CHANGES IN FOOD BEHAVIOR WITH AGE

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ABSTRACT

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By

Carol Jean Wruble

Perceived changes in food behavior with age were assessed for fifty-one main meal preparers who were sixty years and older. Data were collected during the fall of 1975 as part of a North Central Region Experiment Station Study (NC 108), "Changes in Food Practices for Better Nutrition." Respondents indicated a perceived change in food behavior with age. In over half the sample the change in food behavior experienced was a decrease in food intake, an adaptive change in view of the decreased caloric needs of the aged.

The reasons cited for changes in food behavior were attributed to retirement, health, death of family members, and loneliness. Changes in food behavior included: following special diets and decreasing the quantity and variety of foods prepared and eaten. Diets of the elderly sampled generally provided two-thirds of the Recommended Dietary Allowance (RDA) for six nutrients (protein, calcium, thiamin, iron, vitamin A and C) as calculated from food

frequency estimates and food quantity data. Food portion size data were collected using food models.

Males living alone, participants in nutrition programs and respondents citing loneliness and health as reasons for perceived changes in food behavior were among those not meeting two-thirds of the RDA. Environmental factors which may affect the nutrient intakes of an elderly population were identified.

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Carol Jean Wruble

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INTRODUCTION

Complicating environmental factors that are associated with aging such as decreased income, mobility, motivation, and loss of job, family, friends, and status have stereotyped the aged. The "typical elderly" person has been described as chronically ill, poor, isolated and generally regarded as unimportant due to loss of his/her productivity in society. These same complicating factors associated with aging may cause a change in food behavior. What effect these factors may have on the nutritional status of the elderly has not been documented.

Nutritionists have become aware within recent years of the importance of economic, social, and cultural factors which influence dietary patterns, food intake, and the nutritional status of a population. The study of food behavior has been defined as the determination of the ways in which individuals or groups in response to social and cultural pressures select, consume and utilize portions of the available food supply (National Research Council, 1945). The Committee on Food Habits of the National Research Council recognized that improving nutritional practices in the

United States depends as much on knowledge of culture, behavior and personal traits of the population in relation to food as on biochemical and physiological knowledge of nutrient requirements and metabolism.

Few studies have described change in food behavior, that is, the change in how a person relates to food. Americans are eating differently than they did a number of years ago for an assortment of reasons including an increase in the number of food products from which to choose, the increase in food advertising, a shift from rural to urban society, and the growth in population. The change in eating behavior associated with these environmental changes has caused a decline in the nutritional status of the American diet (Henderson, 1972). An analysis of the trends of change in food behavior and the resulting nutritional problems may result in development of corrective measures (McKenzie, 1964). The assessment of environmental factors which induce change in food consumption will be useful to nutritionists and intervention program planners.

It is necessary to know the food history and the effects of chronic illness, decreased physical activity, dentition problems, limited incomes, social isolation, and the lack of motivation of the aged in attempting to meet nutritional needs. Yet, there is little information on the socio-cultural, economic and dietary aspects of the aged as associated with their nutritional status and health

(Rao, 1973). Several studies of nutrient intake that have been completed (Fry, et al., 1963; Emerson, 1964; and Steinkamp, et al., 1965) have indicated that the elderly often consume inadequate amounts of calcium, iron, and vitamins A, D, C, and B complex.

Studies of food intake of the aged have indicated that with change in traditional food intake patterns the nutritional adequacy of the diet decreases (Clarke and Wakefield, 1975 and Stanton and Exton-Smith, 1970). The environmental factors which induce change in food behavior may cause decreased nutritional adequacy of the diet.

As a greater percentage of the American population is comprised of elderly, the need for reliable data of the effect of environmental factors on food behavior of the elderly increases. There is a need to establish then, what the food patterns of the elderly are, and how they can be effectively modified to insure optimal health.

The objectives of this research were to: (a) describe the food behavior of a selected rural elderly population in Michigan, and (b) determine the influence of environmental factors on food behavior of a selected group.

OPERATIONAL DEFINITIONS

Elderly Nutrition Program (Title VII): is a program authorized under Title VII of the Older Americans Act of 1965, to supply low cost, nutritionally sound meals in a congregate setting to people over the age of sixty years and their spouses. The Title VII Program also provides additional supportive services, such as nutrition education and transportation.

Food Behavior: is the way in which an individual or group of people in response to social and cultural pressures, select, prepare and consume portions of the available food supply (National Research Council, 1945).

Food Models: are polyurethane shaped into mounds of different sizes, not suggestive of any particular food (Christensen, 1973). Food models were used to estimate food portion size.

Home-Delivered Meals Program (HDMP): is a program funded through a combination of public and private monies, providing well-balanced meals to the aged who are

homebound, and/or physically handicapped in an attempt to enable the individual to live independently in his/her own home.

Independent: is a person maintaining their own household in a non-institutionalized setting.

Main Meal Preparer: is a person who does the majority of the food preparation in the home.

Participant Observer: is an adult engaged in the process of studying a culture or group of people different from his own.

Recommended Dietary Allowances (RDA): are established by the Food and Nutrition Board of the National Research Council, revised in 1974. The RDA are recommendations for levels of intake of nutrients sufficiently in excess of average nutritional requirements to meet the nutritional needs of most people.

REVIEW OF LITERATURE

Food Behavior

Few studies have been conducted to describe the food behavior of a selected group. A study of food behavior of a population must not be isolated from the social and economic setting of the group. The myriad of factors, social, economical, medical and psychological, which concurrently influence the nutritional well-being of a group must be considered when describing food behavior (Sims, et al., 1972). Current eating patterns reflect the physical, economical, social, technological and ideological aspects of the culture (Gifft, et al., 1972). A cultural definition of food includes the attitudes, habits and customs acquired by learning which are subject to change (Fathauer, 1960). The complexity of the study of food behavior is evident.

Need to Study Food Behavior

To realize the full social benefits from the findings of biochemistry, physiology, agriculture and economics there must be research in the field of food behavior

(National Research Council, 1945). The discoveries made in the laboratory need to be translated into applicable terms for the layman to effect the improvement of the quality of life (National Research Council, 1943). With the knowledge of what people are eating one may determine what to preserve or change in order to make better use of the available food supply. Gordon (1973) indicated there was a need for a system of surveillance of nutritional status of people on which to base the remedial action of nutrition programs. In order to establish methods to strengthen the forces which lead to dietary improvement through nutrition programs, it is necessary to research behavioral aspects for food patterns (Aldrich, 1965). The data collected may be used to design programs which focus on directing change for improvement in nutritional status.

Need for an Instrument to Document Food Behavior

One major problem in conducting research on change in food behavior is the lack of appropriate methodology. Madden and coworkers (1976) stated:

> such research methodology is long overdue and should receive rather high priority in view of the important policy decisions that are made partly on the basis of dietary impact. These policy decisions determine the types of programs available, the allocation of public monies, and ultimately, the well-being of the elderly, the poor and needy populations. Securing, with a valid instrument data on the food behavior of a target population is the first step in designing an effective

intervention method which would provide optimal health and nutritional conditions.

Identification of food sources, typical foods, food terminology, methods of food preparation, storage and the meaning given to food in a particular culture are important steps in the development of instruments for collecting information and interpreting data about food behavior (Kolasa and Bass, 1974). However, no valid instrument has been developed to determine food behavior and food intake of specific populations.

Campbell and Cuthbertson (1963) described the limitations of tools used for collecting and interpreting dietary data pertinent to the elderly as a group. Young and Scrimshaw (1975) compared the accuracy of the twenty-four hour recall of young and old groups of people and concluded that the older people remembered less about their food intake than did younger people. They also ascertained that women of any age remembered better than men of any age due to their lifelong practices of dealing with food. Young and Scrimshaw (1975) established that the twenty-four hour recall was a valid instrument to determine food intake of a group when used with fifty or more people.

Aging Population

In the Hearings before the Select Committee on Nutrition and Human Needs (Senate Select Committee, 1969) Senator McGovern stated that ten percent of the American

population, the elderly, represented the most uniformly malnourished segment of the population. Youland (1961) found that three of four persons over sixty-five years were afflicted with chronic conditions in which nutrition played the single most important role. Wood (1975) suggested that half of the health problems of the elderly were related to their nutritional status. Although the elderly represent fourteen percent of the United State's population, they require more than half the money spent for health services in this country (Watkin, 1975). The elderly live in a social system which gives them little importance and renders low priority to disease prevention at older ages (Wylie, 1975).

Nutrition is one environmental factor directly under man's control. Since proper nutrition can be effective in the maintenance of health, prevention of disease and disability and the deceleration of aging (Watkin, 1973), it becomes increasingly important to establish what factors contribute to suboptimal nutritional status exhibited by many aged.

Environmental Factors of Aging

The aged are a group of individuals who have experienced a variety of physical and emotional insults which may influence their nutritional status. The elderly in America face social isolation as "aged in a youth oriented

society, economically and culturally deprived of a rightful place in society" (Watkin, 1973). Psychologically, the elderly may experience loss of their economic role, friends, family, home and social responsibility. Each loss necessitates a rearrangement of equilibrium which had been set up for comfortable functioning (Weinberg, 1972). The sense of loss associated with the aging process may influence both the nutritional intake and nutritional status of the elderly.

Many situations inherent to the elderly person have handicapped their attempts to obtain an adequate diet. The economic deprivation associated with the elderly frequently leads to inadequate food purchase and food intakes since food is the easiest item to adjust on a fixed income (Watkin, 1975). The elderly population, in general, has a greater frequency of illness than the rest of the population which require medication that may interfere with appetite for food and/or absorption of nutrients. In addition, the elderly may lack the motivation to prepare a meal, especially if alone.

The specific personal and situational factors of the aged must be considered when evaluating nutritional status. It is necessary to evaluate also the effects of related environmental factors on food intake and the subsequent nutritional status of the elderly.

Effect of Environmental Change on Food Behavior

Any change in the usual pattern of living is likely to result in a change in food behavior. The elderly are often in a state of transition relative to their pattern in living. The effects of change on food behavior have not been examined.

