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Health Food Use And Physical Activity Among Rural Older Adults

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HEALTH FOOD USE AND PHYSICAL
ACTIVITY AMONG RURAL OLDER ADULTS

LAURIE A. LaVOIE



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Health Food Use and Physical Activity

Among Rural Older Adults

(TITLE)

BY

LAURIE A. LaVOIE

THESIS

SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS
FOR THE DEGREE OF

Master of Arts

IN THE GRADUATE SCHOOL, EASTERN ILLINOIS UNIVERSITY
CHARLESTON, ILLINOIS

1985
YEAR

I HEREBY RECOMMEND THIS THESIS BE ACCEPTED AS FULFILLING
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ABSTRACT

The purpose of this study was to examine health food use, physical activity, and attitudes toward physical activity of rural older adults. One hundred and thirty-eight older adults (aged 60 or older) from ten senior citizen centers/congregate meal sites in five East Central Illinois counties were interviewed. Health food users were classified in two ways: those who have ever shopped in health food stores, and those who shopped in health food stores regularly (at least once a month) and spent a minimum of \$4.00 per trip. Results indicated that age, income, and distance from a health food store were significantly different ($P < .05$) between those who ever shopped in a health food store and those who had not. Analysis indicated that people aged 60 - 74 were more likely to have ever shopped in a health food store whereas those people aged 75 or older were less likely to have ever shopped in a health food store. With regard to income, analysis indicated that respondents in the higher income bracket (\$10,000 to \$15,000 or more) were more likely to have ever shopped in a health food store, more so than those in the lower income bracket. The distance from a health food store did not deter the use/purchase of health foods among rural older adults. Analysis indicated that the

percentage of those who had ever shopped in a health food store did not decrease with the increase in distance from one to more than ten miles. Analysis of respondent's reasons for using health foods indicated that the majority of health food users reported using health foods for prevention of illness and as prescribed. Doctors were reported to be the primary source of nutrition information by health food users and non-health food users. Analysis of the respondents frequently and length of time spent exercising indicated that a slightly higher percentage of non-health food users exercised on a regular basis. Analysis also indicated that respondents from both health food user and non-user groups reported that exercise was important for their health and were concerned about becoming less active.

DEDICATION

I wish to dedicate this work to my parents, Ted and Bea LaVoie, for their love, understanding, and belief in my goals. It is also to my sister, Debbie LaVoie, who has always been there to listen and encourage me. I also would like to dedicate this work to my good friend, Patty Hinz, for it was she who encouraged me to challenge myself and reach for higher goals.

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CHAPTER I

Introduction

Significance of the Problem:

As the number of people over 65 years of age has increased, there has been a concomitant interest in the nutritional welfare of the elderly. Since elderly people often have poor eating habits, declining health due to aging and disease, decreased activity levels, and reduced and/or fixed incomes, they appear to be prime candidates for exploitation by health food advocates.

In recent years the number of elderly in the United States has been increasing. In 1977 the estimated population of Americans 65 or older was 23 million. In 1980, 24 million Americans were 65 or older, and it is estimated that by the year 2000, 32 million Americans will be over 65 years of age (Grandjean, 1981).

The increased number of older people has increased concern about the physical health status of the elderly. Some research has been conducted in the area of physical exercise and its benefits for older people. Since the elderly are most affected by chronic illnesses which

contribute to decreased activity, finding ways to increase the physical well-being of older people is important.

Statement of the Problem:

Comparatively little research has been done in the area of physical activity and the use of health foods by rural older adults. While some studies have described health food use by older people in an urban elderly population, such as that by Yung, Contento, and Gussow (1984), in an urban elderly population, there has been an apparent lack of information specifically on health food use by rural older people. There is also a need for further research in the area of physical activity habits of the rural elderly.

The portion of this study related to health food use was a replication of the above study by Yung et al. The purpose of this study was to investigate health food use, physical activity, and attitudes about physical activity of rural older adults. Specific objectives of this study were to determine the relationship between various demographic data and the use of health foods, to determine the relationship between location or availability of health food stores and the use/purchase of health foods, to determine the health foods most often purchased by health food users (HFU) and non-health food users (non-HFU), to determine the various resources that provide the primary source of nutrition information for health food users and non-health

food users, and to determine the relationship between frequency and length of physical activity of health food users and non-health food users.

The following null hypotheses were tested:

1. No association exists between characteristic variables (sex, age, education, health status, and socioeconomic status) and the use of health foods.
2. No association exists between the location or availability of the "health food" stores and the use/purchase of health food.
3. No difference exists between the reasons given for using health foods by health food users (HFU) and non-health food users (non-HFU).
4. No difference exists between the primary source of nutrition information reported by health food users (HFU) and non-health food users (non-HFU).
5. No association exists between the frequency of physical activity of health food users (HFU) and non-health food users (non-HFU).
6. No association exists between the length of time engaged in physical activity of health food users (HFU) and non-health food users (non-HFU).

Definition of the Terms:

Definitions for the following terms are those that were used in the replicated study by Yung et al. (1984):

First definition of Health Food Users and non-Health Food Users:

Health Food User-I (HFU-I):

Anyone who had ever shopped in a health food store.

Non-Health Food User-I (non-HFU-I):

Person who had never shopped in a health food store.

Second definition of Health Food Users and non-Health Food Users:

Health Food User-II (HFU-II):

Had to have shopped in a health food store at least once a month and spent at least \$4.00 per trip.

Non-Health Food User-II (non-HFU-II):

Had shopped in a health food store less than once a month and spent less than \$4.00 per trip.

Health Food:

Food products or supplements purchased in a health food store.

Health Food Use:

Health food purchased at a health food store.

Health Food Store:

A store devoted to selling "natural," "organic," or "health foods," and vitamin and mineral supplements.

In addition to the terms used as defined in the replicated study, the following term was also used.

Physical Activity:

Anything that is done when not sitting or lying down, such as walking, dancing, and gardening. (Edlin & Golanty, 1985).

CHAPTER II

Review of Literature

Nutritional Status of the Elderly

The growth of the older population has increased interest in the nutritional status of the elderly. According to the Ten State Nutrition Survey, which focused on low income people, the most prevalent nutrient deficiencies in the elderly were found to be iron; vitamin A in Spanish Americans; riboflavin in Black and Spanish Americans; and vitamin C, which was deficient in the male population. (Department of Health, Education, and Welfare, 1972). Information reported by the 1971 Health and Nutrition Examination Survey (HANES) found that over one-third of Americans, age 60 and older, had diets inadequate in one or more nutrients. The most frequent nutrient deficiencies reported were iron, vitamins A and C, and calcium. (Department of Health, Education, and Welfare, 1975)

O'Hanlon and Kohrs (1978) reviewed studies which assessed the nutrient intake of older Americans. The studies reviewed evaluated calories and other nutrients with varying methods of dietary assessment used to collect the data. In their summary of the dietary studies, the diets of

those 60 or older were most frequently found to be deficient in energy and calcium.

A study by Guthrie, Black, and Madden (1972) investigated nutritional practices of rural elderly citizens. The study was designed to evaluate the nutritional adequacy and dietary practices of predominantly rural elderly people. A 24-hour dietary recall record of food eaten was obtained from 109 people aged 60 or older. Food models were used to assist the respondents in estimating the amount of food consumed. Of the 109 elderly surveyed, over 63% had diets deficient in calcium and vitamin A. Twenty-seven percent were deficient in protein, 18% in iron, and 45% were inadequate in calories, riboflavin, and ascorbic acid.

Dow (1977), investigated the success of the Nutrition Program for the Elderly in improving nutritional status of participants. A three-day dietary survey was obtained from 107 nutrition program participants at five sites in East Central Illinois. The diets were then computer-analyzed for calories and nutrients. More than one-third of the Recommended Dietary Allowances (RDA's) were provided by the food consumed at the five sites. It was found that for those individuals who did not eat all of the food available, intake of one or more nutrients was at low levels. The lowest reported intakes found were for calcium, ascorbic

acid, niacin, thiamin, and vitamin A. Dow's study also indicated that 40% of those surveyed had "excellent" or "good" diets (had intake of at least two-thirds of the RDA), 36% had "fair" diets and 24%, "poor" diets.

A study by Brown (1979) also investigated the benefits of congregate meal program participants in a rural setting. One hundred and thirty-three non-institutionalized older persons were surveyed and classified as homebound, non-participants, part-time meal program participants, and regular meal program participants. The homebound elderly appeared to be at greatest nutritional risk with 50% having dietary intakes rated as fair or poor. Thirty percent of non-participants had fair or poor diets, compared to 24% of part-time meal program participants, and 18% for regular meal program participants.

Franz (1981) reviewed literature on the nutritional requirements of the elderly. The review of information indicated that there were seven nutrients for which risk of deficiency is greatest for older adults. The seven nutrients listed were protein; calcium; vitamins B, C, and D; iron; and water. In conclusion, Franz stated that at least one-third of the elderly have an inadequate intake of calcium, iron, and vitamins A and C. Along with the reported lack of these nutrients, there is evidence that these people consume more simple carbohydrates and fewer

fruits, vegetables, and meats than other adults.

In a 1984 study by Betts and Vivian, the dietary intake of 100 non-institutionalized individuals age 65 and older was assessed and compared to the 1980 Recommended Dietary Allowances (RDA). A 24-hour dietary recall was used to collect the data. The results indicated that total food energy; calcium; folic acid; zinc; and vitamins B-6, B-12, and E were below the recommendations for over one-half of the participants. Therefore, as the older population steadily increases each year, there is the probability that the number of inadequate diets will increase.

Factors Affecting Food/Nutrient Intake

Many of the factors that affect the food intake of younger adults are more frequently observed in the food intake of the elderly population. Nutritional problems are more likely to be complicated or caused by physical and biological changes along with psychosocial changes that accompany the aging process. Other variables which can also affect the nutrient intake of older people include education, situational factors, and economic background.

The physical and biological changes that may adversely affect the nutritional status of the elderly include chronic and acute diseases, as well as physiological changes which are not disease related. Many diseases may affect

digestion, absorption, and utilization of nutrients, while others interfere with nutrient intake and/or increase the excretion of specific nutrients. According to Weimer's study (1983), 80% of the elderly, as compared to 40% of those younger than 65 years of age, have one or more chronic diseases. The chronic diseases most common among the elderly are heart disorders, arthritis, bone disease, and diseases affecting the respiratory and digestive systems. (Weimer, 1983)

Other physiological changes which are not disease related also greatly affect food/nutrient intake. Changes such as (1) a reduction in taste and smell perception which affects the appetite and desire for food, (2) a loss of teeth which impairs chewing ability and limits food choices, (3) a decrease in salivary secretion which interferes with the eating process by causing difficulty in swallowing, (4) a loss of the stomach's ability to secrete hydrochloric acid which may result in decreased protein digestion and mineral absorption, (5) a reduced secretion of mucus and digestive enzymes that may affect the digestion and absorption of foods, (6) a loss of muscle tone in the stomach resulting in reduced gastric motility which delays the emptying of the stomach, and (7) a reduction in the kidney filtration process which in effect results in a decreased capacity to re-absorb glucose and fluid, along

with a reduction in the formation of concentrated urine.
(Natow and Heslin, 1980)

Other variables which can affect the food/nutrient intake, according to Grotkowski and Sims (1978), are the psychosocial factors which may occur with change in the life style of the elderly. Changes such as death of a spouse, immobilization, and isolation from friends, can affect the food intake of an older person. These changes may cause depression and a lack of appetite which then results in a poor diet. Conversely, depression may cause excessive food intake. According to Natow and Heslin (1980), some additional psychosocial factors affecting food intake were: (1) personal taste preference, (2) lifetime eating habits, and (3) lack of socialization with meals. Roe (1983) added food aversion to the list of psychosocial factors influencing food intake. Some examples of factors contributing to food aversion given by Roe were: (1) unattractive surroundings--eating is not attractive to the elderly when the surroundings are dark or the room is noisy, (2) unpleasant company--the elderly are less likely to eat around those who are impatient, inattentive, or abusive, (3) poor food service--the elderly will eat less food if it is bland, unattractive in appearance, or served cold, and (4) disturbances during meals--the amount of food eaten will decrease if the food is served at unaccustomed times or when eating is interrupted.

Research conducted by Grotkowski and Sims (1978), who investigated nutrition knowledge, attitudes, and dietary practices of the elderly, indicated that low education levels and a lack of basic nutrition knowledge seemed to contribute to poor food choices and eating habits. Grotkowski and Sims assessed the nutritional knowledge of 64 participants using a 25-item instrument. The mean score was 7.2, which indicated a fairly low level of nutrition knowledge. In summary, Grotkowski and Sims found that the nutritional adequacy of the diets was highly related to socioeconomic status and the self-evaluation of nutrition knowledge. According to Roe (1983) food preferences can be highly influenced by education. For example, people with lower levels of education are likely to have had the experience of eating a relatively small number of different foods, whereas people with higher levels of education are likely to have had a greater opportunity to eat a variety of foods. Persons with more education are likely to have a wider range of food likes and dislikes. They may also adapt better to special diets than those with less knowledge related to food choices. Since the elderly usually prefer familiar foods, their educational background may impact on their choices. If they do not know what is available, their choices are likely to be limited.

According to Roe (1983) situational factors can have a major effect on food intake of the elderly. Some

situational factors include: (1) limited financial resources, which may alter food choices to cheaper food products increasing the possibility for a lack of nutrient dense foods; (2) lack of transportation or living long distances from stores, which may influence food preferences for those foods that can be carried easily and do not need refrigeration; (3) lack of cooking facilities, which may necessitate the choice of food which requires little, if any, preparation; and, (4) disability of the individual which may constrain food choice, preparation, and food accessibility.

