THE NUTRITION ENVIRONMENT IN RURAL SOUTHERN ILLINOIS: AN AFRICAN-AMERICAN PERSPECTIVE

by

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ABSTRACT

A food desert is defined as "a low-income census tract where a substantial number or share of residents has low access to a supermarket or large grocery store," (USDA, ERS, 2011). The purpose of this study was to examine how African-American residents of a rural food desert navigate their nutrition environment to obtain the foods they eat. Twenty-four in-depth interviews with 17 African-American men and 7 African-American women were conducted in Alexander County and Pulaski County, Illinois. The interviews ascertained ways in which individuals negotiate the limits of the nutrition environment. A quantitative assessment of the availability, price, and quality of African-American culturally-preferred dried legumes (beans), fresh fruits, and fresh vegetables was conducted with the customized Nutrition Environment Measurement Survey-Stores (NEMS-S) in 27 food venues (stores) (Glanz et al., 2007). The qualitative data was coded, categories were established, and themes were derived. The qualitative data analysis software, ATLAS.ti, was used in the study. The quantitative data analyses were completed using SPSS software. The availability and quality of food items were measured with a customized NEMS Scoring Sheet for Stores. The prices of food items were compared among the food venues (stores). Data obtained from interviews and food venue (store) data were triangulated. Culturally-preferred foods remain a dietary staple. Fruit was often given as a snack to children. Changes in diet to address health problems were described as well as specific modifications to diet were made to traditionally southern and African-American food preparation. Family history and food practices that maintained the same flavors in childhood were important. Cultural traditions like gardening were also important. The respondents often settled for the convenience of food available in the area. The mean availability score was highest in the "Big Box Stores" and lowest in the gas stations-convenience stores-food marts. Prices

were generally the lowest in the "Big Box Stores" and highest in the grocery stores. The "Big Box Stores" had the best quality food items. Coordinating shopping trips, carpooling, and gardening, community sharing, were ways challenges in the nutrition environment were managed. Limits of the nutrition environment were further managed through roadside markets, mobile sources, and pantries or give-a-ways. Health educators can better plan, implement, and administer culturally-appropriate interventions and strategies as well as strengthen social, environmental, and political factors that empower residents of the rural nutrition environment.

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CHAPTER 1

INTRODUCTION

> "Food deserts leave too many families stranded and without enough choices when it comes to nourishing their loved ones. And sadly, this is the case in many large cities and rural communities all across this nation. So we need to do more to address the fact that so many of our citizens live in areas where access to healthy food, and thus a healthy future, is simply out of reach," (Obama, 2009).

Background of the Problem

The First Lady of the United States of America, Michelle Obama, expressed the need for access to healthy food in both urban and rural areas during the White House Garden Harvest Party in the summer of 2009. Mrs. Obama's 1,100 square foot garden plot at the White House has in many ways renewed the country's interest in the importance of fresh fruits and vegetables. In addition, the First Lady's Let's Move! campaign, was created to promote healthy choices, improve food quality in schools, increase access to healthy foods, and promote physical activity has been influential in promoting the benefits of consuming fresh fruits and vegetables and reducing obesity among children (Let's Move, 2009).

A number of policies and initiatives have been established to encourage access to nutritious foods. The Farm Bill of 2008 allocated billions of dollars in funding for nutrition programs and includes funding for a study to assess the extent of limited food access in the United States (American Farmland Trust, 2009). The Supplemental Nutrition Assistance Program (SNAP), formerly the Food Stamp Program is under the auspices of the United States Department of Agriculture (USDA), and in 2010 provided nearly $65 billion dollars in food assistance.

The Healthy Food Financing Initiative (HFFIP), a $400 million dollar collaborative with the Treasury Department, USDA, and Office of Health and Human Services (HHS), has a goal to eliminate "food deserts" in the United States in seven years (Healthy Food Financing Initiative Implementation Plan, 2011). A food deserts is defined as "a low-income census tract where a substantial number or share of residents has low access to a supermarket or large grocery store," (USDA, ERS, 2011). A number of published studies have investigated the nutrition environment in urban areas (Franco et al., 2008; Gittelsohn et al., 2007; Glanz et al., 2007; Laska et al., 2010; Moore et al., 2006; Morland et al., 2002; Saelens et al., 2007; Zenk et al., 2005; and Zenk et al., 2006). Far less attention has been given to the rural nutrition environment, yet 20% of the United States population lives in rural areas (Gittelsohn et al., 2007; Liese et al., 2007).

Other policies and initiatives to encourage nutritious foods are Healthy People, Dietary Guidelines for Americans 2010, and the National Prevention Strategy (USDHHSa, 2011; USDA and USDHHS, 2010; and National Prevention Council, 2011). The goal for nutrition and weight status in Healthy People 2020 is to "promote health and reduce chronic disease risk through the consumption of healthful diets and achievement and maintenance of healthy body weights," (USDHHSb, 2011). The Dietary Guidelines for Americans 2010 encourage the consumption of healthy foods among Americans (USDA and USDHHS, 2010). The first ever National Prevention Strategy was released in June 2011. It was developed to increase the number of healthy Americans, and healthy eating is one of the seven priorities (National Prevention Council, 2011).

Social and Environmental Determinants of Diet

Social determinants of diet are explicitly indicated as an important component of nutrition and weight status in Healthy People 2020. Social determinants of diet are the personal

and social factors that influence diet. These social factors include: societal and cultural norms associated with food, food and agricultural policies, food assistance programs, and price. All are of consideration when addressing the consumption of nutritious food among ethnic and regionally diverse populations (USDHHSb, 2011). The concept of "foodways" emerged from the social sciences. It is used to describe the historical, social, cultural, economic, and anthropological characteristics of food and can provide insight to food preferences among specific ethnicities and geographic regions (Foodways, 2003).

Airhihenbuwa et al. (1996), James (2004), Grigsby-Toussaint et al. (2010), and Bovell-Benjamin et al. (2009) have emphasized and identified culturally-preferred foods among African Americans. Grigsby-Toussaint et al. assessed "the availability of commonly consumed and culturally specific fruits and vegetables" in stores located in African-American and Latino neighborhoods of a large midwestern metropolitan city. Their findings suggest that sparse availability may serve as an obstacle to consumption of the fruits and vegetables among the population in these neighborhoods (Grigsby-Toussaint et al., 2010, p. 746).

Anne Bower's, African American Foodways: Explorations of Food and Culture explores the historical, sociological, and anthropological influences on African-American food choices. Crucial to the familial and cultural connection of Blacks in the United States and to their African roots, food "has provided one of the few vehicles through which Blacks have been able to preserve their African heritage," (Whit, 2007; Mendes, 1971). Sweet potatoes, yams, grains, legumes (peas and beans), and oil palm trees were indigenous to Africa. Influences of these products can still be seen with sweet potatoes and yams as a staple during holidays in African-American homes. The influence of rice can be seen in meals prepared in South Carolina. Black-eyed peas are noted as an African contribution to meals (Garrett, 1966). Black-eyed peas and

collard greens are traditionally eaten on New Year's Day (McLeroy et al., 1988). In African-American families black-eyed peas and collard greens are known symbols of good luck and wealth.

There are also specific health benefits to these culturally-preferred foods. The isothiocyanates that occur in cruciferous vegetables such as cabbage, broccoli, and collard, mustard, and turnip greens have been associated with cancer preventive qualities (Murillo & Mehta, 2001). Legumes like beans and peas have properties that aid in the prevention of heart disease, cancer, and diabetes (Mitchell et al., 2009). Because food deserts are characterized by both low income and low access to food venues, increasing the availability of culturally-preferred foods, or other foods of interest to residents, may prove advantageous to consumption (Economic Research Service, 2011).

While research on the rural nutrition environment is limited, some data have been collected in rural Texas and other southern areas of the United States. Sharkey and his colleagues have published articles that investigate the nutrition environment in rural Texas, particularly the Brazos Valley and the Lower Rio Grande Valley (Sharkey et al., 2009; Sharkey et al., 2010; Sharkey et al., 2011). Their important work has focused on such aspects as types of food stores, neighborhood(s) needs, distance to, spatial access to, and fast foods. They have developed conceptual models to characterize food access, and identified ways to measure the food environment and associated challenges (Bustillos et al., 2009; Creel et al., 2008; Dunn et al., 2011; Sharkey, 2009; Sharkey et al., 2009; Sharkey et al., 2010; Sharkey et al., 2011).

Sharkey (2009) distinguishes three types of rural food stores: conventional or traditional, convenience, and nontraditional. The conventional or traditional food stores are "big box stores" like Super Walmarts, grocery stores, and markets (Sharkey, 2009). Gas stations and food marts

are convenience food stores. Nontraditional food stores are pharmacies, mass merchandisers (e.g. Target, Kmart, and Walmart), and dollar stores (Sharkey 2009). Liese and colleagues (2007) focused on the rural built nutrition environment in a southern community (Liese et al., 2007). They studied the types of stores, availability of particular foods, and price.

Conceptual models have emerged to better understand aspects of the nutrition environment. The ecological model of behavior proposes that multiple levels of social factors influence health behaviors: as intrapersonal (individual), interpersonal, institutional, community, and public policy. An onion has been used to depict the ecological model, with the individual in the center and multiple levels of social arrangements surrounding the individual (Sallis et al., 2008). Each of the levels in the ecological model has a significant role in the nutrition environment and in potentially reducing chronic diseases.

The nutritional environment for a defined geographical area can be assessed using the Model of Community Nutrition Environments developed by Glanz et al. (2005). Three types of variables: policy, environmental, and individual, influence eating patterns. The policy variables are government and industry policies. Community nutrition, organizational nutrition, consumer nutrition, and the information environment are all environmental variables. The community nutrition environment includes the types of stores or restaurants in an area, the location, and the accessibility, hours and physical characteristics of the food outlets. The organizational nutrition environment is the home, school, work, and other such environments. Available healthy options and price are factors in the consumer nutrition environment. The information environment consists of media and advertising. Individual variables are sociodemographics, psychosocial factors, and perceived nutrition environment (Glanz et al., 2005).

Gittelsohn and Sharma (2009) have contributed to the literature by exploring the physical, consumer, and social aspects of the nutrition environment in several unique and isolated communities: American Indian reservations, First Nations reserved, Marshall Islands, and low-income Baltimore areas. The findings of their work suggest that "special focus and consideration due to the vulnerability of the populations and to specific and unique aspects of each setting" is called for in such diverse communities.

Mississippi Delta and Southernmost Illinois as Vulnerable Settings

The Mississippi Delta Region which extends from Southern Illinois to Louisiana is characterized by its rich farmland and its large African-American population. It is also characterized by persistent poverty and chronic disease, to such an extent that it has been dubbed "The Stroke Belt" and the "Diabetes Belt" (Barker et al., 2011; Borhani, 1965; Howard, 1999). Moreover, there is a paradox in the Mississippi Delta having rich farmland while food deserts exist in this area.

Alexander and Pulaski counties in Illinois are located in the northern part of the Mississippi Delta Region. These counties share characteristics with other counties in the Delta Region: large African-American populations, rural setting, and high poverty. Alexander and Pulaski Counties except for one city (Cairo) have been identified as food deserts (USDA, ERS, 2011).

Since the Civil War, Alexander and Pulaski Counties have had populations among the greatest percentage of African Americans in the State of Illinois: 35.4% in Alexander, 32.4% in Pulaski. The median household income during 2006-2010 in Alexander and Pulaski counties was $28,833 and $31,173 respectively, with 20.1% and 22.7% of persons living below poverty level (U.S. Census Bureau, 2010). According to the Illinois Department of Human Services,

38% of the households received monthly SNAP benefits in 2010 in Alexander County. In Pulaski, 28% of the households received monthly SNAP benefits (Illinois Department of Human Services, 2010). Together, racial demographics, the rurality of these two counties, their geographic location, socio-economic profile, and food deserts designation warrant an in-depth investigation of the community and consumer nutrition environments. Michelle Obama so eloquently suggests, "so many of our citizens live in areas where access to healthy food, and thus a healthy future, is simply out of reach," (Obama, 2009). The community and consumer nutrition environments of these two counties may serve as a microcosm of areas elsewhere in Mississippi Delta Region.

Need for the Study

The National Prevention Strategy: America's Plan for Better Health and Wellness was developed to guide the United States in a focus on wellness and prevention (National Prevention Council, 2011). With an overarching goal to "increase the number of Americans who are healthy at every stage of life," the strategy has four strategic directions and seven priorities (National Prevention Council, 2011). One of the four strategic directions is the elimination of health disparities, while one of the seven priorities is healthy eating. The National Prevention Strategy supports both the direction and priority with such key facts as, "low-income and minority neighborhoods are less likely to have access to … full-service grocery stores," and that "over 23 million people, including 6.5 million children, live in "food deserts" – neighborhoods that lack access to stores where affordable, healthy food is readily available," (National Prevention Council, 2011). Recently, efforts to encourage healthy eating have begun to focus on macro-level or community, institutional, policy levels; moving beyond the traditional individual

focus on healthy eating. The National Prevention Strategy is another effort facilitated by the United States government to foster prevention, wellness, and improve health among Americans.

