NUTRIENT INTAKE OF ELDERLY HOSPITAL PATIENTS

by

Teresa M. Aleshire

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Human Nutrition and Foods

APPROVED:

--------------------------
J.A. Phillips, Chairman

--------------------------
M.R. Bedford

J. Van Bowen, Jr.

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Chapter 1
INTRODUCTION

Since the enactment of the Older Americans Act of 1965, interest in the welfare of elderly persons, including their dietary status, has become increasingly apparent. Data from the Ten-State Nutrition Survey (1968-1969) indicated some of the elderly people were suffering from malnutrition and estimated that one-half of the elderly's health problems were related to food intake patterns. One tenth of our population, approximately 20 million people, are sixty-five years of age or older (Brown and Bergan, 1977). Holmes estimated that less than half of these 20 million people receive sufficient calories and nutrients to insure physical well-being. Reasons for malnutrition among the elderly are manifold and include lifelong poor eating habits, inadequate financial resources, cultural and educational factors, health and health-related problems and emotional factors related to isolation and solitude.

There is need for a greater awareness of the nutritional status of the elderly population. Studies of food habits and nutrient intakes of elderly hospital patients could provide some information for assessment of dietary adequacy, possible changes needed in menu structure, and types of nutrition education which might prove effective during a hospital stay.
Objectives

The purposes of this study were:

To observe and record the food choices and calculate the nutrient intake of 100 elderly hospital patients.

To compare these nutrient intakes with 1974 Recommended Daily Allowances for people over sixty years of age.

To determine whether educational level, income, or sex influenced the dietary intake of the patients.
Chapter 2
REVIEW OF LITERATURE

Nutrient Needs and Intake of the Elderly

Justice, Howe, and Clark (1974) examined the chronological ages for the population of the United States and stated that in 1900 only one person in twenty-five was over 65 years of age, whereas in 1970, one of ten exceeded that age. The number of persons over 75 years of age has also been increasing. Furthermore, these workers commented that little has been done to improve the health of the elderly population. Holmes (1971) found that less than one-half of our nation's aged population received sufficient nutrients and calories to ensure physical well-being, even though diet has been recognized as one of the most important factors that influences the health and well-being of the elderly people. Reid and Miles (1977) reported little evidence that nutrient needs of elderly persons differ markedly from those of adults in general. The majority of data suggest that calorie intake should be decreased with increasing age, but amounts of nutrients recommended for elderly persons remain basically the same as for the middle aged adults (Guthrie, Black, and Madden, 1972; LeBovit and Baker, 1965; Steinkamp, Cohen, and Walsh, (1965). Energy requirements are reduced because of the decline in basal metabolic rate associated with decreases in physical activity.
An example of diets utilized by elderly people was shown by Guthrie et al. (1972) from a study of 109 subjects. Sixty-three percent of these subjects had diets that were deficient in calories and in vitamin A; 45 percent of these subjects had diets that were deficient in calories, riboflavin, and ascorbic acid; 27 percent of these subjects had diets deficient in protein; and 18 percent of the subjects had diets that were deficient in iron. Morgan (1955), Batchelder (1965), and Clancy (1975) reported that energy value (calories), ascorbic acid, and calcium were most likely to be low in the diets of both males and females. Intakes of calcium, vitamin A, riboflavin, thiamine, and iron were observed as being low (i.e., less than 2/3 Recommended Dietary Allowances, RDA) for many nursing home patients (Henriksen and Cate, 1971; Justice et al. 1974; and Ford and Neville, 1972). Workers of the latter two studies reported that adequate ascorbic acid intake was a problem for patients in some nursing homes but Justice et al. (1974) revealed adequate ascorbic acid intakes. In a study reported by Clancy (1975), calorie, protein, calcium, iron, vitamin A, and ascorbic acid intake were compared to the 1974 RDA for elderly males and females. Of the sample population, 32 percent had diets which were deficient in at least three of the nutrients studied (measurement based on presence of nutrient at 2/3 of the RDA). Reid and Miles (1977) surveyed the nutrient intake of 50 elderly people living in Ontario
and reported that only 10 percent of the subjects had diets meeting the Canadian Dietary Standard. Calories, ascorbic acid, and vitamin A were the nutrients least well supplied in the diets. The cereal group provided most of the calories and nutrients.

**Relationship Between Income and Nutrient Intake**

Almost five million of the nineteen million persons over sixty-five in the United States are living in poverty. Therefore, the relationship between income and nutritional intake may be of critical importance (U.S. Bureau of Census, 1970). Data from a food consumption survey in Rochester, New York supported the proposition that diet quality and income were related to the elderly (USDA Report No. 25, 1965). For fifty-two percent of the two-person households with incomes under $2,000 per year in 1964, the diets reported furnished two-thirds or less of the amount of nutrients recommended by the National Research Council in 1963. Forty-six percent of the two-person households with incomes of $3,000 per year in 1964 reported diets that furnished two-thirds or less of the amount of nutrients recommended. Upon comparing diets reported with money spent on food, it was found that 60 percent of those elderly who spent less than $750 per year on food, had diets which provided less than two-thirds of the 1963 RDA. By comparison, only three percent of those couples who spent
more than $1,150 per year on food had diets which provided less than two-thirds of the required nutrients (USDA Consumer Research Service, 1968).

