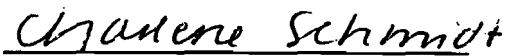


The Role of Food Variety on Perceived Quality of Life  
in Dunn County Congregate Meal Participants

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**ABSTRACT**

The purpose of this study was to determine the role of food variety, as defined by elderly participants, on their perceived quality of life. Data were collected from 79 congregate meal participants in one county in Wisconsin (19 males and 60 females ranging in age from 60-95, one third were 85-89 years old). A written survey was administered to participants after the meal and then small focus groups were conducted. Factors assessed included the participants' gender, age, weight, ideal food variety, actual food variety eaten each day, the importance of food on various life factors, the affect of life factors on food variety, definition of food variety and quality of life, and perceptions of food variety on health. Survey data were analyzed for means and correlations using SPSS while focus group

data were analyzed for common themes, patterns, and trends. Recommended servings for grain, dairy and vegetable groups were found to be greater than both the participants' perception and consumption. Factors identified by participants as affecting food choices the most were energy level, emotional status and physical ability. The participants defined food variety to include food from each of the food groups, as well as foods of different colors. Pearson correlation indicated a positive relationship between food variety and two factors affecting quality of life, mental health and accomplishments of daily activities. Results from the survey data indicated that food was important to social interaction, physical and mental health, and accomplishment of daily activities. These results suggest the need for nutrition education about recommended serving sizes and the need to emphasize the importance of food variety to the quality of life in the aging population.

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## Chapter I: Introduction

The aging population, those 65 years and older, is a vital part of our society and will continue to grow and become a major influence on policy, laws, economics, government, funding, retail, and marketing. The population of individuals aged 65 years and older in the United States is projected to double by the year 2030. The current population of people aged 65 years and older numbers 36 million (roughly 12% of the total population), and is estimated to be over 72 million (nearly 20% of the total population) in the next 25 years. By the year 2050, the senior population is projected to reach over 86 million. This dramatic increase is due to the first Baby Boomers turning 65 in 2011. Baby Boomers are those individuals born between 1946 and 1964 (He, Sengupta, Velkoff, & DeBarros, 2005).

This large increase in the elder population is important to society because older adults, especially those 85 years and older, are dependent on the government, family, or both for financial, physical, and emotional care. It is crucial to be prepared for the large influx of the elderly population by finding ways to increase the quality of life in this population. As an individual increases in age, the risk for health-related problems and disease increase. Therefore, it is important and necessary to look at how food variety affects individuals as they age in hopes of increasing their quality of life.

The Congregate Meals program is a nutrition program aimed at older adults aged 60 years and older. The program typically provides one meal per day, five days each week. The Congregate Meals program was created with the



passing of the Older American's Act in 1965. The purpose of the Congregate Meals program is to decrease malnutrition, promote health, prevent social isolation, slow mental and physical deterioration, act as a link to rehabilitation services, as well as to provide low-cost nutritionally sound meals (Wellman, Rosenzweig, & Lloyd, 2002).

As stated by the Older American's Act of 1972, many elderly persons do not eat adequately because:

- (1) they cannot afford to do so;
- (2) they lack the skills to select and prepare nourishing and well-balanced meals;
- (3) they have limited mobility which may impair their capacity to shop and cook for themselves;
- (4) they have feelings of rejection and loneliness which obliterates the incentive necessary to prepare and eat a meal alone.

These and other physiological, psychological, social and economic changes that occur with aging result in a pattern of living which may contribute to malnutrition and further physical and mental deterioration. Besides promoting better health among the older segment of our population through improved nutrition, the Congregate Meals program reduces the isolation of older age, offering older Americans an opportunity to live their remaining years with dignity and a higher quality of life. Thus, the original purpose of the nutrition program was never limited solely to providing meals, but was always meant to provide more than a meal. The program enables individuals to come together to

socialize and form relationships with other diners and those working at the meal sites while obtaining good, general nutrition.

Quality of life is uniquely defined by each and every person. Merriam-Webster (2008) defines quality of life as a measure of the well-being of a population and overall enjoyment of life. Many factors determine an individual's quality of life. Some of the key factors include education, income, employment, infrastructure, energy, national security, environment, public safety, health, recreation, human rights, and shelter. Several different quality of life tools have been developed over time, each with their own sets of subgroups/categories. Tools are used to assess an individual's or group's quality of life. Many times these tools are in the form of surveys, questionnaires, observations, or interviews. Each quality of life tool has a different focus or goal, some of which include: health, economics, or well-being. All the tools differ slightly in the factors they find significant; however, health and well-being are common factors in nearly all of the tools (Calvert-Henderson, 2006; CDC, 2006; EIU, 2005). To date, no nutrition related quality of life survey exists, although Barr and Schumacher (2003b) have described procedures for creating and validating such a survey.

In public health and in medicine, the concept of health-related quality of life refers to a person or group's perceived physical and mental health over time (CDC, 2006). Good health and nutritional practices are crucial to a person's perceived quality of life, and can help an individual prevent acute and chronic

illnesses (Leutwyler, 1995), and the lack of illness has been shown to increase a person's perceived quality of life.

Food variety is the number of food items or food groups consumed by an individual over a specified period of time (Torheim et al., 2003). Diets with a high food variety have been shown to protect an individual from chronic diseases such as cancer (Vecchia, Munoz, Braga, Fernandez, & Decarli, 1997), as well as promote longevity (Kant, Schatzkin, & Ziegler, 1995), and improve health status (Hsu-Hage & Wahlqvist, 1996). The lack of disease and increase in health status has been shown to increase an individual's quality of life.

All of the essential nutrients necessary to meet nutritional requirements cannot be found in one single food, but are found through the consumption of many different food sources (Hsu-Hage & Wahlqvist, 1996). It is important to consume a variety of foods from each of the food groups in order to obtain all the essential macronutrients, micronutrients, phytochemicals and other compounds found in food. Diets that show the most variety are said to be the healthiest and have been shown to protect against chronic diseases, increase longevity, and improve health status. Likewise, food variety plays a role in overall health and nutritional status (Torheim et al., 2003). Dietary guidelines have emphasized the importance of eating a variety of foods; therefore, a measure of the quality of a diet may be its diversity (Hatloy, Torheim, & Oshaug, 1998).

Limited information is available on the link between food variety and quality of life, especially in the elderly population. However, there is data on food variety and its positive affect on overall health (Torheim et al., 2003; Hatloy,

Torheim, & Oshaug, 1998; Savige, 2002). Studies that examine food variety in different populations have found that those with the highest level of variety tend to live the longest. Food variety has also been shown to positively correlate with nutritional quality, most likely contributing to health and longevity (Savige, 2002).

Health has been found to be a key factor in an individual's quality of life, and food variety positively correlates to health. This study focused upon how food variety, as defined by participants, affected perceived quality of life in those participating in the congregate meal program in Dunn County, WI.

#### *Statement of Problem*

The purpose of this study was to determine the role of food variety, as defined by participants, on perceived quality of life in congregate meal participants in Dunn County, WI. Data were collected in two ways, the first being a short, written survey given to the participants after the meal but before the focus group session. The second data collection method was through focus groups implemented by the researcher in small groups at each meal site. The study was completed during the month of June 2007.

#### *Research Hypothesis*

Food variety plays an integral role in nutrition, and good nutrition is linked to an increased perceived quality of life. The research hypothesis for this study was food variety will positively correlate with perceived quality of life in congregate meal participants.

### *Assumptions*

It was assumed that the participants completed the survey honestly and without fear of repercussions. It is also assumed that participants had equal access to congregate meals and were able to feed themselves, and that participants live in Dunn County and were aged 60 and older.

### *Limitations*

There were several limitations in this study. Some of the Congregate Meals participants had limited capabilities. All participants were from Dunn County and may have answered similarly due to a comparable upbringing, ethnic background, socioeconomic status, or beliefs which may limit generalizations to other parts of the United States. In addition, the study consisted of elderly volunteers who were willing to participate. Lastly, the fear of being excluded from the meal services as a result of answering negatively on the survey or in the focus group, may have altered participants' responses leading to positively skewed results pertaining to the congregate meals and services.

## Chapter II: Literature Review

This chapter will include a description of the elder population, including demographics and factors that affect aging. Also discussed will be the Congregate Meals program in Wisconsin, as well as what factors contribute to food satisfaction and quality of life in this population.

### *Demographics of Older Adults*

Aging is defined by Mahan and Escott-Stump (2000) as a normal process that begins at conception and ends at death. The elder population, age 65 and older, totals more than 35.9 million or 12% of the total population. According to the U.S. Census Bureau (2005) projections, the elder population will increase from 35 million to 72 million or nearly 20% of the total U.S. population by the year 2030. This large increase is due to the Baby Boomer generation beginning to turn 65 years of age in 2011 (US Census Bureau, 2005). The fastest growing age bracket is the 85 plus segment (Mahan & Escott-Stump, 2000).

Historically, the elderly population in the United States has been defined as being 65 years old and above. This broad categorization fails to recognize the many physical, emotional, and socioeconomic differences within the population (Mahan & Escott-Stump, 2000). Instead of grouping all individuals age 65 and older into one category, oftentimes this population is categorized into three different groups: 65-74 years are known as young-old, 75-84 years old are known as old-old, and 85 years plus are known as the oldest-old (US Census Bureau, 2005). These distinct categories are very useful since there is much difference between a healthy 65 year old and a frail 90 year old. The aging

population is a changing one. They have different needs and vary by assistance with daily functions. They are from different generations, have different food preferences, different mental status, different upbringings, and different expectations and goals.