Clark and Wakefield (1975) indicated the need for research especially in the field of food behavior of older people as they experience change in their environment. Howell and Loeb (1969) stated that, "Seniors are vulnerable to the uncompromising aspects of environmental change; the consequent effect on food behavior and nutritional status is unknown."

The psychological and emotional reaction to change in the lives of the elderly may exert a real and potent effect on their pattern of eating (Swanson, 1964). However, it is neither known what these effects are nor the extent to which they interfere with nutritional health in the elderly.

Longitudinal studies of man's development may serve to define the optimal environment for the individual to realize his full biologic and psychologic potential (Berrien, 1973). Specific to the aged population, such studies would define the factors which promote optimal nutrition in the midst of the change experienced with aging.

Nutrient Needs of the Elderly

The physiological implications of aging on nutrient requirements have not been established. In addition, the nutrient requirements of this age group have not been thoroughly studied to date. Evidence would indicate that the only change in nutrient requirement with age is energy calories. The need for caloric decrease with aging is due to changes in physical activity and in body metabolism (due to a decrease in the number of cells in the body). With a decrease in caloric needs, food choices become more critical for the aged to meet nutritional requirements. The elderly often lack the nutrition knowledge to make the necessary critical food choices which would provide recommended levels of protein, vitamins and minerals along with decreased calories.

Nutrient Intake Studies of Elderly

Fry and coworkers (1963) found that mean nutrient intakes of females over sixty-five years met or exceeded the 1958 RDA except for iron, and with the exception of calcium and riboflavin, nutrient intake declined with age. Emerson (1964) attributed low nutrient levels in vitamin A and C of the elderly studied to their omission of yellow and green vegetables, citrus fruit from the diet and the low calcium to their omission of milk in the diet.

In assessing the nutritional status of ten male residents in a home for the aged, Brin and coworkers (1964) determined that clinical deficiencies may exist without expression; supplementation should be based on biochemical evaluation. The lack of protein and possibly iron and the B complex may cause fatigue and lassitude in subjects.

Steinkamp and coworkers (1965) found in a longitudinal study of elderly people that mean intakes of nutrients met the RDA except for calories of men and calcium for women. In the same study, twenty-five percent of the respondents had low intakes of vitamin A and C. Ascorbic acid and calcium intakes did not meet two-thirds RDA in a food consumption study conducted by Le Bovit (1965).

Huntanen (1971) used the twenty-four hour recall as an instrument to collect food intake data of elderly residents in rural Benzie County, Michigan, to determine dietary patterns and food behavior. Thirty-one percent of those interviewed met one-third of the Recommended Dietary Allowance for all nutrients. In addition, Huntanen (1971) found that those on special diets had a balanced diet (met two-thirds RDA). An unbalanced diet was associated with eating alone, regular intake of medicine and low income.

Guthrie and coworkers (1972) evaluated, with the twenty-four hour recall, diets of elderly eligible for food stamps and compared with elderly not eligible for food stamps. Those interviewed who had incomes below the poverty

line had inadequate (less than two-thirds RDA) intakes of iron, protein and riboflavin. The diets of 633 elderly subjects as determined with twenty-four hour food recall by Pao and Burk (1972) provided twenty-five percent fewer calories than the RDA, and less calcium and iron than that of the 1968 RDA.

Schlenker (1976) in a longitudinal study of elderly women in Lansing, Michigan, found that mean intakes of all nutrients except calcium were adequate in the diets of those sampled. In individual cases, calories, calcium, thiamin and vitamin A intakes were low. Schlenker (1976) also found that the decrease in caloric intake of her sample was not related necessarily to poor nutrition.

Studies of Food Behavior of the Elderly

There are limited research data describing the food behavior attitudes and practices which are influencing factors in the health and enjoyment of people in the later years of life. Few studies have been conducted with rural populations to describe dietary changes occurring when people become older. What changes an older person will make in food intake as a result of change in environment and what impact that change will have on food intake has not been established.

In a study of food acceptance and attitudes of the aged (Todhunter et al., 1974), forty percent of the

respondents in their sixth decade had changed their food behavior. Thirty-five percent in their seventh decade had changed their food behavior because of health reasons. Huntanen (1971) concluded that the food patterns of the rural elderly population she interviewed were stable. The food patterns of Huntanen's sample tended to become permanent and changed little with age.

Both Todhunter and coworkers (1974) and Howell and Loeb (1969) suggested that the elderly tended to follow the food habits of their childhood. The implications of an economically deprived childhood may imply an establishment of inadequate food patterns due to the scarcity of food before, during and after the Depression. The effects of affluence also may affect food patterns. Henderson (1972) suggested that the constant increase in use of snack foods is an emerging pattern in food consumption, potentially imposing new nutritional problems.

Several studies have ascertained that a nutritionally "elite" group exists among the aged whose nutritional intake is high and changes little with age (Huntanen, 1971; Todhunter et al., 1974; and Clarke and Wakefield, 1975). Clarke and Wakefield (1975) compared independently living elderly with nursing home residents and determined that the more respondents had changed their traditional eating behavior, the lower their nutritional intakes. Clarke and Wakefield (1975) concluded that good nutritional status could be

maintained by independents with adequate nutrient intakes if they simply ate their usual diet.

A longitudinal study in London, England (Stanton and Exton-Smith, 1970) conducted in 1962 and again in 1969 utilized seven days weighed food samples and food records to determine nutrient intake. The respondents were grouped with respect to their dietary intake changes over seven years. The group whose protein and caloric intake had decreased more than ten percent was identified as having deteriorating health. However, the group that had changed food intake minimally maintained a similar state of height and weight between 1962 and 1969.

Nutrition Programs for the Elderly in Michigan

The food behavior of the aged may be affected by participation in programs which provide food and/or social interaction. A review of the literature describing these nutrition programs and their effects on food behavior and nutritional status is appropriate to this discussion of factors affecting change in food behavior.

Title VII Nutrition Program.--A variety of programs are designed to assist elderly independently living persons to cope with health problems, mobility and environmental problems which otherwise may lead to institutionalization and/or confinement in a nursing home. The Nutrition Program

for elderly authorized under the Older Americans Act of 1965 (Title VII) is one program designed to meet the nutritional needs of the aged population. The Title VII program is the major nutritional supplement program for older people in Michigan (Havel, 1975).

The Title VII National Nutrition Program is a formula grant program operated by State Agencies on Aging. The program is designed to serve people who do not eat properly, cannot afford to eat, lack the mobility to shop, lack the skill to cook, lack the incentive to eat (Wells, 1973). The major objectives of the Title VII program are to: supply low cost, nutritionally sound meals in congregate settings for people over the age of sixty years and their spouses, and provide additional supportive services to the elderly such as transportation, information and referral, shopping assistance, health and welfare counseling, recreation, and nutrition education (Wells, 1973).

The social component of the program may be as important as the food. The Title VII program provides more than just a meal by capitalizing on the importance of food to basic feelings of security (Sherwood, 1973). The multiple facets of the nutrition program which provide social involvement and food are equally important in improving the well-being of the elderly (Troll, 1971). The social life of the adult is built to a great extent around the psychological meaning of food and drink, the nutrition program for the elderly supports this concept.

Pilot programs were authorized in 1971 before national implementation of elderly nutrition programs. Senior citizens, in a free pilot meals program, valued the program and wanted to pay for it (Holmes, 1972). Evaluation of the program was continuous and showed that eating habits and the general feeling of well-being of the participants improved with participation in program. Rankine and Taylor (1975) surveyed the food attitudes of Title VII and home-delivered meals program participants and compared them with the food attitudes of nursing home residents. The data supported the hypothesis that the meals served in the socialized setting of the Title VII program provided participants with more than just basic nutritional requirements. The program also provided social and psychological involvement.

Home-Delivered Meals Program.--The home-delivered meals program (HDMP) is another program in operation in various communities in Michigan. It is designed to meet the nutritional needs of the elderly population who experience physiological, social and economic change in living patterns which may lead to malnutrition. The HDMP in Michigan currently is funded by a combination of private and public monies and is serving approximately 1500 meals each day to the elderly in Michigan.

The HDMP provides, "an adequate, well-balanced, medically appropriate meal to the aged who are homebound,

handicapped or otherwise unable to prepare their own meals, in an attempt to prevent physical and psychological deterioration and to enable the individual to live independently in his/her own home" (Buchholtz, 1971). No studies describing the impact of the home-delivered meals program on food behavior and nutritional status of recipients have been reported.

Nutritional Status of the Elderly in Michigan

The aged have been defined as a population group at nutritional risk in Michigan. As a result of the Survey of Needs sponsored by the Office of Services to the Aging, a Comprehensive Plan on Aging (Kivi, et al., 1974) was formulated and included recommendations to investigate and promote additional funding sources for home-delivered meals programs.

A national evaluation of the impact of the Title VII Senior Nutrition Program on the nutritional status and food behavior of participants has been planned by the Department of Health, Education and Welfare. The evaluation is in the implementation process at this time. Title VII participants in four geographical areas in Michigan are being interviewed as a part of the national evaluation.

As a result of the hearings conducted by Representative Hood in Michigan in 1975, a recommendation was made that the State of Michigan double its financial commitment

to nutrition programs for the elderly to include a greater proportion of the population in need of nutritional services (Havel, 1975). The recommendations of "A Matter of Justice," also called for a nutritional assessment as part of medicaid screening to monitor longitudinal changes in nutritional status of the aged population. With the documentation of nutritional problems through ongoing nutritional status assessment adequate intervention programs may be developed.

Summary

A review of the literature indicates that there is little data available describing the food behavior of the older adult. Because a reliable tool for the collection of food behavior data does not exist, the data secured to date has not been collected in a consistent manner.

There is growing concern within Michigan for the nutritionally at risk elderly population. The nutrition programs designed and implemented both in Michigan and across the U.S. to improve the nutritional status of this vulnerable group have not been evaluated for their effectiveness.

