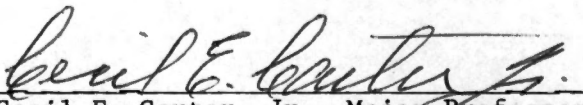
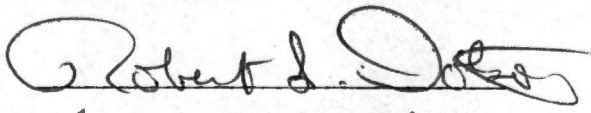


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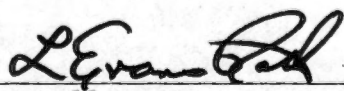
I am submitting herewith a thesis written by Kathy Diann Quillen entitled "Relationships Between Dietary Adequacy of Homemakers Participating in Tennessee's Extension Expanded Food and Nutrition Education Program and Selected Characteristics." I recommend that it be accepted in partial fulfillment of the requirements for the degree of Master of Science, with a major in Agricultural Extension.


Cecil E. Carter, Jr., Major Professor

We have read this thesis
and recommend its acceptance:




Accepted for the Council:


Vice Chancellor
Graduate Studies and Research

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RELATIONSHIPS BETWEEN DIETARY ADEQUACY OF HOMEMAKERS PARTICIPATING
IN TENNESSEE'S EXTENSION EXPANDED FOOD AND NUTRITION
EDUCATION PROGRAM AND SELECTED CHARACTERISTICS

A Thesis

Presented for the

Master of Science

Degree

The University of Tennessee, Knoxville

Kathy Diann Quillen

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ABSTRACT

The purpose of this study was to determine the relationship between the number of servings consumed by homemakers in each of four food groups and personal and family characteristics. This study also was designed to determine the improvement in adequacy of homemakers' diets in each of the four food groups from the initial to the fifth food recall.

The population of this study included homemakers from the nine original Tennessee counties which had participated in Extension's Expanded Food and Nutrition Education Program for a period of at least two years when the data were collected. The sample included 375 participant families which represented a 10.5 percent sample of members from the original counties.

Data from the family record forms were recorded on code sheets. Computations were made by The University of Tennessee Computer Center. Information was tabulated by frequency counts. The analysis of variance F-test was used to determine the relationships between the numbers of servings consumed from each food group and personal and family characteristics. The chi-square test and t-test were used to determine the comparison between adequacy of homemakers' diets from the initial and fifth food recalls. A probability level of 0.05 was accepted as being statistically significant.

Major findings of this study were:

1. Counties reporting the lowest number of servings consumed on the initial food recall had the most potential and made the most improvement during this two year study.

2. Place of residence influenced the number of servings consumed from each food group by homemakers. Farm homemakers consumed significantly more milk servings, while urban homemakers reported more meat servings. Although not significant, farm homemakers continuously reported more fruit/vegetable and bread/cereal servings.
3. From initial to the fifth food recall, farm homemakers made the greatest improvement in all of the food groups except for the fruit/vegetable group in which urban homemakers made the most progress. Thus, farm homemakers appeared to show more benefit from participating in EFNEP than either urban or rural non-farm homemakers.
4. Whether or not a family received welfare or food stamps influenced the number of servings consumed. Welfare and food stamp participants significantly consumed fewer servings from the milk and fruit/vegetable groups.
5. Food stamp and welfare homemakers showed more improvement in number of servings consumed for each food group. Thus, it appears that food stamp and welfare participants benefited more from EFNEP than non-food stamp participants.
6. There were significant relationships between whether or not the EFNEP family received food donation and the numbers of servings consumed from the meat, fruit/vegetable, and bread/cereal groups.
7. There were significant relationships between whether or not the EFNEP homemaker received USDA assistance and the numbers of servings consumed. Where significant, USDA

participants reported more bread/cereal servings and non-USDA participants more milk, fruits and vegetables.

8. There were no significant relationships between the numbers of servings from each food group and whether or not an adult male was present in the household.
9. The relationships between the numbers of servings consumed from each food group and education of homemakers were significant. Homemakers with less than an eighth grade education reported less nutritional adequacy than the other groups.
10. The two groups of homemakers with the lesser amount of education had the most potential for improvement and made the most improvement during this study.
11. Ethnic background influenced the number of servings consumed by homemakers. Where significant, black homemakers consumed more meat servings; while white homemakers consumed more milk and milk products.
12. Black homemakers reported more improvement in number of servings consumed for each food group. Thus, it appears that black homemakers benefited more from EFNEP than white homemakers.
13. There were significant relationships between the numbers of servings consumed and length of time in the program which suggests that there was additional advantage for homemakers to participate in the program up to the 24-month maximum.

14. Except for the meat group, there were significant comparisons between the mean numbers of servings consumed by homemakers from the initial to the fifth food recall.
15. There was no significant comparison between the mean numbers of meat servings consumed by homemakers from the initial to the fifth food recall. Most homemakers were already consuming the two minimum meat servings and more upon enrollment in EFNEP. Thus, a special need existed toward maintaining a level of two meat servings rather than increasing consumption.
16. Throughout the two year period, the least number of servings consumed was in the milk group. Thus, more nutrition education concerning the importance of milk and milk products in the daily diet is needed.
17. Comparison between the dietary adequacy of homemakers consuming minimum servings of the food groups from the initial and fifth food recalls were not significantly related except for the bread/cereal group.

Implications and recommendations for use of findings and recommendations for further study also were made.

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CHAPTER I

INTRODUCTION

I. BACKGROUND AND PROBLEM

The Federal Government's major nutrition education program for which funds are budgeted is the Expanded Food and Nutrition Education Program (EFNEP). It is administered by the Science and Education Administration at an annual appropriation level of approximately \$50 million and is carried out by the Cooperative Extension Service in each state (1:21)*.

During 1964 the Federal Extension Service working with the Alabama Extension Service initiated a pilot program using paraprofessionals to teach nutrition to low-income homemakers in four counties (9:478). This effort proved successful and the Expanded Food and Nutrition Education Program became established in other states in 1968. By 1969 the program came into existence in all 50 states, the District of Columbia, Puerto Rico, and the Virgin Islands, and became a part of the Cooperative Extension Service.

Tennessee began EFNEP in 1968. The program was piloted in 10 counties. The following year 10 more counties were added to the program, and in 1971 the program expanded to 20 additional counties. The highest number of Tennessee counties participating in EFNEP at one time was 41. The 1979 count is 39 counties with 36 of those

*Numbers in parentheses refer to similarly numbered items in the Bibliography; those after the colon are page numbers.

counties also conducting the youth phase--Special Program In Food For Youth (SPIFFY).

Nationally, more than 1.5 million low-income families, representing 6 million family members, have participated in this food and nutrition education program since its start in 1969. There is emphasis on enrolling homemakers with young children in the program. Currently, 5,673 program aides, who are trained and supervised by home economists, are employed to teach families in about half of the counties in the United States (1:21).

The primary purposes of the Expanded Food and Nutrition Education Program are to teach low-income families to improve their diets through increased knowledge of the essentials of nutrition; increase ability to select and buy food; improve practices in food storage and sanitation; increase ability to prepare and serve balanced meals; and increase ability to manage all available resources such as gardens and food stamps.

In 1979, there were approximately 449,000 American families enrolled in EFNEP. Seventy-three percent of these program families had an annual income of less than \$5,000. Minorities accounted for 61 percent of the total, and 39 percent of the homemakers participating had an eighth grade education or less. The average family size was 3.9 persons (1:22).

This study is concerned with the relationship between dietary adequacy of Tennessee EFNEP homemakers and family and personal characteristics. Age, income, education, social status, and general background are some characteristics that may influence the adoption of nutritional practices by homemakers (14:18). Continual evaluation

is essential in providing innovative EFNEP programs that will be accepted and followed by homemakers. Almost everyone has fixed eating habits. However a better understanding of how these and other characteristics of homemakers influence their use of nutrition practices should be a great help to Extension agents in planning effective nutrition programs.

II. NEED FOR THE STUDY

To better serve the needs of the people, the Tennessee Agricultural Extension Service continuously evaluates its programs in an effort to determine the effectiveness of its programs, to aid in identification of clientele having a need for Extension programs, and to plan programs tailored to the current needs of its clientele.

Program guidelines of the Expanded Food and Nutrition Education Program suggest that the program work with hard-to-reach, low-income families. This study is needed to help Tennessee Extension EFNEP Agents improve the quality of their educational programs and better serve the clientele by identifying those families with the greatest needs. Information is needed as to what characterizes those families who show low nutritional adequacy in their diets, and the characteristics of those families who tend to respond most to the program.

This study should give Tennessee State Nutrition Specialists, Extension EFNEP Agents, and Program Aides a better understanding of their clientele which is so essential in program development and aide the staff in the determination of future program direction.

III. PURPOSES AND OBJECTIVES OF THE STUDY

The purpose of this study was to show the relationship between the number of servings consumed by homemakers in each of the four major food groups and personal and family characteristics. This study also was designed to show improvement from the initial to the fifth food recall (two-year benchmark) according to the food groups and factors considered.

The specific objectives of this study were:

1. To determine the relationships between the number of milk servings consumed by homemakers and personal and family characteristics (country, place of residence, received food stamps, received food donation, received USDA assistance, received welfare, whether or not there was a male adult present in the household, the number of years of school completed by the homemaker, ethnic background, and the recorded length of time the family had participated in the program.
2. To determine the relationships between the number of meat servings consumed and personal and family characteristics.
3. To determine the relationships between the number of bread and cereal servings consumed and personal and family characteristics.
4. To determine the relationship between the number of fruit and vegetable servings consumed and personal and family characteristics.

5. To determine the change in the proportion of homemakers with adequate servings from the initial to the fifth 24-hour food recall (2-year period) with each of the four food groups.
6. To determine the change in the number of servings consumed by homemakers in each of the four food groups from the initial to the fifth 24-hour food recall.

IV. LIMITATIONS OF THE STUDY

The population of this study included only those participant families from the nine original Expanded Food and Nutrition Education Program counties in Tennessee who had been active in the program at least for two years.

The study was limited to one dependent variable and ten independent variables. The dependent variable was the number of servings consumed by homemakers in each of the four food groups for each of the five 24-hour food recalls. Other limiting factors were the independent variables which included personal homemaker characteristics and family characteristics. These characteristics were limited to (1) county, (2) place of residence, (3) received food stamps, (4) received food donation, (5) received USDA assistance, (6) received welfare, (7) whether or not there was an adult male present in the household, (8) the educational level achieved by the homemaker, (9) ethnic background, and (10) the length of time the family had participated in the program.

V. DEFINITIONS OF TERMS

In order that the writer and reader have a common understanding of terms used in this study, certain terms are defined as follows:

Adequate diet. In this study, an adequate diet for a homemaker consisted of two or more daily servings from each of the milk and meat groups and four or more servings from each of the bread and cereal and vegetable and fruit groups.

EFNEP Extension Agent. A professional home economist employed by the Extension Service to develop and carry out the Expanded Food and Nutrition Education Program in a county. She is also responsible for selecting, training, and supervising the Program Aides in her county.

EFNEP participant. A homemaker enrolled in an active Expanded Food and Nutrition Education Program under the direction of the Tennessee Agricultural Extension Service.

Food recall. A record of foods eaten by the homemaker during the previous 24-hour period taken at enrollment and at six month intervals thereafter. This information was collected by the Program Aide in a personal interview during a regular home visit and includes all meals, beverages, and snacks, beginning with the meal eaten prior to the interview.

Homemaker. An individual having the primary responsibility for establishing and maintaining the home environment.

Program Aide. A paid paraprofessional employed by the Extension Service to teach nutrition related information to low-income families.

CHAPTER II

REVIEW OF LITERATURE

I. INTRODUCTION

Available literature concerning the dietary adequacy of homemakers in the Expanded Food and Nutrition Education Program and factors that influence the homemakers' diets was limited. Only those studies that were most relevant were reviewed and included in this chapter. Particularly helpful to this study were previous studies done by Reginald Seiders II and J. H. Jones, Jr. Findings from those studies that did relate in some way are reported below according to family and personal characteristics that influenced dietary adequacy of homemakers in the Expanded Food and Nutrition Education Program.

II. SELECTED FINDINGS

Place of Residence

Seiders (11:46-48) found in his study of the Expanded Food and Nutrition Education Program in Tennessee that the farm homemakers did tend to have more adequate intakes for the milk group than either the rural non-farm or the urban homemakers. However, the urban homemakers made the greatest change in milk consumption from the initial to the last food recall (24 to 45 percent). Farm homemakers made the least change (41 to 53 percent). Thirty-eight percent of the rural non-farm homemakers started the program with adequate milk servings, and 51 percent on the last food recall.

For the meat group, Seiders (11:48) reported that a slightly higher percent of homemakers from urban families had adequate number of servings of meat. None of the groups of homemakers made a significant improvement in percent with adequate servings from the initial to the last food recall.

Although Seiders (11:48) found that all residence groups made considerable improvement in the consumption of fruits and vegetables from the initial to the last food recall, the greatest change was made by the farm homemakers (33 to 60 percent). Urban homemakers had the least change (15 to 34 percent) and consistently reported the least percent of adequate servings of fruits and vegetables.

As was true for the milk and fruit/vegetable groups, Seiders (11:49) reported that a significantly lower percent of urban homemakers had an adequate number of servings from the bread/cereal group. However, the urban homemakers made the greatest improvement (37 to 51 percent) from the initial to the latest food recall in adequate number of bread/cereal servings consumed. In general, the urban homemakers had the poorest diets, had the greatest capacity for improvement, and made the greatest improvement from initial to the latest food recall.

Jones (4:24-25) found in his study of the Expanded Food and Nutrition Education Program in Louisiana that farm homemakers made the greatest change in adequate servings of milk consumed (22 to 63 percent) from the first to last food recall. Urban homemakers made the least change (35 to 47 percent). Thirty-four percent of the rural non-farm homemakers started the program with adequate servings, and 55 percent at the end.

Jones (4:27) reported the smallest change of adequate meat servings consumed from the first to last food recall was the urban homemakers (81 to 86 percent). Rural non-farm homemakers made the greatest change (72 to 86 percent) in his study.

