To the Graduate Council:

I am submitting herewith a thesis written by Bonnie W. Fritch entitled "Food And Nutrition Knowledge and Misconceptions of Homemakers in Sequatchie County, Tennessee." I have examined the final copy of this thesis for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Master of Science, with a major in Home Economics.

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and Dean of the Graduate School

FOOD AND NUTRITION KNOWLEDGE AND MISCONCEPTIONS OF HOMEMAKERS IN SEQUATCHIE COUNTY, TENNESSEE

A Thesis

Presented for the

Master of Science

Degree

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Bonnie W. Fritch

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ABSTRACT

The purpose of this study was to investigate food and nutrition knowledge and misconceptions among homemakers in Sequatchie County, Tennessee. The final sample was composed of 121 homemakers, about half of which were Extension Homemaker Council Club members and the other half non-members, chosen randomly for comparison group purposes. The homemakers returned a mailed questionnaire developed to measure knowledge/misconception level, frequent sources of information, interest level in specific food and nutrition related areas, and certain demographic information. The homemaker was described according to participation in an Extension Homemaker Council Club, age, level of education, science related courses taken in school, source of information used in specific areas, and level of interest in specific areas. The level of knowledge/misconception scores were described along with those areas most subject to perpetration of misinformation. Relationships were examined between knowledge/misconception scores and sources of information used by homemakers. Correlations between the knowledge/misconception subscores in certain areas and the level of interest by the homemaker in that area were examined.

The study revealed that the majority of the homemakers surveyed were age 50 and over and had a high school education. The science related course taken by most of the homemakers was home economics. The most frequently used source of information in Diet and Weight watching and in Diet in Relation to Disease was a medical doctor or

nurse. For Food and Nutrients Needed by the Body and for Food Safety, the source used most frequently was the extension agent. For Food and the Athlete, magazines were used most often. Homemakers were most interested in Diet in Relation to Disease and least interested in Diet and the Athlete. They scored highest in the area of Food and Nutrients Needed By the Body and lowest in the area of Food and the Athlete.

The main and interactive effects of several variables were examined for their effect on the dependent variable, knowledge/misconception score. Participation in an Extension Homemaker Council Club had a positive effect on scores for almost all tests conducted. The number of science related courses taken in school had a positive main effect with home economics and chemistry making the most difference on knowledge/misconception score. There was a significant relationship between the score and the source of information used in the areas of Diet and Weight Watching and Diet in Relation to Disease. There were no interactive effects on knowledge/misconception score between the variables studied. No correlation was found between knowledge/misconception score and level of interest in that particular area.

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CHAPTER I

INTRODUCTION TO THE STUDY

Statement of Problem

Nutrition is of interest to virtually every segment of the population (Poplin, 1980). In fact, public interest in nutrition appears to be greater than ever before (Chery, A., Sabry, J.H., & Wollcott, D.M. 1987).

The American public has the most available, abundant, wholesome, nutritious, and safe supply of food that any people have ever had. Yet, it is the most misunderstood food supply of all time (Appledorf, 1981).

Despite advances in the science of food and nutrition, misinformation and misbeliefs still abound. Proliferation of food and nutrition misinformation has a tremendous impact on today's health conscious society (American Dietetic Association, 1988).

Education is felt to be the best line of defense against misconceptions. The level of nutrition knowledge plays an important role in one's ability to discriminate fact from fallacy (Wang, 1971). However, this issue is a complex one with other variables which may interact to have an effect on one's level of misconceptions regarding food and nutrition.

Sims (1976) found certain demographic correlates with the level of nutrition knowledge of homemakers. Dwyer (1970) found that interest in food and nutrition related topics provides an incentive to learn more about the topic. Interest in nutrition increases the exposure of individuals to communication regarding that subject matter, whether accurate or inaccurate information.

This study focused on the homemaker which is defined as the female head of the household. With or without children present, she is truly the "gatekeeper" for most of the food which comes into the home (Lowenberg, et al., 1968). Although men are assuming more non-traditional tasks in the home, women still have more control over meal planning and preparation.

Purpose of Study

The primary purpose of this study was to examine the level of nutrition knowledge, misconceptions, sources of information, nutrition related interests, age, and education of homemakers in Sequatchie County, Tennessee. A secondary purpose was to determine if there is a relationship between knowledge and misconceptions and participating in an Extension Homemaker Council Club. Results of the study can be used for strategical development of programs, such as extension, to counteract food and nutrition misconceptions.

Various studies reveal that there are specific topics of nutrition in which misconceptions are commonly held. Some of these are the use of vitamin supplements, weight reduction, diet relation

to disease, "organic" and "health" foods, food for the athlete, as well as several others. Knowing which of these topics homemakers are most interested in and which are more subject to misconceptions can be of vital importance. Chery et al.,(1987) suggests that distinguishing among correct knowledge, misconceptions and lack of knowledge is important because the educational approaches needed to address a lack of knowledge may be different than those needed to address incorrect knowledge.

Because Extension home economists spend a considerable amount of time with Extension Homemaker Clubs, a secondary purpose of this study was to examine the relationships between these variables and participation in Extension Homemaker Clubs. Extension Homemaker Clubs are educational in nature and study many topics related to family and home. Food and nutrition is one of those study areas. In addition, agents are responsible for delivering programs to the general public, although program delivery methods are often different from those used with homemaker clubs. A careful look at both types of clientele can be useful.

Objectives

The objectives of this study were:

(1) to describe the homemaker sample with regard to Extension Homemaker Council Club membership, age, education, sources of nutrition information used, level of interest in identified

topics, and number of science related courses taken when in school;

(2) to describe the knowledge and misconception level of homemakers in food and nutrition and determine which areas are most subject to perpetration of misinformation among homemakers;

(3) to determine if there was a relationship between total knowledge/misconception score and membership in an Extension Homemaker Council Club and age, education, and number of science related courses taken when in school;

(4) to determine the relationship between knowledge/misconception score and nutritional source of information used by homemakers; and,

(5) to determine the relationship between five subject area knowledge/misconception scores and interest in that area.

Limitations

This study contained certain limitations regarding the sample that was drawn. It was limited to females because most EHC members are female and because of the strong influence that the female head of the household has on other family members' beliefs, attitudes, and behavior relating to food and nutrition. Although the telephone book was the most complete list of homemakers and addresses available, the comparison group was limited to homemakers in the local telephone directory. Finally, the sample was limited to homemakers residing in Sequatchie County.

CHAPTER II

REVIEW OF THE LITERATURE

Food and Nutrition Misconceptions

Nutrition is a science. Being a science, nutrition literature provides more questions than answers. As answers are found to these nutrition questions, more questions develop (Ellenbogen, 1981).

A misconception may be defined as a belief commonly held as true but which is not in accord with scientific evidence to date. This would include fallacies, some fads, and half-truths (Wang, 1971). In spite of advances in the science of nutrition, misinformation and misconceptions are prevalent (American Dietetic Association, 1988). A study of Canadian university students over a thirteen year period revealed that students in 1984 held about the same number of misconceptions as did students in 1971, although the types of misbeliefs had changed (Chery et al. 1987).

Some theories exist which try to explain why food misconceptions exist in a world of educated, nutrition conscious people. Schafer and Yetley (1975) suggest that there are external factors such as family, television, and educational programs which interact with internal factors including perceived needs, attitude, and self-concept to explain the existence of misconceptions. Individual needs that must be satisfied influence the manner in which

external factors and information about nutrition are interpreted for future utilization.

Another viewpoint by Rynearson (1974) focuses on the external forces that affect Americans in promoting misconceptions. He contends that Americans love "hogwash". He believes that the public is interested in nutrition and willing to spend money on foods, vitamins, minerals, and other treatments. Consequently, self-made nutritionists and authorities who are either ignorant or deliberately deceitful are eager to capitalize on the money to be made.

Many complex issues are confounded with the existence of the many misconceptions concerning food and nutrition. Jarvis (1983) points out that people tend to believe in the magical effects of food. "Quacks" make use of food "symbolism" and play on the sympathies of people. A "Quack" is defined as a "person who with little or no foundation pretends to have knowledge or skill in a particular field." By using "symbolism", the quack uses an object to represent something abstract. The quack often uses histories, and testimonials when advertising his/her claims (American Dietetic Association, 1988). Additionally, the title "nutritionist" is unregulated and may be claimed by anyone (Jarvis, 1983). If no other explanation for quackery, or food misconceptions were available, the economic effects would explain its existence. Five billion dollars are spent annually on nutrition remedies alone. On a broader scope, health fraud (including nutrition) and quackery are estimated to be a 25 billion dollar industry (American Dietetic Association, 1988).

Relationship of Food and Nutrition Knowledge, Education and Misconceptions

In most studies, formal education has a positive and direct effect on level of nutrition knowledge (Sanjur, 1982). Young et al. (1956) found that nutrition knowledge was greatest in younger, better educated, higher income homemakers. In a study of mothers of preschool children, Sims, (1976) found a positive correlation between nutrition knowledge, education, family income, and homemaker's stage of the family life cycle. Older homemakers were found to be less knowledgeable and there was a positive correlation between the mother's level of knowledge and the degree of importance she placed on nutrition (Sims, 1976).