In addition to such situational factors, elderly persons are also hindered by low income. Income is likely to be reduced at retirement, and often this lowered income is not adequate to meet the basic needs of the elderly. According to Schlenken (1984), it is assumed that living expenses decrease, and it is believed that older people require less money to live on than younger people. The basic need of food, housing, and transportation change very little, but health care is an ever-increasing expense for the older person. Schlenker (1984) adds that 13% of the general population, as compared to 16% of older persons are poor. These data, however, do not include the institutionalized poor and older people with reduced incomes who live with relatives. Poverty may be one of the most

important environmental determinants of inadequate nutrition among the elderly. Many older adults live on fixed incomes while food prices continue to rise, therefore making it difficult for them to provide for an adequate diet.

(Weimer, 1983) Too often the food choices an elderly person makes are determined by his income, not his desire.

Health Food Use by the Elderly

Since the elderly may be influenced by financial and/or physiological factors which can cause undesirable dietary habits, they become even more susceptible to the influence of health food advocates. To the elderly seeking relief, such advocates tend to represent a life free from pain or discomfort of chronic diseases.

Grotkowski and Sims (1978), who researched the areas of nutritional knowledge, attitudes, and dietary practices of the elderly, surveyed 64 people over the age of 60. A knowledge attitude questionnaire and a three day food record were used to collect the information. When the authors examined the health food purchases, the most commonly reported health foods purchased were: multivitamin supplements, vitamins E and C, wheat germ, and honey. In another study by Kellett, et al (1984), 80 non-institutionalized, retired persons between the ages of 58 and 88 were interviewed to determine vitamin and mineral

supplement usage. Forty-nine percent of the 80 surveyed used supplements. Of that percentage, the majority used one supplement which was a multivitamin preparation.

The most frequently recorded reasons according to Grotkowski and Sims (1978), for the use of health food products by the elderly are: (1) to provide more energy, (2) to help insure health, (3) to prevent colds, and (4) to prevent or treat arthritis. The following two reasons for using supplements identified in Kellett et al study (1984) were: (1) supplements were perceived to contribute to good health; and, (2) they were viewed as a kind of insurance in case a person's diet did not include all the necessary nutrients.

Grotkowski and Sims (1978) also found several nutrition attitudes that were correlated with health food purchases. One attitude reflected that vitamin and mineral supplements are necessary. This correlated with the purchase of vitamin/mineral preparations. Another attitude was that foods and supplements can be used as medicine. This correlated with the use of high-potency vitamins. Therefore, Grotkowski and Sims suggested that such views indicated that nutrition attitudes may be highly related to nutrition practices.

Natow and Heslin (1980) reported that from a representative sample of adults in the United States, 86% of

those surveyed agreed with the statement that those who eat balanced meals obtain the needed amounts of vitamins and other nutrients in the food they eat. Of those polled, three-fourths also agreed that feeling tired and rundown indicated a need for vitamin supplements. It is estimated that more than 600 million dollars is spent yearly by 36 million people who self-prescribe nutrient supplements believing them to be beneficial or even necessary for good health. The elderly, because of their many health concerns, may be vulnerable to the usage of nutrient supplements for maintaining health and forestalling the undesirable effects of aging (Natow and Heslin, 1980).

Exercise and Health of the Elderly

Since physiological factors influence the nutritional status of the elderly, recent studies have investigated the relationship of exercise and the health/nutritional status of the aged. According to Meusel (1981) many of the chronic conditions of the elderly, such as heart disease, hypertension, and diabetes, are not only related to the aging process, but also to the lack of physical activity and exercise as well as poor nutrition habits throughout life. Neglect of physical fitness contributes to many of the diseases or infirmities from which older people suffer. Identified risk factors for such diseases as heart disease,

hypertension, and diabetes, include obesity, stress, and lack of exercise. It seems logical that exercise and physical activities could be a beneficial component of health care for the aged.

Evidence to date suggests that an active lifestyle contributes significantly to the maintenance of health and physical fitness in old age. In a recent council report by the American Medical Association (1984) on exercise programs for the elderly, the physiological benefits of exercise were cited. It is believed that many of the changes that the body experiences in structure and function such as a decrease in bone mass, cardiac output, and vital lung capacity, which are commonly attributed to the aging process, can be retarded by an active exercise program. Bortz (1980) who recently reviewed the biological changes that occur during the aging process in the cardiovascular and nervous systems, body composition, and metabolic functions, found that at least some of these changes are the result of physical inactivity.

Apparently it is important, especially for the elderly, to influence the systems of the body in such a way as to regain or maintain physical fitness and well-being. Taking medicines and using health foods have been promoted as ways to achieve physical fitness and well-being. Such practices could have adverse effects on the body. A better, more

holistic approach would be to eat properly and exercise regularly (Meusel, 1984).

Hollosky (1983) stated that the lack of activity eventually results in a decrease in exercise capacity, cardiovascular deconditioning, muscular atrophy, and in some situations a loss of cells. Exercise can help reduce the occurrence of these conditions which do not have to be inevitable. Exercise can provide the needed stimulus for the maintenance of structural and functional integrity of the cardiovascular system, the skeletal muscles, bones, tendons, and ligaments, and probably the autonomic nervous system and motor neurons.

Although exercise for older adults may be helpful in preventing a further decline in general health, the overall attitudes toward exercise held by the elderly can prevent them from continuing to be physically active. Factors such as feeling too old to exercise or believing that exercise is bad for older persons, can discourage the elderly from using exercise as preventive medicine.

Even though it has become more evident that physical activity is important for most older people, the need for programs, especially in rural areas, for this age group has been ignored. Most programs, facilities, and professional training are "youth" oriented. When people think of

"physical activity and aging" it is usually within the context of rehabilitation and therapy (Levy, 1984).

The review of literature presented has examined the research in the areas of nutritional status of the elderly, factors affecting food/nutrient intake, health food use by the elderly, and exercise and health of the elderly. Several studies have investigated the dietary intake patterns of older people and observed low or marginal nutrient intake. Only a limited number of studies have investigated the dietary intake of rural older people. Moreover, relatively few studies have focused on rural elderly people with respect to factors affecting food intake, health food use, and exercise and health. Most of the studies reviewed surveyed older individuals from urban settings.

The review of literature has indicated a need for more investigation in the area of physical activity and health food usage by older people. More research also needs to be conducted with the use of health foods by rural elderly as compared to urban elderly, and there is a need for the study of physical activity habits of rural older people.

CHAPTER III

Methodology

Sample

The sample consisted of 138 individuals, 60 years of age or older, selected from ten senior citizen centers/congregate meal sites in five East Central Illinois counties. Current population statistics were obtained from the Coles County Regional Planning Commission. (J. Renshaw, personal communication, February 19, 1985) The sample was determined from population statistics in those areas served by the senior citizens center participants surveyed. The number of people sampled at each site was proportional to the actual number of senior citizens, 65 and older, residing in the areas served by the site (Table 1). It was not possible to do random sampling of the participants at each site. Thus volunteer participants were taken in turn until the required or maximum number of participants was interviewed. The projected and actual numbers of participants interviewed at each site are listed in Table 1. The data from all 138 participants were usable, therefore, no additional persons were interviewed. Gathering the sample from these ten sites provided the researcher with the advantage that the participants were living independently,

Table 1

Projected and Actual Number of Participants Interviewed at Each Site

COUNTIES	# OF OLDER PERSONS IN INTERVIEW SITE AREA	% OLDER PERSONS IN SITE AREA OF TOTAL OLDER IN SITE	PROJECTED # OF PARTICIPANTS	ACTUAL # (%) OF PARTICIPANTS
CLARK				
Casey	865			
Marshall	840			
Martinsville	341		*24	*24 (17.4)
TOTAL	*2,046	16.5		
COLES				
Oakland	224	3.5	3	3 (3.9)
Mattoon	3,702	57.9	44	44 (57.1)
North Okaw	102			
Mattoon	2760			
Paradise	119			
Humboldt	165			
Lafayette	556			
Charleston	2,469	38.6	30	30 (39.0)
Pleasant Grove	152			
Charleston	1964			
South Hickory	53			
Morgan	41			
Ashmore	163			
Hutton	96			
TOTAL	*6,395	51.6	*77	*77 (55.8)
CUMBERLAND				
Toledo	*1,151	9.3	*14	* 8 (5.8)
DOUGLAS				
Villa Grove	402			
Murdock	42			
TOTAL	* 444	3.6	* 7	* 7 (5.1)
EDGAR				
Kansas	215	9.1	3	3 (13.6)
Paris	1998	84.6	23	17 (77.3)
Brocton	150	6.3	2	2 (9.1)
TOTAL	*2,363	19.1	*28	*22 (15.9)
GRAND TOTAL			150	*138

* Totals for counties and/or area

were mobile, and capable of choosing whether or not to purchase health foods.

Instrument

The instrument used for data collection was an interviewer-administered questionnaire (Appendix A). The questionnaire included demographic data regarding age, sex, health status, educational level and economic background. The first part of the questionnaire, which focused on health food use, was that used in the Yung et al. study (1984). Questions 5a, 6a, and 9a were added to adapt the survey to a rural population. The second part of the questionnaire contained questions from a physical activity questionnaire that was developed and pilot-tested by the researcher and integrated with the established instrument.

The definitions of health food users and non-users for this study were those used by Yung et al. (1984). The first definition of health food users (HFU-I) considers anyone who had ever shopped in a health food store to be a health food user. Non-health food users (non-HFU-I) were classified as those who never shopped in a health food store. The second definition, health food users II (HFU-II), uses frequency and amount of money spent as the criteria. By the second definition, the health food user had shopped in a health food store at least once a month and spent at least \$4.00

per trip. Non-health food users II (non-HFU-II) were those who shopped in a health food store less than once a month and spent less than \$4.00 per trip.

Graduate students and professors with expertise in nutrition and health were consulted to determine content validity and evaluate the questionnaire for readability and understanding. A pilot test of the instrument was administered to five senior citizens living in an apartment complex for retired people. The individuals interviewed in the pilot-testing of the instrument were not a part of the actual sample. Pilot-testing the instrument allowed the researcher to check the reliability of the instrument and the actual time required for each interview before the interviewing process began.

Procedure

The senior center/congregate meal sites selected were some of those served by the Peace Meal Program (Nutrition Program for the Elderly) in East Central Illinois. Figure 1 shows the five county area within the State of Illinois from which data was collected for this study. Permission was obtained from the director of the congregate meal program and site supervisors to do the interviewing at each of the ten senior centers. A form letter (Appendix B) was sent in advance to the supervisor of each site to introduce the

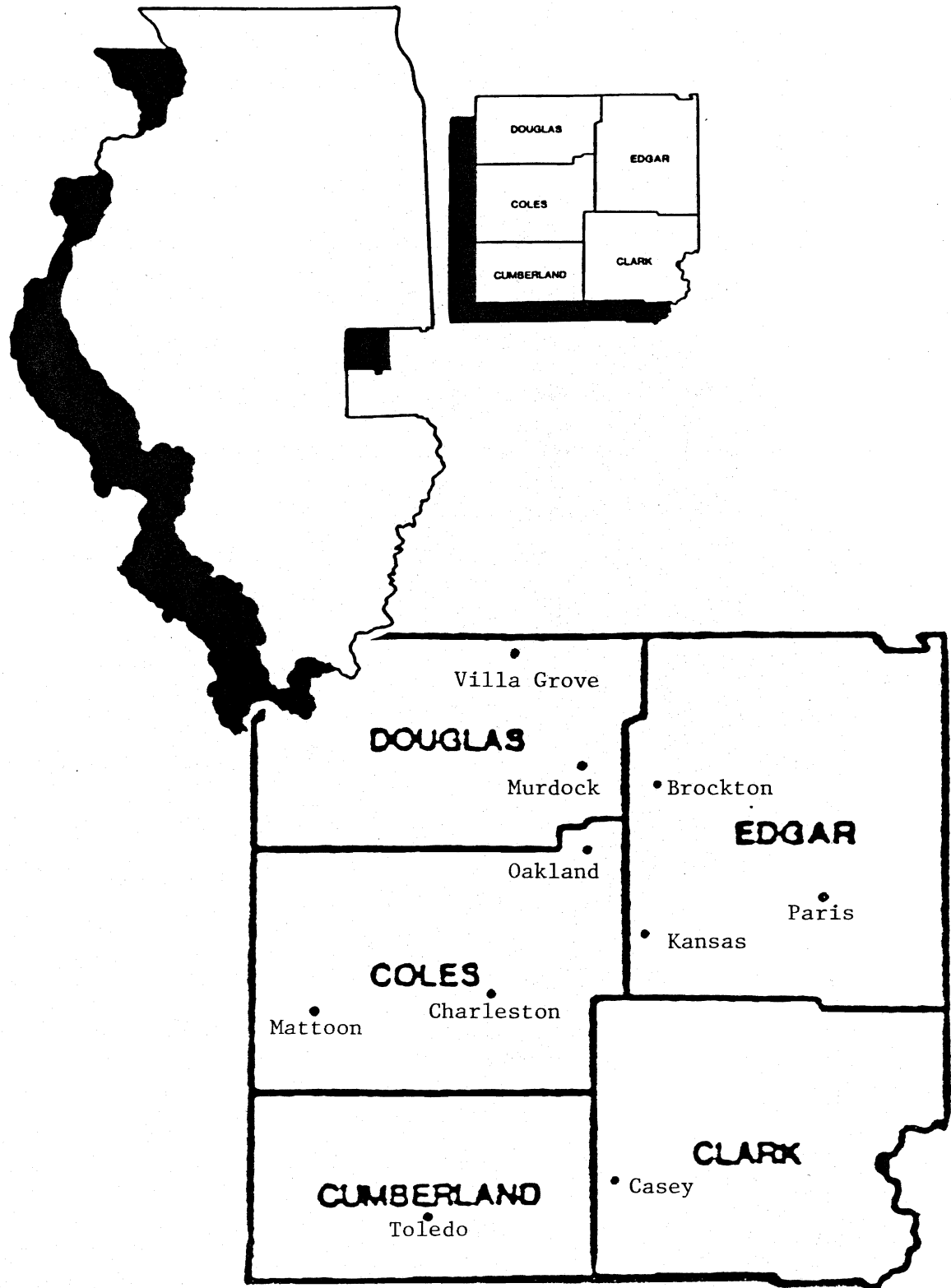


Figure 1. Five county area within the State of Illinois sampled in study

interviewer and explain the purpose of the study. Each site was subsequently visited by the interviewer and interview schedules were established as needed to complete the interviews (Figure 1). At the larger sites (Mattoon, Charleston, Casey, Paris, and Toledo) participants were informed of the study and volunteers were solicited. At the smaller sites (Villa Grove, Oakland, Kansas, Murdock, and Brockton) the site supervisor at each center assisted in the identification of those individuals willing to be interviewed. Persons being questioned were told the purpose of the interview was to survey the shopping and activity habits of senior citizens. Before the participants were to be interviewed they were asked to sign an informed consent form (Appendix C) to assure confidentiality. Each interview was conducted for approximately 15 - 30 minutes using the 38-item questionnaire. The interviewer-administered questionnaire was given to the older adults by the principal investigator. Six of the interviews were collected by an interviewer trained by the investigator.

