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Nutritional Content of Supplemental Food Baskets Distributed by
Charitable Agencies in Northeast Tennessee

A thesis
presented to
the faculty of the Department of Family and Consumer Sciences
East Tennessee State University

In partial fulfillment
of the requirements for the degree
Master of Science in Clinical Nutrition

By
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May 2004

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Keywords: Supplemental food basket, food insecurity.

ABSTRACT

Nutritional Content of Supplemental Food Baskets Distributed by Charitable Agencies in Northeast Tennessee

By

Lillian K. Aliata

The purpose of this study was to determine if the nutritional needs of high-risk community members are met by supplemental food baskets distributed by charitable groups in northeast Tennessee. Hunger is a real problem among the area's elderly population, as 14.3% of the populations live at or below the poverty level. Data were collected using observation interviews at the food bank. A nutrient analysis tool was used to analyze the nutrient content of food items in a standard food basket. The findings were compared to the recommended dietary allowance for the elderly population. The supplemental food basket was adequate in calories but deficient in some nutrients especially calcium. In order to improve the quality of supplemental food baskets, organizations should solicit for highly nutritious foods that can better meet the nutritional needs of the elderly population.

ACKNOWLEDGEMENT

I extend my sincere gratitude and appreciation to my family, especially my father Mr. Ernest S. Aliata for financial and emotional support. My committee chair person, and advisor Elizabeth Lowe who stood behind me and saw to the success of this thesis. Her guidance and constant encouragement helped me go through my masters program successfully.

To my committee members Dr. Mary Kay Anderson and Dr Jamie B. Kridler for there encouragement and support; Sabina Wafula and Rob Wier for their constant encouragement and I also extend my gratitude to the food bank staff and to all these and those not mentioned I extend my deepest gratitude.

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CHAPTER 1

INTRODUCTION

Background

Second Harvest Food Bank, Gray, Tennessee is a non-profit organization affiliated with the national organization of America's Second Harvest and serves the eight counties in northeast Tennessee, specifically Carter, Greene, Hancock, Hawkins, Johnson, Sullivan, Unicoi, and Washington Counties, with emergency food for distribution to individuals at risk of food insecurity (Netfoodbank.org, 2003). The Second Harvest Food Bank of East Tennessee was started in 1982 when a group of concerned citizens heard about a new concept called food banking. They began the work of collecting a trunk load of apples and distributing them to agencies that feed the hungry in the region. The food bank was originally called 'Share' and helped distribute more than 120,000 pounds of food that had been rescued from retailers, manufacturers, and farmers to needy seniors, the homeless, and people with emergencies (Second Harvest.org, 2003).

In May 1986, the Second Harvest Food Bank, Gray Tennessee, was founded as the Tri-Cities Regional Food Bank serving Carter, Greene, Hancock, Hawkins, Johnson, Sullivan, Unicoi, and Washington counties. Recipient agencies served by the Second Harvest Food Bank include all qualified not-for-profit agencies and churches that provide food to the needy at no charge. These agencies distribute supplemental food baskets to individuals within a community who are at a higher risk of being hungry and are in need of emergency food assistance. The agencies include emergency food pantries, soup kitchens, homeless shelters, daycare centers, supported living for the developmentally

disabled and the elderly, and after school as well as summer programs for children (Netfoodbank.org, 2003).

Distributing agencies put together food to be distributed in one container or in food baskets in an attempt to provide nutritious choices, and supplemental food baskets are then delivered to high-risk populations in the community. Examples of distributing agencies include the Good Samaritan Ministries, Haven of Mercy, The Salvation Army, and Munsey Memorial United Methodist Church in addition to other faith-based organizations. Distributing agencies are designed to collect already salvaged food from Second Harvest Food Bank and directly distribute the food to individuals and families. These agencies are located in each county for easy access by the individuals served (Netfoodbank.org, 2003).

The major problem faced by distributing agencies is the lack of food items at times to adequately meet the nutritional needs of those with emergency situations. Agencies like Good Samaritan Ministries are aware that the foods they distribute do not meet the nutritional needs of the population they serve simply because all the food they receive is either from donations or food drives. Second Harvest Food Bank also has limited control over what is received in food drives. Second Harvest Food Bank of Northeast Tennessee has adopted a program of the America's Second Harvest to channel national and local resources through the "Meals on Wheels", a program that provides prepared hot food and distributes it to the elderly population in their homes in an effort to reduce hunger amongst them (Secondharvest.org, 2003).