Income data concerning 104 elderly people who consumed the ten "best" and the ten "worst" diets was studied by Davidson, Livermore, Anderson, and Kaufman (1962) at the Age Center of New England. These workers reported an association between income level and nutrient intake. The incomes of people who consumed the ten "best" diets were generally higher than the income of those with the ten "worst" diets. The average annual incomes were $1,450 for those who consumed the "worst" diet and $9,824 for those who consumed the "best" diet. Davidson et al. (1962) found that those people living in social isolation and on low incomes had lower nutrient intakes than did the people with higher incomes living in social isolation. Nutritional status was positively related to income and negatively related to age. Guthrie et al. (1972) assessed the diets of a group of elderly citizens who were eligible for food assistance and compared their diets to those of a group whose income disqualified them for such a program. Diets of the higher income group were significantly more adequate with respect to iron, riboflavin, and protein.

Johnson and Feniak (1973) studied dietary intake of 74 elderly persons with low incomes and found only 15 percent
of the group were consuming diets that met the Canadian Dietary Standards for caloric intake and the eight nutrients assessed. These diets were low in vitamin A, ascorbic acid, calcium, and iron. Howell and Loeb (1969) found that increased usage of filling foods which usually have minimal nutritional value or "empty calories" and tend to produce a monotonous diet was the pattern for elderly people who had a low income. In comparison, food habits of the elderly people with a higher income showed consumption of a wider variety of foods and beverages, leading to a nutritionally superior diet.

The Relationship of Sex and Nutrient Intake

The dietary records of 24 elderly persons living in nursing homes were assessed for caloric intake and the nutrients: protein, calcium, iron, vitamin A, riboflavin, niacin, and ascorbic acid using values from USDA Handbook #8 (1964). The males had higher intakes of all nutrients than did the females except vitamin A. This finding was interpreted as an indication that the females had a higher consumption of fruits and vegetables (Henriksen and Cate 1971). Reid and Miles (1977) also found significant differences in mean intakes of protein and iron between the sexes. In the latter study, the higher consumption of meat, fish, poultry, and eggs by males resulted in their higher protein and iron intakes. Sex was also shown (Justice et al. 1974)
to have a significant effect on mean intake of certain nutrients. Men consumed more than 200 calories, 30g more carbohydrate and 0.2mg more thiamine than did the women. However, the women consumed 30mg more ascorbic acid, again indicating a higher consumption of fruits and vegetables by females. Comparisons by Korhs (1976) between males and females for the mean percent of the 1974 RDA for calories and eight nutrients revealed significant differences in nutrient intake between the sexes. Males consumed a greater intake of calories, protein, iron, thiamine, niacin, total fat, saturated fat, and cholesterol than did females in the study. However, it should be pointed out that in 1974 RDA for calories, protein, thiamine and niacin were greater for men than for women. The notable differences between the sexes in general was that men had higher calorie and nutrient intakes than did the women.

Relationship of Education and Nutrient Intake

The elderly people today generally have had limited opportunity to receive good nutritional information. Dietary intake was found to be strongly related to education by Clancy (1975). In her sample of 41 women and 6 men, those subjects with more years of education had a significantly greater use of vitamin supplements and higher intakes of calories, protein, iron, vitamin A, and ascorbic acid. A
survey of the nutritional status of 547 senior citizens in Missouri showed that subjects with less education consumed significantly fewer calories and significantly less protein, thiamine, niacin, total fat, and saturated fat (Korhs, 1976).

**Formulation of the Recommended Daily Allowances**

The Food and Nutrition Board was the body responsible for the formulation of recommended daily nutrient intakes that were judged to be adequate in the United States for the maintenance of good nutrition. These formulations were first devised in 1941 and designated as "Recommended Dietary Allowance" (RDA) (RDA, 1968 National Academy of Sciences). The RDA is revised approximately every five years by a panel of authorities in nutrition, the most recent edition was published in 1974.

The allowances were developed as "standards" to "serve as goals for good nutrition" for the population of the United States. Since there was no way of predicting whose nutritional needs were high and whose were low, the RDA's were designed to be recommendations for levels of intake of nutrient requirements of nearly all of the population of the United States (Hegsted, 1972). Even though the RDA are not requirements, they are the best available criteria for evaluating nutrient intake of the healthy population.

The first edition of **Recommended Dietary Allowance** was published in 1943 and seven revisions have been issued
since. The first three editions included calories and nine nutrients. In the fourth (1953) edition, adults were classified by age and caloric requirements were lowered. In the fifth (1958) and sixth (1963) editions caloric requirements were further reduced. Requirements for the water soluble vitamins were also lowered. In the last two revisions (1968 and 1974) changes in the age categories were made and new categories were added for males and for females, 18 to 22 years old. Infant allowances were tabulated separately to allow for the relationship of body mass to energy needs. Additional nutrients tabulated were phosphorus, iodine, magnesium, vitamin B_6, vitamin E, vitamin B_{12}, and folacin (RDA, 1968 National Academy of Sciences, Mitchell, 1974).

Various researchers have emphasized that these RDA's should serve as a guide to health status, and that differences in individual intake from the RDA are significant only in terms of the individual's total health status.