Data Analysis

The significance of response frequencies between the groups of health food users (HFU) and non-health food users (non-HFU) was determined by Student's t-tests and Chi-square analyses. For all t-tests reported a test of the assumption

of homogeneity of variance was performed. Discriminant analysis using the SPSS system, was performed by the direct method to determine which independent variable or variables could discriminate between health food users and non-health food users as classified by the definitions given earlier. A summary of the operational design of the study is appended (Appendix D).

Assumptions

1. The elderly people participating in this study represent that segment of the rural population in East Central Illinois most likely to shop at health food stores.
2. The elderly people in this study are mobile and have access to "health food" stores or stores which supply health foods
3. The interviewer-administered questionnaire will be given similarly by the principal investigator and an additional trained investigator.
4. The instrument used to collect the data will provide valid and reliable information
5. The proportion of people 60 and older in the survey sample reflects the proportion of people 65 and older in the

population.

6. The sample taken at the ten centers will provide a representative cross-section of the rural elderly in the five county area of East Central Illinois.

Limitations

1. The fact that the data was collected in May through early August, may influence the reporting of health food use because of the supply of fresh foods provided by gardens.

2. It was not possible to do random sampling of the participants at the chosen sites due to the fact that they had to agree to be interviewed.

3. The number of participants at the sites may show seasonal variations which may distort data collected.

4. It was not possible to distinguish between individual and household income.

CHAPTER IV

Results and Discussion

The purpose of this study was to investigate health food use, physical activity, and attitudes about physical activity of rural older adults.

One hundred thirty-eight older adults were selected and surveyed from ten senior citizen centers/congregate meal sites in five East Central Illinois counties. Total and group responses to the questionnaire are appended (Appendix E). Eighty-three percent of the total sample were female; 17% were male. Approximately 10% of the total sample were aged 60-64; 21% were aged 65-69; 20% were aged 70-74; and, 49% were aged 75 and over. The range of education of the sample was from less than five years to more than 16 years of formal education. Four percent of the total sample had 0-5 years of formal education; 33% had 6-8 years; 42% had 9-12 years; 17% had 12-16 years; and, 5% had 16 or more years. All participants were non-institutionalized; of the total sample approximately 71% lived alone; 23% lived with their spouse; and, the remaining 6% lived with their children or other relatives.

The total sample was divided into four groups, as defined by Yung et al. (1984) as follows:

Health Food Users I (HFU-I)

Anyone who had ever shopped in a health food store.

Non-Health Food Users I (non-HFU-I):

Person who had never shopped in a health food store.

Health Food User II (HFU-II):

Had shopped in a health food store at least once a month and spent at least \$4.00 per trip.

Non-Health Food Users II (non-HFU-II):

Had shopped in a health food store less than once a month and spent less than \$4.00 per trip.

The following null hypotheses were tested in this study:

1. No association exists between characteristic variables (sex, age, education, health status, and socioeconomic status) and the use of health foods.
2. No association exists between the location or availability of the "health food" stores and the use/purchase of health food.
3. No difference exists between the reasons given for using health foods by health food users and non-health food users.

4. No difference exists between the primary source of nutrition information reported by health food users and non-health food users.

5. No association exists between the frequency of physical activity of health food users and non-health food users.

6. No association exists between the length of time engaged in physical activity of health food users and non-health food users.

Hypotheses one and two were partially rejected; hypotheses three, four, five, and six failed to be rejected. In the following sections, each hypothesis is presented and discussed with the results pertinent to each hypothesis and the implications of the study findings.

Findings and Implications of Hypotheses

Hypothesis One

NO ASSOCIATION EXISTS BETWEEN CHARACTERISTIC VARIABLES (SEX, AGE, EDUCATION, HEALTH STATUS, AND SOCIOECONOMIC STATUS) AND THE USE OF HEALTH FOODS.

Findings of the study were analyzed by Student's t-test and Chi-square analysis. The null hypothesis that there would be no association between characteristic variables and the use of health foods was partially

rejected. No statistically significant differences were found between the characteristic variables of sex, age, education, health status, and socioeconomic status for the groups of health food users and non-users as distinguished by the second definition (HFU-II vs. non-HFU-II).

However, statistically significant differences were found for age ($P < 0.005$), and income ($P < 0.001$) between the groups of health food users and non-users as defined by the first definition (HFU-I vs. non-HFU-I). For the age group 60-69 there were approximately the same number of HFU-I (37%) as non-HFU-I (25%). However, for the 70-74 year old group, approximately 30% were classified as non-HFU-I, whereas about 70% were HFU-I. In the 75 and older age group the relative proportion of health food users and non-users were reversed from that of the 70-74 year olds; almost 71% were non-HFU-I and only 29% were HFU-I. Interestingly, in the 70-74 age category there were twice as many health food users as non-users, whereas in the 75 and older category there were twice as many non-HFU-I as HFU-I. Thus, it appeared that there were more 60 to 74 year olds who used health foods than those who used health foods in the 75 or older age group. The percent and number of persons in the HFU-I and non-HFU-I age groups are presented in Table 2.

Table 2

Percent and Number of Persons in the HFU-I and Non-HFU-I Age Groups

AGE	HFU-I (N=63)	NON-HFU-I (N=75)
60-64	57 ^a (8) ^b	43 ^a (6) ^b
65-69	55 (16)	45 (13)
70-74	70 (19)	30 (8)
75-Over	29 (20)	71 (48)

a=Percent of responses

b=Number of responses

HFU-I=Person who has shopped in a health food store.

NON-HFU-I=Person who has never shopped in a health food store.

An interesting comparison between HFU-I and non-HFU-I was noted with respect to the significant difference related to income. It appeared that in the income range of \$1000 to \$5000 a year, there were more non-HFU-I than HFU-I. In the \$1000 to \$3000 income range, almost 78% were non-HFU-I and only 22% were HFU-I. In the \$3000 to \$5000 income bracket 73% were non-HFU-I, whereas 27% were HFU-I. A slight difference was apparent between the non-HFU-I and HFU-I groups in the \$5000 to \$10,000 income category, with the most notable difference seen between the income range of \$10,000 to over \$15,000. In the \$5000 to \$10,000 category, the HFU-I frequency percentage began to increase slightly to 51%, while the non-HFU-I group had only 49%. In the \$10,000 to \$15,000 category, only 37% were non-HFU-I and 63% were HFU-I, and in the over \$15,000 income range 40% were non-HFU-I compared to the other 60% who were HFU-I. Thus it seems that those in the higher income bracket are more likely to be HFU-I than those who are in the lower income bracket. The percent and number of persons in the HFU-I and non-HFU-I income category are presented in Table 3.

Findings from the discriminant analysis indicated that three of the five characteristic variables were useful in predicting whether a person was more likely to be a health food user or non-health food user by both definitions. For the first definition of health food users (shopped at least

Table 3

Percent and Number of Persons in the HFU-I and Non-HFU-I
Income Category

INCOME	HFU-I (N=63)	NON-HFU-I (N=75)
1000-3000	22 ^a (2) ^b	78 (7)
3000-5000	27 (10)	73 (27)
5000-10,000	51 (28)	49 (27)
10,000-15,000	63 (17)	37 (10)
15,000-Over	60 (b)	40 (4)

a=Percent of responses

b=Number of responses

HFU-I=Person who has shopped in a health food store.

NON-HFU-I=Person who has never shopped in a health food store.

once in a health food store), the variables were: sex, age, and education. By the second definition (shopped at least once a month and spent at least \$4.00 per trip), the variables were: income, health, and age. When the second definition was employed, sex and education were no longer important variables in distinguishing health food users and non-users.

Implications of these findings can be derived from the observations that there is a statistically significant difference between HFU-I vs. non-HFU-I with respect to age. The data shows that 70% in the 70-74 age group are HFU-I compared to 30% which are non-HFU-I. A notable change was seen between the 60 to 69 year olds and the 70 to 74 year olds, possibly indicating the point at which there is a realization that one is getting old and the belief that use of health foods may postpone some effects of aging on the body. At 75 and older this finding appeared to be reversed with more than twice as many non-HFU-I as HFU-I. This could imply that at this age one has lived this many years without the use of health food products, thus, health foods are not viewed as a necessity. Such a finding might also indicate a discontinuation of health food use following a period of use with no perceived benefits.

Yung et al. (1984) found no association between age and whether a person was a health food user or non-user by

either definition. However, this study indicated a significant difference between age and health food use. Other literature reviewed did not reveal any studies in which age was a significant factor in health food use by older people.

A statistically significant difference between HFU-I and non-HFU-I was observed with regard to the characteristic variable of income. This observation would seem to indicate that those in the lower income bracket (\$1000 to \$5000 yearly) were more likely to be non-HFU-I than HFU-I. Those in the higher income bracket (\$10,000 - \$15,000 yearly) were more likely to be HFU-I than non-HFU-I.

According to the Yung et al. (1984), no significant association was seen with the characteristic variable income and whether the individual was a health food user or non-user by either definition. However, a discriminant analysis indicated that income was useful in distinguishing whether a person was more likely to be a health food user or non-health food user by either definition. In other literature reviewed for this study, no specific relationships were indicated between income and the use of health foods.

The t-test and Chi-square analysis of sex as a characteristic variable was not significant at the .05 level by either definition of health food users. It is

interesting to note; however, that a greater proportion of females (almost 53%) than males (38%) were HFU-I. By the second definition only 9% and 91% of males and females, respectively, were HFU-II. One possible implication would be that women are more likely to do the shopping and therefore, buy the "health food" products. Also older women may be more "health conscious" and therefore, utilize health food products to prevent or reduce disease.

No statistical significance was found at the .05 level for the characteristic variable education by either definition of health food users and non-users. Findings from the discriminant analysis of this study found a positive indication that education was an important variable by the first definition, and a negative result was found for the variable education when the second definition was employed. In comparison of the two studies, it was observed in this study that 97% had completed at least a grade school education (from eighth grade on), compared to Yung et al. 86%. It is also interesting to point out that about 22% compared to 15% of Yung et al. sample had attended college. Considering that Yung et al. participants were from an urban setting where the availability of formal schooling is more likely to be greater, it would appear that the larger percentage of those having a formal education would be those

living in an urban area. This observation, however, was not supported by the percentages. In most instances, one might expect a higher percentage of persons from urban areas to have attended college because of more accessibility to higher education institutions. It might be mentioned that this study's rural sample is unusual in that two major universities are within a 50 mile radius and have been in existence for at least 90 years. Yung et al. indicated that the level of education was a factor in whether the person used health foods, implying that those with less formal education may be more likely to use health foods. Another implication might be that the level of formal education for a rural area may not influence health food use as much as other experiences. For example, a rural population is more likely to have a garden and grow fresh fruits and vegetables and, therefore, get their needed nutrients from natural sources rather than "health food" supplements. If people believe that fresh foods provide the best source of nutrients, there may be fewer "health food and supplement" users in a rural population.

Concerning the characteristic variable health status, no significant difference was found by either definition of health food users. Yung et al. study (1984) also found no significant relationships between the health status of the elderly and health food use. However, it is worth noting

that in this study, about 73% of the entire sample reported being in good or excellent health compared to almost 63% of the Yung et al. study. Only 1% compared to 10% of Yung et al. sample indicated they were in poor health. This does not imply that rural people, because they reported being healthier than urban people, use health foods to maintain their health status. However, it may imply that the rural people are more likely to be in better health because of greater opportunity to be involved in more physically active labor.

Hypothesis Two

NO ASSOCIATION EXISTS BETWEEN THE LOCATION
AVAILABILITY OF THE "HEALTH FOOD" STORES AND THE
USE/PURCHASE OF HEALTH FOODS.

Findings related to the association between the location or availability of "health food" stores and the use/purchase of health foods was determined by Student's t-test and Chi-square analysis. The null hypothesis that there would be no relationship between the location of "health food" stores and the use/purchase of health foods was partially rejected. No statistically significant relationship was found between the location of the "health food" store for the health food users and non-users groups as distinguished by the second definition (HFU-II vs. non-HFU-II).