The elderly population is at a high risk of being hungry and having food insecurity because of inadequate income and the aging process. National estimates of

food insecurity among older Americans vary in different states. Data collected by the United States Census Bureau for the United States Department of Agriculture in 2001 showed that 1.4 million households with elderly members (5.5%) experience food insecurity due to lack of resources in 2001 (USDA and US Census Bureau, 2002).

Statement of the problem

Although food banks and distributing agencies are involved in the distribution of supplemental food baskets to individuals in need, the food items that make up the baskets may not fully meet the nutritional needs of the population that receives them. By identifying the majority of the population served and their nutritional needs, food items that are included in a supplemental food basket can be improved by including foods from each food group to better meet the nutritional needs of the individuals that receive it.

Significance of the problem

Hunger is a real problem in the community especially among the elderly population who are unable to shop and cook for themselves (Jung and Frongillo, 2001). In 2002, Second Harvest Food Bank distributed approximately 3.5 million pounds of food to 250 non-profit charities that are involved in the fight against hunger in northeast Tennessee (Netfoodbank.org, 2003). The numbers of hungry people in northeast Tennessee are continuously increasing. This can be seen by the increase in the amount of food distributed in 2002 as compared to the amount distributed in 2001. The amount of food distributed in 2002 was 3.5 million pounds, a marked increase from the 2.9 million pounds distributed to over 250 non-profit charities in the eight counties in 2001.

According to Jeff Keeling of the Johnson City Tennessee Housing Authority, 272 of the clients they serve are elderly majority of them being over 62 years of age. Among the 272 elderly served by Johnson City Tennessee Housing Authority, 152 of them or more than two thirds of the elderly population in the Johnson City Housing Authority receive supplemental food baskets on a monthly basis. (Personal communication, December 15th, 2003)

Supplemental food baskets are given to individuals-in-need in an effort to meet some of their nutritional needs and reduce hunger. By understanding the nutritional needs of the population served, supplemental food baskets can be made to be more nutritionally dense to better meet the needs of those that receive the food baskets.

Question Addressed

1. To what extent do supplemental food baskets meet the nutritional needs of the elderly population that receive the food baskets in northeast Tennessee?

Hypothesis

The populations served receive supplemental food baskets that meet their nutritional needs.

Null Hypothesis

The populations served receive supplemental food baskets that do not meet their nutritional needs.

Limitations

Limitations of this study include:

1. Inconsistency of items in a food basket.
2. The study was limited to Northeast Tennessee and results cannot be generalized
3. Seasonal variation of foods at the food bank.

Definition of Terms

1. Supplemental food basket- Food items intended to supplement the regular diet of low-income households and those with temporary emergencies (USDA.gov, 2003).
2. Hunger - A condition in which people lack the basic food intake to provide them with the energy and nutrients for fully productive, active lives (Starkey, Gray-Donald and Kuhnlein, 1999).
3. Food insecurity - The inability to acquire or consume an adequate quality or sufficient quantity of food in socially acceptable ways, or the uncertainty that one will be able to do so (Starkey, Gray-Donald and Kuhnlein, 1999).
4. Food security - Access at all times by all people to safe, nutritious food that is adequate for an active and healthy life and that is obtained in a socially acceptable manner (Starkey, Gray-Donald and Kuhnlein 1999).
5. Food bank - A central collection and distribution center that provides bulk food to local food pantries and charitable agencies for distribution to those in need. (Anderson, 1990).

6. Distributing agency- Charitable agencies most of which provide food directly to needy clients through food programs like emergency food pantries, soup kitchens, and shelters (Second Harvest .Org, 2003).

7. Recommended dietary allowance (RDA) - Recommendations for daily intake of specific nutrients for groups of healthy individuals set by the Food and Nutrition Board of the National Research Council of the National Academy of Science (Mahan and Escott-Stump, 2002).

8. Elderly Nutrition Program (ENP)- A program, covered by Title III, part C-1 and C-2 and Title VI of the Older American Act, which provides funds for nutritional services to older individuals in the community (Mahan and Escott-Stump, 2002).