Purpose of the Study

The purpose of this study was to examine how African-American residents of a rural food desert navigate their nutrition environment to obtain the foods they eat. Residents' own perceptions of the nutrition environment, their food choices, and strategies for obtaining preferred foods were explored.

Research Questions

1) What foods are respondents eating?
2) To what extent are foods identified by researchers as healthy, culturally-preferred foods a part of the respondents regular diet?
3) What factors contribute to decision-making regarding food selection?
4) What factors contribute to where respondents shop?
5) What are specific characteristics of the nutrition environment: availability, price, and quality?
6) In what ways do the empirical characteristics of the nutrition environment (availability, price, and quality) influence the respondents' food selection and shopping?
7) How, if at all, do participants negotiate the limits of their nutrition environment to obtain healthy, culturally-preferred foods?

Significance to Health Education

The field of health education has seven areas of responsibility that assist in guiding the profession. The first area of responsibility is to "assess needs, assets and capacity for health

education," (NCHEC, 2006). A competency within the first area of responsibility is to "examine factors that enhance or compromise the process of health education" with a sub-competency to "assess social, environmental, and political conditions that may impact health education," (NCHEC, 2006). It is difficult for individuals to select healthy food options if in fact the healthy options are not available or limited, unfairly priced, or of unacceptable quality in communities. Conversely, options may be available but not used to advantage; and rural residents may be able to point to strategies for healthier diets. A better understanding of how rural African Americans operate within their limited nutrition environment can help health educators better plan, implement, and administer culturally-appropriate interventions and strategies to improve nutrition.

Research Design

An interpretive paradigm was used to describe, understand, and interpret how African-American residents of a rural food desert navigate their nutrition environment to obtain the foods they eat (Merriam, 2009). A phenomenological approach which is, "a study of people's conscious experience of their life-world, that is, their "everyday life and social action," the lived experience was examined (Merriam, 2009).

This study was a cross-sectional, mixed method design. It combined qualitative data from in-depth interviews with study participants and quantitative data used an inventory of food venues with a customized Nutrition Environment Measurement Survey-Stores (NEMS-S) that investigated the nutrition environment in Alexander County and Pulaski County in Southern Illinois (Glanz et al., 2007). The study was submitted to the Institutional Review Board of Southern Illinois University Carbondale for review and received approval on May 25, 2012 (Appendix L Southern Illinois University Human Subjects Committee Approval Letter).

Study Sample

A purposeful sample was used for the study, with the goal of maximizing variation to "adequately capture the heterogeneity in the population" (Maxwell, 2005). The participant sample consisted of 24 residents who meet these criteria: self-identified as African American or Black; residents of Alexander County and Pulaski County longer than 5 years; over 21 years of age; and the primary purchaser and preparer of food for the household (Appendix B Interview Eligibility). Individuals were selected from 9 areas within Alexander County and 9 areas within Pulaski County to allow for variations of experiences within the two counties (Maxwell, 2005). Residents of Cairo, Illinois, in Alexander County were not included in the sample; because it is not a food desert per the USDA definition of a food desert (USDA, ERS, 2011).

They were approached at a laundromat, a church, their homes, in their front yards, the parking lot of a store, neighborhood gathering places, the parking lot of a restaurant, and a RV/camper park. Twenty-four participants were asked about their shopping behaviors, food selections, food venues, accessibility, and specific ways in which they negotiate the limits of the nutrition environment.

Twenty-nine food venues (stores) were identified within the study area via existing government and public sources of food venues (stores). These include 5 types: grocery stores (10), "dollar" stores (3), gas stations-convenience stores-food marts (11), meat markets (3), and farmers markets (2) in Alexander and Pulaski counties, Illinois. Additional food venues were identified during the interviews. The most commonly cited food venues (stores) identified during the interviews were added to the sample. These food venues (stores) were located outside of Alexander County and Pulaski County and a new category of food venue (store) developed to describe the food venue (store).

Data Collection

The data collection instruments included an in-depth semi-structured interview protocol developed by the researcher and a customized NEMS-S to collect information about the availability, price, and quality specific food items. Individuals who agreed to participate were interviewed in their homes or other locations. In-depth semi-structured interviews were conducted with participating individuals using an interview protocol (Appendix C Interview Guide). The interview protocol was used to ascertain the foods eaten growing up, foods currently eaten, shopping behaviors, food selections, where they shop, accessibility, and ways in which they negotiate the limits of the nutrition environment. Ground-truthed methods or direct observations were used to investigate the food venues (stores) in the nutrition environment of the study area, (Liese et al., 2007; Odoms-Young et al., 2009; Sharkey et al., 2008).

A customized version of the Nutrition Environment Measurement Survey – Stores (NEMS-S) was used to enable the researcher to document availability, price, and quality of culturally preferred foods in the venues (stores) (Appendix E Customized NEMS-S). Culturally-preferred foods from the literature and the most commonly cited healthy, culturally-preferred foods during the interviews were included in the NEMS-S.

Data Analysis

The audio-recorded interviews were transcribed verbatim to a Microsoft Word document. Participants and their corresponding data were identified by an assigned pseudonym. The data coded and notes, or open coding, were made of the significant information (Merriam, 2009). The codes were used to establish categories. Themes or overarching statements were developed using categories and sorted to complement the research questions. The researcher created a

memo analysis while coding each transcript. The qualitative data analysis software, ATLAS.ti, was used to organize data, label codes, and manage transcribed data.

The researcher kept a reflective journal to document biases, feelings, thoughts, and opinions during collection. Descriptive statistics were used to describe data collected with the interview eligibility criteria such as: frequency and percentage of men and women, frequency and percentage living in each county, mean years of age of the sample, and standard deviation of age. Additionally, descriptive statistics included the mean years lived in the cities and counties, and standard deviation of years lived in the cities and counties. The number and percentage of people who received food benefits and eat meals/food in the household was described.

Data collected with the customized NEMS-S was entered in the NEMS-S Scoring Sheet, a Microsoft Excel worksheet, to document the availability, price, and quality of the items. The available varieties were totaled, grouped, and assigned points (Appendix F Customized NEMS Scoring Sheet for Stores). Each store could receive a maximum NEMS-S availability score of 9 points per food venue (store). The NEMS-S availability scores were compared within food venues (stores): grocery stores, "dollar" stores, gas stations-convenience stores-food marts, meat markets, farmers markets, and other types. The price of the 3 groups of food items in the study were displayed in a table by each of the types of food venues (stores).

Quality of the items were assessed by either acceptable (A) or unacceptable (UA) for the fresh fruits and fresh vegetables. Each store could receive a quality score with a maximum of 6 points per food venue (store). The NEMS-S quality scores was compared within food venues (stores) and among the different types of food venues (stores). The data analyses were completed using SPSS software.

Data obtained from interviews and food venue (store) data obtained from the NEMS-S were triangulated to describe the nutrition environment in the study area. The most cited culturally-preferred foods identified during the interviews were added to the customized NEMS-S; subsequently, the most cited food venues (stores) were assessed with the NEMS-S. Additionally, qualitative data about the availability, price, and quality of food items were used to confirm or negate the same data collected using NEMS-S. Triangulation of data collection methods and the participatory nature of the subjects gave dimensionality to research on the nutrition environment.

Assumptions

Assumptions are, "believed to be a fact, but cannot be verified as one," (Neutens & Rubinson, 2002).

1. Participants willingness to discuss the subject matter and to be honest during the interviews.
2. The researcher being African American and familiar with the study area aided in the reliability, rapport and trust of those being interviewed.
3. The participants' recall of dried legumes (beans and peas), fresh fruits, and fresh vegetables eaten both while growing up and currently were reasonably accurate.
4. The store owners allowed the NEMS-S instrument to be completed in their stores.

Delimitations

Delimitations are boundaries imposed or created by the researcher (Neutens & Rubinson, 2002).

1. The study sample consisted of residents of Alexander and Pulaski Counties, Illinois, living in the counties for at least 5 years, who are African American, over 21 years of age, and the primary purchaser and preparer of foods in the household.
2. The study area included the 6 census tracts (CT) and 22 census block groups (CBG) that comprise Alexander and Pulaski Counties of southern Illinois. Individuals living in the city of Cairo will be excluded from the interviews because these individuals do not reside in a food desert.
3. Restaurants, fast food venues, carry-out foods, other pre-prepared foods were not included in this study.
4. Data was collected during Summer months when specific fruits and vegetables were available.
5. Data collected with the NEMS-S was limited to culturally-preferred dried legumes (beans and peas), fresh fruits, and fresh vegetables.

Limitations

Limitations are boundaries created, "by factors or people other than the researcher," (Neutens & Rubinson, 2002).

1. The seasonality of the culturally-preferred dried legumes (beans and peas), fresh fruits, and fresh vegetables may have led to biased results; in that the availability of specific foods may be limited due to the time of the year or season.
2. The number of stores identified in the study area may also be a limitation as prior studies conducted using NEMS-S include a larger number of food venues or stores.
3. The refusal of store owners to allow the NEMS-S to be conducted in their store may limit the amount of data available.

4. Findings from the qualitative research must be interpreted with caution; they are not directly generalizable to a larger population.
5. The use of a purposeful sample is a limitation because such a sample is not directly generalized to the larger population.

Definitions

Acceptable quality is defined as "peak condition, top quality, good color, fresh, firm, and clean," (Glanz et al., 2007).

Accessibility is "the ease of access to a particular neighbourhood feature with more accessible destinations having lower travel costs in terms of distance, time, and/or financial resources" (Thornton et al., 2011).

African-American Culturally-Preferred Foods are foods documented in previous published literature that explore the foods commonly consumed and/or culturally-preferred by African Americans such as: pinto beans, red beans, black-eyed peas, kidney beans, large lima beans, baby lima beans, navy beans, cantaloupes, strawberries, watermelons, grapes, bananas, apples, peaches, collard greens, mustard greens, turnip greens, spinach, lettuce, kale, cabbage, broccoli, okra, sweet potatoes, pumpkins, squash, and carrots (Bovell-Benjamin 2007; Bovell-Benjamin et al., 2009; Bovell-Benjamin et al., 2010; Grigsby-Toussaint et al., 2010; Izumi et al., 2011; and Odoms-Young et al., 2009).

ATLAS.ti is a qualitative data software that will be used to organize data, assign codes, and manage transcribed data (Creswell, 2007, pp. 166)

Availability of the fruit or vegetable is recognized by yes or no, if the item is identified or not identified (Glanz et al., 2007).

Community Nutrition Environment includes the "type, location, and accessibility of food outlets," (Glanz et al., 2005).

Consumer Nutrition Environment is the available healthy options and price of foods (Glanz et al., 2005).

Dietary Guidelines for Americans is the newest in a series of guidelines of documents

produced by the federal government since 1980 as a means to encourage healthy eating and physical activity in the United States. The new guidelines address nutrition among a population that is overweight with risks of chronic diseases (USDA and USDHHS 2010).

Farm Bill 2008 totals approximately $289 billion dollars with 65% or ($188.9 billion dollars) allocated for nutrition programs (American Farmland Trust, 2009**)**. The farm bill is much more than aid to farmers, but encompasses a wide range of programming that supports growing, eating, conserving, and producing renewable energy.

Farmers Market-Task Force (SB1852) primary responsibility is to assist in developing administrative regulations for farmers markets in the state of Illinois (Illinois General Assembly b, 2011).

Food Deserts is "a low-income census tract where a substantial number or share of residents has low access to a supermarket or large grocery store" (USDA, ERS, 2011).

Food Systems can also be defined as, "the set of complicated, interrelated, and often tangled biophysical and social structures, processes, and materials that yields plant, animal, mineral, and synthetic substances that people define as consumable for sustenance or pleasure" (Gillespie & Gillespie, 2000).

Foodways emerged from the social sciences and is used to describe the historical, social, cultural, economic, and anthropological characteristics to signify the customs and traditions related to food (Encyclopedia of Food & Culture, 2002).

Food Venues (stores) are the locations (grocery stores, "dollar" stores, gas stations-convenience stores-food marts, meat markets, and farmers markets) in the study area where the African-American culturally-preferred foods will be assessed with the Nutrition Environment Measurement Survey-Stores.

Ground-truthed methods are direct or on-site observations (Liese et al., 2007; Odoms-Young et al., 2009; Sharkey et al., 2008)

Healthy Food Financing Initiative a $400 million dollar collaborative with the Treasury Department, USDA, and Office of Health and Human Services (HHS) to increase healthy food outlets in underserved communities with limited access throughout the country ((Healthy Food Financing Initiative Implementation Plan, 2011).

Healthy People 2020 "provides science-based, 10 year national objectives for improving the health of all Americans" (USDHHSa, 2011).

Information nutrition environment consists of media and advertising in the nutrition environment (Glanz et al., 2005).