A statistically significant difference was found between location of "health food" stores and the use/purchase of health foods ($P < 0.000$), according to the first definition (HFU-I vs. non-HFU-I). Almost 46% of HFU-I and 55% of non-HFU-I lived less than a mile from a "health food" store. Interestingly, as the mileage increased, the ratio of HFU-I to non-HFU-I did not decrease. In fact, the percentage of health food users was higher than the percentage of non-users for the range of one to more than ten miles. Approximately 81% of HFU-I compared to 19% of non-HFU-I reported living three to five miles from a "health food" store, and almost 54% of HFU-I and 46% of non-HFU-I lived ten or more miles from a "health food" store. This observation indicates the possibility that the distance to a "health food" store did not influence health food use by rural older adults.

Findings from the discriminant analysis indicated that the proximity of "health food" stores was a useful variable in predicting whether a person was more likely to be a health food user or non-health food user. The location of the "health food" store was an important variable when applied to both definitions of health food users.

Implications of these findings suggest that the location of the "health food" store was not a deterring factor for the HFU-I group. It also might be noted that

this sample was taken from a rural population in which traveling ten or more miles to get food and other necessities is not uncommon.

Yung et al. (1984) indicated that for those who lived near a "health food" store, the distance from the "health food" store appeared to influence health food use. Yung et al. reported that of 117 elderly who lived near a "health food" store, only 53% had ever shopped in the "health food" store. They also reported that of 237 elderly who did not live near a "health food" store, only 32% had ever shopped in one. The authors concluded that the distance from a "health food" store was a relevant factor in the use of health foods. When the second definition was applied, the relationship between location of a "health food" store and whether the person was a health food user (HFU-II) disappeared.

In this study, however, distance was not a major factor in whether the person used health foods. Although statistically, distance is a significant factor in this study, its relationship differs from Yung et al. According to Yung et al., it appeared that of those not living near a health food store, a smaller percentage would travel to shop at the health food store. In this study the distance, be it one to more than ten miles, did not seem to deter older individuals from shopping at a "health food" store.

Hypothesis Three

NO DIFFERENCE EXISTS BETWEEN THE REASONS GIVEN FOR USING HEALTH FOODS BY HEALTH FOOD USERS (HFU) AND NON-HEALTH FOOD USERS (NON-HFU).

Findings related to the association between the reasons given for using health foods by health food users and non-users were determined by Student's t-test and Chi-square analysis. The t-test and Chi-square analysis found no significance at the .05 level when applied to both definitions of health food users. Therefore, the null hypothesis failed to be rejected.

Although no statistically significant differences were found for either of the HFU-I/HFU-II groups, it is important to note that the two main reasons for health food use were prevention of illness and prescription. In the HFU-I/non-HFU-I group, 67% HFU-I and 61% non-HFU-I stated prevention as a reason, while 14% HFU-I and 17% non-HFU-I stated that the "health food" was prescribed. (The first definition of health food users was on the basis of ever shopped in a health food store, therefore, one might conceivably use "health food" without ever having shopped in a health food store.) Almost 64% HFU-II and 65% non-HFU-II reported prevention as a reason; with 9% HFU-II and 16% non-HFU-II reporting that the "health food" was prescribed.

Thus, it appears that in this study the majority of health food users use health foods for the prevention of disease or other undesirable conditions. The percent and number of respondents reporting various explanations as a main reason for health food use may be found in Table 4.

Implications of these findings are particularly noteworthy because of the factors that can influence the use of health food by older adults. Reasons given such as "to build up the blood" or "to keep healthy" underlie preventive measures taken by elderly people to prevent certain conditions from occurring. These reasons also seem to be very logical ones for those who use health foods for prevention purposes. It is also important to not overlook the older people who were not classified as health food users, yet indicated that they purchased "health food" items.

In the Yung et al. study (1984), prevention and cure appeared to be the two main reasons for using health foods. Preventive reasons listed in the study were "good for me" and "health giving", and reasons for using health foods as a cure were: digestion, therapeutic, and medicinal. In order to compare Yung et al. results on this topic to the results of this study, it was necessary to group the nine main reasons given in Yung et al. study into four categories of prevention, cure, prescription, and other.

Table 4

Percent and Number of Respondents Reporting Various Explanations as a Main Reason for Health Food Use

REASON	HFU-I ¹ (N=57)	NON-HFU-I ² (N=36)	HFU-II ³ (N=11)	NON-HFU-II ⁴ (N=82)
Prevention	63 ^a (38) ^b	37(22)	12(7)	88(53)
Cure	56(5)	44(4)	11(1)	89(8)
Prescription	57(8)	43(6)	7(1)	93(13)
Other	60(6)	40(4)	20(2)	80(8)

a = Percent of responses

b = Number of responses

1 = Person who has ever shopped in a health food store

2 = Person who has never shopped in a health food store

3 = Person who shops in health food stores once a month spending at least \$4.00

4 = Person who shops in health food stores less than once a month and spends less than \$4.00 per trip

In review of other literature, it was noted that Grotkowski and Sims (1978) reported the reasons most frequently given for using health foods by the elderly were: to provide more energy, to help insure health, to prevent colds, and to prevent or treat arthritis. Kellett et al. (1984) gave the following two reasons for using health food supplements: 1) perceived to contribute to good health; and, 2) a kind of insurance in case a person's diet did not include all the necessary nutrients. Their data and that of this study strongly implies that those older adults who use health foods (whether rural or urban) do so for preventive reasons. Another implication is that the elderly are the ones who suffer from one or more chronic illnesses; therefore, they are more likely to use health foods to prevent further illness when other measures taken fail to help. This makes the elderly population a high risk group for health food fraud.

Hypothesis Four

NO DIFFERENCE EXISTS BETWEEN THE PRIMARY SOURCE OF NUTRITION INFORMATION REPORTED BY HEALTH FOOD USERS AND NON-HEALTH FOOD USERS.

Findings related to the differences between the primary source of nutrition information reported by health food users and non-users were determined by Student's t-test

and Chi-square analysis. No significant difference was found at the .05 level between groups of health food users and non-users by either definition; thus, the null hypothesis failed to be rejected.

Though the statistics did not indicate any significant differences for either group of HFU-I and HFU-II, it is interesting to note that the two primary sources of nutrition information most often reported for each group were doctors and "other" sources. In the HFU-I and non-HFU-I group, about 38% HFU-I and 45% non-HFU-I listed doctors as their primary source of nutrition information. Thirty-five percent HFU-I and 43% stated other sources such as senior centers, home or county extension, and self for providing the primary source of nutrition information. For the HFU-II and non-HFU-II category, 25% HFU-II and 44% non-HFU-II reported doctors to be their primary nutrition information source, while 25% HFU-II and 41% non-HFU-II listed "other" sources for their nutrition information. The third most frequently cited primary source of information for both users and non-users groups was magazines/newspapers. The magazine most often mentioned as a source of nutrition information was Prevention Magazine. The data appear to indicate that for both the HFU/non-HFU categories, doctors were most frequently cited as the primary source of nutrition information, with "others"

listed next in frequency. "Others" included senior centers, home extension, and self as sources of nutrition information. The percent and number of health food users and non-users reporting various resources as their primary source of nutrition information is presented in Table 5.

Implications for these findings are important in view of the sources of nutrition information used by older people. Thus, if doctors and "other" sources such as home extension and senior centers are reported to provide nutrition information for older persons, the information should be up-to-date and pertinent to the specific needs of the elderly individuals.

It is also interesting to consider responses to the question, "Who introduced you to health foods?" For the HFU-I group, 41% reported doctors, 20% reported self, and 11% reported a friend had introduced them to health food. A different response pattern was shown for the HFU-II group, with 36% reporting self, 27% reporting doctors, and 18% reporting magazines as an introduction to health foods. For both the non-user groups doctors, self, and family respectively, introduced them to health foods.

When comparing the data from this question to that of the hypothesis, it is important to note that doctors appear to be very influential in whether or not an older person uses health foods. Again, this indicates the need for

Table 5

Percent of Health Food Users and Non-Users Reporting Various Resources as Their Primary Source of Nutrition Information

SOURCE	HFU-I ¹ (N=63)	NON-HFU-I ² (N=75)	HFU-II ³ (N=12)	NON-HFU-II ⁴ (N=126)
Doctor	38%	45%	25%	44%
Other	35%	43%	25%	41%
Magazine/Newspaper	11%	7%	25%	7%
Nutritionist/ Dietitian	10%	5%	17%	6%
Book on Health	5%	0%	8%	2%
HF Store Owner	2%	0%	0%	1%

1 = Person who has ever shopped in a health food store

2 = Person who has never shopped in a health food store

3 = Person who shops in health food stores once a month spending at least \$4.00

4 = Person who shops in health food stores less than once a month and spends less than \$4.00 per trip

doctors to not only be knowledgeable in the area of nutrition for elderly people, but also be aware of health food use/abuse by this age group.

The Yung, et al. study (1984) found that the two main sources of nutrition information reported by HFU-I/HFU-II and non-users were doctors and a nutritionist/dietitian. It is interesting to have a nutritionist/dietitian reported as one of the two highest responses, when it was indicated in this study that the second highest response was the "other" category. This could be due to the fact that those in an urban setting have a dietitian relatively close (a nearby hospital), whereas, those in a rural setting might have to travel to the nearest hospital which might be 30 to 50 miles away to consult a dietitian.

Hypothesis Five

NO ASSOCIATION EXISTS BETWEEN THE FREQUENCY OF PHYSICAL ACTIVITY OF HEALTH FOOD USERS AND NON-HEALTH FOOD USERS.

Findings related to the frequency of physical activity of health food users and non-users were determined by Student's t-test and Chi-square analysis. No significant difference was found at the .05 level; therefore, the null hypothesis failed to be rejected.

Though no statistically significant difference was observed, it is worth noting some differences in response frequencies. A slightly higher percent of non-HFU-I/non-HFU-II reported exercising more often than the HFU-I/HFU-II groups. For the one to two times a week category, 65% non-HFU-I compared to only 35% HFU-I reported exercising, and for those reporting to have exercised daily, a little more than half (55%) non-HFU-I compared to 45% HFU-I did so. In the HFU-II/non-HFU-II category, for those reporting to exercise one to two times a week, 91% were non-HFU-II and only 9% HFU-II, while 90% non-HFU-II compared to 10% HFU-II reported exercising daily. The percent of the frequency of exercise between health food users and non-health food users is presented in Table 6.

Implications of these findings indicate somewhat of a negative tendency between frequency of exercising and the use of health foods. One might think that those who use health foods would also be more likely to exercise on a regular basis. Of those indicating regular exercise, more were non-health food users than health food users. Perhaps those who exercise more feel healthier and thus do not perceive the need for "health food".

One other implication was comparing the main reasons for health food use to the frequency of exercise. For the HFU-I/HFU-II groups prevention was the main reason for using

Table 6

Percent and Number of the Frequency of Exercise
Between Health Food Users and Non-Users

FREQUENCY	HFU-I ¹ (N=63)	NON-HFU-I ² (N=75)	HFU-II ³ (N=12)	NON-HFU-II ⁴ (N=126)
Not at all	56% ^a (9) ^b	44% (7)	0% (0)	100% (16)
1-2 x week	35% (8)	65% (15)	9% (2)	91% (21)
3-4 x week	54% (7)	46% (6)	8% (1)	92% (12)
Everyday	45% (39)	55% (47)	10% (9)	90% (77)

a = Percent of responses

b = Number of responses

1 = Person who has ever shopped in a health food store

2 = Person who has never shopped in a health food store

3 = Person who shops in health food stores once a month spending at least \$4.00

4 = Person who shops in health food stores less than once a month and spends less than \$4.00 per trip

health foods. Preventive reasons given such as, "to provide energy" and "to keep healthy" indicate that these people are using health foods to give them the results that exercising provides.

Hypothesis Six

NO ASSOCIATION EXISTS BETWEEN THE LENGTH OF TIME ENGAGED IN PHYSICAL ACTIVITY OF HEALTH FOOD USERS OR NON-HEALTH FOOD USERS.

Findings related to the association between length of physical activity of health food users or non-health food users was determined by Student's t-test and Chi-square analysis. No significant difference at the .05 level was found between groups by either definition of health food users and non-users. Therefore, the null hypothesis failed to be rejected.

Although no significant differences were indicated when comparing length of exercise to whether the individual was a health food user or non-user, slightly more non-HFU indicated exercising for longer periods of time than the health food users. The non-HFU-I group had the largest percentage (43%) of participants exercising for 15 to 30 minutes, with the next largest (31%) exercising for one to fifteen minutes. The same results were indicated for the non-HFU-II group with 42% exercising for 15 to 30 minutes

and 26% exercising for one to fifteen minutes. The percent of length of physical activity between health food users and non-users can be found in Table 7.

Implications for these findings seem to indicate that a slightly higher percentage of non-users compared to users exercise for longer periods of time. This does not necessarily imply that non-health food users are able to exercise longer than health food users. This also does not suggest that health food users should be able to exercise for longer periods of time because they use health foods. What this may imply, however, is that non-HFU appear to exercise more often for longer periods of time than HFU, possibly suggesting that those who use health foods do not see exercise as necessary in their health plan.

Other Findings and Implications

Findings other than those related to the hypotheses in this study are worth noting. Though not statistically significant at the .05 level, but important to note, was the "health food" items most often purchased by the HFU-I/HFU-II groups.