For the fruit/vegetable group, Jones (4:25,28) found that all residence groups reported considerably low percent of adequate servings consumed. Only 6 percent of the rural non-farm homemakers had adequate intakes from the fruit/vegetable group on the first recall, and 18 percent on the last recall. Urban homemakers reported 8 and 26 percent, respectively, on the first and last recalls. Among the farm homemakers, 10 percent had sufficient amounts of fruit/vegetable on the first recall, and 28 percent on the last.

The 1977-78 Department of Agriculture's Nationwide Food Consumption Survey (15:4) suggests that farm homemakers tend to have better diets and often pay less for food than urban families. Home gardens and local farmers' markets contribute to the former finding.

Food Assistant Programs

Madden (6:1) found that families participating in the Commodity Distribution Program in Pennsylvania had no better diets than non-participating families living under similar socioeconomic conditions.

Loyd and Breimyer (5:935) conducted a study of the Commodity Distribution Program in Harrison County, Missouri. They found that a higher percent of families showed an adequate number of servings on three of the four food groups after the study began in comparison to before.

In 1961, a pilot Food Stamp Program began. Qualifying families received stamps at prices below their face value and stamps can be used to purchase food at cooperating grocery stores (6:21). This program appears to be preferred over the donated food program by needy families. Food stamp participants have a free choice in food selection to accomodate their special needs, cultural habits, and food preferences.

However, Madden (6:3) concluded that a large portion of increased food purchasing power made possible by food stamps was being spent on items other than food. Families were not using increased food purchasing power on foods that would supply needed nutrients in the families' diets.

Nelson's (8:1) study concluded that food stamp participants allocated more of their supermarket expenditures to meat, poultry, fish, vegetables and fruits than nonparticipating families.

Maruyama (7:4) found that homemakers in the Expanded Food and Nutrition Education Program receiving food stamps achieved a balanced diet more rapidly than homemakers not receiving stamps--starting at about the same level. Before EFNEP, food stamp recipients were eating at about the same dietary level of adequacy as non-recipients. It also was found that homemakers respond best to a combination of EFNEP and food stamps. It takes three times as long for the non-recipients to achieve the same level of dietary adequacy as stamp recipients.

Education of Homemaker

According to Seider's (11:38-41) study, there was no significant

relationship between education of the homemaker and adequacy of diets. Among those homemakers with eight or more years of school, there appeared to be a lower percent with adequate servings on the initial food recall except for the meat group.

For the milk group, Seiders (11:39) reported that homemakers with eight or more years of school made the greatest change from the initial to the latest food recall (27 to 47 percent). Homemakers with less than eight years of school reported a change in adequate milk servings from 34 to 48 percent.

Seiders (11:39) found that there were practically no changes in adequate meat servings reported by the homemakers. Homemakers with less than eight years of school reported a 4 percent increase from the initial to the latest food recall (73 to 76 percent). White homemakers with more than eight years of school had a 2 percent change (77 to 79 percent).

For the fruit and vegetable group, Seiders (11:40) reported homemakers with more than eight years of education making the greatest change in adequate servings (16 to 42 percent). Homemakers with less than eight years of school also made a significant change in adequate fruit and vegetable servings (22 to 38 percent).

As was true for the milk and fruit/vegetable groups, Seiders (11:40-41) reported that homemakers with more than eight years of school reported a lower percent of adequate servings. However, homemakers with eight or more years of school had the most potential for improvement and did so according to Seiders' study.

Jones (4:25-26) reported that the education of the homemaker did influence the adequacy of the family's and homemaker's diet in

his evaluation of an eight-week Expanded Food and Nutrition Education Program. He found that homemakers with no education made the greater change from the initial to last food recall than homemakers with the most education. His findings were:

1. In general, homemakers with more education, were more likely to consume adequate quantities of milk on both food recalls.
2. Homemakers with no formal education, reported a higher percent of adequate servings of meat than any other group of homemakers.
3. For the fruit and vegetable group, homemakers with no education were least likely to make changes in the percents of homemakers with adequate servings, than those with some education.
4. The greatest change in percents of homemakers with adequate intakes of breads and cereals was made by those homemakers with no education and those with the most education.

Maruyama (7:6) studied the effect of nutrition education on food behavior. He found that the educational level of the participant had an effect on the response to nutrition education. He reported that the rate of improvement in food behavior was positively influenced by the educational level of the homemaker. Homemakers with an education beyond high school reported a higher percent of balanced diets (37 percent) than homemakers with an education of eighth grade or less (18 percent). Homemakers with an education beyond high school also obtained their peak score of 37 percent faster (18 months)

than homemakers with an education of eighth grade or less whose peak score was 24 percent obtained in 30 months.

Wilson and co-workers (17:343) found that there was a relationship between the educational level of the homemaker and adequacy of the family's diet. They reported that the influence of education on dietary adequacy was greater than that of income. It also was found that as the number of years of formal education increased, the more adequate the family's diet was likely to be.

Ethnic Background

Wang and Ephross (16:14-15) studied the Expanded Food and Nutrition Education Program in Maryland. They found that there was a tendency for black homemakers to report less adequate diets than white homemakers.

In a study by Salathe and co-workers (10:9), it was found that the impact of race on food expenditure patterns were significant. Black and white households exhibited almost the same differences in their food selections even when their incomes were equal. Blacks generally spent more per capita and consumed more beef, pork, poultry, fish and seafood. However, they consumed less of cereal and bakery products, dairy products, fresh fruits and vegetables, processed fruits, sugar and other sweets, fats and oils, nonalcoholic beverages, and miscellaneous prepared foods.

Seiders (11:116) reported that a higher percent of white homemakers than black reported an adequate number of servings in the milk, fruit/vegetable, and bread/cereal groups than among the black

homemakers. Black homemakers reported a higher average number of servings from the meat group than white homemakers.

Black homemakers made significant improvement in adequate servings consumed from the initial to the latest food recall in all food groups, except the meat group. White homemakers made improvement in the milk and fruit/vegetable groups.

In a study of the effect of nutrition education on food behavior of Kentucky homemakers, Maruyama (7:7) reported that ethnic background did not appear to be significantly related to dietary adequacy of the family.

Total Time in Program

Seiders (11:101-105) reported that there were no significant relationships between percents of homemakers with adequate diets and length of time in the program. Results were:

1. Only those homemakers in the program for 24 and 30 months made a very significant improvement from the first to latest food recall in the percents of homemakers with adequate servings of milk. There was a significant improvement among those in the program for 12 months.
2. For the meat group, the highest percent of homemakers with adequate servings was among those homemakers who had been in the program for 18 months. None of the groups of homemakers made a significant improvement from the initial to latest food recall for the meat group.
3. All groups of homemakers made very significant improvement from initial to latest food recall in the percents of

homemakers with adequate servings from the fruit and vegetable group, except for those who had been in for 18 and 30 months. They made a significant improvement.

4. For the bread and cereal group, only those homemakers who had been in the program for 18 and 30 months made a significant improvement from the initial to latest food recall in percents of homemakers with adequate intakes.

In 1971, the Synetics Corporation (13:13-14) conducted an evaluative study of the Expanded Food and Nutrition Education Program. From this study, a guideline to determine how long a homemaker should participate in the program resulted. Homemakers which fall in the bottom quarter of adequacy of diet on the initial food recall should probably participate between one and two years in order to receive maximum benefit. Of these homemakers, those who are faster learners could remain in the program from 12 to 18 months. They suggest that the middle level of homemakers participate from 6 to 18 months in the program. The homemakers in the upper quarter of adequacy on the initial food recall could gain most that is available from the program in the first six months.

Frye (3:23) found that there were improvements over time in the percents of homemakers with adequate diets in his study of the Expanded Food and Nutrition Education Program. He reported that only 9 percent of the homemakers had adequate servings from all of the food groups in the initial food recall. After six months in the program, 16 percent had adequate diets. By 12 months, 19 percent reported adequate diets.

Maruyama and co-workers (7:3) reported in their study of nutrition education that there was an overall significant increase in the percent of homemakers consuming a balanced diet over a two year period. They also found that the percent of homemakers with poor diets decreased throughout the two year period, and homemakers with marginal and balanced diets at the beginning of the two year period showed improvement or increased in dietary adequacy.

There is concern that knowledgeable homemakers are retained in the program longer than necessary (2:9). In Spindler and Browne's (12:322) study, they found that families should remain in the program long enough for the development of new food habit patterns and skills in order to have lasting improvements.

CHAPTER III

METHODS AND PROCEDURES

I. THE POPULATION

The population of this study included homemakers from nine original program counties who were presently enrolled in and had participated in the Expanded Food and Nutrition Education Program for at least 24 months when the data were collected in December, 1979. The nine original Expanded Food and Nutrition Education Program counties in Tennessee were Coffee, Davidson, DeKalb, Gibson, Hawkins, Putnam, Roane, Shelby, and Warren (see Figure 1). Two counties in Districts I, III, IV and V were sampled. Only one county in District II was included since the other original county was phased-out from the Expanded Food and Nutrition Education Program in January of 1977.

II. THE SAMPLE

The sample included 375 homemakers, which represented a 10.5 percent sample of members from the original counties. Of the total number of participant families in Tennessee, the nine original counties represented 43 percent of the state total. It should be kept in mind that the sample study was representative of the nine original counties and not necessarily of the entire state.

In selecting samples for this study, the number was limited to only those participants who were currently active in the program.

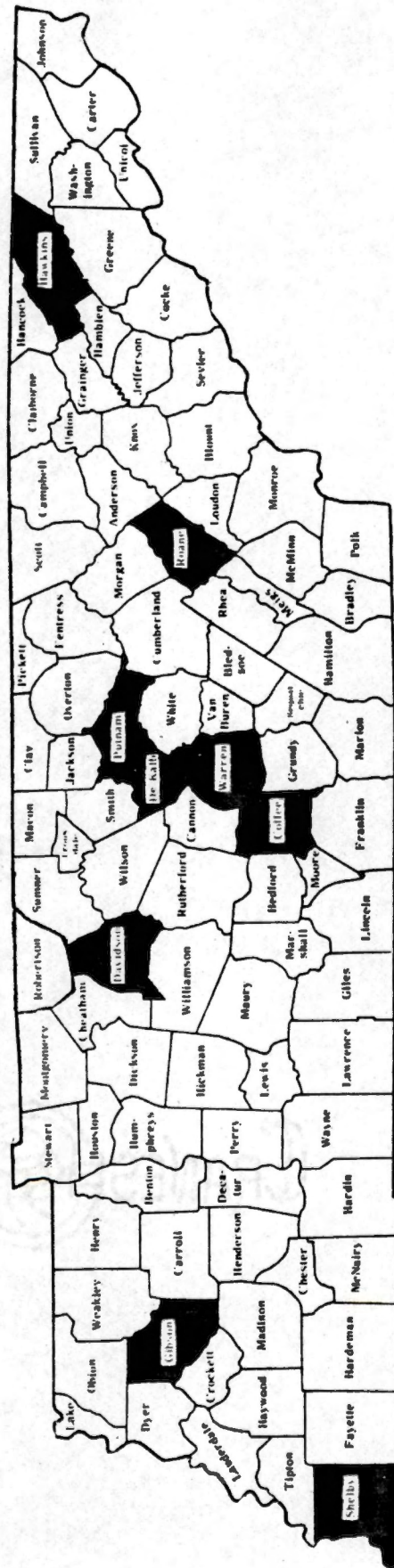


Figure 1. Location of the 9 original expanded food and nutrition education program counties in Tennessee as of December, 1979.

In order to obtain information from five food recalls, the participants had to have been enrolled for a period of at least 24 months in the program.

Starting with the first file which met the above requirements, every fourth qualifying file was pulled from each county's active file. Folders that contained incomplete information from any of the five food recalls or the family history were excluded from the sample study.

III. THE DATA

Data were collected and recorded from seven family record forms available from each of the nine original counties (see Appendix). The record forms for each participant included:

1. Family Record--Part A. This form was a description of the family and was filled out on each family as they enrolled in the program.
2. Family Record--Part B (initial record). This form was the initial food recall and also was taken when the family enrolled in the program. Of particular interest to this study were items number seven through ten. In these items, the number of servings from each of the four food groups were recorded for the previous 24 hours prior to the interview. This will be referred to as the 24-hour food recall.
3. Family Record--Part B (second 24-hour food recall). In addition to the Family Record--Part B being recorded when each family enrolled, the same record also was used as

an evaluation device at six-month intervals. The second 24-hour food recall was recorded after the first six months in the program.

4. Family Record--Part B (third 24-hour food recall). At the twelve-month period, a third food recall was obtained from each family.
5. Family Record--Part B (fourth 24-hour food recall). A fourth food recall was recorded after the family had participated in the program for eighteen months.
6. Family Record--Part B (fifth 24-hour food recall). The last Family Record--Part B which was considered in this study was recorded at the participant's two-year mark. The five 24-hour food recalls were of primary concern in this study in order to observe the progress made over the two-year period in the program.

IV. FOOD RECALL PROCEDURE

The 24-hour food recall was used as an evaluation device to determine the nutritional adequacy of participants in the program. The first food recall was completed upon enrollment in the program and thereafter at six-month intervals. The Program Aide recorded foods that the homemaker had consumed over the past 24 hours. The Aide then rated each homemaker's diet according to adequate diet servings from each of the four food groups--two servings each of milk and meat and four servings each of fruit/vegetables and bread/cereals. This scoring was applied throughout the program to assure that diet information was comparable.

V. METHODS OF SECURING DATA

With the cooperation of the State and County Agricultural Extension Staff in Tennessee and other Extension personnel, it was possible to travel to each sample county and collect the data. Assurance was given that the identities of each participant included in the study would be kept confidential. Each District Supervisor was contacted by the Department of Agricultural Extension Education at The University of Tennessee, Knoxville, describing information needed, collection procedure, and the date of data collection. In each sample county, every fourth folder which contained the family history and the first five consecutive 24-hour food recalls were pulled from the file and data recorded.

VI. ANALYSIS OF DATA

Data from the family record forms were recorded on code sheets. This information was punched on data cards for statistical analysis by The University of Tennessee Computer Center.

Information was tabulated by frequency counts. In Chapter V, chi-square and t-test were used to determine the relationship between the percent of homemakers with adequate servings from each food group in the initial food recall as compared to the fifth 24-hour food recall. In Chapter IV, the analysis of variance F-test was used to determine the relationship between personal and family characteristics among EFNEP participants and the mean number of servings consumed from each of the four food groups from the initial to the fifth food recall. A probability level of 0.05 was accepted as being statistically significant.