It seems logical to assume that there is a direct correlation between knowledge level and misconceptions. That is, one would expect misconception level to go down as knowledge increases. However, some studies indicate this is not always the case. Eckstein (1980) suggests that knowledge of basic food and nutrition principles is not the only prerequisite to overcoming misconceptions. There may be individuals who know scientifically proven facts but are inconsistent in behavior, giving in to popular beliefs. For example, many people are aware that weight reduction is based on the ratio of calories taken in to the body versus calories expended through bodily functions and exercise. The facts are often ignored by many who fall prey to "lose weight while you sleep" pills and gimmicks. Similarly, some people may overcompensate, due to insecurities, just to be on

the safe side. For example, a vitamin supplement taken to make up for poor eating habits can lead to toxic levels in the blood. Dwyer (1970) suggests that wrong answers on a nutrition test may be an indication of wrong learning rather than a lack of knowledge. In other words, a wrong answer can be the result of the subject guessing (lack of knowledge) or a strong belief that the false information is true (wrong learning).

A study of student nurses utilized control groups to compare knowledge gained in nutrition courses and the ability to discriminate facts from fallacy (Poplin, 1980). Poplin found that the student nurses' nutrition knowledge was far superior to that of control groups who had not participated in the classes. However, it was also found that the nurses' ability to discriminate fact from fallacy was dependent on an academic background in chemistry and physiology.

The study of Canadian university students (Chery, Sabry, and Woolcott, 1987) produced similar findings. Even though the knowledge level of the students in 1984 was higher than those in 1971, the levels of nutrition misconceptions were about the same. The study measured the subject's degree of certainty to each response on the questionnaire. This gave the researcher an indication as to which wrong answers were guesses and which were a result of misinformation. The uncertainty of knowledge score rated by the participants was somewhat lower in 1984, indicating that participants had a higher degree of confidence in their own knowledge. As expected, specific topics in which these misconceptions were held changed as some misbeliefs do over a period of time.

Relationship of Food and Nutrition Related Interests to Misconceptions

In order to understand the underlying causes of food faddism and misconceptions, Schafer and Yetley (1975) proposed a model for food behavior. External factors such as family influence, media, and education interact with internal factors, including one's beliefs and needs, or interests to shape one's food related behavior. Bremer and Weatherholz (1975) studied the nutrition attitudes of 679 people in a university community and found that those who scored best on nutrition factual questions also expressed the greatest interest in nutrition. These same respondents were most enthusiastic about organic and health foods and expressed a high degree of interest in them. Likewise, an earlier study by Shipman and McCannon (1964) found that relevance of a topic to each individual determined the degree of interest and so moderated that person's likelihood of self-exposure of communications regarding the topic. Both studies emphasize the importance of interest in a subject as a prerequisite to learning.

Effect of Information Source on Food and Nutrition Misconceptions

If food and nutrition-related interests of an individual have an effect on one's exposure to information in that area, the source of information used and its accuracy could be important in

determining one's level of misconceptions. One study suggests nutrition information disseminated by various type of mass media, professionals, and significant others varies in accuracy (Thomsen, 1988). Although nutrition educators should refrain from making broad, categorical generalizations about the accuracy of nutrition messages based solely upon knowledge of the general source of that information, they should educate the public about generally reliable information sources that are available. The American Dietetic Association (1988) suggests the use of several sources available to the general public.

General health agencies including the Federal Trade Commission, the U.S. Department of Health and Human Services, the Food and Drug Administration, and the Department of Agriculture are recommended. Volunteer health organizations, certain consumer organizations, and credible scientific and professional organizations are also recommended by the American Dietetic Association.

Consumers are confused by the number of different nutrition information sources and have difficulty determining the credibility of those sources. A study of 867 adults in South Carolina (Kunkel, et al., 1986) looked at sources of nutrition information used and the level of confidence placed in that source by the participant. Physicians were the most frequently named professionals used for sources of nutrition information. They were also viewed by the participant as the most credible. Sixty-five percent of the respondents said they used media sources (books, newspapers, and magazines). Fifty-one percent used family and friends as a source

but ranked them lower in credibility. Home economists were more likely to be used as a source of information by women, blacks, and older persons. Few individuals regarded home economists as the most credible source.

A study of elderly persons over 65 by Probart (1989) looked at the factors which influence the older population to choose traditional sources over nontraditional sources of nutrition information. Traditional sources were defined as physicians, dietitians, and extension agents. Nontraditional sources included chiropractors and health food store personnel. It was found that individuals who used nontraditional sources were less able to recognize nutrition misinformation.

The Homemaker as an Influence on Family Members' Nutritional Status

Sources of nutrition information used by individuals relate to a number of demographic characteristics and their relationships are contingent upon the availability of those sources. For example, rural areas are limited in availability of dietitians, health food stores, and weight loss centers. However, the family, and especially the homemaker, has a great influence on most individuals' food beliefs, knowledge, and behavior (Sanjur, 1982). Women play a key role in the everyday supply and distribution of food in many cultures. They transmit attitudes, beliefs, and knowledge to their children. In essence, the homemaker influences both internal and

external forces which affect an individual's food behavior (Sanjur, 1982).

Small children largely depend on a mother's care during early years. Adequate nutrition at this point in life is very important for proper physical and emotional development (Silvern, 1987). Proper nutrition can positively affect the growth rates of children. Silvern (1987) found that both mothers and fathers can have a pronounced influence on a child's food habits and suggested involving parents in nutrition education programs for children.

Adolescents, although more independent in nature than young children, likewise rely on parents as their most often used source of nutrition information (Thomsen, 1988). Studies show that adolescents indicate interpersonal communication in the home with parents as their most frequently used source of information (Skinner and Woodburn, 1984; Douglas and Douglas, 1984). Consequently, the importance of the homemaker in influencing an individual's food knowledge and misconceptions cannot be underestimated.

The Need For Education

According to Herbert (1981), it is imperative to the success of health educators to speak out against questionable nutrition practices, such as weight loss gimmicks and health food claims. Consumers need to know how to evaluate nutritional information in order to minimize the physical, emotional, and economic exploitation of it by others. In all cases re-education and emphasis on the

importance of using correct information will be a challenge (Sanjur, 1982).

Summary

The review of the literature revealed several studies of food and nutrition knowledge and misconceptions. In spite of advances in the science of food and nutrition, misconceptions are common. Some of the variables which have been studied as to their effect on level of misconceptions are food and nutrition knowledge, education, food and nutrition related interests, and source of information. The results indicate that education level, in most studies, results in a higher level of nutrition knowledge. However, a higher level of knowledge does not always result in a lower level of misconception. Some studies indicate that an academic background of courses in the hard sciences has an impact on misconception level. Other research focused on the effect of level of interest in a particular area as a prerequisite to learning, whether it be accurate or inaccurate information. Finally, the source of nutrition information used can affect one's exposure to information in that area. Creditable sources including general health and government agencies were recommended. Educational programming efforts were determined to be the best line of defense for addressing the problem of misconceptions.

CHAPTER III

PROCEDURES AND METHODOLOGY

Design Of Study

The purpose of this study was to investigate the level of food and nutrition knowledge and misconceptions among homemakers in Sequatchie County, Tennessee. A secondary purpose was to study any differences of the two clientele type groups (Extension Homemaker Club members and other homemakers) in relation to the variables studied. The design chosen for this study was a static group comparison. Since this was an "Expost facto" study, no control of treatment or pretesting was possible. This design is superior to the one shot case design in that it involves the use of a comparison group in determining results of treatment. This design, although considered pre-experimental, reduces the common threats to internal validity of history, testing, instrumentation, and regression (Campbell and Stanley, 1966).

Selection Of Sample

This study was exempted and approved by the human subjects committee at the University of Tennessee. The data for this research were collected by a mailed questionnaire to homemakers in Sequatchie County, a rural county, with a population of 8863. Due to the design

of this study, less than half of the sample drawn was made up of Extension Homemaker Council Club members and the rest of the sample was non-members. The questionnaire was mailed to the entire club membership list (90), and to 120 non-members drawn from the local telephone directory using a systematically drawn random technique. It was felt that the response rate from club members would be higher and that in order to have responses from subgroups of comparable size, the random sample would need to contain more non-members than club members.

Questionnaire Development

As a suitable instrument was not available to measure the objectives of this study, a questionnaire was developed (Appendix A) to study food and nutrition knowledge and misconceptions, food and nutrition related interests, food and nutrition sources of information, and selected demographic information of homemakers. The idea for the design of this questionnaire was taken, in part, from a dissertation by Lois Wodarski (1976) at the University of Tennessee, which targeted teenagers rather than homemakers.

Food and Nutrition Knowledge and Misconceptions

Several sources of information were used to identify popular areas of misconceptions in food and nutrition. Textbooks, pamphlets, periodicals, and other popular reading materials were consulted as well as specialists who were knowledgeable in the field of food and

nutrition. Questions were developed and assigned to five specific topic areas including Diet and Weight Watching, Diet in Relation to Disease, Food and Nutrients Needed by the Body, Food Safety, and Food and the Athlete.

