

RELATIONSHIPS AMONG FOOD-RELATED VALUE-ORIENTATIONS,
SOCIO-ECONOMIC STATUS, AND DIET QUALITY
IN INDEPENDENT-LIVING SENIOR CITIZENS IN WINNIPEG

by

KATHLEEN RAE HARRISON

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A thesis submitted to the Faculty of Graduate Studies of
the University of Manitoba in partial fulfillment of the requirements
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Values have recently been recognized as a variable that may aid in explaining food behaviour. Further, values are being increasingly considered by nutrition educators as a factor which may affect an individual's participation in educational programmes and his/her adoption of beliefs related to the programme. A group of 50 independent-living individuals over 59 years of age participated in a study designed to measure, and determine the relationships between, food-related value-orientations and diet quality. Research instruments included a questionnaire with 55 value-orientation statements and 7 demographic questions, and a 3-day food record. Years of education and former occupation prestige were combined as an index of socio-economic status. There was agreement ($p \leq 0.01$) among the seniors as to the hierarchal ranking of the 7 value-orientation scales ($\alpha = 0.70$ to 0.87) derived from the value-orientation statements. Familism was ranked higher, and religion ranked lower, than health, education, economics, convenience, and social-psychological uses ($p \leq 0.05$). Guttman scalogram techniques were applied to develop a 7-step scale of diet quality (C.R. = 0.93 ; C.S. = 0.66) following comparison of mean food group intake to that recommended by Canada's Food Guide (revised 1977). While 96 percent of the subjects reached step 2 (bread and cereals), only 6 percent reached step 7 (milk and milk products). Neither the hierarchal ranking pattern of value-orientations nor the scoring of individual value-orientations were related to diet quality. Socio-economic status level was negatively related to the value-orientations education, economics ($p \leq 0.01$), and religion ($p \leq 0.05$). Concomitant study of attitudes, beliefs, knowledge, values, and demographic factors is necessary to more fully understand the interaction of these variables in relation to the food consumption decision.

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I. INTRODUCTION

The community nutritionist is often concerned with the education and motivation of individuals to modify their food behaviour towards that which is consistent with current nutrition knowledge. Preceding any attempt to induce change, there must be some insight into the many factors which may affect food and nutrition behaviour (Giffit et al., 1972). Previous research into the influences on food behaviour has focused on knowledge, attitudes, beliefs, and various demographic variables such as socio-economic status. However, the literature has shown that these factors, either alone or in combination, do not fully account for the food consumption decision. Values have only recently been recognized as a variable that, together with knowledge, attitudes, and beliefs, may aid in more completely explaining food behaviour (Sims, 1978a; Krondl and Lau, 1978; Horn, 1976).

Further, values are being increasingly considered by nutrition educators as a factor which may affect an individual's participation in educational programmes and his/her adoption of beliefs related to the programme (Kohlmann and Smith, 1970; Giffit et al., 1972; Knutson, 1965; Tonon, 1978; Wardlaw, 1978). Forest (1973) states that "values are the basis of all educational endeavors" and suggests that values can be used to assess programme needs because "our values give meaning, perspective, and importance to the needs, new technical ideas, or actions we experience". Thus, knowledge of food-related values can enable educators to characterize their audience and therefore more effectively plan and develop programmes of interest to specific

target groups (Suter and Barbour, 1975).

However, only two authors have measured food-related values (Suter and Barbour, 1975 and Sims, 1978a), and only one examined the relationship between food-related values and food behaviour. There could be several reasons for the past lack of emphasis placed on the investigation of values. One reason has been the more rapid development of methods for measuring attitudes (Rokeach, 1968). A second possible reason is the lack of a clear definition of values (Magrabi, 1966; Wilson and Nye, 1966). Thirdly, past research into the factors influencing nutrition behaviour has often been conducted for the purposes of inducing a change in these variables in order to change nutrition behaviour. Roter and Wang (1977) have suggested that knowledge, attitudes, and beliefs have been considered legitimate targets for experimental manipulation, whereas values have been regarded as ethically outside the health educators sphere.

With these methodological and ethical considerations in mind, it was the primary purpose of this research to measure, and examine the relationships between, the food-related values and food behaviour of elderly persons. This study was undertaken in order to more completely explain food behaviour and, in the process, characterize a potential target group for nutrition intervention programmes. It is not the intent of this research to suggest values as a target for potential modification, rather that values may be used as a framework within which change might be attempted.

The elderly population was chosen as the focus of this study for several reasons. Many have identified the elderly of the Canadian population as a risk group with respect to nutrition (Monagle, 1967;

Johnson and Feniak, 1965; Rae and Burke, 1978; Leichter et al., 1978; Health and Welfare Canada, 1973; Reid and Miles, 1977). Furthermore, there are an increasing number of elderly in the population (Statistics Canada, 1979), many of whom face problems posed by limited physical, and often economic and social, resources (Busse, 1978; Rao, 1973). In combination, these factors indicate the importance of nutrition programmes that are developed to suit the needs and interests of this target audience.

In the past, research has focused on the nutrient intake of the elderly as opposed to their food patterns (O'Hanlon and Kohrs, 1978). In fact, only one study has detailed the food consumption patterns of Canadian elderly (Health and Welfare Canada, 1977a). Since the aim of nutrition education is to improve food and nutrition practices with the ultimate objective of improving the nutritional status of the target group, a knowledge of the type and amounts of food consumed is pertinent to programme development. Therefore, the present study assessed the dietary patterns of the elderly by examining the intake of food groups.

It is hoped that this research will not only enhance our ability to plan and develop intervention programmes for an important target group, but will also provide an increased understanding of the relationship between values and food behaviour.

II. CONCEPTUAL FRAMEWORK

In order to better understand the factors which may affect the food consumption decision of independent-living senior citizens, the identification and analysis of the interrelationships among many variables is essential. As a conceptual framework for this research, a model which encompasses the work of Sims et al. (1972), Sims (1978a), and Sims and Smiciklas-Wright (1978) was employed (Figure 1). In this model, foods from the available food supply are chosen on the basis of both external and internal influences.

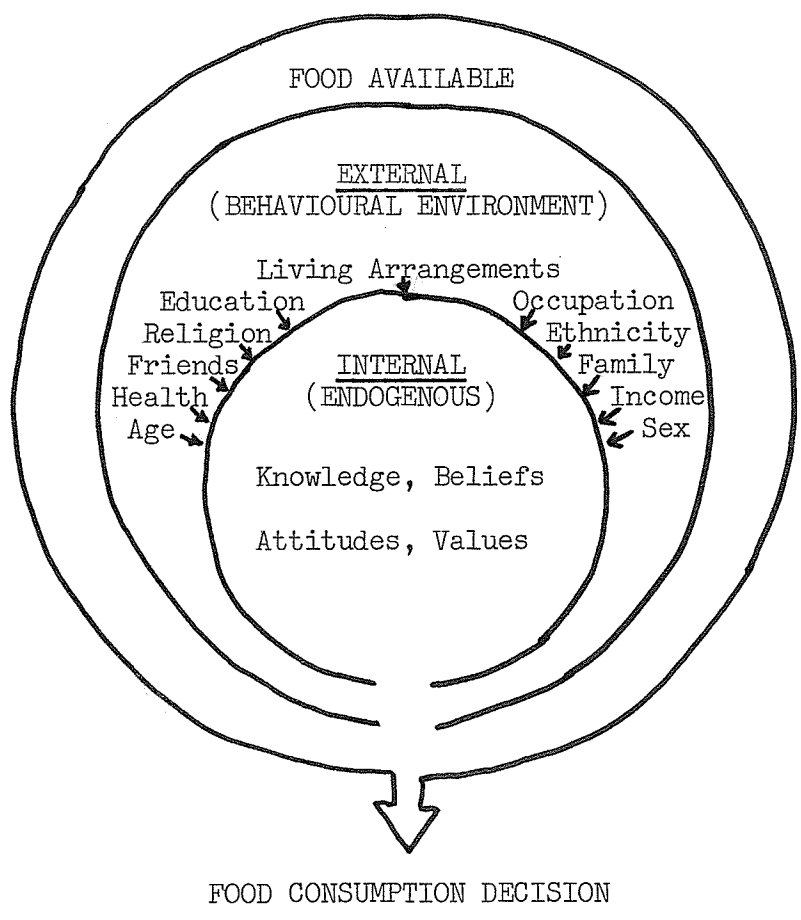


Figure 1. A conceptual model for the study of food consumption decisions of independent-living senior citizens.

The mechanism of action and interaction of these variables on the food choice decision is currently a matter of speculation. Therefore, only a general discussion of this area is offered.

External factors constitute elements of the behavioural environment such as friends, other family members, advertisements, television, and educational programmes. Also included as elements of the behavioural environment are characteristics of the individual's setting such as amount and source of income, occupation, education, living arrangements, ethnicity, etc.. The behavioural environment determines what specific foods will be chosen from the variety that are available and are acceptable for consumption in the particular group to which the individual belongs. These external factors also serve as the environment in which the internal factors are formed.

The internal factors co-exist with the external factors to influence an individual's own personal food choices. These include knowledge, beliefs, attitudes, and values. The individual uses these endogenous variables to choose his foods from among those that are available and culturally acceptable.

For example, the proscription of meat by North American vegetarians may be a result of a combination of several internal and external factors. While meat is available in the supermarket, external factors such as vegetarian friends, the price of meat in relation to one's income, and the lack of adequate storage facilities will partially determine the decision to omit meat from one's diet. As well, the internal factors, such as a belief that too much meat is unhealthy, the knowledge that meat is not essential for an adequate diet, and the value that all life, including food animals is sacred and should

be preserved if possible, would also enter into the decision to avoid meat.

Therefore, the combination of internal and external forces acting upon a person at a specific time results in food consumption behaviour unique to each individual.

III. REVIEW OF LITERATURE

A. FACTORS RELATED TO FOOD BEHAVIOUR IN THE ELDERLY

As outlined in the previous chapter, the food consumption decision of independent-living senior citizens can be conceptualized as resulting from the interaction of internal and external factors. While reviewing the literature to determine the degree of relationship among these factors and food consumption, several observations concerning the literature were noted. First, literature in both the nutrition and gerontological fields contains many reports of nutritional status assessments of senior citizens. Fewer studies have attempted to relate either external or internal factors which may affect food intake to the nutritional or dietary status findings. Second, the various dietary data collection methodologies employed must be considered in the interpretation of research findings. Both the validity of the collection instrument and its applicability to the elderly population must be considered (Campbell and Dodds, 1967; Gersovitz et al., 1978). Third, in the gerontological literature related to nutrition, the reporting of methodological procedures and statistical analysis of the results often was inadequate. Thus it was not possible to draw complete conclusions on the basis of this literature.

This review of the literature concerning the factors related to food behaviour of independent-living senior citizens is based on empirical studies which have been reported in sufficient detail to allow evaluation of the results obtained in light of the methodological procedures employed.

1. External Factors

Studies of the nutritional status of the elderly have often assessed various demographic factors in order to characterize those seniors at increased risk of nutritional deficiency. These factors include age, sex, living arrangements, education, occupation, income, and socio-economic status.

a. Age

Several studies have noted a trend that diets tend to decrease in quality with increasing age. A dietary history and 1-day meal pattern were obtained from low income elderly persons, ranging in age from below 60 to above 90, in Winnipeg by Johnson and Feniak (1965). Of the 74 elderly home-bound subjects, those 80 years of age and over were found to have the greatest number of deficient nutrient intakes. Le Bovit (1965) examined a 1-week recall of food brought into the kitchen of 283 predominantly low income households. The average age of the men was 74 years, and of the women 71 years. It was found that the diets were poorest in those households with older persons. Diets of households with homemakers under 75 years met nutrient allowances more frequently than did those of the older households (54 and 32 percent respectively). However, both of these studies employed memory-dependent diet methodologies. Thus, the lower reported use of food by older senior citizens may be due to difficulties in remembering foods taken, which may increase with age, as opposed to the effect of age alone (Campbell and Dodds, 1967).

Studies which have employed methods for collection of dietary data not requiring seniors to remember over a long period of time

have reported no decrease in diet quality with age. Guthrie et al. (1972) assessed the diets of 109 citizens over 60 in rural Pennsylvania on the basis of a 24-hour dietary recall. The age range of the sample was not given. While the caloric intake of persons over 80 years of age fell below the Recommended Daily Allowance (RDA) for a significantly greater percent of subjects than for those 60 to 69 years of age ($p \leq 0.05$), there was no difference for other nutrients. Todhunter (1976) conducted a study of 529 individuals between 60 and 102 years of age in middle Tennessee. Comparison of dietary ratings, based on the intake of nutrients calculated from a 24-hour recall, among age groups showed "no appreciable differences". While the intakes of iron and vitamin C were lower in those over 80, intakes of calcium and riboflavin were higher. Similar findings were reported by Fry et al. (1963) who used a 7-day weighed intake and a 7-day record to determine the nutrient intake of 32 women, aged 65 to 85, living in Nebraska. Average intakes of calcium and riboflavin were higher in women 75 to 85 years of age, while intakes of other nutrients were higher in the 65 to 74 years age group.

Two studies using food frequency data have reported that diet quality did not correlate significantly with age. Brown (1976) obtained food frequency data from 303 persons over 65 in Illinois. Sixteen percent of the sample were 80 years of age or over. No correlation was found between nutrient intake rating, based on percent of the RDA consumed, and age. Similarly, Clarke and Wakefield (1975) found the nutritional scores, which indicated the number of nutrients consumed in amounts $2/3$ or more of the RDA, of 99 nursing home and 98 independent-living elderly, based on food

frequency data, did not differ significantly with age. The age range of the sample was not reported.

Thus, when diet assessment methods such as records and short-term recalls not requiring recall over as long a period of time are used, diet quality and age do not appear to be significantly related.

b. Sex

It has often been reported that males over 65 tend to have more nutritionally adequate diets than females in this age group. Sinclair (unpublished) collected 4 consecutive 24-hour recalls from 780 subjects in 8 centres across Canada and reported that "males fared somewhat better than the females". Kohrs et al. (1978) reported on the dietary assessment, based on a dietary history, of 136 persons over 59 who participated in the 1973 Missouri Nutrition Survey. While 20 percent of each sex had intakes of 8 nutrients and energy equal to or above the RDA, 58 percent of the men had intakes above 67 percent of the RDA for all nutrients compared to only 30 percent of the women. Todhunter (1976) found that men were more likely to have satisfactory nutrient intakes, calculated from a 24-hour recall, for all nutrients except vitamin C. Similarly, the Nutrition Canada Survey (Health and Welfare Canada, 1973) found the average intake of nutrients, except for thiamin and vitamin C, were higher in men than women in the 65 and over age group. Nutrition Canada employed a 24-hour recall to collect dietary data.

Other researchers, who have subjected their findings to statistical tests of significance, have reported a similar, but not significant, trend for males to have a superior intake of nutrients. Clarke and

Wakefield (1975) found that the intake of nutrients did not differ significantly on the basis of sex. Brown (1976) observed that the percent of men who ate an excellent diet was higher than women, however the difference was not significant. Food frequency data was analyzed in both of these studies. Guthrie et al. (1972) reported that nutrient intake did not differ significantly by sex, while a significantly larger percentage of females than males consumed less than $2/3$ of the RDA ($p \leq 0.05$) for only one nutrient, calcium. Leichter et al. (1978) collected a 24-hour recall from 104 single men and women and 23 couples to determine the nutritional status of the free-living elderly population in Vancouver. For most nutrients, the percentage of women with inadequate intakes was greater than that for men, whether single or married, but the differences were not significant. Thus the studies which have employed food frequency or recall methods for dietary data collection have reported no significant difference in diet quality on the basis of sex.

Two studies which employed food records have found a larger number of significant differences between the diets of elderly men and women. Reid and Miles (1977) analyzed 4-day food records of 50 elderly subjects living in Guelph, Ontario. Males had significantly more variety in their diets than women ($p \leq 0.01$) and significantly higher intakes of protein and iron ($p \leq 0.05$). However, overall mean dietary ratings for men were not significantly higher than for women. Kohrs et al. (1979) obtained a 1-day food record from 466 subjects over 59 in Missouri. It was found that men consumed significantly more energy, protein, iron, thiamin, and niacin than women ($p \leq 0.05$).

Thus, studies employing diet collection methodologies such as

records, which may be more sensitive in detecting differences in food intake (Madden et al., 1976; Gersovitz et al., 1978), have statistically confirmed the trend that males tend to have a higher intake of most nutrients. However, overall diet quality has not been shown to be significantly superior for men.

c. Living Arrangements

Several researchers have found no relationship between living arrangements and diet quality. Todhunter (1976), using recall data, and Brown (1976), using frequency data, report that the nutrient intake of those living alone or with others does not differ. Le Bovit (1965) found equal percentages of 1 and 2-person households with good diets, based on a 1-week recall. A 4-day food record collected by Reid and Miles (1977) indicated that the 31 subjects who lived with another person had significantly higher variety scores than did the 19 who lived alone ($p \leq 0.01$), but their dietary ratings based on nutrient intake did not differ significantly.

However, two studies which employed the diet recall to collect dietary data have found the nutrient intake of persons living alone to be superior to those not living alone. Leichter et al. (1978) report that married persons were more likely to have inadequate intakes of several nutrients, particularly calcium. Married women had significantly lower intakes of energy, carbohydrates, calcium, thiamin, and riboflavin than unmarried women ($p \leq 0.01$). Married men had significantly lower intakes of calcium than single men ($p \leq 0.05$). Guthrie et al. (1972) found that a significantly higher percent of seniors living in 2-person households as opposed to 1-person house-

holds consumed less than $2/3$ of the RDA for vitamin A ($p \leq 0.05$).

Differences in dietary data collection methodologies would not appear to account for the disagreement among researchers as to the relationship between living arrangements and food consumption. Since men tend to have higher intakes of most nutrients, the sex ratio in the samples living alone and not alone may be pertinent. However, Leichter et al. (1978) had equal numbers of men and women in the single and married groups, yet reported married persons more likely to have inadequate nutrient intakes. No further explanation for these contradictory findings has been proposed, therefore, the relationship between living arrangements and diet quality is ambiguous.

d. Education

While Brown (1976) reported that educational level did not correlate significantly with dietary adequacy, based on frequency data, other researchers have found positive correlations between education and nutrient intake. Todhunter (1976) found that the percent of subjects with satisfactory intakes of all 7 nutrients calculated from a 24-hour recall increased with higher levels of formal education. Guthrie et al. (1972) reported that persons with more than 9 years of schooling had diets more adequate in respect to iron ($p \leq 0.02$) and protein ($p \leq 0.05$) than those with 8 years or less. The 24-hour recall was employed in this study also. Kohrs et al. (1979), using a 1-day food record, found that individuals who had completed the twelfth grade had intakes of protein, thiamin and niacin which were significantly higher than those seniors with eighth grade or less education ($p \leq 0.05$).

Because Brown (1976) has employed less precise methods for determining dietary adequacy than the other researchers, one may suggest that a relationship between education level and nutrient intake may have gone undetected. Marr (1971) states that food frequencies are particularly imprecise in the measurement of meat consumption. Since protein intakes were reported to be significantly higher in those with more education by the three other researchers using recalls and records, an imprecise measurement of meat intake may be responsible for some of Brown's (1976) negative findings. On the basis of other researchers, education level and nutrient intake appear to be related.

e. Occupation

Nutrient intake on the basis of former occupation of elderly subjects was analyzed in only one of the studies reviewed (Kohrs et al., 1979). Among Title VII--Nutrition Program for the Elderly participants not eating the program meal, former occupation was related to the intake of energy, thiamin, niacin, and saturated fat. Those who had worked in professional or managerial occupations consumed significantly more of these factors than the subjects in unskilled or manual occupations ($p \leq 0.05$). Non-participant subjects from unskilled or manual occupations consumed significantly more protein, calcium, and thiamin than those in skilled, clerical, professional, or managerial positions ($p \leq 0.05$). Unskilled workers consumed significantly more energy and saturated fat than subjects from clerical and skilled occupations ($p \leq 0.05$). Variation in nutrient intake on the basis of occupation was not found among meal site

participants. Further study of the relationship between occupation and dietary status is warranted.

f. Income

It has often been reported that those senior citizens with higher incomes tend to have better diets than those with lower incomes. Guthrie et al. (1972) assessed the adequacy of the diets of 55 elderly citizens, eligible for food assistance, compared to that of 54 seniors, whose income disqualified for such a programme, on the basis of a 24-hour recall. The higher income group had diets significantly more adequate in respect to protein ($p \leq 0.01$), iron, and riboflavin ($p \leq 0.05$). This finding is in agreement with that of Le Bovit (1965) who examined a 1-week recall of food brought into the kitchen of 283 urban social security recipients. Diets meeting allowances were almost $1\frac{1}{2}$ times as frequent in the high-income group as in the low. Poor diets were more than $2\frac{1}{2}$ times as numerous at the low as at the high-income level. As well, Todhunter (1976) found that as income increased, more subjects met the adequacy standard for all nutrients, calculated using 24-hour recall data. Further, Reid and Miles (1977) report a positive correlation between dietary rating, based on nutrient intake calculated from a 4-day food record, and estimated income level ($p \leq 0.05$).