People today are living longer and healthier lives. The average life expectancy in 1900 was 47.3 and in the year 2000 was 76.9 (US Census Bureau, 2005). The dramatic increase in life expectancy is due to decreased infant mortality and reduced morbidity from disease. Improvements in health care and nutrition are responsible for these lower rates (Mahan & Escott-Stump, 2000; US Census Bureau, 2005). People are also more knowledgeable about healthier ways of living; the ease of obtaining information via the internet has brought nutrition and health information into the home.

It is now well known that nutrition plays a vital role in health status (Chandra, Imbach, Moore, Skelton, & Woolcott, 1991). Good nutrition has been found to lower the risk for many diseases. Positive nutritional habits are also major determinants in influencing the quality of life a person may experience through the aging process (Mahan & Escott-Stump, 2000; Watts, 2005). Individuals who choose healthy foods and a healthful lifestyle view their life as more enjoyable and of a higher quality than those who make poor food and lifestyle choices. A healthful lifestyle appears to be more helpful than genetics in preventing declines normally associated with aging (Watts, 2005). A higher quality of life may be maintained throughout the aging years if healthy foods and lifestyle are made a priority.

The elderly population today is the most diverse and well-educated in US history, yet this population is burdened with chronic diseases including overweight and obesity (Federal Interagency, 2004). The average 75-year-old in the US has three chronic diseases and uses five different prescription drugs (CDC, 2004). It is not uncommon for some individuals to take ten or more prescription drugs. Obesity is the most common nutritional disorder in the elder population, with 73% of Americans over the age of 65 being either overweight or obese (Institute of Medicine, 2000; CDC, 2004). Despite the large percentage of overweight or obese seniors, undernutrition continues to be a persistent problem (Watts, 2005). Due to decreases in caloric requirements as well as the lack of ability to consume adequate food, it becomes more important for the aged population to consume nutrient dense foods. These factors highlight and emphasize the importance of food during aging.

Hypertension, diabetes, and coronary heart disease—three of the six most common chronic diseases—are preventable in part by a healthy diet. It has been found that elders who consistently eat nutritious foods and drink adequate amounts of fluids are less likely to suffer complications from chronic disease or require care in a hospital or other facility (Watts, 2005). Good nutrition is vital to aging well and reducing the risk of chronic disease. The lack of chronic disease and hospital stays is linked to an increased quality of life (Amarantos, Martinez, & Dwyer, 2001).



### *Economic Factors of Aging:*

Low-income elders typically have limited access to food and food choices, especially when bills, medications, and other expenses compete for priority in an already limited budget (Fey-Yensan et al, 2003). Also, elders normally live in one or two person households. So, many times, their food variety is determined by how quickly they consume each food item. For example, an individual may eat green beans three days in a row because they opened a can of beans and will consume them until they are gone. Also, some foods are difficult to prepare for one or two people such as meatloaf or roasts so these foods may be avoided in the diet, thus reducing food variety. This constant battle between food and bills puts low-income elders at risk for nutritional deficiency. When a person's income is insufficient to meet their needs, assistance can be found in such programs as food stamps, home delivered meals, and congregate meals (Niedert & Dorner, 2004). These programs are crucial to many elder's survival and enable them to receive the necessary resources that prove to be so valuable.

### *Psychosocial Factors of Aging*

The Institute of Medicine (1990) defined social isolation as "the absence of social interactions, contacts, and relationships with family and friends, with neighbors on an individual level, and with 'society at large' on a broader level". Social isolation can be measured by the type and strength of social support and how individuals choose to use the support. Social relationships and interactions have a positive impact on quality of life, health, and food intake (Niedert & Dorner, 2004, p. 9). Lack of social relationships and interactions can have a

negative affect on individuals mental health, leading to problems such as anxiety or depression.

Depression in the elder population may be associated with an inability to perform daily tasks, loss of relatives and friends, a feeling of nonproductivity, social isolation, financial concerns, or a decline in cognitive function (Rosenbloom & Wittington, 1993). Depression has been found to affect appetite, digestion, energy level, weight, and well-being (Mahan & Escott-Stump, 2000).

#### *Physical Factors of Aging*

Aging is marked by the changes of most body systems and the progressive loss of lean body mass. The diminished acuity of the body's senses has been shown to interfere with nutritional status. Taste, smell, sight, hearing, and touch diminish at individual rates in every person (Mahan & Escott-Stump, 2000). Many factors contribute to a reduced sense of taste and smell, including normal aging, certain disease such as Alzheimer's disease, medications, surgical interventions, radiation therapy, and environmental exposure (Mahan & Escott-Stump, 2000). Taste and smell begin to diminish at around age 60, with a noticeable acceleration at age 70 (Schiffman, 1994). The progressive loss of taste and smell reduce a person's ability to detect odors and identify foods. Loss of taste acuity has been noted with age, and a greater loss was observed among men than women (Mojet, Christ-Hazelhof, & Heidema, 2001). Taste and smell induce metabolic changes such as salivary, gastric acid and pancreatic secretions, as well as increases in plasma levels of insulin. The decrease in

taste and smell stimulation may impair these metabolic processes (Schiffman & Warwick, 1992).

The senses of taste and smell are not the only senses that diminish with increasing age; hearing loss, impaired vision, and loss of functional status are all a part of aging. The loss of these crucial senses plus decreased appetite, food recognition, and the ability to self-feed, lead to reduced food intake by the elderly (Mahan & Escott-Stump, 2000) and have been associated with the high rate of undernutrition. Undernutrition in the elder population is generally defined as any unintentional weight loss of 1% to 2% per week, 5% per month, or 10% over a period of 6 months (Mitchell, 2003). Preparing food becomes more difficult as the body ages. Also loss of teeth or poor fitting dentures, sore mouth, decrease in saliva, and a decrease in mouth strength all decrease food intake which are common in the elder population.

#### *The Role of Food in our Lives*

Food is essential for life. It provides subsistence, nutrients, and energy. Food is critical to our physiologic well-being, but what, when, and how we eat also contributes to our social, cultural, and psychological quality of life. In many ways, food defines who we are. It is entwined with our sense of self. (Barr & Schumacher, 2003b, p. 177)

Food plays a critical role in the lives of all. It is vital in our family, cultural, and religious celebrations. Examples of food's integral part in our celebrations

and lives can be seen during Christian worship when bread is broken for communion representing the sacrifice of Jesus Christ, cake is used in the celebration of birthdays and weddings, and the Fourth of July is a time to celebrate our freedom and independence with family and friends grilling hamburgers and hot dogs in celebration of Independence Day. Thanksgiving brings the tradition of gathering family around the table and eating turkey dinner in gratitude of the year's blessings, Chanukah is celebrated with potato pancakes, and the Easter egg and ham represent newness and a fresh start. Food is central to our psychological, social, and cultural lives (Barr & Schumacher, 2003a).

#### *Quality of Life*

The World Health Organization (1948) defined quality of life as a complete state of physical, mental, and social well-being and not merely the absence of disease or infirmity. Nutrition not only affects the physiologic and homeostatic aspects of an individual's life, but it also affects his/her quality of life (Barr & Schumacher, 2003b). Food has been found to affect the mental, physical, and social well-being of our lives (Barr & Schumacher, 2003a), all of which are linked to quality of life. The enjoyment of food has been found to be positively associated with quality of life (Vailas, Nitzke, Becker, & Gast, 1998) so as food enjoyment increases, so does quality of life, and as food enjoyment decreases, quality of life also decreases helping to link food to quality of life.

### *What are Congregate Meals?*

The Older Americans Act (OAA) was enacted in 1965. The OAA focused on the overall health and well-being of America's seniors (Watts, 2005). The OAA legislation paved the way for the establishment of the largest, longest-standing coordinated program of community and home-based preventative nutrition and related services to the nation's elderly population (Watts, 2005). The OAA established the US Administration on Aging (AoA), whose overall focus is to enrich the lives and improve the health of American's as they reach their elder years. Nutrition programs are currently the largest division; however, they were not included in the original OAA. Nutrition programs were trial tested for three years beginning in 1968. After the successful three-year demonstration, Congress approved the Elderly Nutrition Program in Title VI of OAA in 1972 (Watts, 2005). In 1978, the Elderly Nutrition Program was consolidated into Title III (Title IIIC-1 Congregate Nutrition Services and Title IIIC-2 Home-delivered Nutrition Services) where it exists today (Watts, 2005; Wellman, Rosenzweig, & Lloyd, 2002).

The nutrition programs are administered by the US Department of Health and Human Services Administration on Aging as a part of aging networks (Wellman, Rosenzweig, & Lloyd, 2002) Aging networks consist of a diverse mix of organizations that work for the well-being of the older population. In addition to nutrition programs, the aging networks focus on providing adequate income, suitable housing, quality physical and mental health services, employment without discrimination, and various other services (Department of Health and

Family Services, 2004). Each part of the network has a unique perspective on how to best serve the older population. Each division works together with a common interest to improve the quality of life of older individuals.

The Older Americans Act Nutrition Program (OAANP), as the Elderly Nutrition Program is called today, is available to all Americans aged 60 years and older and their spouses (Watts, 2005). Also able to receive meals are persons with a disability under age 60 who live in a facility or home primarily occupied with older individuals who receive congregate meals (Department of Health and Family Services, 2004).