The methods for measuring misconceptions in the Wodarski study were adapted and modified from earlier studies by Baker et al. (1964) and Heflin and Pangle (1966). They defined a misconception as a wrong answer in which the respondent expresses a high degree of certainty. On the other hand, knowledge was defined as a correct response with a high level of certainty. With this definition, both misconceptions and knowledge were measured using the same questions on the questionnaire. The same concept of measuring knowledge and misconceptions was adapted and used in this study.

Fifty-one true/false questions were developed for Part I of the questionnaire along with a five point gradation of certainty scale for the homemaker to indicate her level of confidence in her response.

Food and Nutrition-Related Interests

Five selected areas of interest were listed in Part II of the questionnaire for which the homemaker was asked to indicate her level of interest. These areas of interest were identical to the five categories into which the true-false questions were categorized including Diet and Weight Watching, Diet in Relation to Disease, Food and Nutrients Needed by the Body, Food Safety, and Food and the Athlete.

The homemaker was asked to indicate her level of interest in each area on a scale of 1 to 5 with a response of 1 meaning she was extremely interested and a response of 5 meaning she was not interested at all. Responses of 2, 3, or 4 indicated intermediate levels of interest.

Information Sources

Eight possible sources for information of food and nutrition were determined and listed in Part III of the instrument. Homemakers were asked to indicate their most frequently used source of information for each of the areas of Diet and Weight Watching, Diet in Relation to Disease, Food and Nutrients Needed by the Body Food Safety, and Food and the Athlete.

Validity of Instrument

A panel of experts at the University of Tennessee helped establish the face and content validity of the instrument. Among these were food and nutrition specialists from the Agricultural Extension Service as well as professors from the College of Human Ecology. Items on the questionnaire were evaluated as to their relevancy to popular misconceptions, and to categorization to the five topic areas chosen. Each question was analyzed for reading clarity and an effort was made to balance the number of true and false statements.

Pilot Study

In order to further improve the validity and content of the questionnaire, it was pilot tested on a group of fourteen Extension Homemaker club members in nearby Bledsoe County. A frequency count was made on correct and incorrect responses for each question in Part I of the questionnaire. Those items with a high level of incorrect responses were checked again for wording clarity, ambiguity, and relevance to popular topics of misconception. One question was dropped leaving a total of 50 questions on Part I of the questionnaire for the final study.

Administration Of Questionnaire

Prior to mailing the questionnaire, a goal of 55 percent response rate was established. Babbie (1986) stated that a 50 percent response rate on a mailed questionnaire is average. The questionnaire was mailed along with a cover letter and a stamped return envelope. It was number coded to aid in the follow-up of non-responders and to maintain confidentiality of the subjects' responses. Four weeks after the first mailing, a second questionnaire along with a cover letter was mailed to non-responders.

Analysis Of Data

Analysis of these data were conducted using an IBM 3081 mainframe computer available at the University of Tennessee computing

center. The Statistical Package for the Social Scientist (SPSS release 4.0) was used in data analysis (SPSS Reference Guide, 1990). An alpha level of .05 was selected for all probability testing.

Demographic Information

A frequency count was completed for each item on the questionnaire to describe the sample. Numbers and percentages were used to describe demographic characteristics of the sample including age, education level, Extension Homemaker Club membership status, specific science related courses taken in school, and most frequently used sources of information for the five specific areas of food and nutrition.

Knowledge/Misconception Level

Frequency counts and means were used to describe the level of knowledge and misconception among homemakers in objective two. Means and standard deviation were computed to examine the areas of food and nutrition most subject to perpetration of misconceptions.

Score and Interactive Effects by Independent Variables

The effects on knowledge/misconception score were examined with regard to its relationship with the independent variable (Extension Homemaker Club Membership status) and other secondary independent variables including age, education, number of science related courses taken in school, sources of information used by the homemaker, and in level of interest in specific areas of food and nutrition as stated

in objectives three and four. A separate analysis of variance test was run on each of these relationships as stated in objectives number three, four, and five. This allowed for simultaneous comparison of means of variables between groups and within groups and is considered more robust than other nonparametric tests (Touliatois and Compton, 1988). When the F-statistic indicated a significant relationship existed, post hoc tests were run on those independent variables which contained more than two categories.

Relationship of Score and Level of Interest

Pearson's correlation coefficient was used to determine the relationship of knowledge/misconception subscore to the respondent's level of interest in that particular area.

CHAPTER IV

PRESENTATION AND DISCUSSION OF DATA

Questionnaires were mailed to 210 homemakers in Sequatchie County, Tennessee. Of this total, 90 were mailed to the entire EHC membership and 120 non-members were randomly selected from the phone book.

Ninety-five homemakers responded to the initial mailing. Approximately four weeks later, a second questionnaire was sent to non-responders which resulted in an additional return of 26 questionnaires for a total response rate of 58 percent. At this time an analysis was made on the early responders and late responders to see if, in fact, there were any differences between them. Only minor differences were found, therefore, additional mailings were not made as it was assumed that late responders were similar to non-responders (Goldhor, 1972). It was concluded that findings from this sample study are generalizable to the larger population from which it was drawn.

Data from the questionnaire were analyzed regarding internal consistency. For the 121 responding, the true/false portion only of the test had an internal consistency Kuder-Richardson-20 score of .761. The knowledge/misconception portion which included the true/false items plus the degree of certainty of answers had a Cronbach's alpha coefficient of .831. The instrument was considered to be internally consistent and reliable based upon these statistics.

The data were analyzed according to the objectives of this study which were:

1. to describe homemaker sample with regard to Extension Homemaker Council Club membership, age, education, sources of nutrition information used, level of interest in identified topics, and number of science related courses taken when in school;

2. to describe the knowledge and misconception level of homemakers in food and nutrition and determine which areas are most subject to perpetration of misinformation among homemakers;

3. to determine if there was a relationship between total subject matter knowledge/misconception score and membership in Extension Homemaker Council Club and age, education, and number of science related courses taken when in school;

4. to determine the relationship between the knowledge/ misconception score and nutritional source of information used by homemakers; and,

5. to determine if there is a relationship between the level of interest in a specific area of food and nutrition and the knowledge/misconception subscore in that area.

Description of Homemaker

Objective number one was to describe homemakers with regard to Extension Homemaker Club membership, age, education, sources of nutrition information used, level of interest in identified topics, and number of science related courses taken in school. Table I* describes these characteristics.

Fifty-two percent of the sample were EHC members. Twenty-six percent of the respondents were in the age group of 50-65 and an additional twenty-six percent were over age 65. The 30-35 age group and the 40-49 age group were represented with twenty-two and seventeen percent respectively. The remaining respondents were of age 29 or lower.

Five percent of the respondents had received an elementary level education while the largest group had received a high school education (48 percent). Ten percent indicated that vocational/trade school was their highest level while 37 percent had attended or graduated from college.

Thirty-seven percent indicated they had taken a chemistry course in high school or college and 71 percent had studied biology. Sixty eight percent had studied health and 79 percent had taken home economics, making it the school course taken by the largest number of the respondents. Eighteen percent of the homemakers had taken a nutrition course in college.

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*All Tables may be found in Appendix B

Respondents were asked to indicate their most frequently used source of information in five specific nutrition related areas. The possible choices listed on the questionnaire were parent, medical doctor or nurse, television or radio, newspaper, magazines, extension agent, friend, and other sources. The "other" option was open ended so that the respondent could write in a source if different from those listed. The most frequently used source for Diet and Weight Watching information was a medical doctor or nurse at 30 percent. Twenty-three percent said magazines were their most frequently used source in Diet and Weight Watching. Again, medical doctor or nurse was indicated to be the most frequently used source of information in Diet in Relation to Disease, at forty-four percent. In the area of Food and Nutrients Needed by the Body, percentages were more evenly distributed among the sources used, but the extension agent was the most frequently used source of information in this area (35 percent). Also, the extension agent was the most frequently used source of information (42 percent) in the area of Food Safety. Parent, radio and television, and magazines came in second at 13 percent each. For the area of food and the athlete, magazines were most often used as a source of information (37 percent).

Table 2 reports the mean ratings and standard deviation of the level of interest that homemakers had in the same five previously mentioned areas of food and nutrition. Respondents indicated how interested they were by circling a number on a scale of one to five. A response of one meant they were extremely interested and a response of five indicated they were not interested at all. The area

that homemakers were most interested in was Diet In Relation to Disease with a mean response of 1.67 (s.d.= .94). Food Safety was next with a mean of 1.83 (s.d.= .99). Food and Nutrients Needed by the Body was the third overall rated area at 1.88 (s.d.= .92). Diet and Weight Watching had a mean of 2.00 (s.d.= .97). Food and the Athlete was the area they were least interested in with a mean level of 3.45 (s.d.= 1.27). In addition, to having the lowest level of interest, Food and the Athlete had the highest amount of variance of interest within the group.

