky (1965) states that poverty is not a new problem in Texas. The problems of the poor and how to help them have always been present. The passage of the Economic Opportunity Act in 1964 has served to focus widespread attention on the fact that millions of United States citizens still experience economic, physical, and social deprivation.

The number of persons whose incomes were below the low-income or poverty threshold decreased in 1973 for a second straight year. About 23 million persons were classified as low income, 6.1 per cent fewer than in 1972, as reported in Family Economics Review (1975).

What constitutes the condition of being poor in society today may be defined in many ways. The low-income or poverty threshold is a measure of the income needed to provide families differing in size, composition, and place of residence, a minimum adequate level of living according to the Family Economics Review (1975). In 1973, the low-income threshold was \$4,540 for a nonfarm family of four and \$3,871 for a farm family. The number of white persons of low-income level declined between 1972 and 1973 as it had the previous years. Although white persons made up almost two-thirds of all low-income persons in 1973, the poverty rate for white persons was considerably lower (8.4 per cent) than the rate for black persons (31.4 per cent), or for persons of Spanish origin (21.9 per cent).

To be poor is to suffer physically--to lack adequate housing, proper and sufficient food, and necessary medical attention. The mortality rates of the poor are higher than the remainder of the population. There is a stifling of ambition and hope, a fatalistic outlook on life, a feeling of deprivation and social inferiority (Kuvlesky, 1965).

The Family Economics Review (1975) pointed out that the number of low-income persons 65 years of age and over declined by 10 per cent between 1972 and 1973. This reflects substantial increases in Social Security benefits enacted since 1970. In 1973, there were 3.4 million persons 65

years of age and over below the low-income level. This figure accounted for about 15 per cent of all poor persons.

Families headed by a woman made up 45 per cent of all low-income families in 1973, up from 43 per cent in 1972. Low-income black families are more likely to be headed by women than low-income white families, 64 and 37 per cent, respectively (Family Economics Review, 1975).

The Family Economics Review (1975) indicated that about six of every 10 low-income persons resided in metropolitan areas in 1973. A higher proportion of low-income blacks than whites lived in metropolitan areas (68 per cent as compared with 56 per cent). Low-income blacks were disproportionately concentrated in the central cities; whereas, whites were distributed more equally between the central cities and the suburban rings. Of 10 Federal regions, Dallas-Fort Worth and Atlanta had the highest concentration of poor persons (17.5 and 15.5 per cent, respectively), and Chicago and Boston had the lowest concentration (8.1 and 8.4 per cent, respectively).

Corsicana, Texas, was chosen for the site of this study because it is the county where the author is employed and supervises the total Extension Service Home Economics Program including an Expanded Nutrition Program Adult Unit. The Expanded Nutrition Program, initiated by the Texas

Agricultural Extension Service, has only the adult phase of the program.

The purpose of this research was to identify the areas of program needs for limited-income and middle-income families. The following objectives were formulated to accomplish this purpose:

1. To compare the homemakers enrolled in the Expanded Nutrition Program and the middle-income homemakers' knowledge and application of (a) nutrition principles, (b) meal planning principles, (c) food purchasing practices, and (d) food preservation practices to the following variables: age, education, and dietary practices.
2. To determine if a significant correlation exists between the meals actually prepared at home and the frequency of preparing and eating a variety of foods from the four food groups.
3. To ascertain personal and demographic characteristics that may relate to food and nutrition practices of the homemaker.
4. To determine if a correlation exists between Expanded Nutrition homemakers and middle-income homemakers in eating habits (24-hour dietary recall) and family income.

## CHAPTER II

### REVIEW OF LITERATURE

Extensive research has been conducted stressing techniques of assessment of the nutritional status of American families. In the present review, the emphasis will center on the importance of good nutrition, nutritional status in the United States, factors influencing food choices, the importance of nutrition education, consumer shopping practices, and the Expanded Nutrition Program.

#### Importance of Good Nutrition

Dietary practices during infancy and early childhood exert a profound influence on growth and development, both directly and indirectly, as factors affecting lifetime eating habits (Fox et al., 1970). Social class differences in diets still remain, and children of poor parents are, on an average, shorter than children of rich ones (Tizard, 1975). The brain, like the rest of the body, requires food in order to grow. In recent years scientists have become increasingly concerned about the long-term consequences of malnutrition for brain growth and for the

development of higher nervous and mental processes which are functions of the brain. In man the "brain growth spurt," as it is called, starts during the last three months of pre-natal life and continues throughout the first 18 to 24 months of post-natal life. At birth the brain is already about 25 per cent, and by six months, nearly 50 per cent of its mature weight (Tizard, 1975).

The Economic and Social Council of the United Nations has estimated that nearly 300 million children in the world today are physically and, perhaps, mentally retarded due to malnutrition. Goldsmith (1972) states that malnutrition is a health problem resulting from an inadequate intake of food, either quantitatively or qualitatively. When malnutrition is rampant and an adequate food supply is unavailable, the problem becomes one of medicine and public health.

The Ten-State Nutrition Survey (1972) indicated a significant proportion of the population surveyed was malnourished or was at high risk of developing nutritional problems. In this survey evidence of malnutrition was most commonly found among blacks.

Livingston (1971) reported that undernutrition after birth may affect brain development and function as well as physical growth. Malnutrition is more complex than the mere stunting of the brain and body or the erupting of

a disease from an inadequate diet. Livingston (1971) concluded that malnutrition was just one manifestation of a more general problem, limited financial resources.

The Health and Nutrition Examination Survey (1972) revealed that body measurements differ among children of income groups above the poverty level, in that they were taller, heavier, and had greater median tricep skinfold thickness than children in the lower income group of corresponding age and sex groups. The anthropometric data in children and youth revealed very small differences in height and weight between white and Negro groups, but larger differences in two skinfold measurements. The skinfold data indicated relatively greater leanness in Negro children and youth.

The Ten-State Survey (1972) pointed out that children from lower income families were more frequently undersized. There were more underweight children in the younger age groups and in black children generally. Persons in the high-income-ratio state were generally taller and heavier and had larger skinfold measurements than persons of the same race in the low-income-ratio state. Comparisons between blacks and whites indicated that black children were generally taller although not heavier than white children of comparable age.

Debry (1973) stated that malnutrition may be the result of a lack of knowledge concerning an adequate diet, principles of management, or principles of cookery. The individual is motivated to eat by a number of conscious and subconscious factors, some of which are deeply rooted in traditional social and religious customs.

Much has been written about hunger and malnutrition and the need to step up health measures through education, agriculture, and food policies. The world is rich but not making good use of the wealth close at hand. Millions live in the shadow of chronic hunger and malnutrition, while others eat too much and are thus malnourished in a different sense. Hunger and malnutrition are firmly related in patterns of nature, culture, and food availability, as well as in socioeconomic conditions.

Hunger is a symptom of poverty. The poor have practically no bargaining power in the working world. Unskilled and uneducated, they are the most easily replaced workers (Livingston, 1971). Recent studies (Devadas, 1970; Debry, 1973) have traced the causes of malnutrition to poverty, ignorance, traditional beliefs, and unhygienic and unsanitary conditions. Insufficient use of low-cost and easily available foods, waste of foods and nutrients through unsatisfactory and improper cooking methods, undesirable



food habits, and fads are other factors influencing the poverty segment.

Nutritional Status in the United States

Henderson (1972) made the following statement in a special report discussing "Nutritional Problems Growing Out of New Patterns of Food Consumption":

The nutritional status of our country is difficult because of uncertainties regarding our capacity to: 1) eliminate extreme poverty; 2) educate the consumer to the point where he is sufficiently conscious to eat well; and 3) develop realistic guidelines and standards for convenience prepared foods and snacks.

According to the 1965 nationwide survey of household food consumption, poor diets were four times as frequent among households with incomes under \$3,000 as among households with incomes of \$10,000 and over (Adelson, 1968). The Health and Nutrition Examination Survey (1972) was designed to analyze data for certain groups considered high risk for malnutrition: the poor, preschool children, women of child-bearing ages, and the elderly. The poor, for the obvious economic reason of lessened ability to obtain needed foods, but also perhaps by the related lack of knowledge of what constitutes desirable diets, are vulnerable to nutritional deficiencies or imbalances. Based on these data, it is evident that poor nutrition is a fact of life for many Americans and is not confined to any age or socioeconomic group.

The mode of life in the United States has changed radically in the past generation. While the United States produces an overabundance of food, many Americans suffer from improper diets. In an effort to overcome poor eating habits and to improve nutritional knowledge, much research is being done to take a closer look at the problem. The Ten-State Nutrition Study (1972) was designed to determine the magnitude and location of malnutrition and related health problems in this country. There was evidence that many persons made food choices that led to inadequate diets and to poor use of the money available for food. In particular, many households seldom used foods rich in vitamin A. Also, there was a heavy emphasis on meat in many diets, rather than the use of less expensive but excellent protein sources such as fish and poultry, or legumes and nuts. Van DeMark and Underwood (1971) pointed out in their study that Negroes consumed more meat than did Caucasians. All family members of both races had low intake of foods in the vegetable and fruit groups.

Preliminary results of the first Health and Nutrition Examination Survey (1972) state that iron was the nutrient most often found to be below recommended allowances in the diets of the people in the United States. Calcium and vitamins A and C were nutrients also found to be below recommended allowances. This report presented data on

dietary intake and biochemical tests obtained to assess the nutritional status of the United States population, ages one through 74 years. It is the first of several preliminary reports of results obtained in the Nutritional Examination Survey (HANES, 1972). Men, ages 18 to 44 years, were the only age-sex group to show mean dietary intakes of over 100 per cent of the recommended allowances for the nutrients investigated. Evidence of low iron intake levels was supported by results of biochemical tests for iron status--blood hemoglobin, hematocrit, and transferrin saturation. Low hemoglobin and hematocrit values for adults were most prevalent among blacks in the lower income group.

In 1965, a nationwide survey of the food consumption of households in the United States found the nutrients most often below recommended amounts were calcium, ascorbic acid, and vitamin A (Adelson, 1968). Somewhat fewer diets met the recommended allowances for calcium, vitamin A, and ascorbic acid in 1965 than in 1955. Fifty per cent of the diets were rated "good," about 20 per cent were rated "poor," and 30 per cent ranged between good and poor (Adelson, 1968). In a study of Mexican-American migrants in the Lower Rio Grande Valley of Texas conducted by Larson, Dodds, Massoth, and Chase (1974), vitamin A deficiency was the most prevalent nutritional problem.

Investigations of Duyff, Sanjur, and Nelson (1975) have pointed to food habits of 75 Puerto Rican American teenagers in Chicago. Ethnic food patterns made significant contribution to the diet. Vitamin C intake was higher than that noted among most teenage populations in the United States. Traditional patterns also provided substantial amounts of calcium and iron. Vitamin A levels were much lower owing to the typically low consumption of vegetables. Intakes of low-nutritive and high-calorie snack foods were prevalent among the sample population.

The Ten-State Nutrition Survey (1972) reported a substantial number of children and adolescents with caloric intakes below the recommended allowances. Poor dental health associated with a low level of dental care was encountered in many segments of the population. In adolescents it was found that between-meal snacks of high carbohydrate foods such as candies, soft drinks, and pastries were associated with the development of dental caries. Young people in all subgroups had a high dietary intake of vitamin A. Riboflavin status was poor among blacks and among young people of all ethnic groups.