CHAPTER IV

FINDINGS REGARDING ALL FIVE FOOD RECALLS

The purpose of this chapter is to present findings that show the influence of personal and family characteristics of Expanded Food and Nutrition Education Program participants on the number of milk, meat, fruit/vegetable, and bread/cereal servings reported by homemakers over a period of five consecutive 24-hour food recalls. These findings are presented in four tables with each table constituting a section. Each section presents data regarding one of the four food groups.

Ten personal and family characteristics were analyzed and data are reported in each table. The characteristics are: (1) county, (2) place of residence, (3) received food stamps, (4) received food donation, (5) received USDA assistance, (6) received welfare, (7) adult male present in the household, (8) educational level of homemaker, (9) ethnic background of homemaker, and (10) total months in the program.

The tables were divided vertically into 24-hour food recalls. The initial food recall was taken for all homemakers when they enrolled in the EFNEP Program. Thereafter, a food recall was taken each six months. Data were obtained from five consecutive 24-hour food recalls starting with the initial and ending with the fifth food recall as of December, 1979, when the data were collected.

Section I presents findings regarding the relationship between the number of milk servings reported by participants on five food recalls and their personal and family characteristics.

Section II presents findings regarding the relationship between the number of meat servings reported by participants on five food recalls and their family and personal characteristics.

Section III presents findings regarding the relationship between the number of servings from the fruit and vegetable group reported by homemakers at each food recall and their personal and family characteristics.

Section IV presents findings regarding the relationship between the number of servings from the bread and cereal group reported by homemakers at each food recall and their family and personal characteristics.

Information was tabulated by frequency counts. The analysis of variance F-test was used to determine the relationship between family and personal characteristics among EFNEP participants and the mean number of servings consumed from each of the four food groups. A probability level of 0.05 was accepted as being statistically significant.

I. RELATIONSHIP BETWEEN NUMBER OF MILK SERVINGS EFNEP HOMEMAKERS REPORTED AND THEIR FAMILY AND PERSONAL CHARACTERISTICS

This section reports findings regarding the relationship between the number of milk servings EFNEP homemakers reported and their personal and family characteristics. The number of milk servings is shown (Table I) for each category of the personal and family characteristic variables and for each of the five 24-hour food recalls.

TABLE I

Relationship between the Number of Servings
from the Milk Group Reported by Family
and Personal Characteristics of
EFNEP Homemakers

County, Family and Personal Characteristics	Mean Number Servings from the Milk Group				
	First Recall	Second Recall	Third Recall	Fourth Recall	Fifth Recall
<u>County</u>					
Hawkins (N=27)	1.56	1.30	1.37	1.33	1.37
DeKalb (N=24)	1.41	1.17	1.52	1.31	1.21
Warren (N=31)	1.32	1.13	1.06	1.03	1.07
Putnam (N=22)	1.23	1.77	1.50	1.45	1.36
Roane (N=21)	1.00	1.52	1.14	1.19	1.93
Davidson (N=78)	0.92	1.23	1.13	1.06	1.19
Gibson (N=45)	0.78	0.60	0.64	0.87	0.91
Coffee (N=35)	0.69	1.09	1.29	1.66	1.51
Shelby (N=87)	0.66	0.86	0.86	1.05	1.25
F value	6.167	4.948	4.326	3.102	2.041
p	0.000*	0.000*	0.000*	0.002*	0.041*
<u>Place of Residence</u>					
Urban (N=217)	0.88	1.06	1.04	1.07	1.18
Rural non-farm (N=138)	1.05	1.15	1.12	1.24	1.25
Farm (N=20)	1.25	1.10	1.40	1.55	1.65
F value	2.920	0.403	1.668	3.760	3.270
p	0.055	0.669	0.190	0.020*	0.040*

TABLE I (continued)

County, Family and Personal Characteristics	Mean Number Servings from the Milk Group				
	First Recall	Second Recall	Third Recall	Fourth Recall	Fifth Recall
<u>Received Food Stamps</u>					
Yes (N=163)	0.80	1.00	0.87	1.06	1.21
No (N=212)	1.08	1.17	1.25	1.25	1.25
F value	10.329	3.004	17.524	3.94	0.19
p	0.001*	0.084	0.000*	0.48	0.66
<u>Received Food Donation</u>					
Yes (N=19)	1.05	0.95	0.79	1.26	0.89
No (N=356)	0.96	1.10	1.10	1.15	1.25
F value	0.227	0.497	2.215	0.291	3.540
p	0.634	0.481	0.138	0.590	0.060
<u>Received USDA Assistance</u>					
Yes (N=45)	0.67	0.84	0.87	0.91	1.33
No (N=330)	1.00	1.13	1.12	1.19	1.22
F value	5.904	3.665	3.119	4.063	0.868
p	0.016*	0.056	0.078	0.446	0.352
<u>Received Welfare</u>					
Yes (N=130)	0.78	0.99	0.88	1.12	1.27
No (N=245)	1.05	1.16	1.20	1.18	1.21
F value	8.263	2.790	10.447	0.454	0.496
p	0.004*	0.096	0.001*	0.501	0.482

TABLE I. (continued)

County, Family and Personal Characteristics	Mean Number Servings from the Milk Group				
	First Recall	Second Recall	Third Recall	Fourth Recall	Fifth Recall
<u>Adult Male In Household</u>					
Yes (N=130)	0.99	1.14	1.11	1.14	1.20
No (N=245)	0.92	1.03	1.06	1.18	1.28
F value	0.301	1.104	0.680	0.145	1.62
p	0.741	0.333	0.507	0.865	0.200
<u>Education Of Homemaker</u>					
8th or less (N=156)	0.95	1.15	1.12	1.09	1.22
9th-12th (N=195)	0.94	1.05	1.05	1.19	1.21
Beyond H.S. (N=24)	1.21	1.13	1.21	1.29	1.42
F value	1.053	0.576	0.449	0.923	0.719
p	0.350	0.563	0.639	0.318	0.488
<u>Ethnic Background</u>					
White (N=157)	1.16	1.27	1.27	1.28	1.28
Black (N=216)	0.82	0.96	0.95	1.07	1.19
F value	5.217	4.880	4.789	2.446	0.704
p	0.002*	0.002*	0.003*	0.064	0.550

TABLE I (continued)

County, Family and Personal Characteristics	Mean Number Servings from the Milk Group				
	First Recall	Second Recall	Third Recall	Fourth Recall	Fifth Recall
Total Months In Program					
24 months (N=132)	0.73	0.93	0.93	1.11	1.26
30 months (N=75)	0.96	0.92	1.07	1.20	1.09
36 months (N=37)	1.24	0.92	1.00	0.95	1.11
Over 36 months (N=131)	1.11	1.41	1.28	1.24	1.31
F value	5.721	7.970	2.577	1.244	1.552
p	0.001*	0.000*	0.014*	0.294	0.201

*The F value is significant at the 0.05 level for (vertical) differences of each characteristic as related to the mean number of servings reported by homemakers for each food group in each food recall.

County

Analysis of the relationship between the number of servings of milk and the county where the EFNEP participants reside is shown in Table I. Study of the data revealed that there was a significant relationship between the number of servings consumed by the homemakers from the milk group and the county in which they lived.

Hawkins County had the highest mean servings of milk (1.56) on the initial 24-hour food recall. This mean of 1.56 had dropped, however, to 1.37 by the fifth 24-hour food recall.

In general, the number of mean servings from the milk group increased over the two year period. Roane County showed the most progress starting with a mean of 1.00 servings from the milk group and ending with 1.93 servings, and Coffee County was second with an increase from 0.69 servings of milk to 1.51 by the fifth food recall.

Place of Residence

Analysis of the relationship between the mean servings from the milk group and homemaker's place of residence is shown in Table I. Homemaker's place of residence was classified as either urban, rural nonfarm, or farm.

On the fourth and fifth 24-hour food recalls there was a significant relationship between the number of servings from the milk group reported by homemakers and their place of residence. Homemakers who lived on farms reported more servings of milk (1.25) than urban homemakers (0.88) on the initial food recall. The mean servings of milk reported by rural nonfarm homemakers (1.05) was less than that reported by the farm homemakers but higher than urban homemakers.

On the fifth food recall there was a significant relationship between the mean servings of milk and place of residence. Again the farm homemakers reported more servings of milk (1.65), followed by rural nonfarm homemakers (1.25) and urban homemakers (1.25). The farm homemakers did tend to report more servings from the milk group than either the rural nonfarm or the urban homemakers. The number of milk servings reported by homemakers did not differ significantly (i.e., 0.05 level) by place of residence on the second and third food recalls.

Received Food Stamps

Analysis of the relationship between the number of servings of milk and whether or not the EFNEP family participated in the Food Stamp Program is shown in Table I. Study of the data revealed that there was a significant relationship between the number of servings consumed by the homemakers from the milk group in the initial and third food recalls and whether the homemaker received food stamps.

On the initial 24-hour food recall, non-food stamp participants (1.08) reported a significantly higher number of milk servings than food stamp participants (0.80). Non-food stamp participants also reported a significantly higher number of milk servings (1.25) than food stamp participants (0.87) on the third food recall.

Both groups made improvements from the initial to the fifth 24-hour food recall. Food stamp participants made more improvement having an overall increase of 0.41 milk servings while non-food stamp homemakers progress only 0.13 servings.

The non-food stamp homemakers attained their highest number of milk servings (1.25) by the third 24-hour food recall. Food stamp homemakers regressed in number of milk servings consumed on the third food recall, but continued to progress in the number of milk servings (1.21) on the fifth 24-hour food recall. Although the number of milk servings for food stamp participants (1.21) on the last 24-hour food recall was still less than the milk servings of non-food stamp participants (1.25), the food stamp participants reported a higher overall increase in number of milk servings by the end of the study.

Received Food Donation

Analysis of the relationship between the number of milk servings and whether or not the EFNEP homemaker received food donation is shown in Table I. According to the data, the number of milk servings reported by the homemakers did not differ significantly (i.e., 0.05 level) by food donation.

Although not significant, it appeared that the families who did not receive food donation reported more progress over the two year period in number of milk servings (0.96 to 1.25) than homemakers receiving food donation (1.05 to 0.89).

Whether the number of milk servings of homemakers not receiving food donation increased continually throughout the program, the food donation participant's milk servings fluctuated throughout the study reaching their peak number of milk servings in the fourth 24-hour food recall (1.26) and dropping to 0.89 servings in the fifth.

Received USDA Assistance

Analysis of the relationship between the number of servings of milk and whether or not the family received USDA assistance is shown in Table I. As shown in the data, there was a significant relationship in the initial 24-hour food recall between the number of milk servings and USDA assistance.

The homemakers not receiving USDA assistance reported more servings of milk in all food recalls except the last one. In the initial recall, the homemakers receiving USDA assistance reported 0.67 servings of milk while homemakers not receiving any assistance reported 1.00 servings.

Both groups made improvement from the first to the last 24-hour food recall. Homemakers receiving USDA assistance reported an increase of 0.56 servings of milk by the end of the two year period. Homemakers not receiving USDA assistance increased only by 0.22 milk servings during the same time period.

Received Welfare

Analysis of the relationship between the number of servings of milk and whether or not the EFNEP family participated in the Welfare Program is shown in Table I. Data revealed that there was a significant relationship between the number of servings consumed by the homemakers from the milk group in the initial and third food recalls and welfare participation.

Except for the last food recall, nonwelfare homemakers reported more servings of milk than did homemakers on welfare.

Of the two groups, the homemakers receiving welfare reported more improvement of milk servings (0.78 to 1.27) from the initial to the fifth 24-hour food recall than the homemakers not receiving welfare (1.05 to 1.21).

The number of milk servings reported by homemakers did not differ significantly whether or not the homemaker received welfare on the second, fourth, and fifth 24-hour food recalls.

Adult Male in Household

Analysis of the relationship between the number of milk servings consumed by the homemaker and whether or not there was an adult male present in the home is shown in Table I, page 24. Study of the data revealed that there was no significant relationship between the number of servings consumed by the homemakers from the milk group and whether or not an adult male was present in the household.

Although not significant, households that had an adult male present reported more progress in the number of milk servings consumed during this study (0.92 to 1.28) than did households without an adult male (0.99 to 1.20).

Education of Homemaker

Analysis of the relationship between the number of milk servings consumed by the homemaker and the education level of the homemaker is shown in Table I. Homemakers' educational level was categorized as either eighth grade or less, ninth through twelfth grade, or beyond the twelfth grade.

The number of milk servings reported by homemakers did not differ significantly by the homemakers' education level. Homemakers that had education beyond high school reported more servings of milk than the other two groups on all food recalls except the second.

All groups of homemakers made improvement in the number of milk servings consumed from the initial to the last 24-hour food recall. Although homemakers with an education beyond high school reported a higher number of milk servings consumed, the other two groups showed more progress during this study.

Ethnic Background

Analysis of the relationship between the number of servings of milk consumed by the homemaker and the ethnic background of the homemakers is shown in Table I, page 24. Ethnic background was classified as either white, black, or other.

In the first, second, and third 24-hour food recalls, there was a significant relationship between the number of milk servings reported by homemakers and their ethnic background. White homemakers reported more servings of milk on all food recalls than black homemakers.

Both groups of homemakers made improvement in the number of milk servings consumed from the first to last 24-hour food recall. Black homemakers improved by 0.37 servings of milk (0.82 to 1.19) during this study while white homemakers increased by only 0.12 servings (1.16 to 1.28).

Total Months in Program

Analysis of the relationship between the number of servings of milk reported by homemakers and the reported months the homemaker participated in the program is shown in Table I, page 24. Total months of enrollment in the program was classified as either 24 months, 30 months, 36 months, or over 36 months.

Study of the data revealed that there was a significant relationship between the number of milk servings consumed by homemakers and the total months in the program. Homemakers that had participated in the EFNEP program for over 36 months reported a higher number of milk servings than the other three groups in all but the first 24-hour food recall.

Homemakers that had been in the program for 24 months reported the most improvement during this study. They increased the number of milk servings consumed from 0.73 to 1.26. Homemakers that had been in the program for 36 months decreased in number of milk servings reported from 1.24 to 1.11. Thus, the length of time spent in the program after 24 months was not directly related to an increase in the number of servings consumed from the milk group by homemakers.