The Illinois Local Food Entrepreneur & Cottage Food Operation Act (SB0840) allows for the sell of specific foods made in home kitchens at farmers markets with explicit guidelines (Illinois General Assembly b, 2011)

Maximum variation sampling is a type of purposeful sampling that allows the researcher "to adequately capture the heterogeneity in the population," or an array of experiences (Maxwell, 2005).

Model of Community Nutrition Environments was developed by Glanz et al. (2005) to describe the policy, environmental, and individual influences on eating patterns.

The National Prevention Strategy: American's Plan for Better Health and Wellness developed in June 2011 with aims to increase the number of healthy Americans through prevention using four strategic directions and seven priorities (National Prevention Council, 2011).

NEMS-S (Nutrition Environment Measurement Survey-Stores) a measure of the community and consumer nutrition environment that was developed to assess the availability of healthy options, price, and quality of ten food categories (fruit, vegetables, milk, ground beef, hot dogs, frozen dinners, beverages-soda and fruit juice, baked goods, bread, and snack chips) in stores (Honeycutt et al., 2010; McKinnon et al., 2009; and Sallis et al., 2006).

Organizational Nutrition Environment includes home, school, work, and other such environments (Glanz et al., 2005).

Unacceptable quality is defined as "bruised, old looking, mushy, dry, overripe, dark sunken spots in irregular patches, or cracked or broken surfaces, signs of shriveling, mold or excessive softening," (Glanz et al., 2007).

CHAPTER 2

REVIEW OF LITERATURE

The United States Department of Agriculture (USDA) and the United States Department of Health and Human Services (HHS) released the Dietary Guidelines for Americans, 2010 on January 31, 2011. The 2010 edition is the newest in a series of guidelines of documents produced by the federal government since 1980 as a means to encourage healthy eating and physical activity in the United States. The 2010 guidelines differ from previous guidelines in that the previous provisions were, "for healthy Americans ages 2 years older," while the new guidelines are, "for Americans ages 2 years and older, including those who are at increased risk of chronic disease." The new guidelines address nutrition among a population that is overweight with risks of chronic diseases (USDA and USDHHS 2010).

The major recommendations from the Dietary Guidelines for Americans are: calorie balance, reduction and increase of specific foods and their components and nutrients, eating patterns that are healthy, and healthy choices. Moreover, there are recommendations throughout the guidelines that seek to promote health and reduce chronic disease. Twenty-three key recommendations as well as 6 recommendations for particular populations, "children and adolescents, women-capable of becoming pregnant, pregnant, breastfeeding, older adults, and adults at high risk for chronic disease," are included (USDA and USDHHS 2011). The value of diversity in food choices is evident in the guidelines; for the "recommendations accommodate the varied food preferences, cultural traditions, and customs," (USDA and USDHHS 2011).

The Dietary Guidelines for Americans, 2010 acknowledge the food and physical activity environments as well as the multi-sectoral influence of individual, family, organization, community and public policy in promoting health (USDA and USDHHS 2011). The USDA

urges individuals to conceive eating habits in a new way with MyPlate instead of the Food Pyramid. The MyPlate icon was released to the public on June 2nd, 2011 by Michelle Obama and Tom Vilsack the USDA Secretary. The message that accompanies the food icon is to make half your plate fruits and vegetables, the other half grains and protein, add dairy to your meal, and exchange sugary drinks for water (ChooseMyPlate.gov, 2012).

High consumption of cruciferous vegetables like, greens (collard, turnip, and mustard), cabbage, and kale are related to fighting prostate, colon, and lung cancer (Cohen et al., 2000; Kohlmeier et al., 1997; London et al. 2000; Murillo & Mehta 2001; Wattenberg, 1975; Wattenberg, et al., 1976; Wattenberg et al., 1978). Dry beans, peas, and lentils have fiber, protein, folate, zinc, iron, and magnesium, all important nutrients, yet only 7.9% of US adults eat legumes on any particular day (Mitchell et al., 2009). Like legumes, the consumption of dark green and cruciferous vegetables is low among Americans (Johnston et al., 2000). Vegetables like cabbage, broccoli, and greens have been known to have qualities that prevent cancer (Beecher, 1994; Murillo & Mehta, 2001). Many of the recommended healthy food items have also been identified as foods that are culturally preferred by the African-American community.

The social ecological model has been suggested to ascertain influences on dietary patterns. Woods (2009) documents the use of an ecological framework to investigate the link between living beings and the environment as early as the 1800s (Netting, 1986). Since the 1800s the ecological framework has evolved and been used in a variety of disciplines (Lewin, 1936; Skinner, 1953). Human behavior and health promotion are among the many disciplines in which the ecological framework has been used (Barker, 1963; Berkman, 1995; Green et al., 1996; Grzywacz & Fuqua 2000; Minkler, 1999; Richards et al., 1996; Sallis & Owens, 1997; Stokols 1996, 2000a, 2000b).

McLeroy et al. (1998) propose that the social ecological model for health promotion expands the works of previous ecology scholars (Belsky, 1980; Brofenbrenner 1977, 1979) who explore "behavior and its individual and environmental determinants". Brofenbrenner's ecological model emphasizes multiple levels of influence as well as reciprocal causation. Brofenbrenner categorizes the multiple levels of influence as micro, meso, exo, and macrosystems. The microsystem encompasses "face-to-face influences" like family and friends while the mesosystem are the, "interrelations among the various settings," such as a faith-based community or educational setting. The exosystem includes the economic climate or extended social system that has an effect on the individual and the macrosystem entails, "the cultural beliefs and values," that one possesses. Reciprocal causation suggests that behavior both affects and is affected by the social environment (McLeroy et al., 1988).

The Social Ecological Model has five levels of influence on behavior as conceptualized by McLeroy and colleagues. The five levels are: intrapersonal, interpersonal, community factors, organizational (or institutional) factors, and public policies. Characteristics such as knowledge, attitudes, beliefs, and personality traits are intrapersonal factors. Interpersonal influences are the social supports, like family and friends. Community factors are the norms and values that exist within an entity such as an institution or neighborhood. Organizational or institutional factors are the policies and regulations that may impact behavior. Public policy factors are those regulations and laws at all levels of government enacted to promote health (McLeroy et al., 1988; Robinson, 2008).

Smedley and Syme (2000) expanded the ecological model to include demographic characteristics such as: "age, gender, race, ethnicity, and socioeconomic differences". The model is also inclusive of, "social and familial relationships, environmental contingencies, and

broader social and economic trends." Smedley and Syme (2000) use a river metaphor (downstream, mainstream, and upstream) to describe the focus of intervention efforts. The authors further explain downstream as the individual factors, mainstream as population-based factors, and upstream as societal factors or public policies (Smedley & Syme, 2000).

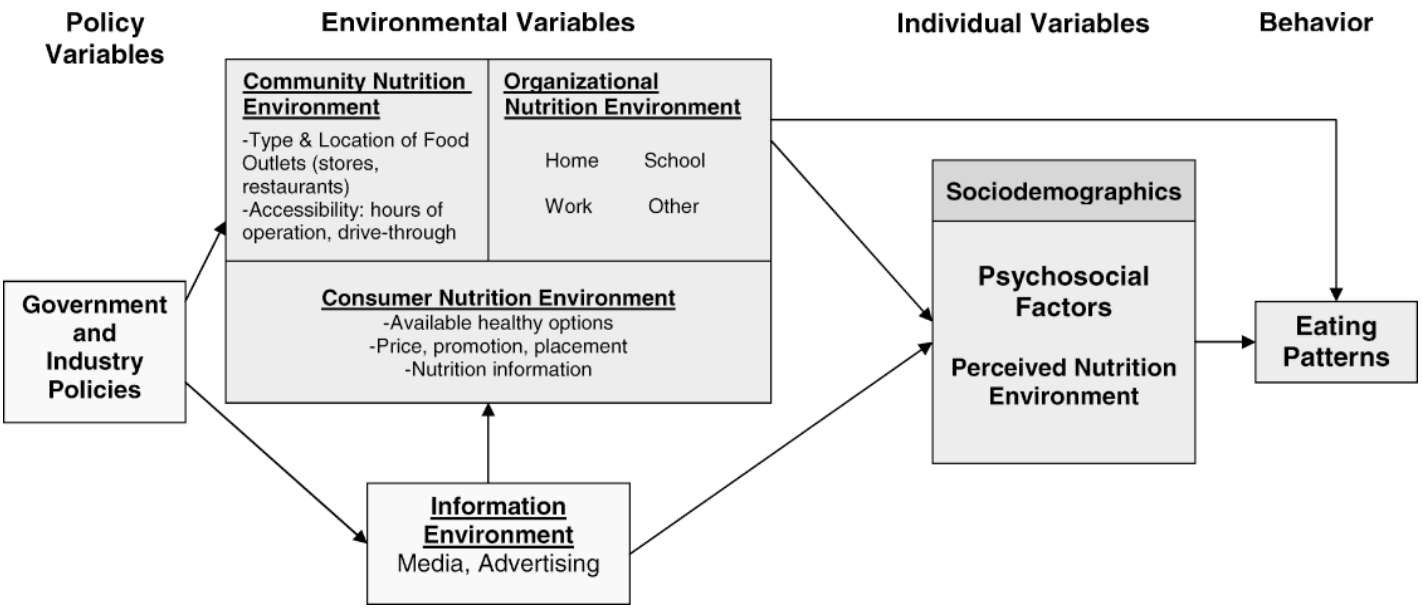
Robinson (2008) conducted a literature review of 12 published articles from 2000 to 2007 to examine the use of the socio-ecological model in health programs to increase intake of fruits and vegetables among low-income African Americans. She identified the complexity of "personal, cultural, and environmental," factors needed to improve fruit and vegetable intake among African Americans with suggestions for families and friends, educational programs, self efficacy, self enhancement, physical environment and food stores, role expectations related to the purchasing, preparation, and planning of food, cultural traditions, and the church. Literature on dietary behavior has largely focused on the individual; however, the social ecological model allows for consideration of the cultural, economic, policy, and environmental factors, specifically food environment, that influence dietary behavior.

Social determinants of diet that explore personal, societal, and cultural factors associated with food, food and agricultural policies, food assistance programs, and price are important factors in the consumption of healthy foods such as fresh produce among ethnic and racially diverse populations in the United States (USDHHSb, 2011). Culture is an important aspect of nutrition and is reflected in the social ecological model at the community level. For example, New Year's Day traditions like black-eyed peas and greens for luck and wealth in the coming year are African-American cultural beliefs and values that continue to be important in many African-American communities related to the food environment (McLeroy et al., 1988).

Moreover, Glanz et al. (2005) applied the ecological model in their Model of Community Nutrition Environments. In this model, policy, environmental, and individual are depicted as influencing eating patterns. Policy includes government and industry policies. Community nutrition, organizational nutrition, consumer nutrition, and the information environment are all environmental variables. The community nutrition environment includes the "type, location, and accessibility of food outlets"; while the organizational nutrition environment includes home, school, work, and other such environments. Available healthy options and price are factors in the consumer nutrition environment. The information environment consists of media and advertising. Individual factors are the socio-demographics, psychosocial factors, and individuals' perceptions about their nutrition environment.

Figure 1

Model of Community Nutrition Environments



Socio-historical and Cultural Implications of Health and Food

Social Determinants of Health and Health Equity

The World Health Organization (WHO) contends that social determinants of health, "are the conditions in which people are born, grow up, live, work, and age," …. "shaped by the distribution of money, power and resources at global, national and local levels, which are themselves influenced by policy choices," (World Health Organization, 2011). WHO's Commission on Social Determinants of Health produced a report, *Closing the gap in a generation, Health equity through action on the social determinants of health*, with three recommendations: "improve daily living conditions; tackle the inequitable distribution of power, money, and resources on all levels; and to measure and understand the problem and assess the impact of action," (Commission on Social Determinants of Health, 2008, pp. 2). The recommendation to improve daily living conditions includes the influence of the places people live on their lives, reflecting an ecological perspective. People living in rural areas experience specific challenges. Rural communities worldwide endure, "underinvestment in infrastructure and amenities," often resulting in out-migration (Commission on Social Determinants of Health, 2008). This out-migration is problematic for both rural and urban areas in that resources become increasingly limited for those in the rural areas; subsequently, urban areas experience the burden of housing, transporting, caring, and feeding the increase populations in the areas (Commission on Social Determinants of Health, 2008).

Healthy People, released every 10 years by the Federal government, presents objectives to improve the health of the nation (USDHHSa, 2011). Among the many topics and objectives of Healthy People 2020 are nutrition and weight status. The goal for nutrition and weight status is to, "promote health and reduce chronic disease risk through the consumption of healthful diets

and achievement and maintenance of healthy body weights," (USDHHSb, 2011). Inadequate nutrition is a health risk related to many chronic diseases like cancer, diabetes, and heart related conditions. Health care and treatment of chronic diseases are expensive yet preventable (CDC, CDPHP, 2011). An analysis of the National Center for Health Statistics (NCHS) data found that 40.5 percent more deaths or 83,570 excess deaths could be prevented if the mortality gap between black and white was eliminated (Satcher et al., 2005). Chronic diseases like heart disease, stroke, cancer, diabetes as well as HIV/AIDS disproportionately impact minorities; consequently, achieving health equity for all is a priority of Healthy People 2020 (CDC, OMHD, 2011).