Preliminary results in the first Health and Nutrition Examination Survey (1972) found that dietary intakes considered "inadequate" were found especially in children aged one to five years, and in adolescents. There was a

high incidence of low transferrin saturation values (i.e., iron-binding capacity was not used up) among children and adolescents, especially among black children with low-income families.

Sabry, Ford, Roberts, and Wardlaw (1974) studied dietary patterns of mothers with young children and reported almost half of the diets were classified as "good." However, in the 26 diets falling below the recommended allowances, calcium and iron were the nutrients most frequently below recommended levels. Certain family characteristics, such as locality of residence, income, and cultural factors, influenced the mother's own assessment of the dietary pattern of the preschool child.

Few studies have dealt with the food problems of the physically handicapped in today's society. An investigation by Garton and Bass (1974) compared 73 deaf students, 12 to 20 years of age, from the Tennessee School for the Deaf with 93 junior and senior high school students with normal hearing from Knoxville. Food preferences of the deaf were similar to those with no hearing problems, with green, red, and yellow vegetables rating the lowest in preference. The low popularity of these vegetables suggests possible low intakes of good sources of vitamins A and C that are often lacking in the diet.

The Ten-State Nutrition Survey (1972) also showed obesity as a nutritionally related problem of significant health concern because of its association with increased rates of diabetes, certain cardiovascular diseases, and other chronic diseases. Obesity was found to be most prevalent in adult women, particularly black women. Men were less frequently obese, although white males in both the adolescent and the adult age groups had a relatively high prevalence of obesity when compared with black males.

Overeating and eating the wrong foods are partly responsible for the steady rise in obesity. The second preliminary report of the nutritional status of the United States population of ages one to 74 years from the Health and Nutrition Examination Survey (1972) revealed that white men, ages 20-29 years, were more obese than Negro men in the same age group. White and Negro men in the 20-29 age group were more obese than their counterparts in the 45-74 age group. Negro women, ages 20-44, were more obese than white women of this age group. Income level appeared to be associated with the prevalence of obesity. With one exception, in the subgroups studied, men in the income group above poverty level had a higher percentage of obesity than those in the lower income group.

Wakefield and Miller (1971) found that weight was an obsession with female college coeds. The older person

is concerned about health and the younger person with appearance. Data indicated that the average-weight group did not include in their diets 75 per cent of the basic food groups, and their knowledge of the basic food groups was generally lacking. All groups limited their consumption of bread and cereal, and one-tenth of the respondents did not drink milk.

The Food and Drug Administration reports that in the past 64 years the food habits of Americans have changed. Two differences are the consumption of less roughage and the increased use of fats, sugars, and refined foods in the diets. It is believed that deficiency in fiber-rich foods may be associated with obesity, diabetes, and heart disease. Foods considered high in fiber are fruits, vegetables, whole-wheat products, beans, and peas.

#### Factors Influencing Food Choices

Nutrition, the science of food as used by plants and animals, denotes the vital process of changing food into everything that contributes directly to the biological structure and functioning of the individual. For man, nutrition also is essential to physical well-being and to social development. Livingston (1971) states that food habits are formed by both objective and subjective factors. Objective factors include physical, biological, and

technological influences. Physical availability of food is influenced by food preservation, food production, food preparation, and material influences. The subjective factors include cultural, societal, and psychological influences.

Food choices may be influenced by such life style indicators as age, family composition, residence, employment, education, and social participation in the community. In attempting to alter or improve food habits, it is necessary to understand the symbolic aspects of food to the individual over and above its nutritional value, as well as the past and present food habits of man's culture and ethnic group.

Debry (1973) pointed out that the process of taking food is associated with various sensations, such as satisfactions or dissatisfactions, and feelings of security or insecurity. The variety of food now available has caused growing interest in the limitations and capabilities of human taste and the psychological and sociological factors affecting food choices. Flavor of food is elusive in character; it can best be defined as a mixture of odor and taste. All five senses--sight, touch, hearing, taste, and smell--are involved in the overall perception of flavor.

Nutritional needs are by no means the only consideration with regard to human well-being. Indeed, the



act of eating cannot be considered in isolation but is related to many other factors. In an investigation of factors influencing individual choices of food, Cosper and Wakefield (1975) reported that approximately 50 per cent of the women questioned reported they ate a given meat product because their family preferred it. Approximately one-third ate certain vegetables, bread, dairy products, and desserts because of family preferences, but personal preferences influenced more women than other family members to select the fruit they ate most frequently. Social influences cause people to consider opinions of others when selecting food.

Brown (1967) describes the food preferences of 101 university students. The study gives evidence that dislikes of a certain food can be traced to being forced to eat it. On the other hand, 14.5 per cent of the freshmen and 25.6 per cent of the upperclassmen attributed their ability to eat a variety of food to the parental policy of eating at least one spoonful before passing judgment.

According to a study of adolescents by Schorr, Sanjur, and Erickson (1972), approximately 10 per cent of the teenagers listed as their most liked foods soda pop, milk, steak, hamburgers, pizza, chicken, French fries, ice cream, spaghetti, orange juice, corn, candy, roast beef, egg, ham, pie, pork chops, apples, bread, frankfurters,

oranges, coke, peas, cheese, and cereal. None of the well liked items is a rich source of vitamin A.

In a study designed to assess nutrient quality of the diets and food practices of the preschool child, Fox et al. (1970) confirmed there is a general reliance on the mother in making food selections. Schorr, Sanjur, and Erickson (1972) presented data on a random sample of 118 adolescents from a small school in western New York State. The adolescent's diet increased significantly in quality with an increase in the father's or the mother's occupational level, mother's educational level, and the extent of the adolescent's social participation and employment, but was not related to age, sex, or family size of the adolescent. The nutritive intake of the adolescent male was considerably superior to that of the female.

Parrish (1971) reported that 16 per cent of the adults in his study habitually skipped breakfast, 20 per cent omitted lunch, and 11 per cent voluntarily skipped the evening meal. Van DeMark and Underwood (1971) conducted a study of dietary habits of teenage families. Data revealed that each member of the teenage Caucasian families consumed more milk than did corresponding members of the teenage Negro families. These findings are in agreement with other recent studies. Van DeMark et al. (1971) note that husbands and wives of teenage Caucasian and Negro races consumed

less than half of the milk recommended and had low intakes of food in the vegetable and fruit groups. These indications support the need for mothers to provide the family with adequate foods rich in calcium, riboflavin, ascorbic acid, and carotene.

Diets in the United States have strayed from the common pattern of three "square" meals a day. The many light meals and snacks are often high in empty calories. Cosper et al. (1975) pointed out that women surveyed averaged 2.7 meals a day. Seventy-two per cent ate three meals a day; 26 per cent ate fewer than three meals a day. Breakfast was eaten daily by 65 per cent, lunch by 70 per cent, and dinner by 93 per cent of the respondents.

Livingston (1971) pointed out that an increasing number of meals are eaten away from home. Also, many families eat few meals together. These changes contribute to a de-emphasis of homemaking and food preparation. An increasing number of family members are encouraged to make their own food choices at an early age. By 1980 it is predicted that 35 billion dollars will be spent on meals taken outside the home (Henderson, 1972). The U. S. Department of Agriculture, Office of Communications (1973), reported that in 1972 nearly 27 billion dollars was spent on food eaten away from home.

Literature supports the conclusion that all systems in which an individual grew up and lives are associated with his diet. Income, education, occupation of parents, size of family, employment of the mother, and arrangements for child care when the mother is employed are some of the influencing factors on the individual (Fox et al., 1970). Values express themselves in terms of choices made by individuals, as being part of that environment where choices occur all the time. Henderson (1972) stated that poverty and ignorance continue to be major reasons for inadequate diets. In dealing with the nutritional deficiencies of this country, focus should be centered on low-income groups. The short supply of nutrients in today's society may stem from inability to pay or to make wise choices.

Through two centuries in Texas, food habits have been established under strict limitations of food availability, both with regard to kind and amount. Only with the diversification created by modern agricultural and industrial technology has the choice between alternatives become real. Improvement in nutritional status depends on daily decisions of the individual regarding his eating habits. It is essential that the individual learn to make wise choices from a wide variety of available foods. Changing food habits is a slow and difficult process.

The Importance of Nutrition Education

Home economics educators have been challenged by Devadas (1970) to keep home economics abreast with today's societal demands by viewing the American society as a whole and responding to the needs of people in program planning and in teaching. Nutrition is one of the areas that needs greater emphasis, particularly for the home-maker. There is a need for a better understanding of how food habits are formed and how habits, once well-established, can be modified.

Sliepcevich (1971) states that food means different things to different people. To some it may serve as a mood-modifying substance to help alleviate feelings of boredom, loneliness, insecurity, tension, frustration, or sorrow. Sliepcevich (1971) and Devadas (1970) agree that food is a common or pleasurable denominator for celebrations, holidays, and rituals, and is an expression of gratitude, friendship, and love.

Schaefer (1969) stated that adequate nutrition means the physiological utilization of essential nutrients in the amount and balance necessary to sustain optimum physical and mental function. Debry (1973) noted that nutrition is influenced by many closely related factors. Freedom of choice in food habits varies according to the circumstances in which a person is born or lives.

For the best results in improving knowledge and dietary habits, beginning nutrition education in the early grades was the recommendation of Head (1974), food scientist at North Carolina State University. In a five-month study of 4,700 students, nutrition education was introduced in two elementary schools, two junior high schools, and one senior high school. The purpose of the study was to evaluate the influence of nutrition education on acceptability and consumption of school-served food, dietary habits, and knowledge of nutrition. Classes selected for the nutrition program were from the fifth, seventh, and tenth grades with an average class size of 26 students. Control data were obtained from five matched schools in the same geographical area. Findings revealed that all fifth grade classes and one seventh grade class significantly improved their knowledge of nutrition as measured by cognitive tests. Three-day dietary recall data indicated that diets of seventh graders improved significantly after nutrition education while the fifth grade groups showed a marked improvement in the diets of both experimental and control students. The amount of change decreased progressively at higher grade levels.

Al-lsi, Kanawati, and McLaren (1975) stated that whenever poverty prevails nutrition education may be a decisive factor in preventing malnutrition in the sense

that better nutrition knowledge may help people get the maximum benefit from the little money they have. This study investigated the relationships between formal education of mothers in Bourj al-Barajneh, a suburb of Beirut, Lebanon, and their nutritional knowledge, nutritional practices, and the growth pattern of their children. The mothers with up to five years of schooling were not better, in either their knowledge or practices of nutrition, than illiterate mothers. This suggests that the primary curriculum in Lebanon offers little nutrition information. It was also noted that mothers with up to nine years of schooling were still very deficient in knowledge and poor in practices, especially in those areas related to infant feeding.

In an Interagency Committee report on Nutrition Education, McFarland (1973) pointed to a lack of motivation as responsible for much of the poor nutritional habits found among many of today's adolescents. McFarland explained the nutrition-motivation problem in the following way:

We all recognize, I'm sure, that motivation is equally as important as nutrition education and offers a problem that is even more difficult to solve . . . Some people obviously are malnourished because they can't afford to buy the necessary foods; this is an economic problem. Some people are malnourished even though they have money; they don't know what to buy. This is an educational problem. But many people are malnourished even though they have the money and know what to buy; they don't care about good nutrition. This is a motivational problem.

Consumer Shopping Practices

A recent study by the Agricultural Experiment Station (1972) revealed that food shopping in the marketplace was more work for nonwhite than for white shoppers. Forty-one per cent of the shoppers with the lowest level of satisfaction with their role performance were nonwhite, whereas only 15 to 21 per cent of the shoppers with above average levels of satisfaction were nonwhite.