The combination of a lack of information on the food behavior of the elderly as a group, and the lack of evaluation of nutrition programs has stimulated a need for investigating the food behavior of a selected rural population in Michigan including those participating in nutrition programs.

METHODOLOGY

Regional Research Project NC 108

In 1975, data for the North Central Region Experiment Station (NC 108) were collected in Michigan describing changes in food practices of fifty-one people over the age of sixty years. Demographic and food intake data were collected in eight other states participating in the NC 108 study: Georgia, Illinois, Indiana, Iowa, Kansas, Minnesota, Missouri and Nebraska, the results of which have not been made available. Data on food practices of elderly persons were collected in Kansas and Illinois. The five year plan for the NC 108 study involved:

1. obtaining food intake, demographic and attitudinal information from a group (to be defined in each state) of fifty main meal preparers.
2. analyzing and evaluating of data collected to determine the need for nutritional intervention.

3. designing intervention tools or programs which would meet the defined needs of the selected group.

This researcher completed only the first objective.

Michigan Research

In addition to obtaining food intake, demographic and attitudinal information from a group of main meal preparers over sixty years, the researcher secured data on environmental factors that influence food behavior of a selected elderly population in Michigan. The method used to collect data was a personal interview. "Changes in Food Behavior with Age" (Appendix) was the interview schedule used to obtain nutrient intake and food behavior data, to describe food behavior change with age in a selected Michigan population and to describe social factors involved in the food selection of main meal preparers over the age of sixty years. Main meal preparers were defined by both the researcher and respondents as those persons who do the majority of the cooking in the home. The procedure followed by this researcher included:

A. Complete an experience in participant observation.

B. Adopt the NC 108 interview schedule and expand interview schedule to include questions about the changes experienced

with age in food behavior, attitudes and practices of main meal preparers over sixty years of age.

C. Select a geographic area and sample population.

D. Interview using an interview schedule and food models to ascertain portion size of foods consumed.

E. Analyze the data.

A more detailed description of the methodology follows.

Participant Observation

The researcher spent three months prior to interviewing as a participant-observer. A participant-observer is an adult engaged in the process of studying a culture or group of people different from his own. The participant-observer's role for a foods and nutrition professional provides the opportunity to study the behavior of a selected group related to food production, selection, procurement, consumption and disposal (Kolasa and Bass, 1974). The experience in participant observation was planned to prepare the researcher for constructing questions to add to NC 108 interview schedule and to prepare the researcher for the role of interviewer.

The experience in participant observation was completed through visits to the Senior Nutrition Programs

(Title VII) in Ingham, Grand Traverse, Manistee, Kalkaska, Antrim, and Huron Counties. These programs are authorized through the Title VII of the Older Americans Act of 1965. Through visits to the Title VII program, contacts were made with Indian, Black, White and Latino elderly populations in both rural and urban settings. Following interview training with faculty supervision, the thirteen original questions were developed by the researcher and were pre-tested with Title VII participants, including the groups mentioned above. To further clarify the meaning of selected questions minor modifications were necessary, after the pretest.

The interview schedule "Changes in Food Behavior with Age" was approved for use with human subjects by the Michigan State University Human Rights Committee.

Field Notes

Field notes were recorded by the researcher both during the participant observation experience and throughout the interview process. The field notes included additional information that may have been overlooked if data available were limited to that collected with the interview schedule. The additional information recorded included observations and information about interviewees. The field notes were used in construction of case studies and in discussion of the results.

Geographical Area

Huron County, Michigan was chosen as the research site for the following reasons: more than ten percent of the county population is over sixty years of age; active, ongoing programs for senior citizens operate within the county including Meals on Wheels (MOW), Title VII program, volunteer groups of senior citizens, Senior Citizen Clubs and a Tri-County Council on Aging; no other food behavior research has been conducted in the area; and the interviewer was familiar with the county.

Contacts were made by the researcher with personnel affiliated with the following agencies and programs: Human Development Commission (sponsor of the Meals on Wheels Program), Title VII Program, Volunteer Bureau, Department of Social Services and the Cooperative Extension Service. The professionals approached indicated a willingness to cooperate with the study. In three instances possible interviewees were named.

Purposive Sample

The sample was chosen by the researcher from names suggested by personnel from agencies in the county and from names suggested by local contacts. The potential interviewees were selected in an attempt to include both men and women, participants of nutrition programs in the

county and the homebound. The person who did the majority of the food preparation was interviewed.

The researcher contacted all potential interviewees by telephone and briefly explained the project. Appointments were made, at the convenience of the interviewee, with those who agreed to be interviewed. Ninety percent of those contacted indicated they were willing to be interviewed for the study. The five people who refused to take part in the study cited their reasons as poor health and lack of information about food and nutrition (two each) and bad eating habits (one).

The reasons given for refusing to be a part of the study may suggest a particular bias in the sample. Lack of knowledge, poor health, and "bad" eating habits may be factors which effect a change on food behavior with age.

Goal Statements

Goal statements identifying personal values were rated by respondents on a 1-5 scale based on the importance of the goal to them. Four health related goals were selected by the researcher to serve as indicators of the importance of health, physical fitness and weight control to the sample. There were twelve goal statements in all.

Interview Process

The interviews were conducted from September through December, 1975. It was necessary to spend more than three hours and/or make additional appointments in order to complete the interview schedule in seven cases. The longest interview lasted six hours and required four appointments. However, the majority of the data were collected during one interview which required between two and three hours to complete.

Food Models

To assist interviewees in estimating their usual serving sizes, food models were used. The models (Christensen, 1973) were made of polyurethane and shaped into: (1) white mounds to represent serving sizes of cottage cheese, ice cream, potatoes, rice and canned fruit; (2) gray mounds to represent serving sizes of cooked vegetables and casseroles and pork and beans; (3) flattened orange and yellow mounds to represent servings of cheese, butter and margarine; and (4) brown patties to represent meat. The volume of the mounds was determined by water displacement in measuring cups. Plastic cups and bowls were used to estimate serving sizes of juice, milk, soup, lettuce salad and cereal. It was assumed that a person usually eats the same size serving for a given food from one time to

another and that an individual can estimate what quantities of the foods he/she can eat.

Interview Schedule

The researcher conducted all fifty-one interviews. Before the interview the interviewees were informed of the confidentiality of their response and the consent form was explained to each and signed by all interviewees. The interview consisted of a twenty-three page interview schedule including: demographic and food behavior data; information on changes in food behavior experienced with age; food frequency information; food portion size information (using the food models previously described); and health related and goal statements.

Data Analysis

A codebook for the NC 108 interview schedule was developed by the technical committee of the North Central Regional Experiment Station Project. The responses obtained from the NC 108 portion of the interview were punched on computer cards. The cards were processed at Iowa State University, Ames, Iowa. Printouts from the analysis included: mean daily intakes of protein, calcium, iron, vitamin A, C and thiamin for each respondent; a composite picture of the entire group of persons based on the intake of the above six nutrients; comparisons of

individuals' mean daily intakes with the 1974 Recommended Dietary Allowance; and number of four food group servings eaten each day.

Tabulation of the frequency of responses from the thirteen original questions were completed. The mean values from demographic data were used to construct a sketch of a typical respondent. The sketch of a typical respondent represented no single individual in the sample. The sketch was intended to describe the environmental factors, food behavior, and change in food behavior commonly found in the sample.

Two additional case studies of nutrition program participants were constructed. The case studies of the HDMP recipient and Title VII participant were actual participants in the study.

RESULTS

Sample Characteristics

The total sample consisted of fifty-one individuals over the age of sixty years, forty-three females and eight males, living in Huron County, Michigan. This sample represented less than one percent of the total population sixty plus years in the county. Eight percent of the respondents were recipients of home-delivered meals and eighteen percent attended an Elderly Nutrition Program regularly. Twenty-six percent of the total sample were receiving meals through nutrition programs in Huron County, Michigan. The nutrition program in Huron County currently serves approximately 500 meals per week to approximately fifteen percent of the elderly population.

The demographic characteristics of the fifty-one respondents are shown in Table 1. The mean age of the sample was 73.6 years with a range of sixty to ninety-five years. Mean annual income was an amount between $5,000 and $6,000. Eighteen percent of those interviewed had annual household incomes below $3,000. Eleven percent indicated

TABLE 1.--Demographic Characteristics of Respondents.

Demographic Characteristics	Number	Percent[a]	Range
Annual Income	n = 51		
0-$2,999	9	17.7	--
$3,000-$5,999	20	39.2	--
$6,000-$9,999	6	11.8	--
Greater than $10,000	10	19.6	$10-22,000
Don't know	6	11.8	--
Education (years completed)			
8 or less	23	45.1	2-8
9-12	12	23.5	--
Greater than 12	16	31.4	13-20
Age (years)			
60-69	18	35.3	--
70-79	25	49.0	--
80+	8	15.7	80-95
Place of Dwelling			
City (population under 5,000)	34	66.7	--
Rural non-farm	12	23.5	--
Farm	5	9.8	--
Living Arrangements			
Living alone	28	54.9	--
Living with spouse	20	39.2	--
Living with relative other than spouse	3	5.9	--
Living with person other than relative	0	0.0	--

[a]In some cases percent greater than 100 due to rounding error.

that they had no knowledge of their annual income. In some cases, it was necessary to ask the spouse to answer the question about income.

The formal education completed by the group also is shown in Table 1. Forty-five percent of the sample had an education level of eight years or less. Thirty-one percent had completed an education level beyond high school. The mean education level of those interviewed was 10.9 years with a range of two to twenty years.

Almost sixty-eight percent of the population sample lived within the limits of towns of less than 5,000 people. Five people still resided on a farm. The remainder of the respondents were rural non-farm residents.

More than half of the respondents lived alone. Forty percent lived with their spouse. The remainder lived with a relative other than a spouse.

Use of Special Diets and Vitamin Supplementation

Table 2 lists special diets and use of vitamin and/or mineral supplements. Special diets prescribed by a physician were reported by twenty-two percent of the respondents.