The purpose of the OAANP is to decrease malnutrition, promote health, prevent physical and mental deterioration, reduce social isolation, link older adults to social and rehabilitative services, and to provide low-cost, nutritionally sound meals (Wellman, Rosenzweig, & Lloyd, 2002). Some nutrition programs provide services besides meals, including nutrition education, screening, and counseling. Unfortunately, these services are not consistently available among program sites due to funding and time constraints. The OAANP is an important public health service that helps in reaching the Healthy People 2010 goals (Watts, 2005). These goals include improving the quality and years of life and reducing health disparities that exist because of differences in sex, race, ethnicity, income, education, disability, or living location (US Department of HHS, 2000).

Congregate meals and home delivered meals are an integral part of home and community-based care systems. Seniors are being discharged earlier from

hospitals and nursing homes and living longer as independents in their own homes. Many of these individuals benefit from congregate and home delivered meals and other nutritional services. The meals are vital to the health of those being served (Wellman, Rosenzweig, & Lloyd, 2002). Accessing quality food in necessary quantities is a challenge that millions of America's seniors face daily. This quality food is necessary to maintain health and decrease the risk of disability. The meals provided by the OAA Nutrition Program helps older adults sustain their health and minimize their out-of-pocket food expenses so that they can use the money for other necessities such as medications, utilities, and shelter (Smith, Mullins, Mushel, Roorda, & Colquitt, 1994). The consistent quality of food and social community formed through these meals allows elders the freedom of staying in their homes. The meals can act as a check-in system to ensure the health and well-being of its participants.

Scientific evidence indicates that the OAA Nutrition Program is successful and necessary because adequate nutrition is necessary to maintain cognitive and physical functioning; to maintain health and quality of life; and to prevent, reduce, and manage chronic disease (Vailas, Nitzke., Becker, & Gast, 1998). It has been shown that the Congregate Meals program effectively increases the quality of the participants' diets (US Administration on Aging, 2006).

### *Meal Consumption*

Many factors contribute to the dietary patterns of the elderly. Some of these factors include: age, gender, social status, mobility, and living arrangements (Kronl, Lau, Yurkiw, & Coleman, 1982). Low food intake is

affected by health reasons, health beliefs, living arrangements, social isolation, eating alone, bereavement, diet-related attitudes, food familiarity, food price and convenience, age-related anorexia, and medication use which impairs taste and appetite (Rolls & Drewnowski, 1996). The increased nutrient needs of the elderly along with decreased appetite, make it extremely important for this population to consume nutrient dense and varied foods to ensure nutritional adequacy.

Congregate meal participants are more likely to be older, widowed, live alone, be less mobile and have less social contact than the general population (De Graaf, Van Staveren, Sneeuw, & Stam, 1990) which is the same population who appear more likely to be consuming inadequate diets (Horwath, Kouris-Blazos, Savige & Wahlqvist, 1999). People who live alone are more likely to experience decreased psychological health resulting in inadequate dietary intake (Davis, Murphy, Neuhaus, & Lein, 1990). According to Drewnowski and Schultz (2001), depression and loneliness, and psychological and psychiatric factors associated with aging have been associated with influencing food choices and food regulation. The intake of cereals, fruits, vegetables, and milk products in the aging population are below the recommended amounts; thus limiting crucial nutrients for health and disease prevention (Horwath, Kouris-Blazos, Savige & Wahlqvist, 1999). It is necessary to uncover the reasons behind this low intake of such nutrient dense food and its affect on this population.

One of the congregate meal program's main goals is to provide meals which are eaten by the participants (Krassie, Smart, & Roberts, 2000). The benefits of food cannot be realized without the food first being consumed. A



challenge when dealing with this population is encouraging adequate food and fluid intake (Spangler & Pettit, 2003). Adequate food intake is crucial in overall health, functional status, and the nutritional status of seniors (Jensen, Kita, Fish, Heydt, & Frey, 1997). In order for the participants to experience the nutritional benefits of the meals they receive, it is necessary that a high percentage of the meal be eaten (Krassie, Smart, & Roberts, 2000). A Canadian study by Fogler-Vevitt and colleagues (1995) found that 81% of food in terms of calories was consumed by participants. Soups and desserts were the foods most well received, suggesting that these foods could be utilized as vehicles for increasing nutrient consumption. Soups and desserts typically are of a softer consistency and may be easier to eat due to dentition problems. Some of the reasons participants did not eat the food included lack of taste, unpopular cooking method, unfavorable texture, and unfamiliarity (Fogler-Levitt, Lau, Csimá, Krondl & Colman 1995). Food likes are influenced by functional aspects such as preparation and price, and food dislikes have been associated with food symbolism such as beliefs about origin or quality. Also, sensory perceptions of food are highly influential to both likes and dislikes. It is important to consider individual food likes and dislikes in an effort to enhance food intake (Spangler & Pettit, 2003).

In a study of entrée food preference in elderly congregate meal participants by Spangler and Pettit (2003), it was found that the most favored foods were cereal products and pasta. The second most favored food groups

were meat and meat substitutes. Glanz, Basil, Maibach, Goldberg, & Snyder (1998) found that taste was the most important determinant of food choice.

Spangler and Pettit (2003) found that different generations have their own food preferences. It has been found that food preferences change throughout a lifetime and that many foods and flavors are acquired over time (Logue & Smith, 1986). A study of 60, 80, and 100 year olds in Georgia by Houston, Johnson, Poon, & Clayton (1994) found differences in food preferences in the different age groups. As an example, 100 year olds consumed more milk and cereals and breads and grains than the younger age groups (Houston, Johnson, Poon, & Clayton, 1994). This difference may be attributed to lack of ability and desire to prepare and eat more complicated foods.

As a person ages, there is potential for food preferences to change. Preferences may change when a spouse dies from those preferences of the couple, to the food preferences of the individual (Quandt, McDonald, Arcury, Bell, & Vitolins, 2000). Oral problems may cause eating to become painful or a nuisance, thus influencing food choices. Foods may be chosen to minimize pain or ease of swallowing (Tuorila, Niskanen, Maunuksela, 2001). Because taste and smell diminish with age, eating patterns and food preferences may change (Booth, Conner & Gibson, 1989).

In summary, assumptions that all provided food is consumed may over estimate the nutritive value provided by the meal. Also, assessing participants' likes and dislikes may be important in increasing participant consumption (Krassie, Smart, & Roberts, 2000). The National Evaluation of the OAA Nutrition

Program published in 1996 found that program participants had higher daily intakes of vital nutrients than nonparticipants of a similar demographic (Mathematica Policy Research, Inc., 1996).

## Chapter III: Methodology

### *Introduction*

Many studies have been conducted concerning quality of life including those conducted by Amarantos, Martinez, and Dwyer (2001), Barr and Schumacher (2003a), and Dubois, Girard, and Bergeron (2000). Most studies pertaining to quality of life have focused on specific diseases or disease states. Nutrition and quality of life have recently become a more researched topic indicating that good nutrition plays a key role in an individual's perceived quality of life (Barr & Schumacher, 2003a). Food and menu variety have been associated with good nutrition (Torheim, et al., 2003, Savige, 2002), but there is a lack of direct research identifying perceived quality of life and food variety. This study was completed to test the relationship between food variety and the perceived quality of life in individuals participating in the Dunn County Congregate Meals program.

This study incorporates both quantitative and qualitative research to gather the most in-depth and accurate data from participants. Quantitative research is used to systematically gather numerical data about the topic. This study used quantitative data for the seven-question survey given to the qualifying participants at each of the Dunn County Congregate Meal Sites. In addition, qualitative research was used during the eleven-question focus group session following the surveys at each of the meal sites. Qualitative research results in a different type of knowledge than does quantitative inquiry. Qualitative research,

in general, takes into account the complex and dynamic qualities of the participants. Its purpose is to gain more in-depth information that may be difficult to convey quantitatively. Qualitative methods are appropriate in situations where one needs to first identify the variables that might later be tested quantitatively, or when quantitative measures cannot adequately describe or interpret a situation.

#### *Selection and Description of Sample*

Subjects for this study were recruited from the Dunn County Congregate Meals program. Individuals recruited were aged 60 years and older and who participated in the Dunn County Congregate Meals. The study was conducted in Dunn County in the state of Wisconsin. The Dunn County Congregate Meal program consisted of ten individual sites throughout the county, eight of which participated in the study. The two sites electing not to participate in the study were located in restaurants or cafes where data collection would not have been possible. The participants at these two sites came and went throughout the afternoon and ate the special of the day instead of a meal directly provided by the congregare meal program. There was not an appropriate time to gather data from the participants, so the two sites elected to not participate.

In order to maximize participation, informative flyers were posted at each site prior to the data collection that included the topic of research and the date and time the researcher would be at each site. Meal site managers were also asked to speak with diners about the date the researcher would be at each site. Subjects were recruited from these sites and asked to participate in a focus group that included a short survey regarding food variety and quality of life. All

individuals who were in attendance the day of the research were asked to participate. Before the meal was served, the researcher explained the nature of the study and asked for any volunteers to participate in the study. Permission to recruit subjects from the Dunn County Congregate Meals sites was obtained from the Dunn County Nutrition Coordinator. This study was approved by the Institutional Review Board for the Protection of Human Subjects at the University of Wisconsin-Stout. See Appendix A, B and C to view the Consent to Participate form provided to each participant, the approval memo from the UW-Stout Institutional Review Board, and application for IRB approval, respectively.