CHAPTER 2

LITERATURE REVIEW

Community Served

According to a report by Hunger in America (2001), 23.3 million Americans rely on emergency food assistance from agencies such as Second Harvest Food Bank. In northeast Tennessee, 14.3% of the population lives at or below the national poverty level (U.S. Census Bureau, 2001). The more rural counties such as Hancock, Carter, Hawkins, Unicoi, and Johnson counties are more affected by poverty than counties in more urban areas like Washington, Greene, and Sullivan counties. In Hawkins county 29.4% of people live below the poverty level while about one in five people living in Johnson County (22.6% of the population) live below the poverty level. In 2002, 3.5 million pounds of food were distributed to needy individuals in northeast Tennessee; the increase in food distribution was 30% more food than the previous year (Netfoodbank.org, 2003). According to the food bank director Rhonda Chafin, the need for emergency food assistance seems to be increasing in 2003 as is evidenced by the fact that they had distributed 2.6 million pounds more food in 2003 as compared to 2002 (Personal Communication, December 10th 2003).

Among the people served by Second Harvest Food Bank locally, 39% were children and 11% were seniors. In June 2003, it was estimated that more than 20,000 children in northeast Tennessee received free or reduced meals at school (USDA, 2002), and that 126,000 adults were regularly hungry and unsure of their next meal (U.S. Census

Bureau, 2001). Tennessee is ranked 10th worst in the country in terms of the largest population who are regularly hungry, and is ranked 13th nationwide in food insecurity.

Food insecurity exists when the ability to acquire acceptable nutritionally adequate or safe food is limited, and individuals are uncertain of underlying consequences of hunger (Hunger in America, 2001; Lee and Frongillo, 2001; and Wolf, Olson, Kendal, and Frongillo, 1996). Populations that are at an increased risk of food insecurity include low income persons, those who are ill, minorities, elderly individuals, women with young children, and children. Older persons are more susceptible to under-nutrition than younger persons. The aging process is marked by an advancing loss of lean body mass in addition to changes in the body system, which includes loss of taste, smell, hearing, and touch (Mahan and Escott-Stump, 2002). Physiologic aging together with limited income, the presence of medical problems, the use of multiple medications, lack of transportation, and social isolation, are factors that contribute to a significant number of older adults consuming less food than required to supply nutrients and energy needs, putting them at an increased nutritional risk (American Dietetic Association, 2000).

Data from the elderly nutrition program of the Older Americans Act show that 67% to 88% of the elderly population is at nutritional risk, while 8% to 16% of older adults do not have regular access to a nutritionally adequate diet (Kennedy, 1995). People over the age of 70 have many health problems and bodily changes that occur with aging reducing which include decreased appetite, which leads to a decreased intake of nutrients.

A study conducted by United States Department of Agriculture (USDA) in 2000 found that the elderly population living alone were most likely to experience hunger than children. Individuals with an income less than 130% of poverty level with insufficient

food were also found to be at increased risk for consuming diets that do not meet the US dietary guidelines (United States Department of Agriculture and United States Department of Health and Human Services, 2000). Among the elderly population living in the community in 2001, 2.2% lived in severe poverty below the 50% poverty level margin (Frongillo, 1999 ; Proctor and Dalakar, 2002). Food insecurity was found to be higher in households with elderly men living alone (6.9%) than with women living alone (Burt, 1993; USDA, 2002). Hunger among the elderly population is attributed to difficulty with food access due to a general lack of income as well as other resources of food. Some of the elderly population, however, have food access problems resulting in disrupted eating patterns or reduced food intake, and this often contributes to health deterioration.

The elderly populations are more likely to be hungry because they lack the ability and strength to prepare food due to them having limited physical mobility that interferes with their ability to shop for and prepare food (Miller, Ohls, Ponza, and McCool, 2002). Diminished food intake can also be a result of reduced appetite, decreased ability to recognize food, forgetfulness, depression, and decreased self-feeding ability (Mahan and Escott-Stump, 2002). Increase in poverty among the elderly population could also be as a result of the decline in retirement wealth and income since 1980 (Weller, 2002). The number of seniors in the country will continue to increase as more baby-boomers reach retirement age and many will require food assistance. A combination of these factors, along with a greater susceptibility to depression, reduction in taste and smell sensations, poor health status, and poor dentition can result in inadequate food consumption among the elderly (Weller, 2002; and Mahan and Escott-Stump, 2002).

Nutrition Programs for the Elderly

Food and nutrition assistance programs serve approximately 11% of the senior population. A survey conducted by the Elderly Nutrition Program (ENP) found that one in ten participants received food stamps while one in six seniors received home delivered meals (Burt, 1993 and Miller et al. 2002). The ENP was created as part of a system of coordinated community-based services targeted toward older individuals at greatest economic or social need (Ponza, Ohls, Miller, McCool, Needels, and Rosenberg, 1996). ENP provides congregate and home delivered meals to help reduce dietary inadequacy among the elderly. An estimated 7% of the older population and 20% of low-income elders receive home-delivered meals and other nutrition related services. The ENP has provided more than 6 billion meals since its creation 30 years ago (Kennedy, 1999 and Miller et al. 2002).