Knowledge/Misconception Level

The second objective was to describe the knowledge/misconception level of homemakers in food and nutrition and determine which areas were most subject to perpetration of misinformation. The knowledge/misconception scores were calculated by using the answers of the respondents to 50 true-false test items about food and nutrition and their level of certainty regarding their answers. If the homemaker correctly answered the test item and indicated a high level of certainty with her answer, this indicated a high level of knowledge. If, on the other hand, she missed the item and was also very certain about her answer, this indicated a high level of misconception. A value of -4 was assigned to high misconception and a value of +4 was assigned to high knowledge. As there were 50 items on the test, the possible knowledge/misconception scores could range from -200 to +200. Table 3 describes respondents' levels of

knowledge/misconception. Actual scores ranged from -27 to 174 with a mean of 71.7 and a standard deviation of 42.3. Table 4 describes how homemakers scored on each of the 50 items on the questionnaire ranging from a +4 to -4. The items which homemakers scored lowest on were "Athletes should eat a lot of protein in order to make their muscles stronger," "Sugar will cause children to be hyperactive," "Lettuce is not a good source of vitamin A," "If the freezer stops, it is unsafe to refreeze meat that has partially thawed," and "It is safe to eat a turkey that has been solidly frozen in the freezer for three years" (knowledge/misconception scores of -1.48,- 1.41, and -.98, and -.55).

Areas Most Subject to Misconception

Included in objective number two was the identification of areas in foods and nutrition which are most subject to perpetration of misinformation among homemakers. Items on the questionnaire were categorized beforehand according to specific areas of Diet and Weight Watching, Diet in Relation to Disease, Food and Nutrients Needed By the Body, Food Safety, and Food and the Athlete (See Table 5). As the total score for each area was based on a number of items, it was not possible to compare scores across subgroups without first equating them. In Table 6 the mean for each area was divided by the total number of items in that category. As the possible range of score for each question was -4 to +4, the resulting mean gives a better comparison of how the homemakers scored in each area. A score of -4

indicates a high level of misconception and a score of +4 indicates a high level of knowledge. Table 6 indicates that homemakers scored better or were more knowledgeable in the area of Food and Nutrients Needed by the Body. On the contrary, they scored lowest in the area of Food and the Athlete.

Interactive Effects of Selected Independent Variables on Knowledge/Misconception Score

Objective three of the study was to determine the relationship between knowledge/misconception scores and membership in Extension Homemaker clubs, and the interactive effects of age, education, and number of science related courses taken in school. In order to determine the relationship, three separate analysis of variance tests were calculated. The relationship between knowledge/misconception scores and the potential interactive effects of membership in EHC clubs and age is indicated in Table 7. The first order interaction between age and club participation was not significant ($F=.32$, $df=3$, $p=.81$). However, the main effects model was significant. Although age does not account for a significant amount of the variance in scores, EHC membership does ($F=8.18$, $df=1$, $p= .01$). Table 8 describes the relationship between knowledge/misconception scores and EHC membership. EHC members scored an average of 83.90 points while non-members scored an average of 58.52 points. Based upon these data it may be concluded that EHC members should score significantly higher than non-members.

Table 9 reports the results from the analysis of variance of the knowledge/misconception score using the variables of EHC membership and educational level. The first order interaction between membership and educational level was not significant (F=.74, df=3, p=.530). However, the main effect of participation in an EHC club was significant (F=12.15, df=1, p=.001) as reported in the previous analysis. The effect of education level was not significant (F=1.63, df=3, p=.186).

The relationship between knowledge/misconception scores and participation in EHC clubs and any moderating effects by the number of science related courses taken in school is shown in Table 10. As shown, there were no first order interactions between the two variables on the dependent variable, knowledge/misconception score (F=1.11, df=5, p=.36). The main effects of both variables were significant, however. Participation in EHC club was significantly related to knowledge/misconception score as was previously described in table 8. The main effect of the number of courses taken on knowledge/misconception score was also significant (F=3.24, df=5, P=.009). Table 11 depicts the relationship between knowledge/ misconception score and number of science related courses. As there are more than two categories in this independent variable, the Duncan's post hoc test was used to determine where the true differences lie, and are reported in table 11. Individuals who had four courses scored different from those who had one or two courses. Those who had five courses scored significantly different from those who had three or fewer. The difference in knowledge/ misconception

score was mainly attributed to homemakers who had four or five science related courses when they were in school.

A further analysis of variance test reveals the specific effect of each science course on the knowledge/misconception score rather than the effect of total number of courses taken. Table 12 describes the analysis of variance for knowledge/misconception score and specific science related courses taken in school. The main effects of each course reveals that having taken chemistry was significant to the overall score ($F=6.25$, $df=1$, $p=.014$), and that studying home economics was significant ($F=5.94$, $df=1$, $p=.016$). Table 13 describes the relationship of knowledge/misconception score and specific science courses taken in school.

Relationship Between Score and Information Source

Objective number four was to determine the relationship between knowledge/misconception score and EHC membership and sources of nutritional information. The homemaker was asked to indicate her most frequently used source of information for the five areas of food and nutrition (Diet and Weight Watching, Diet in Relation To Disease, Food and Nutrients Needed By the Body, Food Safety, and Food and the Athlete. The list of sources from which to choose were parent, medical doctor or nurse, television or radio, newspaper, magazine, extension agent, friend, and other. It was necessary to consider the effect of EHC membership status and source of nutrition information in each of the nutritional areas studied in order to make a

meaningful comparison. A separate analysis of variance test was run on the independent and dependent variables in each of these nutritional areas. Table 14 describes the analysis of variance of the variables of EHC membership and information source on the dependent variable knowledge/misconception score in the area of Diet and Weight Watching. The first order interaction between the two independent variables shows no significance. As noted earlier in overall score analyses, EHC membership participation showed a strong relationship with knowledge/misconception scores. It continued to be significant even in this subcategory of the questionnaire ($F=9.53$, $df=1$, $p=.003$). Table 15 shows the relationship between knowledge/misconception scores of members and non-members in the area of Diet and Weight Watching. Likewise, the main effect of source of information is significant ($F=3.19$, $df=7$, $p=.004$). Because there were more than two categories in the independent variable, source of information, a Duncan's post hoc test was run to determine which categories actually made the most difference on the scores (see Table 16). The lowest scores were made by those who used television or radio for their nutrition source ($\bar{x}=7.60$). The highest scores were made by those who used the newspaper for their source of information.

The influence of knowledge/misconception subscore by EHC membership and source of information for the category of Diet in Relation to Disease is shown in Table 17. The analysis of variance

test revealed no significant interactive effects but the main effects model was significant. Again, EHC membership showed a significant influence on knowledge/misconception score ($F=8.98$, $df=1$, $p=.003$). The relationship between membership and score is reported in Table 18. According to Table 17, the main effect of source of information was significant to score in the area of Diet in Relation to Disease ($F=3.03$, $df=7$, $p=.006$). A Duncan's post hoc test was run in order to determine which sources of information made the most differences in score. As shown in Table 19, friend and parent sources were used most by those who scored lowest on the test. Extension agent, television or radio, magazine, medical doctor or nurse, newspaper, and "other" sources had a positive influence on score. Some of the "other" responses that homemakers indicated were textbooks and teachers.

The influence on knowledge/misconception subscore by EHC membership and source of information in the area of Food and Nutrients Needed By the Body is depicted in Table 20. The analysis of variance test revealed no first order interaction between participation in EHC club and source of information ($F=1.57$, $df=6$, $p=.164$). However, the main effect of membership was significant ($F=8.61$, $df=1$, $p=.004$). Table 21 describes the relationship between knowledge/misconception subscore in the area of Food and Nutrients Needed By the Body and participation in EHC club. Table 20 indicates

no main effects on knowledge/misconception subscore and source of information used for the area of Food and Nutrients Needed By the Body.

The influence on knowledge/misconception subscore in the area of Food Safety by EHC membership and source of information used is described in Table 22. This analysis of variance revealed no first order interaction between participation in EHC club and source of information (F=1.02, df=4, p=.399). However, the main effects model of membership was significant (F=5.47, df=1, p=.021). Table 23 describes the relationship between knowledge/misconception subscore in the area of Food Safety and participation in EHC club. Table 22 indicates no main effect on knowledge/misconception subscore and source of information used in Food Safety.

The last part of objective four considered the influence on knowledge/misconception subscore on items related to Food and the Athlete by participation in EHC club and source of information used in that area. According to Table 24, the first order interaction of the two variables was not significant (F=1.90, df=5, p=.103.) Also, the main effects model of membership was not significant (F=.43, df=1, p=.514), nor was the main effect of source of information significant in this area (F=.56, df=7, p=.784).