### *Instrumentation*

The development of the focus group structure came through conversations with the Dunn County Nutrition Coordinator, professionals in the area, and the researcher's education and experiences working with older adults. The focus group questions were open-ended questions meant to facilitate open discussion and conversation. The researcher asked each of the focus group questions at all sites. Clarifications on original questions were sought when necessary. The participants were gathered together with the researcher to facilitate open discussion. The focus group questions were open-ended in structure and the most in-depth questions were left for the end to encourage group sharing and to not lead participants to a particular conclusion. (See Appendix D for focus group questions).

Along with the focus group questions, a survey was also developed for this study to assist the researcher in gathering information. (See Appendix E to

view the survey). The survey was developed by the researcher and professionals in the area. The survey gathered individual information that would otherwise have been difficult to obtain via a focus group. It required minimal writing with participants checking boxes for all questions besides weight, age, and gender. This helped to make the survey easy and less daunting to fill out. The survey could be filled out by those with difficulty writing such as individuals with arthritis. The two-part data collection allowed the participants to share their information in a way that was the most comfortable to them.

Face validity was established through evaluations by an advisory committee consisting of university professors, experts familiar with the population to be studied, and the Dunn County Nutrition Coordinator. All printed material used a minimum of 14-point font and was printed on white paper using black ink taking into consideration participant's possible visual limitations. Participants needing assistance filling out the surveys were helped by the researcher or meal site staff. All persons wanting to participate in the study were helped to complete the survey.

#### *Data Collection*

Subjects were told that participation was voluntary; electing not to participate would not affect their meal program benefits and responses would be confidential. Consent to participate in the study was obtained from participants through a consent form approved by the UW-Stout IRB. The form was given to the participants and read aloud to ensure comprehension. Those wishing to participate in the research signed the consent form prior to completion of the

survey or focus group. Data collection consisted of a focus group and short survey following a meal at each of the qualifying Congregate Meal sites in Dunn County.

After consent to participate was obtained, but before data were collected, the researcher brought out plastic food models borrowed from the UW-Stout Food and Nutrition department. The food models served as an educational tool to display proper serving size. The participants were allowed and encouraged to pass around and look at the food models. A chart was included on the survey listing food categories, examples of foods that fit into each category, and appropriate serving size (Appendix E). This information and serving size education was given to promote accuracy in portion sizes reported.

The focus group sessions were audio tape recorded to aid in data collection and allowed the researcher to concentrate on the questions and conversation as opposed to recording the participants' comments. The participants were notified that the conversation was audio tape recorded and only the researcher would be listening to the tape. The survey was then distributed and read over for clarification. All questions were answered individually and those who had difficulties in filling out the survey due to visual or other impairments but who still wished to participate were assisted by the researcher or site manager.

### *Data Analysis*

Data were analyzed following data collection by looking for trends and relationships between food variety and quality of life. Data coding was performed



by the researcher and data analyses was performed by a statistical consultant at UW-Stout. Responses were analyzed using SPSS (Statistical Package for the Social Sciences) statistical analysis software. The number of useable surveys was 79 out of 92 total surveys collected.

The survey items were analyzed using descriptive statistics including frequencies, means, standard deviations, and percentages. Inferential statistics were used to analyze participants' food variety (servings of each food group) compared to the importance of food to life factors. The p level for significance was set at 0.05 and therefore anything equal to or less than 0.05 was considered significant. The p-level indicates the probability that the results found are not of chance. So a p-level of 0.05 signifies with 95% confidence that the results found did not happen by chance.

This study analyzed face to face interactive interviews with descriptive and inferential statistics; a form of qualitative research which strives to provide a more detailed, thick, rich, and in-depth description. The focus group questions were analyzed by first transcribing the audio taped interviews from each site. The results from each site were then compiled together and data from all sites were grouped together according to questions and common responses. After data for each question were organized and categorized, it was analyzed for trends, patterns, and common themes. Similar responses to each question were grouped together and were compared and contrasted within each question in order to identify and strengthen themes and participant viewpoints.

### *Limitations*

The research was limited to those individuals who participated in the Dunn County Congregate Meals program. Thus, participation was limited to those attending on that date and who were willing to participate in the research. This study only collected data from congregate meal participants. More research is necessary to see if the same results pertain to home delivered meal recipients and the elder population as a whole. Also, those residing outside of Dunn County were not studied. Some participants also may have answered with what they perceived to be an appropriate answer, rather than an accurate response. Although both food models and a chart listing proper serving sizes of common foods were provided, accuracy in servings reported by subjects and proper serving size and knowledge may have affected the outcome of the study. For instance, if an individual over estimates the number of servings (food variety) consumed, the results of the study may be skewed in that the results would show a higher food variety, and the opposite may be true of underestimating servings. The large sample size helps to minimize the inaccuracy in reported responses.

## Chapter IV: Results

### *Introduction*

This chapter includes findings of this study. Demographic information and item analyses are discussed. The purpose of this study was to determine food variety's role, as defined by participants, on perceived quality of life in congregate meal participants in Dunn County, WI. Factors assessed include the participants' gender, age, weight, ideal food variety, actual food variety eaten each day, the importance of food on various life factors, the affect of life factors on food variety, definition of food variety and quality of life, and perceptions of food variety on health.

### *Subject Selection*

Subjects of this study were selected based on participation in the Dunn County Congregate Meal Program. All subjects present the day of data collection were asked to participate. However, some elected to not participate.

### *Item Analysis: Survey*

Seventy-nine subjects completed the survey portion of the research. Individuals from each of the eight qualifying meal sites in Dunn County contributed to the study. Of the 79 subjects surveyed (n=79), 19 were male (24.1%) and 60 were female (75.9%). Table 1 summarizes the gender breakdown of the participants.

Table 1

## Gender Distribution of Respondents (n=79)

Gender	Number (n)	Percentage (%)
Male	19	24.1
Female	60	75.9

Along with gender, the age of participants was also collected. All of the respondents qualified for the Elderly Nutrition Program by being aged 60 years and older. Table 2 and Figure 1 show the age of the respondents (n=79). Nearly 80 percent of respondents (n=63) were aged 75 years and older with over one third being 85-89 years old. Thirty-four percent were 85-89 years old. Almost 9 percent of the participants were age 90 and older. The mean age of participants was 80 years.

Table 2

## Age of Respondents

Years	Frequency (n)	Percentage (%)
60-64	5	6.3
65-69	4	5.1
70-74	7	8.9
75-79	14	17.7
80-84	15	19
85-89	27	34.2
90-95	7	8.9

Mean=80 years

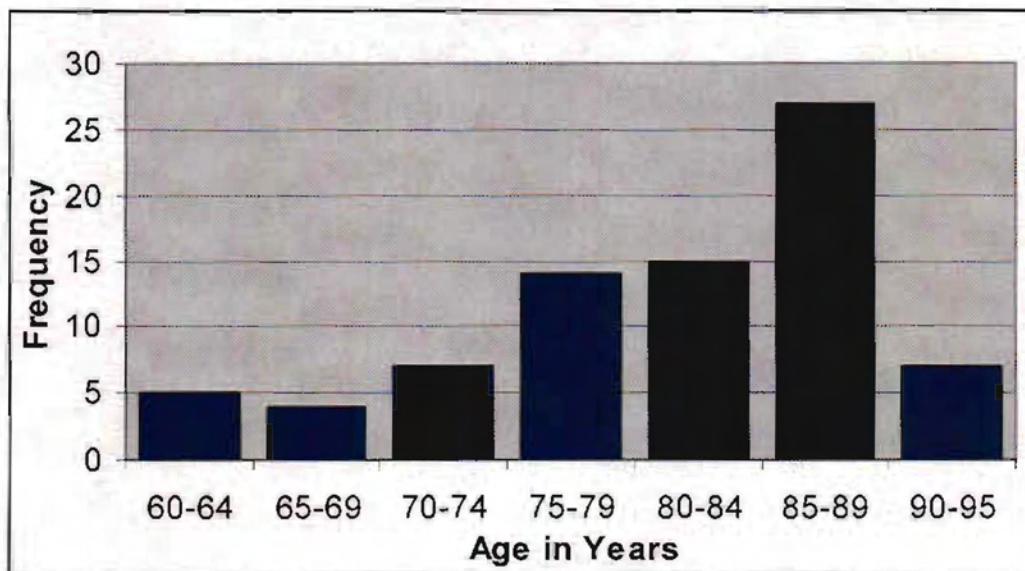


Figure 1. Age of respondents from congregate meal sites in Dunn County who participated in the study.

Mean weight, gender and age were the three factors entered into the USDA [www.mypyramid.gov](http://www.mypyramid.gov) website in order to find the recommended servings of each food group (representing food variety). As mentioned, weight of the participant was one of three factors used to calculate food variety. The respondents were asked to report their weight to the nearest pound. The respondents' weight ( $n=77$ ) ranged from 100 pounds to 294 pounds (Table 4). The mean weight of respondents was 171 pounds with the mode being 150 pounds. Subjects' weight varied greatly showing different levels of caloric and nutrient needs. The mean weight of 171 pounds was used in the [www.mypyramid.gov](http://www.mypyramid.gov) website to calculate the daily recommended amount of each food group.