II. RELATIONSHIP BETWEEN NUMBER OF MEAT SERVINGS EFNEP HOMEMAKERS REPORTED AND THEIR FAMILY AND PERSONAL CHARACTERISTICS

This section reports findings regarding the relationship between the number of meat servings EFNEP homemakers reported and their personal and family characteristics. The number of meat

servings is shown (Table II) for each category of the personal and family characteristic variables and for each of the five 24-hour food recalls.

County

Analysis of the relationship between the number of servings of meat and the county where the EFNEP participants reside is shown in Table II. Study of the data revealed that there was a significant relationship between the number of servings consumed by the homemakers from the meat group in the third, fourth, and fifth 24-hour food recalls and the county in which they lived.

On the initial 24-hour food recall, DeKalb County scored the highest mean serving of meat (2.34). However, by the fifth 24-hour food recall, DeKalb had dropped to 1.90 which was the lowest mean serving of meat of the nine counties. Coffee County showed the greatest progress of this group starting with a mean of 1.91 servings of meat and topping out in the fifth recall with 2.51 servings.

In general, reported servings of meat were at or above the 2.00 servings which is the recommended amount in order to obtain an adequate diet. Increases in the mean servings over the five food recalls of meat were usually slight, and one county fell below the recommended mean of 2.00 servings of meat.

Place of Residence

Analysis of the relationship between the number of servings of meat and the homemaker's place of residence is shown in Table II. Homemaker's place of residence was classified as either urban, rural nonfarm, or farm.

TABLE II

Relationship between the Number of Servings
from the Meat Group Reported by Family
and Personal Characteristics of
EFNEP Homemakers

County, Family and Personal Characteristics	Mean Number Servings from the Meat Group				
	First Recall	Second Recall	Third Recall	Fourth Recall	Fifth Recall
<u>County</u>					
DeKalb (N=29)	2.34	2.03	1.72	1.66	1.90
Shelby (N=87)	2.29	2.40	2.46	2.33	2.39
Gibson (N=45)	2.29	2.42	2.09	2.22	2.29
Davidson (N=78)	2.27	2.32	2.33	2.54	2.33
Hawkins (N=27)	2.19	1.93	1.96	2.04	2.11
Roane (N=27)	2.10	2.29	2.48	2.29	2.29
Warren (N=31)	2.06	2.19	2.29	2.23	2.19
Coffee (N=35)	1.91	2.14	2.17	2.31	2.51
Putnam (N=22)	1.77	2.14	1.86	2.05	2.09
F value	1.952	1.825	3.823	4.130	2.380
p	0.052	0.071	0.000*	0.000*	0.020*
<u>Place of Residence</u>					
Urban (N=217)	2.23	2.31	2.32	2.35	2.31
Rural non-farm (N=138)	2.11	2.21	2.12	2.09	2.21
Farm (N=20)	2.25	2.10	1.90	2.35	2.40
F value	1.063	1.333	4.102	4.735	1.200
p	0.347	0.323	0.017*	0.009*	0.302

TABLE II (continued)

County, Family and Personal Characteristics	Mean Number Servings from the Meat Group				
	First Recall	Second Recall	Third Recall	Fourth Recall	Fifth Recall
<u>Received Food Stamps</u>					
Yes (N=163)	2.23	2.31	2.27	2.29	2.33
No (N=212)	2.15	2.22	2.18	2.23	2.24
F value	0.991	1.267	0.977	0.581	1.514
p	0.320	0.261	0.324	0.447	0.219
<u>Received Food Donation</u>					
Yes (N=19)	2.37	2.26	2.16	2.42	2.68
No (N=356)	2.18	2.26	2.22	2.25	2.26
F value	1.053	0.000	0.115	0.829	6.617
p	0.306	0.992	0.734	0.363	0.011*
<u>Received USDA Assistance</u>					
Yes (N=45)	2.27	2.22	2.38	2.33	2.31
No (N=330)	2.18	2.27	2.20	2.25	2.28
F value	0.520	0.129	1.800	0.448	0.098
p	0.471	0.719	0.181	0.504	0.754
<u>Received Welfare</u>					
Yes (N=130)	2.28	2.32	2.32	2.31	2.39
No (N=245)	2.14	2.23	2.17	2.23	2.22
F value	2.591	0.960	2.536	0.751	5.058
p	0.108	0.328	0.112	0.387	0.025

TABLE II (continued)

County, Family and Personal Characteristics	Mean Number Servings from the Meat Group				
	First Recall	Second Recall	Third Recall	Fourth Recall	Fifth Recall
<u>Adult Male In Household</u>					
Yes (N=212)	2.16	2.00	2.21	2.19	2.28
No (N=163)	2.22	2.28	2.23	2.34	2.29
F value	0.288	0.179	0.475	2.160	1.650
P	0.750	0.836	0.622	0.117	0.193
<u>Education Of Homemaker</u>					
8th or less (N=156)	2.15	2.10	2.04	2.16	2.23
9th-12th (N=195)	2.18	2.34	2.32	2.30	2.31
Beyond H.S. (N=24)	2.46	2.71	2.58	2.54	2.33
F value	1.556	8.786	7.716	3.026	0.653
P	0.212	0.000*	0.005*	0.050*	0.521
<u>Ethnic Background</u>					
White (N=158)	2.04	2.09	2.05	2.09	2.15
Black (N=215)	2.28	2.38	2.34	2.38	2.38
F value	3.547	4.582	4.332	4.540	3.710
P	0.015	0.004*	0.005*	0.004*	0.012*

TABLE II (continued)

County, Family and Personal Characteristics	Mean Number Servings from the Meat Group				
	First Recall	Second Recall	Third Recall	Fourth Recall	Fifth Recall
<u>Total Months In Program</u>					
24 months (N=132)	2.16	2.27	2.33	2.32	2.33
30 months (N=75)	2.24	2.32	2.19	2.31	2.37
36 months (N=37)	2.03	2.11	1.92	1.89	2.14
Over 36 months (N=131)	2.23	2.26	2.21	2.27	2.21
F value	0.790	0.628	2.487	3.009	1.589
P	0.500	0.597	0.060	0.030*	0.192

*The F value is significant at the 0.05 level for (vertical) differences of each characteristic as related to the mean number of servings reported by homemakers for each food group in each food recall.

On the third and fourth 24-hour food recalls, there was a significant relationship between the number of servings from the meat group reported by homemakers and their place of residence. Urban homemakers reported more servings of meat (2.32) on the third food recall than either the rural nonfarm (2.12) or farm (1.90) homemakers.

The fourth food recall also showed a significant relationship between the number of servings from the meat group and place of residence. Urban and farm homemakers both reported 2.35 servings of meat followed by rural nonfarm homemakers (2.09). The number of meat servings reported by homemakers did not differ significantly by place of residence on the first, second, or fifth food recall.

Received Food Stamps

Analysis of the relationship between the number of servings of meat and whether or not the EFNEP family participated in the Food Stamp Program is shown in Table II. Study of the data revealed that the number of meat servings reported by the homemakers did not differ significantly by food stamps.

Although not significant, it appeared that food stamp participants reported slightly more increase over the two year period in number of meat servings consumed (2.23 to 2.33) than did non-food stamp participants (2.15 to 2.24).

Homemakers receiving food stamps reported more servings of meat than non-food stamp homemakers throughout the study. On the initial 24-hour food recall, food stamp participants reported 0.08

more servings of meat than non-food stamp participants, and 0.09 more servings of meat in the last food recall.

Received Food Donation

Analysis of the relationship between the number of meat servings and whether or not the EFNEP homemaker received food donation is shown in Table II. According to the data, there was a significant relationship between the number of services consumed by the homemakers from the meat group on the last 24-hour food recall and whether the homemaker received food donation.

Homemakers receiving food donation reported the same or more servings of meat than did homemakers not receiving food donation except in the third food recall.

Both groups made improvement in the number of meat servings consumed, however, the non-food donation group's improvement was slight. By the end of the two year period, homemakers who received food donation had increased their meat servings by 0.31 (2.37 to 2.68) while the group not receiving food donation increased only 0.08 servings (2.18 to 2.26).

The number of meat servings reported by homemakers did not differ significantly whether or not the homemaker received food donation on the first through the fourth food recalls.

Received USDA Assistance

Analysis of the relationship between the number of servings of meat and whether or not the EFNEP family received USDA assistance is shown in Table II. According to the data, the number of meat servings reported by the homemakers did not differ significantly by USDA assistance.

Even though there was no significance, the families who did not receive USDA assistance reported more progress over the two year period in the number of meat servings (2.18 to 2.28) than homemakers receiving USDA assistance (2.27 to 2.31).

The group receiving USDA assistance reported more servings of meat than did the group not receiving USDA assistance in all but the second food recall.

Received Welfare

Analysis of the relationship between the number of servings of meat and whether or not the EFNEP family received welfare is shown in Table II. Data revealed that there was a significant relationship between the number of meat servings consumed by the homemakers in the fifth 24-hour food recall and welfare participation.

In all food recalls, welfare homemakers reported 0.11 improvement of meat servings (2.28 to 2.39) during the study while non-welfare homemakers increased by 0.08 servings (2.14 to 2.22).

Adult Male in Household

Analysis of the relationship between the number of meat servings consumed by the homemaker and whether or not there was an adult male present in the home is shown in Table II. Study of the data revealed that there was no significant relationship between the number of servings consumed by the homemakers from the meat group and whether or not an adult male was present in the household.

Although not significant, households that had an adult male present reported more progress in the number of meat servings consumed

during this study (2.16 to 2.28) than did households without an adult male (2.22 to 2.29). Households that did not have an adult male present reported more servings of meat than the other group on all five food recalls.

Education of Homemaker

Analysis of the relationship between the number of meat servings consumed by the homemaker and the education level is shown in Table II. Homemaker's education was categorized as either eighth grade or less, ninth through twelfth grade, or beyond the twelfth grade.

The number of meat servings reported by homemakers did differ significantly by the homemakers' educational level in the second, third, and fourth food recalls. Homemakers that had completed education beyond high school reported more servings of meat than the other two groups on all food recalls.

Homemakers with a ninth through twelfth grade education reported the most progress of meat servings (2.18 to 2.31) of the three groups. Although homemakers with an education beyond high school reported a higher number of meat servings consumed, they reported a lower number of meat servings at the end of the study than they began with (2.46 to 2.33).

Ethnic Background

Analysis of the relationship between the number of servings of meat consumed by the homemaker and the ethnic background of the homemakers is shown in Table II. Ethnic background was classified as either white, black, or other.

In every food recall there was a significant relationship between the number of meat servings reported by homemakers and their ethnic background. Black homemakers reported more servings of meat on all 24-hour food recalls than white homemakers.

Both groups of homemakers made improvement in the number of meat servings consumed from the first to the last food recall. White homemakers improved by 0.11 servings of meat (2.04 to 2.15) during this study, and black homemakers increased by 0.10 servings (2.28 to 2.38).

Total Months in Program

Analysis of the relationship between the number of servings of meat reported by homemakers and the reported months the homemaker participated in the program is shown in Table II, page 36. Total months of enrollment in the program was classified as either 24 months, 30 months, 36 months, or over 36 months.

Study of the data revealed that there was a significant relationship between the number of meat servings consumed by homemakers and the total months in the program in the fourth food recall. Homemakers that had participated in the EFNEP program for a period of two years reported a higher number of meat servings than the other groups in the third and fourth food recalls. Homemakers participating in the program for 30 months reported the higher number of meat servings in the first, second, and last 24-hour food recall.

Homemakers that had been in the program for 24 months reported the most improvement during this study. They increased the number of meat servings from 2.16 to 2.33. Homemakers that had been in the

program for over 36 months decreased in number of meat servings from 2.23 to 2.21. Thus, the length of time spent in the program after 24 months was not directly related to an increase in the number of servings consumed from the meat group.

III. RELATIONSHIP BETWEEN NUMBER OF FRUIT/VEGETABLE SERVINGS EFNEP HOMEMAKERS REPORTED AND THEIR FAMILY AND PERSONAL CHARACTERISTICS

This section reports findings regarding the relationship between the number of fruit and vegetable servings EFNEP homemakers reported and their personal and family characteristics. The number of fruit and vegetable servings is shown (Table III) for each category of the personal and family characteristic variables and for each of the 24-hour food recalls.

County

Analysis of the relationship between the number of servings of fruit and vegetable group and the county where the EFNEP participants reside is shown in Table III. Study of the data revealed that there was a significant relationship between the number of servings consumed by the homemakers from the fruit and vegetable group and the county in which they lived on the first, third, and fourth 24-hour food recalls.