The item most often purchased by both the HFU-I and HFU-II was a vitamin/mineral supplement, with 42% HFU-I and 50% HFU-II reported to have purchased the item. Both the HFU-I/HFU-II groups listed "others" (vitamin A, B-12, and Alfalfa tablets), calcium, vitamin C, and vitamin E as the

Table 7

Percent and Number of the Length of Exercise
Between Health Food Users and Non-Users

LENGTH	HFU-I ¹ (N=63)	NON-HFU-I ² (N=75)	HFU-II ³ (N=12)	NON-HFU-II ⁴ (N=126)
1-15 minutes	40 ^a (14) ^b	60(21)	6 (2)	9 (33)
15-30 minutes	44 (23)	56(29)	12 (6)	88(46)
30-60 minutes	52 (13)	48(12)	16 (4)	84(21)
More than 60 minutes	44 (4)	56(5)	0 (0)	100(9)

a = Percent of responses

b = Number of responses

1 = Person who has ever shopped in a health food store

2 = Person who has never shopped in a health food store

3 = Person who shops in health food stores once a month spending
at least \$4.00

4 = Person who shops in health food stores less than once a
month and spends less than \$4.00 per trip

second through fifth most often purchased items, respectively. It might also be noted that vitamin/mineral supplements were items most often purchased by both non-HFU groups. A response frequency list of "health food" items purchased can be found in Table 8.

Implications of these findings indicate that many of the "health food" items purchased were dietary supplements. The use of dietary supplements should be evaluated in view of an older individual's dietary adequacy. Dietary supplements may be used by the elderly for "miraculous" dietary cures for illness, or increase oxygen uptake in the blood, provide more energy, lower blood cholesterol, and eliminate arthritis pain.

In the Yung, et al. (1984) study, vitamin/mineral supplements were also the most often purchased "health food" item, with 34% HFU-I and 42% HFU-II reported to have purchased the item. In the HFU-I group, tea, honey, sugar-free items, and cereals were the second through fifth most often purchased items; and, sugar-free items, tea, honey, and dried fruits ranked second through fifth for the HFU-II group. (Most of these items listed above would be placed in the "others" category of this study.) Therefore, it appears that from the results of Yung et al. study compared to the results of this study, one might think that rural health food users rely more on dietary supplements,

Table 8

Response Frequency List of Health Food Store
Items Reported Purchased

ITEM	HFU-I	HFU-II
Vitamin/Minerals	42%	50%
Others (Such as vitamin A, B12, Alfalfa tablets)	32%	41%
Calcium	24%	33%
Vitamin C	24%	33%
Vitamin E	16%	25%
Potassium	8%	8%
Wheat Germ	6%	17%
Bone Meal	5%	8%
Whole Wheat Products	2%	8%
Honey	2%	8%
Lecithin	2%	8%

HFU-I = Person who has ever shopped in a health food store

HFU-II = Person who shops in health food stores once a month spending
at least \$4.00

whereas urban health food users rely more on somewhat "natural health food" products besides the vitamin/mineral supplements.

It might also be interesting to consider the response to the question, "Where do you buy these products?" For the HFU-I group, the item most often purchased (vitamin/mineral supplement), was obtained by 22% HFU-I at the drug store and only 6% at a health food store. Seventeen percent of those reported purchasing the items at the drug store and 25% HFU-II made their purchase at the health food store. For the next four most frequently purchased items (others, calcium, vitamin C and vitamin E) purchased by both HFU-I/HFU-II, the health food users tended to buy their products at the health food store. It seems logical for the HFU-I group to buy their "health food" items at a drug store when considering this was a rural population and a health food store may not be right around the corner. On the other hand, the rural elderly who are in the HFU-II category indicated getting their items at a health food store, which again, implies that distance from a health food store did not influence the purchase of health foods from health food stores.

Findings related to this study in the area of physical activity and the rural elderly are also noteworthy. Although no statistical significance was found at the .05

level, it is interesting to note whether or not HFU/non-HFU stated that exercise was important in keeping them healthy.

In the HFU-I/non-HFU-I group of those who indicated that exercise was necessary for good health, 47% were HFU-I and 53% were non-HFU-I, whereas only 9% were HFU-II and 91% were non-HFU-II. When asked if exercise was important in maintaining good health, 45% HFU-I and 55% non-HFU-I stated exercise was important in maintaining good health. Only 9% of HFU-II compared to 91% non-HFU-II indicated that exercise was important in maintaining good health.

It was also indicated that of those who considered exercise to be important for their health, 46% were HFU-I and 54% were non-HFU-I, whereas only 9% of HFU-II and 91% of non-HFU-II reported exercise as being important in keeping them healthy. Therefore, it appears that by the first definition of health food users/non-users, exercise is important to both groups, but when the second definition is employed, exercise seems to be more important to the non-HFU group.

Implications of these findings suggest that a slightly larger percentage of non-HFU are more likely to rely on exercise for their health than health food users. This then could imply that for those non-HFU who exercise and feel it is an important factor in keeping them healthy there is no need to use "health foods".

Another interesting question which added implications to those findings was responses to the question, "Are you concerned that as you grow older you may become less active?" For those who were concerned about becoming less active with age, 59% were non-HFU-I compared to 41% HFU-I. In the HFU-II/non-HFU-II group, those who were concerned about becoming less active were 93% non-HFU-II compared to only 7% HFU-II group. These results can be viewed in two different ways. As the higher percentage of those concerned about becoming less active are in the non-HFU category, it seems logical that those people would concern themselves with regular exercise. However, those in the health food users category may not be as concerned because they may be relying on health foods to keep them healthy and provide energy rather than relying on exercise to maintain health.

Similar implications can be found when comparing answers to the question, "Do you perceive yourself as being physically active?", with the results of the above stated questions. Of those who considered themselves to be physically active, 55% were non-HFU-II and 45% HFU-I. In the HFU-II/non-HFU-II category almost 90% non-HFU-II and only 10% HFU-II perceived themselves as being physically active. This again may imply that the more physically active a person is, the less likely one is to use health foods.

CHAPTER V

Summary and Conclusions

Summary

The purpose of this study was to examine health food use, physical activity, and attitudes toward physical activity of rural older adults. To investigate the health food use, physical activity, and attitudes toward physical activity of rural older adults, data were collected from 138 senior citizens selected from ten senior citizens center/congregate meal sites in five East Central Illinois counties. An interviewer-administered questionnaire, consisting of characteristic variables (age, sex, health status, education level, and socioeconomic status), shopping habits, and physical activity attitudes and habits, provided the basis for examining the respondents physical activity and health food use.

Statistical differences at the .05 significance level were identified between the dependent variable (health food user-I/non-user-I) and the independent variables: participant age and participant income. Approximately 49% of the total sample was 75 or older. It appeared that in the 70 to 74 age group, a larger percentage (70%) were health food users, whereas in the 75 and older age group the larger percentage (71%) were non-health food users. Overall, participants in the 60 to 74 age group range tended

to be health food users, while those in the 75 or older age group appeared to be non-health food users.

Participants' income level ranged between \$3000 to \$15,000 yearly, with the largest percentage of total participants (40%) being the \$5000 to \$10,000 yearly income category. Participants with higher incomes (\$5000 up) were more likely to be health food users than those in the lower income levels (less than \$5000) who tended to be non-health food users.

Statistical differences were identified between the dependent variables (use/purchase of health foods) and the independent variables: location and/or availability of a health food store. Of the total sample, 40% lived between two to more than ten miles from a health food store. Distance from a health food store did not appear to affect the use/purchase of health foods among rural older adults. It was indicated that the percentage of health food users was higher than the percentage of non-users for the distance of one to more than ten miles.

Analysis of the participants' reasons for health food use indicated that 67% HFU-I and 64% HFU-II cited prevention of illness or other undesirable conditions as a reason for using health foods. Fourteen percent of the HFU-I and 9% HFU-II group reported using "health foods" as prescribed by a physician. Statements such as "to provide energy", "to

keep healthy", and "to feel better" were the main reasons given for health food use.

Analysis of the difference between the primary source of nutrition information given by health food users and non-users, indicated that doctors, "other" sources (home extension and senior centers) and magazines, respectively, were the three main sources reported. Doctors were the primary source for providing nutrition information for both the HFU-I and II/non-HFU-I and II groups.

Analysis of the data of "health food" items most often purchased by health food users and non-users indicated that vitamin/mineral supplements were purchased most frequently. Other dietary supplements reported to have been purchased were calcium, vitamin C, and vitamin E. Respondents from the HFU-I group reported buying their vitamin/mineral supplements from a drug store, whereas, the HFU-II group was more likely to purchase those products at a health food store.

Analysis of the data concerning the association between physical activity and health food users and non-users seem to indicate that a slightly higher percentage of non-health food users exercised regularly. Respondents from both health food users and non-users groups stated that exercise was important for their health and were concerned about becoming less active with age.

Conclusions

Tests of the hypothesis that there will be no association between the independent variables and the use of health foods resulted in partial rejection of the hypothesis for the specific characteristic variables, age and income. With regard to participants age, analysis indicated that a greater proportion of those aged 60 to 74 tended to be health food users. Individuals 75 years of age or older were more likely to be non-health food users. One explanation may be that for the 60 to 74 age group, the fact that they were getting older has become a reality and health foods may be viewed as a way to postpone the affects of aging. As for the 75 and older group, this might indicate that one has lived this long without the use of health food use, thus there is no perceived need for health food use.

Observations made with regard to age and health food use suggests a need for further research. Additional research in relation to the age at which one starts using "health foods" and the age at which one stops the use of "health foods" would allow for more concise information on age and its relation to health food use and the older population.

In regard to the participants' income, analysis indicated that those in the higher income bracket (\$10,000 to \$15,000) were more likely to be health food users, whereas those with a lower income (\$1,000 to \$5,000) tended to be non-health food users. A logical explanation is that "health food" items are usually more expensive than non-health food items, and for the older people with lower incomes such items are not affordable or economical.

Tests of the hypothesis that there will be no association between location/availability of health food stores and the use/purchase of health foods resulted in the rejection of the hypothesis. With regard to the participants' location from a health food store, analysis indicated that the distance, whether it was one mile or more than ten miles, has no effect on health food use/purchase. One explanation may relate to the fact that this was a rural sample and traveling more than a mile to shop was common; therefore, the distance did not deter health food users from traveling to a health food store to buy the products.

In the replicated study by Yung et al. and this study, health food use is defined in terms of shopped at a health food store, which undoubtedly

under-estimates health food use by those who obtained health food products in other places. Additional research in the area of health food use, which is not restricted to those individuals who shop at a health food store would allow for more thorough conclusions to be drawn.

With regard to those participants stating the main reason for health food use, analysis indicated that the majority of health food users and non-users use such items for the prevention of illness or other undesirable conditions. The main preventive reasons given were to keep healthy and provide energy. One explanation for such health food use is that older people are likely to have one or more chronic diseases for which a cure is not always possible. Those with such illnesses may seek relief from "health food" items. This observation also suggests that older people are more susceptible to health food faddism.

Additional research in the area of reasons for health food use and dietary supplementation among the elderly is needed. Further research about health food use and dietary supplementation among older people would provide more useful information for nutrition education programs relevant to this area.

Further research also needs to be done with the elderly population who do not participate at senior centers/congregate meal programs.

With regard to those participants (HFU/non-HFU) stating their primary source of nutrition information, analysis indicated that doctors provided nutrition information for a majority of health food users and non-users. The second highest source of nutrition information given was home extension and senior centers. One explanation may relate to the fact that older people are in contact with their physician quite often and rely on them for their physical well-being; therefore, they have no reason not to seek advice in the area of nutrition.

In regard to the respondents' physical activity attitudes, analysis indicated that an almost equal number of health food users and non-users stated that exercise was important for their health, and they were concerned about becoming less active with age. Also a slightly higher percentage of non-health food users than health food users exercised on a regular basis. One possible explanation may relate to the fact that exercise is considered an important component of a healthy lifestyle. Therefore, for the health food users, exercise and using health food

products adds to their well-being. On the other hand, another observation can be made in that the non-health food users rely on exercise to maintain their health status; thus, they see no need to use health foods.

Program Planning

Specific program needs were identified by different areas of this study.

(1) The age group reflecting the greatest proportion of health food usage were the 60 to 69 and 70 to 74 year olds. If these age groups tend to use health foods more than other age groups, information should be targeted specifically for this segment of the older population. Information on health food use/abuse or the advantages and disadvantages of dietary supplementation could be provided at senior centers, congregate meal sites, and the information could be sent with those who transport "Meals on Wheels". There is also evidence to support the need for establishing educational programs. Such evidence comes from studies like Klippel and Sweeney (1974) who researched the area of information sources available to the aged consumer, and reported that nutrition knowledge was generally acquired through

informal sources such as magazines and friends. Store (1977) indicated in his study that the aged are especially vulnerable to advertisements claiming cures for well-known chronic illnesses, thus, indicating a need for reliable information on the so-called "cures". Smiciklas-Wright (1981) indicated a need to challenge the obstacles of resistance to change and apathy among the elderly and dispel the many misconceptions the elderly people have toward "health food" through nutrition education programs.

(2) Since the majority of health food users and non-users indicate that doctors provide their primary source of nutrition education, this clearly indicates a need for physician education. If doctors are going to provide nutrition information, they need to be updated on information related to nutrition and elderly people.

(3) Results of this study indicate positive attitudes toward exercise. Thus, programs to educate older persons about the benefits of physical activity as well as programs to implement physical activity need to be provided in a variety of settings such as senior centers and housing complexes for retired older adults.