In summary, dietary data suggested that the nutrient intake of many of the elderly persons has not been optimal and is related to income level, sex, and educational level. Encouragement is needed for the elderly people to eat more nutritious foods.
Chapter 3

PROCEDURES

The Nelson Clinic, a unit of the Medical College of Virginia Hospitals, has a capacity of fifty-one patients — all ambulatory. The patients in the Nelson Clinic may be described demographically as: men and women, black and white, from rural and urban residential areas and with a wide range of income levels and educational backgrounds. These patients eat their meals in the Medicovan Restaurant which is located on the first floor of the Nelson Clinic. The restaurant serves the public as well as the patients. Nutrient intake data were based on the menus (Appendix 1) for Tuesday, Wednesday, and Thursday which were also the observation days. These menus included a large variety of foods and did not vary from week to week. The left side of the menu contained sixteen sandwiches (hot and cold), four large salad bowls, desserts and drinks. This section of the menu remained constant throughout the study. The right side of the menu changed according to the day of the week and included five entree items and eight vegetable items.

Dietary Records

Three-day dietary intakes were recorded for 100 patients who were over sixty years of age. Data on food intake were obtained in such a manner that patients did not realize daily records were being made. The amount of food eaten was usually recorded by the researcher and occasionally by the
hostess who had been instructed in the proper recording tech-
niques.

The amount and type of food ordered was recorded and the
estimated amount that remained after the patient had finished
eating was subtracted. The nursing staff reported additional
snacks consumed by each patient between meals. The duration
of the data collection for the 100 patients extended over a
seven week period. To rule out bias that might develop for
patients who were being counseled by a dietitian, only those
patients who selected their own meals were included in the
records. Some patients were discharged before the end of the
three day sampling period and initial data for these patients
were therefore not included.

**Patient Response**

Each subject was contacted by telephone to make arrange-
ments for a post observation interview. For privacy, all
interviews were conducted in the patient's room. At this time
the importance of the study and the use of the results were
explained. The interview data sheet (Appendix 2) was planned
to produce two types of answers: yes-no answers for specific
factual information and variable answers as to beliefs and
attitudes toward food as a means of building rapport with
each patient. The data sheet was tested prior to this study
with ten elderly patients to determine suitability of ques-
tions and the time required to complete the interview.
Several revisions of the data sheet were made and the average time for completion of the interview was established as half an hour. The same questions were asked in the same order for all patients interviewed. To supplement the interview, information on age, insurance coverage, height, weight, and health problems was tabulated from patients' charts.

**Analysis of Food Intake**

Each item on the food record was coded using a nutrient file based on items from a computer Recall Food Selection Guide (V.P.I.S.U. extension service). The data from the food records were keypunched in an appropriate format for calculating the total daily nutrient intake. Daily intakes of calories, protein, fat, carbohydrate, calcium, iron, vitamin A, riboflavin, niacin, and vitamin C were summed for each patient by using a computer and the percentage of the 1974 RDA's for each nutrient was ascertained. This information was then correlated via computer with the demographic data appropriate for each patient.

Analysis of variance was used to determine the significance of the relationship of nutrient intake to income level, education level, and sex of the patient. The mean dietary rating score for each income level, education level, and sex was used to study statistical differences the variables measured.
Chapter 4

RESULTS AND DISCUSSION

Demographic Information

The sample of 100 patients sixty years of age or older for this study of dietary patterns included forty-seven males and fifty-three females. There were sixty-three white patients and thirty-seven black patients. The youngest patient was sixty and the oldest was eight-nine. Thirty-five patients were overweight and ten patients were underweight as defined by a table for desirable weight from the Metropolitan Life Insurance Company. Forty-one patients were single or widowed and fifty-nine were married; thirty-one lived alone and sixty-nine shared living quarters with spouse, relative, or friend. There were three patients who reported that they were unable to prepare their own food and twenty-six patients who reported that they needed help some of the time. Eight patients reported difficulties with chewing food; thirty-seven patients had partial dentures and twelve patients had complete dentures.

Dietary Rating System

The type of food eaten was observed and the amount eaten was estimated and recorded. The total quantity was summed by a computer from information taken from food composition tables. The results gave three day nutrient intakes. A means of rating the adequacy of the observed nutrient was
necessary. Therefore, mean dietary intakes for each individual were classified according to four levels. For each patient the mean intake of the seven selected nutrients was assigned a numerical value according to the scheme described by Reid et al. (1977) as follows: A value of "4" was assigned for each of the seven selected nutrients if intake met or exceeded 100 percent of the Recommended Daily Allowances (RDA); "3" for each of the nutrients if intake was between sixty-seven percent and ninety-nine percent of the RDA; "2" for each nutrient if intake was between thirty-three percent and sixty-six percent of the RDA and "1" for each nutrient if intake was below thirty-three percent of the RDA. On the basis of this scoring system, a dietary rating was obtained for each patient by totaling the scores for each of the nutrients. The maximum score possible if intakes met or exceeded 100 percent of the RDA was twenty-eight (seven nutrients times the maximum score of four each).

This scoring system reflects in an indirect manner the nutritional adequacy of the diets of the patients. Only actual analysis of duplicate food composites could confirm the values used in this study from food composition tables. The use of this dietary rating system provided a basis for determining trends of nutrient intake within a survey group and therefore comparisons of different groups were made.
Relationship of Nutrient Intake to Income

It is generally recognized that a low income is often a contributing factor to low nutrient intakes. On the contrary it is also known that a high income does not ensure a diet that is nutritionally adequate.