Table 3

## Weight of Participants

Weight in Pounds	Frequency	Percentage
100-124	10	12.9
125-149	13	16.9
150-174	18	23.4
175-199	19	24.7
200-224	7	9.1
225-249	7	9.1
250-274	2	2.6
275-299	1	1.3

Mean = 171 pounds

After gathering demographic information, the participants were asked through the survey what they perceived were varied amounts of servings from each of the food groups ("Perceived" in Table 4) defined as grains, dairy, fruit, vegetables, and meat/protein and how many servings from each food group they actually consumed each day ("Consumed" in Table 4). Means from the two questions were compared with the recommendations ("Recommended" in Table 4) from the USDA [www.mypyramid.gov](http://www.mypyramid.gov) website. These data are depicted also in Figure 2.



Table 4

## Food Variety, a Comparison of Recommended, Perceived and Consumed

Food	Recommended	Perceived	Consumed
	Amount Servings		
Grains	6.00	2.92	2.66
Dairy	3.00	2.87	2.47
Fruit	3.00	3.21	2.34
Vegetables	5.00	3.00	2.39
Meat/Protein	2.00	2.40	2.20

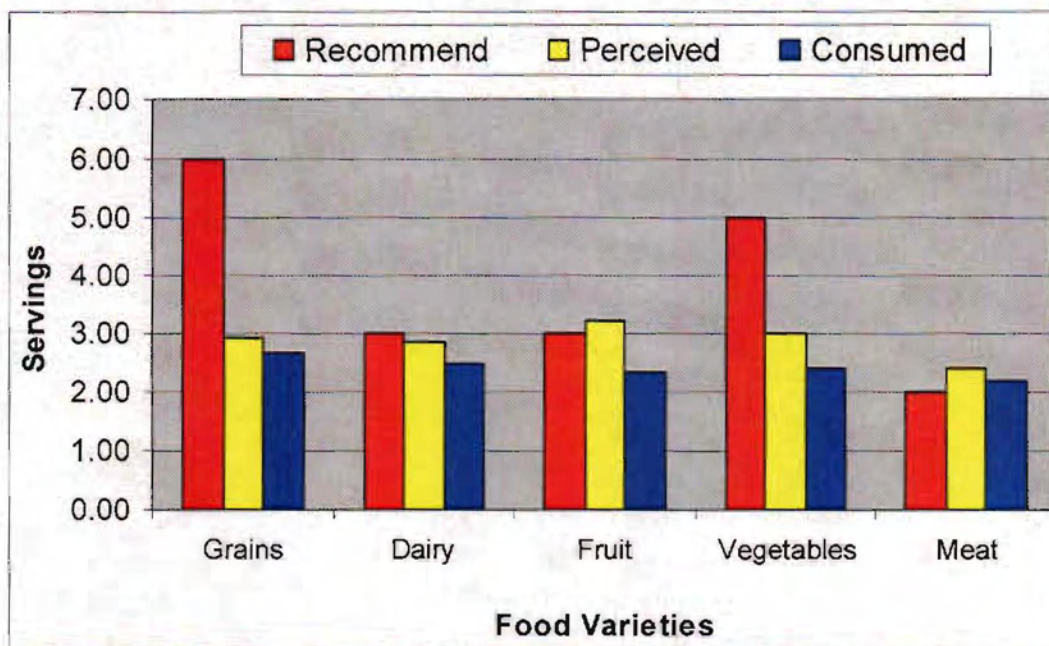


Figure 2. Food variety of respondents from congregate meal sites in Dunn County

The results from this question found the recommended servings for the grain, dairy and vegetable groups to be greater than both the participants'

perceptions of the recommendations and the amounts actually consumed by participants (Table 4/Figure 2). Notably, participants consumed only 44% of recommended servings of grains and 47.8% of recommended servings of vegetables. On the other hand, the participants' perceptions of recommended servings were found to be greater than the actual recommended servings for the fruit and meat/protein groups. In each of the food groups, what the participants thought to be the servings needed was more than the servings they consumed. Also, the servings actually consumed by the participants were found to be less than the recommended serving amounts in each food group except for meat/protein in which the participants consumed 110% of recommended servings.

After noting the large discrepancies between recommended servings, what the participants perceived a varied amount to be, and how much they actually consume, it was crucial to try to identify some of the most influential factors that affected their food choices. It was found that many factors affect food choices in this population. When looking at the factors affecting food choices, participants were asked to rate each of the following life factors and its effect on food variety. Factors analyzed included money available, transportation, ability to prepare/clean-up, shopping, time, energy level, physical ability, and emotional status/how I feel. A 5-point Likert scale was used with the following labels included: 1=does not affect; 2=sometimes affects; 3=occasionally affects; 4=frequently affects; 5=always affects. The data were averaged and it was found that transportation (mean= 1.81) and time (mean= 1.84) were the two factors



affecting food choices the least, while energy level (mean= 2.51), emotional status (mean =2.41), and physical ability (mean= 2.37) had the greatest affect on food choices. (Table 5 and Figure 3).

Table 5

Factors Effect on Food Choices

Factors	Values
Money Available	2.07
Transportation	1.81
Ability to Prepare/Clean-up	1.95
Shopping	2.05
Time	1.84
Energy Level	2.51
Physical Ability	2.37
Emotional Status/How I feel	2.41

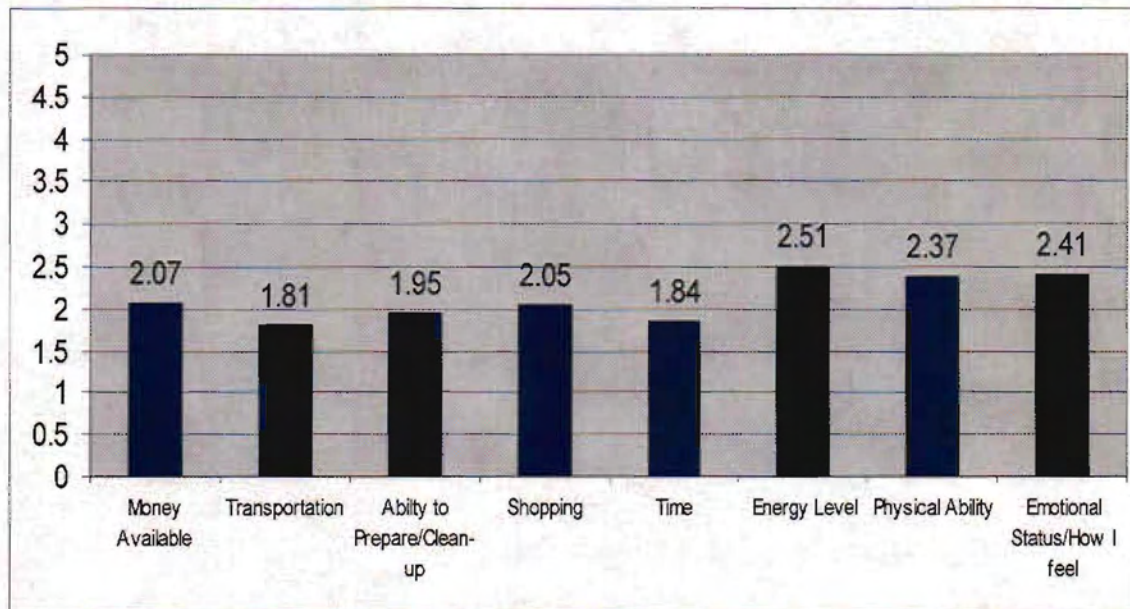


Figure 3. Mean values for various factors effects on food choices of participants from congregate meal sites in Dunn County

After determining what factors affected food choices, it was necessary to research the role of food in participants' lives. Food has been shown to play a role in many different areas in life. As discussed earlier, food does more than provide nutrition. The goal of this survey question was to find what role food played in the participants' lives. The survey asked the participants to rate the importance of food on social interaction, physical health, mental health and accomplishments of daily activities. A 5-point Likert scale was also used for this question. The scale was labeled: 1=not important, 2=slightly important, 3=moderately important, 4=very important, and 5=essential. Results were analyzed and when calculating an average it was found that food was moderately to very important in each of the factors tested that included social interaction (mean=3.07), physical health (mean=3.92), mental health (mean=3.84), and accomplishment of daily activities (mean=3.60) as shown in Table 6 and Figure

4. The results of the Pearson Correlation comparing servings of each food group that the participants consumed to the importance of food to the previous factors, found significance ( $P < 0.05$ ) with both mental health and accomplishments of daily activities, and near significance with physical health ( $P = 0.052$ ) linking increased food variety to mental health, accomplishments of daily activities and physical health.