The purpose of this study was to investigate health food use, physical activity, and attitudes about physical activity of rural older adults. Results of this study indicated that age, income and proximity of the health food store was statistically significant ($P < .05$). With these results and other pertinent information provided by this study, program planning suggestions were made in the areas of nutrition, physical, and physician education. Information provided by studies such as this one can be useful in supplying needed research about the increasing older population.

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APPENDIX A
SURVEY QUESTIONNAIRE

Appendix A. Interview Administered
questionnaire

CENTER NUMBER 73
INTERVIEWER _____

SURVEY QUESTIONNAIRE

1. SEX
 Female
 Male
2. AGE
 60 to 64 yrs.
 65 to 69 yrs.
 70 to 74 yrs.
 75 and over.
3. YEARS OF EDUCATION COMPLETED.
 0 to 5 yrs.
 6 to 8 yrs.
 9 to 12 yrs.
 12 to 16 yrs.
 16 and over.
4. DO YOU LIVE ALONE?
 Yes
 No, please specify with whom: _____
5. DO YOU DO YOUR OWN GROCERY SHOPPING?
 Yes
 No, please specify who shops for you: _____
- 5a. DO YOU SHOP ALONE?
 Yes
 No, please specify who shops with you: _____
6. WHICH OF THE FOLLOWING IS WITHIN WALKING DISTANCE?
 Supermarket
 Corner grocer
 Health Food Store
 Other, please specify: _____
 None
- 6a. HOW FAR DO YOU HAVE TO TRAVEL TO DO YOUR GROCERY SHOPPING?
 Less than a mile
 1-2 miles
 2-5 miles
 5-10 miles
 More than 10 miles
7. WHERE DO YOU DO MOST OF YOUR FOOD SHOPPING?
 Supermarket
 Corner grocer
 Health Food Store
 Other, please specify: _____
8. HOW MUCH MONEY DO YOU SPEND ON FOOD EACH WEEK?
 \$10 or less
 \$11 to \$15
 \$16 to \$20
 \$21 to \$25
 \$26 to \$30
 \$31 to \$35
 \$36 to \$40
 \$41 or more, please specify amount: _____

9. THE AMOUNT OF MONEY SPENT ON FOOD ABOVE IS FOR HOW MANY PEOPLE?

- 1 person
- 2 persons
- 3 persons
- 4 persons
- 5 persons or more

9a. HOW FAR IS THE NEAREST HEALTH FOOD STORE FROM YOU?

- Less than a mile
- 1-2 miles
- 2-5 miles
- 5-10 miles
- More than 10 miles
- Don't know

10. HAVE YOU EVER SHOPPED IN A HEALTH FOOD STORE?

- Yes
- No Interviewer if the answer to this question is NO then go directly to question #17.

11. IF YOU SHOP AT THE HEALTH FOOD STORE, HOW MUCH DO YOU SPEND EACH TRIP?

- 0 to \$2
- \$3 to \$5
- \$6 to \$8
- \$9 to \$11
- \$12 to \$14
- \$15 to \$17
- \$18 to \$20
- \$21 to \$23
- \$24 or more, please specify amount: _____

12. FOR HOW MANY PEOPLE IS THIS AMOUNT SPENT ON HEALTH FOODS?

Please specify: _____

13. IS THE AMOUNT OF MONEY SPENT SHOPPING IN THE HEALTH FOOD STORE INCLUDED IN THE AMOUNT SPENT ON FOOD EACH WEEK? (see question 9)

- Yes
- No

14. HAVE YOU SHOPPED AT A HEALTH FOOD STORE DURING THE PAST 2 WEEKS?

- Yes
- No

15. HOW OFTEN DO YOU SHOP AT A HEALTH FOOD STORE?

- 1 x per week
- 2 x per week
- 3 x per week
- 1 x per month
- 1 x per 2 months

16. WHAT DO YOU MOSTLY BUY AT THE HEALTH FOOD STORE?

List 3 things: _____

17. DO YOU TAKE ANY OF THESE PRODUCTS? (If yes--how often?)
 (Ask about each product listed)

	Daily	2/wk	1/wk	1/mo	Prescribed **
Vitamin & Mineral Supplements	___	___	___	___	___
Vitamin C	___	___	___	___	___
Vitamin E	___	___	___	___	___
Wheat Germ	___	___	___	___	___
Brewer's Yeast	___	___	___	___	___
Whole Wheat products	___	___	___	___	___
Honey or Molasses	___	___	___	___	___
Lecithin	___	___	___	___	___
Bone Meal	___	___	___	___	___
Health Food Snacks, please specify: _____	___	___	___	___	___
_____	___	___	___	___	___
Others: _____	___	___	___	___	___
_____	___	___	___	___	___
_____	___	___	___	___	___

18. WHERE DO YOU BUY THESE PRODUCTS?

	Supermarket/	H. F Store/	Drug Store/	Mail Order/	Other
Vitamin & Mineral Supplements	___	___	___	___	___
Vitamin C	___	___	___	___	___
Vitamin E	___	___	___	___	___
Wheat Germ	___	___	___	___	___
Brewer's Yeast	___	___	___	___	___
Whole Wheat products	___	___	___	___	___
Honey or Molasses	___	___	___	___	___
Lecithin	___	___	___	___	___
Bone Meal	___	___	___	___	___
Health Food Snacks: _____	___	___	___	___	___
_____	___	___	___	___	___
Others: _____	___	___	___	___	___
_____	___	___	___	___	___
_____	___	___	___	___	___

19. WHAT ARE YOUR REASON (OR REASONS) FOR USING HEALTH FOOD?
 Please list:

20. WHO INTRODUCED YOU TO HEALTH FOODS? (Do NOT read list.)

- ___ Friend
- ___ Family
- ___ Newspaper
- ___ Magazine
- ___ Book
- ___ TV Program
- ___ Other, please specify: _____

21. WHICH OF THE FOLLOWING IS YOUR MAIN SOURCE OF NUTRITIONAL INFORMATION?
(LIST IN ORDER: WHICH WILL YOU CONSULT FIRST etc.) (Do NOT read list)
- Magazine or Newspaper
 - Physician or Clinic
 - Label on products
 - Book on health
 - Medical expert on TV
 - TV Commercial
 - Health Food Store owner
 - Nutritionist or Dietitian
 - Other, please specify: _____
22. TO THE BEST OF KNOWLEDGE, HOW LONG HAVE YOU BEEN BUYING HEALTH FOODS?

23. DO YOU CONSIDER YOUR HEALTH TO BE:
- Excellent
 - Good
 - Fair
 - Poor
24. YOUR RANGE OF INCOME IS:
- Less than \$3,000/Yr., or \$250/Month
 - \$3,000-\$5,000/Yr., or \$250-\$415/Month
 - \$5,000-\$10,000/Yr., or \$415-\$830/Month
 - \$10,000-\$15,000/Yr., or \$830-\$1,250/Month
 - Over \$15,000/Yr., or \$1,250/Month
25. DO YOU FEEL EXERCISE IS NECESSARY FOR GOOD HEALTH?
- Yes
 - No
26. DO YOU FEEL EXERCISE CAN BE IMPORTANT IN MAINTAINING GOOD HEALTH?
- Yes
 - No
27. DO YOU FEEL EXERCISE IS IMPROTANT IN KEEPING YOU HEALTHY?
- Yes
 - NO
28. DO YOU FEEL THAT AS YOU GET OLDER EXERCISE IS BAD FOR YOU?
- Yes
 - No
29. HOW WOULD YOU DESCRIBE YOUR PRESENT WEIGHT?
- Underweight
 - Desirable
 - Overweight
 - Obese
- Interviewer: What is your perception of the individuals weight?

30. DO YOU FEEL THAT EXERCISE, OR LACK OF EXERCISE IS RELATED TO YOUR PRESENT WEIGHT?
- Yes
 - No

31. DO YOU PERCEIVE YOURSELF AS BEING A PHYSICALLY ACTIVE PERSON?
- Yes
 No
32. COMPARED TO THE AVERAGE PERSON YOUR AGE, DO YOU THINK THAT YOUR PHYSICAL ACTIVITY LEVEL IS:
- Less than average
 Average
 More than average
33. ARE YOU MORE OR LESS ACTIVE THAN YOU WERE TEN YEARS AGO?
- More active
 Less active
 The same
34. DO YOU HAVE THE ENERGY TO CARRY OUT THE DAILY TASKS YOU WANT TO DO OR WOULD LIKE TO DO?
- Yes
 No
35. ARE YOU CONCERNED THAT AS YOU GROW OLDER YOU MAY BECOME LESS ACTIVE (MORE SEDENTARY)?
- Yes
 No
36. HOW OFTEN DO YOU ENGAGE IN PURPOSEFUL EXERCISE TO IMPROVE YOUR HEALTH?
- Not at all
 1 to 2 times/week
 3 to 4 times/week
 Everyday
37. IF YOU ENGAGE IN PURPOSEFUL EXERCISE, HOW LONG DOES THE EXERCISE PERIOD LAST?
- 0-15 min.
 15-30 min.
 30-60 min.
 More than 60 minutes
38. WHAT TYPE(S) OF PHYSICAL ACTIVITY/EXERCISE DO YOU PARTICIPATE IN?
- House cleaning
 Mowing lawn
 Gardening
 Walking
 Jogging
 Swimming
 Biking
 Dancing
 Other, please specify: _____

APPENDIX B
LETTER OF INTRODUCTION

EASTERN ILLINOIS UNIVERSITY
CHARLESTON, ILLINOIS 61920

May 15, 1985

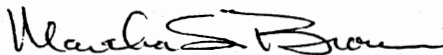
Dear Senior Center Staff/Participant:

This letter is to introduce Laurie LaVoie, a graduate student working on her Master's Degree in Gerontology at Eastern Illinois University. Laurie is conducting a nutrition-related study to meet the thesis requirement for her degree. The purpose of her study is to investigate the shopping and activity habits of senior citizens.

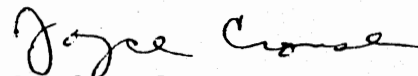
We earnestly request your assistance in this study. There are no right or wrong answers, and all information will be kept confidential. The information obtained will make a valuable contribution to efforts aimed at meeting the nutrition and health needs of older persons.

Your assistance and cooperation are greatly appreciated.

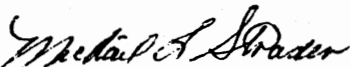
Sincerely,



Dr. Martha S. Brown
Associate Professor
School of Home Economics
Eastern Illinois University



Dr. Joyce Crouse
Assistant Dean/Chairperson
School of Home Economics
Eastern Illinois University



Mr. Michael Strader
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APPENDIX C
CONSENT FORM

CONSENT FORM

It is my understanding that I am participating in a nutrition survey. The purpose of this study is to investigate the shopping and activity habits of senior citizens. The principle investigator in this study, Laurie Lavoie, is a graduate student in Gerontology at Eastern Illinois University.

I understand that I will be asked a series of questions contained in a special questionnaire developed by Ms. Lavoie, who will keep a record of my responses. It is also my understanding that my name will not be used by Ms. Lavoie for publication nor will she identify me personally.

Signature _____

Date _____

APPENDIX D
OPERATIONAL DESIGN

<u>Hypotheses</u>	<u>Objectives</u>	<u>Instruments</u>	<u>Test Statistics</u>
No association exists between the characteristic variables (sex, age, education, health status, and socio-economic status) and the use of health foods.	To determine the relationship between the educational background, socio-economic status, health status, education, age, and sex and the use of health foods. (HFU-I, HFU-II, non-HFU-I, and II)	Interviewer-administered questionnaire	Chi-square analysis Student's t-test Discriminant Analysis
No association exists between the location or availability of the "health food" stores and the use/purchase of health food.	To determine the relationship between location or availability of health food stores and the use/purchase of health food.	(Above)	(Above)
No difference exists between the reasons given for using health foods by HFU and non-users.	To determine the reasons for health food purchases.	(Above)	Chi-square analysis Student's t-test
No differences exists between the primary source of nutrition information reported by HFU's and non-users.	To determine the health foods most often purchased by HFU's and non-users.	(Above)	(Above)
No association exists between the frequency of physical activity of health food users and non-users.	To determine the various resources that provide the primary source of nutrition information for the HFU's and non-users.	(Above)	Chi-square analysis Student's t-test Discriminant analysis
No association exists between the length of time engaged in physical activity of health food users and non-users.	To determine the relationship between the frequency and length of physical activity of health food users and non-users.	Interviewer-administered questionnaire on physical activity/health related factors.	(Above)
	(Above)	(Above)	(Above)