Black Migration to Alexander and Pulaski Counties, Illinois

The counties under investigation in this research reflect several phrases of migration, both in and out migration during the course of nearly 100 years. The southern portion of the rural North became home to a large number of Blacks during and after Civil War; particularly the southernmost counties of Illinois (Carlson, 1982). Prior to the Civil War the Black population numbered only 206 in Pulaski, Massac, and Alexander Counties; by 1900 30% of the population in these 3 counties was Black (14,298 of 47,032) (Carlson 1982). This was proportionately the largest concentration of African Americans outside the south in 1900 (Motley Portwood, 2000). Pulaski County had the largest proportion of Blacks in 1900, with 40% (Carlson, 1982; Carlson, 1987).

Many Blacks came to Southern Illinois from southern states like Tennessee, Kentucky, and Mississippi for economic, social, and political reasons (Carlson, 1982; Carlson, 1987; Motley Portwood, 2000). Isabel Wilkerson also documented the migration in her 2011 book, The Warmth of Other Suns The Epic Story of America's Great Migration, which explores the

lives of 4 individuals who migrated from the South to the North and Northeast for many of the same reasons Carlson suggests discrimination, economic challenges, and natural disasters (Carlson, 1982; Wilkerson, 2011). Many of the Black individuals who migrated to Southern Illinois were former slaves and their descendents from nearby states like Tennessee, Kentucky, Missouri as well as Mississippi, Arkansas (Motley Portwood, 2000). Many Blacks moved from other parts of Illinois to the southernmost part of the state. Many achieved independence by owning farmland and businesses in Pulaski County and Alexander County, Illinois (Carlson, 1987; Motley Portwood, 2000). Like other rural communities in the Mississippi Delta, rural Pulaski and Alexander counties have experienced an out migration to more urban places after World War II (Ginwright & Akom, 2007; Izumi et al., 2011). Although the populations Pulaski and Alexander Counties, Illinois have declined; the two counties still contain the largest percentage of Blacks in Illinois counties with a population of 32.4% and 33.0% respectively, in the 2010 U.S. census (U.S. Census, 2010).

Foodways

Crucial to the familial and cultural connection of Blacks in the United States and to their African roots, food "has provided one of the few vehicles through which Blacks have been able to preserve their African heritage," (Whit, 2007; Mendes, 1971). The term, "foodways," emerged from the social sciences and is used to describe the historical, social, cultural, economic, and anthropological characteristics of food and eating practice. The terms foodways and folklores have been fused to create foodlores to signify the customs and traditions related to food. Foodways was first used among Americans during the New Deal, Works Progress Administration (WPA), and Franklin D. Roosevelt era to document the ways of Americans during this era, fieldworkers were sent to communities, "to gather the evidence of [their]

tradition and creativity among," which entailed aspects of everyday life like celebrations, festivals, and the foods (Encyclopedia of Food & Culture, 2002).

The edited work of Anne Bower, African American: Foodways Explorations of Food and Culture (2007) is a collection of essays on African-American foodways that provides a historical, sociological, and anthropological/archaeological account of African-American food. The essayists in Bower's book argue that these various influences are relevant to foods and consumption habits, among African Americans today. In Robert L. Hall's essay "Food Crops, Medicinal Plants, and the Atlantic Slave Trade," he indicates that sweet potatoes, yams, grains, legumes, and even palm oil trees were indigenous to Africa (Hall, 2007). Even today sweet potatoes and yams are a staple during holidays in African-American and southern homes. The influence of rice can be seen in South Carolina dishes. Legumes like beans and peas are also common in southern and African-American dishes. In fact, scholar Romeo B. Garrett notes black-eyed peas were brought to America by Africans during the middle passage. The peas were used as sustenance for the slaves (Garrett, 1966). Other foods arrived from parts of Asia to Africa and on to the United States: yams, plantains, bananas, and rice. Hot seasonings or spices were used to flavor food and for medicinal purposes in treating problems like indigestion and flatulence.

To reference the African influences on food, Hall maintains that, "nowhere in the United States is this more evident than in the consumption patterns and food preparation techniques found in the southern states, where the descendants of Africans were concentrated during the antebellum period and for many years after," (Hall, 2007). These influences are seen throughout the Mississippi Delta Region and even in areas where large numbers of African Americans migrated. In the essay entitled "Soul Food as Cultural Creation," author William C. Whit

explores "the production, collection, storage and preservation, distribution, preparation, consumption, and disposal of foods," (Whit, 2007). Similarly as noted in Hall's essay, foods such as yams, rice, black-eyed peas, okra, spinach, greens, squash, and sweet potatoes were brought to America from Africa via the slave trade (Whit, 2007).

Once in the Americas, gardens were common among slaves and beneficial for both the slaves and owners. Alliances with Native Americans resulted in the addition of learning how to obtain the most from the new lands they encountered. The many ways slaves acquired food included: hunting and fishing, making use of disposed organ meats, stealing and purchasing foods, and scavenging. A variety of greens were common foods while Native American meat influences were common as well. A way to prepare food quickly, frying, was used among slaves (Whit 2007). Whit concludes the essay by presenting a paradox of how the frying and high fat food culture among Black slaves served their physically strenuous lifestyle; subsequently, those inherited practices have been deadly for their less physically-active descendants.

After emancipation many slaves became sharecroppers or tenant farmers who were often indebted to the land owners; for prices of goods were extremely inflated. Nevertheless, Yentsch contends that some tenant farmers lived parsimonious lifestyles allowing them to acquire land. These land owners acquired the autonomy to garden produce of their liking and raise animals. Later, selling the produce became a means of economic resourcefulness for many Blacks. Vendors would sing songs, "in the rhythm of old spirituals," to garner interest in their produce. One such song, *"Ah got string beans! Ah got cabbage! Ah got collard greens! Ah got um! . . . Ah got anythin' you' need,"* (Yentsch, 2007). Shirley Motley Portwood reminisces of men from Missouri, "who peddled their goods in town or along (our) road," during the summer months in Pulaski County, Illinois. She recalls the men saying, "*Watermelons! Watermelons! Missouri*

melons!" (Motley Portwood, 2000). The social, cultural, economic, anthropological, and historical implications of African and African-American foodways exist among the present day ways foods are obtained, prepared, and consumed in the United States (Bower, 2007).

African-American Culturally-Preferred Foods

A rural southern post-slavery (1895 – 1908) examination of foods consumed by Blacks revealed availability and income were factors associated with core, secondary core, and peripheral foods by Dirks and Duran (2001). Foods that have been previously identified in the literature were also identified by Dirks and Duran. These foods include: pork (bacon and lard) and sugar. Vegetables identified were sweet potatoes, greens, and dried cowpeas (Dirks and Duran, 2001; Hargreaves et al., 2002).

Airhihenbuwa et al. (1996) conducted focus groups interviews in South Central Pennsylvania among African Americans aged 13 to 65 and over to investigate eating patterns and the cultural associations using the cultural appropriateness of health behavior. One of the major 3 themes derived from the focus groups was, "healthfulness of 'soul food' and other traditional food practices." This theme yielded responses that identified soul foods as green vegetables, macaroni and cheese, fried foods, pork, chicken, spicy foods, beans, and organ meats like chitlins (chitterlings). Moreover, pot liquor (the liquid in which vegetables and meats have been prepared) was identified as a common food in African-American communities. It has vitamins and is often used feed infants instead of traditional foods for babies. The focus group participants also recognized that 'soul food' has elevated fat, salt, and cholesterol. The participants also acknowledged the socio-historical and cultural relevance of foods with links to Africa, the implications of slavery, and influence of the southeastern region of the United States on African-American food choices (Airhihenbuwa et al., 1996).

In her 2004 article, "Factors Influencing Food Choices, Dietary Intake, and Nutrition-Related Attitudes among African Americans: Application of a Culturally Sensitive Model," James used concepts of the PEN-3 model to guide focus groups in exploring, "how culture and community impact the nutrition attitudes, food choices, and dietary intake of a select group of African Americans in north central Florida," (James, 2004). Some of the findings suggest among those in the focus group that, "foods are used to celebrate and affirm culture," while vegetables are preferred cooked rather than raw. Foods like cruciferous vegetables, pork (chitterlings, hog maws, and barbecue), macaroni and cheese, and fruit desserts are examples of 'soul foods'. James also provides an operational definition of 'soul foods,' "the 400-year-old African American cuisine … foods of the ancestors (that) nourish the body, nurture the spirit, and comfort the soul," (James, 2004).

Kittler and Sucher (2001) articulate the socio-historical and cultural significance of food in their work. These authors suggest that 'soul food' evolved from a mesh of West African, British, Spanish, and American Indian cultures. Similarly, Kittler and Sucher identify these foods as cruciferous vegetables (green leafy vegetables), pork, sweet potatoes, and corn to name a few. They also emphasize the preparation of these foods as fried, roasted, and boiled (Kittler & Sucher, 2001).

Bovell-Benjamin and colleagues completed two separate studies that used focus groups and food diaries to identify the foods consumed and other aspects of food in a sample of rural southern Blacks (Bovell-Benjamin et al., 2009; Bovell-Benjamin et al., 2010). One study used 8 focus groups to determine the dietary practices and food preferences and preparation among the sample to modify a dietary health questionnaire (DHQ). The researcher's findings were comparable to other literature on diet and southern African Americans, with such characteristics

as high fat, high sodium, sugar, and fried foods. Of particular interest were the fruits and vegetables consumed by the sample. Bovell-Benjamin and colleagues found the cruciferous vegetables (greens, cabbage, collard, turnip), spinach, okra, carrots, squash, and sweet potatoes. An assortment of peas and beans like early peas, black-eyed peas, field peas, sweet peas, purple hull peas, and pinto beans were also commonly consumed legumes (Bovell-Benjamin et al., 2009).

Moreover, Bovell-Benjamin and colleagues also used a 3-day food diary among 114 African Americans living in rural Macon County, Alabama to ascertain the food consumption practices of this sample. The results of the study were reported by the foods consumed during each meal. Similar to the previous study described the foods consumed were high fat, high sodium, sugar, and fried as well as processed-protein and fast foods. Consumption of fruits and vegetables were irregular. Greens were commonly consumed along with peas and beans; however, these foods were prepared with salt, pork, and processed meats. The results suggest the need for culturally specific programs (Bovell-Benjamin et al., 2010). Additionally, the researchers debunk the monolithic notion of African-American culture and emphasize the need for interventions tailored to specific cultures and regions among people of the African diaspora (Bovell-Benjamin et al., 2010).

Grigsby-Toussaint et al. (2010) and Izumi et al. (2011) are among the researchers who have employed quantitative methodologies to investigate foods in minority communities. Grigsby-Toussaint et al. (2010) identified both commonly consumed and culturally-specific fruits and vegetables in Chicago food stores serving African-American and Latino communities. The researchers used chi-squared tests and geographic information systems (GIS) to examine differences in the fruit and vegetable availability in the two communities. The culturally-specific

fruits and vegetables they studied in the African-American communities were greens (mustard, collard, turnip), chard, kale, spinach, okra, a variety of squash, sweet potatoes, beets, black-eyed peas, pinto beans, red beans, and kidney beans. The researchers found that stores in African-American and Latino communities had more "culturally relevant" fresh fruits and vegetables to their community's majority group of residents.

In Detroit, Izumi et al. (2011) explored the consumption and availability of dark-green and orange vegetables in stores serving among neighborhood sample of 919 adults, mostly African American (56.7%) and Latino (22.2%) using linear regression and geographic information system (GIS) data were used in the analysis. Availability was defined as presence of five or more of the vegetables in the store. Sixteen types of vegetables were investigated: 3 types of greens, 2 types of lettuce, spinach, kale, broccoli, sweet potatoes, yams, carrots, pumpkin, and 4 types of squash. An average of 0.61 daily servings were consumed and individuals in neighborhoods without stores possessing five or greater types of the vegetables of interest consumed 0.17 fewer daily servings than individual in areas with fewer stores possessing five or greater types of vegetables of interest.

A qualitative study of 30 women in Greater Englewood, a low-income African-American community in Chicago, detailed perceptions of the food environment and ways the women acquired food. The women in Greater Englewood found many ways to adapt to the environmental barriers such as: purchasing food items in a number of stores, traveling between 0.5 to 5 miles to purchase foods, settling for foods, and being advocates by reporting concerns or requesting food products, quality, or safety (Zenk et al., 2011). Store availability and upkeep as well as food quality and availability were material barriers for the women in this community. While expensive food prices was an economic barrier; safety, the sale of cigarettes and alcohol to

underage persons, and lack of accepting food benefits were social-interactional barriers identified in the study (Zenk et al., 2011).