On the initial 24-hour food recall, DeKalb County scored the highest mean servings of fruit and vegetables consumed (3.55). However, by the fifth food recall, DeKalb had decreased to 3.41

TABLE III

Relationship between the Number of Servings
from the Fruit/Vegetable Group Reported by
Family and Personal Characteristics
of EFNEP Homemakers

County, Family and Personal Characteristics	Mean Number Servings from the Fruit/Vegetable Group				
	First Recall	Second Recall	Third Recall	Fourth Recall	Fifth Recall
<u>County</u>					
DeKalb (N=29)	3.05	3.21	3.24	3.66	3.41
Roane (N=21)	2.57	2.29	2.43	3.00	3.10
Davidson (N=78)	2.51	2.78	3.18	2.97	2.94
Hawkins (N=27)	2.44	2.93	2.63	2.74	3.00
Warren (N=31)	2.39	2.90	2.71	2.74	2.96
Coffee (N=35)	2.29	2.51	3.40	2.97	3.17
Gibson (N=45)	2.20	2.56	2.22	2.84	2.96
Shelby (N=87)	2.08	2.89	2.98	3.30	3.20
Putnam (N=22)	2.00	2.45	2.41	2.82	3.14
F value	4.090	1.555	4.271	1.963	0.615
p	0.001*	0.137	0.000*	0.050*	0.765
<u>Place of Residence</u>					
Urban (N=217)	2.35	2.80	2.93	3.02	3.07
Rural non-farm (N=138)	2.37	2.65	2.74	3.07	3.09
Farm (N=20)	3.00	3.15	3.25	3.05	3.25
F value	2.211	1.649	1.851	0.063	0.194
p	0.111	0.190	0.158	0.939	0.824

TABLE III (continued)

County, Family and Personal Characteristics	Mean Number Servings from the Fruit/Vegetable Group				
	First Recall	Second Recall	Third Recall	Fourth Recall	Fifth Recall
<u>Received Food Stamps</u>					
Yes (N=163)	2.02	2.71	2.76	2.93	3.00
No (N=212)	2.68	2.80	2.97	3.13	3.15
F value	23.935	0.540	2.403	2.133	1.366
p	0.000*	0.460	0.122	0.145	0.243
<u>Received Food Donation</u>					
Yes (N=19)	2.47	2.84	3.26	2.95	2.32
No (N=356)	2.39	2.76	2.86	3.05	3.13
F value	0.075	0.086	1.824	0.110	7.847
p	0.785	0.770	0.177	0.740	0.005*
<u>Received USDA Assistance</u>					
Yes (N=45)	1.93	3.04	2.69	3.22	3.20
No (N=330)	2.45	2.72	2.90	3.02	3.07
F value	6.111	2.640	1.109	1.002	0.436
p	0.014*	0.110	0.293	0.318	0.509
<u>Received Welfare</u>					
Yes (N=130)	2.01	2.74	2.82	2.98	3.01
No (N=245)	2.60	2.77	2.91	3.07	3.13
F value	17.182	0.059	0.466	0.407	0.779
p	0.000*	0.809	0.495	0.524	0.378

TABLE III (continued)

County, Family and Personal Characteristics	Mean Number Servings from the Fruit/Vegetable Group				
	First Recall	Second Recall	Third Recall	Fourth Recall	Fifth Recall
<u>Adult Male In Household</u>					
Yes (N=212)	1.00	3.00	2.90	3.06	3.11
No (N=163)	2.46	2.80	2.85	3.03	3.06
F value	1.021	0.283	0.298	1.300	0.485
p	0.361	0.753	0.742	0.274	0.616
<u>Education Of Homemaker</u>					
8th or less (N=158)	2.30	2.71	2.67	2.94	3.05
9th-12th (N=195)	2.35	2.78	2.96	3.08	3.01
Beyond H.S. (N=24)	3.29	2.96	3.50	3.38	3.92
F value	6.041	0.472	5.402	1.378	5.962
p	0.003*	0.624	0.005*	0.253	0.003*
<u>Ethnic Background</u>					
White (N=158)	2.44	2.75	2.82	2.96	3.05
Black (N=215)	2.35	2.76	2.92	3.11	3.11
F value	1.438	1.082	0.443	0.830	1.822
p	0.231	0.357	0.722	0.480	0.143

TABLE III (continued)

County, Family and Personal Characteristics	Mean Number Servings from the Fruit/Vegetable Group				
	First Recall	Second Recall	Third Recall	Fourth Recall	Fifth Recall
<u>Total Months In Program</u>					
24 months (N=132)	2.09	2.65	2.85	3.05	3.12
30 months (N=75)	2.41	2.93	2.95	2.92	3.15
36 months (N=37)	2.49	2.41	2.19	2.97	2.84
Over 36 months (N=131)	2.66	2.87	3.06	3.13	3.08
F value	4.116	2.149	4.698	0.465	0.587
p	0.007*	0.094	0.003*	0.707	0.624

*The F value is significant at the 0.05 level for (vertical) differences of each characteristic as related to the mean number of servings reported by homemakers for each food group in each food recall.

servings. This was the only county which reported a lower number of fruit and vegetable servings at the end of the two year period than they began with in the program.

Putnam and Shelby Counties showed the most progress over the two year period. Putnam increased from 2.00 servings of fruit and vegetables in the first food recall to 3.14 servings by the fifth recall, and Shelby climbed from 2.08 to 3.20 servings of fruit and vegetables over the same time period.

The county that homemakers resided in showed no significant influence on the number of servings of fruit and vegetables reported by EFNEP homemakers on the second and fifth 24-hour food recalls.

Place of Residence

Analysis of the relationship between the number of servings of fruit and vegetables and the homemakers place of residence is shown in Table III. Homemaker's place of residence was classified as either urban, rural nonfarm, or farm.

The number of fruit and vegetable servings reported by homemakers did not differ significantly by place of residence on any of the five 24-hour food recalls. Homemakers that lived on farms reported more servings of fruit and vegetables than either urban or rural nonfarm homemakers on all food recalls except the fourth.

All groups of homemakers made improvement in the number of fruit and vegetable servings consumed from the initial food recall to the last. Urban and rural nonfarm homemakers both reported an overall increase of 0.72 servings of fruit and vegetables during the two year period while farm homemakers progressed only 0.25 servings.

Received Food Stamps

Analysis of the relationship between the number of servings of fruit and vegetables and whether or not the EFNEP family participated in the Food Stamp Program is shown in Table III. Study of the data revealed that there was a significant relationship between the number of servings consumed by the homemakers from the fruit and vegetable group in the initial 24-hour food recall and whether the homemaker received food stamps.

On the initial 24-hour food recall, non-food participants reported a higher number of fruit and vegetable servings (2.68) than food stamp participants (2.02). Non-food stamp homemakers reported more fruit and vegetable servings on each food recall than did the homemakers receiving food stamps.

Although non-food stamp homemakers reported more servings of fruits and vegetables, food stamp homemakers showed more progress during the two year period. Food stamp participants increased 0.98 servings of fruit and vegetables (2.02 to 3.00) while the other group increased by 0.47 servings (2.68 to 3.15).

Received Food Donation

Analysis of the relationship between the number of fruit and vegetable servings and whether or not the EFNEP family received food donation is shown in Table III. According to the data, there was a significant relationship between the number of fruit and vegetable servings consumed by the homemakers on the last 24-hour food recall and whether the homemaker had received food donation.

Homemakers receiving food donation obtained their peak number of fruit and vegetable servings (3.26) on the third 24-hour food recall. This was an increase of 0.79 servings over the initial recall. However, by the end of the two year period, the number of fruit and vegetable servings (2.32) was less than what the group began with (2.47). The homemakers not receiving food donation increased by 0.74 servings of fruit and vegetables (2.39 to 3.13).

Received USDA Assistance

Analysis of the relationship between the number of servings of fruit and vegetables and whether or not the EFNEP family received USDA assistance is shown in Table III. Data revealed that there was a significant relationship between the number of fruit and vegetable servings consumed by the homemakers in the initial food recall and USDA assistance.

Non-USDA assistance participants reported more servings of fruit and vegetables in the initial food recall (2.45) than the other group (1.93). However the homemakers receiving USDA assistance surpassed the non-participants in number of fruit and vegetable servings in the fourth recall and ended the study with 3.20 servings as compared to 3.07 servings by non-USDA participants.

Thus, homemakers who received USDA assistance reported more progress over the two year period in the number of fruit and vegetable servings consumed (1.93 to 3.20) than homemakers who did not receive any assistance (2.45 to 3.07).

Received Welfare

Analysis of the relationship between the number of servings of fruit and vegetables consumed by EFNEP homemakers and whether or not they received welfare is shown in Table III. Study of the data revealed that there was a significant relationship between the number of fruit and vegetable servings reported by the homemakers in the initial food recall and welfare participation.

In all 24-hour food recalls, homemakers not receiving welfare reported more servings of fruit and vegetables than did homemakers receiving welfare.

Of the two groups, welfare homemakers reported more improvement during the study. They reported an increase of 1.00 serving of fruit and vegetables (2.01 to 3.01) while homemakers not receiving welfare improved by only 0.53 servings (2.60 to 3.13).

Adult Male in Household

Analysis of the relationship between the number of fruit and vegetable servings consumed by the homemakers and whether or not there was an adult male present in the home is shown in Table III. Study of the data revealed that there was no significant relationship between the number of servings consumed by the homemakers from the fruit and vegetable group and whether or not an adult male was present in the household.

Although not significant, households that had an adult male present reported more progress in the number of fruit and vegetable servings consumed during this study (1.00 to 3.11) than did households that did not have an adult male present (2.46 to 3.06). Households

that had an adult male present reported more servings of fruit and vegetables than the other group on all but the initial 24-hour food recall.

Education of Homemaker

Analysis of the relationship between the number of fruit and vegetable servings consumed by the homemaker and the education level of the homemaker is shown in Table III. Homemaker's education was categorized as either eighth grade or less, ninth through twelfth grade, or beyond the twelfth grade.

The number of fruit and vegetable servings reported by homemaker's educational level in initial, third, and fifth food recalls were significant. Homemakers that had education beyond high school reported more servings of fruit and vegetables than the other two groups on all 24-hour food recalls.

Homemakers with an education level of eighth grade or less reported the most progress of fruit and vegetable servings (2.30 to 3.05) consumed of the three groups. Although homemakers with an education level beyond high school reported a higher number of fruit and vegetable servings consumed, the other two groups showed more progress during this study.

Ethnic Background

Analysis of the relationship between the number of servings of fruits and vegetables consumed by the homemaker and the ethnic background of the homemaker is shown in Table III. Ethnic background was classified as either white, black, or other.

In every food recall there was no significant difference between the number of fruit and vegetable servings reported by the homemakers and their ethnic background.

Both groups of homemakers made improvement in the number of fruit and vegetable servings consumed from the first to the last 24-hour food recall. Black homemakers improve by 0.76 servings of fruit and vegetables (2.35 to 3.11) during this study while white homemakers increased by 0.61 servings (2.44 to 3.05).

Total Months in Program

Analysis of the relationship between the number of servings of fruit and vegetables reported by homemakers and the reported months the homemaker had participated in the program is shown in Table III, page 46. Total months of enrollment in the program was classified as either 24, 30, 36, or over 36 months.

Study of the data revealed that there was a significant relationship between the number of fruit and vegetable servings consumed by homemakers and the total months in the program in the initial and third 24-hour food recalls. From these two food recalls, homemakers that had participated in the program for over 36 months reported a higher number of fruit and vegetable servings than the other groups.

Homemakers that had been in the program for 24 months reported the most improvement during this study. They increased the number of fruit and vegetables consumed by 1.03 servings (2.09 to 3.12). Homemakers that had been in the program for 36 months showed the least improvement (0.35) in the program. Thus, the length of time spent

in the program after 24 months was not directly related to an increase in the number of servings consumed from the fruit and vegetable group.

IV. RELATIONSHIP BETWEEN NUMBER OF BREAD/CEREAL SERVINGS EFNEP HOMEMAKERS REPORTED AND THEIR FAMILY AND PERSONAL CHARACTERISTICS

This section reports findings regarding the relationship between the number of bread and cereal servings EFNEP homemakers reported and their personal and family characteristics. The number of bread and cereal servings is shown (Table IV) for each category of the personal and family characteristic variables and for each of the 24-hour food recalls.

County

Analysis of the relationship between the number of servings of bread and cereal and the county where the EFNEP participants reside is shown in Table IV. Study of the data revealed that there was a significant relationship in each 24-hour food recall between the number of servings consumed by the homemaker from the bread and cereal group and the county in which they lived.

On the initial 24-hour food recall, DeKalb County scored the highest mean servings of bread and cereal (4.34). However, on the other four food recalls, Shelby lead the nine counties with the highest mean servings of bread and cereal consumed (3.98, 4.14, 4.21, and 4.15). Davidson and Shelby Counties showed the most progress over the two year period. Davidson reported an overall increase

TABLE IV

Relationship between the Number of Servings
from the Bread/Cereal Group Reported by
Family and Personal Characteristics
of EFNEP Homemakers

County, Family and Personal Characteristics	Mean Number Servings from the Bread/Cereal Group				
	First Recall	Second Recall	Third Recall	Fourth Recall	Fifth Recall
<u>County</u>					
DeKalb (N=29)	4.34	3.66	3.79	4.10	3.55
Shelby (N=87)	3.69	3.98	4.14	4.21	4.15
Roane (N=21)	3.67	3.76	3.38	3.86	3.48
Warren (N=31)	3.58	3.68	3.35	3.32	3.68
Gibson (N=45)	3.53	3.82	3.56	3.40	3.69
Hawkins (N=27)	3.48	3.56	3.22	3.59	3.74
Putnam (N=22)	3.45	3.91	3.72	3.86	3.82
Coffee (N=35)	3.40	3.40	3.66	3.80	2.89
Davidson (N=78)	2.99	3.23	3.09	3.29	3.46
F value	4.150	3.228	5.886	5.747	3.201
p	0.001*	0.002*	0.000*	0.000*	0.002*
<u>Place of Residence</u>					
Urban (N=217)	3.45	3.63	3.53	3.76	3.79
Rural non-farm (N=138)	3.61	3.75	3.72	3.65	3.66
Farm (N=20)	3.50	3.30	3.25	3.80	4.00
F value	0.753	1.667	2.168	0.491	1.404
p	0.472	0.190	0.116	0.612	0.247

TABLE IV (continued)

County, Family and Personal Characteristics	Mean Number Servings from the Bread/ Cereal Group				
	First Recall	Second Recall	Third Recall	Fourth Recall	Fifth Recall
<u>Received Food Stamps</u>					
Yes (N=163)	3.61	3.77	3.71	3.79	3.87
No (N=212)	3.43	3.57	3.48	3.67	3.67
F value	2.143	3.230	3.917	1.111	3.993
p	0.144	0.073	0.049	0.292	0.046
<u>Received Food Donation</u>					
Yes (N=19)	3.53	3.52	3.53	3.74	4.26
No (N=356)	3.51	3.66	3.58	3.72	3.73
F value	0.004	0.278	0.048	0.006	5.299
p	0.950	0.598	0.827	0.937	0.022*
<u>Received USDA Assistance</u>					
Yes (N=45)	3.69	3.93	4.02	4.29	4.16
No (N=330)	3.48	3.62	3.52	3.64	3.70
F value	1.126	3.486	8.037	14.446	8.486
p	0.289	0.063	0.005*	0.002*	0.004*
<u>Received Welfare</u>					
Yes (N=130)	3.67	3.82	3.85	3.85	3.95
No (N=245)	3.42	3.56	3.44	3.65	3.65
F value	3.497	5.006	11.382	2.769	8.144
p	0.062	0.026*	0.001*	0.097	0.005*

TABLE IV (continued)

County, Family and Personal Characteristics	Mean Number Servings from the Bread/Cereal Group				
	First Recall	Second Recall	Third Recall	Fourth Recall	Fifth Recall
<u>Adult Male In Household</u>					
Yes (N=212)	3.58	3.62	3.56	3.69	3.75
No (N=163)	3.42	3.71	3.62	3.75	3.77
F value	0.951	1.472	1.129	0.832	0.303
P	0.387	0.230	0.325	0.436	0.739
<u>Education Of Homemaker</u>					
8th or less (N=156)	3.43	3.49	3.47	3.55	3.65
9th-12th (N=195)	3.61	3.75	3.71	3.89	3.88
Beyond H.S. (N=24)	3.25	3.88	3.29	3.42	3.46
F value	1.506	3.115	2.858	5.161	3.496
P	0.223	0.046*	0.059	0.006*	0.031*
<u>Ethnic Background</u>					
White (N=158)	3.54	3.57	3.51	3.72	3.64
Black (N=215)	3.47	3.71	3.63	3.72	3.83
F value	1.102	1.054	0.937	0.165	2.166
P	0.348	0.369	0.423	0.920	0.092

TABLE IV (continued)

County, Family and Personal Characteristics	Mean Number Servings from the Bread/Cereal Group				
	First Recall	Second Recall	Third Recall	Fourth Recall	Fifth Recall
<u>Total Months In Program</u>					
24 months (N=132)	3.60	3.74	3.83	3.94	3.93
30 months (N=75)	3.61	3.77	3.67	3.68	4.01
36 months (N=37)	3.41	3.62	3.32	3.57	3.35
Over 36 months (N=131)	3.39	3.50	3.36	3.56	3.54
F value	0.943	1.472	4.731	3.055	7.493
P	0.420	0.222	0.003*	0.028*	0.000*

*The F value is significant at the 0.05 level for (vertical) differences of each characteristic as related to the mean number of servings reported by homemakers for each food group in each food recall.

of 0.47 servings of bread and cereal during the two year period while Shelby reported an increase of 0.46 servings.