Goodman (1968) surveyed a low-income area in Philadelphia in which there were no large or modern food retailing facilities. Approximately 92 per cent of the 520 families interviewed did their principal grocery shopping outside their neighborhoods at small independent stores to avoid high prices. With respect to mode of transportation, approximately 45 per cent of the sample used the automobile, 14 per cent used public transportation, and the remainder walked to the store.

Kunreuther (1973) undertook a study to determine if the poor pay more because of buying practices related to size-effect. The findings supported the hypothesis that the poor may pay more because constraints force them to buy smaller sizes on a more frequent basis than middle-income shoppers. The problems of a limited budget and inadequate storage space did restrict the size of an item purchased by the poor. Less than 15 per cent of middle-income families



in the study shopped at small neighborhood stores while more than 60 per cent of the low-income families did a major portion of their shopping at the small grocery.

Boone and Bonno (1971), in their report on food buying habits of the urban poor, found that low-income families do pay more for food purchases when they shop at small neighborhood stores. The respondents were aware of the consequences of shopping at the small neighborhood stores; however, neighborhood stores furnished residents a variety of services not offered by chain stores, such as credit and delivery service.

In 1971, a study by Samli and French found that 54.4 per cent of a group of 75 families chose to shop at one particular store because of transportation difficulties. The families had no choice but to patronize the most conveniently located store. The study was based on data gathered from a food program serving two southwestern Virginia counties which were heavy farming areas with sparse population. All of the participating stores for food stamp recipients had higher prices than nonparticipating supermarkets. The small stores had a price differential as high as 9 per cent. These data support other studies showing that the poor do indeed pay more. The rural poor paid an average of 3.5 per cent more to obtain the same groceries as might be obtained in the base stores.

Berry and Solomon (1971) found the low-income Mexican-Americans of Denver were inclined to shop at large supermarkets and to travel the necessary distance to get there. This finding is in general agreement with a study by Goodman (1968), who found that 81 per cent of the low-income families surveyed in Philadelphia did their principal grocery shopping at chain supermarkets, all of which were outside the survey area.

Low-income Mexican-Americans shopped for food on the average of twice a week and spent significant sums as a result of such shopping trips (Berry et al., 1971). Specifically, the average number of times respondents shopped per week was 1.85, with 35 per cent of the sample shopping just once a week. The majority of consumers did not appear to be characterized by shopping immobility due to lack of transportation. Also, the low-income Mexican-Americans studied by Berry et al. placed a great deal of emphasis on relatively low-cost, fresh, staple items rather than on frozen, prepared, or more expensive items.

#### Expanded Nutrition Program

To best meet the needs of homemakers enrolled in extension educational programs, the extension agent should have an understanding of the attitudes of the homemakers which relate to food habits and food consumption practices.

The extension service conducts foods and nutrition classes for women to provide opportunities for learning the principles of nutrition and meal management in feeding the family. To teach successfully a need exists to investigate factors which influence the homemaker in formulating or in altering ideas about nutrition practices.

In a majority of households women are responsible for meal planning, food purchasing, and food preparation. These responsibilities are most important functions for the nutritional well-being of the family members. A study conducted by Pearson (1973) revealed that 80 per cent of the homemakers reported that, in their judgment, their families obtained nutritionally adequate meals. But data showed that only 62 per cent of all household members had a week-day food intake that included items from all four food groups. Inadequate consumption of milk and milk products and dark green and deep yellow vegetables were principal problems in the daily intake of households.

Epprawright, Fox, Fryer, Lamkin, and Vivian (1970), in a study of meal frequency, found that 40 per cent of the mothers regarded planning meals that are appealing, quickly prepared, and economical as a chore. Forty-six per cent considered preparing food three times a day every day of the year monotonous. Epprawright et al. concluded that homemakers needed more training on skills in food preparation.

In early 1969 the Cooperative Extension Service of Texas received a special fund from the federal government to expand its work in nutrition education to more effectively reach low-income families. The Expanded Nutrition Program was launched at this time. The allocation of the federal funds to the states is based on size of the limited-income population. The same approach was followed in selecting locations for the Expanded Nutrition Program in Texas. All counties in the state, with a few exceptions, having over 12,000 of their population classified as "poor" were given top priority.

Twelve pilot counties were chosen to participate in this effort on the basis of the number of poor residing in the county, the concentration of poor in urban areas, and the ability of extension staff members to take on the responsibility of the program. The following counties were included: Lubbock, Dallas, Smith, Cass-Marion, El Paso, Tom Green, McLennan, Travis, Bexar, Harris, Hidalgo, and Cameron.

In 1971, in a third category of counties, one program assistant and seven aides were made available to conduct the program with adults under the direction of the existing extension staff. Counties included in this category are Ellis, Navarro, Hunt, Gregg, Williamson, Falls, Angelina, Rusk, Cherokee, Anderson, Houston, Victoria,

Guadalupe, Fayette, DeWitt, Atascosa, Wharton, Liberty, Orange, Brazoria, Willacy, Starr, Maverick, San Patricio, Kleberg, Gonzales, and Bastrop.

Much of the success of the program has been attributed to the approach being used to reach families. Instead of expecting the poor to go to local centers or agencies for help, the program has gone to them. Homemakers have been taught on a one-to-one basis within the secure environment of their own homes. Paraprofessionals, program aides who are members of the target community, have been chosen to work directly with families.

Many studies have been undertaken to investigate the characteristics of successful aides and the Expanded Nutrition Program. Scores of studies have analyzed instructional programs and materials employed by these aides. One such investigation was conducted by Spindler, Jacobson, and Russell (1969) on action programs to improve nutrition. Qualifications for selection of program aides were developed. The following set of standards was developed for choosing aides.

- Empathy and compassion for low-income families.
- Keen perception and appreciation of various values and standards in our society.
- Demonstrated ability to work with people.
- Maturity and flexibility; receptiveness to new ideas and acceptance of supervision from professional staff.
- Enthusiasm, and willingness to work, even when results are minute and delayed.

Acceptable standards in homemaking skills.  
Educational background necessary to understand and follow training and policies required for conducting an educational program on this level.

Although some overall differences were evident in many state programs, greater differences were found in the training being given to the aides. Spindler et al. (1969) stated that a minimum of a three-week induction training is recommended, with at least 15 lessons or about 30 hours training in foods and nutrition. In addition to this induction training, the paraprofessional received in-service training each week. At the weekly training meetings their logs and records were turned in; their problems were discussed; and lessons in food, nutrition, or related subjects, such as sanitation, food selection and buying, and money management were given.

In an effort to define the characteristics and attitudes of an effective paraprofessional, many studies have been conducted. Prichard and Smith (1975) conducted a study to examine the work-oriented attitudes of aides in the Expanded Nutrition Program and the attitudes of clients toward the aides. Since the attitudes of clients might be reflected in those of paraprofessionals, Prichard et al. found that for the 76 questionnaires returned 96 per cent of the respondents indicated that the aides were friendly. None checked that the aide was bossy. The items "she

listened to my problems," "she understood my problems," and "she knows how to help me" were checked by 63 per cent, 68 per cent, and 70 per cent, respectively.

Ways in which clients indicated being helped by aides were: "planned meals" (75 per cent), "showed me how to prepare some recipes" (62 per cent), "shopping for food to save money" (59 per cent), "helped me be a better housekeeper" (30 per cent), "helped me gain confidence in myself" (28 per cent), "getting children enrolled in free lunch or breakfast" (25 per cent), "getting food stamps" (18 per cent), "getting food help from another agency" (11 per cent) (Prichard et al., 1975).

An approach used to determine the effectiveness of the Expanded Foods and Nutrition Educational Program in Louisiana was discussed in a study by Verma and Jones (1973). The purpose of the study was to observe differences in the dietary levels of homemakers reached through visits, meetings, and a combination of home visits and group meetings. Homemakers enrolled in the nutrition educational program were studied according to three learning exposures. Group one, the homemakers who were to receive instruction in the home visit approach by the aide, would not attend a small group meeting. Group two, the homemakers who would receive instructions from the aide in small group meetings, would not be visited individually by the aide.

The third group, called the visit-meeting group, consisted of homemakers who would receive instructions both in their homes and in small group meetings. Verma et al.(1973) reported that diets of low-income homemakers in Louisiana met recommended daily allowances in the meat group, but were below recommended levels in milk and milk products, fruits and vegetables, and breads and cereals. The results substantiated the hypothesis that consumption levels increase early in an educational program, then reach a plateau, and hold at that level with only minor variations. Generally, the greatest change in consumption occurred during the first two months of the program. The next largest change occurred during the second two-month period, after which there was a definite "leveling off" of consumption. From the beginning of the program to the end of the 12-month period, homemakers who received home visits increased their consumption of milk and milk products and fruits and vegetables to a greater extent than did homemakers who attended meetings.

The Verma et al. study (1973) showed that with an increase of home visits with the homemaker, there was a significant increase in the levels of consumption of milk and milk products and breads and cereals. However, an increase in the small group meetings with the homemakers did not result in significant increases in consumption of milk



and milk products and breads and cereals. It would appear, therefore, that some nutritional advantage could be gained for the increased consumption of milk and milk products and breads and cereals by increasing the frequency of home visits over that of group meetings with the homemakers.

In a nationwide study conducted to evaluate the impact of the Expanded Nutrition Education Program on low-income families (1972), the records of 10,500 families from 135 sample units were analyzed. The average monthly family income was \$221 of which \$76, about one-third, was spent for food. Families with monthly incomes of less than \$100 spent less than \$35 per month for food, whereas those with incomes of \$400 and more spent in excess of \$120.

Wang and Ephross (1970) compared the educational tasks of the aide when evaluating the dietary practices of the homemakers. A total of 119 homemakers, 69 from Carolina County and 51 from Allegany County, Maryland, were selected at random sampling for the final evaluation. Three interviewers in each county were recruited and trained to administer the questionnaire to the homemaker during January, 1970. As a second source of data, the aides were asked to fill out a written questionnaire regarding their work with each program family included in the sample. The third source of data included tape-recorded group interviews with all aides in the county.

Wang et al. (1970) summarized the perceptions of the homemaker. Nearly all of the homemakers felt that the Expanded Food and Nutrition Program had been helpful to them and that the majority of the help had been with nutritional practices, including food buying and use of the food stamp program (90 per cent for white homemakers and 97 per cent for black homemakers). Seventy-three per cent of the homemakers could specify a new food they had learned about from an aide. Homemakers were asked what they had prepared for their families for three meals of the previous day. Only 57 per cent of the meals could be judged as well-balanced or fairly well-balanced. Of these, 39 meals or 11 per cent had been missed. While the majority of the missed meals were lunches, in four cases the family had not eaten supper the night before. It was found that 57 per cent of the white homemakers and 74 per cent of the black homemakers looked forward to the aide being helpful to them in the future. Homemakers expressed a need for help in areas other than nutrition. When homemakers were asked how well they thought their families would be doing five years hence, 75 per cent of the blacks and 58 per cent of the whites looked to the future with hope.

In a study of 128 homemakers enrolled in the Expanded Nutrition Program in California, Ikeda (1975) found that homemakers wanted to know how to stretch meager food budgets

to feed their families. Secondly, under the topic of "food preparation," the homemakers wanted help with cooking and recipes. The third ranking item was "meal planning"; homemakers wanted to know how to plan meals to fit within their budget and to meet the family's nutritional needs.