In their article that suggests implications for intervention and policy, Odoms-Young et al. (2009) also provided insight to the "social aspects of neighborhoods," in African-American communities such as physical safety and ethnic/cultural differences between the customers and retailers. Likewise, in low-income inner city Baltimore, language and cultural challenges were identified among the Asian-American store merchants in African-American communities (Gittelsohn et al., 2009).

Nutrition Environment

Food Systems

Until recently, little attention has been given to the complex and intricate process known as a food system. A food system is an all-encompassing term used to describe the process food takes to arrive at consumption or the process from "farm to the purchaser," (Thibert et al., 2011). Food system can also be defined as, "the set of complicated, interrelated, and often tangled biophysical and social structures, processes, and materials that yields plant, animal, mineral, and synthetic substances that people define as consumable for sustenance or pleasure," (Gillespie & Gillespie, 2000 pp. 2; Kloppenburg et al., 1996; Sobal et al., 1998). As the definition for food systems is broad, the involved and interrelated process entails agriculture, social aspects of food, production, transportation, distribution, home facets of food, waste, and policies (Gillespie & Gillespie et al., 2000). Eckert and colleagues (2011) postulate that food systems are not only rural and agricultural centered. Pothukichi and Kaufman (1999) identified reasons as to the oversight of urban food systems of which are geographic specific policy and challenges. There are urban characteristics to food systems that urban planners can use to orchestrate food systems.

Planners and those with land use expertise incorporate food systems as an afterthought if at all in their planning efforts; nonetheless, community food systems could have an integral role in facilitating access to food in all geographic diverse areas.

Community food systems are the smaller segments of the larger food systems. It "is that part of the larger food system that is geographically located in a community," (Gillispie & Gillespie, 2000 pp. 5). These systems can be managed by those within or outside of the community. Healthfulness, sustainability, resiliency, and accessibility are a few community system characteristics. Accessibility implies the ability to obtain likeable foods (Gillispie & Gillespie, 2000). Rural communities have particularly vulnerable community food systems due to the distance and isolation; yet there are assets of these communities that can be strengthened. "One way to build community health and restore rural communities' local food infrastructure is by emphasizing local, sustainable, and healthy food systems," (Mader & Busse, 2011 pp. 50). Similarly, improving the social and civic structures in rural counties and communities can improve food issues. A study that examined food insecurity and civic structure found that personal connections, social support, food security, rural church food banks, outreach, and potlucks are means to improve the food issues in such communities (Morton et al., 2005)

Food Access

A conceptual model of food access borrowed from literature in access to healthcare has been proposed by Sharkey et al. (2010). The model suggests that characteristics of the food environment (type, size, location, foods, price, and quality) are both influenced by and influence potential consumer characteristics (neighborhood, transportation, food preparation and preferences, and culture). The barriers or facilitators constituted by these characteristics influence food purchases, choices, and eating. The food environment characteristics also

influence the potential access or availability. Potential access is the geographic and social dimensions. Realized access or utilization is the place where the consumers purchase foods. The potential consumer characteristics influence the realized access or utilization (Sharkey et al., 2009). The conceptual model of food access provides a new means to investigate the food environment and its influences with the opportunity to measure the components. This conceptual model is particularly significant because it differentiates between potential and realized access. For example, a food store may be located in one's neighborhood or considered available (potential access) but the individual may instead use other food venues (realized access).

Rural Food Environment

A number of published studies have investigated the food environment in urban areas, large metropolitan cities (Franco et al., 2008; Gittelsohn et al., 2007; Glanz et al., 2007; Laska et al., 2010; Moore et al., 2006; Morland et al., 2002; Saelens et al. 2007; Song et al. 2009; Zenk et al., 2005; Zenk et al., 2006). Far less, attention has been given to the rural nutrition environment; yet 20% of the United States population lives in rural areas (Gittelsohn et al., 2007; Liese et al., 2007).

Sharkey (2009) distinguishes three types of rural food stores: conventional or traditional, convenience, and nontraditional. The conventional or traditional food stores are "big box stores" like Super Walmarts, grocery stores, and markets (Sharkey 2009). Gas stations and food marts are classified as convenience food stores. While examples of nontraditional food stores are pharmacies, mass merchandisers (e.g. Target, Kmart, and Walmart), and dollar stores (Sharkey 2009).

Liese et al. (2007) focused on the rural built nutritional environment, in Orangeburg County, South Carolina, where 77 stores of 3 different types: supermarkets (16%), grocery

stores (10%), and convenience stores (74%) were visited to measure the price and availability of specific foods. The foods measured were vegetables, milk, chicken, beef, tuna, salmon, turkey, and bread. Additionally, the built environment included measures of store types, hours, handicap parking, ramp/curb cuts, off-street parking, automatic doors, and accepting food stamps. The findings were that there were more convenience stores (with fewer healthy foods) than supermarkets and groceries stores, which provided healthy options and affordable foods. Supermarkets had the best store amenities among the three types of stores (Liese et al., 2007).

Likewise, Sharkey and colleagues conducted studies to explore the nutrition environment in rural areas, particularly in rural Texas (Sharkey, et al. 2009; Sharkey et al., 2010; Sharkey, 2011). Their work focused on such aspects as types of food stores, neighborhood needs, distance, spatial access, fast foods, developing conceptual models for food access, and identifying ways to measure the food environment and associated challenges (Bustillos et al., 2009; Creel et al., 2008; Dunn et al., 2011; Sharkey, 2009; Sharkey et al., 2009; Sharkey et al., 2010; Sharkey et al., 2011).

Accessibility, availability, and affordability are also characteristic of these studies. Accessibility, which is of particular importance in rural areas, focuses on location and transportation. The food choices and health value of foods are related to the concept of availability. The pricing of foods is associated with affordability (Sharkey, 2009). In one such study, the researchers explored the availability and affordability of certain fresh fruit and vegetables along with the neighborhood characteristics in a large rural area of Texas. The findings from the multivariate regression analysis found that stores located, “in neighborhoods with a higher percentages of Black residents paid more for fresh fruits and vegetables,” when median income was held constant.

Measuring Food Environments

How to measure the food environment in both the urban and rural areas has been of interest. A variety of approaches have been used to measure the food environment. Physical, consumer, and social aspects of the food environment have been investigated. Studies that measure the food environment have explored big box stores, supermarkets, grocery stores, convenience stores, gas stations, food marts, fast food restaurants or other food carry out places, diners, farmers markets, and even the home food environment. Urban and rural areas have been measured. Various foods representing all of the food groups have been measured in the study of the food environment. These foods represent all of the food groups. The quantity, quality, and pricing of the food are the consumer aspects that have been studied. Finally, the social aspects of the food environment are food stocking, sharing, and cultural dynamics between the store owners and consumers (Gittelsohn & Sharma, 2009).

The Nutrition Environment Measures Survey (NEMS), has been developed by Glanz and colleagues to obtain quantitative data of specific foods in stores and restaurants. The NEMS consists of two surveys, NEMS-Restaurants and NEMS-Stores. NEMS- R is used to measure features of the restaurant: main entrees, salads, food availability, beverages, children menu's, facilitators and barriers of healthy eating, pricing, and signage. NEMS-Stores was developed to measure retail stores in community and consumer nutrition environments. The community nutrition environment consists of the number, type, location and accessibility of food sources while the consumer nutrition environment consists of the availability, cost, and quality of ten food categories (fruit, vegetables, milk, ground beef, hot dogs, frozen dinners, beverages-soda and fruit juice, baked goods, bread, and snack chips) in stores. The survey was tested in four Atlanta, GA neighborhoods between 2004 and 2005 in 85 stores. The NEMS provides a

community and consumer nutrition environment measures that are reliable and valid. NEMS has face validity, construct validity, high inter-rater reliability, and high test-retest reliability (Glanz et al., 2007; Honeycutt et al., 2010; McKinnon et al., 2009; Saelens et al. 2007; Sallis et al., 2006). NEMS-S has been modified for a variety of settings and can be useful in measuring the nutrition environment in food deserts.

Another measure of the food environment is spatial access or the use Geographic Information Systems (GIS) methodologies. Geographic Information Systems (GIS) is the capturing, storing, managing, analyzing, and displaying of geographic information. It is generally known as the map making software. Spatial analytical methods allow for more complex manipulation of data. These methods and geocoding, identifying a specific address, have been used by various researchers in assessing the food environment (Austin et al., 2005; Bodor et al., 2007; Hubley, 2011; Kremer et al., 2011; Larson et al., 2009; Liese et al., 2007; Moore et al., 2008; Ramroop et al., 2008; Sharkey, 2008; Sharkey, 2009; Sharkey et al. 2009; Sharkey et al., 2010; Sharkey et al., 2011; Zenk et al., 2005). GIS has been used to measure accessibility, proximity, buffers, density, walkability, and drivability of the nutrition environment and the built environment (Thornton et al., 2011).

Nutrition and Food Policy

Federal Food Related Policy

Farm Bill of 2008 (Food, Conversation and Energy Act of 2008)

The Food, Conversation and Energy Act of 2008 also known as the Farm Bill of 2008 totals approximately $289 billion dollars with 65% or ($188.9 billion dollars) allocated for nutrition programs (American Farmland Trust, 2009). The additional $100.1 billion dollars or 35% is used for disaster relief, insurance of crops, conservation, commodities, and other related

needs (American Farmland Trust, 2009). The farm bill is much more than aid to farmers, but encompasses a wide range of programming that supports growing, eating, conserving, and producing renewable energy. The bill has provisions for farmers that shields revenue as oppose to price. Endeavors to protect farm lands, ranches, and to conserve resources like water through the Wetlands Reserve Program (WRP) at $24.1 billion dollars are made in the 2008 Farm Bill (American Farmland Trust, 2009). Additionally, funds have been provided for renewable energy.

Several programs within the farm bill were created to support local foods, farmers markets, and nutritious eating. The Farmer Marketing Assistance Program is five year, $33 million dollars in funding to create and publicize farmers' markets. Low-income people can obtain fresh foods direct from local farms with funding from The Community Food Projects Program. It is a ten year, $5 million dollars in funding that unites low-income and locally-farmed fresh foods.

School age children and seniors also benefit from provisions of the farm bill. The Fresh Fruit and Vegetable Snack Program provides for five years, $500 million dollars in funding to assist schools with snacks that consist of fresh fruit and vegetables. The Senior Farmers Market Nutrition Program is an annual voucher program of $20.6 million dollars in which seniors who are low-income can buy fresh fruits and vegetables.

Finally, the Healthy Urban Food Enterprise Development Center provides three years of $3 million dollars in funding for underserved communities to obtain local and healthy food (American Farmland Trust, 2009). There is funding in agricultural programs to support healthy eating and make healthy foods more accessible and affordable for people living in the United

States. It is anticipated that The Farm Bill of 2012 or the Food, Conversation and Energy Act of 2012 will have more of the same resources than the 2008 bill.

Healthy Food Financing Initiative

In 2010, the Presidential Administration specifically Mrs. Obama's Let's Move! initiative, announced the Healthy Food Financing Initiative (HFFI), a $400 million dollar collaborative with the Treasury Department, USDA, and Office of Health and Human Services (HHS) to increase healthy food outlets in underserved communities with limited access throughout the country. The goal of the initiative is to eliminate "food deserts" in the United States in seven years, eradicate childhood obesity rates, create employment opportunities, encourage 'livable communities,' and develop agriculture opportunities. Each of three government agencies has a role in advancing the aims of the initiative.

The Department of Treasury will make financing provisions, $250 million dollars from the New Markets Tax Credit (NMTC) and $25 million dollars for community development financial institutions (CDFIs), to support food options that are healthy. HHS will receive $20 million for business development in community economic development (CED) work. The USDA will have a total of $117.6 million dollars such that $35 million, $79 million, and $3.6 million dollars are allocated for facilities, planning and promotion ($35 million) and rural business development ($82.6 million) (Healthy Food Financing Initiative Implementation Plan, 2011). With accountability as a hallmark of the President Barack Obama Administration, the HFFI has a goal to, "measurably reduce the number of food deserts through a concerted, multi-year, performance-driven effort," (Healthy Food Financing Initiative Implementation Plan, 2011).

Mrs. Obama, announced on July 20th, 2011 that retailers, SUPERVALU, Walgreens, Walmart, as well as regional pledges from California FreshWorks Fund, Brown's Super Store, Calhoun Grocer, and Klein's Family Markets will address food deserts in the United States. The collaborations will facilitate job creation and access to healthy foods. An estimated 1,500 stores will either be opened or expanded; subsequently, greater than 46,000 jobs will be created in the areas. The regional pledges are also committed to building, opening, or increasing access to healthy foods (Let's Move! Access to Healthy, Affordable Food, 2011).