It is the position of the American Dietetic Association that all people regardless of gender, age, socioeconomic status, racial, ethnic status should have access to food and nutrition programs as well as adequate food supplies that promote optimal physical and cognitive function (American. Diet. Assoc. 2003). Food and nutrition programs meet the needs of a vast majority of the population in need. Individuals who participate in federally funded food and nutrition programs have been shown to improve their intake of selected nutrients and calories (Kennedy, 1999).

Nutritional Recommendations for the Elderly

The Food and Nutrition Board of the National Academy of Sciences establishes the recommended dietary allowance (RDA) for healthy persons. The RDA provides

recommendations for daily calorie and nutrient intake levels sufficient to meet the nutritional requirements of nearly all (97% to 98%) healthy individuals in various life stages and gender groups (Barr, Murphy, and Poos, 2002; and Mahan and Escott-Stump, 2002). RDAs are recommended for healthy population groups but do not take into account the differences between individuals or those with disease or health conditions. The estimated average requirement (EAR) is a probability approach that can be applied to most nutrients because an individual's actual intake is almost never known (Barr, Murphy, and Poos, 2002). EAR is used to estimate the requirement for a specific age and gender group. Among the elderly population, measuring day-to-day intake can be difficult due to variations in intake that make it difficult to state with complete certainty whether or not an individual's intake meets his or her requirement (Barr, Murphy, and Poos, 2002).

Adequate Intake (AI) is the recommended intake level based on observed or experimentally determined approximations or estimates of nutrient intake by a group of healthy people who are assumed to be adequate in nutrient intake (Barr, Murphy, and Poos, 2002; American Diet Assoc. 2003). This method cannot be effectively used among the elderly population because most of them have underlying medical conditions and are taking medications that either interact with foods or affect food intake by lowering appetite or increase discomfort level by causing nausea, vomiting or constipation. The recommended AI for protein is 0.8g/kg to 1.0g/kg of an individual's body weight, which is about 12-14% of the total calories. Carbohydrate should be at least 50% of one's total calorie intake. Fiber intake is 20-35g/day while fat is recommended in small amounts (Mahan and Escott-Stump, 2002).

Dietary Guidelines for Americans emphasize the need to select a diet varied in whole grains, fruits, and vegetables to improve fiber intake, limited fat intake, and obtain nutrients in different fruits and vegetables (USDA.gov, 2000). However, variation in dietary intake among the elderly people is unlikely because most of them have limited resources and the supplemental baskets do not offer a variety to choose from.

Several investigators have used results of the Third National Health and Nutrition Examination Survey (NHANES III) to examine dietary intake in relation to food security and food insufficiency among the elderly (Rose and Oliveira, 1997; Mahan and Escott-Stump, 2002). One study found that the intake of energy, proteins, calcium, magnesium, zinc, and vitamin A, E, and B6 were lower than the recommended dietary allowance for people over the age of 70 (Lee and Frongillo, 2001). Rose and Oliveira (1997) also found that the elderly over age 65 years who were in food insufficient households were most likely to have intake below 50% of RDA. More than 40% of older Americans have been identified to be at nutritional risk, and of those 10% are malnourished or have an inadequate nutritional intake.

Nutrition Guidelines for the Elderly

During the aging process, the basal metabolic rate slows and the amount of lean body mass is reduced (Mahan and Escott-Stump, 2000). Physical activity among most elderly individuals also decreases resulting in a lower energy requirement and an increase in fatty tissue (Wolf, Olson, Kendal, and Frongillo, 1996). Nutrient needs among adults differ with age, physiological, and pathological conditions. Energy requirements generally decrease with age due to a decrease in basal metabolic rate. Meeting the

nutritional needs of the elderly population is challenging because their needs for protein and vitamins should be individualized according to each person's health condition (Mahan and Escott-Stump, 2002). A new food guide pyramid for older adults developed by the United States Department of Agriculture and Human Nutrition Research Center on Aging is different in size from the well-known food guide pyramid. Tufts food guide pyramid is narrower than the original food guide pyramid and it recognizes that seniors usually need less energy and, therefore, eat less but the same number of servings is recommended. Appendix 1.