Relationship Between Score and Level of Interest

Objective number five was to determine the relationship between the five subject area knowledge/misconception scores and interest in that specific subject area. This was achieved by correlating the respondent's subscores and level of interest in each area. Homemakers were asked to indicate their level of interest in specific areas of Diet and Weight Watching, Diet in Relation to Disease, Food and Nutrients Needed By the Body, Food Safety, and Food and the Athlete. A response of 1 meant they were extremely interested, a response of 2 meant they were very interested, a response of 3 meant they were moderately interested, a response of 4 meant they were slightly interested, and a response of 5 meant they were not interested at all. Correlation coefficients between the level of interest and knowledge/misconception scores were determined to examine this relationship. Table 25 reports the correlation between knowledge/misconception subscores and the level of interest that the homemaker had in specific food and nutrition areas. According to Davis (1971), a correlation coefficient of .01-.09 is negligible. Therefore, it may be concluded there was no significant relationship between knowledge/misconception subscore and the level of interest in a particular area.

CHAPTER V

SUMMARY AND CONCLUSIONS

Summary

The purpose of this study was to investigate food and nutrition knowledge and misconceptions among homemakers in Sequatchie County, Tennessee. The final sample was composed of 121 homemakers, about half of which were Extension Homemaker Council Club members and the other half non-members, chosen randomly for comparison group purposes. The homemakers returned a mailed questionnaire developed to measure knowledge/misconception level, frequent sources of information, interest level in specific food and nutrition related areas, and certain demographic information. The homemaker was described according to participation in an Extension Homemaker Council Club, age, level of education, science related courses taken in school, source of information used in specific areas, and level of interest in specific areas. The level of knowledge/misconception scores were described along with those areas most subject to perpetration of misinformation. Relationships were examined between knowledge/misconception scores and sources of information used by homemakers. Correlations between the knowledge/misconception subscores in certain areas and the level of interest by the homemaker in that area were examined.

The study revealed that the majority of the homemakers surveyed were age 50 and over and had a high school education. The science related course taken by most of the homemakers was home economics. The most frequently used source of information in Diet and Weight watching and in Diet in Relation to Disease was a medical doctor or nurse. For Food and Nutrients Needed by the Body and for Food Safety it was the extension agent. For Food and the Athlete, magazines were used most often. Homemakers were most interested in Diet in Relation to Disease and least interested in Diet and the Athlete. They scored highest in the area of Food and Nutrients Needed By the Body and lowest in the area of Food and the Athlete.

The main and interactive effects of several variables were examined for their effect on the dependent variable, knowledge/ misconception score. Participation in an Extension Homemaker Council Club had a positive effect on scores in almost all tests conducted. The number of science related courses taken in school had a positive main effect with home economics and chemistry making the most difference on score. There was a significant relationship between the score and the source of information used in the areas of Diet and Weight Watching and Diet in Relation to Disease. There were no interactive effects on score between the variables studied. No correlation was found between a homemaker's score and her level of interest in that particular area.

Comparison With Other Studies

Several of the findings of this study were similar to findings of other studies reviewed. According to Sanjur (1982), many studies on nutrition knowledge conclude that formal education has a positive and direct effect on level of knowledge. This, however, is not always the case as was indicated by this study. The general level of education did not have a significant effect on knowledge/misconception score. However, the total number of science related courses taken when in school did have an effect, specifically home economics and chemistry courses. In a similar study of student nurses, Poplin (1980) utilized control groups to compare knowledge gained in nutrition courses and ability to discriminate facts from fallacy. Poplin found that participating in nutrition courses did, indeed, make a difference. Furthermore, the difference was dependent on the nurses academic background in chemistry and physiology. Wodarski (1976) found in her study of teenagers that a background of chemistry and biology improved their nutrition knowledge scores.

Unlike the present study, Wodarski (1976) found no correlation between score and source of information used. On the other hand, the present study found no correlation between level of interest in an area and score in that area, as did the Wodarski (1976) study.

Conclusions and Implications

The results of this study indicate a considerable amount of confusion exists among homemakers regarding the area of food and nutrition. Contradictory facts from a number of sources along with false advertising claims keep the homemaker guessing at who to believe.

The role of educators can be a vital one in helping counter fallacies with facts. As found with this study, a general education is not enough to combat this problem. It must be more specific in nature. Not only did the total number of science related courses taken by the homemaker when in school make a difference on score, but specific courses including chemistry and home economics, also, made a difference. Education in nutrition should be targeted both in the home and in the public education system. In the home, education should begin with the young child, thus the tremendous role of the homemaker in this process. Furthermore, adults should be targeted with nutritional education programs in order to replace misconceptions with correct knowledge.

Extension agents are in a prime position to reach homemakers who are not involved in public education. The importance of Extension Homemaker Council clubs was indicated by this study. Extension Homemaker Council clubs are an excellent way of reaching homemakers with informal teaching methods including group meetings, circular letters, and personal contacts. Unfortunately, these club members make up a small percentage of the population. Additional

methods must be sought to meet the needs of more of the population. As found in this study, the newspaper was used often as a source of nutrition information by the homemakers. Thus, the extension agent should make use of this method to reach non-EHC members about food and nutrition.

Extension agents need to emphasize the use of reliable sources of information. Teaching homemakers the skills to evaluate information as well as the source of that information can be of tremendous value in combating misinformation. This study found a significant relationship between knowledge/misconception score and sources of information used in Diet and Weight Watching and in Diet in Relation to Disease. Although a relationship was not found with score and information source in the other areas including Food and Nutrients Needed By the Body, Food Safety, and Food and the Athlete, it could be because there was some overlap in how several of the questions on the questionnaire could be categorized. Also, the category of Food and the Athlete contained considerably fewer questions than did the other categories.

Extension agents were found to be the most frequently used source of information in Food and Nutrients Needed By the Body and Food Safety. In order to continue to be the leading source of information in these areas, it is imperative that state staff communicate topics of current consumer concern to agents in a timely manner.

Programming topics of extension agents are preventive in nature. Perhaps this is why homemakers consider agents a source in

Food and Nutrients Needed By the Body and Food Safety, topics which might, also, be considered preventive in nature. Homemakers were most interested in the area of Diet in Relation to Disease. Because of this, extension agents should take advantage of this interest and put strong emphasis on programming in Diet and Disease. By the time a homemaker consults a doctor regarding Diet in Relation to Disease, the problem is often therapeutic in nature.

In addition to targeting nutrition education in the home, it should be emphasized in the public education system. The importance of studying home economics was indicated in this study. With today's strong curriculum emphasis on basic liberal arts and hard science courses, home economics often takes a back burner as an elective or may be eliminated entirely. Can curriculum decision makers afford to disregard the benefits derived from home economics courses which provide students with empirically grounded information on which to evaluate and make decisions, not only in food and nutrition, but in many other areas, too?

Recommendations For Further Research

As a result of this study, several suggestions are in order for future research. Although the instrument developed for this study tested to be a very reliable one, an additional study might explore the relationship between the level of certainty of response and personality types of respondents. It was observed informally in this

study, for example, that many respondents were very sure or very unsure of their responses consistently throughout the questionnaire.

This study focused exclusively on women because most Extension Homemaker club members are women and one of purposes of the study was to see if members scored higher on the questionnaire. Many men, however, have become more involved in home and family responsi-ilities, including food and nutrition. Furthermore some single parent families are headed by men. A study which incorporated men would probably give a more balanced approach to studying food and nutrition misconceptions.

Another study might explore the differences found in this rural county as compared to those found in a more urban area. Although extension agents are often more visible in small rural counties, an urban setting might propose more variables for consideration to the researcher.

This study found no significant correlation between the level of interest in an area and the knowledge/misconception subscore for that area. Again, this could be attributed to the categorization of items on the instrument, or perhaps it could be due to the fact that homemakers seek nutrition information based on "need" rather than "interest." A further study might examine a homemaker's knowledge/ misconception level in relation to her need for information in specific food and nutrition areas.

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APPENDIXES

APPENDIX A

QUESTIONNAIRE

#

This is a questionnaire to determine nutrition knowledge and misconceptions. Participation is voluntary and no ill feelings will be felt if you choose not to return the survey. There is no anticipated personal risk. Please do not put your name on the survey. The surveys are numbered, but this is for use in sending reminders to those who have not responded. Returning the completed survey indicates your informed consent to participate.

If you have questions, I will be glad to answer them (949-2611). Please return the survey to Bonnie Fritch, P.O. Box 548, Dunlap, Tennessee, 37327.

PART I

The following section contains statements about food and nutrition. Read each statement. Circle the "T" (true) if you believe the statement is true, or "F" (false) if you believe the statement is false. Once you have made this decision, indicate your degree of certainty or sureness on your answer by circling one of the numbers to the right of your answer. If you are very sure of your answer, circle "1." If you are very unsure about your answer, circle "5." For some statements, the numbers 2, 3, or 4 may better describe your certainty of your answer. If so, circle one of those numbers.

For example, consider the following statement:
"George Washington was the first president of the United States."

(T) F (1) 2 3 4 5

Is the statement True (False)? Circle "T" ("F"). How certain are you of this answer? Circle the appropriate number to indicate this. Please be sure to circle both a letter and a number after each statement.