On the other hand, two studies found little association between income and diet. Myres and Kroetsch (1978) reported that the data collected during the Nutrition Canada survey by 24-hour recall show only small differences in the nutrient intake of those over 65 due to income level. As well, Brown (1976) found no significant corre-

lation between diet adequacy, based on frequency data, and income.

Disagreement among researchers as to the relationship between income and diet quality may be related to the absolute income levels of the populations studied. The populations studied by Brown (1976) and reported on by Myers and Kroetsch (1978) appear to have had much higher levels of income than the other populations studied. In the Brown (1976) sample, although over one-half of the sample had an income under \$10,000 per year, only 10 percent had an income of less than \$3,000 per year. About 40 percent had an income over \$11,000 per year, and 14 percent had an income over \$20,000 per year. In contrast, only 10 percent of the Reid and Miles (1977) sample had incomes of \$5,000 and over. Therefore, while income level may be related to nutrient or dietary status of senior citizens at lower absolute income levels, above a certain minimum level, income may no longer be a determining factor in food consumption. As a result, at higher absolute levels of income, increasing income may not be related to an increase in diet quality.

g. Socio-economic Status

Grotkowski and Sims (1978) have combined several demographic factors into an index of socio-economic status. Variables used were source of income, occupation (before retirement), and educational attainment. This combined index was significantly related to intakes of energy, protein, fat, and vitamin C ($p \leq 0.05$) calculated from a 3-day food record obtained from 40 senior citizens. Correlation coefficients for intakes of these nutrients and socio-economic status were 0.31, 0.36, 0.39, and 0.33 respectively. The value of

r^2 indicates that socio-economic status index accounted for a maximum of 15 percent of the variance in nutrient intake (Caliendo et al., 1976).

A combined socio-economic status index has not been employed by other researchers in the gerontological nutrition field, but given the more comprehensive description of the seniors' level of living which may be obtained with this index, further use of this type of indicator is warranted.

To summarize, the relationship between several external variables and food behaviour of senior citizens has been examined. Conclusions concerning the relationship of living arrangements and diet quality could not be drawn due to conflicting research reports. Overall diet quality has not been related to age or sex. Income was related to nutrient intake at lower absolute levels of income only. Both education and occupation were found to be related to nutrient intake but, when combined together with source of income in an index of socio-economic status, only approximately 15 percent of the variance in nutrient intake could be accounted for. Clearly, other external factors and internal factors such as attitudes, beliefs, knowledge, and values must account for a portion of the unexplained variance in food behaviour.

2. Internal Factors

The literature concerned with the internal variables which may influence food behaviour in the elderly is inferior in both quantity and quality to that of the external variables. While several papers have described the nutrition attitudes, beliefs, and knowledge of the elderly (Todhunter, 1976; Rae and Burke, 1978; Elwood, 1975; Kronl, 1978), fewer studies have assessed the relationships between these variables and diet quality (Brown, 1976; Rountree and Tinklin, 1975; Grotkowski and Sims, 1978). In addition, there are no studies reported concerning the food-related values of senior citizens. Unfortunately, the reports of the research by Brown (1976) and Rountree and Tinklin (1975) did not describe the instruments used to assess knowledge, beliefs, and attitudes nor detail, either numerically or statistically, the findings of their respective studies. Further, Chronbach alpha coefficients of internal reliability for the questionnaire instruments have been reported by only Grotkowski and Sims (1978). This coefficient is of importance in assessing the quality of the research instrument.¹ Therefore, only the work of Grotkowski and Sims (1978) warranted inclusion in this review.

The review which follows will examine the relationship of knowledge, attitudes, and beliefs of the elderly to diet status as reported by Grotkowski and Sims (1978). Finally, the literature which may suggest a possible relationship between values and food behaviour in the elderly will be discussed.

¹A coefficient of 0.70 is considered indicative of acceptable reliability.

a. Knowledge

Seniors' nutritional knowledge was assessed by an instrument derived from the work of Eppright et al. (1970) containing twenty true-false and multiple-choice items with an internal reliability of 0.80. The test assessed general knowledge of nutrition, food composition, misconceptions about food, and the application of principles of nutrition.

The association between nutritional knowledge score and nutrient intake, calculated from 3-day records, was not sufficiently strong to be statistically significant at $p \leq 0.05$. At most, 8 percent of the variance in nutrient intake was accounted for by varying levels of nutrition knowledge.

b. Beliefs

Beliefs about nutrition and diet were measured with three scales: (a) misconceptions about weight-reducing diets; (b) using food and supplements as medicines; and (c) necessity of vitamin/mineral supplements. The reliability coefficients for these scales were 0.71, 0.70, and 0.58 respectively. Responses to scale items ranged from "strongly disagree" to "strongly agree" and were recorded on a 5-point Likert type format. Scores were obtained by adding the responses to each item in the scale for each subject.

Significant negative correlations were found between the intakes of certain nutrients and two beliefs: "misconceptions about weight-reducing diets" and intakes of kilocalories, fat, and calcium; and the belief "vitamin/mineral supplements are necessary" with caloric and carbohydrate intakes. However, the relatively low reliability

of the latter scale must be considered. The belief "food and supplements can be used as medicine" was not significantly related to the intake of any nutrient.

A maximum of 14 percent of the variance in nutrient intakes was accounted for by variance in intensity of these beliefs, based on r^2 calculations.

c. Attitudes

The attitude "nutrition is important" was assessed in the same manner as were the three beliefs, using a scale with reliability of 0.76. This attitude was not significantly related to the intake of any nutrient, and accounted for a maximum of 6 percent of the variance in nutrient intakes.

To summarize the findings of Grotkowski and Sims (1978), nutrition knowledge, the belief that "food and supplements can be used as medicine", and the attitude "nutrition is important" were not related to nutrient intake as calculated from a 3-day food record. Two other beliefs were negatively related to the intake of several nutrients, but accounted for a maximum of 14 percent of the variance in nutrient intake. Conclusions as to the practical significance of these findings cannot be drawn on the basis of this one study alone, since the correlation coefficients indicate only weak relationships between these internal variables and nutrient intake.

d. Values

While there are no studies specifically concerning the food-

related values of the elderly, there have been several papers which implicitly suggest that values may exert an influence on the food consumption behaviour of the elderly. Lau (1978) states that food quality may be sacrificed for social needs if the price of food was to increase disproportionately to the income of seniors. Furthermore, Busse (1978), in discussing food preferences, reports that elderly persons frequently relate that their food and beverage preferences are associated with pleasant life experiences. Busse (1978) suggests that seniors seek out and prefer symbols of reassurance and security. In addition, many authors have suggested that health concerns may motivate changes in seniors' food habits (Brown, 1976; Elwood, 1975; Shannon and Smiciklas-Wright, 1979; Jordan et al., 1954). From these reports, it can be hypothesized that values such as health, social-psychological meanings of food, and economics may be related to the food choices of senior citizens.

To conclude this section concerning the internal and external factors which may be related to food behaviour in the elderly, one may state that the degree of relationship shown between any of the variables and diet quality is tenuous. The work of Grotkowski and Sims (1978) suggests that, assuming no interaction among the factors, a maximum of 30 percent of the variance in nutrient intakes of senior citizens is accounted for by socio-economic status index (comprised of income source, education, and occupation components) and the internal factors of knowledge, beliefs, and attitudes. Age and sex have not been related to overall diet quality. As well, a definite relationship between living arrangements, or income at higher income

levels, and diet quality has not been demonstrated. Therefore, since food behaviour in the elderly is not completely explained by these variables, and since it can be hypothesized that values may be related to food choices of senior citizens, study of the relationship between food-related values and diet quality in senior citizens is warranted.

B. VALUES AND FOOD BEHAVIOUR

It has been suggested that values may account for some of the unexplained variance in food behaviour of the elderly. In order to explore this proposition, this section will first define the term "values" and discuss the theoretical interrelationships among values, attitudes, beliefs, and behaviour. Secondly, further evidence to support the theoretical justification for the study of values and food behaviour will be presented.

1. Values, and Their Relationship to Attitudes, Beliefs, and Behaviour

a. Values Defined

The term "values" is a much used, generally understood, but seldom a precisely defined word. Theoreticians and researchers have employed the term in different ways in accordance with their research purposes, theoretical orientations, or personal preferences. Operational definitions have also varied, depending upon the purposes of research or analysis. Therefore, those definitions which have been employed by researchers in the home economics and health fields will be selectively reviewed.

Kluckhohn (1959) has defined a value as:

...a conception, explicit or implicit, distinctive of an individual or characteristic of a group, of the desirable which influences the selection from available modes, means, and ends of action.

This classic definition agrees essentially with those developed by Williams (1960), Jacob and Flink (1962), Smith (1964), Engebretson (1965), and Knutson (1965).

Defined in this way, values can be considered to have three basic

elements. First, values are conceptions. Values are not directly observable but rather represent inferences and abstractions based upon what is said and done by individuals (Kluckhohn, 1959). For example, the statement "people ought to help each other" is not a value but rather one manifestation of a value. Kluckhohn (1959) stated that the word "conception" was included in his definition to involve a "cognitive" element.

Second, values have to do with what is thought desirable. Kluckhohn et al. (1956) state that a value is "not just a preference, a desire, but a formulation of the desirable, the 'ought' and 'should' standards which influence action". Rokeach (1968) describes a value as "a preference for the preferable". By including the word "desirable" in his definition, Kluckhohn (1959) brought out the fact that values always have an "affective" as well as a "cognitive" dimension: "the combination of 'conception' with 'desirable' establishes the union of reason and feeling inherent in the word 'value'" (Kluckhohn, 1959).

Third, values affect an individual's selection among possible courses of action, and therefore a "behavioural" element is included in the definition. Kluckhohn (1959) states that values are operative whenever a person selects one course of action or line of thought over another, provided the selection wasn't simply an impulse or considered temporarily expedient. In other words, values are criteria that enter into a person's decision-making process.

Thus values have a cognitive, affective, and behavioural element. Rokeach (1968) considers values to have a strong motivational element as well. This would suggest that, after having entered into the decision making process, values would motivate action on the decision.

These elements of values are illustrated in the following discussion by Rokeach (1968).

Values...have to do with modes of conduct and end-states of existence. To say that a person 'has a value' is to say that a specific mode of conduct or end-state of existence is personally and socially preferable to alternative modes of conduct or end-states of existence. Once a value is internalized it becomes, consciously or unconsciously, a standard or criterion for guiding action, for developing and maintaining attitudes toward relevant objects and situations, for justifying self and others, and for comparing self with others. Finally, a value is a standard employed to influence the values, attitudes, and actions of at least some others--our children's, for example.

As conceptions of the desirable, values affect selection not only among the goals or ends of action but also among the means and modes of attaining the ends. Rokeach (1968) clarifies this difference:

The distinction between preferable modes of conduct and preferable end states of existence...is a distinction between values representing means and ends, between instrumental and terminal values....An instrumental value is therefore defined as a single belief that always takes the following form: 'I believe that such-and-such a mode of conduct (for example honesty, courage) is personally and socially preferable in all situations with respect to all objects.' A terminal value takes a comparable form: 'I believe that such-and-such an end state of existence (for example, salvation, a world at peace) is personally and socially worth striving for.'

To further illustrate this distinction, the value 'health' will be discussed as both a terminal and an instrumental value. Often health professionals regard 'health' as a goal or terminal value. However, for many people 'health' is an instrumental rather than a terminal value, that is "one does not want good health simply for the sake of having good health" (Horn, 1976). Usually health is "secondary to other goals that are considered more important to the individual and whose attainment suffers in the absence of good health" (Horn, 1976). Therefore, in order to plan an effective

education programme, the values that are related to nutrition behaviour must be identified and considered.

b. Theoretical Interrelationships Between Values, Attitudes, Beliefs, and Behaviour

The relationships between behaviour and attitudes, beliefs, and values remain controversial. To clarify this topic, attitudes and beliefs must first be defined and differentiated from each other and from values.

Both Fishbein and Ajzen (1965) and Rokeach (1968) have described an attitude as "a learned predisposition to respond in a consistently favorable or unfavorable manner with respect to a given object."

Rokeach (1968) expands on this definition:

An attitude...is an organization of several beliefs focused on a specific object (physical or social, concrete or abstract) or situation, predisposing one to respond in some preferential manner. Some of these beliefs about an object or situation concern matters of fact and others concern matters of evaluation. An attitude is thus a package of beliefs consisting of interconnected assertions to the effect that certain things about a specific object or situation are true or false, and other things about it are desirable or undesirable.

Fishbein and Ajzen (1965) differentiate attitudes from beliefs:

"Whereas attitude refers to a person's favorable or unfavorable evaluation of an object, beliefs represent the information he has about the object...a belief links an object to some attribute."

Values, as previously defined, differ from attitudes in several important respects.

While an attitude represents several beliefs focused on a specific object or situation, a value is a single belief that transcendentally guides actions and judgements across specific objects and situations, and beyond immediate goals to more ultimate end-states of existence. Moreover, a value, unlike

an attitude, is an imperative to action, not only a belief about the preferable but also a preference for the preferable. Finally, a value, unlike an attitude, is a standard or yardstick to guide actions, attitudes, comparisons, evaluations, and justifications of self and others.

(Rokeach, 1968)

Roter and Wang (1977) have summarized Rokeach's thinking using an "onion layer" analysis of behaviour. The outermost concept, least directly associated with behaviour, is knowledge; beliefs follow; attitudes are closer; and values are the most central concept and directly associated with behaviour.

Finally, Rokeach (1968) states that values themselves are arranged in value systems within which ideals or values are hierarchically organized in terms of importance. Thus when a person is confronted with a situation which may activate two or more values in conflict with one another, a person's value system will become manifest. For example, one may have to choose between behaving compassionately or behaving competently, but not both. Thus, a value system can be defined as "a learned organization of rules for making choices and for resolving conflicts—between two or more modes of behavior or between two or more end-states of existence" (Rokeach, 1968).

In contrast with the above, Fishbein and Ajzen (1965) do not feel that a distinction between values and attitudes is warranted, "since it has not been demonstrated that these variables obey different scientific laws". Thus, the lack of agreement on the differentiation of values from attitudes serves to indicate the speculative nature of research based on this theory. It was, however, considered appropriate to accept the theories of Kluckhohn (1959) and Rokeach (1968) as a basis for this study in view of the

widespread application of these theories in the home economics and health-related literature (Suter and Barbour, 1975; Dyer, 1962; Kohlmann and Smith, 1970; Knutson, 1965; Steelman, 1976; Roter and Wang, 1977; Sims, 1978a; Krondl and Lau, 1978; Sims and Smiciklas-Wright, 1978; Schafer and Yetley, 1975).

2. Theoretical Justification for the Study of Values in Relation to Food Behaviour

Rokeach (1968) has suggested that research into factors which affect behaviour should be concentrated on values rather than attitudes or beliefs. Several reasons for this stance are given. First, because values are concise and basic guiding principles of an individual's behaviour, they are more directly related to behaviour. Second, values are conceptually more dynamic than attitudes or beliefs since they have a strong motivational component. Third, values are the determinants of attitudes as well as behaviour. Fourth, since people possess considerably fewer values than attitudes², values provide a more economical analytical tool for describing and explaining similarities and differences between persons and groups. Thus it appears there is justification for the consideration of values as a factor which may influence food behaviour.

However, perhaps for reasons of ethics and methodological disagreement, as discussed in the Introduction, most of the research investigating the relationships of internal factors to food behav-

²Rokeach (1968) believed that most people have thousands of attitudes and beliefs, but only several dozens of instrumental values and only a few terminal values.

our has concentrated on attitudes, beliefs, and knowledge rather than values. Yet, as shown in section III.A.2., these variables do not account for a large portion of the variance in food behaviour of senior citizens. Further, the discussion to follow will indicate that these variables do not fully explain food behaviour in other age groups.

Mothers of preschool children have been the focus of several investigations which have attempted to relate mothers' knowledge, attitudes, and beliefs to food consumption of the child. Eppright et al. (1970) reported associations among the scores of 2000 mothers on a nutrition knowledge and attitude test and the nutritional quality of the childrens' diets. Knowledge was assessed by a 35 item test which contained statements pertaining to general knowledge of nutrition, food composition, misconceptions about food, and the application of principles of nutrition. Answers included "true", "false", or "don't know"; provision was made for indicating one of five degrees of certainty for the response. Attitudes towards meal planning, food preparation, nutrition, and permissiveness in feeding children were measured using statements with possible responses of "agree or disagree" and "favourable or unfavourable", with the degree of certainty indicated. No internal reliability coefficients for either instrument were reported. Energy and nutrient content of the diets were calculated from a 3-day food record kept for the child by the mother. A sequential selection procedure—selecting first that variable with the highest absolute correlation, secondly that variable with the next highest partial correlation after adjusting to the first, and so forth—indicated permissiveness most often and

attitudes toward meal planning and food preparation next most often related to intakes of food energy and nutrients. Nutrition knowledge also was included in several of the correlation analyses. In no case did attitude toward nutrition increase the multiple correlation significantly after the inclusion of the other four variables. The multiple correlation coefficients varied from 0.08 to 0.15, indicating that a large fraction of the total variation remained unexplained by these variables (Eppright et al., 1970).

Mothers of preschool children (n=113) in Ithaca, New York were the focus of a study conducted by Caliendo et al. (1977) which attempted to integrate the complex of interacting factors affecting dietary and nutritional status. The independent variables included those of family demography and resource availability; maternal variables including attitudes relevant to parental and homemaking skills, questions related to the mothers' attitudes toward the preschooler himself, and the eating situation. Preschoolers characteristics included: age, sex, ordinal position, food preferences, and responsiveness to the eating situation. The questions on the mothers' attitudes toward the eating situation and the preschoolers' food consumption were those used by Eppright et al. (1970), while questions from the Parental Attitude Research Instrument (Schafer and Bell, 1958) were used to assess other maternal and homemaker attitudes. No reliability coefficients were reported. The dependent variable of diet quality of the child was based on a 24-hour recall, as recalled by the mother, and derived from food group servings consumed. A path analysis model was constructed in which independent variables which correlated most significantly with the dietary quality score

were regressed on the latter dependent variable. Even though many other independent variables as well as attitudes were included in the model, only 50 percent of the variance in diet quality was explained in this study (Caliendo et al., 1977).

Sims and Morris (1974) took an ecological approach in the investigation of the factors related to childrens' nutritional status. The intakes of selected nutrients by 163 preschool children in Michigan were examined in relation to selected factors characterizing the child's near environment. Mothers' nutritional knowledge and attitudes were assessed using the instruments developed by Eppright et al. (1970). To obtain information about childrens' nutrient intake, mothers kept 3 separate 24-hour records of their childrens' food intake. Nutritional knowledge and the attitude "feeding permissiveness" were not significantly related to nutrient intake, although the correlation coefficients were similar to those obtained with a much larger sample by Eppright et al. (1970). The "nutrition is important" attitude was significantly ($p \leq 0.01$) related to the intake of calcium, while accounting for only 9 percent of the variance in calcium intake.