Table 6

Importance of Food to Life Factors of Congregate Meal Program Participants in Dunn County

Life Factors	Response*
Social Interaction	3.07
Physical Health	3.92
Mental Health	3.84
Accomplishment of Daily Activities	3.60

\*Based on 5 point scale with 1=not important; 2=slightly important, 3=moderately important; 4=very important; 5=essential



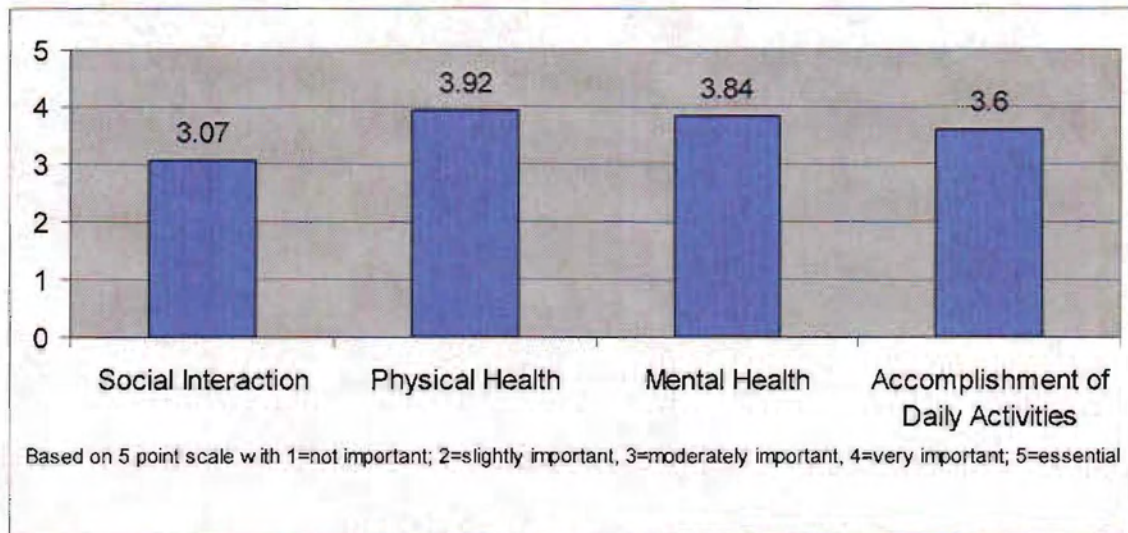


Figure 4. Importance of food to life factors of participants from congregate meal programs of Dunn County

*Item Analysis: Focus Group*

The survey, with the preceding questions, was first given to participants to gather quantitative data on food variety and food's role in quality of life. Following the survey, a focus group session was conducted in order to gain additional information not previously provided such as feelings and emotions surrounding food variety and quality of life. The questions used for the focus group are found in Appendix D. The focus group session began by asking participants what some of their favorite foods were and why they were their favorite. This question was used as a warm-up question. Its purpose was to help the participants to think about food and emotions involved with food. This question was non-intrusive as it brought about cheerful and happy thoughts of food. This question helped build trust and rapport between the researcher and participants. The "why" part of the question was included to elicit emotions and deeper thinking. The participants responded almost exclusively with main dishes—specifically roast beef and

casseroles/hot dishes being their favorite foods. Participants indicated these foods brought about feelings of comfort since they were foods the participants had throughout their life times. Participants stated the foods brought back good memories of family and friends. Other responses included desserts items such as pie or ice cream and side dishes like mashed potatoes with gravy.

In order to further research into food variety including availability and lack of variety, the participants in the focus groups were asked what foods they really wished they could have more often. This question helped target food variety as the more foods the participants cannot or do not eat represent lack of variety. The following excerpt from a participant embodies a common theme reported by others (Female Congregate Meal site participant, 2007).

“There are many [foods we wish we could have more often]. We don't always get variety because most of us live alone, and if we buy a container of oatmeal, we'll eat it until its gone. Especially with things that spoil like cream or fruit and vegetables. So our diets are boring and repetitive. Maybe not boring, but certainly repetitive.”

It was crucial to gain access to participants' opinions, views, and thoughts on food variety in order to better understand its role in perceived quality of life. The participants were asked to describe food variety and what it meant to them personally. This question focused on finding what factors affect and influence food variety. There are many ways that food can be varied, and one person's variety may be another's monotony and one person's monotony may be another's variety. It is for this reason it was crucial to find how participants define food variety. In general, participants described food variety in the following ways:

- “Different colors”

- “Vegetables, bread and butter, meat, cheese, potatoes, gravy and something sweet”
- “Different foods”

To dig deeper into variety and how the participants view variety, the participants were asked to describe a meal that has variety. This question was designed to find what the participants view as adequate in reference to variety and to obtain a more concrete definition of variety. This question offered participants an opportunity to think about food in a new and different way. Respondents defined variety in several different ways. To some, variety was different colors, or different food groups, and to others food variety was simply different foods. Respondents commonly defined a meal with variety as:

- “Little bit of this and little bit of that”
- “[A meal with variety is] very colorful. Not all bland colors”
- “Vegetables, bread and butter, meat, cheese, potatoes, gravy and something sweet”

After investigating how the participants describe food variety, it was important to determine how closely the amounts consumed from each food group were to earlier recommendations calculated on the [www.mypyramid.gov](http://www.mypyramid.gov) website. Previous data from the survey indicated that participants were consuming roughly 80% of recommended servings of dairy and fruit and 110% of recommended servings of meat/protein daily, but only approximately 45% of recommended servings of grains and vegetables daily. The participants were asked in what ways the congregate meals were providing enough variety. This

part of the focus group session focused on discovering how their individual need for variety was fulfilled by the congregate meals program. Overall, participants responded positively with answers such as:

- “We get all sorts of different foods each day; each meal has different food groups”
- “The [congregate] meals provide lots of variety. They do a great job.”
- “We get a little of this, and a little of that. We don’t eat the same thing everyday.”

These results indicate satisfaction with variety offered at the meal sites even though it was found that the participants lack servings of grains and vegetables daily.

As stated in previous chapters, health has been shown to be positively associated with quality of life. In an effort to determine in what ways a relationship exists between food variety and quality of life it was necessary to discover if the participants felt a meal with variety was more beneficial to health. This question was aimed at finding how participants viewed food variety as beneficial to health and was a new concept for many of the respondents. Most participants paused several seconds before responding, or led off with words such as “I guess I’ve never thought about that”. After time for reflection, the participants indicated food variety to be important to good mental and physical health. Some participant responses included:

- [Variety is important to health]-if you eat all the same thing all the time, it wouldn’t be good for your health or your appetite, you wouldn’t eat much.

- You could be healthy on a monotonous diet. But it would have to be a balanced diet.
- I used to have really high [blood] pressures and was taking 2 pills for it, then I started to eat more fruits and vegetables and now I only take half of one pill.
- [Without variety you would become] tired of it mentally. I get bored when I eat the same thing everyday.
- That's why we eat here—we get variety, it's hard to get variety when you are eating and cooking for one or two.
- Different nutrients do different things for you. You need them all to live.
- If you eat the same thing all the time, it gets boring. I like to try new foods and not eat the same thing.
- Food keeps us kicking
- You get different vitamins.

Nutrition programs were established for many reasons. Their aim is more than increasing food intake. Therefore, the participants were asked to identify the reasons they chose to participate in the congregate meal program and if they felt they benefited from these services. Participants reported a variety of reasons for attending the congregate meal program that included responses ranging from entertainment to habit. Many respondents discussed the opportunity to build relationships. As reported by the participants, the congregate meals provide both a meal with variety and an opportunity for “fellowship”, “companionship”, and “camaraderie”. The respondents also reported socializing and eating together



outside the lunch meal, which increases food variety. Participants stated they liked the food the Congregate Meals Program provided and appreciated not having to shop, prepare, and clean-up after meals. Other responses included:

- Like the people here
- The food is good
- Exercise-we do some each day before the meal.

The diners were asked to explain if the variety of the congregate meals affected what they chose to eat during other meals of the day. This question focused on discovering how the diners perceived variety. It was necessary to discuss whether the participants ate meals other than the congregate meals and if they focused on consuming food variety over each day or at each meal. The participants were asked what other foods they ate on congregate meal days versus non-congregate meal days, if they feel they had variety at the site, and did they consume variety at other meals? The following were comments made by participants to this question:

- “I don’t feel like I need to watch what I eat for other meals because we get good foods here”
- “Well, I try to get some food from each of the food groups in everyday, and the days that I come to eat here, I don’t have to worry so much, because we get something from each group.”

Responses to this question indicated that participants viewed food variety as a daily goal and strove to consume food based on daily intake instead of variety consumed with each meal. The majority of participants stated that the

days they ate at the congregate meals site, they ate a typical breakfast but ate very little for the evening meal. This reported meal pattern is common throughout this population. Participants stated that often times for the evening meal they ate soup, sandwich, or leftovers brought home from the lunch meal. Participants generally stated that they tried to get variety over each day and the variety offered through the congregate meals enabled them to not worry so much about food variety and alleviated their need to focus on additional variety. The participants stated they felt they ate a more varied diet on the days they ate at the meal site.

After much discussion on food and variety, quality of life was discussed. The participants were asked what it meant when they heard that someone had a satisfying or good quality of life. It was essential to uncover how the participants defined quality of life and what factors attribute to quality of life. The participants answered with a wide range of responses. Some of the factors the participants felt attributed to quality of life included: "having money in the bank that you don't care if you spend", "health", "family", "friends", "work", "no aches and pains" and "socialization opportunities". The most common responses from participants defining a satisfying or good quality of life included "good health", "limited stress", and "having an overall good life". One participant indicated that those with a good quality of life are "well adjusted in their social life, get along with other people, smile a lot, laugh a lot, and make other people happy."

Finally, after discussing both food variety and quality of life separately, the focus groups were asked to discuss them together in order to determine what

type of relationship existed between food variety and perceived quality of life.

The goal of the question was to discover food variety's role in quality of life. The participants were asked in what ways food variety affected their quality of life.