The most frequently (six percent) reported diet followed was the diabetic diet. Weight reduction and modified fat diets were cited by four percent of the sample each.

TABLE 2.--Use of Special Diets and Vitamin and/or Mineral Supplements by Main Meal Preparers.

Use of Diets and/or Vitamin/Mineral Supplements	Number	Percent[a]
Special Diets		
Diabetic	3	6
Weight Reduction (physician prescribed)	2	4
Modified Fat	2	4
Weight Reduction (self prescribed)	2	4
Ulcer	1	2
Restricted Salt	1	2
Vitamin and/or Mineral Supplements[b]	11	22

[a]In some cases percents greater than 100 due to rounding error.

[b]Respondents indicated whether they used supplements, the type and dosage were not described.

Both an ulcer and a restricted salt diet were reported. Four percent of the respondents were following self-prescribed weight reduction diets. All diets, both physician and self-prescribed, were reported by women.

Twenty-two percent of the respondents stated that they took a vitamin and/or mineral supplement each day. The type of preparation complex and dosage were not described by respondents. None of the respondents indicated they took more than one vitamin/mineral preparation. All respondents taking vitamin supplements were women.

Change in Food Behavior with Age

When the respondents were asked whether they had changed their food behavior as a result of age, eight percent reported no change. Fourteen percent of the respondents stated that they were eating better than they did when they were younger.

Almost seventy-eight percent changed their food behavior with age, citing loneliness and health as reasons most frequently. Twenty-eight percent of the cases stated they were eating less food less often. Twenty-six percent indicated they were no longer cooking as they had when they were younger.

Adjustments Made in Food Purchasing Behavior

The food purchasing behavior of respondents is described in Table 3. More than twenty-five percent of the annual income was spent for food by twenty-two percent of the respondents. When asked what adjustments were made because of the increase in food prices, seventy-five percent of the respondents indicated that they had made some adjustments in their food purchasing behavior. Twenty percent mentioned the high price of meat as a factor they considered when shopping. More than twenty percent of the sample stated that having a garden and preserving food were methods they used to "stretch" their food dollar.

TABLE 3.--Food Purchasing Behavior of Main Meal Preparers.

Food Purchasing Behavior	Number	Percent[a]
Percent Income for Food	n = 51	
Less than 10	2	4
11-15	11	22
16-20	6	12
21-25	10	20
26-30	2	4
Greater than 30	9	18
Don't know	11	22
Adjustments Made by Main Meal Preparers Due to an Increase in Food Prices		
Purchase foods desired	13	25
Use coupons, watch ads	18	35
Watch meat prices	10	20
Have a garden	10	20

[a]In some cases, percents greater than 100 due to rounding error.

Over one-fourth of the respondents bought the food they desired regardless of the cost. As one respondent stated, "you have to eat no matter what the cost."

Nutrient Intake of Main Meal Preparers

The dietary intake of six nutrients (calcium, protein, thiamin, iron and vitamins A and C) of main meal preparers is described in Table 4. The food frequency and food quantity data were calculated as percents of the 1974 Recommended Dietary Allowance (RDA) for men and for women over fifty-one years of age, separately.

TABLE 4.--Percent of Main Meal Preparers with Dietary Intakes Less than 66 Percent RDA, 66-100 Percent or Greater than RDA for Selected Nutrients.

Nutrient	Less Than 66% RDA[a]	66-100% RDA[a]	Greater Than 100% RDA[a]
	%	%	%
Protein	8	8	86
Calcium	22	38	42
Iron	6	22	68
Vitamin A	2	4	94
Thiamin	10	11	70
Vitamin C	4	4	94

[a]Based on 1974 individual Recommended Dietary Allowances for adult men and women 51 plus years.

Eighty-six percent of the respondents had protein intakes which exceeded one hundred percent of the 1974 RDA for protein. Combined with the percent of those reaching 66-100 percent of the RDA for protein, more than ninety percent of the respondents met at least two-thirds of the RDA for protein. The mean protein intake for this sample was 68 grams per day, with a standard deviation of 22 grams.

Calcium intake exceeded two-thirds of the RDA for seventy-eight percent of the respondents. The mean intake of calcium for the total sample was 796 milligrams per day, with a standard deviation of 341 milligrams.

Iron intake levels were below the two-thirds RDA in three cases, all male respondents. Over ninety percent of the sample met or exceeded the two-thirds of the RDA

for iron. The mean intake was 12 milligrams per day, with a standard deviation of 4.6 milligrams.

Nearly ninety-five percent of the sample had vitamin A intakes which exceeded one hundred percent of the RDA. Only one respondent had a vitamin intake that did not meet the requirements set by 2/3 RDA for vitamin A.

Vitamin C intake in ninety-four percent of the respondents exceeded one hundred percent of the RDA. Only two respondents did not meet the requirements set up by the RDA for vitamin C.

Thiamin intake met the two-thirds the RDA in eight percent of the cases. Approximately twenty percent of the respondents did not meet the two-thirds RDA for thiamin.

Importance of Goal Statements to Main Meal Preparers

Goal statements were rated for importance by main meal preparers (Table 5). The statements concerned the importance of physical fitness, weight control, the quality of the diet and disease prevention techniques to the respondent. The mean scores (Table 5) indicated that the goal statements were considered important to very important by the respondents.

TABLE 5.--Mean Rating Given by Main Meal Preparers for Selected Goal Statements.[a]

Statement	Mean Rating	Range
To maintain or improve the quality of my diet	4.5	2-5
To maintain or improve my physical fitness	4.5	2-5
To learn and practice preventative techniques for heart disease and other diseases	4.5	2-5
To maintain or achieve desirable weight	4.2	1-5

[a]Goal statements were rated by respondents for importance assigned on a 1-5 point scale. A 5 rating indicated a very important goal, a 1 rating indicated an unimportant goal.

Outstanding Event and Effects on Food Behavior

Seventy-eight percent of the respondents indicated that an event that had occurred in their life had changed their life style (Table 6). The change in life style was attributed most frequently to: retirement (twenty-four percent); death in the family (twenty-two percent); and health problems (sixteen percent). Decreased income, divorce and a move from the farm to the city were reported by four percent, each. Two percent of the respondents mentioned having no transportation while another noted increased income as an event which contributed to a life

TABLE 6.--Events and Effects Described by Main Meal Preparers as Instrumental in Changing Life Style.

Event and Effects	Number	Percent[a]
Events	n = 51	
Retirement	12	24
Death in family	11	22
No event	11	22
Health problem	8	16
Move from farm	2	4
Divorce	2	4
Decreased income	2	4
Increased income	1	2
No transportation	1	2
Other	1	2
Effect of Event on Food Behavior of Main Meal Preparers		
No change	21	42
Cook less	8	16
Eat better	6	12
Follow special diet	6	12
Have a garden now	5	10
Eat too much	2	4
Skip meals	2	4
No interest in food	1	2

[a]Percents greater than 100 due to rounding error.

style change. The remaining twenty-two percent stated that there had been no real "outstanding event" that changed their food behavior and that their life had proceeded with little change.

Changes in Food Preparation Practices

Changes in food preparation, too, have been made by some respondents. Table 7 lists the responses made by

TABLE 7.--Main Meal Preparer's Change in Practices with Age Toward Cooking.

Practices	Number	Percent[a]
Changes	n = 51	
No change	29	58
Cooking difficult when alone	14	28
Prepare less now	3	6
Experiment more with foods	2	4
Clean up is a problem	2	4
Unable to cook now	1	2
Changes in Preparation Practices for Guests		
Prepare "homemade" food	10	20
Prepare special meats with all the fixings	8	16
Prepare food the same	8	16
Other	5	10
Prepare "Grandma's" recipe	5	10
Bake something "special"	5	10
Do not have guests	4	8
Prepare something would not for self	3	6
Prepare "real meal"	3	6

[a]In some cases, percents greater than 100 due to rounding error.

main meal preparers describing how their food preparation practices have changed as they aged. Fifty-eight percent experienced no change in food preparation, either they "still loved to cook" or "never were too crazy about it to begin with." Twenty-eight percent stated that because they were left alone, they lacked the incentive to cook a meal often. One respondent was no longer able to cook because of a physical handicap. Two people found time

after retirement to experiment with foods. The remaining responses did not reflect changes in food practices attributable to aging.

Food Preparation for Guests

Over two-thirds of the respondents described guest meals as special events. Description of particular family recipes, "Grandma's recipe" or "homemade" foods were shared by the respondents with the researcher. Sixteen percent of the main meal preparers indicated they would prepare a "special meat and all the fixings" for their guests. "Special meat and all the fixings" was defined as a menu of potatoes, vegetables, salad, homemade rolls and a dessert "they had fussed over."

In preparing foods for guests, sixteen percent of the sample did nothing differently. In most cases, main meal preparers who reported preparing nothing differently for guests were preparing meals for more than two people.

Six percent of the respondents prepared foods they would never prepare for themselves because of the time involved in preparation. One female stated, "I do not consider myself a person to cook for."

Food Considered a Treat

Main meal preparers were asked what foods they would think of eating if they wanted to treat themselves.

Thirty-six percent of the respondents indicated that dessert foods, especially pie (eighteen percent), ice cream, cookies and candy bars were considered special treats. Fruits and vegetables were cited as treats by twelve percent of the interviewees.

Eight percent of the respondents could not label any food as a "treat" since they have "whatever I want." Macaroni and canned tomatoes were considered a favorite food by one gentleman, another male stated, "a cold beer." Homemade soups also were mentioned by six percent of the respondents.

Profile of Typical Respondent

The construction of the profile of a typical respondent was used to summarize the means of the demographic, food behavior and nutrient intake data of the sample population. The profile of the typical respondent is a composite picture of the respondents interviewed, not representative of any individual but rather of the general sample population.

The typical respondent in this study was a seventy-three year old female with the education of 10.9 years. Her income was between $5,000 and $6,000 per year and she spent between twenty and thirty percent of her income for food. The typical respondent neither followed a special diet nor used vitamin or mineral supplements. The typical

respondent lived alone, within a town with less than 2,500 population.