All of the patients in this study gave information as to whether they received food stamps, income from the federal "Social Security" plan, a pension, revenue from a retirement plan, investments, or savings, and in addition whether they were receiving financial assistance from Medicaid or Medicare. The distribution of ranges of annual income is presented in Table 1. No one had an income below $2,000 per year and two-thirds of the patients had incomes above $6,000 per year. Many subjects were reluctant to state their annual income, but did give the level of income within a $2,000 range. Incomes were different between the races with the white population having significantly higher incomes (p < .02).

A comparison of the mean dietary intake for patients within each range of incomes indicated that the patients with lower incomes had diets somewhat less adequate than did those with higher incomes (Table 2). The adequacy of the dietary intake was significantly different for five of the seven selected nutrients: protein (p < .05), niacin (p < .03), riboflavin (p < .03), vitamin A (p < .04), and vitamin C (p < .002). This finding substantiates that of LeBovit
Table I

Estimated Ranges of Annual Income for the Patients, Tabulated by Sex and Race

<table>
<thead>
<tr>
<th>Income Level</th>
<th>Total</th>
<th>Male</th>
<th>Female</th>
<th>Significance*</th>
<th>Significance*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
<td>No.</td>
<td>%a</td>
<td>No.</td>
</tr>
<tr>
<td>Below $2,000</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>$2,000-3,999</td>
<td>17</td>
<td>17</td>
<td>6</td>
<td>12.8</td>
<td>1</td>
</tr>
<tr>
<td>$4,000-5,999</td>
<td>17</td>
<td>17</td>
<td>5</td>
<td>10.6</td>
<td>1</td>
</tr>
<tr>
<td>$6,000-7,999</td>
<td>15</td>
<td>15</td>
<td>2</td>
<td>4.3</td>
<td>5</td>
</tr>
<tr>
<td>$8,000-9,999</td>
<td>13</td>
<td>13</td>
<td>3</td>
<td>6.4</td>
<td>8</td>
</tr>
<tr>
<td>Over $10,000</td>
<td>38</td>
<td>38</td>
<td>2</td>
<td>4.3</td>
<td>14</td>
</tr>
</tbody>
</table>

a. Percentages expressed as the fractional part of all males
b. Percentages expressed as the fractional part of all females

* All numbers below .05 are considered significant. A chi-square test showed that income was higher for whites for both sexes.
Table II

Mean Dietary Rating Score for Each Range of Income

<table>
<thead>
<tr>
<th>Income Level</th>
<th>Total No.</th>
<th>Mean Dietary Rating Score&lt;sup&gt;a&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Below $2,000</td>
<td>0</td>
<td>19.5</td>
</tr>
<tr>
<td>$2,000-3,999</td>
<td>17</td>
<td>21.1</td>
</tr>
<tr>
<td>$4,000-5,999</td>
<td>15</td>
<td>24.0</td>
</tr>
<tr>
<td>$8,000-9,999</td>
<td>13</td>
<td>24.0</td>
</tr>
<tr>
<td>over $10,000</td>
<td>38</td>
<td>25.9</td>
</tr>
</tbody>
</table>

Significance .0102

<sup>a</sup>Dietary Rating Score arrived at by summation of arbitrary values assigned for certain percentage levels of RDA's taken by patients. See Chapter 3 "Results and Discussion" for more detailed consideration of this method.

Using analysis of variance the mean dietary scores were found different for different income levels. The means increase as the income level increases.
(1965), who studied dietary intakes of a variety of people who were recipients of "Social Security" payments. The percentage of protein, carbohydrate and fat in the diets reported in this report, also had an impact on dietary adequacy, to the extent that as the range of income increased, the quantity of protein in the diet was increased and the quantity of carbohydrates was decreased.

It should be emphasized that none of the patients in this study had annual income levels less than $2,000. This is in contrast to other literature previously cited in this paper and may have had some influence on the results. Since the patients were allowed "free choices" of foods and did not pay for their individual meals (a single room fee was charged regardless of the food eaten) the cost of the particular foods eaten was not of great importance in making selections of food. Therefore, calculated dietary intakes reported in this study reflect foods the patients would eat if there were no financial restrictions, but not necessarily foods usually eaten at home.

Relationship of Nutrient Intake to Education

Level of education completed appeared to have an influence on the adequacy of the nutrient intake. As noted in Table 3, seventy-three percent of the patients had completed at least high school education. No significant differences existed between the races for the educational level completed
## Table III

### Educational Level Achieved by Patients Tabulated by Sex and Race

<table>
<thead>
<tr>
<th>Education</th>
<th>Total No.</th>
<th>Total %</th>
<th>Male Black No.</th>
<th>Male White No.</th>
<th>Female Black No.</th>
<th>Female White No.</th>
<th>Significance*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grade School</td>
<td>12</td>
<td>12</td>
<td>2</td>
<td>0</td>
<td>7</td>
<td>3</td>
<td>.0733</td>
</tr>
<tr>
<td>High School</td>
<td>61</td>
<td>61</td>
<td>14</td>
<td>20</td>
<td>10</td>
<td>17</td>
<td></td>
</tr>
<tr>
<td>College</td>
<td>27</td>
<td>27</td>
<td>2</td>
<td>9</td>
<td>2</td>
<td>14</td>
<td></td>
</tr>
</tbody>
</table>

*All numbers below .05 are considered significant. Using the chi-square test, black and white females were found to have different education levels; the white having a tendency to have more education.*
by the males; however, the white females attained a significantly higher level of education than did the black females. The only significant nutritional trend obtained regarding education showed those patients with a high school education as having the lowest intake of calories \((p < .02)\) and protein \((p < .01)\). However, the mean dietary rating for all patients score tended to increase as their education level increased (Table 4). This finding substantiates that of Guthrie et al. (1972) and of Clancy (1975).