The nutrient intake of 61 nursing mothers was related to the mothers' nutrition knowledge, attitudes, and beliefs by Sims (1978b). Nutritional knowledge was measured on a 36 item true/false and multiple choice instrument originally developed by Eppright et al. (1970). The internal reliability of the instrument was 0.77. Several attitudes were measured: "nutrition is important"; "meal planning is important"; and "meal preparation is enjoyable". The scales were originally developed by Eppright et al. (1970) and

had reliability coefficients of 0.83, 0.72, and 0.74 respectively. The belief "vitamin supplements are necessary" was measured on a scale developed by Grotkowski and Sims (1978) with a reliability coefficient of 0.78. Nutrient intake was calculated from a 3-day food record, and subsequently grouped into 4 nutrient indexes. While nutrition knowledge was significantly related to each of the nutrient group indexes, it was not significantly related to any single nutrient intake. In either case, only 5 to 24 percent of the variance in nutrient intake was explained by this factor.

Thus, studies concerning the relationships between mothers' nutrition knowledge, attitudes, and beliefs have accounted for only a portion of the variance in preschoolers' and mothers' nutrient intakes. Clearly, the influence of other factors such as values can be hypothesized.

Only one study has been reported which has examined the relationship between food-related values and food behaviour. Sims (1978a) attempted to determine if a typology of food-related attitudes, beliefs, and value-orientations would characterize a group of people who had voluntarily adopted vegetarianism from those who had not. Nine food-related value-orientations were identified by the researcher as being related to food consumption choices: health; economics; social-psychological uses of food; creativity; religion; ethics; education; familism; and aesthetics. The measurement scales were patterned after the work of Suter and Barbour (1975) and Kohlmann and Smith (1970), whose work will be discussed in section V.A.1.b.. Reliability for the scales varied from 0.73 to 0.93. The attitude "nutrition is important" was measured as previously described with

a reliability of 0.84. Four belief scales developed by previous work of Sims and other researchers, were used: "belief about dangers of food processing"; "belief in health foods"; "belief in taking vitamin/mineral supplements"; and "misconceptions about weight reduction". Reliability coefficients for the scales were 0.85, 0.90, 0.73, and 0.74 respectively. Results indicated that vegetarians and non-vegetarians differed significantly on the basis of many characteristics, including their value-orientations. The value-orientations of ethics, health, and religion were scored higher by vegetarians ($p \leq 0.001$) while those of economics, familism, and social-psychological uses of food were scored higher by non-vegetarians ($p \leq 0.01$, 0.05, and 0.01 respectively). For further insight, linear discriminant analysis was used in an attempt to differentiate between the vegetarian and non-vegetarian groups. This statistical technique can be used to classify an observation into one of several predetermined categories depending upon the individual characteristics of the observation (Sims, 1978a). In this research, a successful discriminant analysis would be able to differentiate between vegetarian and non-vegetarian behaviour on the basis of attitudes, beliefs, and food-related value-orientations. Of all the variables studied, the value-orientations of ethics and social-psychological uses of food were found to be the most predictive of vegetarianism and non-vegetarianism respectively.

The literature has shown that the factors of attitudes, beliefs, and knowledge do not fully account for food behaviour. Indeed, the study of vegetarians by Sims (1978a) has suggested that values may

be an important influence on food behaviour. Combined with the theoretical basis for the study of values and food behaviour, the literature provides support for the hypothesis that values may be related to food behaviour.

IV. RESEARCH DESIGN

A. OPERATIONAL DEFINITIONS

1. Values

For the purposes of this research, the measurable indicator of value, 'value-orientation', was used instead of value. Kluckhohn and Strodtbeck (1961) define value-orientations as:

...complex but definitely patterned (rank ordered) principles resulting from the transactional interplay of three analytically distinguishable elements of the evaluative process—the cognitive, the affective, and the directive elements—which give order and direction to the everflowing stream of human acts and thoughts as these relate to the solution of 'common human' problems.

The conceptual basis for the selection of this definition is elaborated in Chapter V.

Value-orientations were quantified by means of scale scores resulting from individual statement responses within the scales. Value-orientation hierarchy was operationally defined as the rank-order patterning of standardized scale scores, with a higher score representing greater perceived value.

2. Food Behaviour

The term 'diet quality' was chosen as the operational indicator of food behaviour. It was defined as the Guttman scalogram level attained (maximum score of 6) on the basis of the intakes of six food groups.

3. Socio-economic Status

For current research purposes, this concept was defined as the

level achieved in the distribution of socio-economic status scores, derived from the individual's number of years of formal education multiplied by the occupational prestige rank, according to the technique developed by Chappell (personal communication)³.

B. ASSUMPTIONS

The underlying assumptions of this study were:

1. Values of individuals can be quantified.
2. Values of individuals are interrelated in a hierarchy.
3. Values operate as one of the factors influencing food consumption decisions in the elderly.

C. OBJECTIVES

To give direction to this study five objectives were formulated.

1. To determine the food-related value-orientation hierarchy of an elderly population by adapting and testing the reliability of the Sims (1978a) value-orientation scales.
2. To measure the current habitual food intake of an elderly population and compare it to Canada's Food Guide recommendations.
3. To determine the scalability, by Guttman scalogram analysis techniques, of the food groups consumed by the elderly.
4. To measure the socio-economic status levels of elderly subjects.
5. To determine the relationships among food-related value-orientations, socio-economic status, and diet quality in an elderly

³Dr. Neena L. Chappell, Assistant Professor, Dept. of Social and Preventive Medicine, University of Manitoba, May, 1979.

population.

D. HYPOTHESES

On the basis of the review of literature describing the theory and experimental work explaining food behaviour in the elderly, the following hypotheses were formulated:

1. Senior citizens within a diet quality level will agree on a rank-order pattern of the value-orientations.
2. There will be a difference in the rank-order patterns of the value-orientations of senior citizens at different diet quality levels.
3. Senior citizens at different diet quality levels will assign different scale scores for individual value-orientations.
4. There is a positive correlation between diet quality level and scores on the value-orientation scales of education, health, and familism.
5. A correlation between socio-economic status level and diet quality level will be explained by a difference in the rank-order pattern of value-orientations among socio-economic status levels.

E. RESEARCH FORMAT

According to Kerlinger (1973) this study would be classed as ex post facto research since the independent variable of value-orientations was not manipulated. Rather, inferences about the relations between value-orientations and diet quality were made from concomitant variation of the independent and dependent variables.

An extraneous variable, socio-economic status, has been controlled by building it into the research design as an attribute variable. The variables of institutional residence and medical modification of diet, both of which would restrict food choices, were controlled through specific selection of the sample.

The central interest of this study was the relations among variables, thus putting an emphasis on the internal rather than external aspects of the study. Therefore, the generalization of the findings to the entire population of free-living senior citizens would not be valid (Kerlinger, 1973).

V. METHODOLOGY

A. RESEARCH INSTRUMENTS

1. Value-orientation Questionnaire

In this section, the conceptual basis for the measurement of values will first be discussed, followed by a review of the methods that have been used to assess values in the fields of home economics or gerontology. Finally, the adaptation, pretest, and final revision of the Sims (1978a) value-orientation scales will be described.

a. Conceptual Basis for the Measurement of Values

Assuming values are operative when an individual selects one line of thought or course of action, values, then, can be discerned by analysis of selections made in 'choice' situations (Kluckhohn, 1959). The investigation of values can also be carried out with the use of questionnaires consisting of statements about the desirable, or selection between possible paths of actions on the basis of values (Kluckhohn, 1959). These value statements are normative or 'ought' or 'should' statements.

However, in attempting to measure and compare the value patterns of individuals or groups, it is difficult to separate "values, as standards, from perceptions and assumptions regarding the nature of man and his place in the universe" (Knutson, 1965). Kluckhohn (1959) similarly states that "value elements and existential premises are almost inextricably blended in the overall picture of experience that characterizes an individual or a group". Thus, values are constrained within the framework of what is taken as 'given by nature'.

For example:

In their conceptions of a desirable state of affairs people do not postulate conditions under which the law of gravity ceases to operate, the threats and irritations of climatic variations disappear completely, or food and drink appear spontaneously ready for consumption.

(Kluckhohn, 1959)

It was therefore proposed by Kluckhohn (1959) that the term 'value-orientation' be applied to this blend of principles that tend to govern behaviour, symbolizing the fact that affective-cognitive (value) and strictly cognitive (orientation) elements are merged. Whereas value statements are normative statements, "a value-orientation is a set of linked propositions embracing both value and existential elements" (Kluckhohn, 1959).

Kluckhohn (1959) defines a value-orientation as

a generalized and organized conception, influencing behaviour, of nature, of man's place in it, of man's relation to man, and of the desirable and non-desirable as they may relate to man-environment and interhuman relations.

This definition agrees with that of Kluckhohn and Strodtbeck (1961) given in Chapter IV. Both authors state that value-orientations may be held by individuals or groups.

Use of the term value-orientation by Sims (1978a) to describe scales derived from responses to individual statements is consistent with this theory.

b. Value Measurement Methodology in Home Economics and Gerontological Research

Two techniques of value measurement have been used in the home economics and gerontological research reviewed. The first technique employs descriptive statements to which the subject responds, and

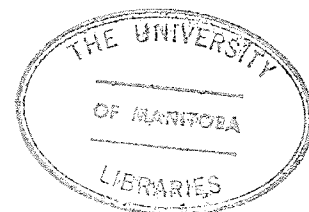
the second requires that the subject react to the value concept itself.

The home economics literature contains several reports of studies which have employed descriptive statements to assess values. Dyer (1962) developed a forced-choice instrument to gain knowledge about homemakers' awareness of values as they are mediated through family activities. Value was operationally defined as "the criteria used to determine goals and means of attaining these goals" (Dyer, 1962). Following a review of earlier literature, nine values were chosen for measurement: family centrism; health; aesthetics; friendship; freedom; education; economy; prestige; and religion.

Suter and Barbour (1975) designed a forced-choice value instrument to determine low income mothers' hierarchical rankings of food-related values. The operational definition of values employed was that of Engebretson (1965): "Values are considered to be conceptions of the desirable which affect an individual's choices among possible courses of action". Criteria for the selection of values to be used in the research were that the values be food-related, of primary relevance to mothers of preschool children, and compatible and consistent with the operational definition of values. On the basis of a review of literature, six values were selected for study: economy; health; work efficiency; family life; education; and friendship. For each value, four food-related statements were selected for use in constructing the instrument. In an effort to gather descriptive items related to food-oriented values, a review was made of professional and non-professional literature on subjects such

as health, nutrition, food, low income life styles, and food-related values. Statement validity was assessed by professionals. The forced-choice, paired-value method of determining the hierarchal ranking of the values was used. Statements for each value were paired with statements from the other five values exactly four times on a random basis. Scoring of the values instrument was as follows: the value statement chosen was given a score of '1' and the value statement not chosen was given a score of '0'. A total score for each value was computed.

Kohlmann and Smith (1970) developed two inventories to assess personal values related to home and family life. The definition of Kluckhohn (1959) was accepted as the operational definition of values. Eight values were selected for investigation: concern for others; economy; education; family life; friendship; health; status; and work efficiency. A pool of statements involving behaviours pertinent to each of the values was developed after collecting behavioural descriptions of homemakers from the literature, observing and interviewing homemakers and husbands, and from suggestions of educators working with homemakers. The method of responding involved the certainty scale. The woman was to indicate, on a scale from 1 to 99, how certain she was that a woman would be liked or disliked if she were described by each statement. In turn, the man was directed to rate each statement on the 1 to 99 scale as to how socially desirable or undesirable he considered the behaviour expressed when used to describe men in general. A higher number indicated a more socially desirable response or more certainty by the woman she would be liked. A response of 50 indicated



no opinion regarding the behaviour. The responses of men and women were used to compute correlations among all possible pairs of items from each inventory. An examination of the correlation matrices was then made to identify clusters of three or more items that inter-correlated with items from other clusters. Each cluster was believed to represent a value. Three clusters were found: a status scale (reliability = 0.82) and family life scale (reliability = 0.95) for women, and a family life scale for men (reliability = 0.90).

Sims (1978a) patterned her value-orientation scales after the work of the previous two pairs of authors. The value-orientation definition of Kluckhohn (1959) was employed. Ten values assumed to be related to food choices were identified by the researcher: health; economics; friendship/social status; creativity; religion; ethics; education; familism; aesthetics; and emotional uses of food. In a manner similar to Suter and Barbour (1975) and Kohlmann and Smith (1970), six to ten items were written for each value. Responses to each item were made on a five-point Likert scale, ranging from strongly agree (5) to strongly disagree (1). Based on the results of factor analysis, the friendship/social status scale and emotional uses of food scale were collapsed into one and renamed social-psychological uses of food. The original questionnaire as administered by Sims (1978a) contained eighty-six food-related value-orientation items. Based on the results of validity and reliability analysis of this sample, certain items were deleted from the original scales before analysis. Reliability coefficients for the scales, following revision, ranged from 0.73 to 0.93.

The gerontological literature contains two value research reports in which the subjects reacted to the value concept itself. Christenson (1977) assessed the relative importance which adults in various age strata, ranging from less than thirty years to more than 70 years of age, attach to Williams' (1960) "dominant American values". Respondents reacted to the question: "There are many things in life which we value. Below are listed some American values and beliefs. How important are these to you?" Fourteen value conceptions, such as 'patriotism', equality', etc., were studied. Responses were slight, moderate, great, and very great.

Antonucci (1974) explored the relationship between values and adjustment in old age. Values were defined as "those aspects of an individual's life that he considers important, that is, the guiding principles that determine his goals throughout life". Ten values were chosen from the Rokeach (1968) value survey on the basis of factor analysis to determine those values related in varying degrees to work. The semantic differential technique was used to evaluate the values.

The decision to utilize an adapted version of the Sims (1978a) value-orientation scales for this research was made following consideration of several factors. First, the scales were developed in the theoretical framework accepted by many value researchers (Kluckhohn, 1959; Suter and Barbour, 1975; Kohlmann and Smith, 1970). Second, the scales were derived specifically to determine food-related value-orientations. Third, the scales have been developed,

and modified, for an adult population on the basis of validity and reliability considerations. Finally, the adaptation of an existing research instrument would allow for refinement of the tool as well as comparison of the values across studies.

c. Adaptation of the Value-orientation Questionnaire

Initially, several modifications were made to the Sims (1978a) scales. Obvious 'vegetarianism' statements were not considered appropriate to the objectives of the study, thus the 'ethics' scale was deleted and minor changes in wording were made. Wording of several statements was also changed to make the statements more appropriate to the living arrangements of most elderly. Because the response scale was thought bias inducing, several modifications to the response categories were made. The response categories were changed from '5' (strongly agree) through '1' (strongly disagree), to 'SA' (strongly agree), 'A' (agree), 'U' (undecided), 'D' (disagree), and 'SD' (strongly disagree). The original middle response category had been '3' (no opinion) but was modified to avoid symbolizing the response as 'NO'. The questionnaire was typed with large print to facilitate reading by senior citizens. The pretest questionnaire can be found in Appendix A.

The questionnaire was then pretested on a very heterogeneous group of fifteen individuals over fifty-five years of age. The pretest participants included volunteers from a seniors' drop-in centre, a seniors' apartment block, and personal contacts of the researcher and her committee. All pretest subjects were independent-living.

Following the pretest, several modifications were made on the basis of comments from the pretest participants concerning the questionnaire, a minimum reliability coefficient of 0.70 for each scale, and a minimum of 5 statements in each scale. On the basis of comments offered by the pretest group, the questionnaire was substantially shortened and a convenience scale constructed, since convenience was often mentioned in relation to food choices. Reliability calculations indicated that extensive revision of the economics scale was needed and that the reliability of several scales would be increased by deleting individual statements.

In order to revise the economics scale and to develop a convenience scale, descriptive statements were developed. Several resources were employed to determine these statements including professional literature, senior citizens' comments, and Department of Foods and Nutrition personnel. These two new scales were pretested on Department personnel and modified on the basis of the criteria mentioned previously.

These changes resulted in a questionnaire which would minimize subject fatigue while more thoroughly assessing those values which may influence the food consumption decision. A total of fifty-five statements were included in the final questionnaire, which included nine value-orientation scales, each containing five to seven statements. The statements comprising each scale together with the reliability of the scales are found in Appendix B. The final questionnaire is contained in Appendix C.

In view of the special needs of the elderly, instructions for completing the questionnaire were adapted from those of Sims (1978a).

2. Three-day Food Record

Objectives related to the collection of dietary data were: to measure the current habitual food intake of the sample and compare it to Canada's Food Guide (Health and Welfare Canada, 1977b) recommendations; to determine the scalability, by Guttman scalogram techniques, of the food group consumption of the sample; and to determine the relationships among food-related value-orientations, socio-economic status, and diet quality in the sample. In view of these objectives, a three-day food record was chosen for several reasons. A three day period, as opposed to a twenty-four hour period, is appropriate for classifying individuals into groups based on dietary intake (O'Hanlon and Kohrs, 1978). In addition, this method has been shown to have the highest degree of reliability and validity of the methods used with free-living and elderly populations (Madden et al., 1976; Gersovitz et al., 1978). Furthermore, this method does not depend solely on memory, an important consideration when working with an elderly population (Campbell and Dodds, 1967).

It was assumed that the non-employed lifestyle of the population group would not cause the weekend diets of the subjects to differ greatly from those consumed on weekdays. Based on this assumption, and the availability of personnel, the decision was made to collect three consecutive weekday food records.

Instructions were developed to ensure record keeping which would allow the calculation of the number of servings from each food group. A sample of a one-day record was included to serve as an example. A 15 cm ruler was provided to each subject to facilitate measurement.

The format of the food record and the instructions for completing the record were pretested on a varied group of seven senior citizens, all independent-living. One-day records were collected for pretest purposes. Minor revisions were made to the instructions and format following the pretest.

The final food record forms are contained in Appendix C .

3. Socio-economic Status

Several factors must be considered when assessing the level of living or socio-economic status of an elderly population. First, it is logical to presume that there is a very great difference in life-style between older individuals or couples whose incomes have, throughout adulthood, been low and those whose lowered income has come only with retirement (Howell and Loeb, 1969). As most Canadians are reduced to low income levels following retirement, actual income is often unrelated to other socio-economic status indices such as education and occupation (Chappell and Havens, 1979). Second, subjects often are reluctant or unable to state the exact amount of income received (Reid and Miles, 1977). Therefore, reported income is not necessarily a valid indicator of the level of living, or socio-economic status, of senior citizens.

An index of socio-economic status has been developed, with the above considerations in mind, specifically for the elderly Canadian population by Chappell (personal communication). The scale is based on level of educational attainment and prestige of major life occupation as reported by Pineo et al. (1977). Thus the validity of the socio-economic status measure as an indicator of level of living

appears to be improved. This index was employed in the current research.

The socio-economic status scale questions are those numbered 1 and 2 on the demographic questionnaire in Appendix C. In use, this questionnaire was attached at the back of the value-orientation questionnaire.

4. Demographic Questions

Following a review of the literature, the content and format of several biographical questions were determined. These questions were included in order to characterize the sample and facilitate comparison to other research. The last five questions on the demographic questionnaire (Appendix C) were included for these purposes.

B. IMPLEMENTATION OF THE STUDY

1. The Sample

The research format and the nature of the research instruments required that eligibility for participation in this study be limited to that portion of the senior citizen population which was: independent-living; not currently following a written diet plan prescribed by a doctor or dietitian; and able to read and write English.

Subjects were recruited as volunteers from the community. In order to contact independent-living senior citizens, contact was established with the Age and Opportunity Centre Inc. in Winnipeg. This agency endorsed this study in a letter to their community Centres and, in addition, supplied a directory of all senior citizens' organizations in this city. The researcher and an assistant then telephoned groups to explain the study and ask permission to speak about the research in order to solicit volunteers at a meeting of the group. Arrangements were made to speak to seventeen groups, mainly Age and Opportunity Centres and church groups. As well, personal friends of the researcher, who were eligible for the study, were solicited. In order to obtain 50 subjects, the number considered sufficient in view of the funds and personnel available, over 500 senior citizens were approached to participate. Thus a low response rate (10 percent) was encountered.