Food Deserts

Access to Affordable and Nutritious Food: Measuring and Understanding Food Deserts and Their Consequences

Section 7527 of The Food, Conservation, and Energy Act of 2008 (Farm Bill of 2008) provided for a study and report, *Access to Affordable and Nutritious Food: Measuring and Understanding Food Deserts and Their Consequences*, on limited access to affordable and nutritious food. The aims of the one-year study were to assess limited food access and its effects, describe the features and causes of limited food access, and provide recommendations that are inclusive of initiatives, retail incentives, and improvements to food assistance efforts and nutrition programs (Farm Bill, 2008). There were a variety of methods used to achieve the aims of the study. A literature review on the subject was conducted. Two workshops were hosted, October 2008 and January 2009, with a wide range of stakeholders to articulate issues regarding food deserts and limited access as well as with the Institute of Medicine of the National Academies. As a collaborator, the National Poverty Center at the University of Michigan, completed work on food access and the findings were presented at a conference. Numerous sources of data were used for the study. Data of food stores in the US was compiled, food access

among households, and Supplemental Nutrition Assistance Program (SNAP) or food stamps data was analyzed (Ver Ploeg et al., 2009).

The results of the study described food access in the United States. The distance a household is from a food store, supermarket or large grocery store, with reasonably priced healthy foods and transportation to the store limits access to the store (Ver Ploeg et al., 2009). The results also demonstrated that market conditions (supply and demand) are important considerations in food access in various areas of the U.S. Prices at small stores, where people with limited access shop for food, are greater than larger stores. Yet, another finding from the study is that among community development efforts the "promotion of culturally-specific foods for ethnic minorities," have been used (Ver Ploeg et al., 2009). Community development efforts can foster ways to gain access to nutritious and enjoyable foods in areas with limited access. Ver Ploeg et al. recommend that further research at the personal and geographic areas on food is needed to explore access, availability, and affordability (Ver Ploeg et al., 2009).

Recommendations based on the study suggest the need to understand and quantify access to food; shopping that occurs with people's routines such as work should be considered as well as aspects of shopping outside of one's neighborhood. Other important areas of study include: shopping activities and travel modes, times, distances, costs, and shopping decisions (Ver Ploeg et al., 2009).

Michelle Obama's Healthy Food Financing Initiative working group has crafted a definition for food deserts. A food desert is, "a low-income census tract where a substantial number or share of residents has low access to a supermarket or large grocery store." Food deserts are furthered characterized through the definitions of low-income and low-access communities. Low-income community is defined as a census tract with, "a poverty rate of 20

percent or higher, or a median family income at or below 80 percent of the area's median family income." Low-access community is defined as, "at least 500 people and/or at least 33 percent of the census tract's population must reside more than one mile from a supermarket or large grocery store (for rural census tracts, the distance is more than 10 miles)." The United States Department of Agriculture has a developed a Food Desert Locator (USDA, ERS, 2011). The Food Desert Locator spatially identifies food deserts in the US by census tracts. Portions of Alexander and Pulaski Counties, Illinois are among these areas classified as Food Deserts. The locator endeavors to quantify and identify food deserts, so that planning, programming, and interventions can be made more effective in reducing the food deserts.

The notion of food deserts came about in the United Kingdom (Eckert et al., 2011). While it has been used in a variety of context; it is simply limited food access. Some groups interested in limited food access have rejected the term food deserts. Hank Herrera, food justice activist suggests that, "a desert...is a natural phenomenon. Lack of access to fresh, healthy food is not natural. It is not accidental," (Cook, 2011). Herrera further describes how limited food access in communities manifests, "from structural inequities, deliberate public and private resource allocation decisions that exclude healthy from those communities. That kind of inequity is food apartheid," (Cook, 2011). Many prefer the use of food oasis or food equity to describe limited access to healthy food options.

Supplemental Nutrition Assistance Program

The Food Stamp Program (FSP), Supplemental Nutrition Assistance Program (SNAP), was renamed in the 2008 Farm Bill on October 1, 2008. SNAP is under of the auspices of the United States Department of Agriculture's (USDA), Food and Nutrition Service (FNS). It is the, "largest domestic food and nutrition assistance program for low-income Americans and serves as

a source of demand for the products of American farmers and food industries," (Congressional Digest 2010). The cost of SNAP and the numbers of people served are massive, $53.638 billion dollars for fiscal year 2009, 15.23 million households, and 33.72 million people participating monthly (Yen 2010). As of fiscal year 2010, the total cost of SNAP has increased to $68.308 billion while 18.62 million households and 40.30 million people are participating monthly (USDA-FNS 2011).

There is a vast amount of literature on USDA programs, SNAP and (Special Supplemental Nutrition Program for Women, Infants and Children) WIC. WIC makes provisions for healthy foods, healthy food education, and referrals to women carrying children, postpartum, breastfeeding as well as babies and children under 5 years of age (Yen, 2010). The literature on SNAP and WIC detail a variety of topics (Currie 2000; Fox et al., 2004; Moffitt 2000) interestingly is the literature that explores the programs and nutrient intakes (Butler et al., 1985; Butler & Raymond 1996; Devaney & Moffitt 1991; Oliveira & Gundersen 2000).

Yen (2010) implies that the literature on nutrient intake and SNAP and WIC programs are divergent. His quantitative research, several nutrient equations with dual endogenous programs, on aspects of partaking in WIC and SNAP and program effects on iron, potassium, vitamin E, and fiber intake among young children in the US found WIC increases iron, potassium, and fiber as SNAP a limited impact on fiber intake (Yen, 2010).

Hubley (2011) used a customized NEMS-S survey or the Maine Nutrition Environment Measure Survey (ME-NEMS) and spatial analytic techniques to describe the food environment in 50 stores that accept SNAP benefits in rural Somerset County, Maine. The stores that accept SNAP were selected, "to assess the food environment for the poorest of the poor," (Hubley, 2011). The results of the study show that the residents who live 10 miles of stores with rated

well by the ME-NEMS survey. The researcher suggests that qualitative data would be an asset to the study. Nonetheless, more research is needed on the USDA programs, SNAP and WIC, on nutrient intakes among adults and the availability, pricing, and quality of foods in all stores and particularly those that accept SNAP and WIC.

State Food Related Policy

Illinois Representative Dugan and Senator Koehler are sponsors of The Illinois Local Food Entrepreneur & Cottage Food Operation Act (SB0840) introduced in early 2011. The legislation, sent to the Illinois Governor on June 24, 2011, is timely as interest in local foods gain momentum. The legislation addresses restrictive barriers in food production and sells. It allows for the sell of specific foods made in home kitchens at farmers markets with explicit guidelines. These non-potentially hazardous foods, with time and temperature control safety, include: select baked goods, a variety of (fruit and other) jams, jellies, preserves, fruit butters, dry herbs, and seasonings. These aforementioned items can be sold at farmers markets. There is a specific definition for Farmers Markets. Farmers markets are defined as, "a common facility or area where farmers gather to sell a variety of fresh fruits and vegetables and other locally produced farm and food products directly to consumers," (Illinois General Assembly a, 2011). Additionally, gross sales of the product should not exceed $25,000 in a calendar year. The legislation also requires that the packaging meets the labeling requirements of the Illinois Food, Drug and Cosmetic Act. The labeling is required to include: name and address of the cottage food operation, name of food product, ingredients, date the product was made, allergen labeling, name and residence of preparer and seller. A statement must be included on the product that reads: *"This product was produced in a kitchen not subject to public health inspection that may also process common food allergens."* Finally the registered, preparer and seller shall have an

approved Food Service Sanitation Management Certificate, from the Department of Public Health.

The cottage food operation, "a person who produces or packages non-potentially hazardous food in a kitchen of that person' primary domestic residence for direct sale by the owner or a family member, stored in the residence where the food is made," shall also be registered with a health department (Illinois General Assembly a, 2011). The legislation enables the growth of local entrepreneurship and the sell of homemade foods. The Illinois Local Food Entrepreneur & Cottage Food Operation Act was approved by the Governor on August 16, 2011 and will be effective January 1, 2012.

Likewise on, June 29, 2011, legislation (SB1852) that calls for the formation of a Farmers Market-Task Force was sent to the Governor for signature. The Farmers Market-Task Force was sponsored by Senator David Luechtefeld and Representative Mike Bost among other Senators and Representatives. It is an amendment to the Food Handling Regulation Enforcement Act (Illinois General Assembly b, 2011).

The primary responsibility of the taskforce is to assist in developing administrative regulations for farmers markets in the state of Illinois. The taskforce will assist in ascertaining products and practices that are allowed and that hinder business at farmers markets. The Director of the Department of Public will be responsible for forming the task force to implement administrative regulations for farmers markets throughout the State of Illinois. The taskforce will have a minimum of 24 members with 2 year terms. The membership will represent individuals from diverse groups, from government officials, to farmers who sell products at the farmers market, to individuals from the general public engaged in farmers markets. Furthermore, government officials or their designees that will hold membership on the task force include:

Lieutenant Governor, Director of Commerce and Economic Opportunity, Director of Agriculture, Director of Public Health, Minority Leader of the House of Representatives, Speaker of the House of Representatives, Minority Leader of the Senate, and the President of the Senate (Illinois General Assembly b, 2011). The Farmers Market-Task Force was approved by the Governor on August 16, 2011 and effective the same day.

Alexander and Pulaski Counties in the southernmost part of Illinois are two counties that can benefit from the new food-related policies. The counties have a combined population of 14,399 and together have a total land area of 455.80 square miles. The demographic make-up of the two counties is nearly equally split between male and female, mostly White, age, and income. The counties are 50.5% (7,274) female, 62.4% White (8,983), and 34.1% Black (4,909) (US Census 2010).

Alexander is the larger of the two counties in population and total land area, 8,238 people and 236.38 square miles (US Census, 2010). The county seat of Alexander County is Cairo which has both racial and social historic significance. The City of Cairo is located at the confluence of the Mississippi and Ohio Rivers. The Mississippi River boarders the west side of the city, while the Ohio River at the east (Olson & Wright Morton, 2012). A few other towns in Alexander County are McClure, Thebes, and Tamms. The demographics of Alexander County include: 50.8% (4,182) male, 60.9% (5,018) White, and 35.4% (2,915) Black (US Census, 2010). According to the American Community Survey 2005-2009, 24% of the people in Alexander County lived in poverty, the median income of households was $28,983, and the median age was 43 (American Community Survey, 2005-2009).

The county seat of Pulaski County is Mound City, a small town of 588 residents as of 2010. Pulaski County has a population of 6,161 and a total land area of 200.79 square miles. It

is 52.2% (3,218) female, 64.4% (3,965) White, and 32.4% (1,994) Black (US Census 2010). Twenty-eight percent of individuals in Alexander County lived in poverty, the median income of households was $28,775, and the median age was 39.7 (American Community Survey, 2005-2009). Alexander and Pulaski Counties are among the highest percent of African Americans in all of the Illinois' 102 counties. Many of southern traditions, customs, and ways of living from migration have been preserved among Blacks in Southern Illinois (Motley Portwood, 2000).

Areas of Alexander and Pulaski Counties are among areas identified as "food deserts" in the state of Illinois. The United States Department of Agriculture (USDA) has developed a Food Desert Locator. The Food Desert Locator spatially identifies food-deserts in the US by census tracts (USDA, ERS, 2011). The USDA also has a Supplemental Nutrition Assistance Program (SNAP) Retailer Locator that identifies (name, address, and geographic coordinates) stores throughout the country participating in the program formally known as Food Stamps Assistance Program (USDA FNS SNAP, 2011).

CHAPTER THREE

METHODS

Purpose of the Study

The purpose of this study was to examine how African-American residents of a rural food desert navigate their nutrition environment to obtain the foods they eat. Residents' own perceptions of the nutrition environment, their food choices, and strategies for obtaining preferred foods were explored.

Research Questions

1) What foods are respondents eating?
2) To what extent are foods identified by researchers as healthy, culturally-preferred foods a part of the respondents regular diet?
3) What factors contribute to decision-making regarding food selection?
4) What factors contribute to where respondents shop?
5) What are specific characteristics of the nutrition environment: availability, price, and quality?
6) In what ways do the empirical characteristics of the nutrition environment (availability, price, and quality) influence the respondents' food selection and shopping?
7) How, if at all, do participants negotiate the limits of their nutrition environment to obtain healthy, culturally-preferred foods?

Research Design

An interpretive paradigm was used to describe, understand, and interpret how African-American residents of a rural food desert navigate their nutrition environment to obtain the foods

they eat (Merriam, 2009). A phenomenological approach which is, "a study of people's conscious experience of their life-world, that is, their "everyday life and social action," the lived experience was examined (Merriam, 2009).

This study was a cross-sectional, mixed method design. It combined qualitative data from in-depth interviews with study participants and quantitative data used an inventory of food venues with a customized Nutrition Environment Measurement Survey-Stores (NEMS-S) that investigated the nutrition environment in Alexander and Pulaski counties in Southern Illinois (Glanz et al., 2007).