APPENDIX E

TOTAL AND GROUP RESPONSES TO THE QUESTIONNAIRE

TOTAL AND GROUP RESPONSES TO THE QUESTIONNAIRE

QUESTION	TOTAL	HFU-I	NHFU-I	HFU-II	NHFU-II
SEX					
Male	17.4 ^a (24) ^b	14.3(9)	20.0(15)	16.7(2)	17.5(22)
Female	82.6 (114)	85.7(54)	80.0(60)	83.3(10)	82.5(104)
AGE					
60-64	10.1 (14)	12.7(8)	8.0(6)	8.3(1)	10.3(13)
65-69	21.0 (29)	25.4(16)	17.3(13)	25.0(3)	20.6(26)
70-74	19.6 (27)	30.2(19)	10.7(8)	41.7(5)	17.5(22)
75-over	49.3 (68)	31.7(20)	64.0(48)	25.0(3)	51.6(65)
Years Education					
0-5	3.6 (5)	3.2(2)	4.0(3)	8.3(1)	3.2(4)
6-8	32.6 (45)	28.6(18)	36.0(27)	33.3(4)	32.5(41)
9-12	42.0 (58)	41.3(26)	42.7(32)	25.0(3)	43.7(55)
12-16	16.7 (23)	20.6(13)	13.3(10)	25.0(3)	15.9(20)
16-over	5.1 (7)	6.3(4)	4.0(3)	8.3(1)	4.8(6)
Live Alone					
Yes	71.1 (99)	66.7(42)	76.0(57)	66.7(8)	72.2(91)
No - spouse	22.5 (31)	28.6(18)	17.3(13)	25.0(3)	22.2(28)
With children	3.6 (5)	3.2(2)	4.0(3)	8.3(1)	3.2(4)
Other relatives	2.2 (3)	1.6(1)	2.7(2)	-----	2.4(3)
Own Shopping					
Yes	83.3 (115)	84.1(53)	82.7(62)	83.3(10)	83.3(105)
No - spouse	5.8 (8)	7.9(5)	4.0(3)	8.3(1)	5.6(7)
With children	4.3 (6)	4.8(3)	4.0(3)	8.3(1)	4.0(5)
Other relatives	4.3 (6)	3.2(2)	5.3(4)	-----	4.8(6)
Non-relatives	2.2 (3)	-----	4.0(3)	-----	2.4(3)
Shop Alone					
Yes	60.9 (84)	68.3(43)	54.7(41)	75.0(9)	59.5(75)
No - spouse	16.7 (23)	19.0(12)	14.7(11)	8.3(1)	17.5(22)
With children	10.9 (15)	4.8(3)	16.0(12)	8.3(1)	11.1(14)
Other relatives	6.5 (9)	6.3(4)	6.7(5)	-----	7.1(9)
Non-relatives	5.1 (7)	1.6(1)	8.0(6)	8.3(1)	4.8(6)
Walking Distance					
Supermarket	43.5 (60)	41.3(26)	45.3(34)	33.3(4)	44.4(56)
Corner grocer	3.6 (5)	4.8(3)	2.7(2)	-----	4.0(5)
H.F. Store	-----	-----	-----	-----	-----
Other	-----	-----	-----	-----	-----
None	52.9 (73)	54.0(34)	52.0(39)	66.7(8)	51.6(65)
Travel					
Less than 1	47.1 ^a (65) ^b	46.0(29)	48.0(36)	16.7(2)	50.0(63)
1-2	37.7 (52)	30.2(19)	44.0(33)	75.0(9)	34.1(43)
2-5	5.8 (8)	7.9(5)	4.0(3)	-----	6.3(8)
5-10	4.3 (6)	7.9(5)	1.3(1)	-----	4.8(6)
More than 10	5.1 (7)	7.9(5)	2.7(2)	8.3(1)	4.8(6)
Most Shop					
Supermarket	98.6 (136)	100.0(63)	97.3(73)	100.0(12)	98.4(124)
Corner grocer	1.4 (2)	-----	2.7(2)	-----	1.6(2)
Money spent/week					
Less than 10	18.8 (26)	12.7(8)	24.0(18)	16.7(2)	19.0(24)
11-15	13.0 (18)	14.3(9)	12.0(9)	25.0(3)	11.9(15)
16-20	20.3 (28)	15.9(10)	24.0(18)	-----	22.2(28)
21-25	15.2 (21)	19.0(12)	12.0(9)	25.0(3)	14.3(18)
26-30	14.5 (20)	23.8(15)	6.7(5)	8.3(1)	15.1(19)
31-35	3.6 (5)	3.2(2)	4.0(3)	-----	4.0(5)
36-40	4.3 (6)	3.2(2)	5.3(4)	-----	4.8(6)
41 - more	10.1 (14)	7.9(5)	12.0(9)	25.0(3)	8.7(11)
How many people					
1 person	71.1 (99)	65.1(41)	77.3(58)	58.3(7)	73.0(92)
2 persons	25.4 (35)	34.9(22)	17.3(13)	41.7(5)	23.8(30)
3 persons	1.4 (2)	-----	2.7(2)	-----	1.6(2)
4 persons	1.4 (2)	-----	2.7(2)	-----	1.6(2)

Nearest H.F.S.					
Less than 1	15.9 (22)	15.9(10)	16.0(12)	16.7(2)	15.9(20)
1-2	18.1 (25)	25.4(16)	12.0(9)	8.3(1)	19.0(24)
2-5	11.6 (16)	20.6(13)	4.0(3)	33.3(4)	9.5(12)
5-10	8.7 (12)	11.1(7)	6.7(5)	16.7(2)	7.9(10)
More than 10	18.8 (26)	22.2(14)	16.0(12)	16.7(2)	19.0(24)
Don't know	26.8 (37)	4.8(3)	45.3(34)	8.3(1)	28.6(36)
Ever Shop in H.F.S.					
Yes	45.7 (63)	100.0(63)	-----	100.0(12)	45.5(51)
No	54.3 (75)	-----	100.0(75)	-----	59.5(75)
Spend in trip H.F.S.					
0-2	7.2 (10)	15.9(10)	-----	-----	7.9(10)
3-5	18.1 (25)	39.7(25)	-----	-----	19.8(25)
6-8	7.2 (10)	15.9(10)	-----	58.3(7)	2.4(3)
9-11	3.6(5)	7.9(5)	-----	8.3(1)	3.2(4)
12-14	1.4 (2)	3.2(2)	-----	-----	1.6 (2)
15-17	2.9 (4)	6.3(4)	-----	16.7(2)	1.6(2)
18-20	1.4 (2)	3.2(2)	-----	8.3(1)	.8(1)
24-more	1.4 (2)	3.2(2)	-----	8.3(1)	.8(1)
No response	56.5 (78)	4.8(3)	100.0(75)	-----	61.9(78)
Number People					
1 Person	31.9 (44)	69.8(44)	-----	83.3(10)	27.0(34)
2 Persons	10.9 (15)	23.8(15)	-----	16.7(2)	10.3(13)
No response	57.2 (79)	6.3(4)	100.0(75)	-----	62.7(79)
Number 13					
Yes	13.0 (18)	28.6(18)	-----	33.3(4)	11.1(14)
No	29.7 (41)	65.1(41)	-----	66.7(8)	26.2(33)
No response	57.2 (79)	6.3(4)	100.0(75)	-----	62.7(79)
Shop at H.F.S./2 weeks					
Yes	4.3 (6)	9.5(6)	-----	25.0(3)	2.4(3)
No	38.4 (53)	84.1(53)	-----	75.0(9)	34.9(44)
No response	57.2 (79)	6.3(4)	100.0(75)	-----	62.7(79)
Often Shop H.F.S.					
1x week	.7 (1)	1.6(1)	-----	-----	.8(1)
2x month	2.9 (4)	6.3(4)	-----	16.7(2)	1.6(2)
1x month	11.6 (16)	25.4(16)	-----	83.3(10)	4.8(6)
1x/2 month	12.3 (17)	27.0(17)	-----	-----	13.5(17)
1-2x year	15.2 (21)	33.3(21)	-----	-----	16.7(21)
No response	57.2 (79)	6.3(4)	100.0(75)	-----	62.7(79)
Mostly buy at H.F.S.					
Vitamin & Mineral Sup.	13.0 ^a (18) ^b	28.6(18)	-----	33.3(4)	11.1(14)
Food Supplement	7.2 (10)	15.9(10)	-----	8.3(1)	7.1(9)
Food/Beverage	11.6 (16)	25.4(16)	-----	16.7(2)	11.1(14)
Food Product	.7 (7)	1.6(1)	-----	-----	.8(1)
Combo 1 & 2	2.2 (3)	4.8(3)	-----	8.3(1)	1.6(2)
Combo 1 & 3	5.8 (8)	12.7(8)	-----	25.0(3)	4.0(5)
Combo 2 & 3	1.4 (2)	3.2(2)	-----	8.3(1)	.8(1)
No response	58.0 (80)	7.9(5)	100.0(75)	-----	63.5(80)
Use Vitamin & Mineral					
Daily/Not Prescribed	21.0 (29)	27.0(17)	16.0(12)	41.7(5)	19.0(24)
Daily/Prescribed	5.1 (7)	7.9(5)	2.7(2)	-----	5.6(7)
2 week/Not Prescribed	1.4 (2)	3.2(2)	-----	8.3(1)	.8(1)
1/month/N.P	.7 (1)	1.6(1)	-----	-----	.8(1)
3x week/N.P	.7 (1)	-----	1.3(1)	-----	.8(1)
Seasonal/N.P	1.4 (2)	1.6(1)	1.3(1)	-----	1.6(2)
N.R.	69.9 (96)	58.7(37)	78.7(59)	50.0(6)	71.4(90)
Use Vitamin C					
Daily/N.P	12.3 (17)	22.2(14)	4.0(3)	33.3(4)	10.3(13)
1 month/N.P	.7 (1)	-----	1.3(1)	-----	.8(1)
3 week/N.P	.7 (1)	-----	1.3(1)	-----	.8(1)
Seasonal/N.P	1.4 (2)	1.6(1)	1.3(1)	-----	1.6(2)
N.R.	84.8 (117)	76.2(48)	92.0(69)	66.7(8)	86.5(109)
Use Vitamin E					
Daily/N.P	9.4 (13)	15.9(10)	4.0(3)	25.0(3)	7.9(10)
N.R	90.6 (125)	84.1(53)	96.0(72)	75.0(9)	92.1(116)
Use Wheat Germ					
Daily/N.P	2.9 (4)	6.3(4)	-----	16.7(2)	1.6(2)
N.R	97.1 (134)	93.7(59)	100.0(75)	183.3(10)	98.4(124)

Use Brewers Yeast					
N.R.	100.0 (138)	100.0(63)	100.0(75)	100.0(12)	100.0(126)
Use Whole Wheat Prod.					
Daily/N.P	1.4 (2)	1.6(1)	1.3(1)	8.3(1)	.8(1)
N.R.	98.6 (136)	98.4(62)	98.7(74)	91.7(11)	99.2(125)
Use Honey					
1 month/N,P	.7 (1)	1.5(1)	-----	8.3(1)	-----
N.R.	99.3 (137)	98.4(62)	100.0(75)	91.7(11)	100.0(126)
Use Lecithin					
Daily/N.P	.7 (1)	1.6(1)	-----	8.3(1)	-----
N.R.	99.3 (137)	98.4(62)	100.0(75)	91.7(11)	100.0(126)
Use Bone Meal					
Daily/N.P	2.2 (3)	4.8(3)	-----	8.3(1)	1.6(2)
N.R.	97.8 (135)	95.2(60)	100.0(126)	91.7(11)	98.4(124)
Use Calcium					
Daily/N.P	8.7 (12)	14.3(9)	4.0(3)	33.3(4)	6.3(8)
Daily/Presc.	2.9 (4)	6.3(4)	-----	-----	3.2(4)
2 week/N.P	.7 (1)	1.6(1)	-----	-----	.8(1)
2 week/Presc.	.7 (1)	1.6(1)	-----	-----	.8(1)
N.R.	87.0 (120)	76.2(48)	96.0(72)	66.7(8)	88.9(112)
Use Potassium					
Daily/N.P	2.9 (4)	3.2(2)	2.7(2)	8.3(1)	2.4(3)
Daily/Presc.	2.9 (4)	1.6(1)	4.0(3)	-----	3.2(4)
2 week/N.P	1.4 (2)	3.2(2)	-----	-----	1.6(2)
N.R.	92.8 (128)	92.1(58)	93.3(70)	91.7(11)	92.9(117)
Use: Others					
Daily/N.P	17.4 (24)	22.2(14)	13.3(10)	33.3(4)	15.9(20)
Daily/Presc.	3.6 (5)	3.2(2)	4.0(3)	8.3(1)	3.2(4)
2 week/N.P	1.4 (2)	3.2(2)	-----	-----	1.6(2)
2 week/Presc.	.7 (1)	1.6(1)	-----	-----	.8(1)
1 month/N.P	1.4 (2)	1.6(1)	1.3(1)	-----	1.6(1)
N.R.	75.4 (104)	68.3(43)	81.3(61)	58.3(7)	77.0(97)
Buy Vitamin & Mineral					
Supermarket	1.4 (2)	3.2(2)	-----	-----	1.6(2)
H.F. Store	2.9 (4)	6.3(4)	-----	25.0(3)	.8(1)
Drug Store	20.3 (28)	22.2(14)	18.7(14)	16.7(2)	20.6(26)
Mail Order	1.4 (2)	3.2(2)	-----	8.3(1)	.8(1)
H.F. & D.S.	.7 (1)	1.6(1)	-----	-----	.8(1)
Other	4.3 (6)	4.8(3)	4.0(3)	-----	4.8(6)
N.R.	68.8 (95)	58.7(37)	77.3(58)	50.0(6)	70.6(89)
Buy Vitamin C					
Supermarket	.7 (1)	-----	1.3(1)	-----	1.6(2)
H.F. Store	6.5 (9)	14.3(9)	-----	16.7(2)	.8(1)
Drug Store	4.3 (6)	4.8(3)	4.0(3)	8.3(1)	20.6(26)
Mail Order	.7 (1)	1.6(1)	-----	8.3(1)	.8(1)
H.F. & D.S.	.7 (1)	1.6(1)	-----	-----	.8(1)
H.F. & M.O.	.7 (1)	1.6(1)	-----	-----	.8(1)
Other	.7 (1)	-----	1.3(1)	-----	4.8(6)
N.R.	85.5 (118)	76.2(48)	93.3(70)	66.7(8)	70.6(89)
Buy Vitamin E					
H.F. Store	2.9 (4)	6.3(4)	-----	16.7(2)	1.6(2)
Drug Store	2.2 (3)	1.6(1)	2.7(2)	-----	2.4(3)
Mail Order	1.4 (2)	3.2(2)	-----	8.3(1)	.8(1)
H.F. & D.S.	.7 (1)	1.6(1)	-----	-----	.8(1)
H.F. & M.O.	.7 (1)	1.6(1)	-----	-----	.8(1)
Other	1.4 (2)	1.6(1)	1.3(1)	-----	1.6(2)
N.R.	90.6 (125)	84.1(53)	96.0(72)	75.0(9)	92.1(116)
Buy Wheat Germ					
H.F. Store	2.9 (4)	6.3(4)	-----	16.7(2)	1.6(2)
N.R.	97.1 (134)	93.7(59)	100.0(75)	83.3(10)	98.4(124)
Buy Brewers Yeast					
N.R.	100.0 (138)	100.0(63)	100.0(75)	100.0(12)	100.0(126)
Buy Whole Wheat Prod.					
Supermarket	.7 (1)	-----	1.3(1)	-----	.8(1)
H.F. Store	.7 (1)	11.6(1)	-----	8.3(1)	-----
N.R.	98.6 (136)	98.4(62)	98.7(74)	91.7(11)	99.2(125)