There could be several possible reasons for the low response rate. As a 'reward' for participation in the study, the senior citizens were offered a dietary assessment and, if desired, a nutrition counselling session with a trained nutritionist. However, many seniors stated they felt that they were not in need of this

type of service and declined from participation in the study because they "weren't having any problems". Thus the reward offered may not have been meaningful to this population. Those seniors who participated in the study appeared to appreciate the 'reward' but seemed to participate for other reasons. The social contact provided by the visits seemed important. As well, they felt that adequate nutrition could be a problem for seniors and they hoped their participation might assist other seniors with "more problems". A higher response rate may have been attained if personal contact with the seniors by mail or telephone had been made. Unavailability of senior citizens' groups membership lists made personal contact impossible.

2. Data Collection Procedure

a. Interviewer Training

Three dietetic interns and one graduate dietitian provided the researcher with interviewing assistance during the course of data collection. In order to standardize interviewing procedures, a two hour training session for the interviewers was conducted by the researcher. General interviewing procedures, with an emphasis on problems that might be encountered with the elderly, as well as interview content and protocols were discussed at the training session. Each interviewer was provided with the materials in Appendix D, and with a set of Imperial measuring cups and spoons to facilitate checking the food records. The schedule of interviews for the week and a set of folders, each containing a numbered consent form, value-orientation questionnaire, and food record form, were

given to the interviewers at this time. Interviewers were given one folder and one ruler for each subject.

b. Interview Procedure

Senior citizens participating in the study were contacted by telephone and arrangements were made for three home visits. Interviews were scheduled for the day before recording was to start, the second day of recording, and the day following completion of recording. Thus interviews were scheduled for some subjects on Monday, Wednesday, and Friday and for others on Tuesday, Thursday, and Saturday. This scheme allowed for optimum use of the interviewers and resulted in food records kept for Tuesday through Thursday and Wednesday through Friday. Details of the interview scheduling can be found in Appendix D.

The purpose of the first visit was to explain the procedure for completing the food record and to have the senior complete the consent form. The instructions for keeping the record, the record forms, and the ruler were left with the senior. During the second visit, the first day's record was checked. If the subject had problems in completing the record, the instructions were repeated and clarified at this time. The third visit included the checking of the second and third days' records, completion of the questionnaire, and an oral assessment of the subjects' diet, with a possible counseling session. The booklet Shopping for Food and Nutrition (Agriculture Canada and Health and Welfare Canada, 1978) was used as an educational aid and as a reward during the third visit. Details of the interview content are contained in the checklists found in Appendix D.

Following completion of data collection, a letter of thanks was sent and following data analysis, a summary of the research findings were forwarded to each participant.

3. Data Analysis

a. Value-orientation Questionnaire

i. Reliability

The questionnaire was coded with strongly agree through strongly disagree responses receiving a score of 5 through 1 respectively for all statements except numbers 23 and 45. The latter statements were scored in the opposite direction due to the negative wording of the statements.

Reliability analysis, using SPSS subprogram RELIABILITY (Nie et al., 1975) was carried out on the nine scales. The Chronbach alpha coefficients obtained for the scales included in the pretest and study questionnaires are reported in Table 1.

It is notable that the coefficients of reliability decreased markedly for several scales when given to the final test population. Kerlinger (1973) describes reliability as "the proportion of the 'true' variance to the total obtained variance of the data yielded by a measuring instrument". Considering the above definition in equation form, $r_{tt} = \frac{V_{\infty}}{V_t}$ (V_{∞} = true variance; V_t = total obtained), if the total obtained variance is large, the reliability coefficient is low. When the total obtained variance increased from the smaller pretest group to the larger study group, there was a corresponding decrease in reliability.

Scales having a reliability coefficient of 0.70 or larger, with

TABLE 1

RELIABILITY COEFFICIENTS OF SCALES INCLUDED IN
THE PRETEST AND STUDY QUESTIONNAIRES

Scale	Number of Items	Chronbach Alpha Coefficients	
		Pretest	Study
Social-psych- ological uses	7	0.85	0.63
Education	5	0.85	0.75
Convenience	7	0.87	0.75
Economics	7	0.73	0.77
Aesthetics	5	0.75	0.22
Religion	6	0.84	0.87
Familism	5	0.80	0.74
Health	7	0.77	0.81
Creativity	5	0.82	0.49

a minimum of 5 statements, were included in statistical analysis. To meet this criteria, statement number 1 in the social-psychological uses scale was eliminated, thus increasing the reliability to 0.70. The aesthetics and creativity scales were eliminated from further analysis because it was not possible to meet the minimum reliability criteria.

ii. Hierarchical ranking

Scores on the remaining statements for each of the seven scales were totalled to achieve seven scale scores for each individual. Scale scores were then standardized on the basis of percent of maximum possible score for each scale. These standardized scores were then

ranked for each individual, from 1 through 7, with 1 representing the highest standardized score. When ties occurred between two or more standardized scores, each standardized score was given the mean of the ranks for which it was tied. Thus a hierarchal ranking of the seven value-orientations was obtained for each individual.

b. Socio-economic Status Level

Using the method of Chappell (personal communication) socio-economic status scores were calculated for each individual. Formal education (in years) was multiplied by the prestige rank of the seniors' major life occupation (Pineo et al., 1977).

To calculate the occupation-prestige rank, the stated occupation was first classified using the Canadian Classification and Dictionary of Occupations (Department of Manpower and Immigration, 1971). The first four digits of this seven digit classification were then placed into occupation categories to which prestige ranks had been assigned (Pineo et al., 1977). Individuals who stated their occupation as homemaker or housewife were assigned a prestige rank equivalent to that of a secretary (Nilson, 1975). The occupation categories and their ranks are presented in Table 2, with highest rank indicating highest prestige.

Five socio-economic status levels were developed on the basis of the distribution of individual socio-economic status scores.

TABLE 2
 PRESTIGE RANK OF OCCUPATION CATEGORIES¹

Occupation Category	Rank
Self-employed professionals	16
Employed professionals	15
High level management	14
Semi-professional	13
Technicians	12
Middle management	11
Supervisors	10
Foremen	9
Skilled clerical-sales-service	8
Skilled crafts and trades	7
Farmers	6
Semi-skilled clerical-sales-service	5
Semi-skilled manual	4
Unskilled clerical-sales-service	3
Unskilled manual	2
Farm labourers	1

¹Adapted from Pineo et al. (1977)

- c. Diet Quality Level
- i. Food record coding

In order to calculate the food group consumption of each individual, serving size criteria as stated in Canada's Food Guide Handbook (Health and Welfare Canada, 1977b) were employed. Thus, a serving in the milk and milk products group contained approximately 300 mg calcium, and a serving in the meat and meat alternates group contained approximately 17 to 22 g protein. The unit in which a food is commonly consumed was considered a serving in the bread and cereals and fruit and vegetables group. The household measurement listed in Nutrient Value of Some Common Foods (Health and Welfare Canada, 1979) was used to determine common serving portions for foods not specifically listed in the Handbook.

Two additional food categories, fruits and vegetables rich in vitamin C and fruits and vegetables rich in vitamin A, were considered important in the overall assessment of diet quality (Hertzler and Owen, 1976). To be included in the vitamin C group, the usual serving of a fruit or vegetable must contribute 100 percent of the recommended daily intake of vitamin C. To be included in the vitamin A group, the usual serving of a fruit or vegetable must contribute at least 25 percent of the recommended daily intake of vitamin A (Health and Welfare Canada, 1975). These criteria were established in view of the finding that fruits and vegetables contribute 92 and 25 percent of the vitamin C and A respectively in the diet of those over 65 (Health and Welfare Canada, 1977a).

Food records were coded according to the above criteria for serving size. The total number of servings consumed from each of the

six food groups were recorded for the three-day period. Means for the three days were calculated for each senior. Food items that did not belong in any of the food groups were not coded because caloric intake was not being studied.

ii. Guttman scalogram analysis

To permit statistical evaluation of those factors associated with overall quality of diet, Guttman scalogram analysis was used to determine a single score for each individual representing diet quality. Guttman scalogram analysis has been used successfully in studies to describe the range of food patterns in a number of population groups (Chassey et al., 1967; Schorr et al., 1972; Hertzler and Owen, 1976; Caliendo et al., 1977). As well, Mongeau (1973) states that food scales are becoming recognized as a method for separating individuals into categories because "the scalability of a diet indicates that it follows a set pattern according to the underlying forces affecting the food intake". Further, Hertzler and Owen (1976) conclude that the regularity shown in these scales may indicate "the presence of a unidimensional form by which to describe and analyze food habits".

A Guttman scale or scalogram has the properties of being ordinal, cumulative, reproducible, and unidimensional (Guttman, 1944). As the scale is cumulative, a diet which includes food items within a given scale step will also include all the items contained in the preceding steps. Knowing a subject's position on the scale, the items in the scale he has consumed can be reproduced or predicted. A subject's position on the scale also specifies the level of diet quality.

The application of scalogram analysis consisted of treating the food groups as sets of items and the mean food group intakes as responses. Based on the usage of each food group as suggested by Canada's Food Guide, the seniors' mean food group intake received a 'plus' (+) if it met or exceeded the recommended number of servings, and a 'minus' (-) if it failed to meet the standard. When Canada's Food Guide suggested a range for the number of servings, the minimum number was used as the standard, since this would allow probable nutrient adequacy with a minimum of calories (Health and Welfare Canada, 1977b). A mean intake of one serving in each of the vitamin A and vitamin C groups was set as the standard. Food groups were then ranked from highest to lowest, based on the number of +'s recorded in each group. The subjects were then rank ordered from highest to lowest, based on the number of food groups with a +, and the cutting points for the scale steps established. The seniors were assigned a diet quality score based on the highest step reached.

A perfect Guttman scale is rarely, if ever, obtained (Guttman, 1944). The 'coefficient of reproducibility' and the 'coefficient of scalability' estimate the seriousness of errors occurring in a scale and thus measure the degree to which a sample forms a perfect Guttman scale. The formulae for these coefficients are found in Appendix E. The coefficients range from 0 to 1, and the scalogram is considered acceptable when the coefficient of reliability is greater than or equal to 0.90 and the coefficient of scalability is greater than or equal to 0.65 (Schlegel, unpublished). The scale obtained in this research had coefficients of reliability and scalability of 0.93 and 0.66 respectively.

d. Demographic Data

Frequency distributions for the various demographic factors were calculated. Mean values for education level and age were also calculated.

4. Statistical Analysis

Nonparametric statistical tests were chosen to test the hypotheses of this study for two reasons. First, all of the independent variables, except years of education, and the principle dependent variable, diet quality level, were measured in nominal or ordinal manners. Second, the normality of the distribution could not be assumed.

The Kendall Coefficient of Concordance was used to measure the overall agreement among the sets of value-orientation rankings for the sample as a whole, within and between diet quality levels, and within and between socio-economic status levels (Siegel, 1956).

The Friedman two-way analysis of variance by ranks was used to determine whether all the value-orientations were ranked equally (Siegel, 1956). Tukey's multiple comparison test was applied to the data to locate when the differences occurred (Larmond, 1977).

The Kruskal-Wallis one-way analysis of variance by ranks was used to determine if there were relationships between the scores obtained on individual value-orientation scales and diet quality level (Siegel, 1956).

Kendall rank correlation coefficients, tau, were computed among the independent and dependent variables using the appropriate computer package program (Nie et al., 1970).

Relationships were considered to be significant at the 5 percent level of probability.

VI. RESULTS AND DISCUSSION

A. DEMOGRAPHIC CHARACTERISTICS OF THE SAMPLE

The data pertaining to the demographic characteristics of the sample are shown in Tables 3 and 4. The final sample consisted of fifty senior citizens, thirty-eight women and twelve men. Twenty-four of the subjects lived alone, four men and twenty women, while the remaining twenty-six subjects lived with another person or persons. Included in the sample were six married couples. Three subjects were still employed.

The distribution of subjects according to age group is presented in Table 3. Seventy-six percent of the sample was under seventy-five years of age. The grouped mean age of the sample was 71.59 years.

TABLE 3
DISTRIBUTION OF SUBJECTS BY AGE GROUP

Age Group (years)	Number of Subjects	Percent of Subjects
60 - 64	10	20
65 - 69	9	18
70 - 74	19	38
75 - 79	7	14
80 - 84	3	6
85 - 89	1	2
≥ 90 ¹	1	2

¹actual age = 92 years

The distribution of subjects by country of origin is shown in Table 4. Sixty-eight percent of the subjects were born in Canada.

TABLE 4
DISTRIBUTION OF SUBJECTS BY COUNTRY OF ORIGIN

Country of Origin	Number of Subjects	Percent of Subjects
Canada	34	68
United States	3	6
England	3	6
Scotland	3	6
Hungary	2	4
Germany	2	4
Ukraine	1	2
Northern Ireland	1	2
Russia	1	2

The sample had a mean of 10.50 ± 3.28^3 years of education, with a range of 2 to 19 years of education.

The mean occupation-prestige rank was 8.34 ± 3.22 , with a range of 3 to 15 (within a possible range of 1 to 16). Therefore this sample had an average occupation-prestige rank slightly higher than skilled clerical-sales-service occupations, with a range from unskilled clerical-sales-service to employed professional occupations (Table 2).

³ \pm standard deviation

B. DISCUSSION OF RESEARCH OBJECTIVES AND HYPOTHESES

Objective 1: To determine the food-related value-orientation heirarchy of an elderly population by adapting and testing the reliability of the Sims (1978a) value-orientation scales.

A hierarchal ranking pattern of value-orientations was derived for the sample (Figure 2). Kendall's Coefficient of Concordance determined that there was significant agreement among the sample as to the ranking pattern of the value-orientations ($p \leq 0.01$; $s = 425.26 > 343.80$). Further, Tukey's multiple comparison test was applied to locate significant differences which had been determined by the Friedman two-way analysis of variance ($p \leq 0.001$; $\chi^2 = 94.70 > 22.46$).

1. Familism_A¹
2. Health_B
3. Education_{BC}
4. Economics_{CD}
5. Convenience_{DE}
6. Social-psychological uses_E
7. Religion_F

¹any two value-orientations followed by the same letter are not ranked significantly differently at the 5 percent level

Figure 2. Hierarchal ranking of value-orientations by the sample

The value-orientation familism was ranked significantly higher than the other value-orientations reflecting the perception of the subjects that familism was the most important value in relation to

food. Younger samples studied by Suter and Barbour (1975) and Dyer (1962), as well as Sims's (1978a) non-vegetarians, also ranked family concerns highest although different research instruments were employed by Suter and Barbour (1975) and Dyer (1962).

However, it was not expected that this elderly sample would rank family concerns first for two reasons. First, approximately one-half of the sample lived alone. Second, the literature, as previously reviewed in section III.A.2.d., suggested that health, economic, and social-psychological considerations may be related to food choices, but did not mention possible family influences.

Therefore, one could interpret this finding several ways. First, when given the opportunity, seniors may choose to eat in a family-like setting, with health and economic concerns secondary. Second, a strong emphasis on meal-time as a family occasion, developed at an earlier stage of the life cycle, may not have been displaced by other concerns even though many of the seniors were not living in family situations. These factors together with a possible absence of family may account for the results.

Suter and Barbour's (1975) subjects and Sims's (1978a) non-vegetarians both ranked health third, whereas the elderly in this study ranked health second. The difference in the emphasis on this value-orientation may be partially explained by the difference in ages of the groups surveyed. The Sims (1978a) group had a mean age of twenty-one years, while Suter and Barbour (1975) sampled mothers of preschool children. Giffit et al. (1972) suggest that an older person, perhaps subject to the "aches of aging", may be more willing to apply nutritive quality as a basis for food choice than a young

person perhaps in better health. Similar thoughts have been expressed by other authors (Brown, 1976; Elwood, 1975; Jordan et al., 1954). However, health was not ranked significantly higher than education, which suggests that the elderly may be as interested in learning about nutrition as the younger sample of Sims (1978a), in which both vegetarians and non-vegetarians ranked education second. Suter and Barbour's (1975) low income mothers ranked education sixth.

Economics was ranked significantly lower than familism and health, thus it appears that even in a time of reduced income, as retirement is likely to be, economic considerations are not perceived as taking precedence. Economics was not ranked significantly differently than education or convenience, but was ranked significantly higher than social-psychological uses of food and religion.

Although the thought has often been expressed that seniors may not be motivated to cook for themselves (Rao, 1973), convenience was ranked lower than familism, health, and education. Thus convenience alone does not fully explain the food behaviour of the elderly.

Social-psychological uses was ranked very low in the hierarchy, even though the literature would suggest that social needs and symbols of security are important influences for senior citizens (Lau, 1978; Busse, 1978). Perhaps, as Kluckhohn (1959) states, values may be implicit as well as explicit. Social-psychological concerns may be only implicitly reflected in the food choices of seniors and as such may not be perceived by the seniors as being an influence on their food choices.

Religion was ranked significantly lower than all the other

value-orientations by this sample. Sims's (1978a) non-vegetarians also ranked religion last. One might have thought that older persons perhaps more traditional, would consider their religion more of an influence than younger persons. However this was not borne out in this study.

These studies, using different samples and measuring instruments, have found that values related to family and health tended to be ranked highly, while religion ranked very low. However, the vegetarians that were studied by Sims (1978a) ranked the food-related value-orientations differently than the non-vegetarians and the elderly (Table 5). Perhaps the food-related values of groups with distinct food-behaviour or life-style patterns, such as vegetarians or particular ethnic groups, are different from populations displaying 'typical' food behaviour. In order to investigate this hypothesis, a large random sample would be needed in order to see differences between groups. Alternately, those groups with distinct food-behaviour or life-style patterns could be selectively sampled, as was done by Sims (1978a), to determine if the value-orientation hierarchy differences detected by Sims (1978a) are also evident in the senior citizen population.

TABLE 5

A COMPARISON OF VALUE-ORIENTATION HIERARCHIES OF THE ELDERLY WITH SIMS (1978a) SAMPLES

Value-orientation	Rank	
	Elderly	Sims (1978a) Non-vegetarians Vegetarians
Familism	1	3
Health	2	1
Education	3	2
Economics	4	5
Convenience	5	Not Tested
Social-psychological uses	6	6
Religion	7	4

Objective 2: To measure the current habitual food intake of and elderly population and compare it to Canada's Food Guide recommendations.

The data concerning the food group consumption of the sample are presented in Tables 6 through 8. The mean daily food group intakes of the sample are shown in Table 6. The sample consumed an average of $1\frac{1}{4}$ servings from the milk and milk products group, $4\frac{2}{3}$ servings of bread and cereals, and $1\frac{3}{4}$ servings from the meat and meat alternates group. Approximately 5 servings of fruit and vegetables were consumed daily, 2 of which were servings of vitamin C and/or A rich fruit and vegetables.

TABLE 6
THREE-DAY MEAN DAILY FOOD GROUP INTAKES OF SUBJECTS

Food Group	3-Day Mean Intake (Number of Servings)	Range
Milk and Milk Products	1.21±0.64	0.05- 2.85
Bread and Cereals	4.67±2.08	0.67-10.42
Meat and Meat Alternates	1.70±0.69	0.63- 3.63
Fruit and Vegetables	4.93±1.43	2.19- 8.66
Vitamin C rich Fruit and Vegetables	1.46±0.73	0.17- 2.85
Vitamin A rich Fruit and Vegetables	0.53±0.59	0.00- 2.83

A comparison of the sample's mean daily food group intake to that recommended by Canada's Food Guide is presented in Table 7. Mean daily intakes of bread and cereals, fruit and vegetables, and vitamin C rich fruit and vegetables exceeded the suggested intakes. The mean intakes of milk and milk products, meat and meat alternates, and vitamin A rich fruit and vegetables were below the recommended levels. The statistical significance of these differences was not determined.