Participants responded:

- "I think that if you eat all one type of food, then you're missing out on the other parts. If you eat just the liquids, then you miss out on the solids, and you miss out on the chewing and what it does with your body."
- [Variety] "keeps you looking forward to something"
- "I think food is important with family and friends"
- "Without food you wouldn't be alive-no quality of life there"
- "Food makes me happy-if I don't eat I get cranky and you need to be happy"

In closing, participants were asked if they had any other thoughts or information to contribute to the discussion. No additional information was obtained from participants from this question.

## Chapter V: Discussion

### *Introduction*

This chapter provides a discussion of the results of this research, conclusions, and recommendations for future research. As the population aged 65+ in the US grows to account for over 20% of the total population by the year 2030 (US Census Bureau, 2005), it is increasingly important to focus our attention on uncovering the roles of specific factors that affect perceived quality of life. This additional attention and research is necessary in order to make the added years of such a large portion of the population as enjoyable and healthful as possible. The term “quality of life” has a unique meaning to each and every person and has been found to be influenced by many life factors by both this study and other research including that from Amarantos, Martinez and Dwyer (2001). It was with this thought that this study tried to decipher food variety’s role in perceived quality of life in Congregate Meal participants in Dunn County, WI.

Food variety can be defined as the number of food items or food groups consumed by an individual over a specified period of time. It has been shown that diets with high food variety protect an individual from chronic diseases such as cancer. High variety diets also promote longevity and improve health status (Vecchia, Munoz, Braga, Fernandez, & Decarli, 1997; Hsu-Hage & Wahlqvist, 1996). This lack of disease and increase in health status, have been shown to increase an individual’s quality of life. Conversely, good health and nutritional practices are crucial to a person’s perceived quality of life, and can help an

individual prevent acute and chronic illnesses (Leutwyler, 1995). In summary, lack of disease has been found to increase quality of life and increased quality of life has been shown to prevent disease. The results of this study serve to confirm the complex nature of the relationship between food variety and quality of life.

#### *Discussion: Survey*

The current quantitative and qualitative study was conducted as an effort to update past research and help link food variety to perceived quality of life. This study was conducted with the help of Congregate Meal participants from Dunn County, WI. Seventy-nine men (n= 19; 24.1%) and women (n = 60; 74.9%) completed the survey portion of the research in addition to participating in the focus group sessions.

The first part of the survey asked participants to report their gender, weight, and age. This information was used to calculate the average recommended amount of servings for this population based on the USDA [www.mypyramid.gov](http://www.mypyramid.gov) recommendations. The average age of the participants was 80 years. Nearly 80 percent of respondents (n=63) were aged 75 years and older with over one third being 85-89 years old. This large proportion of individuals over the age of 75, stresses the importance of the Congregate Meals Program on the quality of life for this age group. As a result, this data emphasizes the need to uncover the roles that specific life factors play on perceived quality of life so that meaning and value to life can be maintained as long as possible.

The survey indicated that subjects' mean weight was 171 pounds with a range from 100 to 294 pounds. This large span in weight, emphasizes the variety

of individuals and the different levels of caloric and nutrient needs which represent a large range of recommended servings.

When the participants were asked to quantify the number of servings from each food group they perceived to be recommended and the actual amount of servings they consumed from each food group, it was found that the largest discrepancy between the amount recommended (established on the [www.mypyramid.gov](http://www.mypyramid.gov) website) and the amount actually consumed was in grains (44% of recommended) and vegetables (47.8% of recommended). Participants consumed 82% of recommended dairy, 78% of recommended fruit and 110% of recommended meat/protein daily. However, the participants consistently perceived the recommended servings to be less than the actual recommendations; this might lead to a lower consumption of these food groups. The only exceptions were the fruit and meat groups. With the fruit group, on average, the participants perceived the recommended daily servings to be slightly higher (7%) than the actual recommendations, yet participants still consumed less than both perceived and recommended daily servings (78% of recommendations). In reference to the meat group, the participants perceived the recommended servings to be 20% higher than the actual recommendations, but with this food group, they actually consumed more than the recommended daily amount (110% of recommendations) indicating that the participants are consuming adequate protein. These results suggest the need for more participant information and education on recommended servings of each food group, particularly grains and vegetables and the importance of consuming a diet

with variety. Information on easy ways to increase vegetables and grains to ensure adequate nutrient intake would be most valuable to this population. These results also indicate a possible link between low grain and vegetable consumption to spoilage and difficulty of preparation of these food groups. Bread and fresh vegetables in particular may be difficult to consume in their entirety before spoilage as well as the time and ability it takes an individual to prepare fresh vegetables.

Participants were asked to rate the importance of specific factors on food choice. Factors analyzed included money available, transportation, ability to prepare/clean-up, shopping, time, energy level, physical ability, and emotional status/how I feel. It was found that transportation and time were the two factors affecting food choices the least, while energy level, emotional status, and physical ability had the greatest affect on food choices. Money available, shopping, and ability to prepare/clean-up were all found to sometimes affect food choices.

Money available may affect food choices with some participants because of the cost of medications, medical bills, insurance, and daily living expenses. Also possibly affecting available money is the respondents' eligibility for Social Security benefits and subsequent retirement with 93.6% of respondents being age 65 and older thus qualifying them for governmental benefits and increasing the likelihood of retirement. The quantity of money available to purchase food may affect food variety and choices because an individual with a limited budget would not be able to purchase as large of a variety of food as someone who has

a larger food budget. Those with a limited budget would have to be more conscious about the types and amounts of foods purchased, taking into consideration price and spoilage. For example, a person with a limited budget may not buy a large variety of fresh fruits and vegetables because he/she may not be able to eat them all before spoiling. Whereas a person with a larger food budget may not be as influenced by spoilage since he/she would have the money to buy more of that particular item if desired. Also possibly affecting food choices and variety would be the need for those with a limited budget to shop differently throughout the seasons as the price of food varies. Some produce is less expensive in the spring and summer months such as asparagus, strawberries or grapes. Other produce is less expensive during the fall and winter like apples, sweet potatoes or citrus fruit, thus possibly resulting in limiting the variety of food able to be purchased by someone with a limited budget. Individuals with limited food income should be referred to services such as food stamps or farmer's market vouchers in order to alleviate the financial burden of rising food costs (Fey-Yensan et al., 2003).

Transportation was the factor that affected food choices the least. The fact that the participants were able to get to the congregate meal sites shows they have access to reliable transportation and have a greater chance of being able to travel to a store to purchase food. Transportation could be a factor affecting food choices with some participants or others in the same age bracket because some seniors may not have access to a driver's license because of vision, hearing, and age associated diminishes in reflex and response time. Access to a vehicle may



be limited due to lack of funds or maintenance difficulties. Lack of transportation would result in making the purchase of food both in stores and restaurants much more difficult limiting food variety to the items the person was able to have delivered or the items available if transportation could be arranged.

Ability to prepare/clean-up is a key factor in food variety since dexterity, due to age or other health concerns such as arthritis, may inhibit the ability or ease of preparation. Strength, vision, smell, taste, hearing, touch, and energy also diminish with age and may interfere with preparation and/or cleaning. An individual who finds preparing or cleaning-up meals difficult would have his/her food choices limited to those of convenience such as canned foods or frozen meals. On the other hand, a person who has no difficulty in preparing or cleaning-up after meals would have the opportunity to consume a larger variety of food and meal items thus eliminating the affect on food choices. The congregate meal program offers participants the opportunity for food and meals that they may not be able to prepare on their own which results in an increase in the variety of food. Food packaged in ready to use packaging that is easy to open and use as well as special utensils or gadgets may be beneficial to those who find preparing and cleaning up after meals difficult.

Shopping may affect food choices because one's ability to get to a store may be inhibited as well as being able to reach items on high or low shelves, being able to walk through the store without difficulty, and pick up and carry groceries from the store and into the home. Having the energy to go shopping also may affect the desire to shop for foods or prepare meals and food choices.

Each of these factors may either positively or negatively effect the participant's food variety. If an individual is able to shop for food without difficulty, they have a greater opportunity for food variety than one who has limited shopping capabilities. In order to increase food variety in this population, grocery delivery services may be a viable option. Many grocery stores offer delivery services for those who find shopping difficult.

Time was the second lowest factor affecting food choices. Some participants made comments such as "all I have is time". The age most frequently associated with retirement is 65 years old and 93.6% of the participants were found to be 65 years and older. Without the obligation to work, many of the participants have more leisure time than at any other time in their adult lives. Lack of time may negatively affect the participants' food choices due to involvement in various activities, volunteer opportunities, part-time jobs, travel, or doctor's appointments. Consuming a diet high in variety may be more time consuming than one of monotony since it takes time to decide on new menu choices, shop for new ingredients, and prepare new food items. A person with little time may find it easier to make a large quantity of a food item (such as soup) and eat it until it is finished. Time would be saved in the decision of what to eat, the preparation time as well as time for shopping and cleaning-up. On the other hand, an individual with much leisure time could spend time planning out a new menu for each meal of the day, shopping for each meal, and preparing and eating each meal, thus resulting in an increase of food variety.

The following results reemphasize food's varied role in daily living among the aging population. Social interaction, physical health, mental health, and accomplishments of daily living have all been found to play a role in quality of life. The participants' responses indicate that food is moderately to very important to each of these life factors, helping to link food to quality of life. The results of the Pearson Correlation comparing the servings of each food group the participants consumed to the importance of food to the previous factors, found significance ( $P < 0.05$ ) with both mental health and accomplishments of daily activities, and near significance with physical health ( $P = 0.052$ ). This indicates a positive correlation between food variety consumed and mental health, accomplishments of daily activities and physical health. This data suggest the importance of food variety including the need for education of the aging as well as those involved in their lives such as health care workers, family and friends.