The patients in this study tended to have reached a higher level of education than persons reported in other studies cited earlier in this paper. Educational level achieved may have affected nutritional adequacy by providing a better opportunity for improved economic status or it may in itself have had an ameliorating effect.

Relationship of Nutrient Intake with Sex of the Patient

Nutrient intake was not significantly different for male and female patients, perhaps because the common characteristic of these patients was that they were not limited either financially or in the variety of food offered for the three day observation. The mean percentage of each nutrient and the level of significance are shown in Table 5. Carbohydrates supplied about forty percent of the calories consumed by males and forty-two percent of the calories consumed by females. About forty-four percent of the calories consumed
Table IV

Mean Dietary Rating Score for Each Education Level

<table>
<thead>
<tr>
<th>Education Level</th>
<th>Total No.</th>
<th>Mean Dietary Rating Score&lt;sup&gt;a&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grade School&lt;sup&gt;b&lt;/sup&gt;</td>
<td>12</td>
<td>20.1</td>
</tr>
<tr>
<td>High School&lt;sup&gt;c&lt;/sup&gt;</td>
<td>61</td>
<td>23.2</td>
</tr>
<tr>
<td>College&lt;sup&gt;d&lt;/sup&gt;</td>
<td>27</td>
<td>26.0</td>
</tr>
</tbody>
</table>

*Significance .0743

<sup>a</sup> See comment under Note "a" Table 2
<sup>b</sup> Grade School - grades one through seven
<sup>c</sup> High School - grades eight through twelve
<sup>d</sup> College - one year or more

* All numbers below .05 are considered significant. A chi-square test showed that the mean dietary rating score increased as educational level increased.
Table V

Intake of Selected Nutrients by Male and Female Patients

<table>
<thead>
<tr>
<th>Nutrients</th>
<th>Males mean percent of RDA(^a)</th>
<th>Females mean percent of RDA(^a)</th>
<th>Significance(^b)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Protein</td>
<td>135</td>
<td>120</td>
<td>.06</td>
</tr>
<tr>
<td>Calcium</td>
<td>106</td>
<td>96</td>
<td>.22</td>
</tr>
<tr>
<td>Iron</td>
<td>112</td>
<td>113</td>
<td>.84</td>
</tr>
<tr>
<td>Vitamin A</td>
<td>223</td>
<td>201</td>
<td>.52</td>
</tr>
<tr>
<td>Riboflavin</td>
<td>134</td>
<td>140</td>
<td>.55</td>
</tr>
<tr>
<td>Niacin</td>
<td>118</td>
<td>130</td>
<td>.13</td>
</tr>
<tr>
<td>Vitamin C</td>
<td>135</td>
<td>130</td>
<td>.61</td>
</tr>
</tbody>
</table>

\(^a\) Mean percentage of RDA was calculated individually for males and females in an effort to make a more appropriate evaluation of each sex's nutrient intake.

\(^b\) Indicates whether statistically a difference was found between males and females for each nutrient above.
by both males and females were supplied by fat. This intake possibly reflects the large amount of fried foods offered on the menus. Perhaps since people can not easily deep fat fry food at home, they tend to choose these foods more often when eating in a restaurant facility. The percentage of protein in the diet was shown to be higher for the males than for the females \( (p < .02) \). About fifteen percent of the calories consumed by males and thirteen percent of calories consumed by females were supplied by protein. The higher intake of protein for males was possibly the reflection of the higher consumption of meats, eggs, and milk by the males.

The males had a higher mean dietary rating than the females, but the difference was slight and similar to the differences shown in the study by Reid et al. (1977).
Conclusions

A positive association was observed between high income and education level and adequacy of nutrient intake. No association was observed between sex and the adequacy of nutrient intake.

Emphasis needs to be placed on increasing the dietary calcium and decreasing the dietary fat. This could be accomplished by simple changes in the study menu. Some of the items now fried could be offered as baked or broiled items. More calcium in the diet could be obtained through the use of more dairy products.
Chapter 5

SUMMARY

A three day food intake was recorded for 100 elderly patients who were subsequently interviewed to determine the relationship of income level, educational level completed and sex of the person with the nutrient intakes of these patients. Three-day caloric and nutrient intakes were recorded and compared to the 1974 Recommended Daily Allowances (RDA). Mean intake for a three-day period of seven nutrients showed patient averages met at least 100 percent of the RDA for all nutrients except calcium. The females had a mean intake of ninety-six percent of the RDA for calcium. The patients with the lower incomes had dietary patterns that were less adequate than the patterns for those with higher incomes, and these patients ate more carbohydrate and less protein than did the patients with higher incomes. Nutrient intake was increased for the patients as their level of education increased. There were no significant differences in the nutrient intakes between sexes. The males had a higher nutrient intake and had a higher percentage of protein in their diets than did the females, however, the differences were slight. It was concluded from the above results that certain beneficial changes in the study menu could be made. Especially important areas such as calcium and fat intake may need modification at some time in the future as more light is shed on these areas.
REFERENCES CITED