Expressed nutrition information needs of the homemaker should be considered in nutrition education program planning. By examining data from nutrition status studies, and by investigating the expressed nutrition needs of the homemaker, nutrition educators may be able to develop new approaches that will be successful in improving people's food habits.

The literature confirms that there is hunger and malnutrition in our land and that nutrition educational programs are needed. Leverton (1967) refers to various nutrition educational programs underway to combat malnutrition and to raise the nutritional status of American families.

Spindler et al. (1969) reported that the services rendered by 4,000 home economists of the Extension Service have been expanded with the addition of 5,000 Extension Paraprofessionals who are helping approximately 200,000 poor families to improve their diets. About half of the county home economists in extension are presently involved in the Expanded Nutrition Program. County staff members

working in the Expanded Nutrition Educational Program assume the major responsibility for training the paraprofessionals. However, state extension staff members and representatives of local or county agencies and organizations also give some of the training.

Wang et al. (1970) related these facts concerning how aides felt about their jobs. The primary expressed need was for more training in areas other than nutrition. Aides requested more lesson plans on management of housekeeping jobs and more related to how to help both in knowledge and in skills. Homemakers who acquire sufficient food knowledge and satisfactory consumption practices after participating in the program for a given period of time are dropped from the program. All the aides in this study felt that they were distinctly uncomfortable about this practice. The aides consider this may result in retrogression on the part of the homemakers and see the need for structures within which homemakers can maintain and extend their gains.

## CHAPTER III

### PROCEDURE

This study involved gathering data on the present nutritional status of two groups of homemakers as a basis for planning educational programs based on these findings. The study was conducted with 100 homemakers in Corsicana, Navarro County, Texas.

The overall purpose of this study was to elicit food and nutrition information, nutrition knowledge, nutrition practices, buying habits, and food preservation practices of 100 Navarro County homemakers. The specific purposes were:

1. To compare the homemakers enrolled in the Expanded Nutrition Program and the middle-income homemakers' knowledge and application of (a) nutrition principles, (b) meal planning principles, (c) food purchasing practices, and (d) food preservation practices to the following variables: age, education, and dietary practices.
2. To determine if a significant correlation exists between the meals actually prepared at home and the

frequency of preparing and eating a variety of foods from the four food groups.

3. To ascertain personal and demographic characteristics that may relate to food and nutrition practices of the homemaker.
4. To determine if a correlation exists between Expanded Nutrition homemakers and middle-income homemakers in eating habits (24-hour dietary recall) and family income.

#### The Sample

The sample for the study was composed of 100 homemakers chosen from the Expanded Nutrition Program and from middle-income homemakers participating in Extension Service educational programs. Homemakers enrolled in the Expanded Nutrition Program were randomly selected from some 285 homemakers enrolled in the program. Homemakers for the study were personally contacted by the investigator. Only the first 50 homemakers who responded without reservation were invited to participate in the study.

The sample of 80 middle-income homemakers, selected at random from records in the County Extension office, was mailed letters requesting their assistance with the study. Fifty-one homemakers returned cards stating that they would complete the questionnaire. The homemakers were mailed a questionnaire to be completed in the home. A stamped

envelope was included for returning the completed questionnaire.

### Instrument for the Study

A structured questionnaire was developed by the author to collect data for the study. This instrument was designed to cover nutrition principles, meal planning, food preservation practices, food buying and food preparation, and a food frequency checklist. (See Appendix.)

The first section was made up of demographic information. The second section was composed of multiple-choice type questions. The third section was a frequency count with the homemaker checking the food served either "daily," "3 or 4 times weekly," "once or twice weekly," "less frequently," or "never." The fourth section of the questionnaire was to be filled in by the homemaker summarizing food preservation practices.

The 24-hour dietary recall was used to evaluate the dietary practices of the homemaker in feeding the family for a one-day period. The inventory containing 20 tasks on food buying practices gave the homemakers an opportunity to respond in writing to the list in four ways: "always," "sometimes," "seldom," or "never."

Upon completion of the formulation of the instrument, a pilot study was carried out by the County Extension

Agent in Waco, Texas. Twenty homemakers took part in the study administered by the agent in Waco.

#### Collection of the Data

Data were collected personally by the researcher using home visits to 50 homemakers enrolled in the Expanded Nutrition Program. The purpose of the research was explained to each respondent and it was emphasized that the questionnaire was not a "test" and results would not be given out to anyone. Eighty middle-income homemakers were mailed questionnaires and a stamped envelope to return the completed material. This method allowed the investigator to have 100 per cent return. The homemakers for the study were from various ethnic groups and differed in educational levels.

A two-month period was allowed to complete the interviews. Compilation of the data assures that no family is personally identifiable in the research report.

#### Techniques of Data Analysis

Statistical methods employed in the study of food habits and dietary practices consisted of a simple Pearson Product-Moment Correlation Coefficient. Pearson's method was used to test significance of the selected variables.

A frequency and distribution count was used to provide some insight into the practices and traits of the



homemakers and to analyze the relationships between characteristics of the homemakers and food consumption behavior. Food preferences were analyzed through an item analysis. which provided comparisons with the use of percentages.

CHAPTER IV  
PRESENTATION OF DATA WITH ANALYSIS  
AND DISCUSSION

This study was designed to investigate food habits and dietary practices of enrolled Expanded Nutrition homemakers and middle-income homemakers in Navarro County. Five categories of needed information were requested in the questionnaire constructed by the investigator. The first section requested demographic information. The second section included multiple-choice questions. The third section was a frequency count with the homemaker checking each of the foods listed as to the frequency of serving. The homemaker checked either "daily," "three or four times weekly," "once or twice weekly," "less frequently," or "never." The fourth section of the questionnaire was to be completed by the homemaker summarizing food preservation practices.

The 24-hour dietary recall was used to evaluate the dietary practices of the homemaker in feeding the family for a one-day period. Responses to buying practices were "always," "sometimes," "seldom," or "never." Values of one to four points were assigned to the responses, with "always" being assigned the highest value.

Subjects were selected by the random sample procedure. Each group was composed of 50 homemakers in the Corsicana, Navarro County area. Certain variables, namely, age, marital status, number in the family, ethnic group, employment, income, and education were studied in relationship to the five sections of the questionnaire.

#### Characteristics of the Respondents

Six socioeconomic factors were used in describing the homemakers. These were age, education, marital status, number in the family, sources of income, and total monthly income. Knowledge of food preparation, preservation, and food buying practices of the homemaker were also determined.

#### Age

Participants ranged in age from 19 to 50 years or more (table 1). Homemakers in the middle-income group had three age groups represented: 20 per cent were 20 to 34 years old; 44 per cent, 35-49 years old; and 36 per cent were 50 years of age or older. No homemakers were under 20 years of age in Group I. In Group I, 20 per cent were Negro, 78 per cent were white, and 2 per cent Mexican-Americans. A higher percentage of the homemakers were 35-49 years of age.

TABLE 1

AGE, RACE, AND MARITAL STATUS OF TWO GROUPS OF  
HOMEMAKERS IN NAVARRO COUNTY

Characteristics of Homemakers	Homemakers			
	Group I Middle- Income (n=50)		Group II Expanded Nutrition (n=50)	
	Num- ber	Per Cent	Num- ber	Per Cent
<u>Age</u>				
20 years	0	0.00	3	6.00
20-34 years	10	20.00	12	24.00
35-49 years	22	44.00	15	30.00
50 years or more	18	36.00	20	40.00
<u>Race</u>				
Negro	10	20.00	44	88.00
Mexican-American	1	2.00	2	4.00
White	39	78.00	4	8.00
<u>Marital Status</u>				
Married	48	96.00	28	56.00
Widowed	2	4.00	10	20.00
Divorced	0	0.00	2	4.00
Separated	0	0.00	1	2.00
Single	0	0.00	9	18.00

Four age groups were represented in Group II:

6 per cent were under 20 years of age; 24 per cent were 20 to 34 years old; 30 per cent, 35 to 49 years old; and 40 per cent, 50 years old or older. Eighty-eight per cent of the participants were Negro, 8 per cent were white, and 4 per cent were Mexican-American. A higher percentage of the homemakers in Group II were 50 years of age or older.

#### Marital Status

Ninety-six per cent of the respondents in Group I were married and 4 per cent were widowed. On the other hand, in Group II a total of 56 per cent were married; 20 per cent were widowed, and 24 per cent were divorced, separated, or single (table 1).

#### Family Size

Families varied in size from one to nine persons and consisted primarily of parents and children (table 2). Over half of the families had one or two children. Sixteen per cent of the families in Group I and 26 per cent of the families in Group II had three or more children. Over 40 per cent of the families had no children.

When children were present, they were usually six to 19 years old. Very few children were less than three years of age (table 2).

TABLE 2

COMPOSITION OF FAMILIES OF TWO GROUPS OF  
HOMEMAKERS IN NAVARRO COUNTY

Family Composition	Homemakers			
	Group I Middle- Income (n=50)		Group II Expanded Nutrition (n=50)	
	Num- ber	Per Cent	Num- ber	Per Cent
<u>Number of Children</u>				
None	22	44.00	21	42.00
One child	8	16.00	8	16.00
Two children	12	24.00	8	16.00
Three children	6	12.00	7	14.00
Four children	1	2.00	1	2.00
Five children	1	2.00	3	6.00
Six children	0	0.00	1	2.00
Seven children	0	0.00	1	2.00
<u>Ages of Children</u>				
<u>Under Three Years</u>				
None	48	96.00	42	84.00
One child	2	4.00	7	14.00
Two children	0	0.00	1	2.00
<u>Three to Six Years</u>				
None	39	78.00	37	74.00
One child	10	20.00	8	16.00
Two children	1	2.00	5	10.00

TABLE 2--Continued

Family Composition	Homemakers			
	Group I Middle- Income (n=50)		Group II Expanded Nutrition (n=50)	
	Num- ber	Per Cent	Num- ber	Per Cent
<u>Ages of Children, continued</u>				
<u>Seven to 12 Years</u>				
None	30	60.00	33	66.00
One child	16	32.00	9	18.00
Two children	3	6.00	4	8.00
Three children	1	2.00	1	2.00
Four children	0	0.00	1	2.00
Five children	0	0.00	2	4.00
<u>13 to 15 Years</u>				
None	41	82.00	37	74.00
One child	9	18.00	11	22.00
Two children	0	0.00	2	4.00
<u>16 to 20 Years</u>				
None	38	76.00	46	92.00
One child	11	22.00	3	6.00
Two children	1	2.00	1	2.00

### Education of the Homemaker

Two per cent of the participants in Group I indicated an educational level of six grades or less. Twenty-eight per cent completed grades seven to 12; 36 per cent were college graduates; and 34 per cent had advanced college work.

Eighteen per cent of the homemakers in Group II had the educational background level of six grades or less. Seventy per cent were high school graduates or less; 10 per cent were college graduates; and 2 per cent had advanced college work (table 3).

### Employment Status

The dominant occupation of the homemaker was determined. The occupational distribution of Group I homemakers was as follows: 16 per cent, self-employed; 18 per cent, city, state, or federal government jobs; 16 per cent, business or company; 6 per cent, teacher; and 40 per cent, homemaker (table 3).

The occupational distribution for Group II was as follows: 8 per cent, residential employment; 8 per cent, city, state, or federal government jobs; 16 per cent, business or company; 2 per cent, teacher; and 66 per cent, homemaker.