*Discussion: Focus Group*

The focus group session consisted of 11 questions which were asked to all willing participants following the written survey. The participants indicated their food choices were primarily limited by the shelf life of the food and how quickly they could consume the specific food product. This response is very insightful and helps to uncover the reasons behind the participant's eating habits as they relate to food variety. This data also relates to the survey portion of research in that food variety is strongly related to spoilage and shelf life. If individuals are limiting their food choices based on shelf life and spoilage, then food variety would subsequently be limited. According to the US Census Bureau

(2005), individuals aged 60 years and over often times live in either one or two person homes. It takes more time for individuals living in a one or two person home to consume an entire food than those living with larger families. It would be more difficult for those in the population questioned to consistently consume a large variety of food than others living with a larger family. These results indicate that foods packaged in smaller, more manageable portions would be beneficial to this population so that they would have the opportunity to focus on food variety instead of shelf life.

Participants responded in several different ways when asked to define food variety. To some, variety was different colors, different food groups, or different textured foods, and to others food variety was simply different foods in general. It is interesting to discover how each participant defined variety. When asked to define a varied meal, participants included food from each of the food groups, as well as foods of different colors. The responses to both questions were very similar, emphasizing the consistency in participants' viewpoints on food variety and establishing a reference for future questions. This data indicates that although each diner is an individual with different height, weight, and age, his/her viewpoint of variety remains similar to the rest of the population for both food and meal variety.

The diners were asked if they felt the Congregate Meals Program provided food variety. This question aimed to discover if the participants were satisfied with the food received, how they obtain food variety, and how theoretical food variety translates into reality for participants. Participants indicated a great

deal of satisfaction with the food variety offered through the congregate meals. These responses affirm the participants' previous definition of food variety as the meals provided through the Congregate Meal Program include foods from different food groups and of different colors, tastes and textures.

When asked to explain why or why not a meal with variety is more beneficial to health, the participants indicated they felt that food variety was beneficial to not only physical but also mental health. These results support the data from the previous survey in that variety positively affects mental and physical health as well as accomplishments of daily activities. The participants discussed the benefits of various nutrients on health, and food's role in preventing and managing disease. Participants also talked about the importance of variety for mental health purposes. They indicated that they would get bored with a monotonous diet and that they feel better when they consume a variety of foods. The participants seemed to understand and agree with other research on the health benefits of a varied diet which correlates with increased mental and physical health. They reported the importance of varied nutrients and mental benefits of eating a variety of different foods each day. Variety relates to fewer chronic and acute diseases and increased longevity which have been linked to increased quality of life.

Participants responded that very often the time spent at the meal site is one of the only opportunities they have to interact with others and build friendships. This group of diners acts as a network and allows the participants resources for transportation to doctor appointments, shopping, church, and other

activities as well as a system of checking in on each other to ensure safety. The focus groups were questioned about why the participants kept coming back to the meal sites and what benefits they received from participating in the meals. As stated above, the participants reported benefits besides simply food. The responses discussed by the participants, including camaraderie and fellowship, have all been linked to increased quality of life. This implied that the participants' quality of life has been increased by both the variety of food consumed through the congregate meals and the social network created during mealtimes. It is important to remember when discussing quality of life that it cannot be defined by one factor alone but rather is multifactorial.

Lastly, the participants were asked in what ways food affected their quality of life. This question and subsequent conversation summed up all the previous questions and responses as well as supporting data from the survey. The conversation was an opportunity to uncover how the participants defined food variety's role in perceived quality of life. The participants overwhelmingly indicated that food variety is directly correlated to perceived quality of life. That is, in general, the more food variety in one's life, the higher the perceived quality of life. This relationship is attributed to several factors including, physical health, wellbeing, mental health and satisfaction. This conversation implies the importance of food variety and its positive role in people's lives.

### *Conclusions*

The results of this study serve to confirm the complex nature of the relationship between food variety and perceived quality of life. As previously

indicated, this research found that individuals need additional education on food portion and variety recommendations in hopes of increasing the proportion of individuals consuming recommended amounts of each food group as to promote health, disease prevention and overall quality of life.

Energy level, emotional status, and physical ability were found to have the greatest affect on food choices of the factors assessed. Greater emphasis needs to be placed on helping individuals overcome these obstacles. Some examples would be to encourage physical activity to help increase energy level, emotional status and also physical ability. Emotional support should be addressed, as well as assisting with services such as shopping assistants, simple meal ideas, equipment like magnifying glasses or modified cooking stations, and specialized utensils to help individuals increase their food variety.

Social interaction, physical health, mental health, and accomplishments of daily living have all been found to play a role in quality of life, and the participants' responses indicated that food was moderately to very important to each of these life factors, helping to link food to quality of life. From the survey, statistical significance was found linking increased food variety to both mental health and accomplishments of daily activities and near significance was found between physical health and food variety. Supporting this information, the focus group indicated a strong correlation between social interaction/networking to quality of life. These results show the importance of food variety to these life factors and the necessity to educate the population on the benefits of food variety.

Participants indicated through the survey that of all the factors questioned, food was the least important to social interaction, and they overwhelmingly indicated in the focus group that social interaction was crucial to quality of life. These results signify the importance of social interaction to quality of life, but lessen the impact of food's role in the participants' social lives, reemphasizing the complexity of perceived quality of life and the need for additional research.

The conclusions drawn from this study may be beneficial to a myriad of groups including the Congregate Meals, nutrition professionals, health care providers, social workers, health, nutrition, psychology, and gerontology educators, as well as all aging individuals and their family and friends. For example, these results would be helpful when planning menus for this population to encourage variety in food in hopes of increasing quality of life, or when seeking to increase food variety or ways to improve quality of life in the aging as well as other populations. Educators could use this information when discussing the aging population in order to teach professionals as well as the general public about the importance of food variety and social interaction on quality of life.

### *Recommendations*

Additional research needs to be conducted to fully understand food variety's role in quality of life. In order to improve upon this research, it may be helpful to conduct individual interviews to gather more specific and detailed information from participants. This would allow the researcher an opportunity to assess each participant's dietary needs and to obtain usual food intake to compare for nutritional adequacy making it possible to more accurately analyze



actual intake. This detailed food information could be used to compare data gathered from the survey and focus group sessions helping to determine the relationship between food variety and quality of life. By gathering more accurate and detailed information on food variety and comparing it to the survey and focus group data, it would allow for better understanding of the relationship between both food variety and quality of life. Detailed food records were not gathered from participants in order to increase the diners' participation in the research as well as encourage participants to complete both the survey and focus group sessions. It was felt that limiting the time the diners needed to participate in data collection was important as well as to be as least invasive as possible.

Other recommendations include alternative data analysis of the respondents' daily food recommendations. This study took the mean participant weight (171) and age (80) along with most common gender (female) and entered the information into the [www.mypyramid.gov](http://www.mypyramid.gov) website to determine daily food recommendations. A more detailed method of analyzing this data would be to enter each participant's weight, age and height into the [www.mypyramid.gov](http://www.mypyramid.gov) website to determine personalized recommendations and then compare this information to the participant's perceived variety as well as actual amount consumed.

Additional information that would be helpful to gather for future research would be the participants health status, economic status, stress level, and involvement with family or friends, all of which the participants included when defining quality of life, to see what affect food variety has on these factors. Again,

this information was not included in the original survey as to keep the survey as short and simple as possible in order to increase participation and completion. Additional research in this population as well as in different age categories and geographic locations needs to be completed to determine if these results are similar within other groups.

The results of this study will be compiled and shared with the Dunn County Congregate Meal Program Director. The Director will then share the results with each meal site and participant. The meal participants and Program Director will be able to see and understand food variety's crucial role in perceived quality of life in hopes of increasing the consumption of food variety.

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Appendix A

Consent to Participate in Research

## **Consent to Participate In UW-Stout Approved Research Food Variety and Quality of Life**

### **Description:**

I am conducting a research project to determine if there is a relationship between food variety and perceived quality of life in adults aged 60 years and older participating in the congregate meal program.

### **Risks and Benefits:**

It is not anticipated that this study will present any medical or social risk to you. There may be benefits to you indirectly through the Dunn County Congregate Meal program. The results of the study will be shared with the programs as to food variety's affect on perceived quality of life.

### **Time Commitment:**

The time commitment expected is approximately 45 minutes. Fifteen minutes is anticipated for the survey and approximately 30 minutes will be spent in a focus group discussing food variety and quality of life.

### **Confidentiality:**

The information gathered will be kept strictly confidential and any reports or findings will not contain your name or any other identifying information.

### **Right to Withdraw:**

Your participation in this project is completely voluntary. If at any time you wish to stop participating in this research, you may do so without coercion or prejudice.

### **IRB Approval:**

This study has been reviewed and approved by The University of Wisconsin-Stout's Institutional Review Board (IRB). The IRB has determined that this study meets the ethical obligations required by federal law and University policies. If you have questions or concerns regarding this study please contact the Investigator or Advisor. If you have any questions, concerns, or reports regarding your rights as a research subject, please contact the IRB Administrator.

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## **Consent to Participate In UW-Stout Approved Research**

### **Food Variety and Quality of Life**

**Statement of Consent:**

By signing this consent form you agree to participate in the project entitled, "Food Variety and Quality of Life"

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Signature

Date