Typical respondent had experienced a change in her food behavior with age because she had been left alone and lacked the motivation to prepare a meal for herself. Health, physical fitness and "proper diet" were important to the typical respondent. Her nutrient intake, based on the 1974 RDA was lowest in calcium. The protein, vitamin A and C intakes of this typical respondent were greater than one hundred percent of the RDA.

Nutrition Program Case Studies

Twenty-five percent of the respondents were participants in nutrition programs in Huron County, Michigan. A detailed description of two nutrition program participants was made. The two case studies (a Meals on Wheels recipient and a participant in the Elderly Nutrition Program) illustrate some of the environmental factors which may precipitate food behavior changes and subsequent changes in the nutritional status of the elderly. The two cases are not meant to represent typical nutrition program participants. These case studies were chosen because of their life styles and low nutrient intakes. These case studies illustrate several factors relating the environmental effects on food behavior.

Profile of a Male Recipient of a Home-Delivered Meal.--The profile of a male Home-Delivered Meals Program participant follows. Mr. M. is seventy-nine years of age, with an income of $2,000-$3,000 a year. Mr. M. has an eighth grade education. In his earlier days Mr. M. loved to dance, but in the last two years, arthritis has left him crippled, dependent on a walker for limited mobility.

Because of his physical handicap, Mr. M. is unable to cook, since he doesn't trust himself anymore around the stove. Additionally, Mr. M. doesn't "care to eat" anymore. In the last two years Mr. M. has lost over eighty pounds, both due to this loss of interest in food and his inability to prepare his meals. His typical daily food pattern was:

Breakfast:	toast and coffee
Lunch:	home-delivered meal (three times per week): meat, potatoes, vegetables, fruit, milk, dessert; on days when home-delivered meals are not provided, a sandwich was consumed.
Dinner:	macaroni or eggs or leftover food from home-delivered lunch; neighbors occasionally brought him a casserole.

Before retirement and the recent physical complications caused by arthritis, Mr. M. had three "big meals a day." Now, he admits to eating simpler meals, with much less variety of foods over the course of a day or week's time.

Profile of a Title VII Nutrition Program Participant.--Mr. C. is a seventy-five year old male with a second grade education. His income is approximately $2,000 to $3,000 a year. Mr. C. has a garden and does his own canning and housekeeping, owns a car and feels "pretty healthy." He has a grandson living with him but they rarely share meals because of the boy's schedule.

Mr. C. stated that, "He didn't care if he never sees meats again" and that he never liked fruit. His typical daily food pattern was:

Breakfast:	coffee and cookies
Lunch:	Title VII meal about three times a week (meat, servings of fruit/ vegetables, bread, butter, milk and dessert) or on other days he ate warm potatoes, bread and butter.
Snacks:	Before bedtime--twenty-four saltine crackers broken into a bowl of milk.

Mr. C. stated that he noticed he eats less food and not as many different kinds of food these days except when he attends the Title VII program. His favorite food is cooked macaroni and tomatoes which he "could eat all day." When he has guests he serves a T.V. dinner which he thinks is the "best invention ever."

Mr. C.'s nutrient intake was below the two-thirds the 1974 RDA in protein, iron, thiamin, vitamins A and C. Mr. C. ate 1.5 servings of dairy products, 0.6 servings of protein, less than 0.1 servings of dark green or dark yellow fruits and vegetables, 2.3 servings of high sugar

sources and 2.0 servings of high empty calorie sources. Of the total sample, Mr. C.'s diet was deficient (below the two-thirds RDA) in the largest number (five) of nutrients: protein, vitamin C and A, iron, and thiamin.

DISCUSSION, SUMMARY, CONCLUSIONS

Data were collected and analyzed to determine the changes in food behavior experienced with age and the dietary intake of a selected, rural population in Michigan. Little data have been collected which describe the environmental factors which affect the food behavior of the aged.

An interview schedule with added open-end questions was used to determine the changes experienced in food behavior of a rural Michigan elderly population. The added questions were designed to allow for original personal responses. With the open-end questions, the respondents were not limited in their choice of responses. An open-end interview schedule does require more time to administer and tabulation of responses is proportionately more complex than a structured questionnaire. As Young and Scrimshaw (1975) found, providing more time when interviewing older adults often results in more complete and useful data.

Demographic Data

No correlations or associations were completed for demographic characteristics and the nutrient intake of the

sample. The demographic data collected were used only to describe the population.

In general, the annual income and education of the sample was higher than that of other elderly populations studied (Huntanen, 1971; and Todhunter, et al., 1974). The effect of income education and age on the nutrient intake of the sample was not determined.

Use of Special Diets and Vitamin Supplements

The use of special diets in twenty-two percent of the sample was similar to the results of Todhunter and coworkers (1974) who found that eighteen percent of the elderly people interviewed followed a special diet. The elderly following physician-prescribed special diets in Huntanen's (1971) study were those meeting two-thirds the RDA for nutrients. Le Bovit (1965) concluded that in the elderly subjects, special diets were not associated with lowered nutrient intakes. Of the eleven respondents on special diets in this study, two had nutrient intakes below the two-thirds RDA for calcium. In this sample, special diets generally were not related to inadequate nutrient intake.

The use of vitamin/mineral supplements in this study (twenty-two percent) was a much lower percentage of the sample than found by Steinkamp and coworkers (1965) thirty percent, Jordan and coworkers (1954) forty-four percent,

and Schlenker (1976) forty-three percent. Schlenker (1976) found that the supplements used by forty-three percent of the elderly women sampled did not supply the nutrient that was low in their diet. Le Bovit (1965) found that fifty percent of those taking supplements already had good diets.

A detailed look at the diets of the twenty-two percent of the respondents taking vitamins in this sample showed that nutrient intakes from food were sufficient in all cases to meet at least two-thirds of the RDA for all nutrients. The inclusion of vitamin or mineral preparations to supplement the diets of the female respondents was unnecessary.

Change in Food Behavior

As reflected in the preceding composite profile (see page 42) changes in food behavior with age occurred within this rural population. Those interviewed who had indicated that their food behavior changed as a result of aging did state that the change decreased their total food intake. Schlenker (1976) also found that nutrient intake decreased as the individual aged and that a decrease in energy intake did not result in poor nutrition. The perceived change in food behavior of this population was adaptive to the need to decrease caloric intake with age.

The high percentage (seventy-eight percent) of perceived change in food behavior experienced with age by

this elderly population does not correspond with the results of Huntanen's (1971) study of another elderly population in Michigan. Huntanen (1971) found that the dietary patterns tend to become permanent and change little with age.

Loneliness and health were cited as major reasons for change in food behavior of the rural elderly sampled which may lead to cooking less often and eating smaller quantities of food. These results agree with results found by other researchers. Todhunter and coworkers (1974) found that about forty percent of the elderly interviewed had changed their food behavior because of health reasons. Medical and social reasons were most often given for changes in eating habits of the one hundred elderly New York residents interviewed by Jordan and coworkers (1954).

The effect of change in food behavior on nutrient intake in this study, cannot be described precisely with the available data. The respondents had adequate intake levels (above two-thirds RDA) for protein, iron, thiamin, calcium and vitamins A and C in most cases. The adequate nutrient intakes suggest that the perceived and actual changes in food behavior of this sample do not lead to poor nutrient intakes.

Loneliness and eating alone were cited by twelve percent of the respondents with the lowest nutrient intake levels as factors contributing to their lack of motivation

to prepare meals. Davidson and coworkers (1962) found that socially isolated men and women had less variety in their meal pattern and had lower mean intakes of all nutrients but iron. Guggenheim and Margulec (1965) found a higher incidence of poor diets among persons living alone. Schlenker (1976) found that women who ate alone had lowered intakes of protein, iron and niacin. However, Batata and coworkers (1967) concluded that the diet of the older person living alone was no more likely to be deficient than those living with companions. The data here suggested that eating alone was a factor contributing to low nutrient intake but would not cause necessarily a poor diet.

Adjustments Made in Food Purchasing

Decreased income and/or high food prices were not considered factors in securing an adequate diet by this sample. This does not support Watkin's (1975) concept that economic deprivation associated with the elderly frequently leads to inadequate food purchase and intakes, since food is the easiest item to adjust on a fixed income.

When faced with increased food prices, the majority of those interviewed used coupons, purchased cheaper meats, or purchased foods advertised as specials. Many respondents indicated they had made similar adjustments throughout their life. The twenty-five percent who made no adjustments in food purchasing behavior because of rising food prices

accepted the high food prices because "you have to eat" regardless of the price of food. The stereotyped concept that the elderly "cannot afford to buy" an adequate diet, was not supported in statements made by these rural elderly respondents.

RDA

Dietary data is evaluated often using the RDA as a standard. The recommended dietary allowances are determined as levels of intake of essential nutrients considered ". . . on the basis of available scientific knowledge to be adequate to meet the known nutritional needs of every healthy person" (Food and Nutrition Board, National Research Council, 1974), plus a safety factor. The RDA are meant to be goals at which to aim in providing for the nutritional needs of groups of people (Muller and Voris, 1969). Evaluating the food intake of a population on the basis of the RDA is an acceptable method used in describing dietary adequacy. The use of RDA as a standard measure of dietary adequacy allows for comparisons among other studies. The nutrient intake from food frequency data in this sample was calculated separately as a percentage of the 1974 RDA for men and women 51 years and older.

Nutrient Intake

The nutrient intake most frequently below two-thirds the RDA in diets of respondents was calcium in twenty-two percent of the sample. Le Bovit (1965) also found that calcium intake of the elderly he interviewed was low. The mean intake of calcium was low in Schlenker's (1976) sample, too.

Seventy-eight percent of this sample did meet two-thirds of RDA for calcium. This was similar to the findings of Fry and coworkers (1963) who determined that eighty-two percent of the elderly met two-thirds the 1958 RDA for calcium.