TABLE 3

EDUCATIONAL BACKGROUND, EMPLOYMENT, AND HOUSEHOLD  
INCOME OF TWO GROUPS OF HOMEMAKERS  
IN NAVARRO COUNTY

Factors	Homemakers			
	Group I Middle- Income (n=50)		Group II Expanded Nutrition (n=50)	
	Num- ber	Per Cent	Num- ber	Per Cent
<u>Educational Level</u>				
Grades one-six	1	2.00	9	18.00
Grades seven-12	14	28.00	35	70.00
College graduate	18	36.00	5	10.00
College graduate or more	17	34.00	1	2.00
<u>Employment Status</u>				
Employed	25	50.00	17	34.00
Not employed	24	48.00	33	66.00
<u>Type of Employment</u>				
Self-employed	8	16.00	0	0.00
Residential employment	0	0.00	4	8.00
City, state, or federal government	9	18.00	4	8.00
Business or company	8	16.00	8	16.00
Professional (teacher)	3	6.00	1	2.00
Clerical office	0	0.00	0	0.00
Homemaker (only)	20	40.00	33	66.00

TABLE 3--Continued

Factors	Homemakers			
	Group I Middle- Income (n=50)		Group II Expanded Nutrition (n=50)	
	Num- ber	Per Cent	Num- ber	Per Cent
<u>Monthly Household Income</u>				
Less than \$100	2	4.00	13	26.00
\$100-199	1	2.00	5	10.00
\$200-299	4	8.00	11	22.00
\$300-399	1	2.00	11	22.00
\$400-499	4	8.00	6	12.00
\$500-599	11	22.00	4	8.00
\$700-999	2	4.00	0	0.00
\$1,000 or more	18	36.00	0	0.00

### Monthly Household Income

Fifty per cent of the homemakers in Group I were employed and 48 per cent were not employed. In Group II 34 per cent were employed and 66 per cent were not employed. Slightly more than one-third of the families had monthly incomes of \$500 to \$599. However, only four of these homemakers were in Group II, the Expanded Nutrition homemakers. Income was reported in the \$1,000 or more per monthly range by 18 per cent of the families in Group I. Most of the families of Group II had lower incomes than did the families in Group I. A total of 92 per cent of this group had incomes of less than \$500 per month. Fifty-eight per cent had incomes of less than \$300 per month.

### Food Consumption Patterns

In any nutrition program it is emphasized that there is a necessity of eating from the daily food guide, to provide variety in selection of food for good health. The 24-hour dietary recall was chosen to evaluate the diets served to the families for one day.

### Dietary Recall

In order to reach the recommended daily allowance for optimum health, the individual needs two servings from the meat group, two servings from the milk group (adult), four servings from the vegetables and fruits, and four

servings from the bread and cereal group. Only a small percentage of the meals eaten by either group of homemakers were rated as a balanced diet.

Data revealed that 38 per cent of the middle-income homemakers received two or more servings from the milk group, while only 8 per cent reached this level for the homemakers enrolled in the Expanded Nutrition Program (table 4).

Eighty-two per cent of the middle-income homemakers had two or more servings from the meat group as compared to 70 per cent of the Expanded Nutrition homemakers. Fifty per cent of the middle-income homemakers received four or more servings from the vegetable and fruit group, and 22 per cent of the Expanded Nutrition group reported four or more servings.

A total of 42 per cent of the middle-income homemakers and 28 per cent of the Expanded Nutrition Program group had four or more servings from the bread and cereal group. Thirty-six per cent of the Expanded Nutrition homemakers had one serving from the milk group daily; 22 per cent listed four servings from the vegetable and fruit group; and 24 per cent listed three servings from the bread and cereal group.

TABLE 4

NUMBER OF SERVINGS IN EACH OF THE BASIC FOUR FOOD GROUPS  
AS RECORDED IN A 24-HOUR FOOD RECALL BY TWO GROUPS  
OF HOMEMAKERS IN NAVARRO COUNTY

Number of Servings	Homemakers			
	Group I Middle- Income (n=50)		Group II Expanded Nutrition (n=50)	
	Num- ber	Per Cent	Num- ber	Per Cent
<u>Milk Group</u>				
None	13	26.00	28	56.00
One serving	18	36.00	18	36.00
Two servings	19	38.00	4	8.00
<u>Meat Group</u>				
None	3	6.00	3	6.00
One serving	6	12.00	12	24.00
Two servings	41	82.00	35	70.00
<u>Vegetable-Fruit Group</u>				
None	5	10.00	14	28.00
One serving	1	2.00	8	16.00
Two servings	9	18.00	8	16.00
Three servings	10	20.00	9	18.00
Four servings	25	50.00	11	22.00
<u>Bread-Cereal Group</u>				
None	4	8.00	3	6.00
One serving	3	6.00	9	18.00
Two servings	11	22.00	12	24.00
Three servings	11	22.00	12	24.00
Four servings	21	42.00	14	28.00
<u>Other</u>				
None	1	2.00	3	6.00
One serving	11	22.00	18	36.00
Two-three servings	25	50.00	23	46.00
Four or more servings	13	26.00	6	12.00

### Meals Served at Home

Data revealed that 80 per cent of the participants in Group I and 62 per cent in Group II prepared breakfast for all family members. The noon meal was prepared by 62 per cent of the middle-income homemakers as compared with 46 per cent of the Expanded Nutrition homemakers (table 5).

Ninety per cent of the middle-income homemakers prepared the evening meal for all family members as compared with 72 per cent for the Expanded Nutrition homemakers. Snacking tended to be practiced by both groups. Forty-two per cent of the middle-income homemakers prepared snacks for all family members. Forty per cent of the Expanded Nutrition homemakers prepared snacks for all family members.

### Frequency of Serving Selected Foods

Consumption frequencies of a single food for an individual were characterized by five degrees of responses: "served daily," "three or four times weekly," "once or twice weekly," "less frequently," or "never." A total of 82 foods were listed in the questionnaire. The responses are shown in tables 6 through 10.

The most frequently served food items for the respondents were fresh milk and butter or margarine. Foods served daily were lettuce from the list of vitamin A food sources; white bread, prepared cereals, cornbread, and whole

TABLE 5

MEALS PREPARED IN THE HOME AS REPORTED BY TWO GROUPS  
OF HOMEMAKERS IN NAVARRO COUNTY

Meals Prepared in Home	Homemakers			
	Group I Middle- Income (n=50)		Group II Expanded Nutrition (n=50)	
	Num- ber	Per Cent	Num- ber	Per Cent
<u>Breakfast</u>				
No response	3	6.00	3	6.00
Self only	7	14.00	16	32.00
All family members	40	80.00	31	62.00
<u>Noon Meal</u>				
No response	10	20.00	17	34.00
Self only	9	18.00	10	20.00
All family members	31	62.00	23	46.00
<u>Evening Meal</u>				
No response	2	4.00	4	8.00
Self only	3	6.00	10	20.00
All family members	45	90.00	36	72.00
<u>Snacks</u>				
No response	22	44.00	21	42.00
Self only	7	14.00	9	18.00
All family members	21	42.00	20	40.00

wheat bread from the bread and cereal group; oranges from the list of ascorbic acid food sources; and eggs, bacon, and peanut butter from the meat group.

Most of the vitamin A food sources listed were served either once or twice a week or less than once a week (table 6). Cherries, apricots, asparagus, broccoli, and pumpkin were never served by high percentages of homemakers from Group II. Food sources of vitamin A were served more frequently by homemakers of Group I than by homemakers of Group II. The findings in this study suggest that families are not consuming adequate amounts of foods from the fruit and vegetable group. This study is supported by the previous studies by Van DeMark and Underwood (1971) indicating that all family members of both races had low intakes of foods in the vegetable and fruit group.

All adults, and children need citrus fruits, tomatoes, cabbage, and other vitamin C rich foods daily. Foods high in vitamin C most frequently checked in the less than once a week category were as follows: cabbage, grapefruit, oranges, lemons, peppers, strawberries, tangerines, lima beans, raspberries, and cauliflower. Homemakers of neither group had high intakes of vitamin C. However, the homemakers in the middle-income group had better intakes of vitamin C than homemakers in Group II (table 7).



TABLE 6

PERCENTAGES OF TWO GROUPS OF HOMEMAKERS REPORTING THE FREQUENCY OF SERVING SELECTED FRUIT AND VEGETABLE SOURCES OF VITAMIN A VALUE

Food Sources	Frequency of Serving									
	Daily		3-4 times per week		1-2 times per week		Once a Week		Never	
	Group I	Group II	Group I	Group II	Group I	Group II	Group I	Group II	Group I	Group II
Cherries	0	2	0	2	6	6	74	48	20	42
Apricots	0	0	2	4	4	12	66	32	26	50
Asparagus	0	2	0	4	28	10	52	40	18	42
Broccoli	0	2	4	2	42	22	34	30	20	42
Cantaloupe	2	4	2	2	12	18	66	54	16	22
Carrots	2	2	10	20	48	54	34	14	4	8
Collards	0	2	0	10	16	28	46	42	38	18
Corn	4	8	8	18	48	42	38	30	2	2
Lettuce	36	20	39	28	16	26	8	24	2	0
Mustard greens	0	4	2	8	24	34	58	42	16	12
Okra	2	2	2	8	30	30	58	44	8	12
Pumpkin	0	0	0	0	4	8	58	40	38	50
Spinach	0	8	6	10	48	38	38	36	8	8
Squash	0	4	8	8	44	24	42	56	4	8
Sweet potatoes	0	2	4	10	24	30	60	50	12	8
Peaches	0	8	18	14	32	46	48	28	2	4
Turnip greens	2	8	4	8	26	48	54	24	12	12
Snap beans	0	6	18	18	60	34	20	36	2	6
Celery	2	6	18	14	18	22	50	48	8	14
Brussels sprouts	0	0	0	0	22	14	54	32	22	62

Group I = Middle-income homemakers.

Group II = Expanded Nutrition homemakers.

TABLE 7

PERCENTAGES OF TWO GROUPS OF HOMEMAKERS REPORTING THE FREQUENCY OF  
SERVING SELECTED FOOD SOURCES OF ASCORBIC ACID.

Food Sources	Frequency of Serving									
	Daily		3-4 times per week		1-2 times per week		Once a Week		Never	
	Group I	Group II	Group I	Group II	Group I	Group II	Group I	Group II	Group I	Group II
Cabbage	0	2	6	16	38	56	48	16	8	10
Grapefruit	6	12	8	4	26	32	46	36	14	16
Oranges	28	16	26	14	22	30	20	24	2	14
Lemons	6	12	8	6	20	34	62	52	4	2
Peppers (hot or sweet)	6	14	8	14	20	20	48	32	18	18
Strawberries	4	4	2	12	26	30	62	38	6	16
Tangerines	0	0	2	12	18	10	58	44	22	32
Tomato	8	22	40	28	42	32	8	14	0	4
Irish potato	8	20	34	18	48	52	8	12	2	4
Lima beans	2	0	0	2	20	42	68	40	8	14
Raspberries	0	0	0	0	0	8	38	30	10	62
Watermelon	0	10	2	14	8	14	98	50	10	10
Cauliflower	0	0	0	0	24	10	46	34	30	56

Group I = Middle-income homemakers.

Group II = Expanded Nutrition homemakers.