TABLE 7
THREE-DAY MEAN DAILY FOOD GROUP INTAKES AS COMPARED
TO CANADA'S FOOD GUIDE RECOMMENDATIONS

Food Group	Number of Servings	
	3-Day Mean Intake	Recommendation
Milk and Milk Products	1.21	2
Bread and Cereals	4.67	3
Meat and Meat Alternates	1.70	2
Fruit and Vegetables	4.93	4
Vitamin C rich Fruit and Vegetables	1.46	1 ¹
Vitamin A rich Fruit and Vegetables	0.53	1 ¹

¹ derived for this study

Table 8 presents the percentage of subjects consuming less than 100, 67, and 34 percent of the recommended number of servings of the food groups. The bread and cereals group had the highest frequency

of adequate intakes while the milk and milk products group had the lowest number of adequate intakes. Fruits and vegetables in general and vitamin C rich fruit and vegetables in particular were consumed in adequate amounts by approximately three-quarters of the sample, whereas approximately one-quarter of the sample consumed vitamin A rich fruits and vegetables at the standard level. Slightly less than one-third of the sample consumed the recommended number of servings of meat and meat alternates.

TABLE 8
PERCENT OF CANADA'S FOOD GUIDE RECOMMENDATIONS CONSUMED

Food Group	100%	99-67%	66-34%	≤33%
	(% of Subjects)			
Milk and Milk Products	12	22	48	18
Bread and Cereals	90	6	2	2
Meat and Meat Alternates	30	38	28	4
Fruit and Vegetables	74	20	6	0
Vitamin C rich Fruit and Vegetables	78	14	0	8
Vitamin A rich Fruit and Vegetables	22	10	20	48

The literature concerning the food group intake of the elderly is far from agreement as to what is the typical food group intake of the elderly. Nutrition Canada (Health and Welfare Canada, 1977a) reported that a similar number of servings of milk and milk products and

meat and meat alternates was consumed by the national population over sixty-five years of age. However, the reported intake of fruit and vegetables by the Winnipeg study is greater than for the national sample (4.93 vs 3.75 servings respectively). The higher reported intake in the Winnipeg sample may be due to several factors. The Nutrition Canada data was obtained by the 24-hour recall method which tends to underestimate larger intakes (Gersovitz et al., 1978; Madden et al., 1976). As well, the recall may not account for foods and amounts "forgotten" by elderly subjects (Campbell and Dodds, 1967). Further, there has been a general increase in fruit and vegetable consumption across Canada since 1970, when the Nutrition Canada survey took place (Statistics Canada, 1970; Statistics Canada, 1978). However, Nutrition Canada used 100 g of fruit and vegetables as being equivalent to one serving, whereas this study used common volume measurements. Thus the slightly different serving sizes may also account for the difference. As a result, the national consumption of fruits and vegetables was below that recommended by Canada's Food Guide. Other food group patterns as compared to Canada's Food Guide were similar. That is, meat and meat alternates and milk and milk products were consumed in inadequate amounts with breads and cereals consumed in greater than minimum recommended amounts. Nutrition Canada did not report intakes of vitamin C and A rich fruit and vegetables.

As well, other researchers have reported conflicting findings. Reid and Miles (1978), based on a 3-day food record, reported that with the exception of fruits and vegetables, the mean daily consumption of the other food groups met the recommendations of Canada's

Food Guide. While seventy-eight percent of the subjects in the Winnipeg study consumed at least one serving of vitamin C rich fruit and vegetables, only fifty-eight percent of the Reid and Miles (1978) subjects did so.

Rae and Burke (1978) reported on the adequacy of food selection of elderly clients before counselling assessed against a standard developed from the Dietary Standard for Canada (Health and Welfare Canada, 1975) and Canada's Food Guide. While two-thirds of the subjects had adequate intakes of milk and vegetables, one-half had adequate consumption of fruit and bread and cereals, and one-third consumed adequate meat. The data collection method was not reported. Thus, meat and meat alternates intake is comparable to the Winnipeg study as is the fruit and vegetable intake. However, milk consumption in adequate amounts was much higher than in the Winnipeg study, while bread and cereal adequate consumption was lower.

The frequency of inadequate consumption of milk and milk products and fruit and vegetables in the current study is similar to that reported by Kohrs et al. (1978) using food frequency data from 135 subjects over 65. However, they report a higher percent (62) of seniors consuming inadequate amounts of bread and cereals, and lower percentages consuming less than the recommended amounts of vitamin C (5 percent) and A (39 percent) rich fruits and vegetables respectively.

Thus, while the current research is not in total agreement with the literature, neither are the reports in the literature in agreement with one another. Much more research is necessary in order to

document the food intake patterns of the elderly before general conclusions regarding the 'typical' food pattern of the elderly can be made.

Objective 3: To determine the scalability, by Guttman scalogram analysis techniques, of the food groups consumed by the elderly.

Guttman scalogram analysis produced the scale of food groups and subject distribution shown in Table 9. From the results of Objective 2, it follows that bread and cereals is the lowest food group on the Guttman scale, with milk and milk products the highest group on the scale. Sixty percent of the subjects are in Levels 0 through 3, with the remaining 40 percent in Levels 4 through 6. The largest percent of the subjects is found in Level 3, indicating that adequate consumption of bread and cereals, vitamin C rich fruit and vegetables, and fruit and vegetables in general was the most frequently found food pattern. Only 6 percent of the subjects consumed all the food groups in adequate amounts, thus reaching Level 6. It appears that the distribution of subjects according to Guttman scale level is approximately normally distributed, with fewer subjects at either end of the scale and the highest percentage of the subjects in the middle level.

Food groups found at each scale step agree with others who have found that the most common items tend to be grains (breads and cereals) (Hertzler and Owen, 1976). Dairy foods and fruits and vegetables tended to occur least frequently in most scales. The use of foods such as milk may, however, occupy different scale positions depending on the population sampled. For example, one might expect milk to be a more basic food in the diet of younger persons as opposed to senior citizens (Kronold and Floyd, 1979). This has been shown by comparing the results of this study with that of Schorr et al. (1972)

TABLE 9
 FREQUENCY DISTRIBUTION OF SUBJECTS BY GUTTMAN SCALOGRAM LEVEL

Scale Level	Food Groups Consumed in Adequate Amounts	Number of Subjects	Percent of Subjects Consuming Each Food Group
0	None	2	100
1	Bread and Cereals	8	96
2	Level 1 + Vitamin C rich Fruit and Vegetables	3	80
3	Level 2 + Fruit and Vegetables	17	74
4	Level 3 + Meat and Meat Alternates	8	40
5	Level 4 + Vitamin A rich Fruit and Vegetables	9	24
6	Level 5 + Milk and Milk Products	3	6

who studied teenagers and found milk to be the most frequently consumed food, and as such, occupying the lowest Guttman scale step. However, Schorr et al. (1972) scaled only the number of subjects consuming the food and not the amounts consumed.

This research has shown that the food group intakes of senior citizens are scalable and form a pattern which is similar to other age groups.

Objective 4: To measure the socio-economic status levels of elderly subjects.

Socio-economic status scores, the product of years of education and occupation-prestige rank, ranged from 6 to 240, with a mean of 93.94±57.24. The five socio-economic status levels derived from the distribution of these scores are shown in Table 10.

TABLE 10
FREQUENCY DISTRIBUTION OF SUBJECTS BY SOCIO-ECONOMIC STATUS LEVEL

Socio-economic Status Level	Range of Scores	Number of Subjects	Percent of Subjects
1	6- 40	9	18
2	48- 64	9	18
3	72- 88	11	22
4	96-130	11	22
5	143-240	10	20

When the range of possible socio-economic status scores obtained by this method (0 through possible 320) is considered, this sample is primarily in the lower half of the range.

Objective 5: To determine the relationships among food-related value-orientations, socio-economic status, and diet quality in an elderly population.

The hypotheses formulated to determine the relationships among food-related value-orientations, socio-economic status, and diet quality were statistically tested and the following results obtained.

H_{a1} : Senior citizens within a diet quality level will agree on a rank-order pattern of the value-orientations.

Agreement within diet quality levels was necessary before level of agreement among different diet quality levels could be tested. Standard deviations obtained during calculation of the Kendall Coefficient of Concordance and the level of significance of agreement at the diet quality levels are shown in Table 11.

TABLE 11
SIGNIFICANCE OF AGREEMENT ON VALUE-ORIENTATION
RANKING PATTERNS WITHIN DIET QUALITY LEVELS

Diet Quality Level	s Obtained	Significance
0	84.50	not significant
1	1041.50	≤ 0.01
2	184.00	≤ 0.05
3	5071.50	≤ 0.01
4	1377.50	≤ 0.01
5	1651.00	≤ 0.01
6	129.50	not significant

Within each of diet quality levels 1 through 5 there was significant agreement as to the rank-order pattern of value-orientations. The non-significance at levels 0 and 6 could be due to the small number of subjects at each of these levels (Table 9). Levels 0 and 6 were therefore excluded from the test for H_{a_2} because there was not significant agreement within the level.

H_{a_2} : There will be a difference in the rank-order patterns of the value-orientations of senior citizens at different diet quality levels.

The standard deviation obtained in the calculation of the Kendall Coefficient of Concordance was 425.26 which is greater than 343.80, the standard deviation required for statistical significance at the level of $p \leq 0.01$. If value-orientation rank patterns were related to diet quality, one would expect both agreement within diet quality levels and disagreement among different diet quality levels. Since there was significant agreement in the rank pattern of the value-orientations between diet quality levels 1 through 5, differences in diet quality are not accounted for by differences in the rank-order patterns of value-orientations.

H_{a_3} : Senior citizens at different diet quality levels will assign different scale scores for individual value-orientations.

Kruskall-Wallis one-way analysis of variance across the seven diet quality levels were performed and are shown in Table 12.

There were no significant differences in the scale scores of any of the value-orientations by diet quality level. If a relationship

TABLE 12
SIGNIFICANCE OF DIFFERENCE IN VALUE-ORIENTATION
SCALE SCORES ACROSS DIET QUALITY LEVELS

Value-orientation	Chi Square Obtained	Significance
Social-psychological Uses	4.41	0.70
Education	7.06	0.50
Convenience	9.41	0.20
Economics	9.74	0.20
Religion	4.76	0.70
Familism	5.13	0.70
Health	9.48	0.20

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existed between value-orientation scale scores and diet quality, a difference in the scores of one or more value-orientation scales would be expected at different diet quality levels. Therefore, differences in diet quality are not related to differences in value-orientation scale scores.

H_{a_4} : There is a positive correlation between diet quality level and scores on the value-orientation scales of education, health, and familism.

Kendall rank correlation coefficients between the value-orientation scale scores and diet quality level are shown in Table 13. It had been hypothesized that the value-orientations education, health, and family would be positively related to diet quality level in that a higher importance attached to these values might be thought to

TABLE 13
 RELATIONSHIPS BETWEEN VALUE-ORIENTATION
 SCALE SCORES AND DIET QUALITY LEVEL

Value-orientation	Kendall Coefficient (tau)	Significance
Social-psychological Uses	-0.020	0.855
Education	0.061	0.579
Convenience	-0.097	0.368
Economics	-0.045	0.678
Religion	-0.032	0.767
Familism	0.114	0.325
Health	-0.004	0.972

promote more adequate food intake. However, this hypothesis was not borne out in the study. Thus it does not appear that an increased value on health, the usual emphasis of nutrition education programs (Hill, 1966), is related to a more adequate food intake as compared to Canada's Food Guide.

One could speculate as to the possible reasons for this finding. Perhaps the relationship of food to health has not been effectively communicated to this sample, suggesting that new educational approaches may be needed. As well, one could hypothesize that supportive beliefs, attitudes, and knowledge may be necessary for the senior to realize his value-orientation. For example, a senior may score health highly, yet may not eat a healthful diet because of a lack of knowledge regarding nutritious food choices, a belief that vitamin and mineral supplements can provide all the nutrients needed, or the attitude that nutrition is not important to health. Further, external var-

ables, such as income, may have affected the realization of this value, since income below a certain minimum level may affect the individual's ability to purchase foods of his choice. Therefore, further studies are necessary to determine the possible interrelationships among value-orientations and other variables affecting food behaviour.

H_{a5} : A correlation between socio-economic status level and diet quality level will be explained by a difference in the rank-order pattern of value-orientations among socio-economic status levels.

Kendall rank correlation coefficients between socio-economic status level, the components of socio-economic status level (years of education and occupation-prestige rank), and diet quality level are presented in Table 14. While years of education was not significantly related to diet quality, occupation-prestige rank and socio-economic status level were significantly and negatively related to diet quality level.

TABLE 14
RELATIONSHIPS BETWEEN SOCIO-ECONOMIC
STATUS INDICES AND DIET QUALITY LEVEL

Variable	Kendall Coefficient (tau)	Significance
Years of Education	-0.195	0.074
Occupation-prestige Rank	-0.230	0.044
Socio-economic Status Level	-0.225	0.049

Guthrie et al. (1972) and Kohrs et al. (1979) have reported years of education to be significantly and positively related to specific nutrient intakes of the elderly. However, the relationship of education level to overall diet quality has not previously been determined. This may account for the difference in findings, since other factors, such as sex, have been found to be related to the intake of specific nutrients while not being related to overall diet quality (Reid and Miles, 1977).

The significant negative relationship between occupation-prestige rank and diet quality level is in agreement with the one study reported which analyzed this relationship (Kohrs et al., 1979). These authors found that seniors from manual occupations consumed more energy, protein, calcium, and thiamin than those from higher occupational levels. The following explanation of these findings was offered by Kohrs et al. (1979).

...during their active working years, these men [from manual occupations] probably consumed more energy and protein foods than men in other occupations. After retirement, the habits of a life-time continued, even when they ate all of their meals at home. When available money had to be carefully budgeted, persons with manual labor backgrounds perhaps would give meat and total food quantity a higher priority than would individuals with professional, managerial, and business backgrounds.

Considering that the method of diet quality assessment in the current research was concerned with the amounts of foods consumed, the explanation offered by Kohrs et al. (1979) may be relevant to this research. Consumption of two or more servings of meat and meat alternates would have placed subjects at diet quality level 4 or higher, while a greater total food intake would also be likely to result in a higher diet quality level being attained.

In order to determine whether this theory was applicable to this research, the relationships between individual food group intakes and occupation-prestige rank were calculated (Table 15). This data would suggest that increased intakes of vitamin A rich fruit and vegetables, rather than meat, at lower occupational levels may account for higher diet quality ratings. An adequate intake of vitamin A rich fruit and vegetables would have placed a subject at the second highest diet quality level, Level 5.

TABLE 15
RELATIONSHIPS BETWEEN FOOD GROUP INTAKE AND
OCCUPATION-PRESTIGE RANK

Food Group	Kendall Coefficient (tau)	Significance
Milk and Milk Products	0.108	0.309
Bread and Cereals	0.136	0.203
Meat and Meat Alternates	0.127	0.232
Fruit and Vegetables	-0.183	0.084
Vitamin C rich Fruit and Vegetables	0.022	0.839
Vitamin A rich Fruit and Vegetables	-0.297	0.006

Similarly, in order to examine the reason for the significant negative relationship between diet quality level and socio-economic status level, the relationships between food group intakes and socio-economic status level were examined (Table 16). It was

TABLE 16
 RELATIONSHIPS BETWEEN FOOD GROUP INTAKES AND
 SOCIO-ECONOMIC STATUS LEVEL

Food Group	Kendall Coefficient (tau)	Significance
Milk and Milk Products	0.146	0.168
Bread and Cereals	0.012	0.911
Meat and Meat Alternates	0.140	0.187
Fruit and Vegetables	-0.234	0.027
Vitamin C rich fruit and Vegetables	-0.052	0.625
Vitamin A rich fruit and Vegetables	-0.305	0.005

found that fruit and vegetables in general, as well as vitamin A rich fruit and vegetables were consumed in significantly greater amounts by those at lower socio-economic status levels.

One could speculate as to the possible reasons for the negative relationship between socio-economic status level and overall diet quality that was found in this research. Perhaps people at higher socio-economic status levels may continue purchasing patterns which may have been habituated in times of higher income (Howell and Loeb, 1969). The use of more expensive cuts of meat and selection of canned goods by major brand name may result in the senior purchasing less total food on a fixed budget. This in turn may result in a lower diet quality level being attained since less food purchases would likely be reflected in fewer food group

recommendations being met. As well, while seniors at higher levels of income actually spend more money on food (Plonk and Pulley, 1977), this study would indicate that the types and amounts of foods purchased are pertinent. Perhaps 'extra' foods such as cake and cookies may be purchased more frequently at higher income levels, which would result in higher intakes of energy and fat, as found by Grotkowski and Sims (1978). Thus, seniors from higher socio-economic status levels may not be as able to adjust, in a nutritionally adequate manner, to a reduced food budget as seniors who were at lower socio-economic status levels for most of their lives. Further, Kohrs et al. (1979) suggest that seniors from manual occupations, which in this study would be reflected in a lower socio-economic status level, may give a higher priority to total food quantity when faced with a reduced income. This practice would likely result in a higher diet quality level. Therefore, the allocation of money for food may be related to past food consumption patterns. Thus, seniors at lower socio-economic status levels may have purchasing and budgeting practices which favour a higher diet quality level when faced with a reduced income. It would be interesting to conduct further research to reanalyze the food consumption data and calculate the kinds and amounts of non-food-group items consumed at various socio-economic status levels in order to test this hypothesis.

The negative relationship between socio-economic status level and diet quality level obtained in this research is in disagreement with Grotkowski and Sims (1978), who used a similar socio-economic status index and 3-day food record, and found a significant positive correlation between socio-economic status level and several nutrients

(energy, protein, fat, and ascorbic acid). However, the findings of Grotkowski and Sims (1978) can be considered questionable when the data analysis and statistical procedures employed in their study are compared to the current research. The manner in which the food consumption data was analyzed differed between the studies. Grotkowski and Sims (1978) calculated the intakes of energy and ten nutrients from all foods consumed, which were then related to socio-economic status. The Winnipeg research calculated food group intake from the food consumption data. Food items that did not belong in any of the food groups were not coded because caloric and nutrient intake were not being studied. Guttman scalogram analysis was then applied to produce an overall diet quality score which was then related to socio-economic status. Because Guttman scale techniques treat food group intakes as dichotomous variables, either failing or succeeding in meeting the standard, once a food group recommendation has been met, no further credit is given. However, the use of absolute intakes of foods or nutrients, as in Grotkowski and Sims (1978), assumes 'more is better', thus crediting intakes beyond a level of meaningful contribution (Batt, 1979). For example, the mean intake of protein and ascorbic acid, both nutrients found to be related to socio-economic status by Grotkowski and Sims (1978), were consumed in amounts ranging from 23 percent to 144 percent in excess of the RDA. As well, energy and nutrients such as fat may have been obtained from foods which were not analyzed in the Winnipeg research, such as cake and butter. It would have been more appropriate for Grotkowski and Sims (1978) to score the nutrient intakes in such a way so that a higher score would reflect better dietary

practices and give an indication of total dietary patterns, as was done in the Winnipeg study. Then the proposed linear relationship between diet quality and socio-economic status could be tested.

In testing the relationship between diet quality and socio-economic status, Grotkowski and Sims (1978) utilized the Pearson product moment correlation coefficient. This parametric statistical procedure assumes that the data collected had the properties of at least an interval level of measurement and were normally distributed (Siegel, 1959). The use of a socio-economic status index would indicate an ordinal rather than interval level of measure. As well, one might speculate that the distribution of dietary practices, such as nutrient intake, would be skewed rather than normally distributed (Batt, 1979). Therefore, the statistical procedures employed by Grotkowski and Sims (1978) do not appear appropriate when the characteristics of the data are considered. Further, since parametric rather than non-parametric statistics are more likely to produce significant results (Siegel, 1959), one could question whether the relationship found to be significant at the $p < 0.05$ level would have been at the same level of significance with the use of the more appropriate non-parametric procedures. The Winnipeg study employed non-parametric statistical methods.

Thus, when data analysis and statistical procedures are considered, it appears that the Winnipeg study has employed more appropriate techniques than those found by Grotkowski and Sims (1978) to produce a significantly positive relationship between nutrient intake and socio-economic status.

It was hypothesized that a correlation between socio-economic status level and diet quality level would be explained by a difference in the rank-order pattern of value-orientations among socio-economic status levels. However, it was found that there was significant agreement across socio-economic status levels as to the rank-order pattern of value-orientations ($s = 428.23 > 343.80$ where $p \leq 0.01$). Therefore, the negative relationship between diet quality and socio-economic status level cannot be explained by a concomitant difference in value-orientation ranking patterns. However, in exploring the relationships between individual value-orientation scale scores and socio-economic status level it was found that there were several relationships significant at the $p \leq 0.05$ level (Table 17). The value-orientations education, economics, and religion were significantly and negatively related to socio-economic status level.