Iron intake levels were lowest for men in this study. The mean intake for men was 10.6 milligrams with standard deviation of 5.7 milligrams. The mean intake of iron for females was 12.5 milligrams with a standard deviation of 4.4 milligrams. The low iron levels found in individual cases of the Ten State Nutrition Survey (U.S. Department HEW, 1972) were apparent in a very small portion of this sample. The poor iron intake levels of the meals in this sample reflected a poor dietary history. Low (below two-thirds RDA) levels of iron were accompanied by low intakes of protein and thiamin in men.

Protein intakes exceeded the two-thirds RDA in eighty-six percent of this sample. This corresponds with Huntanen's (1971) findings of eighty-nine percent of the

elderly sample meeting at least two-thirds RDA for protein. Protein intakes of the elderly subjects sampled by Steinkamp and coworkers (1965) generally met recommended protein levels also.

The diets of this population did not indicate that there was difficulty in securing adequate protein. However, twenty percent of the sample had made adjustments when purchasing meat. The adjustment made was to purchase cheaper cuts of meat, not to exclude meat from the diet.

Fry and coworkers (1963) found ninety percent of their sample had vitamin A intakes greater than two-thirds the RDA. The similarly high (exceeding one hundred percent RDA) vitamin A intakes in ninety-four percent of this sample may be a cause for alarm, considering the long term effects of high vitamin A intakes. However, Schlenker (1976) found that the serum vitamin A and carotene levels were not correlated with dietary intakes of the elderly women she sampled. This may suggest, as did Brin and coworkers (1964) that there is a need to combine biochemical tests and diet recall methods to get an accurate estimate of intake and consequent nutritional status of elderly subjects.

The procedure for data collection, using food frequency estimates to calculate percent RDA, is not a precise measure of intake. As Madden and associates (1976) found, the elderly tend to overrate their diet when utilizing twenty-four hour recall and food frequency methods. And,

as a few respondents indicated, "it sounds like I eat alot of food, doesn't it?" which illustrates Madden's findings.

Vitamin C intake levels were high in this sample (ninety-four percent of the sample had intakes for vitamin C greater than one hundred percent of the RDA). In Le Bovit's (1965) sample, vitamin C was the nutrient most often in short supply. Steinkamp and coworkers (1965) found twenty-five percent of the subjects with low levels of vitamin C intake. Todhunter and coworkers' (1974) study found only fifty-eight percent of those interviewed with one hundred percent of the RDA for vitamin C.

The seemingly high intake of vitamin C, compared with other findings, may be due to the scheduling of interviewing in the fall. During the fall of the year garden produce was plentiful. Many respondents indicated they had gardens or had received fruits and vegetables from family and/or friends. If the interviewing had been conducted in the winter, the seasonal vitamin C sources may have been absent.

Of the ten percent of the respondents not meeting two-thirds the RDA for thiamin, six percent had intakes below two-thirds for at least two other nutrients. Schlenker (1976) found individual deficiencies in thiamin intakes especially in those with inadequate protein intakes. In this sample, three of the five respondents not meeting two-thirds the RDA for thiamin also did not meet two-thirds the RDA for protein.

Importance of Goals

There was general consensus within the sample of the importance of physical fitness, disease prevention and weight control. The importance of diet and health to the respondents was illustrated by comments such as: "I'm sure I'm still here because I eat right" or "too many old people neglect themselves, I make sure I have three well balanced meals a day." This would indicate that diet considered in relation to health was a strong motivator for this elderly population.

Outstanding Events and Effects on Food Behavior

The events which cause change in life style mentioned most frequently were retirement, death in the family, and health problems. There were three cases in which decreased income and lack of transportation affected the life style. The older adult with inadequate income and inadequate transportation was not typical of this population.

The changes in food behavior which resulted from a change in life style were indicative of change leading to decreased food intake in the majority of cases (greater than fifty percent). When change involved eating smaller amounts of food, the change was adaptive to the needs of the elderly for decreased caloric intake. However, when food behavior changes were translated into erratic food

behaviors (preparing food less often, skipping meals or eating too much food), the traditional food patterns were not stable. Adequate nutrient intake was not maintained by the sixteen percent of the population that had cited that their changes in food behavior involved one of the preceding food behaviors. As the results indicate, following special diets did not predispose the respondents to inadequate food intakes.

Food for Guests and Food Considered Treats

The foods prepared differently for guests by this rural population involved long preparation times or family recipes, in most cases. A trend to prepare something unusual, or something which would be considered "special" by the guests was evident. Of those doing nothing differently for guests than for self, many indicated their meals were always "like company meals" because they still prepared meals for the family (more than two or three people in most cases). The fact that seventy-six percent of the sample demonstrated special food preparation for guests implies that food has special meaning for people over the age of sixty. Desserts and homemade baked foods were considered by the sample as a treat. These items were mentioned most frequently as giving high satisfaction to the individual. Food remains an important component in the lives of the elderly. This finding supports the concept that food and drink are important in the social lives of older adults.

Case Studies

The case studies constructed from data collected using the interview schedule and field notes illustrate the food behavior of two male nutrition program participants. Both men expressed a noticeable decrease in the variety of foods they had been consuming. In one case, the development of a physical handicap interfered with food preparation. In the other case, the loss of the spouse, who had done the majority of the food preparation in the home, lead to a simplified diet which was easy for the gentlemen to prepare.

Both men communicated to the researcher that the respective nutrition programs that they participated in, provided a "real meal" which was a luxury for them.

The case studies illustrate the findings of Exton-Smith (1968) that men living alone generally have poorer diets due to their limited experience with food preparation. The potential vulnerability to nutritional inadequacy of men less accustomed to food preparation was documented in these cases.

Other Nutrition Program Participants

The other nutrition program participants interviewed were either men living alone, or "isolated" women on special diets, or men and women with physical handicaps. The meals and/or social involvement provided through the

nutrition program (as described by the respondents) did improve the "isolation" and problems with procurement of food due to physical handicaps.

The impact of the meal on the nutritional status of participants in this study was not determined. Generally, the variety in the "balanced meal" afforded the only opportunity to include fruits and vegetables in the diet of some participants. These findings correspond to Davidson and coworkers (1962) who found that socially isolated men and women had less variety in the meal pattern with lowered mean daily intakes of all nutrients but iron.

Defining a need for nutritional intervention because of isolation or physical handicaps or poor health or inability to prepare meals is recommended. However, having only three or five meals available each week through nutrition programs leaves the "nutritionally at risk" participant with no assistance for the remaining sixteen to eighteen meals they must provide each week. In order to prevent institutionalization and improve nutritional intake, it is necessary to supply more than three meals a week for those at "nutritional risk." The ten percent of the sample who had intakes below two-thirds RDA for two or more nutrients and were participants of nutrition programs support the need for a more comprehensive nutrition program aimed at intervention of nutrition problems, in which success is defined as improvement of nutritional and physical health.

General Summary

The "typical aged person" in this study was not chronically ill, poor and isolated. Income, education and the lack of transportation were not related to proper nutrient intake in this study. The dietary intake of a rural population exceeded one hundred percent of the RDA for six nutrients in most cases. A varied diet in proper amounts without supplementation did supply the nutrients required. As illustrated by the twelve percent of the population with intakes below two-thirds the RDA for two or more nutrients, certain environmental factors affect nutrient intake. These factors include: living and eating alone, having specific health problems, or erratic eating patterns (skipping meals and ingesting diets with limited varieties of foods).

Changes in food behavior were made in response to "outstanding events" occurring in the lives of over half those sampled, including loss of spouse, retirement and/or health problems. The food behavior changes occurring were: cooking less and eating less food, following special diets, eating better, having a garden, skipping meals, losing interest in food and eating too much.

In most cases, the perceived change in food behavior experienced was adaptive to the changing nutritional needs of the older adult. Because of the design of this research,

the effect of change in food behavior on nutritional intake was difficult to ascertain.

The specific environmental factors of the nutrition program participants interviewed were translated into food behavior changes and resulted in the poorest diets of the sample. Of the twelve percent of respondents below the two-thirds RDA for two or more nutrients, ten percent were nutrition program participants. The findings of this study suggest that those factors which contribute to "nutritional risks" may be found in:

a. men who have lost their spouse and are left to supply their own meals;
b. isolated men and/or women who may lack the incentive to prepare adequate meals;
c. those who have had poor lifetime food patterns or developed food behaviors with age or simplified diets and erratic or unusual eating patterns;
d. those with physical handicaps and limited mobility;
e. those with low incomes.

The environmental factors listed above may be significant indicators of elderly persons at nutritional risk. The food behavior and dietary intake data of the population have supported these conclusions. It must be clarified that these factors (death, health, isolation, simplified

diets, physical handicaps and low incomes) in themselves do not cause poor diets in the elderly. Rather, these factors may influence changes in food behavior which result in less than optimal nutrition for the elderly.

Limitations of the Research and Needs for Future Research

1. Only trends can be defined from data collected on a purposively drawn small sample of fifty-one.

2. The researcher's familiarity with the geographical area as an indigenous interviewer may be a source of potential bias in interviewing.

3. The cross-sectional nature of this investigation can indicate perceived change in food behavior. Actual change in food behavior would require longitudinal research utilizing different tools.

4. The findings of this research are limited by the accuracy of the food frequency recall as a method for estimating food intake.

If the quality of the nutritional environment of the elderly is to be maintained in the context of environmental change, the conditions for the preservation of desirable food behaviors in a changing culture must be determined.

In view of the limitations of this research there exists a need in future research to:

1. develop, test, and establish a reliable instrument to determine food behavior and nutrient intake of the elderly population;

2. determine the nutritional needs of the elderly with greater accuracy than RDA;

3. discover the impact of the environment and changes in life style and food behavior;

4. assess the impact of nutrition programs on food behavior and nutritional status of the target population to evaluate the effectiveness of nutrition intervention programs; and

5. identify environmental variables significantly related to nutrition problems in the independent older person to design nutrition intervention programs which diminish the effect of environmental variables.

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APPENDIX

Changes in Food Behavior with Age

Consent Form

I, _____, the undersigned, willingly consent to be interviewed about my food behavior and personal attitudes and goals.