TABLE 8

PERCENTAGES OF TWO GROUPS OF HOMEMAKERS REPORTING THE FREQUENCY OF  
SERVING SELECTED FOODS FROM THE BREAD AND CEREAL GROUP

Food Sources	Frequency of Serving									
	Daily		3-4 times per week		1-2 times per week		Once a Week		Never	
	Group I	Group II	Group I	Group II	Group I	Group II	Group I	Group II	Group I	Group II
Biscuits	14	10	16	20	28	40	40	24	2	4
Prepared cereals	30	54	26	10	24	14	16	16	4	4
Bread-white	60	70	12	10	12	8	10	12	4	0
Bread-rye	4	6	4	0	8	4	56	26	28	64
Bread-whole wheat	22	8	4	6	4	4	44	24	24	54
Cornbread	6	38	14	28	36	20	38	10	2	4
Grits	4	6	6	14	16	18	44	42	28	20
Macaroni	0	6	2	2	54	38	40	50	4	4
Noodles	0	2	0	4	30	34	58	44	12	14
Oatmeal	0	12	16	14	20	28	48	38	16	6
Rice	0	2	16	8	42	60	38	28	2	2
Spaghetti	0	0	2	2	44	48	50	36	2	6

Group I = Middle-income homemakers.

Group II = Expanded Nutrition homemakers.

TABLE 9

PERCENTAGES OF TWO GROUPS OF HOMEMAKERS REPORTING THE FREQUENCY OF  
SERVING MILK AND MILK PRODUCTS

Food Sources	Frequency of Serving									
	Daily		3-4 times per week		1-2 times per week		Once a Week		Never	
	Group I	Group II	Group I	Group II	Group I	Group II	Group I	Group II	Group I	Group II
Fresh milk	76	70	12	8	2	8	2	8	8	6
Non-fat dry milk	6	6	8	10	8	12	30	14	44	56
Canned milk	8	28	12	8	58	8	0	36	16	16
Buttermilk	2	12	8	12	20	16	28	40	32	18
Cheese (cream)	2	10	10	8	10	14	54	46	14	20
Cottage cheese	0	10	6	8	26	18	48	42	10	20
Custard	2	8	0	10	8	18	50	40	30	22
Ice cream	32	20	16	10	34	34	16	30	0	4
Butter-Margarine	86	78	10	12	4	4	0	2	0	0

Group I = Middle-income homemakers.

Group II = Expanded Nutrition homemakers.

TABLE 10

PERCENTAGES OF TWO GROUPS OF HOMEMAKERS REPORTING THE FREQUENCY OF  
SERVING SELECTED FOOD SOURCES OF PROTEIN

Food Sources	Frequency of Serving									
	Daily		3-4 times per week		1-2 times per week		Once a Week		Never	
	Group I	Group II	Group I	Group II	Group I	Group II	Group I	Group II	Group I	Group II
Beans (dry)	2	4	2	16	40	62	54	10	0	8
Roast beef	2	2	8	10	60	64	24	24	2	0
Beef steak	8	4	10	12	64	50	14	28	4	6
Canned beef	0	2	0	4	6	4	36	32	50	58
Beef and vege- table stew	0	0	4	10	24	42	62	30	4	18
Bacon	32	48	14	24	34	16	20	10	0	0
Chicken	2	8	4	32	76	58	16	2	0	0
Eggs	36	60	30	22	26	10	6	6	2	0
Fish	0	4	4	12	44	44	46	36	6	4
Hamburger	0	4	22	22	58	46	16	24	4	2
Lamb	0	2	2	2	2	8	16	20	78	68
Liver	0	0	2	0	18	44	42	38	36	16
Pork	0	0	4	14	30	26	44	40	18	20
Sausage	6	10	8	20	26	36	50	20	10	14
Salmon	0	4	2	6	12	18	52	38	34	34
Tuna	0	8	10	8	40	38	42	40	8	6
Peas (dry)	0	2	0	4	20	42	48	32	28	18
Peanuts	6	4	2	4	6	18	62	38	20	36
Peanut butter	14	16	18	18	38	28	28	24	2	14

Group I = Middle-income homemakers.

Group II = Expanded Nutrition homemakers.

The foods from the bread and cereal group less frequently served by the respondents were as follows: biscuits, rye bread, whole wheat bread, cornbread, grits, macaroni, noodles, oatmeal, and spaghetti. The intake of foods from the bread and cereal group was higher for Group I than for Group II (table 8).

Foods from the milk group most frequently served daily were fresh milk and butter or margarine. Ice cream was served fairly frequently by both groups. Cream cheese and cottage cheese were the food items most frequently served once a week. Non-fat dry milk was never served by 40 per cent of Group I and 50 per cent of Group II homemakers. Buttermilk was never served by 18 per cent of the families of Group II and 32 per cent of Group I. Custard was an item infrequently served by both groups (table 9).

Protein foods served daily or frequently by the homemakers were bacon, eggs, peanut butter, and hamburger (table 10). Served one or two times a week by many homemakers were dry beans, roast beef, beef steak, chicken, fish, and tuna. Over half of each group reported never serving lamb and canned beef. About a fifth of each group reported never serving liver, pork, salmon, dry peas, and peanuts.

Food Preservation Knowledge

The investigation of homemakers' sources of food preservation information revealed that the majority of the homemakers, 42 per cent and 45 per cent, listed their mother as the source. In each case the first percentage listed is for Group I homemakers and the second for Group II. A smaller percentage, 10 per cent, of each group were self taught (table 11).

When asked what methods were used to can fruit, jellies, jams, preserves, green beans, corn, and tomatoes, the majority, 72 per cent and 94 per cent, did not check a method. The boiling-water-bath method is recommended for canning fruits, fruit juices, tomatoes, and pickled vegetables. Ten per cent listed the water-bath method for fruits and tomatoes and two per cent listed the water-bath method for preserving jellies, jams, and preserves. The pressure canner method is necessary for processing all non-acid vegetables in order to prevent possible spoilage and/or botulism. Two per cent of the homemakers listed this method for canning green beans. Homemakers checked the open-kettle method for preserving corn. Open-kettle method is recommended only for jellies. In the open-kettle method the food is cooked in an uncovered kettle and poured into sterilized hot jars. Twenty-six per cent of the

TABLE 11

SOURCES OF FOOD PRESERVATION INFORMATION AND AMOUNTS OF  
FOODS PRESERVED BY TWO GROUPS OF  
HOMEMAKERS IN NAVARRO COUNTY

Factors	Homemakers			
	Group I Middle- Income (n=50)		Group II Expanded Nutrition (n=50)	
	Num- ber	Per Cent	Num- ber	Per Cent
<u>Sources of Information</u>				
Mother	21	42.00	24	48.00
Self-taught	5	10.00	5	10.00
Extension Service	0	0.00	3	6.00
Neighbor or relative	2	4.00	4	8.00
High school class	0	0.00	1	2.00
Other	1	2.00	5	10.00
None	21	42.00	8	16.00
<u>Amounts Preserved</u>				
<u>All Foods</u>				
Pints				
None	41	82.00	45	90.00
1-10	1	2.00	3	6.00
11-30	6	12.00	0	0.00
31-80	2	4.00	2	4.00
Quarts				
None	45	90.00	41	82.00
1-10	2	4.00	3	6.00
11-30	3	6.00	5	10.00
31-80	0	0.00	1	2.00



TABLE 11--Continued

Factors	Homemakers			
	Group I Middle- Income (n=50)		Group II Expanded Nutrition (n=50)	
	Num- ber	Per Cent	Num- ber	Per Cent
<u>Amounts Preserved, continued</u>				
<u>Jam, Jellies, and Preserves</u>				
Glasses (12 oz.)				
None	41	82.00	47	94.00
1-10	5	10.00	0	0.00
11-30	0	0.00	3	6.00
31-80	4	8.00	0	0.00
81-100	0	0.00	0	0.00
Pints				
None	36	72.00	32	64.00
1-10	6	12.00	9	18.00
11-30	5	10.00	3	6.00
31-80	2	4.00	4	8.00
81-100	0	0.00	0	0.00
100 and above	0	0.00	2	4.00
<u>Pickles</u>				
Pints				
None	41	82.00	44	88.00
1-10	4	8.00	3	6.00
11-30	2	4.00	3	6.00
31-80	2	4.00	0	0.00
80-100	1	2.00	0	0.00
Quarts				
None	46	92.00	43	86.00
1-10	1	2.00	4	8.00
11-30	2	4.00	3	6.00
31-80	1	2.00	0	0.00
80-100	0	0.00	0	0.00

homemakers used this method for jelly and 2 per cent for green beans and corn.

The Expanded Nutrition aides stressed the home garden as a potential economical source of food. The study showed that 40 to 48 per cent of the homemakers had a garden, and that 20 to 25 per cent did not have a garden this year.

#### Food Preservation Practices

A campaign was started in 1974 to educate the American public on the hazards associated with microbiological contamination of food. Careless handling of food in the home is a major source of food-borne infection. A very small number of the homemakers, 20 per cent, did can or pickle food at home. Seventy-two to 94 per cent of the respondents in the study did not check the methods for preserving jellies, green beans, corn, and tomatoes (table 11). This fact could be due to inexperience or distrust of the methods they had used. About 48 per cent of the participants practiced freezing foods to contribute to the family food supply (table 12).

TABLE 12

AMOUNTS OF FOODS FROZEN BY TWO GROUPS OF  
HOMEMAKERS IN NAVARRO COUNTY

Amounts of Foods Frozen	Homemakers			
	Group I Middle- Income (n=50)		Group II Expanded Nutrition (n=50)	
	Num- ber	Per Cent	Num- ber	Per Cent
<u>Pounds</u>				
None	27	54.00	37	74.00
1-10	4	8.00	4	8.00
11-30	7	14.00	2	4.00
31-80	3	6.00	4	8.00
81-100	6	12.00	3	6.00
300 and above	3	6.00	0	0.00
<u>Pints</u>				
None	32	64.00	39	78.00
1-20	4	8.00	6	12.00
21-40	5	10.00	2	4.00
41-60	4	8.00	1	2.00
61-80	2	4.00	1	2.00
81-100	3	6.00	1	2.00
<u>Quarts</u>				
None	31	62.00	30	60.00
1-20	10	20.00	12	24.00
21-40	4	8.00	3	6.00
41-60	1	2.00	2	4.00
61-80	0	0.00	0	0.00
81-200	4	8.00	2	4.00

### Food Buying

A major section of this study considered various factors associated with food buying and shopping practices of the family. Results such as these were reported: 96 per cent of the respondents indicated that they shopped at a large supermarket, while 6 per cent shopped at a neighborhood grocery store. Only 2 per cent of the homemakers stated that they shopped at a discount store.

Information concerning the homemakers' buying practices was obtained by listing 17 activities involved in food buying. The responses checked were: "always," "sometimes," "seldom," or "never" (table 13).

For the shopping variable of "having a food budget," 32 per cent of the middle-income homemakers and 42 per cent of the Expanded Nutrition program homemakers always practice setting up a workable budget. Homemakers who never followed a workable food budget were 24 per cent of the middle-income homemakers and 28 per cent of the Expanded Nutrition Program homemakers (table 13).