The food guide pyramid for older adults emphasizes that eight–eight ounce glasses of water are required daily to prevent dehydration; therefore, water is used as the base of the pyramid. The pyramid also has a flag at the top to indicate a recommendation for dietary supplements such as calcium, Vitamin B-12, and Vitamin D because older adults tend to eat less food than the general healthy population and they do not absorb and process nutrients as efficiently as young people (Mahan and Escott-Stump, 2000; and USDA, 2002). According to the new pyramid, three servings of dairy items are the recommended number of servings that would meet the 1200-1400mg requirements for calcium. Vitamin D should be 600 (IU) equivalents, which would also be supplied by three eight-ounce glasses of milk daily. Vitamin B₁₂ recommendation is 2-4 micrograms daily, and can be obtained from animal sources, such as eggs and cheese, in the diet. A fiber icon has also been added as a reminder for seniors to consume fiber daily with an effort to help prevent constipation, hemorrhoids, colon cancer, and diverticulosis. A total of 20-30 grams of fiber are recommended (USDA, 2003). There is no established RDA

for carbohydrates, although the recommended amount is 50% to 60% of total daily calories should be from carbohydrates.

It is the position of the American Dietetic Association (ADA) that access to adequate amounts of safe, nutritious, and culturally appropriate food at all times is a fundamental human right. The ADA supports nutrition programs and encourages practices that combat hunger and malnutrition, produce food security, promote self-sufficiency, and are environmentally and economically sustainable. Many nutrition programs have tried to resolve the problem of hunger in the community, but the problem still persists. The ADA identifies sustainable development as the long-term strategy that will achieve food security in a world of plenty. The ADA also states that sustainable development can be achieved if the gap between the rich and the poor is narrowed to adjust consumption patterns. Imbalance in power brings about social classes, which contributes to increasing food insecurity and hunger among the lower level individuals in rank (Am Diet. Assoc. 2003).

CHAPTER 3

DESIGN AND METHODOLOGY

Food Basket Sample

Supplemental food baskets vary greatly in the amount and type of nutrients they provide, and food items in each basket depend upon the availability of food at the time the basket is prepared. The agencies often recommend that a standard food basket for a family of two on a given day would contain:

1 Can of a vegetable: Green beans, Spinach, or Kale

2 Cans of fruit or fruit juice: Apple juice or Peaches

2 Cans of soup: Tomato soup

1 Non-juice drink

2 Boxes of Macaroni

1 Boxed meal: (Rice or Pasta).

1 Dried product: Beans or Sandwich meat.

1 Cereal: Box Oatmeal or Crackers

1-2 Meat products: Beef or Chicken

1 Canned meat: Tuna

2 Bread products

One refrigerated item: Bologna, Hotdog, or a Dessert

Instrument

The diet analysis software program Nutrition Analysis Tools version 2.0 was used to analyze the nutrient content of food basket items compared to the recommended dietary allowance for age and gender. Analysis options include recommended nutrients for subjects based upon the elderly age group and the amount of specific nutrients as compared to the recommended dietary allowance.

Data Collection Procedure

This study included participant observation at the food bank and at the distributing agency as well as semi-structured interviews with the food bank staff. Additionally the principal investigator observed packaging of a supplemental food basket.

Data Analysis

Foods in a sample food basket were analyzed using the Nutrition Analysis Tools (NAT) and Systems Version 2.0 developed by the Department of Food Science and Human Nutrition at the University of Illinois at Urbana-Champaign. The Nutrient Data System provides values for twenty different nutrients based upon serving sizes of the foods. Nutrient composition of foods was compared to the nutritional needs of the study population based on gender to determine the specific nutrient requirement as defined by the US Department of Agriculture and Human Nutrition Research Center. Percentage of the recommended dietary allowance (RDA) was then determined.

The recommended amounts of foods based on the Food Guide Pyramid for Older Adults are:

- 3 or more servings vegetables
- 3 or more servings dairy products
- 6 or more servings grains and cereals
- 2 or more servings meat, beans, and fish
- 2 or more servings fruits

Ref. Tufts Food Guide Pyramid for Older Adults (Appendix 1)

Portions used for nutrient analysis from the typical food basket:

- 1 serving vegetable from green beans
- 4 servings from bread, cereal, and rice
- 2 servings from meat and beans
- 2 servings fruit or juice
- 1 serving soup