Hawkins (3.74), Davidson (3.46), and Coffee (2.89) were the only three counties which obtained the highest servings of bread and cereal for their respective county in the fifth 24-hour food recall. The peak number of servings of bread and cereal for Shelby (4.21) and Roane (3.86) Counties were reported in the fourth 24-hour food recall. In the second food recall, Putnam (3.91), Gibson (3.82), and Warren (3.68) Counties obtained the highest number of servings of bread and cereal for their county, and DeKalb reported the highest number of servings for bread and cereal for their county when they enrolled in the EFNEP program. Therefore, the number of bread and cereal servings did not necessarily increase with each consecutive food recall.

Place of Residence

Analysis of the relationship between the number of servings of bread and cereal and the homemaker's place of residence is shown on Table IV. Homemaker's place of residence was classified as either urban, rural nonfarm, or farm.

The number of bread and cereal servings reported by homemakers did not differ significantly by place of residence on any of the five food recalls. Rural nonfarm homemakers reported more servings of bread and cereal on the initial, second, and third 24-hour food recall and less servings on the fourth and fifth recalls than either urban or farm homemakers. Farm homemakers reported more servings

of bread and cereal in the fourth and fifth food recalls than either the urban or rural nonfarm homemakers.

All groups of homemakers made improvement for the number of bread and cereal servings consumed from the initial to the fifth recall. Farm homemakers showed the most progress for the two year period reporting an overall increase of 0.50 number of bread and cereal servings. Urban homemakers followed with an overall increase of 0.34 servings of bread and cereal and rural nonfarm with 0.05 servings.

Received Food Stamps

Analysis of the relationship between the number of servings of bread and cereal and whether or not the EFNEP family participated in the Food Stamp Program is shown in Table IV. Study of the data revealed that there was a significant relationship between the number of servings consumed by the homemakers from the bread and cereal group in the third and fifth food recalls and food stamp participation.

In each food recall, homemakers receiving food stamps reported a higher number of bread and cereal servings than did non-welfare homemakers.

Both groups reported a slight improvement over the two year period in number of bread and cereal servings consumed. Welfare homemakers reported an increase of 0.26 servings of bread and cereal (3.61 to 3.87) while non-welfare participants increased by 0.24 servings (3.43 to 3.67).

Received Food Donation

Analysis of the relationship between the number of bread and cereal servings and whether or not the EFNEP family received food donation is shown in Table IV. According to the data, there was a significant relationship between the number of bread and cereal servings consumed by the homemakers on the last food recall and whether the homemaker had received food donation.

Homemakers that received food donation reported a higher number of bread and cereal servings on the initial, fourth, and fifth food recalls than families not receiving food donation.

Homemakers receiving food donation reported more improvement in number of servings consumed from the bread and cereal group (3.53 to 4.26) from the initial to the last food recall than did homemakers not receiving food donation (3.51 to 3.73).

Received USDA Assistance

Analysis of the relationship between the number of servings of bread and cereal and whether or not the EFNEP family received USDA assistance is shown in Table IV. Data revealed that there was a significant relationship between the number of bread and cereal servings consumed by the homemakers in the third, fourth, and fifth food recalls and USDA assistance.

In each food recall, homemakers receiving USDA assistance reported more servings of bread and cereal than did homemakers not receiving USDA assistance.

Both groups made improvements in the number of bread and cereal servings consumed during this study. Homemakers receiving USDA

assistance reported an increase of 0.47 (3.69 to 4.16) servings of bread and cereal from the initial to the last 24-hour food recall, and homemakers not receiving USDA assistance increased by 0.22 (3.48 to 3.70) servings.

Received Welfare

Analysis of the relationship between the number of servings of bread and cereal consumed by EFNEP homemakers and whether or not they received welfare is shown in Table IV. Study of the data revealed that there was a significant relationship between the number of bread and cereal servings reported by the homemakers on the second, third, and fifth food recalls and welfare participation.

In all food recalls, welfare homemakers reported more servings of bread and cereal than did homemakers not receiving welfare.

Homemakers who received welfare reported more progress over the two year period in number of bread and cereal servings (3.67 to 3.95) consumed than homemakers not receiving welfare (3.42 to 3.65).

Adult Male Present in Household

Analysis of the relationship between the number of bread and cereal servings consumed by the homemakers and whether or not there was an adult male present in the home is shown in Table IV. Study of the data revealed that there was no significant relationship between the number of servings consumed by the homemakers from the bread and cereal group and whether or not an adult male was present in the household.

Although not significant, households that did not have an adult male present reported more progress in the number of bread

and cereal servings consumed (3.42 to 3.77) than did households with an adult male present (3.58 to 3.75).

Education of Homemaker

Analysis of the relationship between the number of bread and cereal servings consumed by the homemaker and the education level of the homemaker is shown in Table IV, page 57. Homemaker's education level was categorized as either eighth grade or less, ninth through twelfth grade, or beyond high school.

The number of bread and cereal servings reported by homemakers did differ significantly by the homemakers' educational level in the second and fourth food recalls. Homemakers having a ninth through twelfth grade education level reported more servings of bread and cereal on all food recalls except the second.

All groups of homemakers made improvement in the number of bread and cereal servings consumed from the initial to the last food recall. Homemakers with a ninth through twelfth grade education reported the most progress of bread and cereal servings (3.61 to 3.88).

Ethnic Background

Analysis of the relationship between the number of servings of bread and cereal consumed by the homemakers and the ethnic background of the homemaker is shown in Table IV. Ethnic background was classified as either white, black, or other.

The number of bread and cereal servings did not differ significantly by the homemaker's ethnic background. Black homemakers

reported the same or slightly more servings of bread and cereal on all but the initial food recall.

Both groups of homemakers made a slight improvement in the number of bread and cereal servings consumed from the initial to the last food recall. Black homemakers improved by 0.12 servings (3.47 to 3.83) of bread and cereal, and white homemakers improved by 0.10 servings (3.54 to 3.64).

Total Months in Program

Analysis of the relationship between the number of servings of bread and cereal reported by homemakers and the total months the homemaker participated in the program is shown in Table IV, page 57. Total months of enrollment in the program was classified as either 24, 30, 36, or over 36 months.

Study of the data revealed that there was a significant relationship between the number of bread and cereal servings consumed by homemakers and the total months in the program in the third and fifth food recalls. Homemakers that had participated in the program for two or two and one-half years reported a higher number of bread and cereal servings than the other groups in all food recalls.

Homemakers that had been in the program for 24 months reported the most improvement during this study. They increased the number of bread and cereal servings consumed from 3.60 to 3.93. Homemakers that had been in the program for 36 months decreased in servings from 3.41 to 3.35. Thus, the length of time spent in the program after 24 months was not directly related to an increase in the number of servings consumed from the bread and cereal group.

CHAPTER V

FINDINGS COMPARING THE INITIAL AND FIFTH FOOD RECALL

The purpose of this chapter is to present findings that show the change in proportion of homemakers with adequate servings with each of the four food groups during the two year study. These findings are presented in two tables with each table constituting a section.

Section I presents findings regarding the comparison of adequacy of EFNEP homemakers' diets from the initial to the fifth food recall.

Section II presents findings regarding the comparison of mean servings consumed by EFNEP homemakers from each food group from the initial to the fifth food recall.

Information was tabulated by frequency counts. The analysis of variance t-test and chi-square test were used to determine the comparison between adequacy of diets from each food group from the initial to the fifth food recall. A probability level of 0.05 was accepted as being statistically significant.

I. COMPARISON OF ADEQUACY OF EFNEP HOMEMAKERS' DIETS FROM THE INITIAL TO THE FIFTH FOOD RECALL

This section reports findings regarding the comparison of adequacy of EFNEP homemakers' diets from the initial to the fifth food recall. The number of adequate servings is shown (Table V) for six categories (milk--two servings, meat--two servings, fruit/vegetable--four servings, bread/cereal--four servings, one serving

TABLE V

Comparison of Adequacy of Homemakers' Diets from the
Initial to the Fifth Food Recall*

Fifth Recall	Initial Recall			
	Yes		No	
	Number	Percent	Number	Percent
<u>Consumed Minimum Milk Servings (2)</u>				
Yes (132)	39	41.1	93	33.2
No (243)	56	58.9	187	66.8
375	95	100.0	280	100.0

$$\chi^2 = 1.59, p = 0.21$$

<u>Consumed Minimum Meat Servings (2)</u>				
Yes (322)	264	87.1	58	80.6
No (53)	39	12.9	14	19.4
375	303	100.0	72	100.0

$$\chi^2 = 1.57, p = 0.21$$

<u>Consumed Minimum Fruit/Vegetable Servings (4)</u>				
Yes (149)	39	49.4	110	37.2
No (226)	40	50.6	186	62.8
375	79	100.0	296	100.0

$$\chi^2 = 3.39, p = 0.07$$

<u>Consumed Minimum Bread/Cereal Servings (4)</u>				
Yes (226)	141	70.9	85	48.3
No (149)	58	29.1	91	51.7
375	199	100.0	176	100.0

$$\chi^2 = 18.92, p = 0.00^{**}$$

<u>Consumed at least One Serving from each Group</u>				
Yes (304)	195	83.0	109	77.9
No (71)	40	17.0	31	22.1
375	235	100.0	140	100.0

$$\chi^2 = 1.18, p = 0.28$$

TABLE V (continued)

Fifth Recall	Initial Recall			
	Yes		No	
	Number	Percent	Number	Percent
<u>Consumed Minimum Servings from each Food Group (2,2,4,4)</u>				
Yes (42)	1	7.7	41	11.3
No (333)	12	92.3	321	88.7
375	13	100.0	362	100.0

$$x^2 = 0.00, \quad p = 1.00$$

* Adequate diet by food group is based on two daily servings from each of the milk and meat groups and four daily servings from each of the vegetable/fruit and bread/cereal groups.

** The x^2 value is significant at the 0.05 level.

from each group, and minimum servings from each group) for the initial and fifth food recalls.

Consumed Minimum Milk Servings (2)

Analysis of the comparison between the adequacy of milk servings consumed by EFNEP participants in the initial and fifth food recalls is shown in Table V. Study of the data revealed that there was no significant change in adequacy of minimum milk servings consumed from the first to the last food recall during the two year study.

However, there was an increase in the number of homemakers consuming the minimum two milk servings by the end of the study. In the initial food recall 95 of 375 (25%) homemakers consumed the minimum milk servings, but at the fifth food recall, 132 (35.2%) homemakers were reported in this category. This was an overall increase of 12.5% of the total homemakers which were now consuming the minimum milk servings.

The table also revealed that 56 (58.9%) of the 95 homemakers who reported minimum milk servings on the initial food recall, did not meet this recommendation on the fifth food recall. However, 93 (33.2%) of the 280 homemakers reporting that they did not consume minimum milk servings on the first recall, did make a positive change on the fifth food recall. Thus, there was a net (93 to 56) of 37 homemakers making a positive change of minimum milk servings during the two year study.

Consumed Minimum Meat Servings (2)

Analysis of the comparison between the adequacy of meat servings consumed by EFNEP homemakers in the initial and fifth food recalls is shown in Table V. Study of the data revealed that there was no significant change in adequacy of minimum meat servings consumed from the first to the last food recall during the two year period. However, at the initial food recall, 303 (80.8% of the 375 homemakers were already consuming at least two meat servings. There was little need and range for a positive increase to occur. Even though 322 homemakers reported minimum meat servings at the end of the study, most of the EFNEP homemakers were consuming two and sometimes more meat servings at their entrance in the EFNEP program. Therefore, EFNEP Agents may need to spend more time educating and encouraging homemakers to cut their daily meat intake to only two servings rather than educating them to consume more meat.

Consumed Minimum Fruit/Vegetable Servings (4)

Analysis of the comparison between the adequacy of fruit and vegetables consumed by EFNEP participants in the initial and fifth food recalls is shown in Table V. Study of the data revealed that there was no significant change in adequacy of minimum fruit and vegetable servings consumed from the first to the fifth food recall during this two year study.

However there was an increase in the number of homemakers consuming the minimum of at least four fruit and vegetable servings by the end of the study. Thus, it appears that some homemakers improved by the EFNEP program. From the initial to the fifth food

recall, 40 homemakers went from consuming the minimum fruit and vegetable servings to not consuming it. However, 110 homemakers changed from not consuming the minimum fruit and vegetable servings in the initial food recall to consuming at least four servings in the fifth recall. Thus, there was a net positive change of 70 homemakers during the two years.

Note should be taken that even though more homemakers were consuming at least four servings of fruit and vegetables, the largest majority of homemakers (60.3%) were still not consuming recommended servings by the fifth food recall.