		VERY SURE → VERY UNSURE
1. Sugar has more calories than honey.	T F	1 2 3 4 5
2. A medium sized baked potato has fewer calories than a 4 ounce portion of beef.	T F	1 2 3 4 5
3. People should take vitamin supplements just to make sure they get enough.	T F	1 2 3 4 5
4. Leftover food should not sit out on the counter more than two hours.	T F	1 2 3 4 5
5. A slice of toast is lower in calories than the same slice of bread untoasted.	T F	1 2 3 4 5
6. Meats are a good source of fiber.	T F	1 2 3 4 5
7. Supplementing a diet with vitamin pills can result in super vitality, greater endurance, and freedom from illness.	T F	1 2 3 4 5
8. Food cravings are a sign the body needs those foods.	T F	1 2 3 4 5
9. Eating foods containing saturated fat increases blood cholesterol level more than does eating foods containing cholesterol.	T F	1 2 3 4 5
10. The only way to lose weight is to eat fewer calories than the body uses.	T F	1 2 3 4 5
11. Exercise does not increase the appetite.	T F	1 2 3 4 5
12. All popular weight loss diets have been calculated to insure that they do not cause deficiency or imbalance of nutrients.	T F	1 2 3 4 5
13. Bread and potatoes should not be eliminated from the diet when trying to lose weight.	T F	1 2 3 4 5

PLEASE GO ON TO BACK OF THIS PAGE

			VERY SURE				VERY UNSURE
14.	Butter and margarine have about the same number of calories.	T F	1	2	3	4	5
15.	A combination of lecithin, vinegar, and kelp helps the body burn fat.	T F	1	2	3	4	5
16.	It is <u>not</u> harmful to eat milk and fish at the same time.	T F	1	2	3	4	5
17.	Eating a lot of broccoli will <u>not</u> prevent cancer.	T F	1	2	3	4	5
18.	Athletes should eat a lot of protein in order to make their muscles stronger.	T F	1	2	3	4	5
19.	There is <u>no</u> danger in eating raw uncooked eggs.	T F	1	2	3	4	5
20.	It is alright to eat cheese that has molded, as long as the molded portion has been trimmed off.	T F	1	2	3	4	5
21.	Reconstituted (powdered) dry skim milk is just as good nutritionally as fresh skim milk.	T F	1	2	3	4	5
22.	Taking vitamin C pills will prevent colds.	T F	1	2	3	4	5
23.	Saturated fat contains more calories than unsaturated fat.	T F	1	2	3	4	5
24.	An adequate diet does <u>not</u> have to contain meat.	T F	1	2	3	4	5
25.	Obesity is usually caused by improper gland functioning.	T F	1	2	3	4	5
26.	Poor nutrition is seldom a problem among middle class and upper class families.	T F	1	2	3	4	5
27.	Eaten in small quantities, the green substance found on white potatoes is <u>not</u> harmful.	T F	1	2	3	4	5
28.	It is <u>not</u> necessary to refrigerate hard boiled eggs.	T F	1	2	3	4	5
29.	Eating a candy bar before competition will boost an athlete's performance throughout the game.	T F	1	2	3	4	5
30.	Brown eggs are no better for you than white eggs.	T F	1	2	3	4	5
31.	It is <u>not</u> advisable that athletes take salt tablets.	T F	1	2	3	4	5
32.	Eating foods cooked in aluminum pans may cause brain disorders.	T F	1	2	3	4	5
33.	Lettuce is <u>not</u> a good source of Vitamin A.	T F	1	2	3	4	5
34.	All nutrition information that is printed in newspapers and magazines has <u>not</u> been checked for accuracy.	T F	1	2	3	4	5
35.	If the freezer stops, it is unsafe to refreeze meat that has partially thawed.	T F	1	2	3	4	5
36.	A healthy diet may include unlimited amounts of polyunsaturated fat.	T F	1	2	3	4	5
37.	Anyone called a "nutritionist" is a reliable source of information.	T F	1	2	3	4	5

			VERY SURE				VERY UNSURE
38.	Any use of pesticides and other chemicals on growing fruits and vegetables is a threat to our health.	T F	1	2	3	4	5
39.	Illnesses cannot be cured by specific foods.	T F	1	2	3	4	5
40.	Losing body fat takes longer than losing body fluids.	T F	1	2	3	4	5
41.	It is safe to eat a turkey that has been solidly frozen in the freezer for three years.	T F	1	2	3	4	5
42.	Fruit juice is higher in vitamin C than fruit drink.	T F	1	2	3	4	5
43.	Foods labeled "no cholesterol" may not be a good choice for persons on a low fat diet.	T F	1	2	3	4	5
44.	Studies indicate that exercise is very important in increasing the amount of good cholesterol (HDL's) in the blood.	T F	1	2	3	4	5
45.	Eating grapefruit will not make the body burn more fat.	T F	1	2	3	4	5
46.	Sugar will cause children to be hyperactive.	T F	1	2	3	4	5
47.	On food labels, "low-cal," "reduced calorie," and "lite," all mean basically the same thing.	T F	1	2	3	4	5
48.	One should take fish oil capsules to reduce the risk of heart disease.	T F	1	2	3	4	5
49.	Everyone should be on a low cholesterol diet.	T F	1	2	3	4	5
50.	Eating too many sweets does not cause diabetes.	T F	1	2	3	4	5

PART II

How do you rate the following topics relating to food and nutrition according to your interests? If you find the topic extremely interesting circle (1); very interesting (2); moderately interesting (3); slightly interesting (4) and not at all interesting (5).

1=Extremely Interesting
2=Very Interesting
3=Moderately Interesting
4=Slightly Interesting
5=Not at all Interesting

	EI	VI	MI	SI	NI
diet and weight watching	1	2	3	4	5
diet in relation to disease (heart, diabetes, cancer)	1	2	3	4	5
foods and nutrients needed by the body	1	2	3	4	5
food safety	1	2	3	4	5
food and the athlete	1	2	3	4	5

ALMOST FINISHED-----please go on to the next page

PART III

In Column I below are listed several topics on food and nutrition. Column II lists sources you may have used to get information on the topics in Column I. For each topic in Column I, indicate your most frequently used source (one only) from Column II.

Column I	Column II
____ diet and weight watching	1. parent
____ diet in relation to disease	2. medical dr. or nurse 3. t.v. or radio
____ food and nutrients needed by the body	4. newspaper 5. magazines
____ food safety	6. extension agent 7. friend
____ food for the athlete	8. other_____

PART IV

Please indicate your response by circling one of the choices presented.

1. Are you a member of an Extension homemaker club in Sequatchie County?

   yes no

2. If no, have you ever received nutrition information of any kind from the UT County Extension Office? Circle those which apply.

   a. bulletins
   b. home economics newsletter
   c. attended meetings
   d. newspaper articles

3. Indicate your highest level of education

   a. elementary school
   b. high school
   c. vocational/trade school
   d. college

4. Age

   a. under 20
   b. 20-29
   c. 30-39
   d. 40-49
   e. 50-65
   f. over 65

5. Indicate courses you may have taken in high school or college. You may select more than one.

   a. chemistry
   b. biology
   c. health
   d. home economics
   e. nutrition (college only)

THANKS VERY MUCH!!

(please return in the enclosed envelope)

APPENDIX B

TABLES

TABLE I

CHARACTERISTICS OF HOMEMAKERS

Characteristics		Respondents Number	Percent
EHC Membership			
Member		63	52.1
Non-member		57	47.9
	Total	121	100.0
Age			
Under 20		2	1.7
20-29		7	5.8
30-39		27	22.3
40-49		21	17.4
50-65		32	26.4
Over 65		32	26.4
	Total	121	100.0
Highest Education Level			
elementary		6	5.0
high school		58	47.9
vocational/trade school		12	9.9
college		45	37.2
	Total	121	100.0
Science Related Courses*			
chemistry		45	37.2
biology		86	71.1
health		82	67.8
home economics		95	79.3
nutrition (college only)		22	18.2
Most Frequent Source of Information for Diet and Weight Watching			
parent		5	4.2
medical doctor or nurse		36	30.3
television or radio		10	8.4
newspaper		3	2.5
magazine		28	23.5
extension agent		14	11.8
friend		1	9.2
other		12	10.1
	Total	119	100.0

*Totals will not all sum to 100 percent because respondents could select more than one answer.