Table 1: Nutrient analysis of a typical food basket

<i>Nutrient</i>	<i>Apple Juice 1c</i>	<i>Chicke n 3oz</i>	<i>Beans 1c</i>	<i>Rice ½ c</i>	<i>Soup 1c</i>	<i>Cerea l 1c</i>	<i>Brea d 2sl</i>	<i>Green Beans ½ c</i>	<i>Total</i>
Calories	116	201.57	190.26	132.6	103.35	110	178.5	17.68	1049.96 kcal
Protein (gm)	0	25.86	6.93	2.45	2.39	3	6.34	0.95	47.92 gm
Fat (g)	0	10.12	6.55	0.21	2.39	2	2.4	0.07	23.74 g
CHO (g)	29.02	0	26.96	29.28	19.35	22	34.4	4.15	165.16 g
Fiber (g)	0.25	0	6.93	-	0.53	3	6.1	2.29	19.21 g
Calcium (mg)	17.36	11.06	76.86	1.02	53	39.99	53.2	30.6	283.09 mg
Phosphorus (mg)	17.36	173.50	137.34	33.66	66.25	99.99.	133	16.32	577.43 mg
Iron (mg)	0.99	1.19	2.52	0.21	0.53	8.1	2.2	0.54	16.28 mg
Sodium (mg)	7.44	66.34	531.72	0	943.4	280	349.9	8.84	2187.64 mg
Potassium (mg)	295.12	171.80	451.08	26.52	294.15	95.	163.4	96.16	1593.23 mg
Vitamin A (IU)	2.48	95.26	0	0	832.1	500	0	359.04	1788.88 IU
Thiamin (mg)	0.05	0.1	0.17	0.2	0.06	0.38	0.2	0.03	1.19 mg
Riboflavin (mg)	0.04	0.2	0.06	0.015	0.05	0.43	0.2	0.05	1.05 mg
Niacin (mg)	0.25	4.24	0.52	15.41	0.77	5.01	3.1	0.28	29.58 mg
Vitamin C (mg)	103.07	1.87	1.39	0.69	4.51	6	.0	5.58	123.11 mg

Ref: NAT Version 2.0

CHAPTER 4

RESULTS

Data Analysis

Based on the results from the NAT Version 2.0 analysis, the RDA was compared to the actual amount of nutrients received from the supplemental food basket to determine the percentage of RDA met by the supplemental foods.

Table 2: Analysis for Men			
Nutrient	RDA	Total Values from sampled basket	% Recommended
Total Calories	2300	1049.96	46%
Protein (g)	63	47.92	76%
Carbohydrate(g)	-	165.16	-
Fiber (g)	30	19.12	64%
Total fat (g)	76.6	23.74	31%
Vitamin A (IU)	5000	1788.88	36%
Thiamin (mg)	1.2	1.19	99%
Riboflavin (mg)	1.3	1.05	81%
Niacin (mg)	16	29.58	185%
Vitamin C (mg)	90	123.11	137%
Calcium (mg)	1200	283.09	24%
Iron (mg)	10	16.28	163%
Sodium (mg)	2400	2187.64	91%
Phosphorus(mg)	700	577.43	82%

Ref: NAT Version 2.0

Table 3: Analysis for Women			
Nutrient	RDA	Total Values from sampled basket	% Recommended
Total Calories	1900	1049.96	55%
Protein (g)	50	47.92	96%
Carbohydrate(g)	-	165.16	-
Fiber (g)	30	19.12	64%
Total fat (g)	63.33	23.74	31%
Vitamin A (IU)	4000	1788.88	36%
Thiamin (mg)	1.1	1.19	108%
Riboflavin (mg)	1.1	1.05	95%
Niacin (mg)	14	29.58	211%
Vitamin C (mg)	75	123.11	164%
Calcium (mg)	1200	283.09	24%
Iron (mg)	10	16.28	163%
Sodium (mg)	2400	2187.64	91%
Phosphorus(mg)	700	577.43	82%

Ref: NAT Version 2.0

Based on the results from the analysis of the supplemental food basket, there was a difference in the amount of nutrients met by men as compared to women. Given the same amount of food, according to the recommended number of servings using the food guide pyramid for the elderly and RDA, most of the nutritional needs of the study population were not met by the food basket. Men received 49% of the recommended dietary allowance of calories while women received 55% of the RDA. For protein, men received 76% of the recommended amount while women received 96% of the RDA. Both groups were deficient in the amount of calcium and only received 24% of the RDA. Men were lacking vitamin A, receiving 36% of RDA while women received 45% of the RDA for vitamin A. For iron, sodium, phosphorus, vitamin C, thiamin, riboflavin, and niacin, both groups received an adequate amount greater than 90% RDA.