Consumed Minimum Bread/Cereal Servings (4)

Analysis of the comparison between the adequacy of bread and cereal servings consumed by EFNEP participants in the initial and fifth food recalls is shown in Table V. Study of the data revealed that there was a significant change in adequacy of minimum bread and cereal servings consumed from the initial to the fifth food recall during the two year study.

During the two year study, 58 homemakers made a negative change while 85 made a positive improvement. Thus, there was a net increase of 27 homemakers who were consuming the minimum bread and cereal servings by the end of the study. Therefore, homemakers appeared to benefit by participating in the EFNEP program.

Consumed At Least One Serving From Each Food Group

Analysis of the comparison between the adequacy of at least one serving from each food group consumed by EFNEP participants in

the initial and fifth food recalls is shown in Table V. Study of the data revealed that there was no significant change in adequacy of at least one serving from each food group consumed from the initial to the fifth food recall during the two year period.

However there was an increase in the number of homemakers consuming at least one serving from each food group by the fifth food recall. Thus, it appears that homemakers did improve by participating in the EFNEP program. From the initial to the fifth food recall, 40 homemakers went from consuming at least one serving from each group to not consuming this proportion. However, 109 homemakers changed from not consuming at least one serving from each food group in the initial food recall to consuming this amount in the fifth food recall. Thus, there was a net positive change of 69 homemakers consuming at least one serving from each food group during the two years of participation. By the end of the study, 81% (304 of 375) of the homemakers were consuming at least one serving from each food group.

Consumed Minimum Servings From Each Food Group

Analysis of the comparison between the adequacy of minimum servings from each food group consumed by EFNEP participants in the initial and fifth food recalls is shown in Table V. Study of the data revealed that there was no significant change in adequacy of minimum servings from each food group consumed from the initial to the fifth food recall during the two year period.

The data revealed that most homemakers did not consume minimum servings from each food group either at the initial or the fifth food recall.

II. COMPARISON OF MEAN SERVINGS CONSUMED BY EFNEP HOMEMAKERS FROM EACH FOOD GROUP FROM THE INITIAL TO THE FIFTH FOOD RECALL

This section reports findings regarding the comparison of mean servings consumed by EFNEP homemakers from each food group from the initial to the fifth food recall. The number of mean servings is shown in Table VI for each of the four food groups (milk, meat, fruit/vegetable, and bread/cereal) for the initial and fifth food recalls.

Milk Group

Analysis of the comparison between the number of servings of milk consumed by EFNEP homemakers in the initial and fifth food recalls is shown in Table VI. Study of the data revealed that there was a significant (0.05 or less) comparison between the number of milk servings consumed in the first and fifth food recalls.

The number of milk servings reported in the initial food recall was 0.96 servings. This was increased to 1.23 milk servings by the fifth food recall. Although this was an improvement of 0.27 milk servings, homemakers were still 0.77 servings short of the recommended two servings of milk and milk products.

TABLE VI

Comparison of Mean Servings Consumed by EFNEP
Homemakers from each Food Group from the
Initial to the Fifth Food Recall

Mean Servings	Food Recall (n = 375)			
	Initial	Fifth	T Value	P
Milk	0.96	1.23	4.73	0.00*
Meat	2.19	2.28	1.80	0.07
Fruit/Vegetable	2.39	3.09	3.15	0.00*
Bread/Cereals	3.51	3.74	3.29	0.00*

*The t value is significant at the .05 level.

Meat Group

Analysis of the comparison between the number of servings of meat consumed by EFNEP homemakers in the initial and fifth food recalls is shown in Table VI. Study of the data revealed that there was no significant comparison between the number of meat servings consumed in the first and fifth food recalls.

Although not significant, 2.19 servings of meat were reported by homemakers in the initial food recall. By the fifth food recall, the number of meat servings had increased to 2.28 servings.

It should be noted that two servings are recommended for meat. As homemakers entered the EFNEP program, most had already surpassed the recommended servings. Thus, more concentration should be toward maintaining a level of two meat servings rather than increasing it.

Fruit/Vegetable Group

Analysis of the comparison between the number of fruit and vegetable servings consumed by EFNEP participants in the initial and fifth food recalls is shown in Table VI. Study of the data revealed that there was a significant comparison between the number of fruit and vegetable servings consumed in the first and fifth food recalls.

There was an overall increase of 0.70 (2.39 to 3.09) fruit and vegetable servings during the two year period. Even though the number of fruits and vegetables consumed by homemakers increased significantly, the mean was still short of the four recommended servings.

Bread/Cereal Servings

Analysis of the comparison between the number of bread and cereal servings consumed by EFNEP homemakers in the initial and fifth food recalls is shown in Table VI. Study of the data revealed that there was a significant comparison between the number of bread and cereal servings consumed in the first and fifth food recalls.

In the first food recall, homemakers reported 3.51 servings of breads and cereals. By the fifth food recall, homemakers had increased their consumption of breads and cereals to 3.74. This was an increase of 0.23 servings.

CHAPTER VI

SUMMARY OF MAJOR FINDINGS

I. PURPOSES AND SPECIFIC OBJECTIVES

The main purpose of this study was to determine the relationship between the number of servings consumed by homemakers in each of the four food groups and certain personal and family characteristics. This study also was designed to determine the improvement in adequacy of homemakers' diets in each of the four food groups from the initial to the fifth food recall.

Specific Objectives

The specific objectives of this study were:

1. To determine the relationships between the number of milk servings consumed by homemakers and personal and family characteristics (county, place of residence, received food stamps, received food donation, received USDA assistance, received welfare, whether or not there was an adult male present in the household, the number of years of school completed by the homemaker, ethnic background, and the recorded length of time the family had participated in the program.
2. To determine the relationships between the number of meat servings consumed and the personal and family characteristics studied.

3. To determine the relationships between the number of bread and cereal servings consumed and the personal and family characteristics.
4. To determine the relationships between the number of fruit and vegetable servings consumed and the personal and family characteristics.
5. To determine the change in the proportion of homemakers with adequate servings from the initial to the fifth 24-hour food recall (two-year benchmark) with each of the four food groups.
6. To determine the change in the number of servings consumed by homemakers in each of the four food groups from the initial to the fifth 24-hour food recall.

II. METHOD OF INVESTIGATION

The population of this study included homemakers from the nine original Tennessee counties which had participated in Extension's Expanded Food and Nutrition Education Program (EFNEP) for a period of at least two years when the data were collected. The sample included 375 participant families which represented a 10.5 percent sample of members from the original counties.

III. METHOD OF ANALYSIS

Data from the family record forms were recorded on code sheets. This information was punched on data cards for statistical analysis by The University of Tennessee Computer Center.

Information was tabulated by frequency counts. In Chapter V the chi-square and t-tests were used to determine the relationship between the number of homemakers with adequate servings from each food group in the initial food recall as compared to the fifth 24-hour food recall. The analysis of variance F-test was used in Chapter IV to determine the relationship between personal and family characteristics among EFNEP participants and the mean number of servings consumed from each of the four food groups from the initial to the fifth food recall. A probability level of 0.05 was accepted as being statistically significant.

IV. MAJOR FINDINGS REGARDING THE RELATIONS OF ADEQUACY OF HOMEMAKERS' DIETS IN EACH FOOD GROUP AND PERSONAL AND FAMILY CHARACTERISTICS

The data study revealed that there were significant relationships between personal and family characteristics and number of servings consumed from each of the four groups. The major findings of this study will be presented under the headings of the independent variables.

County

1. There was a significant relationship between the county of residence and number of servings consumed by homemakers from the milk group and the bread/cereal group.
2. There was a significant relationship between the number of meat servings consumed by homemakers and their county of residence on the third, fourth, and fifth food recalls.

3. On the initial, third, and fourth food recall, there was a significant relationship between the county and number of fruit/vegetable servings consumed by homemakers.
4. For the fruit/vegetable group, all counties increased the number of servings consumed from the initial to the fifth food recall.
5. Counties which reported the lowest number of servings consumed on the initial food recall in the milk, meat, and bread/cereal groups had the most potential for improvement and made the most improvement during the two-year period of this study. Except for the fruit/vegetable group, the top 2-3 counties which reported the highest number of servings consumed on the initial food recall, either decreased or stayed the same as compared to the fifth food recall.

Place of Residence

1. There was a significant relationship between the number of milk servings consumed by homemakers and place of residence on the fourth and fifth food recalls.
2. On the third and fourth food recalls, there was a significant relationship between the number of meat servings consumed and place of residence.
3. There was no significant relationship between the number of fruit/vegetable and bread/cereal servings consumed and place of residence. However, farm families reported

a higher number of fruit/vegetable servings on all but one food recall than did rural non-farm or urban homemakers who were usually the lowest.

4. In all food recalls except one, farm families reported a higher number of milk servings than rural non-farm and urban families who consumed the lowest number of milk servings.
5. Urban homemakers reported the highest number of meat servings consumed in all but one food recall.
6. All groups of homemakers made improvement in the number of servings consumed in each food group from the initial to the fifth food recall. From the initial to the fifth food recall, the farm homemakers made the greatest improvement in all of the food groups except for the fruit/vegetable group, in the number of servings consumed. Urban homemakers reported the most positive change during the two-year period in number of servings consumed from the fruit/vegetable group. Thus, farm homemakers appeared to show more benefit from participating in the EFNEP program than either urban or rural non-farm homemakers.

Received Food Stamps

1. For the initial, second, and third food recalls, there was a significant relationship between the number of milk servings consumed and whether or not the EFNEP family participated in the food stamp program. On all food

recalls, non-food stamp participants recorded a higher number of milk servings than food stamp participants.

2. There was no significant relationship between the number of meat servings and food stamp participants. However, food stamp participants consumed more meat servings than non-food stamp families on every food recall.
3. There was a significant relationship between the number of fruit/vegetable servings consumed and food stamp participation on the initial food recall. On every food recall, non-food stamp families consumed more servings from the fruit/vegetable group than food stamp families.
4. For the bread/cereal group, there was no significant relationship for food stamp participation. However, food stamp participants reported more servings from the bread/cereal group than non-participants on every food recall.
5. With food stamp participants consuming more meat and bread/cereal, they appear to have a greater need for nutrition education as to the importance of milk and fruit/vegetables in their diets. Non-food stamp participants had a need for nutrition education in the importance of consuming meat and bread/cereals in their diets.
6. Both groups showed improvement from the initial to the fifth food recall. However, food stamp homemakers reported more positive change in number of servings consumed for each food group. Thus, it appears that food stamp

participants benefited more from EFNEP than non-food stamp participants.

Received Food Donation

1. On the fifth food recall, there was a significant relationship between whether or not the EFNEP family received food donation and the number of servings consumed from the meat, fruit/vegetable, and bread/cereal groups.
2. There was no significant relationship between the number of milk servings consumed and whether or not the EFNEP family received food donation. Therefore, food donation had no apparent influence on milk servings consumed by EFNEP homemakers.
3. Both groups of homemakers made improvement from the initial to the last food recall, excepting that homemakers who received food donations had a negative change in the fruit/vegetable group. This food group would be a potential area for nutrition teaching in order to improve their dietary practices.
4. Food donation participants improved dietary habits more in the bread/cereal and meat groups while non-food donation participants increased servings in the fruit/vegetable and milk groups. Thus, the food groups where homemakers need more nutritional knowledge according to whether or not they received food donations are identified.

Received USDA Assistance

1. According to the data, on the initial food recall there were significant relationships between whether or not the EFNEP family received USDA assistance and the number of servings reported from the milk and fruit/vegetable groups. Where significant, non-USDA participants reported more servings in these two food groups.
2. There was also a significant relationship on the third, fourth, and fifth food recalls between the number of bread/cereal servings consumed and USDA assistance participation. In all food recalls, homemakers receiving USDA assistance reported more bread/cereal servings.
3. There was no relationship between whether or not the EFNEP participants received USDA assistance and the number of meat servings reported. Therefore, participation in the USDA program had no influence on the number of servings EFNEP homemakers consumed from the meat group.
4. Both groups showed improvement from the initial to the fifth food recall. However, food donation homemakers reported more positive change in number of servings consumed from all food groups except the milk group. Thus, it appears that homemakers receiving food donation benefited more from EFNEP than non-food donation participants.
5. Both groups of homemakers reported the least number of servings in the milk group. Thus, more nutrition education concerning the importance of milk and milk products in the daily diet is needed.

Received Welfare Payments

1. In the initial and third food recalls, there was a significant relationship between the number of milk servings consumed by homemakers and whether or not they received welfare checks. Welfare homemakers reported fewer servings of milk on all but the last food recall.
2. Whether or not the homemaker received welfare had no significant influence on number of meat servings consumed. However, welfare homemakers reported more servings of meat consumed on every food recall.
3. For the bread/cereal group, there was a significant relationship with welfare participation on the second, third, and fifth food recall. On all food recalls, welfare homemakers consumed more bread/cereal servings.
4. There was a significant relationship between whether or not the homemaker received welfare payments and the number of servings consumed in the fruit/vegetable group on the initial recall. Non-welfare homemakers reported more servings on all food recalls.
5. With welfare homemakers consuming more meat and bread/cereal, they appear to have a greater need for nutrition education as to the importance of milk and fruit/vegetables in their diets. Non-welfare participants had a need for nutrition education regarding the importance of consuming meat and bread/cereals in their diets.
6. Both groups showed improvement from the initial to the fifth food recall. However, welfare homemakers reported

more positive change in number of servings consumed from each food group. Thus, it appears that welfare participants benefited more from EFNEP in terms of increasing the number of servings consumed than non-welfare participants.

7. Both groups of homemakers reported the least number of servings from the milk group. Thus, more nutrition education concerning the importance of milk and milk products in the daily diet is needed.

Adult Male in Household

1. There was no significant relationship between the number of servings from each food group and whether or not an adult male was present in the household.
2. Both groups made improvement from the initial to the fifth food recall. Both groups made the most progress in the fruit/vegetable group which was the food group with the most potential for improvement.
3. During this study, households with an adult male reported the most progress in the meat and fruit/vegetable groups. Households without an adult male present made more progress in the milk and bread/cereal groups. Households without an adult male present probably had less income. Therefore, they may have bought more of the less expensive foods. Lessons in money management, food preservation, and food storage may benefit these homemakers.