Buy Honey					
Other	.7 (1)	1.6(1)	-----	8.3(1)	-----
N.R.	99.3 (137)	98.4(62)	100.0(75)	91.7(11)	100.0(126)
Buy Lecithin					
N.R.	100.0 (138)	100.0(63)	100.0(75)	100.0(12)	100.0(126)
Buy Bone Meal					
H.F. Store	1.4 (2)	3.2(2)	-----	8.3(1)	.8(1)
Drug Store	.7(1)	1.6(1)	-----	-----	.8(1)
N.R.	97.8 (135)	95.2(60)	100.0(75)	91.7(11)	98.4(124)
Buy Calcium					
H.F. Store	5.1 (7)	11.1(7)	-----	25.0(3)	3.2(4)
Drug Store	5.1 (7)	7.9(5)	2.7(2)	-----	5.6(7)
Mail Order	1.4 (2)	3.2(2)	-----	8.3(1)	.8(1)
H.F. & M.O.	.7 (1)	1.6(1)	-----	-----	.8(1)
Other	.7 (1)	-----	1.3(1)	-----	.8(1)
N.R.	87.0 (120)	76.2(48)	96.0(72)	66.7(8)	88.9(112)
Buy Potassium					
H.F. Store	2.2 (3)	4.8(3)	-----	-----	2.4(3)
Drug Store	2.9 (4)	1.6(1)	4.0(3)	-----	3.2(4)
Mail Order	.7 (1)	1.6(1)	-----	8.3(1)	-----
Other	1.4 (2)	-----	2.7(2)	-----	1.6(2)
N.R.	92.8 (128)	92.1(58)	93.3(70)	91.7(11)	92.9(117)
Buy: Others					
Supermarket	2.9 (4)	1.6(1)	4.0(3)	-----	3.2(4)
H.F. Store	8.7 (12)	19.0(12)	-----	25.0(3)	7.1(9)
Drug Store	5.8 (8)	4.8(3)	6.7(5)	-----	6.3(8)
Mail Order	1.4 (2)	3.2(2)	-----	8.3(1)	.8(1)
H.F. & M.O.	.7 (1)	1.6(1)	-----	-----	.8(1)
Other	5.1 (7)	1.6(1)	8.0(6)	8.3(1)	4.8(6)
N.R.	75.4 (104)	68.3(48)	81.3(61)	58.3(7)	77.0(97)
Reason(s) Use H.F.					
Prevention	43.5 ^a (60) ^b	60.3 (38)	29.3(22)	58.3(7)	42.1(53)
Cure	6.5 (9)	7.9 (5)	5.3(4)	8.3(1)	6.3(8)
Prescribed	10.1 (14)	12.7(8)	8.0(6)	8.3(1)	10.3(13)
Other	17.2 (10)	9.5(6)	5.3(4)	16.7(2)	6.3(8)
N.R.	32.6 (45)	9.5(6)	52.0(39)	8.3(1)	34.9(44)
Introduced to H.F.					
Friend	5.8 (8)	9.5(6)	2.7(1)	8.3(1)	5.6(7)
Family	6.5 (9)	6.3(4)	6.7(5)	-----	7.1(9)
Newspaper	1.4 (2)	3.2(2)	-----	-----	1.6(2)
Magazine	4.3 (6)	7.9(5)	1.3(1)	16.7(2)	3.2(4)
Book	.7 (1)	1.6(1)	-----	8.3(1)	-----
T.V.	4.3 (6)	4.8(3)	4.0(3)	-----	4.8(6)
Doctor	29.7 (41)	36.5(23)	24.0(18)	25.0(3)	30.2(38)
Self	12.3 (17)	17.5(11)	8.0(6)	33.3(4)	10.3(13)
Senior Center	.7 (1)	1.6(1)	-----	-----	.8(1)
N.R.	34.1 (47)	11.1(7)	53.3(40)	8.3(1)	5.6(7)
Main Source Nutr. In.					
Mag/Newspaper	8.7 (12)	11.1(7)	6.7(5)	25.0(3)	7.1(9)
Doctor	42.0 (58)	38.1(24)	45.3(39)	25.0(3)	43.7(55)
Book on Health	2.2 (3)	4.8(3)	-----	8.3(1)	1.6(2)
H.F. Store Owner	.7 (1)	1.6(1)	-----	-----	.8(1)
Nutr./Dietitian	7.2 (10)	9.5(6)	5.3(4)	16.7(2)	6.3(8)
Other	39.1 (54)	34.9(22)	42.7(32)	25.0(3)	40.5(51)
How long buy H.F.					
Less than 1 month	2.9 (4)	-----	5.3(4)	-----	3.2(4)
1T 1 month/6months	1.4 (2)	3.2(2)	-----	-----	1.6(2)
6 months/1 year	4.3 (6)	7.9(5)	1.3(1)	16.7(2)	3.2(4)
1-5 years	23.2 (32)	33.3(21)	14.7(11)	25.0(3)	23.0(29)
5-10 years	8.0 (11)	11.1(7)	5.3(4)	8.3(1)	7.9(10)
10-20 years	19.6 (27)	25.4(16)	14.7(11)	33.3(4)	18.3(23)
20 or more years	6.5 (9)	9.5(6)	4.0(3)	16.7(2)	5.6(7)
N.R.	34.1 (47)	9.5(6)	54.7(41)	-----	51.3(47)
Health					
Excellent	8.0 (11)	9.5 (6)	6.7(5)	8.3(1)	7.9(10)
Good	69.6 (96)	69.8(44)	69.3(52)	75.0(9)	69.0(87)
Fair	21.0 (29)	20.6(13)	21.3(16)	16.7(2)	21.4(27)
Poor	1.4 (2)	-----	2.7(2)	-----	1.6(2)

Range of Income					
Less than 3000 yr.	6.5 (9)	3.2(2)	9.3(7)	8.3(1)	6.3(8)
3000-5000 year	26.8 (37)	15.9(10)	36.0(27)	33.3(4)	26.2(33)
5000-10,000 yr.	39.9 (55)	44.4(28)	36.0(27)	25.0(3)	41.3(52)
10,000-15,000 yr.	19.6 (27)	27.0(17)	13.3(10)	25.0(3)	19.0(24)
Over 15,000 yr.	7.2 (10)	9.5(6)	5.3(4)	8.3(1)	7.1(9)
Exercise Necessary					
Yes	95.7 (132)	98.4(62)	93.3(70)	100.0(12)	95.2(120)
No	4.3 (6)	1.6(1)	6.7(5)	-----	4.8(6)
Exercise Important					
Yes	99.3 (137)	98.4(62)	100.0(75)	100.0(12)	92.2(125)
No	.7 (1)	1.6(1)	-----	-----	.8(1)
Exercise Important to you					
Yes	94.9 (131)	95.2(60)	94.7(71)	100.0(10)	94.4(119)
No	5.1 (7)	4.8(3)	5.3(4)	-----	5.6(7)
Exercise Bad for you					
Yes	10.1 (14)	6.3(4)	13.3(10)	-----	11.1(14)
No	89.9 (124)	93.7(59)	86.7(65)	100.0(12)	88.9(112)
Describe Present					
Underweight	2.2 (3)	1.6(1)	2.7(2)	-----	2.4(3)
Desirable	44.9 (62)	41.3(26)	48.0(36)	50.0(6)	44.4(56)
Overweight	62.9 (73)	57.1(36)	49.3(37)	50.0(6)	53.2(67)
Exercise related weight					
Yes	54.3 ^a (75) ^b	55.6(35)	53.3(40)	66.7(8)	53.2(67)
No	45.7 (63)	44.4(28)	46.7(35)	33.3(4)	46.8(59)
Perceive active					
Yes	83.3 (115)	82.5(52)	84.0(63)	91.7(11)	82.5(104)
No	16.7 (23)	17.5(11)	16.0(12)	8.3(1)	17.5(22)
Physical Act. Level					
Less than average	13.8 (19)	17.5(11)	10.7(8)	8.3(1)	14.3(18)
Average	69.5 (82)	50.8(32)	66.7(50)	58.7(7)	59.5(75)
More	26.8 (37)	31.7(20)	22.7(17)	33.3(4)	26.2(33)
More or Less Active					
More	7.2 (10)	9.5(6)	5.3(4)	16.7(2)	6.3(8)
Less	60.9 (84)	61.9(39)	60.0(45)	50.0(6)	61.9(78)
Same	31.9 (44)	28.6(18)	34.7(26)	33.3(4)	31.7(40)
Energy do tasks					
Yes	70.3 (97)	65.1(41)	74.7(56)	66.7(8)	70.6(89)
No	29.7 (41)	34.9(22)	25.3(19)	33.3(4)	29.4(37)
Become less active					
Yes	66.7 (92)	60.3(38)	72.0(54)	50.0(6)	68.3(86)
No	33.3 (46)	39.7(25)	28.0(21)	50.0(6)	31.7(40)
How often exercise					
None	11.6 (16)	14.3(9)	9.3(7)	-----	12.7(16)
1-2 weeks	16.7 (23)	12.7(8)	20.0(15)	16.7(2)	16.7(21)
3-4 weeks	9.4 (13)	11.1(7)	8.0(6)	8.3(1)	9.5(12)
Everyday	62.3 (86)	61.9(39)	62.7(47)	75.0(9)	61.1(77)
How long exercise					
1-15 minutes	25.4 (35)	22.2(14)	28.0(21)	16.7(2)	26.2(33)
15-30 minutes	37.7 (52)	36.5(23)	38.7(29)	50.0(6)	36.5(46)
30-60 minutes	18.1 (25)	20.5(13)	16.0(12)	33.3(4)	16.7(21)
More than 60	6.5 (9)	6.3(4)	6.7(5)	-----	7.1(9)
None	12.3 (17)	14.3(9)	10.7(8)	-----	13.5(17)
Types Exercise					
Yes	100.0 (138)	100.0(63)	100.0(75)	100.0(12)	100.0(126)
Housecleaning					
Yes	30.4 (42)	36.5(23)	25.3(19)	41.7(5)	29.4(37)
No	69.6 (96)	63.5(40)	74.7(56)	58.3(7)	70.6(89)
Mowing					
Yes	12.3 (17)	19.0(12)	6.7(5)	-----	13.5(17)
No	87.7 (121)	81.0(51)	93.3(75)	100.0(12)	86.5(109)
Gardening					
Yes	20.3 (28)	22.2(14)	18.7(14)	8.3(1)	21.4(27)
No	79.7 (110)	77.8(49)	81.3(61)	91.7(11)	78.6(99)
Walking					
Yes	75.4 (104)	79.4(50)	72.0(54)	91.7(11)	73.8(93)
No	24.6 (34)	20.6(13)	28.0(21)	8.3(1)	26.2(33)
Jogging					
Yes	2.2 (3)	4.8(3)	-----	-----	2.4(3)
No	97.8 (135)	95.2(60)	100.0(75)	100.0(12)	97.6(123)

Swimming					
Yes	1.4 (2)	1.6 (1)	1.3 (1)	-----	1.6 (2)
No	98.6 (136)	98.4(62)	98.7(74)	100.0(12)	98.4(124)
Biking					
Yes	21.0 (29)	22.2(14)	20.0(15)	25.0(3)	20.6(26)
No	79.0 (109)	77.8(49)	80.0(60)	75.0(9)	79.4(100)
Dancing					
Yes	2.2 (3)	-----	4.0(3)	-----	2.4(3)
No	97.8 (135)	100.0(63)	96.0(72)	100.0(12)	97.6(123)
Other					
Yes	29.7 (41)	25.4(16)	33.3(25)	58.3(7)	27.0(34)
No	70.3 (97)	74.6(47)	66.7(50)	41.7(5)	73.0(92)

a = Percent of responses

b = Number of responses

HFU-I = Person who has ever shopped in a health food store

NHFU-I = Person who has never shopped in a health food store

HFU-II = Person who shops in health food stores once a month spending at least \$4.00

NHFU-II = Person who shops in health food stores less than once a month and spends less than \$4.00 per trip

VITA

Laurie A. LaVoie was born June 21, 1962 in Watseka, Illinois and grew up in LaHogue, Illinois. She received her elementary and secondary education in Gilman, Illinois. She received the degree of Bachelor of Science in Physical Education with Teacher Certification from Eastern Illinois University, Charleston, Illinois in May, 1984. She was admitted to the M.A. in Gerontology program at Eastern Illinois University in August, 1984, and completed an internship in Geriatric Services at the Carle Clinic Wellness Center, Urbana, Illinois, in November, 1985.

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