TABLE 17
RELATIONSHIPS BETWEEN VALUE-ORIENTATION SCALE SCORES
AND SOCIO-ECONOMIC STATUS LEVEL

Value-orientation	Kendall Coefficient (tau)	Significance
Social- psychological Uses	-0.124	0.258
Education	-0.285	0.009
Convenience	0.055	0.612
Economics	-0.279	0.010
Religion	-0.258	0.019
Familism	-0.006	0.957
Health	-0.025	0.816

Thus, while no direct relationship was found between value-orientation scale scores and diet quality, there were significant relationships between value-orientations and socio-economic status level and between socio-economic status level and diet quality level. In particular, the relationship among the value-orientation education, socio-economic status level, and diet quality level is worthy of discussion (Figure 3). The education value-orientation was one of the only two value-orientations which showed a positive trend in relation to diet quality. As well, the education value-orientation was significantly, and negatively, related to socio-economic status level. In other words, persons at lower socio-economic status levels were found to score the value-orientation education significantly higher, and this value-orientation, in turn, was weakly positively related to diet quality. It is possible that the significant negative relationship between socio-economic status level and diet quality may be partially explained by the negative relationship between socio-economic status level and the value-orientation education. Thus, further study of the relationship between the education value-orientation and diet quality appears warranted.

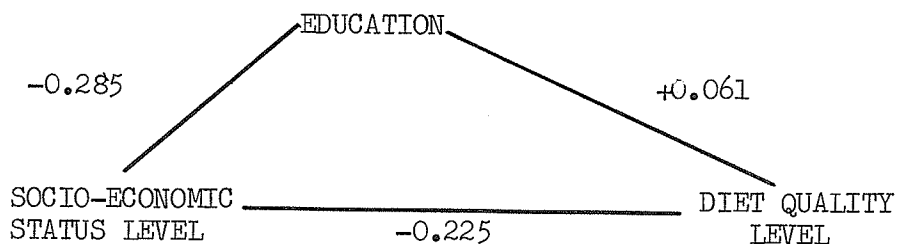


Figure 3. Relationships among socio-economic status level, education value-orientation, and diet quality (Kendall's tau)

While the value-orientations of religion and economics were significantly and negatively related to socio-economic status level, they also showed a negative trend in relation to diet quality and so do not appear to explain the relationship between socio-economic status level and diet quality.

There could be several possible explanations for the finding that value-orientations and diet quality were not directly related. Both the value-orientation measurement instrument and the research design must be considered. The value-orientation measurement instrument employed in this research necessitated the derivation of the value-orientation hierarchy by the researcher on the basis of the standardized value-orientation scale scores. Had the subjects been asked to hierarchally rank the value-orientation concepts according to their perceived degree of influence on the food consumption decision, perhaps the hierarchy may be been different. More research is necessary to develop such a method. As well, the adapted Sims (1978a) scales may not have embraced all the value-orientations considered important by the elderly. Thus, a key value-orientation may have been missed. More descriptive research is required in order to document all the values which may enter into the food consumption decision.

The research design accounted for only a few of the many variables which may have influenced the food consumption patterns of the subjects. It is apparent that further research which examines the patterns and interrelationships among food-related knowledge, attitudes, beliefs, and values, along with external variables, in relation to nutrition behaviour is required. Concomitant study of all these factors

is necessary to understand the interaction of variables in relation to the food consumption decision.

Further, in the design of this research, it was implicitly assumed that people act rationally, that is, to maximize their value-orientations, when selecting foods. The question can be raised as to whether this is an accurate assumption, or whether the food consumption decision is usually one "determined simply by impulse or by a purely rational calculus of temporary expediency" in which case value-orientations may not be operative (Kluckhohn, 1959). Perhaps the food consumption decision is typically one of "habit" and only during particular periods of the life cycle, for example pregnancy or during crisis situations such as serious illness, are values manifest in conscious food choices. Thus, one might not expect to find a direct relationship between value-orientations and diet quality in senior citizens in a state of health which allows them to participate in community groups. Further research into the relationship between value-orientations and diet quality conducted with other population groups is needed in order to test this hypothesis.

VII. SUMMARY AND CONCLUSIONS

A group of 50 independent-living individuals, 38 women and 12 men over 59 years of age, participated in a study designed to determine the relationships between food-related value-orientations and diet quality. Demographic variables assessed included age, sex, living arrangements, country of origin, years of education, and former occupation-prestige. The latter two variables were combined as an index of socio-economic status. The mean age of the sample was 71.59 years, with 76 percent of the subjects under 75 years of age. Twenty-four of the subjects lived alone, 4 men and 20 women. Sixty-eight percent of the sample was born in Canada. The sample had a mean educational attainment of 10.50 years, and a mean former occupation-prestige rank of 8.34.

The Sims (1978a) value-orientation scales were adapted for an elderly sample. The Chronbach alpha reliability coefficients for the 7 scales included in final analysis ranged from 0.70 to 0.87. There was significant agreement by the sample as a whole as to the ranking pattern of the value-orientations ($p \leq 0.01$), with the value-orientations ranked significantly differently within the hierarchy ($p \leq 0.001$). Familism was ranked higher, and religion ranked lower, than health, education, economics, convenience, and social-psychological uses ($p \leq 0.05$).

With respect to the diet quality of the group, calculated from a 3-day food record, the mean intake of 3 of the 6 food groups met or exceeded the intake suggested by Canada's Food Guide. Mean daily intake of bread and cereals, fruit and vegetables, and vitamin C

rich fruit and vegetables exceeded the suggested intake. The mean intake of meat and meat alternates, vitamin A rich fruit and vegetables, and milk and milk products was below the recommended levels. Guttman scalogram analysis produced a 7-step food group scale with a coefficient of reliability of 0.93 and a coefficient of scalability of 0.66. While 96 percent of the subjects reached step 2 (bread and cereals), only 6 percent reached step 7 (milk and milk products).

Occupation-prestige rank and socio-economic status level were negatively related to diet quality ($p \leq 0.05$). The scale scores for the value-orientations education, economics, and religion were significantly and negatively related to socio-economic status level ($p \leq 0.05$). Neither the hierarchal ranking pattern of value-orientations nor the scoring of individual value-orientations were related to diet quality. Thus, no direct relationship between value-orientations and diet quality was found in the independent-living senior citizens sampled. However, in order to evaluate the significance of this finding, more research is necessary to more fully develop the theory concerning the mechanism of action of values on behaviour in general, as well as on food behaviour in particular.

VIII. IMPLICATIONS

Certain considerations are fundamental to nutrition education regardless of the age of the target audience. The ultimate objective is to improve the nutritional status of the target group. This usually requires that individuals who have established food habits adopt new or innovative food and nutrition ideas or practices. However, an intimate relationship exists between peoples' life-style and the food they choose to eat: "dietary practices are a part of a person's whole behaviour pattern which reflects efforts to cope with all of his needs, desires, fears, and aspirations" (Giffit, et al., 1972). Therefore, an effective process of education must place priority on the people involved rather than on the teaching of nutrition per se.

Knowledge of food-related values should enable educators to consider the context in which food and its relation to health are important to their audiences. This research has found that familism was valued more highly than health in relation to food. As well, it was found that those who valued health more highly did not necessarily have higher diet quality scores. It is therefore apparent that other variables besides a value placed on health are operative in the food choice decision. Since nutrition educators often use health as a motive for changing nutrition behaviour, perhaps the focus of the nutrition education message should be reassessed. Further, nutrition educators cannot concentrate on one feature of a person's belief system such as knowledge or attitudes, and expect to effect a change in nutrition behaviour. Rather, an attempt

must be made to appreciate the complicated but subtle connection between what people choose to eat and all the other aspects of their lives.

Other factors must also be considered when developing nutrition education programmes for the elderly. Of particular importance is the fact that dietary habits of older individuals have been well established for a number of years. Thus programmes should not emphasize drastic changes in eating patterns but attempt to use the established eating patterns to best advantage. Therefore, a knowledge of the type and amounts of foods currently consumed is pertinent to programme development. This research has confirmed the findings of other researchers that bread and cereals are the basis of most senior citizens' diets, with meat and milk products being consumed much less frequently. Thus, an emphasis should be placed on integrating these latter foods into existing eating patterns in any intervention programmes. As well, the importance attached to familism may suggest that in considering the nature of the intervention programme, settings which simulate a family environment, such as well planned congregate meal programmes, may be conducive to stimulating interest in food and nutrition. Further, this research has suggested that it is not only those seniors in typically low socioeconomic status environments that may benefit from nutrition intervention programmes.

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APPENDICES

APPENDIX A
PRETEST QUESTIONNAIRE

IDENTIFICATION NUMBER: _____

THIS QUESTIONNAIRE IS PART OF A RESEARCH STUDY CONDUCTED BY MRS. KATHY HARRISON OF THE UNIVERSITY OF MANITOBA TO DETERMINE HOW SENIOR CITIZENS FEEL ABOUT NUTRITION AND THE FOOD THEY EAT.

THE QUESTIONNAIRE IS DIVIDED INTO 2 SECTIONS. PART A CONCERNS QUESTIONS ON HOW YOU FEEL ABOUT THE FOOD YOU EAT, AND PART B REQUESTS SOME BACKGROUND INFORMATION ON THE PARTICIPANTS IN THE STUDY.

IN ADVANCE - THANK YOU FOR YOUR COOPERATION.

* * * * *

PART A

INSTRUCTIONS:

PLEASE INDICATE HOW YOU FEEL ABOUT EACH OF THE STATEMENTS BY CIRCLING THE APPROPRIATE RESPONSE. IF YOU HAVE "NO OPINION", PLEASE INDICATE ACCORDINGLY.

SA = STRONGLY AGREE

A = AGREE

N = NO OPINION

D = DISAGREE

SD = STRONGLY DISAGREE

EXAMPLE:

I SOMETIMES LIKE TO WATCH TELEVISION. SA A N D SD

PLEASE PROCEED TO THE NEXT PAGE.

	STRONGLY AGREE	AGREE	NO OPINION	DISAGREE	STRONGLY DISAGREE
1. MORE PEOPLE SHOULD AVAIL THEMSELVES OF NUTRITION CLASSES IN ORDER TO BE BETTER INFORMED ABOUT FEEDING THEMSELVES AND THEIR FAMILIES.	SA	A	N	D	SD
2. EATING THE SAME FOODS AS MY FRIENDS IS IMPORTANT TO ME.	SA	A	N	D	SD
3. CERTAIN FOODS I EAT HELP ME EXPRESS MY EMOTIONS, FOR EXAMPLE -- EATING STEAK MAKES ME FEEL STRONGER AND MORE POWERFUL.	SA	A	N	D	SD
4. IT IS IMPORTANT THAT A FAMILY EATS AT LEAST ONE MEAL A DAY TOGETHER SO THAT EACH MEMBER CAN HAVE SOME TIME TO TALK TO EACH OTHER.	SA	A	N	D	SD
5. IF I WANT TO EXPRESS LOVE OR AFFECTION FOR SOMEONE, I WOULD TAKE HIM OR HER A GIFT OF FOOD OR INVITE HIM OR HER TO DINNER.	SA	A	N	D	SD
6. I WOULD RATHER PREPARE GOURMET MEALS THAN DO ANYTHING ELSE.	SA	A	N	D	SD
7. I ESPECIALLY ENJOY ENTERTAINING DINNER GUESTS BECAUSE THEN I FEEL LIKE I CAN SPEND MORE FOR FOOD THAN I ORDINARILY DO.	SA	A	N	D	SD
8. BRINGING A GIFT OF WINE OR CANDY TO YOUR FRIENDS IS AN EXCELLENT WAY OF EXPRESSING AFFECTION.	SA	A	N	D	SD
9. A PROPER DIET IS THE MAIN FACTOR IN PREVENTING AND CURING PRACTICALLY ALL DISEASES.	SA	A	N	D	SD
10. MORE PEOPLE SHOULD FIND COOKING AS A UNIQUE CREATIVE EXPERIENCE RATHER THAN A BORING CHORE.	SA	A	N	D	SD

PLEASE TURN PAGE

	STRONGLY AGREE	AGREE	NO OPINION	DISAGREE	STRONGLY DISAGREE
11. KNOWING THAT I CAN PREPARE MEALS THAT REQUIRE MUCH TIME AND SKILL THAT MOST PEOPLE CAN'T IS A SOURCE OF GREAT PERSONAL PRIDE TO ME.	SA	A	N	D	SD
12. IF I HAVE A FRIEND WHO LIVES ALONE, I OFTEN INVITE HIM/HER TO SHARE A SPECIAL MEAL WITH US.	SA	A	N	D	SD
13. I BELIEVE THAT DIET IS THE MAIN CONTROLLING FACTOR WHEN IT COMES TO MAINTAINING HEALTH AND CONTROLLING DISEASE.	SA	A	N	D	SD
14. IT IS IMPORTANT THAT THE FOOD ONE EATS REFLECTS HIS RELIGIOUS BELIEFS.	SA	A	N	D	SD
15. FAMILIES SHOULD EAT DINNER TOGETHER AT THE TIME THAT MAKES EVERYBODY THE HAPPIEST.	SA	A	N	D	SD
16. I WOULDN'T EAT THE WAY I DO IF IT WEREN'T FOR MY FRIENDS.	SA	A	N	D	SD
17. IT DOESN'T MATTER MUCH WHETHER A FAMILY EATS TOGETHER OR NOT.	SA	A	N	D	SD
18. WITH EVERYONE IN FAMILIES SO BUSY IN VARIOUS ACTIVITIES, IT IS VIRTUALLY IMPOSSIBLE FOR THEM TO EAT MEALS TOGETHER.	SA	A	N	D	SD
19. I USUALLY LOOK FOR INFORMATION ON FOOD OR NUTRITION WHEN I READ A MAGAZINE OR NEWSPAPER.	SA	A	N	D	SD
20. MY RELIGIOUS BELIEFS DICTATE THE TYPES OF FOODS I EAT AND THE WAYS I PREPARE THEM.	SA	A	N	D	SD

PLEASE TURN PAGE

	STRONGLY AGREE	AGREE	NO OPINION	DISAGREE	STRONGLY DISAGREE
21. COOKING IS A BORING, MONOTONOUS CHORE RATHER THAN A SATISFYING, CREATIVE EXPERIENCE.	SA	A	N	D	SD
22. I DO NOT WORRY ABOUT COMBINING FOODS OF DIFFERENT COLORS IN A MEAL.	SA	A	N	D	SD
23. THE COST OF FOOD IS THE MOST IMPORTANT INFLUENCE ON THE KINDS OF FOODS I EAT.	SA	A	N	D	SD
24. WHEN I HAVE GUESTS FOR DINNER, I ALWAYS TRY TO PREPARE SPECIAL DISHES AND USE MY BEST TABLEWARE.	SA	A	N	D	SD
25. WHEN NEW BOOKS ARE WRITTEN ABOUT DIETING OR NUTRITION, I USUALLY TRY TO READ THEM.	SA	A	N	D	SD
26. IT IS IMPORTANT TO ME TO EAT ONLY THOSE FOODS WHICH ARE IMPORTANT TO MY HEALTH.	SA	A	N	D	SD
27. ONE OF THE BEST WAYS FOR A HOMEMAKER TO GAIN RECOGNITION FROM FRIENDS IS TO BE A GOOD COOK.	SA	A	N	D	SD
28. I THINK IT IS MORE IMPORTANT THAT THE FOODS I CHOOSE BE MORALLY RIGHT ON THE BASIS OF MY RELIGIOUS BELIEFS THAN FOODS WHICH ARE EXPENSIVE OR POPULAR.	SA	A	N	D	SD
29. EATING MEALS TOGETHER AS A FAMILY IS IMPORTANT.	SA	A	N	D	SD
30. ENTERTAINING BY GIVING LARGE DINNER PARTIES IS AN EXCELLENT WAY TO GAIN STATUS AMONG FRIENDS.	SA	A	N	D	SD

PLEASE TURN PAGE

	STRONGLY AGREE	AGREE	NO OPINION	DISAGREE	STRONGLY DISAGREE
31. MORE PEOPLE SHOULD CHOOSE FOOD ON THE BASIS OF THEIR RELIGIOUS BELIEF THAN TO BE SOCIALLY ACCEPTABLE.	SA	A	N	D	SD
32. EVEN IF MEALS ARE HEALTHFUL, I DO NOT CARE TO EAT FOODS THAT ARE NOT ATTRACTIVELY PREPARED.	SA	A	N	D	SD
33. I ALWAYS COMPARE PRICES BETWEEN NEIGHBORHOOD GROCERY STORES AND THE MAJOR SUPERMARKETS AND BUY FOODS WHERE THEY COST THE LEAST.	SA	A	N	D	SD
34. IT IS IMPORTANT TO REWARD CHILDREN BY GIVING EXTRA DESSERT OR A SPECIAL "TREAT" AND PUNISH THEM BY WITHHOLDING FOODS.	SA	A	N	D	SD
35. I CHOOSE THE FOODS I DO MAINLY ON THE BASIS OF COST.	SA	A	N	D	SD
36. A GOOD DIET IS THE MOST IMPORTANT FACTOR IN CONTRIBUTING TO GOOD HEALTH.	SA	A	N	D	SD
37. I THINK IT IS IMPORTANT TO HAVE MEALS TOGETHER WITH FRIENDS QUITE OFTEN.	SA	A	N	D	SD
38. AVOIDING CERTAIN FOODS RESULTS IN IMPROVED HEALTH.	SA	A	N	D	SD
39. IT IS IMPORTANT THAT MEALTIME BE A HAPPY TIME FOR A FAMILY.	SA	A	N	D	SD
40. I TRY TO BUY MAINLY THOSE FOODS ON SPECIAL SALES AT LOWER PRICES WHEN I GO TO THE GROCERY STORE.	SA	A	N	D	SD
41. I AM CAREFUL TO PREPARE FOODS IN SUCH A WAY THAT THE NUTRITIONAL VALUE IS NOT LOST.	SA	A	N	S	SB

PLEASE TURN PAGE

	STRONGLY AGREE	AGREE	NO OPINION	DISAGREE	STRONGLY DISAGREE
42. FOOD COOKERY HELPS SATISFY MY YEARNING TO EXPRESS MYSELF.	SA	A	N	D	SD
43. BEING ABLE TO PREPARE FOODS "FROM SCRATCH" RATHER THAN FROM MIXES IS IMPORTANT TO ME.	SA	A	N	D	SD
44. I LIKE TO EAT THE SAME KINDS OF FOODS THAT MY FRIENDS DO.	SA	A	N	D	SD
45. IT IS IMPORTANT TO CHOOSE A VARIETY OF FOODS SO THAT I WILL FEEL BETTER.	SA	A	N	D	SD
46. COOKING IS AS MUCH A CREATIVE ACTIVITY AS PAINTING AND WRITING.	SA	A	N	D	SD
47. ATTRACTIVE COLOR AND TEXTURE COMBINATIONS IN FOODS ARE IMPORTANT TO ME.	SA	A	N	D	SD
48. CHILDREN SHOULD NOT BE PERMITTED TO EAT MEALS ALONE, WITHOUT THEIR PARENTS.	SA	A	N	D	SD
49. I CHOOSE TO EAT ONLY THOSE FOODS WHICH ARE HEALTHFUL AND AVOID ALL OTHERS.	SA	A	N	D	SD
50. I OFTEN HAVE GUESTS FOR DINNER AS A MEANS OF EXPRESSING MY FRIENDSHIP TO THEM.	SA	A	N	D	SD
51. I DO NOT LIKE MEALS THAT ARE NOT PLANNED TO LOOK ATTRACTIVE AND APPEALING ON MY PLATE.	SA	A	N	D	SD
52. EVEN IF I AM TEMPTED TO EAT FOODS LIKE MY FRIENDS, I TRY TO EAT ONLY THOSE FOODS WHICH ARE ACCEPTABLE TO MY RELIGIOUS BELIEFS.	SA	A	N	D	SD