Education of Homemaker

1. According to the data, the homemakers' educational level had no significant influence on the number of servings consumed from the milk group.
2. Homemakers with an education beyond high school reported more servings from the milk, meat, and fruit/vegetable groups than either of the other two groups of homemakers. Homemakers with an eighth through twelfth grade education reported the most bread/cereal servings consumed. Homemakers with an education of less than eighth grade level reported the least number of servings consumed in each food group. Thus, homemakers with little education are in the greatest need for nutrition education, and have the most potential for improvement.
3. During this study, all groups of homemakers improved their adequacy of diets. Homemakers with an education beyond high school actually decreased in number of meat servings consumed. Thus, the nutrition education proved beneficial in showing that more than two servings of meat is not necessary to have an adequate diet. More is not always better!
4. The two groups of homemakers with the least amounts of education had the most potential for improvement and made the most improvement, therefore, showing the most benefits from the EFNEP program.
5. There were significant relationships between the education level of the homemaker and the numbers of servings consumed

from the meat group (second, third, and fourth recalls), fruit/vegetable group (initial, third, and fifth recalls), and the bread/cereal group (second and fourth recalls).

Ethnic Background

1. There was a significant relationship between the number of servings from the milk group and the ethnic background of the homemaker on the first three food recalls. On all recalls, white homemakers consumed more milk servings suggesting that there is a need for more nutrition education to black homemakers as to the importance of milk and milk products in their diets.
2. According to the data, there were no significant relationships between ethnic background and the numbers of servings consumed from the fruit/vegetable and bread/cereal groups. Therefore, ethnic background appeared to have no influence on these two food groups.
3. In the meat group, there were significant relationships between ethnic background and the number of servings consumed in all food recalls excepting the first one. In all recalls, both groups of homemakers consumed more than the recommended amount of two servings, and black homemakers reported more servings of meat than white homemakers. Thus, more nutrition education is needed to show that excess amounts of meat which are consumed are not necessarily healthy. This dietary habit also can be an expensive one.

4. Both groups of homemakers showed improvement from the initial to the fifth food recall. However, black homemakers reported more positive change in number of servings consumed for each food group. Thus, it appears that black homemakers benefited more from EFNEP than white homemakers.

Total Months in Program

1. There were significant positive relationships between the total months in the EFNEP program and the numbers of milk servings consumed by homemakers in the first three food recalls.
2. In the meat group there was a significant relationship between the number of meat servings and total months in the EFNEP program in the fourth food recall.
3. On the initial and third food recall, total months in program had significant influences on the numbers of fruit/vegetable servings consumed.
4. On the last three food recalls, there were significant relationships between the total months in program and the numbers of bread/cereal servings consumed.

V. MAJOR FINDINGS REGARDING THE COMPARISONS OF ADEQUACY OF EFNEP HOMEMAKERS' DIETS FROM THE INITIAL AND FIFTH FOOD RECALL

The data revealed that there were significant comparisons of adequacy of EFNEP homemakers' diets between the initial and fifth

food recall. The major findings of this study will be presented under the headings of the food group variables.

Milk Group

1. There was no significant comparison between adequacy of minimum milk servings (i.e., two) consumed by the homemakers from the initial food recall to the fifth. Thus, it appeared that homemakers made little progress toward consuming the minimum two milk servings.
2. There was a significant comparison between the number of milk servings consumed by homemakers in the first and fifth food recalls. Homemakers increased consumption of milk from 0.96 servings in the initial food recall to 1.23 at the fifth food recall. Thus, there was improvement in number of milk servings consumed from the initial to the fifth food recall.

Meat Group

1. There was no significant comparison between the adequacy of minimum meat servings (i.e., two) consumed by EFNEP participants at the initial and fifth food recalls. Since homemakers appeared to consume two or more meat servings at the initial food recall, there was a need for a decrease in meat servings to occur.
2. There was no significant comparison between the number of meat servings consumed by EFNEP homemakers in the initial and fifth food recall.

Fruit/Vegetable Group

1. There was no significant comparison between the adequacy of minimum fruit and vegetable servings (i.e., four) consumed by EFNEP homemakers at the initial and fifth food recalls. Thus, it appeared that homemakers made little progress in increasing their consumption toward the minimum four fruit and vegetable servings during the 24 months of the program.
2. There was a significant comparison between the number of fruit and vegetable servings consumed by EFNEP homemakers in the initial and fifth food recalls. Homemakers had an overall increase of 0.70 (i.e., from 2.39 to 3.09) servings from the fruit and vegetable group during the two year period. Thus, progress was noted in the number of fruit and vegetable servings consumed by homemakers at the end of two years.

Bread/Cereal Group

1. There was a significant comparison between the adequacy of minimum bread and cereal servings (i.e., four) consumed by EFNEP homemakers at the initial and fifth food recalls. Therefore, improvement was made by homemakers in the program to increase their consumption of bread and cereal servings.
2. There was a significant comparison between the number of bread and cereal servings consumed by EFNEP homemakers in the initial and fifth food recall. Homemakers increased

their consumption from 3.51 servings in the initial food recall to 3.74 servings in the fifth food recall. Thus, progress was made by homemakers in increasing their consumption of bread and cereal.

Other

1. There was no significant comparison between the adequacy of homemakers consuming at least one serving from each food group in the initial and fifth food recalls.
2. There was no significant comparison between the adequacy of minimum servings from each food group consumed by EFNEP homemakers in the initial and fifth food recalls.

VI. IMPLICATIONS AND RECOMMENDATIONS

Based on the findings of this study, the following implications and recommendations were made as to what characterizes families who show low nutritional adequacy and what factors contribute most to response to the EFNEP program.

1. Food stamp and welfare participants consumed a higher number of servings from the meat and bread/cereal groups than non-participants. More education is needed to encourage these families to consume more milk, milk products, fruits and vegetables.
2. Except for the milk and bread/cereal groups, a higher number of servings was reported among black homemakers than white homemakers. Therefore, special consideration should be given to improving the nutritional adequacy of

white homemakers. Black homemakers should be encouraged to consume more milk and milk products and bread and cereal.

3. There appeared to be significant relationship between the number of servings consumed from each food group and education of the homemaker. Homemakers with less than an eighth grade education had less nutritional adequacy than the other groups. Therefore, number of years of education would seem to be a good indicator of homemakers with the greatest nutritional needs.
4. Since there appeared to be no significant relationship between whether or not an adult male was present in the home and the number of servings consumed by homemakers in each food group, the presence of an adult male in a household may not seem to be a useful indicator of dietary adequacy.
5. There was a significant relationship between the number of servings consumed and length of time in the program which suggests that there was additional advantage for homemakers to stay in the program for at least two years. Homemakers should be encouraged to participate in EFNEP activities.
6. Since there appeared to be no significant relationship between the receiving of food assistance and the number of milk servings consumed by homemakers, it would appear that the food assistance program would not indicate families in need of the milk group.

7. There was significant comparison between the adequacy of minimum bread and cereal servings consumed by EFNEP homemakers at the initial and fifth food recalls. Therefore, it appeared that homemakers increased their consumption of fruits and vegetables by participating in the program.
8. Excepting the meat group, there were significant comparisons between the mean numbers of servings consumed by homemakers from the initial to the fifth food recall. Therefore, education should be continued in these food group areas where potential for improvement is the greatest.
9. There was no significant comparison between the mean number of meat servings consumed by homemakers from the initial to the fifth food recall. Most homemakers were already consuming the two minimum meat servings and more upon enrollment in EFNEP. Thus, a special need exists and emphasis should be toward maintaining a level of two meat servings rather than increasing the consumption of it.
10. Although not significant, households with an adult male reported the most progress in meat and fruit/vegetable groups. Households without an adult male present made more progress in the milk and bread/cereal groups. Households without an adult male probably had less income; therefore, purchased more of the less expensive foods. Lessons in money management, food preservation, and food storage may benefit these homemakers.

11. In the relationship between education level of homemakers and the number of servings consumed, the two groups of homemakers with the least amounts of education had the most potential for improvement and made the most improvement during the two year study. Therefore these homemakers should be encouraged to enroll in EFNEP.
12. There was a significant relationship between the number of servings consumed and the ethnic background of the homemaker. Black homemakers reported more improvement in numbers of servings consumed for each food group from the initial to the fifth food recall. Thus, it appears that black homemakers benefited more from EFNEP than white homemakers.
13. Counties which reported the lowest number of servings consumed on the initial food recall in the milk, meat, and bread/cereal groups had the most potential for improvement and made the most improvement during the two year period. Except for the fruit/vegetable group, the top 2-3 counties which reported the highest number of servings consumed on the initial food recall, either decreased or stayed the same as compared to the fifth food recall. Therefore, special consideration also should be given to enroll counties that score low on the initial food recall to EFNEP without the exclusion of other counties.

VI. RECOMMENDATIONS FOR FURTHER STUDY

1. Studies should be done to characterize homemakers who tend to participate in the program for extended periods of time without significant improvement or regression of diets.
2. Other studies should be conducted to determine combined characteristics that might be used to identify eligible homemakers having inadequate diets who could benefit from participating in EFNEP.
3. Further studies are needed to determine the characteristics of homemakers not making significant improvement or regressing from the initial to the fifth food recall.
4. Other studies should be conducted to determine ways EFNEP can cooperate with other organizations in teaching nutrition to low income homemakers.
5. Additional research is needed to identify motivational factors that would be useful in helping homemakers realize the benefits of adopting recommended nutrition practices.



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APPENDICES

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APPENDIX A

COPIES OF EFNEP FAMILY HISTORY AND FOOD RECALL FORMS

CHAMBERLAIN

1. AIDE'S NAME

STATE NO.

D. UNIT NO.

4. FAMILY ID NO.

B. DATE FAMILY ENROLLED	
-------------------------	--

6. FAMILY RECEIVED (Some time during the year):

- (a) ☐ Participating in USDA Food Stamp/Food Distribution Program
- (b) ☐ Not participating in USDA Food Stamp/Food Distribution Program
- (c) ☐ Welfare

FAMILY MEMBERS (First name)	AGE (years) (8)	SEX		Now in School (11)	CHECK IF "YES"
		Male (9)	Female (10)		Participated in School Lunch Program last week (12)
NO. OF FAMILY MEMBERS	TOTALS →				

13. HIGHEST GRADE IN SCHOOL COMPLETED BY HOMEMAKER

- ☐ 8th Grade or less ☐ 9th thru 12th ☐ Beyond High School

14. CHECK FOR HOMEMAKER

- (a) ☐ White (not of Hispanic origin) (c) ☐ Hispanic (e) ☐ Asian or Pacific Islander
(b) ☐ Black (not of Hispanic origin) (d) ☐ American Indian/Alaskan Native

18. TERMINATION DATE AND REASON

B. HOMEMAKER FOOD CONSUMPTION, FAMILY INCOME, AND EXPENDITURE				
1. HOW MANY FOOD RECALL RECORDS HAVE YOU TAKEN ON THIS FAMILY (including this one)?	2. DATE			
3. WHAT DID HOMEMAKER EAT AND DRINK IN THE LAST 24 HOURS?				
To be filled out by Aide on Homemaker	TO BE FILLED OUT BY TRAINER AGENT			
Kind of food and drink (Enter main foods in mixed dishes)	Milk	Meat	Veg./Fruit	Bread/Cereal
Morning:				
Midmorning:				
Noon:				
Afternoon:				
Evening:				
Before bed:				
4. TOTAL ACTUAL INCOME FOR FAMILY LAST MONTH?	TOTAL NO. OF SERVINGS	(7)	(8)	(9)
\$ _____ (Include wages and salaries, social security, welfare and insurance payments, pensions and cash support from others. If family has income from farming, include 1/12th of last year's income after expenses.) Check one: ☐ Under \$166 ☐ \$167 - \$250 ☐ \$251 - \$333 ☐ \$334 - \$416 ☐ \$417 - \$516 ☐ \$517 and over	11. TOTALS 1 OR MORE SERVINGS OF EACH OF FOUR FOOD GROUPS.	1	1	1
		☐ YES ☐ NO		
	12. TOTALS 2 OR MORE SERVINGS MILK/MEAT; 4 OR MORE VEG/FRUIT AND BREAD/CEREALS	2	2	4
		☐ YES ☐ NO		
5. HOW MUCH DID HOMEMAKER SPEND FOR FOOD LAST MONTH, INCLUDING CASH AND CREDIT?				
(Do not include value of foods received under Food Distribution Program or other food assistance programs. If in the Food Stamp Program, include only amount spent to purchase food stamps or coupons.) \$ _____				
6. IF IN THE FOOD STAMP PROGRAM, WHAT WAS THE VALUE OF THE BENEFITS RECEIVED?				
\$ _____				

APPENDIX B

SUMMARY OF EFNEP STUDY



TABLE VII
Summary of Expanded Food and Nutrition
Educational Program Study

Family and Personal Characteristics	Surveyed Participants	
	Number	Percent
<u>County</u>		
Gibson	45	12.0
Shelby	87	23.2
Davidson	78	20.8
Coffee	35	9.3
Warren	31	8.3
DeKalb	29	7.7
Putnam	22	5.9
Hawkins	27	7.2
Roane	21	5.6
<u>Place of Residence</u>		
Urban	217	57.9
Rural non-farm	138	36.8
Farm	20	5.3
<u>Received Food Stamps</u>		
Yes	163	43.5
No	212	56.5
<u>Received Food Donation</u>		
Yes	19	5.1
No	356	94.9
<u>Received USDA Assistance</u>		
Yes	45	12.0
No	330	94.9
<u>Received Welfare</u>		
Yes	130	34.7
No	245	65.3
<u>Adult Male Present in Household</u>		
Yes	212	56.5
No	163	43.5
<u>Education of Homemaker</u>		
8th or less	156	41.6
9th-12th grade	195	52.0
Beyond high school	24	6.4

TABLE VII (continued)

Family and Personal Characteristics	Surveyed Participants	
	Number	Percent
<u>Ethnic Background</u>		
Black	216	57.6
White	159	42.4
Other	0	0.0
<u>Total Months in Program</u>		
24 Months	132	35.2
30 Months	75	20.0
36 Months	37	9.9
Over 36 Months	131	34.9

VITA

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She attended The University of Tennessee, Knoxville, where she received a Bachelor of Science Degree in Vocational Home Economics in 1979. She was graduated from The University of Tennessee, Knoxville, with a Master of Science Degree in Agricultural Extension in December, 1980.

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