TABLE I (continued)

Characteristics		Respondents Number	Percent
Frequent Source of Information for Diet in Relation to Disease			
parent		1	.8
medical doctor or nurse		53	44.5
television or radio		16	13.4
newspaper		16	13.4
magazine		21	17.6
extension agent		6	5.0
friend		3	2.5
other		3	2.5
	Total	119	100.0
Frequent Source of Information for Food and Nutrients Needed By the Body			
parent		4	3.4
medical doctor or nurse		16	13.4
television or radio		9	7.6
newspaper		6	5.0
magazine		31	26.1
extension agent		35	29.4
friend		2	1.7
other		16	13.4
	Total	119	100.0
Frequent Source of Information for Food Safety			
parent		16	13.4
medical doctor or nurse		3	2.5
television or radio		16	13.4
newspaper		12	10.1
magazine		16	13.4
extension agent		50	42.0
friend		2	1.7
other		4	3.4
	Total	119	100.0
Frequent Source of Information for Food and the Athlete			
parent		1	.9
medical doctor or nurse		8	7.5
television or radio		28	26.2
newspaper		12	11.2
magazine		40	37.4
extension agent		1	.9
friend		9	8.4
other		8	7.5
	Total	107	100.0

TABLE 2

LEVEL OF INTEREST OF HOMEMAKERS IN FOOD AND NUTRITION AREAS

Topic	Mean Level Of Interest*	Standard Deviation
Diet and Weight Watching	2.00	.97
Diet in Relation to Disease	1.67	.94
Food and Nutrients Needed By the Body	1.88	.92
Food Safety	1.83	.99
Food and the Athlete	3.45	1.27

*1=high interest, 5=low interest

TABLE 3

KNOWLEDGE/MISCONCEPTION LEVEL OF HOMEMAKERS

Range of Scores	N	Percent
-27 to -1	5	4.1
0 to 25	14	11.6
26 to 50	19	15.7
51 to 75	30	24.8
76 to 100	14	11.6
101 to 125	28	23.1
126 to 150	9	7.4
150 to 174	2	1.7
Total	121	100.0

Possible Range	Actual Range	Mean	Standard Deviation
-200 to 200 (low to high)	-27 to 174	71.7	42.3

TABLE 4

HOMEMAKERS' RESPONSES TO QUESTIONNAIRE ITEMS

Item Description	% Answered Correctly	Mean Knowledge/ Misconception Score*
18. Athletes should eat a lot of protein in order to make their muscles stronger.(F)	22.5	-1.48
46. Sugar will cause children to be hyperactive.(F)	28.1	-1.41
33. Lettuce is not a good source of Vitamin A.(T)	36.4	-.98
35. If the freezer stops, it is unsafe to refreeze meat that has partially thawed.(F)	42.1	-.68
41. It is safe to eat a turkey that has been solidly frozen in the freezer for three year.(T)	38.0	-.55
47. On food labels, "low-cal," "reduced calorie," and "lite," all mean basically the same thing.(F)	41.3	-.49
23. Saturated fat contains more calories than unsaturated fat.(F)	39.7	-.36
38. Any use of pesticides and other chemicals on growing fruits and vegetables is a threat to our health.(F)	52.5	-.01
14. Butter and margarine have about the same number of calories.(T)	53.7	.34
49. Everyone should be on a low cholesterol diet.(F)	56.2	.45
11. Exercise does not increase the appetite.(T)	52.1	.48
27. Eaten in small quantities, the green substance found on white potatoes is not harmful.(T)	56.7	.49
29. Eating a candy bar before competition will boost an athlete's performance throughout the game.(F)	62.8	.68

*Possible Range of Score -4 to +4

TABLE 4 (Continued)

Item Description	% Answered Correctly	Mean Knowledge/ Misconception Score
15. A combination of lecithin, vinegar, and kelp helps the body burn fat.(F)	66.7	.68
31. It is not advisable that athletes take salt tablets.(T)	57.0	.72
32. Eating foods cooked in aluminum pans may cause brain disorders.(F)	66.9	.96
39. Illnesses cannot be cured by specific foods.(T)	64.5	1.03
1. Sugar has more calories than honey.(F)	66.9	1.05
9. Eating foods containing saturated fat increases blood cholesterol level more than does eating foods containing cholesterol.(T)	66.1	1.08
37. Anyone called a "nutritionist" is a reliable source of information.(F)	70.2	1.35
22. Taking vitamin C pills will prevent colds.(F)	72.7	1.36
36. A healthy diet may include unlimited amounts of polyunsaturated fat.(F)	72.7	1.39
48. One should take fish oil capsules to reduce the risk of heart disease.(F)	77.7	1.55
5. A slice of toast is lower in calories than the same slice of bread untoasted.(F)	76.9	1.73
34. All nutrition information that is printed in newspapers and magazines has not been checked for accuracy.(T)	79.3	1.79
43. Foods labeled "no cholesterol" may not be a good choice for persons on a low fat diet.(T)	76.0	1.80
8. Food cravings are a sign the body needs those foods.(F)	80.2	1.82
45. Eating grapefruit will not make the body burn more fat.(T)	75.5	1.91

TABLE 4 (Continued)

Item Description	% Answered Correctly	Mean Knowledge/ Misconception Score
17. Eating a lot of broccoli will not prevent cancer.(T)	78.5	1.94
20. It is alright to eat cheese that has molded as long as the molded portion has been trimmed off.(T)	86.0	2.06
2. A medium sized baked potato has fewer calories than a 4 ounce portion of beef.(T)	83.5	2.09
10. The only was to lose weight is to eat fewer calories than the body uses.(T)	76.9	2.13
6. Meats are a good source of fiber.(F)	85.8	2.13
3. People should take vitamin supplements just to make sure they get enough.(F)	81.8	2.17
12. All popular weight loss diets have been calculated to insure that they do not cause deficiency or imbalance of nutrients.(F)	85.1	2.26
21. Reconstituted (powdered) milk dry skim mild is just as good nutritionally as fresh skim milk.(T)	82.6	2.31
16. It is not harmful to eat milk and fish at the same time.(T)	82.6	2.35
24. An adequate diet does not have to contain meat.(T)	82.6	2.36
50. Eating too many sweets does not cause diabetes.(F)	82.6	2.38
25. Obesity is usually caused by improper gland functioning.(F)	86.0	2.38
7. Supplementing a diet with vitamin pills can result in super vitality, greater endurance, and freedom from illness.(F)	87.6	2.39
26. Poor nutrition is seldom a problem among middle class and upper class families.(F)	86.0	2.40

TABLE 4 (Continued)

Item Description	% Answered Correctly	Mean Knowledge/ Misconception Score
30. Brown eggs are not better for you than white eggs.(T)	86.0	2.51
13. Bread and potatoes should not be eliminated from the diet when trying to lose weight.(T)	86.0	2.58
44. Studies indicate that exercise is very important in increasing the amount of good cholesterol (HDL's) in the diet.(T)	94.2	2.82
19. There is no danger in eating raw uncooked eggs.(F)	88.4	2.87
28. It is not necessary to refrigerate hard boiled eggs.(F)	94.2	3.12
40. Losing body fat takes longer than losing body fluids.(T)	95.0	3.21
4. Leftover food should not sit out on the counter more than two hours.(T)	93.4	3.28
42. Fruit juice is higher in vitamin C than fruit drink.(T)	98.3	3.42

TABLE 5

CATEGORIZATION OF ITEMS INTO SUBJECT AREAS

Category	Item #	Total Questions
Diet and Weight Watching	1,2,5,10,11,12,13,14,15, 23,25,27,40,45,47	15
Diet in Relation to Disease	6,9,17,22,36,39,43,44,46, 48,49,50	12
Food and Nutrients Needed	3,7,8,21,24,26,30,33,34, 37,42	11
Food Safety	4,16,19,20,28,32,35,38,41	9
Food and the Athlete	18,29,31	3
	Total	50

TABLE 6

MEAN KNOWLEDGE/MISCONCEPTION SCORES BY SUBJECT AREAS

Subject Area	N	$\bar{x}$*
Diet and Weight Watching	119	1.36
Diet and Disease	119	1.38
Food and Nutrients Needed by Body	119	1.97
Food Safety	119	1.51
Food and the Athlete	107	-.01

* Possible Range for $\bar{x}$: -4 to +4

TABLE 7

ANOVA FOR KNOWLEDGE/MISCONCEPTION SCORE BY EHC MEMBERSHIP AND AGE

Source	SS	df	MS	F	p
Total Main Effects	28291.88	6	4715.31	2.84	.013
Membership	13583.91	1	13583.91	8.18	.005
Age	8828.25	5	1765.65	1.06	.385
Age x Membership	1577.78	3	525.93	.32	.813
Explained	29869.65	9	3318.85	2.00	.046
Residual	184341.89	111	1660.74		
Total	214211.54	120	1785.10		

TABLE 8

THE RELATIONSHIP BETWEEN KNOWLEDGE/MISCONCEPTION SCORE AND PARTICIPATION IN EHC CLUB

Category	N	$\bar{x}$ Score*
Members	63	83.90
Non-members	58	58.52

*Possible Range of $\bar{x}$ Score: -200 to +200

TABLE 9

ANOVA FOR KNOWLEDGE/MISCONCEPTION SCORE BY EHC MEMBERSHIP AND LEVEL OF EDUCATION

Source	SS	df	MS	F	p
Total Main Effects	27408.28	4	6852.07	4.23	.003
Membership	19702.96	1	19702.96	12.15	.001
Level of Education	7944.65	3	2648.22	1.63	.186
Education x Membership	3600.73	3	1200.25	.74	.530
Explained	31009.01	7	4429.86	2.73	.012
Residual	183202.53	113	1621.26		
Total	214211.54	120	1785.10		

TABLE 10

ANOVA FOR KNOWLEDGE/MISCONCEPTION SCORE BY EHC MEMBERSHIP AND NUMBER OF SCIENCE RELATED COURSES TAKEN IN SCHOOL

Source	SS	df	MS	F	p
Total Main Effects	43603.29	6	72.67	4.88	.000
Membership	15532.58	1	15532.58	10.43	.002
Science Courses Taken	24139.70	5	4827.93	3.24	.009
Membership x Science Course	8284.30	5	1656.86	1.11	.358
Explained	51887.59	11	4717.05	3.17	.001
Residual	162323.95	109	1489.21		
Total	214211.54	120	1785.10		

TABLE 11

DUNCAN'S POST HOC TEST ON KNOWLEDGE/MISCONCEPTION SCORE AND TOTAL SCIENCE RELATED COURSES TAKEN IN SCHOOL

Number of Courses Taken	N	$\bar{x}$ Score*
0	9	58.67 A B
1	13	57.31 A
2	24	54.38 A
3	40	72.02 A B
4	25	87.04 B C
5	10	104.50 C
Total	121	

*Scores with the same letter beside them are not different at the .05 level. Possible Range for $\bar{x}$: -200 to +200.