Sampling Methods

Creswell (2007) suggests that sampling can occur at various levels: site, event or process, and participant (Creswell, 2007). Sampling for the qualitative methods used in this study occurred at the site (Alexander and Pulaski County, Illinois) and participant level (African-American participants). A purposeful convenience sample was selected for in-depth semi-structured interviews. Purposeful sampling is "designed to understand certain select cases in their own right rather than to generalize results to a population," (Isaac & Michael 1997, p. 223). The researcher used discretion in selecting participants who "best meet(s) the purposes of the study" (Neutens & Rubinson, 2002). There are four goals in purposeful selection. Of the four goals, the most important goals for the study are to capture heterogeneity and to examine specific incidents that are important for theories that began or developed the study (Maxwell, 2005). Men, women, people of a variety of ages over 21, and people living in various parts of Alexander and Pulaski counties were interviewed to capture heterogeneity. The data rich findings from the interviews contributed to the emerging literature on the nutrition environment. A type of purposeful sampling, "maximum variation" was used, "to adequately capture the heterogeneity

in the population," (Maxwell, 2005). Maximum variation sampling allowed the researcher to obtain an array of experiences from the field (Maxwell, 2005). Interviews with individuals in Alexander and Pulaski Counties were conducted throughout the two counties to achieve heterogeneity. Participants were approached in the yards of their homes, a laundromat, a church, their homes, in their front yards, the parking lot of a store, neighborhood gathering places, the parking lot of a restaurant, and a RV/camper park. The participants were asked to complete an informed consent for participation in the study (Appendix A Informed Consent). Criteria met by interview participants included: self-identified as African-American or Black, resident of Alexander and Pulaski County longer than 5 years, over 21 years of age, and the primary purchaser and preparer of food for the household. These characteristics ensured that the individual was aware of stores in the area, familiar with food purchased and prepared within the household, and participated in making food selection decisions. Moreover, being over 21 years of age assisted in the individual selected for the interview being the primary purchaser and preparer of food for the household.

All food venues (stores) in the study area, Alexander and Pulaski counties, were identified. A list of 17 stores were obtained from the USDA Supplemental Nutrition Assistance Program (SNAP) Retailer Locator that identifies name, address, latitude and longitude of stores throughout the country participating in the program formally known as Food Stamps Assistance Program (USDA FNS SNAP, 2011). A list of grocers was obtained from the Illinois Department of Agriculture, but only one store in the two counties was found on this list. (This store was also included on the USDA SNAP Retailer Locator.) The online resource, www.yellowbook.com, was used to identify 3 additional grocery stores and 9 additional gas stations-convenience stores-food marts in the two counties. The 29 food venues, in Alexander and Pulaski counties, Illinois

that had been identified were categorized into 5 types: grocery stores (10), "dollar" stores (3), gas stations-convenience stores- food marts (11), meat markets (3), and farmers markets (2). Individuals were asked questions about the venues where they shop. The most commonly cited food venues (stores) identified during the interviews were added to the sample. These food venues (stores) were located outside of Alexander and Pulaski counties and a new category of food venue was developed to describe the venue.

Instrumentation

The goal of the interview was to query individuals to describe foods eaten with emphasis on African-American culturally-preferred dried legumes (beans and peas), fresh fruits, and fresh vegetables. Other questions were about the shopping behaviors, where they shop, food venues, and accessibility. Finally, the interviews ascertained ways in which individuals negotiated the limits of the nutrition environment.

Culturally-preferred foods that were assessed for this study were: pinto beans, red beans, black-eyed peas, kidney beans, cantaloupes, strawberries, watermelons, collard greens, mustard greens, turnip greens, spinach, lettuce, kale, cabbage, broccoli, okra, sweet potatoes, pumpkins, squash, and carrots. The culturally-preferred foods selected for this study were obtained from previous published studies that explore the foods commonly consumed and/or culturally-preferred by African Americans (Bovell-Benjamin 2007; Bovell-Benjamin et al., 2009; Bovell-Benjamin et al., 2010; Grigsby-Toussaint et al., 2010; Izumi et al., 2011; and Odoms-Young et al., 2009).

The Nutrition Environment Measures Survey Stores (NEMS-Stores) was used to obtain quantitative data on availability, price, and quality of specific food items from the identified stores. The NEMS-S assesses the nutrition environment providing a community and consumer

nutrition environment measure that is reliable and valid (Honeycutt et al., 2010; McKinnon et al., 2009; and Sallis et al., 2006). The NEMS-S was developed to assess the availability of healthy options, price, and quality of ten food categories (fruit, vegetables, milk, ground beef, hot dogs, frozen dinners, beverages-soda and fruit juice, baked goods, bread, and snack chips) in stores. The instrument was customized to culturally-preferred dried legumes (beans and peas), fresh fruits, and fresh vegetables for the proposed study. (Appendix E Customized NEMS-Stores). The most commonly cited culturally-preferred foods during the interviews were added to the Nutrition Environment Measurement Survey – Stores (NEMS-S).

NEMS-S assesses the availability, price, and quality of the fruits and vegetables. The availability of the fruit or vegetable is recognized by yes or no, if the item is identified or not identified. The measures of the physical quality of the fruits and vegetables are acceptable or unacceptable. Acceptable is defined as "peak condition, top quality, good color, fresh, firm, and clean," (Glanz et al., 2007). Unacceptable is defined as "bruised, old looking, mushy, dry, overripe, dark sunken spots in irregular patches, or cracked or broken surfaces, signs of shriveling, mold or excessive softening," (Glanz et al., 2007). The cost of the fruits and vegetables were assessed per pound of items or individual item, not on sale.

Data Collection

Participant Interviews

Individuals were read the informed consent and given the opportunity to refuse participation (Appendix A Informed Consent). Individuals who refused to participate in an interview were thanked for their time. The interviews were approximately 60 minutes or less and were audio-recorded. An incentive of a $10.00 gift certificate to a food store (venue) was given to each interviewee from the researcher for their time spent in the interview.

Availability and Accessibility

A pseudonym and an eight digit store ID number were given to each store to protect the confidentiality of the store (NEMS, 2011). The county of location, store, type of food venue, and alphabetized pseudonym of store are the four components of the store ID (NEMS, 2011). Per the NEMS-S enumeration procedures, a store ID number was given to each store. The store identification protected the confidentiality of the store for analysis and reporting purposes. It consisted of an *eight digit number (00-0-00-000).* The *first two digits* defined the area such that (01) represents Alexander County, Illinois, (02) represents Pulaski County, Illinois, (03) represents Union County, Illinois, and (04) represents Cape Girardeau County, MO. The *third digit* denoted that it is a store (1) and not a restaurant (2) while the *fourth and fifth digits* identified the type of store. Grocery stores are represented by (01), "dollar" stores (02), Gas Stations-Convenience Stores-Food Marts (03), Meat Markets (04), Farmers Markets (05), and Other Types (06). Finally, the *sixth, seventh, and eighth digits* were specific IDs in alphabetically order of the store name (001, 002, 003) (NEMS, 2011).

An in-person visit to request permission to conduct the NEMS-S in the respective stores was made with each store manager/owner. A letter was given to store managers that explained the study and ensured confidentiality. The letter also requested permission to conduct NEMS-S (Appendix D Letter to Store Owners). Store assessments using NEMS-S were conducted during week days between 9 am to 4 pm (NEMS, 2011).

Data Analysis

The audio-recorded interviews were transcribed verbatim into a Microsoft Word document and read. Participants and their corresponding data were identified by an assigned

pseudonym. The data were coded and notes, or open coding, were made of significant information (Merriam, 2009). Codes are used, "to label, separate, compile, and organize data," (Charmaz, 1983). Furthermore, "the core purpose of coding is to mark the units of text as they relate meaningfully to categories," (Lindlof and Taylor, 2002). The codes were used to establish categories. Lindlof and Taylor (2002) describe a category as, "an array of general phenomenon … and other types of "bins" in which to put items that are similar." Themes or overarching statements were developed using categories and sorted to complement the research questions. The researcher created a memo analysis while coding each transcript. The memo analysis aided the researcher in the analysis of the qualitative data by documenting thoughts about the findings. The qualitative data analysis software, ATLAS.ti, was used to organize data, label codes, and manage transcribed data. Quotes captured the natural language and vernacular of the individuals being interviewed (Creswell, 2007). The individuals interviewed were given pseudonyms to protect their confidentiality when quotes were used from their interview.

The researcher kept a reflective journal to document biases, feelings, thoughts, and opinions during collection. Journal entries were dated and identified with a number that corresponded to the interview for referencing. The journal aided in identifying any reactions and changes to interview questions, probes, successes, and challenges in the interview process. Interviews were conducted beyond saturation or when no new information was obtained to ensure adequate engagement in the field (Creswell, 2007). Descriptive statistics were used to describe data collected with the interview eligibility criteria such as: frequency and percentage of men and women, frequency and percentage living in each county, mean years of age of the sample, and standard deviation of age. Additionally, descriptive statistics included the mean years lived in the cities and counties, and standard deviation of years lived in the cities and

counties. The number and percentage of people who received food benefits and eat meals/food in the household was described.

Data collected with the customized NEMS-S was entered in a modified NEMS-S Scoring Sheet, a Microsoft Excel worksheet, to document the availability, price, and quality of the items. The scoring system for the availability and quality of the items was adapted from the NEMS-S Scoring Sheet in that there are 7 varieties of dried legumes (beans and peas), 7 varieties of fresh fruits, and 12 varieties of fresh vegetables. Availability of the items was measured by summing the number of Yes' recorded for each variety of the food items: dried legumes (beans and peas), fresh fruits, and fresh vegetables assessed with the NEMS-S. The available varieties were totaled, grouped, and assigned points (Appendix F Customized NEMS Scoring Sheet for Stores). The maximum points assigned to each of the 3 food categories, dried legumes (beans and peas), fresh fruits, and fresh vegetables, for availability was 3. Each store could receive a maximum NEMS-S availability score of 9 points per food venue (store). The NEMS-S availability scores were compared within food venues (stores): grocery stores, "dollar" stores, gas stations-convenience stores-food marts, meat markets, farmers markets, and other types.

Quality of the items were assessed by either acceptable (A) or unacceptable (UA) for the fresh fruits and fresh vegetables. Acceptable items were those that are fresh, clean, and of the best condition and color. Unacceptable items are those that are soft, old, damaged, or moldy. The quality of the dried legumes (beans) was not assessed. The total acceptable (A) quality was summed for the fresh fruits and fresh vegetables assessed with the NEMS-S. The variety of acceptable quality fresh fruits and fresh vegetables was divided by the number of available fresh fruits and fresh vegetables to obtain the percentage of the acceptable fresh fruits and fresh vegetables. The percentage of acceptable fresh fruits and fresh vegetables was assigned points.

Each store could receive a quality score with a maximum NEMS-S quality score of 6 points per food venue (store). The NEMS-S quality scores were compared within food venues (stores) and among the different types of food venues (stores).

Frequencies were used for the total food venues (stores) identified through ground-truthed or on-site observation methods. The number and type of food venues (stores) that were not in business or operation, the number of venues that refused participation in the study, and the number of venues where the NEMS-S was completed were quantified. The price of the 3 groups of food items in the study were displayed in a table by each of the types of food venues (stores) and compared.

Data obtained from interviews and food venue (store) data obtained from the NEMS-S were triangulated to describe the nutrition environment in the study area. There is value in combining both qualitative and quantitative data. The qualitative data collected in this study was used developmentally or to inform the quantitative methods. The most cited culturally-preferred foods identified during the interviews were added to the customized NEMS-S; subsequently, the most cited food venues (stores) were assessed with the NEMS-S. Additionally, qualitative data about the availability, price, and quality of food items were used to confirm or negate the same data collected using NEMS-S. Triangulation of data collection methods and the participatory nature of the subjects gave dimensionality to research on the nutrition environment.

Validity and Reliability

Credibility or internal validity was achieved by triangulation. Two of the four types of triangulation were used, multiple methods and multiple data sources. The qualitative methods are the in-depth semi-structured interviews and the quantitative methods are the assessments of the food venues (stores) using the NEMS-S. The multiple data sources used for the study were

the transcripts from the interviews, the NEMS-S, and the reflective journal. Triangulation or the multiple methods are strategies, "that add[s] rigor, breadth, complexity, richness, and depth to any inquiry," (Denzin and Lincoln, 2005).

Credibility was achieved during the interviews by prolonged and varied field experiences. Conducting in-depth interviews with 24 African Americans throughout Alexander and Pulaski counties, excluding the city of Cairo, ensured both prolonged and varied field experiences. Engagement in the field occurred beyond saturation being reached during the interviews or once no new information was discovered. Assessments of all food venues (stores) using ground-truthed methods and the NEMS-S ensured prolonged and varied experience. Credibility was also achieved through the researcher's reflective journal that documented any reactions and changes to interview questions, probes, successes, and challenges in the interview process. Member checking was conducted during the study by restating individual's responses and giving the participants an opportunity to confirm and negate understanding in the interviews. Member checking or respondent validation increased credibility.