CHAPTER 5

DISCUSSION, CONCLUSION AND RECOMMENDATIONS

Discussion

The elderly who don't have enough to eat tend to consume fewer calories and less of the recommended nutrients; particularly protein, iron, magnesium, and zinc, vitamin B-6, vitamin B12, riboflavin, and niacin in comparison to the elderly who have sufficient food (Frongillo and Jung, 2001). The estimated intake of fiber, fat, vitamin A, niacin, and calcium was found to be below the recommended daily allowance by approximately 50% for both men and women (Frongillo, 1999).

Factors such as poverty, low education, mental and physical impairments, and social isolation are related to inadequate purchasing power for nutritious foods, which then leads to food insecurity. Food and nutrition programs are the primary sources of food assistance for most of the older population within the community (Ponza et al. 1996).

Based on the results from this particular study, the elderly population seems to be getting adequate calories and more than 50% of protein from food items in a supplemental food basket. The baskets are deficient in the amount of calcium they consume which is problematic among the elderly population. The aging process is characterized by increased bone loss and failure of the body to adequately absorb calcium efficiently therefore increasing the need for calcium intake. Vitamin D is also dependent on calcium and phosphorus in the diet. Lack of calcium in a supplemental food basket could be improved by providing food items that are fortified with calcium such as

calcium-fortified juice and grain products, adding cheese to the food basket, and increasing the amount of dark green leafy vegetables such as collard greens in the basket. Evaporated milk may also be included in the food basket as an additional source of calcium.

Because the elderly population tend to eat fewer calcium foods, they should be educated on the importance of supplementing calcium and vitamin D in the diet to decrease bone loss and improve general health. The elderly population should be made aware of foods that are high in calcium, such as dairy products, dark green leafy vegetables, and calcium fortified products which they should be eat on a daily basis to improve their overall health.

Comparison of energy intakes may not provide a satisfactory indication of the adequacy of the supplemental food baskets since the baskets is not intended to meet all the caloric needs of the individuals that receive them. The total values from a sampled basket provided in table 2 and 3 are based on a standard age group above 62 years for both men and women. Comparison of energy intakes may also not provide a satisfactory indication of the adequacy of intake because individuals have different caloric and nutritional needs depending on variations in body size, basal metabolic rate, and physical activity.

The Dietary Guidelines for Americans emphasize the need for the selection of a diet varied in whole grains, fruits, and vegetables that improve fiber intake, a diet that is limited in fat and obtains nutrients concentrated in different food sources (Agriculture Research Service, 2000). Both the food guide pyramid and Elderly Nutrition Programs promote a varied diet and emphasize the need for the elderly to achieve adequate nutrient

intake. Based on this particular study, the elderly population have little variety and few choices because foods at the food bank are so limited and dependent upon food donations.

Limitations to this study, which includes seasonal variability of food at the food bank, could be avoided to some extent in future studies if a similar study is done during a different season. Seasonal variability usually determines the types and amount of food at the food bank, which in turn affects the type and amount of food items in a supplemental food basket. Seasonal variability may be studied in future research if data are collected during different seasons. The food bank tends to have more fresh fruits and vegetables during the summer months as compared to other seasons because these items are easily salvaged from the farmers markets. Food baskets that are distributed during the summer season tend to have more fresh food items as compared to other seasons when canned foods are plentiful. During the winter months the food banks tend to have more food because they hold more food drives during the fall. Individuals tend to contribute more towards the end of the year when they have more to spend for the holiday season. These differences in the amount of food and types of foods at the food bank affect the quality and quantity of food items in a basket at the time of distribution.

Conclusion

The typical food basket that was sampled contained some nutritious foods but it did not meet all the nutritional requirements of the elderly based on the recommended dietary allowances. An elderly individual receiving a similar basket will be certain that some of his or her nutritional needs will be met if she or he uses amounts of the food

items based on the food guide pyramid for the elderly. However, the elderly population still need to be reminded to eat additional items in order to meet the RDA for some nutrients, especially calcium, that are missing because the food baskets should be used to supplement food that they already have on a daily basis. The elderly population should also be reminded of the general principles of planning nutritious balanced meals with modifications that will accommodate individual needs.

If food banks are aware of the needs of the population they serve and in turn solicit for more nutritious foods, then they may have enough nutritious commodities to distribute at most times. If this happens the elderly populations that rely on food banks for food assistance will have enough to eat, and their nutritional needs will be better met. If there is fair distribution of wealth and power, the elderly will most likely have more to spend on food and become less hungry which in turn will lead to most of the elderly population becoming more food secure.