PLEASE TURN PAGE

	STRONGLY AGREE	AGREE	NO OPINION	DISAGREE	STRONGLY DISAGREE
53. IT IS PLEASING TO ME WHEN GARNISHES AND OTHER DECORATIONS HAVE BEEN ADDED TO DISHES TO MAKE THEM MORE ATTRACTIVE.	SA	A	N	D	SD
54. I WISH I HAD THE TIME TO LEARN MORE ABOUT NUTRITION AND THE FOODS I NEED TO EAT.	SA	A	N	D	SD
55. ONE SHOULD TRY TO SERVE EXPENSIVE FOODS, NOT JUST "EVERYDAY" MEALS, TO DINNER GUESTS.	SA	A	N	D	SD
56. I FEEL I NEED TO LEARN MORE ABOUT GOOD NUTRITION.	SA	A	N	D	SD
57. I CONSIDER COOKING AND EATING A PHILOSOPHIC AND RELIGIOUS EXPERIENCE.	SA	A	N	D	SD
58. IF A PERSON IS NOT EATING WELL, HIS HEALTH WILL SURELY SUFFER.	SA	A	N	D	SD
59. COOKING IS AN IMPORTANT CREATIVE ART.	SA	A	N	D	SD
60. YOU SHOULD ALWAYS THINK ABOUT HOW MUCH FOOD COSTS BEFORE YOU DECIDE TO EAT IT.	SA	A	N	D	SD
61. ONE SHOULD ONLY EAT FOODS WHICH CONTRIBUTE TO GOOD HEALTH.	SA	A	N	D	SD
62. PEOPLE SHOULD ONLY EAT "WHOLESOME " FOODS AND AVOID "JUNK" FOODS.	SA	A	N	D	SD
63. IT IS IMPORTANT TO ME THAT I FOLLOW THE TEACHINGS OF MY CHURCH WHEN IT COMES TO CHOOSING FOOD.	SA	A	N	D	SD

PLEASE TURN PAGE

	STRONGLY AGREE	AGREE	NO OPINION	DISAGREE	STRONGLY DISAGREE
64. I THINK ABOUT THE HEALTH-GIVING PROPERTIES OF FOODS WHEN I EAT THEM.	SA	A	N	D	SD
65. I TRULY REGRET THAT I DO NOT KNOW MORE ABOUT NUTRITION.	SA	A	N	D	SD
66. I WOULD CHOOSE VERY DIFFERENT FOODS THAN THE ONES I DO IF I COULD AFFORD THEM.	SA	A	N	D	SD
67. I FEEL IT IS IMPORTANT TO PREPARE SOMETHING SPECIAL AND "OUT OF THE ORDINARY" WHEN ENTERTAINING.	SA	A	N	D	SD
68. MEALTIME IS MUCH MORE PLEASANT WHEN EATEN TOGETHER AS A FAMILY.	SA	A	N	D	SD
69. I CHOOSE THE FOODS I DO MAINLY BECAUSE OF MY FRIENDS' INFLUENCE.	SA	A	N	D	SD
70. I USE INFORMATION AND FACTS ABOUT NUTRITION WHEN I PLAN MY OWN DIET.	SA	A	N	D	SD
71. IT IS PLEASING TO ME WHEN MEALS CONTAIN FOODS OF DIFFERENT COLORS AND TEXTURES.	SA	A	N	D	SD

PLEASE TURN PAGE

IDENTIFICATION NUMBER: _____

PART B

NOW I WOULD LIKE TO KNOW A LITTLE BIT ABOUT YOU. YOUR RESPONSES WILL BE KEPT ENTIRELY CONFIDENTIAL.

1. WHAT WAS YOUR MAJOR OCCUPATION IN LIFE? _____

2. WHAT WAS THE LAST GRADE YOU COMPLETED IN SCHOOL OR THE LAST YEAR COMPLETED IN COLLEGE? _____
3. WHAT COUNTRY WERE YOU BORN IN? _____

PLEASE CHECK THE APPROPRIATE RESPONSE.

4. _____ MALE
_____ FEMALE
5. ARE YOU NOW EMPLOYED? _____ YES
_____ NO
6. DO YOU LIVE ALONE? _____ YES
_____ NO
7. WHAT IS YOUR AGE? _____ LESS THAN 60 YEARS
_____ 60 - 64 YEARS
_____ 65 - 69 YEARS
_____ 70 - 74 YEARS
_____ 75 - 79 YEARS
_____ 80 - 84 YEARS
_____ 85 - 89 YEARS
_____ 90 OR MORE YEARS

THANK YOU FOR YOUR WILLINGNESS TO PARTICIPATE IN THIS STUDY,
YOUR COOPERATION IS GREATLY APPRECIATED.

APPENDIX B
PRETEST VALUE-ORIENTATION SCALE
ITEMS AND RELIABILITY

VALUE-ORIENTATION QUESTIONNAIRE

Pre-Test Reliability

Socio-psychological Uses

01. I like the same kinds of foods that my friends do.
10. One of the best ways for a homemaker to gain recognition from friends is to be a good cook.
19. Certain foods I eat help me express my emotions, for example - eating steak makes me feel stronger and more powerful.
27. I choose the foods I do mainly because of my friends' influence.
31. I especially enjoy entertaining dinner guests because then I feel like I can spend more for food than I ordinarily do.
36. If I want to express love or affection for someone, I would take him or her a gift of food or invite him or her to dinner.
53. I wouldn't eat the way I do if it weren't for my friends.

7 items
pretest reliability: $\alpha=0.85$

Education

08. I feel I need to learn more about good nutrition.
15. When new books are written about dieting or nutrition, I usually try to read them.
22. I use information and facts about nutrition when I plan my own diet.
26. I truly regret that I do not know more about nutrition.
41. I wish I had the time to learn more about nutrition and the foods I need to eat.

5 items
pretest reliability: $\alpha=0.83$

Convenience

06. Ease of preparation is an important influence on the kinds of food I eat.

-2-

14. I think about the amount of preparation need for a food before I decide to buy it.
28. It is pleasing to me when meals take only a short time to prepare.
33. I use convenience foods even when they are more expensive.
37. I choose the foods I do mainly because they are simple to prepare.
45. I do not worry about how much time a meal takes to prepare.
55. Convenience is a major factor in my choice of foods.

7 items

pretest reliability: $\alpha = 0.87$

Economics

03. I try to buy foods on special sales (lower prices) when I go to the grocery store.
11. Money is the thing I consider most when I plan meals.
18. The price of food is an important influence on the kinds of food I eat.
35. If I had more money to spend for food, I would eat different foods than the ones I do now.
39. Eating out is too expensive unless I have no other choice.
43. I always consider how much a food costs before I decide to buy it.
49. I try to compare prices between neighborhood grocery stores and buy foods where they cost the least.
52. I choose the foods I do mainly on the basis of cost.

8 items

pretest reliability: $\alpha = 0.73$

Aesthetics

05. I do not like meals that are not planned to look attractive and appealing on my plate.
12. I do not worry about combining foods of different colors in a meal.
24. Even if meals are healthful, I do not care to eat foods that are not attractively prepared.

-3-

34. It is pleasing to me when garnishes and other decorations have been added to dishes to make them more attractive.
44. It is pleasing to me when meals contain foods of different colors and textures.
- 5 items
pretest reliability: $\alpha = 0.75$

Religion

13. More people should choose food on the basis of their religious beliefs than to be sociably acceptable.
21. It is important that the food one eats reflects his religious beliefs.
25. I consider cooking and eating a philosophic and religious experience.
38. Even if I am tempted to eat foods like my friends, I try to eat only those foods which are acceptable to my religious beliefs.
46. My religious beliefs dictate the types of foods I eat and ways I prepare them.
54. It is important to me that I follow the teachings of my church when it comes to choosing food.
- 6 items
pretest reliability: $\alpha = 0.84$

Familism

09. Families should eat dinner together at the time that makes everybody the happiest.
16. Mealtime is much more pleasant when eaten together as a family.
30. Eating meals together as a family is important.
42. It is important that a family eats at least one meal a day together so that members can have some time to talk to each other.
51. It is important that mealtime be a happy time for a family.
- 5 items
pretest reliability: $\alpha = 0.80$

-4-

Health

04. A good diet is the most important factor in contributing to good health.
07. I choose to eat only those foods which are healthful and avoid all others.
17. It is important to me to eat only those foods which are important to my health.
29. If a person is not eating well, his health will surely suffer.
40. One should eat only those foods which contribute to good health.
47. I think about the health-giving properties of foods when I eat them.
50. I believe that diet is the main controlling factor when it comes to maintaining health and controlling disease.

7 items

pretest reliability: $\alpha=0.71$ Creativity

02. Cooking is as much a creative activity as painting and writing.
20. Cooking is an important creative art.
23. Being able to prepare foods "from scratch" rather than from mixes is important to me.
32. Food cookery helps satisfy my yearning to express myself.
48. Knowing that I can prepare meals that require much time and skill that most people can't is a source of great personal pride to me.

5 items

pretest reliability: $\alpha=0.82$

APPENDIX C
FINAL RESEARCH INSTRUMENTS

CONSENT FORM

THE PURPOSE OF THIS RESEARCH IS TO OBTAIN A BETTER UNDERSTANDING OF THE EATING PRACTICES OF SENIOR CITIZENS AND HOW SENIOR CITIZENS FEEL ABOUT THE FOOD THEY EAT,

PARTICIPANTS WILL BE REQUIRED TO COMPLETE THE FOLLOWING:

1. A 3 DAY FOOD RECORD;
2. A 55 ITEM QUESTIONNAIRE CONCERNING FEELINGS TOWARD FOOD; AND
3. A 7 ITEM BIOGRAPHICAL QUESTIONNAIRE.

PARTICIPANTS WILL BE CONTACTED BY TELEPHONE AND THREE HOME VISITS ARRANGED. THE VISITS WILL OCCUR EVERY SECOND DAY FOR ONE WEEK. THE FIRST TWO VISITS WILL BE TO EXPLAIN AND CHECK THE FOOD RECORD, AND WILL LAST FOR ONE-HALF HOUR EACH. THE FOOD RECORDS WILL BE COLLECTED AND THE QUESTIONNAIRES COMPLETED DURING THE THIRD VISIT, WHICH WILL LAST FOR ONE HOUR.

AT THE CONCLUSION OF THE THIRD VISIT, THE INTERVIEWER WILL PROVIDE EACH PARTICIPANT WITH A BRIEF DIETARY ASSESSMENT AND ANSWER ANY FOOD OR NUTRITION QUESTIONS THEY MAY HAVE.

RESPONSES TO THE QUESTIONNAIRES AND THE FOOD RECORDS WILL BE KEPT ENTIRELY CONFIDENTIAL. PARTICIPANTS MAY WITHDRAW FROM THE STUDY AT ANY TIME WITHOUT PENALTY.

I HAVE HAD THE PROJECT EXPLAINED TO ME AND AGREE TO PARTICIPATE.
I AM NOT CURRENTLY FOLLOWING A WRITTEN DIET PLAN THAT HAS BEEN
PRESCRIBED BY A DOCTOR OR A DIETITIAN.

SIGNATURE _____
ADDRESS _____
TELEPHONE _____

IDENTIFICATION NUMBER: _____

THIS QUESTIONNAIRE IS PART OF A RESEARCH STUDY CONDUCTED BY MRS. KATHY HARRISON OF THE UNIVERSITY OF MANITOBA TO DETERMINE HOW SENIOR CITIZENS FEEL ABOUT NUTRITION AND THE FOOD THEY EAT.

THE QUESTIONNAIRE IS DIVIDED INTO 2 SECTIONS. PART A CONCERNS QUESTIONS ON HOW YOU FEEL ABOUT THE FOOD YOU EAT, AND PART B REQUESTS SOME BACKGROUND INFORMATION ON THE PARTICIPANTS IN THE STUDY.

IN ADVANCE - THANK-YOU FOR YOUR COOPERATION.

* * * * *

PART A

ON THE FOLLOWING PAGES YOU WILL FIND MANY DIFFERENT STATEMENTS ABOUT FEELINGS TOWARD FOOD. THERE ARE NO "TRICK" QUESTIONS AND WE THINK YOU WILL FIND THIS QUESTIONNAIRE MOST INTERESTING TO COMPLETE. REMEMBER, THIS IS NOT A TEST. THERE ARE NO RIGHT OR WRONG ANSWERS TO THE QUESTIONS. WE ARE INTERESTED ONLY IN YOUR FEELINGS ABOUT THESE MATTERS.

YOUR RESPONSES TO THE QUESTIONNAIRE WILL BE KEPT ENTIRELY CONFIDENTIAL. ALL QUESTIONNAIRES WILL BE PROCESSED USING AN IDENTIFICATION NUMBER ONLY; NO NAMES WILL EVER BE USED.

PLEASE DO YOUR BEST TO ANSWER EVERY QUESTION AS HONESTLY AND FRANKLY AS YOU CAN.

INSTRUCTIONS:

PLEASE INDICATE HOW YOU FEEL ABOUT EACH OF THE STATEMENTS BY CIRCLING THE APPROPRIATE RESPONSE. IF YOU ARE UNDECIDED OR NEUTRAL, PLEASE INDICATE ACCORDINGLY.

SA = STRONGLY AGREE

A = AGREE

U = UNDECIDED OR NEUTRAL

D = DISAGREE

SD = STRONGLY DISAGREE

EXAMPLE:

I SOMETIMES LIKE TO WATCH TELEVISION. SA (A) U D SD

PLEASE TURN THE PAGE.

	STRONGLY AGREE	AGREE	UNDECIDED OR NEUTRAL	DISAGREE	STRONGLY DISAGREE
1. I LIKE TO EAT THE SAME KINDS OF FOODS THAT MY FRIENDS DO.	SA	A	U	D	SD
2. COOKING IS AS MUCH A CREATIVE ACTIVITY AS PAINTING AND WRITING.	SA	A	U	D	SD
3. I TRY TO BUY FOODS ON SPECIAL SALES (LOWER PRICES) WHEN I GO TO THE GROCERY STORE.	SA	A	U	D	SD
4. A GOOD DIET IS THE MOST IMPORTANT FACTOR IN CONTRIBUTING TO GOOD HEALTH.	SA	A	U	D	SD
5. I DO NOT LIKE MEALS THAT ARE NOT PLANNED TO LOOK ATTRACTIVE AND APPEALING ON MY PLATE.	SA	A	U	D	SD
6. EASE OF PREPARATION IS AN IMPORTANT INFLUENCE ON THE KINDS OF FOOD I EAT.	SA	A	U	D	SD
7. I CHOOSE TO EAT ONLY THOSE FOODS WHICH ARE HEALTHFUL AND AVOID ALL OTHERS.	SA	A	U	D	SD
8. I FEEL I NEED TO LEARN MORE ABOUT GOOD NUTRITION.	SA	A	U	D	SD
9. FAMILIES SHOULD EAT DINNER TOGETHER AT THE TIME THAT MAKES EVERYBODY THE HAPPIEST.	SA	A	U	D	SD
10. ONE OF THE BEST WAYS FOR A HOME-MAKER TO GAIN RECOGNITION FROM FRIENDS IS TO BE A GOOD COOK.	SA	A	U	D	SD
11. MONEY IS THE THING I CONSIDER MOST WHEN I PLAN MEALS.	SA	A	U	D	SD

PLEASE TURN THE PAGE.

	STRONGLY AGREE	AGREE	UNDECIDED OR NEUTRAL	DISAGREE	STRONGLY DISAGREE
12. I DO NOT WORRY ABOUT COMBINING FOODS OF DIFFERENT COLORS IN A MEAL.	SA	A	U	D	SD
13. MORE PEOPLE SHOULD CHOOSE FOOD ON THE BASIS OF THEIR RELIGIOUS BELIEF THAN TO BE SOCIALLY ACCEPTABLE.	SA	A	U	D	SD
14. I THINK ABOUT THE AMOUNT OF PREPARATION NEEDED FOR A FOOD BEFORE I DECIDE TO BUY IT.	SA	A	U	D	SD
15. WHEN NEW BOOKS ARE WRITTEN ABOUT DIETING OR NUTRITION, I USUALLY TRY TO READ THEM.	SA	A	U	D	SD
16. MEALTIME IS MUCH MORE PLEASANT WHEN EATEN TOGETHER AS A FAMILY.	SA	A	U	D	SD
17. IT IS IMPORTANT TO ME TO EAT ONLY THOSE FOODS WHICH ARE IMPORTANT TO MY HEALTH.	SA	A	U	D	SD
18. THE PRICE OF FOOD IS AN IMPORTANT INFLUENCE ON THE KINDS OF FOOD I EAT.	SA	A	U	D	SD
19. CERTAIN FOODS I EAT HELP ME EXPRESS MY EMOTIONS, FOR EXAMPLE - EATING STEAK MAKES ME FEEL STRONGER AND MORE POWERFUL.	SA	A	U	D	SD
20. COOKING IS AN IMPORTANT CREATIVE ART.	SA	A	U	D	SD
21. IT IS IMPORTANT THAT THE FOOD ONE EATS REFLECTS HIS RELIGIOUS BELIEFS.	SA	A	U	D	SD
22. I USE INFORMATION AND FACTS ABOUT NUTRITION WHEN I PLAN MY OWN DIET.	SA	A	U	D	SD

PLEASE TURN THE PAGE.

	STRONGLY AGREE	AGREE	UNDECIDED OR NEUTRAL	DISAGREE	STRONGLY DISAGREE
23. BEING ABLE TO PREPARE FOODS "FROM SCRATCH" RATHER THAN FROM MIXES IS IMPORTANT TO ME.	SA	A	U	D	SD
24. EVEN IF MEALS ARE HEALTHFUL, I DO NOT CARE TO EAT FOODS THAT ARE NOT ATTRACTIVELY PREPARED.	SA	A	U	D	SD
25. I CONSIDER COOKING AND EATING A PHILOSOPHIC AND RELIGIOUS EXPERIENCE.	SA	A	U	D	SD
26. I TRULY REGRET THAT I DO NOT KNOW MORE ABOUT NUTRITION.	SA	A	U	D	SD
27. I CHOOSE THE FOODS I DO MAINLY BECAUSE OF MY FRIENDS' INFLUENCE.	SA	A	U	D	SD
28. IT IS PLEASING TO ME WHEN MEALS TAKE ONLY A SHORT TIME TO PREPARE.	SA	A	U	D	SD
29. IF A PERSON IS NOT EATING WELL, HIS HEALTH WILL SURELY SUFFER.	SA	A	U	D	SD
30. EATING MEALS TOGETHER AS A FAMILY IS IMPORTANT.	SA	A	U	D	SD
31. I ESPECIALLY ENJOY ENTERTAINING DINNER GUESTS BECAUSE THEN I FEEL LIKE I CAN SPEND MORE FOR FOOD THAN I ORDINARILY DO.	SA	A	U	D	SD
32. FOOD COOKERY HELPS SATISFY MY YEARNING TO EXPRESS MYSELF.	SA	A	U	D	SD
33. I USE CONVENIENCE FOODS EVEN WHEN THEY ARE MORE EXPENSIVE.	SA	A	U	D	SD

PLEASE TURN THE PAGE.