Eighty-four per cent of the middle-income homemakers and 70 per cent of the Expanded Nutrition Program homemakers indicated always or sometimes using a shopping list. The data revealed that more middle-income homemakers knew the amount of money available for food than did the Expanded Nutrition Program homemakers, 68 per cent

TABLE 13

PERCENTAGES OF TWO GROUPS OF HOMEMAKERS REPORTING THE FREQUENCY  
OF UTILIZING CERTAIN SHOPPING PRACTICES

Shopping Variable	Percentages of Groups							
	Always		Sometimes		Seldom		Never	
	Group I	Group II	Group I	Group II	Group I	Group II	Group I	Group II
Have food budget	32	42	20	24	18	4	24	28
Shop with list	58	36	26	34	10	4	4	26
Know amount money available	68	54	16	14	10	8	4	22
Plan meals before shopping	26	26	58	40	12	8	4	24
Find out best buys	52	48	38	24	8	6	2	20
Check quality and price	72	56	22	24	2	4	4	16
Buy the forms that fit needs	82	78	18	18	0	2	0	2
Read labels, compare prices	82	70	14	18	2	0	2	8
Buy store brand foods	20	36	72	52	4	6	2	4
Buy name brand foods	16	34	76	50	6	10	0	6
Storage for large quantities	60	54	22	22	2	8	12	12
Buy in quantity	58	34	28	24	4	12	8	22
Use food stamps	0	50	0	6	0	42	100	2
Use non-fat dry milk for cooking	16	14	24	22	8	6	46	52
Use non-fat dry milk for drinking	8	10	12	18	10	14	64	50
Buy less expensive cuts of meat	16	52	64	38	4	4	14	4
Buy dry beans, peas, lentils	14	72	64	16	14	4	6	8
Buy cooked cereals	14	62	62	32	12	4	8	0
Buy day-old bread	12	40	42	30	18	8	26	20
Buy day-old bakery goods	12	26	34	14	10	14	42	40

Group I = Middle-income homemakers.

Group II = Expanded Nutrition homemakers.

to 54 per cent, respectively. More of the middle-income homemakers planned meals before shopping than did the Expanded Nutrition Program homemakers.

Fifty-two per cent of the middle-income homemakers and 48 per cent of the Expanded Nutrition Program homemakers always practiced shopping for the best buys. Ninety-six per cent of the middle-income homemakers always, sometimes, or seldom checked for quality and price as compared to 84 per cent of the Expanded Nutrition Program homemakers.

Buying the forms of foods that best fit the family needs was always practiced by 82 per cent of the middle-income homemakers and by 78 per cent of the Expanded Nutrition Program homemakers. For the practice "reading labels," 82 per cent of the middle-income homemakers and 70 per cent of the Expanded Nutrition Program homemakers always practice this variable.

For the shopping variable "buy store brand foods" about 90 per cent of the homemakers in Group I and in Group II always or sometimes bought store brand foods. Ninety-two per cent of the Group I homemakers and 84 per cent of the Expanded Nutrition Program homemakers always or sometimes bought name brand foods.

Eighty-two per cent of the middle-income homemakers and 76 per cent of the Expanded Nutrition homemakers always or sometimes had storage space for large quantities of

food. For the practice "buy in quantity" 86 per cent of the middle-income homemakers sometimes or always bought in quantity. Thirty-four per cent of the Expanded Nutrition homemakers seldom or never bought in quantity.

While none of the Group I homemakers used food stamps, 50 per cent of the Expanded Nutrition homemakers always did.

Homemakers were asked if non-fat dry milk was used for cooking or for drinking. Fifty-four per cent of Group I homemakers and 58 per cent of Group II homemakers never or seldom used non-fat dry milk for cooking. Seventy-four per cent of Group I and 64 per cent of Group II homemakers seldom or never used non-fat dry milk for drinking. Eighty per cent of Group I homemakers and 90 per cent of Group II homemakers always or sometimes buy less expensive cuts of meat.

For the variable "buy dry beans, peas, lentils," 78 per cent of the middle-income homemakers and 88 per cent of the Expanded Nutrition homemakers sometimes or always purchased dry beans, peas, and lentils. About the same percentage of each group also purchased cooked cereals.

Buying day-old bread and bakery goods was practiced sometimes or always by about 50 per cent of Group I homemakers. Seventy per cent of the Expanded Nutrition

homemakers sometimes or always bought day-old bread but only 40 per cent of them purchased day-old bakery goods.

#### Soft Drinks Utilized

The population that utilized soft drinks included 36 per cent of the Expanded Nutrition homemakers and 45 per cent of the middle-income homemakers. Slightly over half of the middle-income homemakers purchased 10 12-ounce containers a week, and over three-fourths of the Expanded Nutrition homemakers purchased 13 12-ounce containers weekly (table 14). No significant trend differences were apparent by income, age, size of family, and education regarding this distribution (table 14).

#### Correlations

The relationship between the selected variables and questionnaire items was analyzed to determine the significance of the obtained coefficients of correlations. Having 50 degrees of freedom, coefficients exceeding .27 were significantly different from zero correlation at the .05 level of confidence for two-tailed tests. Significant correlations indicate that the relationship between the variables concerned is not a chance relationship at the .05 level of significance. Correlations significant at the .05 level are indicated by single asterisks in the accompanying tables.



TABLE 14

RESPONSES OF TWO GROUPS OF HOMEMAKERS IN NAVARRO  
COUNTY REPORTING SOFT DRINK PURCHASES

Purchase of Soft Drinks	Homemakers			
	Group I Middle- Income (n=50)		Group II Expanded Nutrition (n=50)	
	Num- ber	Per Cent	Num- ber	Per Cent
<u>Purchase</u>				
Yes	45	90.00	36	72.00
No	4	8.00	13	26.00
Number of 12 oz. containers a week				
None	10	20.00	17	34.00
Two	2	4.00	3	6.00
Four	4	8.00	2	4.00
Six	10	20.00	13	26.00
Eight	5	10.00	3	6.00
Ten	3	6.00	1	2.00
Twelve	6	12.00	5	10.00
Sixteen	3	6.00	10	20.00
Eighteen	1	2.00	0	0.00
Twenty or more	5	10.00	3	6.00

Variables included in this portion were those pertaining to the knowledge of the respondent concerning the various nutrition facts and principles. Practices of the participants related to food and nutrition were also included. Although there are many structural characteristics of the family, the investigator sought to measure only four characteristics: income, age, education, and family size. The purpose of this section is to assess the relationship of the four measures of family structure and the measures of food decisions of the homemaker.

#### Influence of Income

Table 15 shows the degree of association as indicated by the coefficient of correlation between the homemakers' frequency of serving a particular food and the income of a participating homemaker. The frequency of serving milk was significantly correlated with income for the middle-income group ( $r = 0.36$ ). This indicated that the frequency of serving milk increased as the income of the respondent increased. In the remaining variables pertaining to income and food frequency, correlations were not significant for either the middle-income or Expanded Nutrition Program participants.

TABLE 15

CORRELATIONS BETWEEN VARIABLES FOR TWO GROUPS OF  
HOMEMAKERS IN NAVARRO COUNTY

Variables	Correlations	
	Group I Middle- Income (n=50)	Group II Expanded Nutrition (n=50)
<u>Frequency of Purchase of Specific Items with Income Level</u>		
Liver	-.19	-.24
Fresh milk	.11	.36*
Non-fat dry milk	.06	-.13
Carrots	.10	.19
Spinach	.03	-.03
Orange juice	.26	.17
Broccoli	.07	.12
<u>Frequency of Purchase with Age of Homemaker</u>		
Liver	.04	.09
Fresh milk	.10	.13
Non-fat dry milk	.10	.18
Carrots	.32*	.05
Collard greens	.05	.17
Oranges	.13	-.14
Broccoli	.12	-.25
Spinach	.03	.09

\*p < .05.

### Influence of Age

It may be observed that the influence of age showed significance at the .05 level with frequency of purchase of carrots listed in the study. Pearson's Product-Moment Correlation Coefficient analysis showed age level of the homemaker to be significant in affecting the respondent's frequency of serving carrots in a middle-income family. The older the homemaker the more importance was placed on serving the family carrots--a vitamin A food (table 15).

### Influence of Education

The degree of association measured and indicated by the correlation coefficient between the educational level of the homemaker and buying practice variables pertaining to food and nutrition are shown in table 16. It was hypothesized that Expanded Nutrition homemakers would have difficulty in food shopping. Expanded Nutrition homemakers' responses resulted in a coefficient of .38, which was significant at the .05 level, indicating that as the educational level of the homemaker increased the more frequently the homemaker, when shopping, became aware of the importance of looking for the best buys.

The correlation between education and homemaker shopping for specials was .39, significant at the .05 level, indicating that as the educational level rose, so did the

TABLE 16

CORRELATIONS BETWEEN SHOPPING PRACTICES FOR TWO  
GROUPS OF HOMEMAKERS IN NAVARRO COUNTY

Variable	Correlations	
	Group I Middle- Income (n=50)	Group II Expanded Nutrition (n=50)
<u>Shopping Variable with</u> <u>Education</u>		
Plan meals before shopping	-.02	.27*
Find best buys before shopping	-.25	.38*
Check for quality and price	-.26	.39*
Read labels	-.04	.36*

\*p < .05.

knowledge of how important it was for the homemaker to check for quality and price of specials before shopping. The higher the educational level of the homemaker, the more aware she was in reading the labels on food purchases; the coefficient of .36 indicated this finding. Thus, in general, better educated Expanded Nutrition Program mothers appear to practice making a shopping list more often than homemakers with lower levels of education. The higher the educational level of the mother, the more favorable was her attitude toward making a shopping list for meal planning and food preparation. A coefficient of .27 was significant at the .05 level indicating that the higher the educational level of the homemaker, the more frequent the homemaker will be found planning family meals before shopping.

Family size was found to be non-significant in affecting any food variables of the respondents. The frequency with which foods were consumed by the homemaker during this period was not significantly correlated to the number of family members.

## CHAPTER V

### SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Nutrition education is one of the oldest Extension Service home economics programs, but the Expanded Nutrition Program is special for many reasons. The focus is on hard-to-reach, low-income families. The program is mainly on a person-to-person basis with the individuals who do the food shopping and the meal preparation in the target families. Some work also is done in small groups.

The Expanded Nutrition Program aide is a neighborhood worker hired to help low-income families improve the nutritive quality and adequacy of their diets and make the best use of their resources. The aide receives thorough training on how to teach basic food and nutrition, make home visits, gain the confidence of low-income families, and initiate learning experiences.

The purpose of this research was to identify the areas of program needs for limited-income and middle-income homemakers. The following objectives were formulated to accomplish this purpose:

1. To compare the homemakers enrolled in the Expanded Nutrition Program and the middle-income homemakers' knowledge and application of (a) nutrition principles, (b) meal planning principles, (c) food purchasing practices, and (d) food preservation practices to the following variables: age, education, and dietary practices.
2. To determine if a significant correlation exists between the meals actually prepared at home and the frequency of preparing and eating a variety of foods from the four food groups.
3. To ascertain personal and demographic characteristics that may relate to food and nutrition practices of the homemaker.
4. To determine if a correlation exists between Expanded Nutrition homemakers and middle-income homemakers in eating habits (24-hour dietary recall) and family income.

The sample for the study consisted of 50 middle-income homemakers and 50 Expanded Nutrition Program homemakers in Corsicana, Navarro County, Texas. Data were obtained by the use of a questionnaire developed by the investigator.



The questionnaire is composed of the following:

1) demographic information, 2) food habits, 3) food preferences, 4) food preservation practices, 5) 24-hour dietary recall, and 6) food buying practices. The questionnaire was administered by or under the direction of the investigator. This method of gathering data insured a 100 per cent return. Food habits and dietary practices were analyzed by the simple Pearson Product-Moment Correlation Coefficient. Pearson's method was used to test the significance of the selected variables.

#### Summary

The sample for the study consisted of 50 middle-income homemakers and 50 Expanded Nutrition Program homemakers in Corsicana, Navarro County, Texas. The homemakers' ages ranged from 19 to 50 years or more. The largest age category for Group I, middle-income homemakers, was 35-49 years. The largest age category for Group II, Expanded Nutrition Program homemakers, was 50 years or more.