APPENDICES
## Fruit or Juice

<table>
<thead>
<tr>
<th>Item</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Orange Juice</td>
<td>.35</td>
</tr>
<tr>
<td>Grapefruit Juice</td>
<td>.35</td>
</tr>
<tr>
<td>Tomato Juice</td>
<td>.35</td>
</tr>
<tr>
<td>Prune Juice</td>
<td>.35</td>
</tr>
<tr>
<td>Stewed Prunes</td>
<td>.35</td>
</tr>
<tr>
<td>Fresh Fruit in Season</td>
<td>.45</td>
</tr>
<tr>
<td>Applesauce</td>
<td>.30</td>
</tr>
<tr>
<td>Fruit Cup</td>
<td>.40</td>
</tr>
</tbody>
</table>

## Cereal

- With Milk: .40
- With Cream: .50

**HOT CEREALS**
- Grits
- Oatmeal
- Cream of Wheat
- Farina

**INDIVIDUAL PACKAGE, COLD CEREAL**
- Corn Flakes
- Raisin Bran
- Shredded Wheat
- Special "K"
- Puffed Rice
- Puffed Wheat
- Rice Krispies

## Beverages

- Coffee, Tea, or Sanka: .30
- Hot Chocolate or Milk: .30
### Complete Breakfast

<table>
<thead>
<tr>
<th></th>
<th>Item Description</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>One Egg, any style with One Slice toast, Two Strips Bacon</td>
<td>$1.20</td>
</tr>
<tr>
<td>2</td>
<td>Two Eggs, any style with Two Slices toast, Two Strips Bacon</td>
<td>$1.70</td>
</tr>
<tr>
<td>3</td>
<td>Two Eggs, any style with Two Slices toast</td>
<td>$1.05</td>
</tr>
<tr>
<td>4</td>
<td>Farmers Omelette with Toast</td>
<td>$1.30</td>
</tr>
<tr>
<td>5</td>
<td>French Toast with Sausage Patties</td>
<td>$1.45</td>
</tr>
<tr>
<td>6</td>
<td>Three Golden Hot Cakes</td>
<td>$1.10</td>
</tr>
<tr>
<td>7</td>
<td>Creamed Chipped Beef on Biscuit</td>
<td>$1.15</td>
</tr>
<tr>
<td>8</td>
<td>Golden Cheddar Cheese Omelette with One Slice toast, Grilled Ham</td>
<td>$1.90</td>
</tr>
</tbody>
</table>

### Side Orders

<table>
<thead>
<tr>
<th>Item Description</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bacon, two strips</td>
<td>$0.70</td>
</tr>
<tr>
<td>Sausage Patty</td>
<td>$0.50</td>
</tr>
<tr>
<td>One Egg, any style</td>
<td>$0.40</td>
</tr>
<tr>
<td>Hash Brown Potatoes</td>
<td>$0.40</td>
</tr>
<tr>
<td>Danish Pastry</td>
<td>$0.45</td>
</tr>
<tr>
<td>Grilled Ham</td>
<td>$0.70</td>
</tr>
<tr>
<td>Two Slices toast with Jelly</td>
<td>$0.30</td>
</tr>
<tr>
<td>English Muffin with Jelly</td>
<td>$0.35</td>
</tr>
<tr>
<td>Corn Oil Margarine (no charge with bread)</td>
<td>$0.05</td>
</tr>
</tbody>
</table>
Appetizers

Chilled Fruit Juice ........................................... .35
Chicken Consomme ........................................... .40
Beef Consomme ............................................. .40
Soup of the Day ................................................ .50

Entrees

1. Baked Dinner Loaf with Mushroom Gravy .................. 2.20
   Choice of Two Vegetables and Roll or Our Own Homemade Cornbread
2. Manicotti with Tomato Sauce ................................. 2.00
   Choice of Two Vegetables and Roll or Our Own Homemade Cornbread
3. Sauteed Chicken Livers on Toast with Fricassee Sauce .... 2.10
   Choice of Two Vegetables and Roll or Our Own Homemade Cornbread
4. Cup of Soup, Grilled Cheese Sandwich ...................... 1.55
   On Choice of Bread, Beverage
5. Buckboard, Ham, Swiss Cheese, Cole Slaw with Russian Dressing .... 1.85
   On Rye Bread with Lettuce and Tomato Garnish

Luncheon Special

Creamed Chipped Beef and Mushrooms ...................... 1.85
Over Buttered Toast with Mixed Vegetables, Beverage
(no substitutions please)

Side Orders

Garden Salad, Choice of Dressing .......................... .45
Sliced Tomato Salad ........................................ .40
Mixed Vegetables ............................................ .35
Vegetable of the Day ....................................... .35
Tangy Cole Slaw ............................................. .35
Cottage Cheese Salad ........................................ .35
Whipped Potatoes ............................................ .35
French Fried Potatoes ...................................... .45
Chili Con Carne ............................................. .75
Appetizers

Chilled Fruit Juice ........................................... .35
Chicken Consomme ........................................... .40
Beef Consomme .............................................. .40
Soup of the Day ............................................. .50

Entrees

1. Tender Grilled Liver with Sauteed Onions .................. 2.95
   Choice of Two Vegetables and Roll or Our Own Homemade Cornbread

2. Creamy Macaroni and Cheese ................................ 1.95
   Choice of Two Vegetables and Roll or Our Own Homemade Cornbread