TABLE 12

ANOVA FOR KNOWLEDGE/MISCONCEPTION SCORE AND SPECIFIC SCIENCE RELATED COURSES TAKEN IN SCHOOL

Source	SS	df	MS	F	p
Total Main Effects	31237.26	5	6247.45	3.93	.003
Chemistry	9951.12	1	9951.12	6.25	.014
Biology	19.10	1	19.10	.01	.913
Health	1086.08	1	1086.08	.68	.410
Home economics	9451.94	1	9451.94	5.94	.016
Nutrition	321.10	1	321.10	.20	.654
Explained	31237.26	5	6247.45	3.93	.003
Residual	182974.28	115	1591.08		
Total	214211.54	120	1785.10		

TABLE 13

THE RELATIONSHIP BETWEEN KNOWLEDGE/MISCONCEPTION SCORE AND HAVING TAKEN CHEMISTRY OR HOME ECONOMICS IN SCHOOL

	Took Course		Did Not Take Course	
Course Description	N	$\bar{x}$ Score*	N	$\bar{x}$ Score*
Chemistry	45	86.51	76	62.99
Home Economics	96	77.58	25	49.28

*Possible Range for $\bar{x}$: -200 to +200.

TABLE 14

ANOVA FOR DIET AND WEIGHT WATCHING SUBSCORE BY EHC MEMBERSHIP AND SOURCE OF INFORMATION

Source	SS	df	MS	F	p
Total Main Effects	8140.58	8	1017.57	3.85	.001
Membership	2517.63	1	2517.63	9.53	.003
Source of information	5901.51	7	843.07	3.19	.004
Membership x Source of Information	380.18	6	63.36	.24	.962
Explained	8520.76	14	608.63	2.30	.008
Residual	27470.74	104	264.14		
Total	35991.50	118	305.01		

TABLE 15

THE RELATIONSHIP BETWEEN DIET AND WEIGHT WATCHING SUBSCORE AND EHC MEMBERSHIP

Category	N	$\bar{x}$ Score*
Members	62	24.61
Non-members	57	15.93

*Possible Range For $\bar{x}$ Score: -200 to +200.

TABLE 16

DUNCAN'S POST HOC TEST ON DIET AND WEIGHT WATCHING SUBSCORE AND SOURCE OF NUTRITION INFORMATION

Source	N	$\bar{x}$ Score*	
Television or Radio	10	7.60	A
Friend	11	13.55	AB
Parent	5	14.80	AB
Medical Doctor or Nurse	36	17.44	AB
Magazine	28	24.36	BC
Other	12	26.42	BC
Extension Agent	14	27.14	BC
Newspaper	3	42.67	

*Scores with the same letter beside them are not different at the .05 level. Possible Range for $\bar{x}$: -200 to +200.

TABLE 17

ANOVA FOR DIET IN RELATION TO DISEASE SUBSCORE BY EHC MEMBERSHIP AND SOURCE OF INFORMATION

Source	SS	df	MS	F	p
Total Main Effects	3485.86	8	435.73	4.26	.000
Membership	919.41	1	919.41	8.98	.003
source of information	2172.13	7	310.31	3.03	.006
Membership x Source of Information	318.94	5	63.79	.62	.682
Explained	3804.80	13	292.68	2.86	.001
Residual	10749.42	105	102.38		
Total	14554.22	118	123.34		

TABLE 18

THE RELATIONSHIP BETWEEN DIET IN RELATION TO DISEASE SUBSCORE AND EHC MEMBERSHIP

Category	N	$\bar{x}$ Score*
Members	63	19.75
Non-members	56	13.09

*Possible Range For $\bar{x}$ Score: -200 to +200

TABLE 19

DUNCAN'S POST HOC TEST ON DIET IN RELATION TO DISEASE SUBSCORE AND SOURCE OF NUTRITION INFORMATION

Source	N	$\bar{x}$ Score*
Friend	3	-6.67 A
Parent	1	-1.00 AB
Extension Agent	6	11.33 B
Television or Radio	16	15.00 B
Magazine	21	15.90 B
Medical Doctor or Nurse	53	18.57 B
Newspaper	16	18.94 B
Other	3	23.00 B

*Scores with the same letter beside them are not different at the .05 level. Possible Range for $\bar{x}$: -200 to +200.

TABLE 20

ANOVA FOR FOOD AND NUTRIENTS NEEDED BY THE BODY SUBSCORE BY EHC MEMBERSHIP AND SOURCE OF INFORMATION

Source	SS	df	MS	F	p
Total Main Effects	1919.45	8	239.93	2.15	.038
Membership	963.16	1	963.16	8.61	.004
Source of Information	1232.53	7	176.08	1.57	.151
Membership x Source of Information	1051.15	6	175.19	1.57	.164
Explained	2970.60	14	212.19	1.90	.035
Residual	11632.28	104	111.85		
Total	14602.87	118	123.75		

TABLE 21

THE RELATIONSHIP BETWEEN FOOD AND NUTRIENTS NEEDED BY THE BODY SUBSCORE AND EHC MEMBERSHIP

Category	N	$\bar{x}$ Score*
Members	63	23.92
Non-members	56	19.11

*Possible Range for $\bar{x}$: -200 to +200

TABLE 22

ANOVA FOR FOOD SAFETY SUBSCORE BY EHC MEMBERSHIP AND SOURCE OF INFORMATION

Source	SS	df	MS	F	p
Total Main Effects	1536.35	8	192.04	2.10	.042
Membership	500.92	1	500.92	5.47	.021
Source of Information	1242.40	7	177.49	1.94	.071
Membership x Source of Information	374.84	4	93.71	1.02	.399
Explained	1911.18	12	159.27	1.74	.068
Residual	9705.04	106	91.56		
Total	11616.22	118	98.44		

TABLE 23

THE RELATIONSHIP BETWEEN FOOD SAFETY SUBSCORE AND EHC MEMBERSHIP

Category	N	$\bar{x}$ Score*
Members	63	15.10
Non-members	56	11.95

*Possible Range For $\bar{x}$: -200 to +200

TABLE 24

ANOVA FOR FOOD AND THE ATHLETE SUBSCORE BY EHC MEMBERSHIP AND SOURCE OF INFORMATION

Source	SS	df	MS	F	p
Total Main Effects	144.08	8	18.01	.56	.809
Membership	13.82	1	13.82	.43	.514
Source of information	127.09	7	18.15	.56	.784
Membership x Source of Information	305.62	5	61.12	1.90	.103
Explained	449.69	13	34.60	1.07	.393
Residual	3000.16	93	32.26		
Total	3449.85	106	32.55		

TABLE 25

CORRELATION COEFFECIENTS BETWEEN KNOWLEDGE/MISCONCEPTION SUBSCORES AND LEVEL OF INTEREST IN CORRESPONDING FOOD AND NUTRITION AREAS

Area of Interest	r	r^2
Diet and Weight Watching	.03	<.01
Diet in Relation to Disease	-.05	<.01
Food and Nutrients Needed by the Body	-.01	<.01
Food Safety	-.05	<.01
Food and the Athlete	.06	<.01

VITA

Bonnie W. Fritch was born on February 18, 1950 in Maryville, Tennessee. She is the daughter of Mr. and Mrs. Carson Willocks and was reared in Carpenter's Campground Community in Blount County, Tennessee. She graduated from Everett High in 1968 and entered the University of Tennessee at Knoxville that fall. She graduated from that institution in 1972 with a Bachelor of Science degree in Textiles and Clothing. She worked with Proffitt's Department Store in operations in Knoxville from 1972 until 1977 when she accepted a position with Auburn University in Heflin, Alabama as assistant Extension Agent in home economics. In 1984 She transferred to Tennessee to the Agricultural Extension Service where she now resides in Sequatchie County as Associate Extension Agent for home economics. She began her graduate work at the University of Tennessee in 1986 by attending the yearly winter short course available to extension agents as a means of professional improvement.

She is a Certified Home Economist and is a member of the National Association of Extension Home Economists. She is the wife of John N. Fritch and the mother of Timothy Neilson Fritch.