I do so understanding my responses will contribute to the goals of this research project which has been explained to me. I have had the opportunity to ask questions. I understand there is no obligation to stay in the study and all my answers will be held in strict confidence. I also may request a summary of the study. The possible benefits and risks have been explained.

_____
Participant

_____
Interviewer

_____
Date

_____
Address

Date of Interview _____ Schedule Number _____

Time Interview Began: Area Number _____

_____ a.m. _____ p.m. Segment Number _____

Time Interview Ended: Household Number _____

_____ a.m. _____ p.m. Interviewer's Name _____

Nutrition Study

Michigan State University

Department of Food Science and Human Nutrition

NC 108 - Changes in Food Practices for Better Nutrition

MAIN MEAL PREPARER

Introduction

Hello, I'm _____ from the Experiment Station at Michigan State University. We are doing a survey to learn more about the foods people eat and why they eat these foods. We would very much appreciate your answering some questions for us. I need to speak with the main meal preparer of your family--that is the person who does most of the meal preparation for your family--be it husband, wife, son, daughter, grandmother or grandfather or housekeeper.

I.D. No. _____

SOCIAL FACTORS IN FOOD SELECTION

FACE SHEET

THIS INFORMATION IS TO BE COMPLETED BY INTERVIEWER.

Date of Interview: _____, 19____

Location of Interview: _____, _____
(City) (State)

Size of City: _____

Sex of Respondent (circle the correct letter): M F

1. Who is the main food preparer in this household? _____

2. What is the age and sex of each person in this household (including the main food preparer)?

Members of Household

Relation to Head	Age	Sex	Relation to Head	Age	Sex
Head of Household			4.		
2.			5.		
3.			6.		

3. What is the relationship of each person to the head of the household (including the main food preparer)?

4. What is the highest grade that you have completed in school?

5. What certificates or degrees have you earned beyond high school?

0=Not applicable no high school degree
1=High school diploma only
2=Technical School, specify
3=Associate Arts Degree
4=Bachelor's Degree (B.A. or B.S.)
5=Master's Degree
6=D.V.M., M.D., or D.O.
7=Ph.D. or equivalent
8=Other, Specify

NC-108 Regional Core Items
Food Science and Human Nutrition
Michigan State University

Developed
June, 1973

6. What is the highest grade that the head of household has completed in school?

7. What certificates or degrees has the head of the household earned beyond high school?

0=Not applicable no high school degree
1=High school diploma only
2=Technical school, specify
3=Associate Arts Degree
4=Bachelor's Degree (B.A. or B.S.)
5=Master's Degree
6=D.V.M., M.D., or D.O.
7=Ph.D. or equivalent
8=Other, specify

8. Have you had any high school and/or college training in food preparation and nutrition?

9. What is the occupation of the head of this household?

10. During the past year, have you used food stamps?

11. How many months during the past year did you use food stamps?

12. When you are using food stamps, what is approximately the amount you spend on food stamps per month?

13. What is the money value of your food stamps per month?

14. Approximately how many meals which you eat are prepared and eaten in your home per week?

0__, 1__, 2__, 3__, 4__, 5__, 6__, 7__, 8__, 9__,
10 or more___.

15. Approximately how many meals which you eat are prepared at a restaurant, cafeteria, or obtained from a vending machine per week?

0__, 1__, 2__, 3__, 4__, 5__, 6__, 7__, 8__, 9__,
10 or more__.

16. Approximately how much money do you spend for groceries in an average week, including milk and meal, excluding cigarettes and beer?

17. Which category best represents your total family income, before taxes?

1.	under $1,000	2.	$1,000 to $1,999
3.	$2,000 to $2,999	4.	$3,000 to $3,999
5.	$4,000 to $4,999	6.	$5,000 to $5,999
7.	$6,000 to $8,999	8.	$7,000 to $7,999
9.	$8,000 to $8,999	10.	$9,000 to $9,999
11.	$10,000 to $11,999	12.	$12,000 to $14,999
13.	$15,000 to $24,999	14.	$25,000 to $49,999

18. I am trying to establish the types of changes people experience in their food habits with age--could you reflect on your food habits in the last ___ years (researcher's note: calculate number of years since reaching 60 years of age), have you noticed any changes? New foods, new diet, changes in selection, preparation or attitude about food?

19. How do you manage with food prices and the tight money situation, are you doing anything special with your food dollar?

20. Have there been any outstanding events in your life which have changed the way you live? (PROBE: such as moving, death in the family or retirement?)

21. In what ways has _____ (fill in response from Question #20) changed your food habits? (PROBE: when my grandfather died, my grandmother suddenly quit cooking, and when my youngest brother left home, my mother found herself "not bothering" with meals. Do you find the same kinds of things happening in your life since _____?)

22. When you want to treat yourself, what types of foods do you buy and prepare?

23. When the family visits, or perhaps you have guests, what kinds of foods do you prepare, anything differently?

24. Before _____ (fill in outstanding event here) how many times a day did you eat?

25. Could you describe your meal pattern in the last _____ (calculate since reaching 60) years? (PROBE: how many meals, when, how many different dishes served at each).

26. Before _____ (fill in outstanding event from Question #20) what types of meals did you serve, that is about how many dishes, of what type did you prepare for your meals?

27. Since _____ (fill in outstanding event from Question #20) have you noticed any change in the amount of variety within each meal? (PROBE: the number of different foods you have within each meal?)

28. What was the maximum number of people living with you that you cooked for?

29. How many people do you cook for now?

30. How has this affected your attitude toward cooking? (PROBE: how do you feel about cooking now, does the number served affect the foods you prepare, how?)

31. Are you satisfied with the kinds of foods you are eating?

32. If no, what kinds of changes would you like to make in the foods you eat?

33. If yes, would you make any changes in the kinds of foods you are eating? If yes, what changes would you make?

<u>This section is about you and your own eating habits</u>.

34. Do you usually eat at approximately the same times each day?

35. On the average, how many days per week do you eat a morning meal?

36. On the average, how many of these morning meals which you eat are prepared and eaten in your home or carried with you and eaten away from home?

37. On the average, how many of these morning meals are prepared at a restaurant, cafeteria, or obtained from a vending machine?

38. On the average, how many days a week do you eat a mid-day meal?

39. On the average, how many days per week do you eat a mid-day meal which is prepared in your home (this includes a sack lunch prepared at home)?

40. On the average, how many of your mid-day meals are prepared at a restaurant, cafeteria, or obtained from a vending machine?

41. On the average, how many days per week do you eat an evening meal?

42. On the average, how many of your evening meals are prepared in your home (this includes a sack lunch prepared at home)?

43. On the average, how many of your evening meals are prepared at a restaurant, cafeteria, or obtained from a vending machine?

44. On the average, how many snacks and drinks (other than coffee or tea) per day do you eat or drink in the:

    morning _____

    afternoon _____

    evening _____

45. Would you please indicate to me which of the following diets you are currently following?

    0. No diet
    1. For gaining weight
    2. For allergy
    3. Diabetic
    4. Modified fat
    5. Restricted salt
    6. Ulcer diet
    7. High protein
    8. Low cholesterol diet
    9. Weight reduction (own prescription)
    10. Weight reduction (doctor's prescription)

46. If a diet you are presently on is not on this list, what is it?

I have just asked you what your usual food pattern for meals and snacks is. Now I am going to ask you how often you eat certain food items. I'd like you to give the answer something like this: number of times per day, or number of times per week, or number of times per month, or number of times per year, or never. Please answer for yourself only. We are interested in asking about milk you drink. There are five (5) kinds of milk commonly consumed. They are whole milk, 2% milk, skim milk, reconstituted dry milk, and chocolate milk or cocoa. Which of these kinds of milk do you drink? "How often do you drink _____?"

		No. of times	(Code) 1 2 3 4 Frequency	Food Code
47.	1 glass, whole milk		DWMY	
48.	1 glass, 2% milk		DWMY	
49.	1 glass, skim milk		DWMY	
50.	1 glass, reconstituted dry milk (specify brand):		DWMY	
51.	1 glass chocolate milk or 1 cup cocoa		DWMY	

"How often do you eat (or drink) _____?"

		No. of times	(Code) 1 2 3 4 Frequency	Food Code
52.	Milk on cereal		DWMY	
53.	Milk or cream in coffee (specify kind):		DWMY	
54.	Pudding, yogurt, or custard		DWMY	
55.	Ice cream		DWMY	
56.	Cottage cheese		DWMY	
57.	Other cheeses and cheese dishes		DWMY	

		No. of times	(Code) 1 2 3 4 Frequency	Food Code
58.	How many times do you eat meat per week? This is meat of any kind: plain, in mixtures, or in sandwiches, excluding ordinary bacon.		DWMY	
59.	How many of these (insert the number given in Q. #58) meat servings would usually be ham, pork, sausage, cold cuts or hot dogs? Don't count the number of times you eat ordinary bacon.		W	
60.	How many of these (insert the number given in Q. #58) meat servings would usually be beef or lamb?		W	
61.	How many of these (insert the number given in Q. #58) meat servings would be chicken, turkey or fish?		W	
62.	Of the (insert the number given in Q. #58) servings of meat, how many of these would be plain meat, not mixed with anything?		W	
63.	Of the (insert the number given in Q. #58) servings of meat, how many would be mistures: casserole, stew, meaty soups, spegetti with meat sauce, etc.?		W	
64.	Of the (insert the number given in Q. #58) servings of meat, how many would be sandwiches, hot dogs or hamburgers on a bun?		W	
65.	Liver		DWMY	
66.	Eggs, such as scrambled, fried, poached, deviled, etc., but not those used in baking		DWMY	