3. Crisp and Tender Quarter Fried Chicken .................. 2.25
   Choice of Two Vegetables and Roll or Our Own Homemade Cornbread

4. Cup of Soup, Tuna Salad Sandwich .......................... 1.55
   On Choice of Bread and Beverage

5. Grilled Reuben ........................................... 1.85
   Tasty Corn Beef, Swiss Cheese and Sauerkraut on Rye Bread

Luncheon Special

Spaghetti with Meat Sauce and Parmesan Cheese ............... 1.85
Tossed Green Salad and Beverage, Our Own Homemade Cornbread or
Light and Fluffy Hot Roll (no substitutions please)

Side Orders

Garden Salad, Choice of Dressing ................................ 45
Sliced Tomato Salad .......................................... 40
French Style Green Beans ..................................... 40
Vegetable of the Day .......................................... 35
Tangy Cole Slaw ................................................ 35
Cottage Cheese Salad ........................................ 35
Whipped Potatoes .............................................. 35
French Fried Potatoes ........................................ 45
Chili Con Carne ................................................ 75
Appetizers

Chilled Fruit Juice ......................................................... .35
Chicken Consomme ......................................................... .40
Beef Consomme ......................................................... .40
Soup of the Day ............................................................ .50

Entrees

1. Hot Turkey Sandwich with Whipped Potatoes and Mixed Vegetable Garnish ........................................... 2.35
   Choice of One Vegetable and Roll or Our Own Homemade Cornbread

2. Deep Fried Fish Filet ..................................................... 1.90
   Choice of Two Vegetables and Roll or Our Own Homemade Cornbread

3. Creamed Chicken and Vegetables over Buttered Toast ............................................................................ 2.00
   Choice of One Vegetable and Roll or Our Own Homemade Cornbread

4. Hot Corned Beef on Rye with Cole Slaw ................................................................................................. 1.85

5. Teen Twist Sandwich ................................................................................................................................. 1.85
   Sliced Ham and Cheese with Shredded Lettuce Bed and Tomato Slices
   on Grilled Twist Roll

Luncheon Special

Baked Lasagne .................................................................................. 1.85
Choice of One Vegetable and Beverage, Our Own Homemade Cornbread or
Light and Fluffy Hot Roll (no substitutions please)

Side Orders

Garden Salad, Choice of Dressing ...................................................... .45
Sliced Tomato Salad ........................................................................... .40
Mixed Vegetables ................................................................................ .35
Vegetable of the Day ........................................................................... .35
Tangy Cole Slaw .................................................................................. .35
Cottage Cheese Salad .......................................................................... .35
Whipped Potatoes ................................................................................ .35
French Fried Potatoes .......................................................................... .45
Chili Con Carne .................................................................................... .
Appetizers

Chilled Juice ......................................................... .35
Chicken Consomme ............................................. .40
Beef Consomme ................................................... .40
Soup of the Day ..................................................... .50

Entrees

Complete Dinner includes Appetizer, choice of Two Vegetables, Our Own Homemade Cornbread or Roll, Beverage, and your choice of Ice Cream, Pudding or Jello.

<table>
<thead>
<tr>
<th>A La Carte</th>
<th>Complete Dinner</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Grilled Pork Chops (2) smothered in rich gravy</td>
<td>3.25</td>
</tr>
<tr>
<td>2. Spaghetti with Meat Sauce</td>
<td>2.25</td>
</tr>
<tr>
<td>3. Golden Baked Chicken Quarters</td>
<td>2.25</td>
</tr>
<tr>
<td>Breast or Leg Quarter</td>
<td></td>
</tr>
<tr>
<td>4. Grilled 8 oz. Dinner Steak with Onion Rings</td>
<td>4.25</td>
</tr>
</tbody>
</table>

Evening Special

Fried Fish Fillet with Tartar Sauce ........................................ 2.75
Served with your Choice of Vegetables, Our Own Homemade Cornbread or a Light and Fluffy Hot Roll, and Beverage (no substitutions please)

Side Orders

Garden Salad, choice of dressing ........................................... .45
Sliced Tomato Salad ....................................................... .40
Mixed Vegetables ............................................................. .35
Vegetable of the Day ........................................................... .35
Tangy Cole Slaw ................................................................. .35
Cottage Cheese Salad .......................................................... .35
Baked Potato with Butter ..................................................... .35
French Fried Potatoes .......................................................... .45
Chili Con Carne ................................................................. .75
Appetizers

Chilled Juice ......................................................... .35
Chicken Consomme .................................................. .40
Beef Consomme ..................................................... .40
Soup of the Day ..................................................... .50

Entrees

Complete Dinner includes Appetizer, choice of Two Vegetables, Our Own Homemade Cornbread or Roll, Beverage, and your choice of Ice Cream, Pudding or Jello.