The majority of the subjects had completed 11 years of educational training. Analysis showed that the majority of the homemakers had families with three to five members. The large families, with seven or more family members, were often from non-white homemakers. Eighty per cent of the

middle-income homemakers were white; on the other hand, 80 per cent of the Expanded Nutrition homemakers were black.

Fifty per cent of the middle-income homemakers were employed and 48 per cent were not employed. In Group II, Expanded Nutrition Program homemakers, 24 per cent were employed and 66 per cent were not employed. Most of the homemakers in Group II had lower incomes than did the families in Group I. A total of 92 per cent of the Expanded Nutrition Program homemakers had incomes of less than \$500 per month.

The frequency of serving milk was significantly correlated with income for the middle-income homemaker group ( $r = 0.36$ ). This correlation indicated that the frequency of serving milk increased as the income of the respondent increased.

Shopping variables were found to be significantly correlated to the education of the Expanded Nutrition Program homemakers. For the Expanded Nutrition Program homemakers shopping variables "the aspect of planning meals before shopping," "reading labels," "shopping for the best buys," and "checking the quality and price of foods" were related to their educational level. The higher the educational level of the Expanded Nutrition Program homemaker, the more aware she was of how to make the best of these shopping practices. The frequency of purchasing carrots

was significantly correlated with age for the middle-income homemaker ( $r = 0.32$ ). This correlation indicated that the older the middle-income homemaker, the more emphasis or importance was placed on serving carrots, a vitamin A food.

The most frequently served food items for the respondents were fresh milk and butter or margarine, listed in the milk group. Food served daily from the list of vitamin A food sources was lettuce; white bread, prepared cereals, cornbread, and whole wheat bread from the bread and cereal group; oranges from the list of ascorbic acid food sources; and eggs, bacon, and peanut butter from the meat group. The findings in this study suggest that families are not consuming adequate amounts of foods from the fruit and vegetable group.

### Conclusions

Since food habits of the homemakers have been formulated, a thorough knowledge on the part of the home economist of how to motivate the homemaker to change attitudes based on nutrition concepts and principles is essential. The food and nutrition program in Navarro County should provide knowledge which is basic for modification of attitudes. Homemakers need to be assisted in planning meals around the basic four food groups, and in

understanding how food habits and attitudes affect the life of an individual and of the family.

Homemakers revealed the need for more training in food safety, storage, and food preservation practices. The present study revealed that very few families enlist the services of the Extension home economist for planning the family's food needs.

Today's Extension Service home economics program more adequately meets the needs and interests of the low-income groups than of any other group. The foods program should be adjusted to meet the needs and interests of all homemakers, regardless of socioeconomic conditions.

#### Recommendations

Based upon data obtained from the study, the following recommendations seem appropriate.

1. The aide's lesson plans revealed very little teaching on the milk group and vegetable and fruit group. It is therefore recommended that these important nutrients, calcium, vitamin A, and vitamin C, be given more emphasis.

2. More investigation of the role of personal, socio-cultural, economic, and educational practices in determining food practices is needed.

3. The nutrition education program should be adjusted to meet the needs and interests of all homemakers, regardless of socioeconomic conditions.

4. Increased emphasis on freezing and canning techniques seems desirable.

5. The need for Extension to continue to emphasize programs in time and money management was substantiated. For example, 26 per cent of the shoppers were not using a shopping list.

6. Forty-six to 52 per cent of the homemakers said they did not use non-fat dry milk for cooking or drinking. Extension should develop programs in these areas emphasizing less expensive products.

7. Teaching effort should be directed to food groups that were listed as less frequently or never eaten.

8. Studies replicating procedures reported here might be valuable in determining whether these findings can be confirmed in other settings.

## APPENDIX

## FOOD AND NUTRITION QUESTIONNAIRE FOR HOMEMAKERS

Instructions: Please read each statement or question carefully. Indicate your answer or answers by checking in the blank beside the appropriate response. We are interested in learning about your food practices, frequency of eating certain foods, food preservation practices, and the extent to which you benefited from the Navarro County Extension Service Program.

### A. Personal Data

1. How old were you on your last birthday?  
☐ Below 20                      ☐ 35-49  
☐ 20-34                          ☐ 50 or over
2. How many years of school have you completed?  
(circle is necessary)  
☐ Elementary    1    2    3    4    5    6  
☐ Middle and Senior High School  
                              7    8    9    10    11    12  
☐ College    1    2    3    4
3. Have you ever attended business or technical school?  
☐ yes                              ☐ no
4. Marital status, are you:  
☐ Married                      ☐ Number of years married  
☐ Widowed
5. Race or ethnic group:  
☐ Black  
☐ Mexican-American  
☐ White  
☐ Other
6. How many people other than yourself live in your household?  
☐ Adults                      ☐ Children
7. What are the different ages of children living in your household?  
☐ Under 3                      ☐ 13-15                      ☐ Over 20  
☐ 3-6                          ☐ 16-20                      ☐ None  
☐ 7-12

8. How much income do you take home each month?

☐ Less than \$100      ☐ \$400-\$499  
☐ \$200-\$299      ☐ \$500-\$699  
☐ \$300-\$399      ☐ \$1000 or more

9. Are you working?

☐ yes      ☐ no

10. For whom do you work?

☐ Self-employed  
☐ Residential employment  
☐ City, State, or Federal Government  
☐ A business or company (Name \_\_\_\_\_)  
☐ Number of hours employed away from home

11. What kind of stove do you use in your home for cooking?

☐ Wood      ☐ Hot plate  
☐ Electric      ☐ Gas  
☐ Kerosene      ☐ Oil  
☐ Other, specify \_\_\_\_\_

12. Do you use an oven?

☐ Yes      ☐ No

13. Check the meals prepared for your family members. Do you usually prepare these meals, just for yourself, for some of the family, or for all family members?

Meal	Family Members				
	Self	All	Adults	Preschool Children	Teen-agers
Breakfast					
Noon meal					
Evening meal					
Snacks					



14. How often do you serve the following foods at home?

Food	Frequency				
	daily	3-4 times weekly	once-twice weekly	less fre- quently	never
Fresh milk					
Dry milk (non-fat)					
Canned milk					
Buttermilk					
Cheese, Creamed					
Cheese, Cottage					
Cheese, other type					
Custard					
Ice cream					
Butter, margarine					
<u>MEAT GROUP</u>					
Beans (dry)					
Beef, roast					
Beef, steaks					
Beef, canned					
Beef and vegetable stew					
Bacon					
Chicken					
Eggs					
Fish					
Hamburger					
Lamb					
Liver					
Pork					
Sausage					
Salmon					
Tuna					
Peas (dry)					
Peanuts					
Peanut butter					
Other nuts					
<u>VEGETABLE AND FRUIT GROUP</u>					
Apples					
Apple sauce					
Apricots					

Food	Frequency				
	daily	3-4 times weekly	once-twice weekly	less fre- quently	never
Asparagus					
Banana					
Blackberries					
Beets					
Broccoli					
Brussel sprouts					
Cantaloupe					
Cherries					
Cranberries					
Cabbage					
Carrots					
Cauliflower					
Celery					
Collards					
Corn					
Cucumber					
Dates					
Figs					
Fruit cocktail					
Grapefruit					
Irish potatoes					
Lemons					
Lima beans					
Lettuce					
Mustard greens					
Oranges					
Okra					
Onions					
Pepper (hot or sweet)					
Pumpkin					
Peaches					
Pears					
Pineapple					
Prunes					
Radishes					
Raisins					
Raspberries					
Sauerkraut					
Spinach					
Squash					
Sweet Potatoes					
Strawberries					
Snap beans					
Tangerine					

Food	Frequency				
	daily	3-4 times weekly	once-twice weekly	less fre- quently	never
Tomatoes					
Turnip greens					
Watermelon					
BREAD AND CEREAL GROUP					
Biscuits					
Prepared cereals					
Bread, white					
Bread, rye					
Bread, whole wheat					
Cornbread					
Grits					
Macaroni					
Noodles					
Oatmeal					
Rice					
Spaghetti					

# B. Summary of Food Preservation Record

15. What jellies, jams, butter, or preserves did you make last year?

Type	Amount		
	Glasses	Pints	Quarts

16. Where are the jellies, jams, butter, and preserves stored? \_\_\_\_\_

17. What kind of jars did you use for food preservation purposes?

- ☐ Empty jars on hand  
☐ Empty glasses  
☐ Special purchased jars

18. What kind of canning equipment do you use?  
☐ Pressure canner  
☐ Pressure cooker  
☐ Hot water bath  
☐ Regular kettle
19. Did you have a garden last year?  
☐ yes ☐ no
20. Where did you get the foods you canned?  
☐ Own garden  
☐ Bought from store  
☐ Obtained from relative or neighbor  
☐ Slaughtered
21. What methods did you use for canning? (check method used)

Food	Methods			
	Pressure Canner	Pressure Cooker	Water Bath	Open Kettle
Fruit				
Jellies-jams				
Green beans				
Corn				
Tomatoes				

22. Where did you learn your canning methods?
- |  |   |
|--|---|
| <input type="checkbox"/> Mother            | <input type="checkbox"/> Neighbor or relative |
| <input type="checkbox"/> Self taught       | <input type="checkbox"/> High school class    |
| <input type="checkbox"/> Extension Service | <input type="checkbox"/> Other _____          |

23. What foods did you freeze?

[illegible]

24. What foods did you can last year?

Name of Product	Amount	
	Pints	Quarts

25. Where did you store your frozen foods?

☐ Freezer                      ☐ Upright                      ☐ Chest  
☐ Freezer unit in refrigerator  
☐ Locker plant  
☐ Home of neighbor or relative

26. What foods did you pickle?

Name of Product	Amount	
	Pints	Quarts

27. What did you eat and drink in the last 24 hours?

MORNING

MID-MORNING

NOON

AFTERNOON

EVENING

### C. Food Buying Practices

28. How close is the grocery store where you do most of your shopping?  
 \_\_\_\_\_ blocks or \_\_\_\_\_ miles.

29. Where do you usually buy your groceries?

- ☐ Supermarket or chain store  
☐ Meat market  
☐ Roadside market  
☐ Discount store  
☐ Drive-In  
☐ Independent or neighborhood store

30. When you buy, do you:

Practice	Frequency			
	always	sometimes	seldom	never
Have a food budget?				
Shop with a list?				
Know amount of money available for food?				
Plan meals before shopping?				
Find out before shopping what foods are the best buys?				
Check the quality and price of "specials"?				
Buy the forms of foods that best fit your needs?				
Read labels and compare prices?				
Buy store brand foods?				
Buy name brand foods?				
Have storage space to purchase food in quantities?				
Buy in quantity when appropriate?				
Use food stamps?				
Use non-fat dry milk for cooking?				
Use non-fat dry milk for drinking?				
Buy less expensive cuts of meat?				

Practice	Frequency			
	always	sometimes	seldom	never
Buy dry beans, peas, or lentils?				
Buy cereals that require cooking?				
Buy day-old bread?				
Buy day-old bakery goods?				

31. Do you buy soft drinks? \_\_\_\_Yes \_\_\_\_No  
If the answer is yes, list the amounts you buy for  
a week.

Name of Beverage	Amounts purchased weekly			
	12 oz. cans 6 pack	12 oz can	16 oz bottle	32 oz bottle

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