		No. of times	(Code) 1 2 3 4 Frequency	Food Code
67.	Peanut butter or nuts		DWMY	
68.	Cooked dried beans, such as pork 'n beans, lentils, bean soup, soy beans, etc.		DWMY	
69.	Carrots, cooked or raw		DWMY	
70.	Squash, all kinds except zucchini		DWMY	
71.	Sweet potatoes or pumpkin		DWMY	
72.	Broccoli		DWMY	
73.	Tomato soup or vegetable soup		DWMY	
74.	Green beans, peas or corn		DWMY	
75.	Brussel sprouts		DWMY	
76.	Cabbage		DWMY	
77.	Other vegetables frequently eaten. Specify:		DWMY	
78.	Other vegetables frequently eaten. Specify:		DWMY	
79.	Rice, such as instant, regular long, cooking, converted, brown, wild, rice mix. Specify kind:		DWMY	
80.	Noodles, macaroni or spegetti		DWMY	
81.	Instant mashed potatoes		DWMY	
82.	Frozen potatoes, such as french fried, tater tots, or hash browns		DWMY	
83.	Cooked fresh potatoes, such as baked, boiled, or fried		DWMY	
84.	Pizza		DWMY	

		No. of times	(Code) 1 2 3 4 Frequency	Food Code
85.	Lettuce salad		DWMY	
86.	Fortified fruit-flavored drink, such as Hi C, Tang, Start, Awake, Orange +, Wagner's. Specify kind:		DWMY	
87.	Oranges, orange juice, grapefruit, grapefruit juice, or tangerines		DWMY	
88.	Other fruit juices, excluding tomato, fortified fruit-flavored, orange, and grapefruit juices. Specify:		DWMY	
89.	Other fruit juices. Specify:		DWMY	
90.	Apples, bananas and pears		DWMY	
91.	Canned peaches, canned applesauce, canned fruit cocktail, canned pears, canned apricots, and canned pineapple		DWMY	
92.	Dried apricots, prunes, raisins, and figs. Specify:		DWMY	
93.	Hot or cold cereal. Specify brand:		DWMY	
94.	Bread, 1 piece, such as toast, sandwich bread, french toast, rolls, biscuits, muffins, hamburger buns, hot dog buns, etc.		DWMY	
95.	Is the bread usually enriched or unenriched? Don't know enriched, unenriched		DWMY	
96.	Sweet rolls, donuts, one serving		DWMY	
97.	Pancakes, waffles, 1-4 inch diameter		DWMY	
98.	Butter or margarine, one serving such as butter or margarine placed on potatoes, vegetables, bread, etc., except in baking		DWMY	

		No. of times	(Code) 1 2 3 4 Frequency	Food Code
99.	Pie, pastry, cake, cookies, baked desserts		DWMY	
100.	Candy or candy bars		DWMY	
101.	Crispy, munching foods, such as potato chips, corn chips, pretzels, popcorn, fritos		DWMY	
102.	Crackers		DWMY	
103.	Sugar, syrup, honey, jam, jelly, marmalade, preserves, apple butter		DWMY	
104.	Low calorie pop		DWMY	
105.	Regular pop or kool aid		DWMY	
106.	Instant breakfast		DWMY	
107.	Dietary beverage, such as Slender, Metrecal, Sego, etc.		DWMY	
108.	Tea or coffee		DWMY	
109.	Beer, wine, whiskey or other alcoholic beverages		DWMY	
110.	Vitamin or mineral supplements		DWMY	
	Tomatoes, such as canned, raw, in sauce, or as tomato juice, but excluding catsup			
111.	In season:		DWMY	
112.	Out of Season:		DWMY	
	Dark leafy greens, such as chard, spinach, beet greens, dandelion greens or turnip greens			
113.	In Season:		DWMY	
114.	Out of Season:		DWMY	

		No. of times	(Code) 1 2 3 4 Frequency	Food Code
	Muskmelon or Canteloupe			
115.	In Season:		DWMY	
116.	Out of Season:		DWMY	
	Peaches			
117.	In Season:		DWMY	
118.	Out of Season:		DWMY	

(INTERVIEWER: ASSEMBLE FOOD MODELS.)

In order to help estimate the size of servings of certain foods you eat, I have several food models representing different serving sizes, each labeled with a number. Could you tell me which model or models most closely resemble the size of serving of _____ (insert food) that you usually eat?

Add together both first and second helpings.

		MODEL	PROPORTION OF MODEL
(White Models)			
119.	Ice cream	— — —	— —
120.	Cottage Cheese	— — —	— —
121.	Potatoes	— — —	— —
122.	Rice	— — —	— —
123.	Canned fruit	— — —	— —
(Gray Models)			
124.	Casserole	— — —	— —
125.	Cooked vegetables	— — —	— —
126.	Cooked dried beans, such as pork and beans	— — —	— —
(Bowl) (MARKED IN ONE CUP UNITS)			
127.	Tomato or vegetable soup	— — —	— —

	MODEL	PROPORTION OF MODEL
128. Cereal	— — —	— —
129. Lettuce Salad	— — —	— —
(Brown Models)		
130. Plain meat, no fat or bone	— — —	— —
(Glasses)		
131. Milk	— — —	— —
132. Orange or grapefruit juice	— — —	— —
(Orange Models)		
133. Cheese	— — —	— —
(Yellow Models)		
134. Butter or margarine	— — —	— —

135. After you left home to go to work, school or the military, but before marriage, did you eating habits change in any way?

136. How did they change?

137. After you were married, did your eating habits change in any way?

138. How did they change?

139. After you had children eating with the family, did your eating habits change in any way?

140. How did they change?

We are interested in your feelings or opinions about the following statements. You will probably agree with some of these statements and disagree with some of them.

After each statement, tell me if you agree with the statement or disagree with the statement. After you have done this please indicate how strongly you agree or disagree with the statement. For example, if it really doesn't make much difference to you, if you agree or disagree with the statement you would rate the statement one (1). If you very strongly agree or disagree with the statement, you would rate it five (5). For some statements, the numbers 2, 3 or 4 may better describe how strongly you agree or disagree with the statement. If this is the case, you would rate the statement the appropriate number.

Time spent by a person in finding out about new ideas and practices is time well spent.	A	D	1	2	3	4	5
I think traditional ways are the best ways of doing things.	A	D	1	2	3	4	5
The man who stands alone is the man who is admired.	A	D	1	2	3	4	5
About the only thing that science has accomplished for the individual is to make life more complicated.	A	D	1	2	3	4	5
Education is valuable but it will never be as valuable as experience for success.	A	D	1	2	3	4	5
Everything considered, all of the scientific developments in this country have done about as much harm as good.	A	D	1	2	3	4	5
Fate seems to decide some people will be successful--others failures.	A	D	1	2	3	4	5
It is more important for people to make decisions on the basis of past experience than to try to find new ways of doing things.	A	D	1	2	3	4	5

Many people have become so scientific they have forgotten the importance of good practical judgment.	A	D	1	2	3	4	5
One of the best indicators of whether a man will be successful is his ability to make his own decisions.	A	D	1	2	3	4	5
If a man wants a thing done right, he must do it himself.	A	D	1	2	3	4	5
Young people today are too willing to take chances because they have never known how tough times can be.	A	D	1	2	3	4	5
Actually, you can rely on very few people.	A	D	1	2	3	4	5
The future is in the hands of fate and we might as well accept it.	A	D	1	2	3	4	5
The most important function of education is to teach a person to be independent.	A	D	1	2	3	4	5
In making decisions it is more important to follow one's own judgment rather than to do what other people are doing.	A	D	1	2	3	4	5
I regard myself as the kind of person who is willing to take a few more risks than the average person.	A	D	1	2	3	4	5
Everyone should have some money laid aside for a "rainy day."	A	D	1	2	3	4	5
I'm not concerned about what my neighbors think of the way I live.	A	D	1	2	3	4	5
Probably the best guide in making decisions is what has worked in the past.	A	D	1	2	3	4	5

The best advice to a young family is to be cautious.	A	D	1	2	3	4	5
There is really no reason for man to explore outer space.	A	D	1	2	3	4	5
We should view whatever happens to us as planned by forces beyond our control.	A	D	1	2	3	4	5
In making decisions it is better to think in terms of minimizing losses rather than maximizing profits.	A	D	1	2	3	4	5
The person who gets ahead fastest is the one who sticks to the old proven way of doing things.	A	D	1	2	3	4	5
I would rather invest money in a savings account in a bank than in the stock market.	A	D	1	2	3	4	5
Man's future depends primarily upon the technical advances made by scientific research.	A	D	1	2	3	4	5
Scientific information is a necessity to a person in making decisions.	A	D	1	2	3	4	5
Much of the scientific information people receive is too impractical to be of value.	A	D	1	2	3	4	5
Man is the victim of circumstances beyond his control.	A	D	1	2	3	4	5

GOALS

5 POINT LIKERT METHOD

People vary greatly in the goals they consider important. I will read 12 goals to you. I would like to know how you feel about each goal. If you feel the goal is important to you, you would use the number at the right hand side of the scale on CARD _____. If the goal is not very important, you would use a number at the left hand side of the scale. The number you choose depends on how strongly you feel about the importance of the goal.

For example, consider the goal:

Be a Good Citizen

If this goal is very important to you, you would give it a 5. If it is somewhat important, you would give it a 4. If this goal is not important at all to you, you would give it a 1. If it is not important but you don't feel so strongly about it, you would give it a 2. You can use any number on the scale to describe how you feel about the importance of each goal.

		Circle Response				
1.	Be a good manager of money and time	1	2	3	4	5
2.	Gain and maintain the respect of people outside the family	1	2	3	4	5
3.	Maintain or improve the quality of my diet	1	2	3	4	5
4.	Maintain or improve my physical fitness	1	2	3	4	5
5.	Be active in community or church affairs	1	2	3	4	5
6.	Increase money income	1	2	3	4	5
7.	Learn and practice preventive techniques for heart disease	1	2	3	4	5
8.	Obtain security--financial, etc.	1	2	3	4	5
9.	Reduce debts or increase savings	1	2	3	4	5
10.	Maintain or achieve desirable weight	1	2	3	4	5
11.	Cloth myself and family attractively	1	2	3	4	5
12.	Maintain or improve the outside appearance of the house and yard	1	2	3	4	5