<table>
<thead>
<tr>
<th>Item</th>
<th>A La Carte</th>
<th>Complete Dinner</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Grilled Beef Liver with Sauteed Onions</td>
<td>2.00</td>
<td>3.50</td>
</tr>
<tr>
<td>2. Golden Fried Scallops, Tartar Sauce</td>
<td>3.00</td>
<td>4.50</td>
</tr>
<tr>
<td>3. London Broil with Sherry Mushroom Sauce</td>
<td>3.50</td>
<td>5.00</td>
</tr>
<tr>
<td>Thinly sliced marinated beef</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Grilled 8 oz. Dinner Steak with Onion Rings</td>
<td>4.25</td>
<td>5.75</td>
</tr>
</tbody>
</table>

Evening Special

Barbecued Chicken Quarter ........................................... 2.75
Choice of Two Vegetables, Our Own Homemade Cornbread or a Light and Fluffy Hot Roll, and Beverage (no substitutions please)

Side Orders

Garden Salad, choice of dressing .................................. .45
Sliced Tomato Salad .................................................. .40
Whole Kernel Corn ................................................... .35
Vegetable of the Day .................................................. .35
Tangy Cole Slaw ....................................................... .35
Cottage Cheese Salad .................................................. .35
Baked Potato with Butter ............................................. .35
French Fried Potatoes .................................................. .45
Chili Con Carne ......................................................... .75
Appetizers

Chilled Juice ................................................................. .35
Chicken Consomme ......................................................... .40
Beef Consomme ............................................................. .40
Soup of the Day .............................................................. .50

Entrees

Complete Dinner includes Appetizer, choice of Two Vegetables, Our Own Homemade Cornbread or Roll, Beverage, and your choice of Ice Cream, Pudding or Jello.

<table>
<thead>
<tr>
<th>A La Carte</th>
<th>Complete Dinner</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Mariner’s Platter with Tartar Sauce .......................... 3.75</td>
<td>5.25</td>
</tr>
<tr>
<td>A Variety of Seafood including Shrimp, Scallops, Crab cake and Fried Fish Fillet</td>
<td></td>
</tr>
<tr>
<td>2. Hickory Smoked Ham Steak with Pineapple Ring ................. 3.25</td>
<td>4.50</td>
</tr>
<tr>
<td>3. Fried Chicken Breast on a Bed of Rice, Topped with Almondine Sauce .................. 2.75</td>
<td>4.25</td>
</tr>
<tr>
<td>4. Swiss Steak served with Vegetable Gravy ....................... 3.25</td>
<td>4.75</td>
</tr>
<tr>
<td>Tomatoes, Green Peppers, Onions and Celery</td>
<td></td>
</tr>
</tbody>
</table>

Evening Special

Two Grilled Knockwurst with Sauerkraut and Green Peas .................. 2.75
Our Own Homemade Cornbread or a Light and Fluffy Hot Roll
(no substitutions please)

Side Orders

Garden Salad, choice of dressing ......................................... .45
Sliced Tomato Salad ......................................................... .40
Garden Peas ................................................................. .35
Vegetable of the Day ...................................................... .35
Tangy Cole Slaw ............................................................. .35
Cottage Cheese Salad ...................................................... .35
Baked Potato with Butter .................................................. .35
French Fried Potatoes ..................................................... .45
Interview - Code Form

Date
Height
Weight
Sex
Age
Race
Marital Status - married, widow, divorced, separated, single
Housing - Apartment, house, room, trailer.
  Do you own or rent?
Living Conditions - with spouse, relative, friend, other
Occupation - Employed, volunteer, retired
Religion - Catholic, Protestant, Jewish, other
Education - Grade school, High school, College

Food
Favorite foods -
Most disliked foods -
Foods that disagree with you
Do you eat same foods as in childhood
Do you think your diet is good, fair, poor

Health
Teeth - own, none, partial dentures, complete dentures
  Is chewing a problem? Yes, no, sometimes
Mobility - normal, limited, wheelchair, walker
Physical ability to prepare food - Yes, no
Dietary supplements - Yes, no
Where do you get your information about foods and nutrition?
Radio, newspaper, T.V., magazine, medical person, family

How much television do you watch each day? Less than 1 hour, 1 hour, 2 hours, 3 hours, 4 hours or more

Income

Source - Social Security, old age assistance, pension, investments, annuity, insurance, medicare, medicaid, food stamps, relatives, other

Amount of money spent on food per week - 5 dollars or less, 5-10 dollars, 10-15 dollars, 15-20 dollars, 20-25 dollars, over 25 dollars

Do you cut expenses on food to economize? Yes, no

Do you raise any of your own food?

Yearly amount of income - $2,000, $2,000-$4,000, $4,000-$6,000, $6,000-$8,000, $8,000-$10,000, over $10,000
The vita has been removed from the scanned document
NUTRIENT INTAKE OF ELDERLY HOSPITAL PATIENTS

by

Teresa Morano Aleshire

(Abstract)

A three-day food intake was recorded for 100 elderly patients who were subsequently interviewed to determine the relationship of income level, educational level completed, and sex of the person with the nutrient intakes of these patients. Three-day caloric and nutrient intakes were recorded and compared to the 1974 Recommended Daily Allowances (RDA). Mean intake for a three-day period of seven nutrients showed patient averages met at least 100 percent of the RDA for all nutrients except calcium. The females had a mean intake of ninety-six percent of the RDA for calcium. The patients with the lower incomes had dietary patterns that were less adequate than the patterns for those with higher incomes, and these patients ate more carbohydrate and less protein than did the patients with higher income. Nutrient intake was increased for the patients as their level of education increased. There were no significant differences in the nutrient intakes between sexes. The males had a higher nutrient intake and had a higher percentage of protein in their diets than did the females, however, the differences were slight. It was concluded from the above results that
certain beneficial changes in the study menu could be made. Especially important areas such as calcium and fat intake may need modification at some time in the future as more light is shed on these areas.