Recommendations

Organizations and individuals that participate in food donations and food drives should be made aware of the population groups for whom the food items are intended as well as their nutritional needs. If participating agencies are aware of the needs of the population that they assist, these organizations might solicit for highly nutritious food for their recipients. The individuals receiving the supplemental baskets in turn will also benefit by getting food baskets that are balanced and nutritionally dense to meet most of the nutritional needs for older adults.

In northeast Tennessee, the majority of the populations served by Second Harvest Food Bank are the elderly. Their nutritional needs of the elderly population are higher in calcium and vitamin A, both of which are lacking in supplemental food baskets. Variety of food items in a supplemental food basket is also limited and do not give the elderly population a variety from which to choose. To better meet the nutritional needs of those served, foods that the Second Harvest Food Bank and other organizations solicit for should be fortified in order to increase their nutritional content especially in calcium, vitamin D, and vitamin A. The Second Harvest Food Bank should also try to obtain canned milk products that the elderly are able to use in order to further increase the amount of calcium in their diet. Organizers of food drives should also attempt to promote a variety of food items so that variation can be included in a supplemental basket. This may increase the amount and types of nutrients consumed and may improve the nutritional status of the recipients.

Suggested Food List

A suggested food list that Second Harvest Food Bank and other organizations can use in the solicitation of food is:

- Green leafy Vegetables or Yellow Vegetables.
- Macaroni, Pasta, Rice, or Noodles
- Beans (all varieties)
- Sandwich Meats
- Canned Milk (Evaporated milk products)
- Calcium Fortified Juices

- Fortified Breakfast Cereals
- Meat products: Canned Meats and Fish
- Peanut Butter
- Cheese
- Canned Fruits

It is also recommended to further study the food list and contact the media regarding preferred items in a food drive, develop educational brochures to be put in food basket, and teach the organizers of food drives to know the needs of the target populations.

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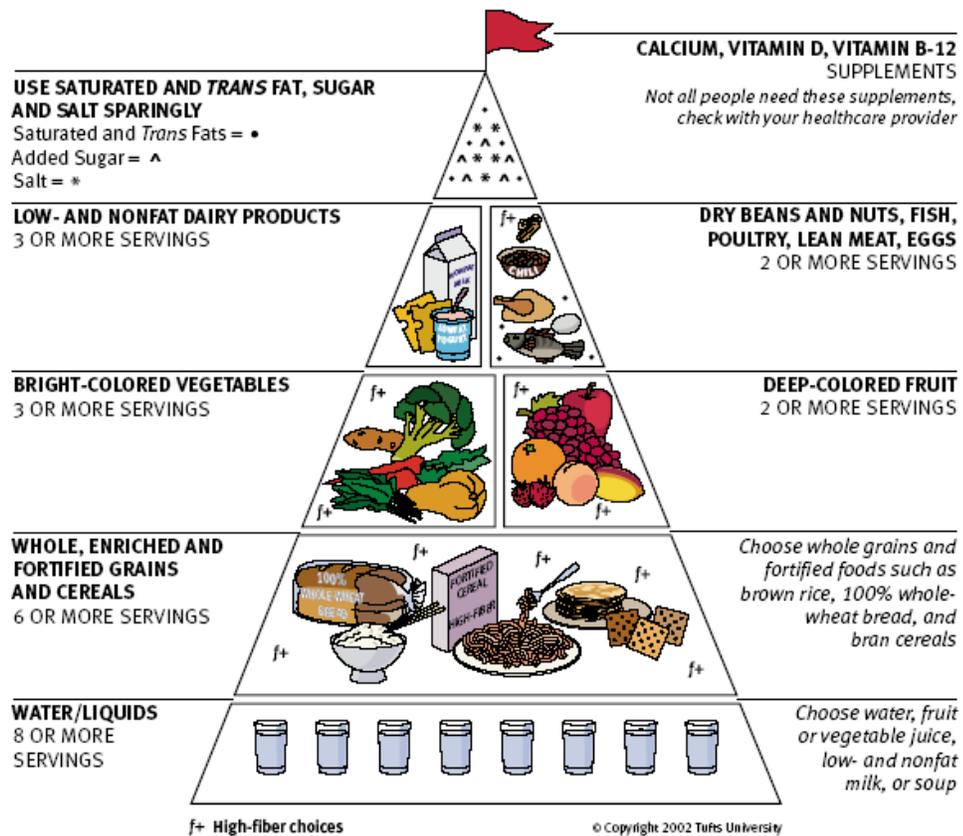
Appendix 1

Food Guide Pyramid for Older Adults

APPENDIX 1

TUFTS

Food Guide Pyramid for Older Adults



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