	STRONGLY AGREE	AGREE	UNDECIDED OR NEUTRAL	DISAGREE	STRONGLY DISAGREE
34. IT IS PLEASING TO ME WHEN GARNISHES AND OTHER DECORATIONS HAVE BEEN ADDED TO DISHES TO MAKE THEM MORE ATTRACTIVE.	SA	A	U	D	SD
35. IF I HAD MORE MONEY TO SPEND FOR FOOD, I WOULD EAT DIFFERENT FOODS THAN THE ONES I DO NOW.	SA	A	U	D	SD
36. IF I WANT TO EXPRESS LOVE OR AFFECTION FOR SOMEONE, I WOULD TAKE HIM OR HER A GIFT OF FOOD OR INVITE HIM OR HER TO DINNER.	SA	A	U	D	SD
37. I CHOOSE THE FOODS I DO MAINLY BECAUSE THEY ARE SIMPLE TO PREPARE.	SA	A	U	D	SD
38. EVEN IF I AM TEMPTED TO EAT FOODS LIKE MY FRIENDS, I TRY TO EAT ONLY THOSE FOODS WHICH ARE ACCEPTABLE TO MY RELIGIOUS BELIEFS.	SA	A	U	D	SD
39. EATING OUT IS TOO EXPENSIVE UNLESS I HAVE NO OTHER CHOICE.	SA	A	U	D	SD
40. ONE SHOULD EAT ONLY THOSE FOODS WHICH CONTRIBUTE TO GOOD HEALTH.	SA	A	U	D	SD
41. I WISH I HAD THE TIME TO LEARN MORE ABOUT NUTRITION AND THE FOODS I NEED TO EAT.	SA	A	U	D	SD
42. IT IS IMPORTANT THAT A FAMILY EATS AT LEAST ONE MEAL A DAY TOGETHER SO THAT MEMBERS CAN HAVE SOME TIME TO TALK TO EACH OTHER.	SA	A	U	D	SD
43. I ALWAYS CONSIDER HOW MUCH A FOOD COSTS BEFORE I DECIDE TO BUY IT.	SA	A	U	D	SD
44. IT IS PLEASING TO ME WHEN MEALS CONTAIN FOODS OF DIFFERENT COLOURS AND TEXTURES.	SA	A	U	D	SD

PLEASE TURN THE PAGE.

	STRONGLY AGREE	AGREE	UNDECIDED OR NEUTRAL	DISAGREE	STRONGLY DISAGREE
45. I DO NOT WORRY ABOUT HOW MUCH TIME A MEAL TAKES TO PREPARE.	SA	A	U	D	SD
46. MY RELIGIOUS BELIEFS DICTATE THE TYPES OF FOODS I EAT AND THE WAYS I PREPARE THEM.	SA	A	U	D	SD
47. I THINK ABOUT THE HEALTH-GIVING PROPERTIES OF FOODS WHEN I EAT THEM.	SA	A	U	D	SD
48. KNOWING THAT I CAN PREPARE MEALS THAT REQUIRE MUCH TIME AND SKILL THAT MOST PEOPLE CAN'T IS A SOURCE OF GREAT PERSONAL PRIDE TO ME.	SA	A	U	D	SD
49. I TRY TO COMPARE PRICES BETWEEN GROCERY STORES AND BUY FOODS WHERE THEY COST THE LEAST.	SA	A	U	D	SD
50. I BELIEVE THAT DIET IS THE MAIN CONTROLLING FACTOR WHEN IT COMES TO MAINTAINING HEALTH AND CONTROLLING DISEASE.	SA	A	U	D	SD
51. IT IS IMPORTANT THAT MEALTIME BE A HAPPY TIME FOR A FAMILY.	SA	A	U	D	SD
52. I CHOOSE THE FOODS I DO MAINLY ON THE BASIS OF COST.	SA	A	U	D	SD
53. I WOULDN'T EAT THE WAY I DO IF IT WEREN'T FOR MY FRIENDS.	SA	A	U	D	SD
54. IT IS IMPORTANT TO ME THAT I FOLLOW THE TEACHINGS OF MY CHURCH WHEN IT COMES TO CHOOSING FOOD.	SA	A	U	D	SD
55. CONVENIENCE IS A MAJOR FACTOR IN MY CHOICE OF FOODS.	SA	A	U	D	SD

PLEASE TURN THE PAGE.

IDENTIFICATION NUMBER: _____

PART B

NOW I WOULD LIKE TO KNOW A LITTLE BIT ABOUT YOU. YOUR RESPONSES WILL BE KEPT ENTIRLY CONFIDENTIAL.

1. WHAT WAS YOUR MAJOR OCCUPATION IN LIFE?

2. WHAT WAS THE LAST GRADE YOU COMPLETED IN SCHOOL OR THE LAST YEAR COMPLETED IN COLLEGE? _____

3. WHAT COUNTRY WERE YOU BORN IN? _____

PLEASE CHECK THE APPROPRIATE RESPONSE.

4. MALE _____

FEMALE _____

5. ARE YOU NOW EMPLOYED? YES _____

No _____

6. DO YOU LIVE ALONE? YES _____

No _____

7. WHAT IS YOUR AGE? LESS THAN 60 YEARS _____

60 - 64 YEARS _____

65 - 69 YEARS _____

70 - 74 YEARS _____

75 - 79 YEARS _____

80 - 84 YEARS _____

85 - 89 YEARS _____

90 OR MORE YEARS _____

THANK-YOU.

INSTRUCTIONS FOR COMPLETING YOUR FOOD RECORD:

1. PLEASE WRITE DOWN ALL FOODS AND BEVERAGES YOU EAT AND DRINK ON _____ AND _____.
2. EAT AS YOU USUALLY DO. INCLUDE EVERYTHING EATEN AWAY FROM HOME, BETWEEN MEALS, ETC. PLEASE DO NOT CHANGE YOUR DIET FOR THIS SURVEY.
3. PLEASE RECORD THE FOODS AS SOON AS POSSIBLE AFTER THEY ARE EATEN. USE A SEPARATE LINE FOR EACH FOOD OR DRINK. BRAND NAMES ARE NOT NECESSARY.
4. RECORD THE AMOUNTS OF FOODS OR BEVERAGES EATEN. THE NEXT PAGE LISTS SUGGESTED WAYS OF MEASURING FOODS IN YOUR DIET.
FOR EXAMPLE: 1 EGG, BOILED
 1 PORK CHOP, BREADED, FRIED, 3" X 4" X 1/2"
 1/2 CUP ORANGE JUICE
 3/4 CUP CORNFLAKES WITH 2 TEASPOONS SUGAR
 AND 1/2 CUP MILK.
5. FOR COMBINATION ITEMS, RECORD THE INGREDIENTS THAT ARE USED.
FOR EXAMPLE: SCRAMBLED EGGS MADE WITH 2 EGGS AND 2 TABLESPOONS MILK, FRIED IN 1 TEASPOON BUTTER, MACARONI AND CHEESE WITH 1/2 CUP COOKED MACARONI, 1/4 CUP CHEDDAR CHEESE AND 1/4 CUP MILK.
6. INDICATE IF MILK OR CREAM IS USED IN COFFEE, TEA OR HOT CHOCOLATE AND IN PREPARATION OF PUDDINGS, SOUPS, CASSEROLES, ETC. DO NOT FORGET TO INCLUDE ITEMS SUCH AS BUTTER, MARGARINE, JAM, SUGAR, ETC. INCLUDE ANYTHING THAT IS EATEN.
7. IN THE SPACE FOR COMMENTS, PLEASE NOTE IF THE DAY'S FOOD IS USUAL FOR YOU. ALSO, PLEASE RECORD IF YOU ARE RESTRICTING YOUR DIET OR ARE TAKING ANY VITAMIN OR MINERAL SUPPLEMENTS.
8. PLEASE EXAMINE THE SAMPLE ONE DAY FOOD RECORD ON PAGE 3.
9. YOUR FIRST DAY'S RECORD WILL BE CHECKED ON _____ AT _____. THE THIRD VISIT WILL BE ON _____ AT _____. IF YOU HAVE ANY QUESTIONS OR MUST CHANGE A VISIT TIME, PLEASE CALL MRS. HARRISON AT 474-9901.

SUGGESTED WAYS OF MEASURING FOODS IN THE DIET

FOOD	MEASURE
MILK, ETC. (WHOLE, 2%, SKIM) (IN TEA, COFFEE, ON CEREAL)	CUPS, TABLESPOONS (T.) TUMBLERS (LARGE OR SMALL)
CEREALS (DRY, COOKED, PRESWEETENED)	TABLESPOONS (T.) OR CUPS
BREAD (WHITE, BROWN, WHOLE WHEAT, RYE)	SLICES, LARGE OR SMALL LOAF
POTATOES (MASHED, BOILED, FRIED, CHIPS)	TABLESPOONS (T.) OR COMPARE WITH THE SIZE OF AN EGG
SUGAR (IN TEA & COFFEE; ON CEREAL)	TABLESPOON (T.) OR TEASPOONS (TSP.)
PUDDINGS (WITH OR WITHOUT MILK)	TABLESPOONS (T.) OR CUPS
BISCUITS	NUMBER AND TYPE
JAM, JELLY, PEANUT BUTTER	TEASPOONS (TSP.)
SWEETS, CHOCOLATE, ICE CREAM	COST SIZE, NUMBER OR TABLESPOONS (T.)
MEAT	SLICES - $3\frac{1}{2}'' \times 2\frac{1}{2}'' \times \frac{1}{2}''$ OR $3\frac{1}{2}'' \times 2\frac{1}{2}'' \times \frac{1}{4}''$

IDENTIFICATION NUMBER: 073LIST BELOW ALL THE FOOD YOU EAT AND DRINK ON TUES. MAY 8

AMOUNT	NAME OF FOOD	AMOUNT	NAME OF FOOD
2 slices	white bread, toasted	1/2 cup	green beans
2 tsp	butter	1 glass	red wine
2 tsp	grape jelly	1 slice	apple pie, about 3 1/2" or large
1/2 cup	orange juice		
1 cup	coffee with		
1 tsp	milk	2 cups	coffee with
3/4 cup	fruit salad with	2 tsp	milk
1/4	banana	1 cup	hot chocolate with
1/2	orange	1 tsp	cocoa
1/8	apple	1 tsp	sugar
2 tsp	sugar	1 cup	milk
1 slice	rye bread with		
1 tsp	butter	4	crackers, saltines
1 cup	tea, black	2	pieces cheddar cheese, about 1 1/2" x 1" x 1/4"
1	danish pastry, 6" long, 3" wide		
1 cup	tea black		
1 thigh and			
1 breast	fried chicken		
1	large baked potato		
2 tsp	butter		
1 cup	tossed salad lettuce with		
1/8	of a tomato		
1 tbs	French dressing		

COMMENTS: I'm not on any special diet. Dinner was
at a restaurant. I usually eat dinner out
about 3 times a month.

I don't take any supplements.

APPENDIX D
INTERVIEW CONTENT, PROTOCOL,
AND SCHEDULING DETAILS

INTERVIEWING

Efficiency and accuracy are the goals, but there is no single way to conduct an ideal interview. No interviewing pattern will fit every situation. The reactions of the people you meet will differ and you must be able to adapt yourself to these differences. You will need to use common sense, patience and tact. The following suggestions are made to assist each interviewer in developing his/her own communication skills.

Verbal and Non-Verbal Communication

The non-verbal can be as important as the verbal part of the interview process. An unconscious nod of the head or grimace will encourage or discourage further responses by the person being interviewed. The interviewer should attempt to eliminate any action which will unconsciously influence the person being interviewed. Inappropriate or distracting wearing apparel will have a similar effect upon the interviewing process.

The interviewer must be sincere and straight-forward in the verbal part of the interview. After several interviews there is a temptation for the interviewer to use a monotone and become machine-like in his/her responses to the person being interviewed. Keep in mind that while it may be your last interview for the day it is the other person's first with you.

Each interview has been allotted a limited amount of time and the interviewer is expected to see that the time limits are observed. Interviewers find it necessary to courteously but firmly avoid the intrusion of small talk into the interview. When the interviewer conducts him/herself in a warm but professional manner the person being interviewed will respond in a similar manner.

Working with the Elderly

The basic methods of understanding and working with people are very much the same regardless of whether they are 6, 16, 26 or 66. However, there are several points to consider when working with the elderly in particular.

Often your visit will be an important social event. Take time to enjoy their conversation for 5 - 10 minutes at the beginning and end of the interview. Try to stay on the topic during food record checking and questionnaire completion, however.

Language and writing skills may not be as strong as the average persons'. It helps if you let the senior 'guide' you through the food record so they can explain any words which may be illegible or misspelled. Do not appear hurried when they are completing the questionnaire.

Problems which may be Encountered

1. respondent gives incomplete or ambiguous responses
 - use appropriate probing technique

- do not use leading questions such as:

"Did you have butter on your toast?" or
"What did you eat for lunch?"

2. respondent is too verbose - gives much irrelevant information
 - show interest while tactfully interrupting and leading the subject back to the interview topic
 - phrases such as the following may help:

"That's an interesting point Mrs. Smith, but..." or
"I see. Now, where were we? Oh yes..." or
"That's nice. Perhaps we could talk about that more
after the interview."

3. respondent may test interviewers for "right" answers
 - respond in a neutral manner that shows interest in the respondent:

"There is no right answer. We're interested in your feelings."

INTERVIEW 1Before the interview:

1. Do you have the subject's:
 - consent form with identification number
 - food record with identification number, dates for completion of records, and times and dates for future visits?
2. Do you have the ruler?

Steps in the interview:

1. Introduce yourself.
 - an interviewer for Mrs. Harrison's nutrition study
2. Thank very much for agreeing to participate.
 - this study will provide information needed for home economists and nutritionists to plan nutrition programs for seniors
3. Explain purpose of interview.
 - to obtain written consent and explain how to keep food record
 - should take approximately 30 to 45 minutes
4. Read through consent form with senior.
 - get signature and information regarding special diet
 - take the form with you and place in file for subject
5. Explain purpose of food record.
 - to obtain a complete record of all the foods and beverages the person is eating
 - so that on the third visit a discussion of the senior's diet will be easier
6. Read through the instructions, examples of measurement and sample day with the senior.
7. Give the senior the ruler and explain to use for foods such as meat, biscuits, etc. Also senior may use his/her own measuring tools.
8. Confirm the next two visits.
 - indicated on page 1 of food record instructions
 - if problems in the mean time, call Mrs. Harrison at 474-9901
 - the next visit will be to see how senior is doing with the food record and answer any questions about record, about $\frac{1}{2}$ hour
9. Thank the senior very much for their cooperation.

INTERVIEW 2Before the interview:

1. Do you have the measuring cups and spoons?

Steps in the interview:

1. Refresh senior's memory.
 - use your name and mention nutrition study
2. Explain purpose of visit.
 - to see if senior is having any problems with food record
 - should take approximately 30 to 45 minutes
3. Check Day 1 record for completeness using protocol provided.
 - is the day typical? Why not, if no?
 - is the respondent on a special diet? Does it agree with that listed on consent form?
 - is the respondent taking any vitamin or mineral supplements? Type and amount of nutrients in daily portion?
4. Ensure food record is being kept for current day.
 - if not - do a recall, using protocol provided, and have subject continue recording
5. Remind the subject to keep the record for the following day.
6. Encourage the subject in record keeping.
 - reinforce good points from Day 1 record ie. completeness and accuracy
 - point out areas of possible improvement
 - important to obtain an accurate and complete picture of senior's eating habits
7. Confirm final visit.
 - purpose to check and collect final days records, fill out questionnaire and discuss any food or nutrition concerns senior may have, about 1 hr.
 - if problems in the mean time, call Mrs. Harrison at 474-9901
8. Thank very much for their cooperation.

INTERVIEW 3Before the interview:

1. Do you have the subject's file with:
 - questionnaire and consent form
 - booklet "Shopping for Food and Nutrition"?
2. Do you have the measuring cups and spoons?

Steps in the interview:

1. Refresh senior's memory.
 - use your name and mention nutrition study
2. Explain purpose of visit.
 - to check and collect food records
 - to fill out questionnaire
 - to talk about senior's diet and food concerns
 - should take about 1 hour
3. Read through instructions on questionnaire with senior.
 - emphasize no right answers
 - interested in feelings, not necessarily what they do

While subject completes questionnaire:

4. Check Day 2 and Day 3 records for completeness and note any apparent omissions or discrepancies.
5. Review record for Day 1 and code food group servings.

Upon completion of questionnaire:

6. Ensure all questions are answered.
7. Check food records for Day 2 and Day 3 for completeness and accuracy.
 - use protocol as in interview 2
 - if no record for either of the days, do recall as per protocol
 - is the day typical? Why not, if no?
 - is the respondent on a special diet? Does it agree with that listed on consent form?
 - is the respondent taking any vitamin or mineral supplements? Type and amount of nutrients in daily portion?
8. Discuss Day 1 food record using protocol provided.
 - discuss any other concerns at this time
9. Leave booklet with senior.
 - point out items which may interest them
 - show where further information may be obtained
10. Ensure subject's file is complete.
 - consent form, food records for 3 days, completed questionnaire
11. Thank the senior very much for cooperation.
 - a summary of the results of the study will be mailed later.

PROTOCOL FOR CHECKING FOOD RECORD

1. Explain that it is necessary to make sure everything eaten or drunk is recorded as it will help us to obtain a more accurate picture of the senior's eating habits.
2. Read through the food record chronologically.
 - "And the first thing you ate yesterday morning was ...?"
 - if you notice that something appears to be missing, ask:
 - "Did you eat or drink anything else at this time?"
3. Ensure there is a complete description of the food or combination dish foods:
 - contents of sandwiches
 - homemade vs commercial (eg. soup)
4. Ensure the amounts for foods and foods within combination dishes are definite:
 - $\frac{1}{2}$ cup, not 1 serving or 1 small bowl
5. Place clarification words on food record:
 - if respondent does not have milk or sugar listed after tea, and takes neither, please write 'clear' after tea

 - if no after-supper snack, draw line across form so I know it has been checked

 - if a typical day and no special diet, please write this in the space for comments

 - if no vitamins, please write this in the space for comments

PROTOCOL FOR 24-HOUR RECALL

To be used if food record has not been kept. Record on record form and mark 'recall' on top of form.

1. Begin:

"Let's start with yesterday. What was the first thing you ate or drank?"

Continue:

"Did you eat or drink anything else at this time?"

"When was the next time you had something to eat or drink?"

2. Continue through the day until the 24 hour period is covered.
3. Assist the respondent by helping him/her recall his/her activities of the day.
4. When this list of foods has been completed, go back to the first food mentioned and question the respondent about the amount of food consumed, using the cups and spoons.

"Now we'd like to know how much of these foods you've had. You said you had orange juice for breakfast. How much did you have?"

In some cases, the respondent may offer information regarding the amount eaten as he recalls his food intake - record these when first mentioned and clarify later.

PROTOCOL FOR EVALUATION OF FOOD RECORD

1. Using the chart on page 10 of "Shopping for Food and Nutrition", compare kinds and amount of food eaten with those recommended by Canada's Food Guide.
 - use serving guides provided on pages 6 - 8 of booklet.
 - when range is given, use smaller value
 - estimate when necessary
2. Identify the good practices and encourage their continued use.
3. Help the senior identify the poor practices, that is the food groups for which intake is especially low.
4. Help the senior to suggest ways to improve the diet by adding foods that fit the person's cultural pattern, preferences, and can be obtained with available money.

Interview Schedule

Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
<ul style="list-style-type: none"> - visit group 1 in home to explain procedure for food record for Tues., Wed. and Thurs. -confirm Wed. and Fri. visits (½ hour visit) 	<ul style="list-style-type: none"> - visit group 2 in home to explain procedure for food record for Wed., Thurs. and Fri. -confirm Thurs. & Sat. visits (½ hour visit) 	<ul style="list-style-type: none"> - visit group 1 in home to check and collect food record for Tues. -answer any questions regarding recording -clarify instructions if recording could be improved (½ hour visit) 	<ul style="list-style-type: none"> - visit group 2 in home to check and collect food record for Wed. answer any questions regarding recording -clarify instructions if recording could be improved (½ hour visit) 	<ul style="list-style-type: none"> -visit group 1 in home to check and collect food records for Wed. and Thurs. -give and explain plain questionnaire orally assess diet (1 hour visit) 	<ul style="list-style-type: none"> -visit group 2 in home to check and collect food records for Thurs. and Fri. -give and explain questionnaire orally assess diet (1 hour visit)

group 1: will be completing food records for Tuesday, Wednesday and Thursday. They will have their first day's record checked and collected on Wednesday and their other 2 days checked and collected on Friday. The questionnaire will be filled out while the records are being checked on Friday. Following completion of the questionnaire, the interviewer will give a brief oral assessment of the subjects diet, if desired by subject.

group 2: same procedure as above except 1 day later.

There will be (hopefully) 5 senior citizens to be visited each day.

APPENDIX E
GUTTMAN SCALE COEFFICIENTS

$$\text{Coefficient of Reproducibility (C.R.)} = 1 - \frac{\text{Errors}}{\text{Total Responses}}$$

$$\text{Coefficient of Scalability (C.S.)} = 1 - \frac{\text{Errors}}{\text{Maximum Errors}}$$