Transferability or external validity is the applicability of the findings (Merriam, 2009 pp. 223). Comparing the findings with existing literature on the nutrition environment in rural areas achieved transferability. Maximum variation was used as a means to assess transferability as individuals residing in two different counties, different areas within the counties, male and female, and of varying ages were interviewed. Moreover, reliability or dependability was achieved through 2 different peer examinations of codes that developed from the qualitative data. Peer review or examination of the transcripts, codes, categories, and themes occurred by additional researchers to assess the data (Creswell, 2007, pp. 45, Merriam, 2009; pp. 220). Confirmability or the researcher's objectivity was achieved through the researcher's reflective

journal (Lincoln & Guba, 1985). The researcher being African American and the familiarity of study area aided in the reliability, rapport and trust in community (Hildebrand, 2010).

Reflexivity and Positionality

"Reflexivity is the process of reflecting critically on the self as researcher, the "human as instrument," (Denzin and Lincoln, 2005). The researcher was cognizant of the positionality, or one's position within the research by reflecting on the ways in which race, class, gender, and family history in the study area influence the study. Although the researcher has family history in the study area, the researcher was aware of the extent to which not being born and raised in the area has an influence on the research. The process of reflexivity requires researchers to examine "with our selves and with the multiple identities that represent the fluid self in research setting," (Denzin and Lincoln, 2005). These identities were explored throughout the entire research process.

CHAPTER FOUR

RESULTS

Purpose of the Study

The purpose of this study was to examine how African-American residents of a rural food desert navigate their nutrition environment to obtain the foods they eat. Residents' own perceptions of the nutrition environment, their food choices, and strategies for obtaining preferred foods were explored.

Research Questions

1) What foods are respondents eating?
2) To what extent are foods identified by researchers as healthy, culturally-preferred foods a part of the respondents regular diet?
3) What factors contribute to decision-making regarding food selection?
4) What factors contribute to where respondents shop?
5) What are specific characteristics of the nutrition environment: (availability, price, and quality)?
6) In what ways do the empirical characteristics of the nutrition environment (availability, price, and quality) influence the respondents' food selection and shopping?
7) How, if at all, do participants negotiate the limits of their nutrition environment to obtain healthy, culturally-preferred foods?

Chapter 4 presents the key findings of the research. It is organized by the demographic characteristics of participants, food related characteristics and practices of the participants, and

characteristics of the food environment in the study communities. The results are presented primarily in the order of the research questions.

Study Participants

Demographic characteristics of respondents are shown in Table 3. A total of 24 African-American (Black) men and women were interviewed living in Alexander County and Pulaski County, Illinois (excluding the city of Cairo). All the individuals interviewed for the study were the primary purchaser and preparer of foods in their household. Seventeen women (71%) and seven men (29%) were interviewed, with a mean age of 47 years. Twelve (50%) participants lived in Alexander County and 12 (50%) lived in Pulaski County at the time of the interviews. The participants lived in various areas of the two counties. They resided in such towns as Hodges Park, Klondike, Sandusky, Tamms, Thebes, and Unity in Alexander County. Participants from Pulaski County lived in Mounds, New Grand Chain, Olmsted, Perks, Pulaski, Ullin, and Villa Ridge. The individuals had lived in their respective counties a mean of 23 years and their respective cities a mean of 20 years. Most of respondents resided in the study area the majority of their lives. Some respondents had lived in the study area their entire lives.

A total of 32 people were approached for interviews. Three people declined to be interviewed and 5 did not meet the selection criteria. The 24 respondents were eligible and interviewed between June 2, 2012 and June 28, 2012 at a variety of locations. Individuals were interviewed at a laundromat, a church, their homes, in their front yards, the parking lot of a store, neighborhood gathering places, the parking lot of a restaurant, and a RV/camper park. The shortest interview was 11 minutes and 35 seconds, while the longest interview was 54 minutes and 56 seconds. Respondents were given pseudonyms as their interviews were transcribed.

Table 4. displays the respondents who received food benefits (SNAP/LINK), the number of people who eat meals/food in the household, and the relationship of the persons who ate food in the household to the study participant. This information provides details about: the socio-economic status of the respondent who was the primary purchaser and preparer of the foods, the relationship of those consuming the foods to the respondent, and the number of people the respondent was responsible for feeding. Half (50%) of the participants received food benefits (SNAP/LINK). Five (21%) of the participants were the sole person eating meals/food in their household. Eight (33%) of the participants had one other person who ate meals/food in the household, either a partner (husband), child (son/daughter), or sibling (brother). There were also multi-generational relationships between respondents and those who ate meals/food in the household. Many of the respondents were responsible for feeding their children, grandchildren, and parents.

Table 3. Demographic Characteristics of Participants, Organized by County and City of Residence

Pseudonym	Sex	Age	County of Residence	Town of Residence	Years lived in County	Years lived in City
Angela	Female	49	Alexander	Hodges Park	12	12
Buchanan	Male	72	Alexander	Hodges Park	30	4
Carmen	Female	54	Alexander	Klondike	38	38
Devin	Female	53	Alexander	Sandusky	19	19
Eugene	Male	61	Alexander	Sandusky	61	61
Francis	Male	53	Alexander	Tamms	34	33
Genell	Female	39	Alexander	Tamms	25	25
Heather	Female	25	Alexander	Thebes	25	2.5
Illia	Female	24	Alexander	Thebes	12	2
[a]Jasmine	Female	33	Alexander	Thebes	0.5	0.5
[b]Katie	Female	41	Alexander	Thebes	1	1
Lender	Female	36	Alexander	Unity	8	8
Monique	Female	34	Pulaski	Mounds	34	34
Nelson	Male	67	Pulaski	Mounds	13	13
[c]Oliver	Male	69	Pulaski	Mounds	30	30
Pierre	Male	33	Pulaski	New Grand Chain	5	5
Quinn	Female	73	Pulaski	Olmsted	35	35
Rachel	Female	21	Pulaski	Perks	20	20
Steven	Male	38	Pulaski	Pulaski	18	18
Tamara	Female	61	Pulaski	Pulaski	5	5
Ulonda	Female	40	Pulaski	Pulaski	20	20
Vashti	Female	40	Pulaski	Ullin	15	15
Willow	Female	56	Pulaski	Ullin	25	25
Xandra	Female	66	Pulaski	Villa Ridge	66	42
Mean (Standard Deviation)		47 (15.87)			23 (14.16)	20 (15.16)

Note:
[a]Lived in Pulaski, Pulaski County for 32.5 years
[b]Lived in Pulaski, Pulaski County for 40 years
[c]Lived in Mounds, Pulaski County for 30 years, but interviewed in East Cape Girardeau, Illinois at RV/camper park

Table 4. Food Related Characteristics of Participants, Organized by County and City of Residence

Pseudonym	County of Residence	Town of Residence	Received Food Benefits SNAP/LINK	No. of People who eat meals/food in household	Relationship of those who eat meals/foods in household
Angela	Alexander	Hodges Park	No	4	Me, Parents, Siblings
Buchanan	Alexander	Hodges Park	No	2	Me, Sibling (Brother)
Carmen	Alexander	Klondike	No	1	Me
Devin	Alexander	Sandusky	No	2	Me, Children (Daughter)
Eugene	Alexander	Sandusky	No	4	Me, Partner (Wife), Children, Grandchildren
Francis	Alexander	Tamms	No	4	Me, Children, Grandchildren, Nieces/Nephews
Genell	Alexander	Tamms	Yes	2	Me, Sibling (Brother)
Heather	Alexander	Thebes	Yes	4	Me, Children, Partner
Illia	Alexander	Thebes	Yes	3	Me, Children
Jasmine	Alexander	Thebes	Yes	3	Me, Children
Katie	Alexander	Thebes	Yes	2	Me, Children (Daughter)
Lender	Alexander	Unity	Yes	3	Me Children
Monique	Pulaski	Mounds	Yes	3	Me, Children
Nelson	Pulaski	Mounds	No	2	Me, Children (Son)
Oliver	Pulaski	Mounds	No	1	Me
Pierre	Pulaski	New Grand Chain	No	4	Me, Children, Partner, No relation/Neighbors/Friends
Quinn	Pulaski	Olmsted	Yes	1	Me
Rachel	Pulaski	Perks	Yes	6	Me, Parents, Children, Siblings
Steven	Pulaski	Pulaski	Yes	1	Me
Tamara	Pulaski	Pulaski	Yes	1	Me
Ursula	Pulaski	Pulaski	No	3	Me, Partner, Children
Vashti	Pulaski	Ullin	No	2	Me, Parents
Willow	Pulaski	Ullin	Yes	2	Me, Partner (Husband)
Xandra	Pulaski	Villa Ridge	No	2	Me, Partner (Husband)

Dried Legumes (Beans and Peas), Fresh Fruits, and Fresh Vegetables

Foods that respondents are currently eating and the extent to which the foods identified by researchers as healthy, culturally-preferred are a part of the respondent's regular diet emerged. Table 5. displays the dried legumes (beans and peas), fresh fruits, and fresh vegetables most commonly consumed by participants, in descending order of frequency identified by the respondents.

Table 5. Most Commonly Consumed Dried Legumes (Beans and Peas), Fresh Fruits, and Fresh Vegetables (in descending order)

Dried Legumes (Beans and Peas)	**Fresh Fruits**	**Fresh Vegetables**
Black-Eyed Peas	Strawberries	Greens
White Beans/Navy Beans/Great Northern Beans	Grapes	Corn
Pinto Beans	Watermelon	Cabbage
Lima Beans	Bananas	Tomatoes
Black Beans	Peaches	Carrots
(Green Beans)	Oranges	Broccoli
	Apples	Cucumbers
	Cantaloupes	Lettuce

Black-eyed peas, and white beans such as navy beans and great northern beans, were the most commonly cited beans, pinto beans, lima beans, and black beans were also commonly cited beans. In addition, kidney beans, crowder peas, purple hull peas, and pole beans were mentioned. Green beans and pole beans were mistakenly identified by several as legumes. The most commonly cited consumed fruits were strawberries, grapes, watermelon, bananas, peaches, oranges, apples, cantaloupes, and fruit was consumed every day by many of the individuals interviewed. Greens, corn, cabbage, tomatoes, carrots, broccoli, cucumbers, and lettuce were the most commonly cited vegetables. Green leafy vegetables like greens, (mustard, collard, and turnip) cabbage, and lettuce were consumed by nearly everyone in the study. The foods

consumed by each respondent are shown in Table 6 Dried Legumes (Beans), Fresh Fruits, and Fresh Vegetables Currently Consumed by Participants.

Pseudonym	City of Residence	County of Residence	Dried Legumes (Beans and Peas)	Fresh Fruits	Fresh Vegetables
Angela	Hodges Park	Alexander	Green Beans, Black Eyed Peas	Watermelons, Strawberries Bananas, Peaches, Apples Pineapples	Corn, Broccoli, Cabbage, Tomatoes Cucumbers
Buchanan	Hodges Park	Alexander	Pinto Beans, Navy Beans, Black Eyed Peas, Lima Beans	Bananas, Watermelons Strawberries	Tomatoes, Green Beans Cabbage, Greens, Cucumbers
Carmen	Klondike	Alexander	Pinto Beans, White Beans Kidney Beans, Green Beans	Apples, Bananas, Oranges Pineapples, Mangoes	Squash, Corn, Kale, Cabbage, Lettuce Zucchini, Collard and Mustard Greens Green Beans, Potatoes
Devin	Sandusky	Alexander	Navy Beans, Red Beans, Peas, Black Eyed Peas, Green Beans	Strawberries, Peaches, Apples Oranges, Bananas, Grapefruits, Blueberries	Lettuce, Greens, Celery, Onions, Cucumbers, Potatoes, Sweet Potatoes Cabbage, Carrots, Broccoli, Cauliflower
Eugene	Sandusky	Alexander	White Beans, Green Beans, Lima Beans, Peas	Apples, Oranges, Pears, Peaches	Sweet Potatoes, Greens, Corn Tomatoes, Onions
Francis	Tamms	Alexander	Black Eyed Peas, Navy Beans Brown Beans, White Beans Green Beans, Crowder Beans	Apples, Oranges, Pears, Peaches Grapes, Watermelons, Cantaloupes	Greens, Spinach, Cabbage, Corn
Genell	Tamms	Alexander	Brown Beans, Black Eyed Peas White Beans, Black Beans	Bananas, Strawberries, Apples Grapes, Oranges, Cantaloupes	Asparagus, Broccoli, Carrots
Heather	Thebes	Alexander	Kidney Beans	Watermelon, Cantaloupe, Strawberries	Green Beans, Potatoes, Corn
Illia	Thebes	Alexander	Baked Beans	Watermelon, Grapes, Strawberries Cherries, Bananas	Cabbage, Green Beans
Jasmine	Thebes	Alexander	None	Peaches, Pineapples, Strawberries	Broccoli, Greens, Cauliflower, Cabbage, Brussel Sprouts, Carrots
Katie	Thebes	Alexander	White Beans	Watermelon, Peaches, Cantaloupes, Grapes, Strawberries, Bananas	Cucumbers, Squash, Greens, Okra, Corn
Lender	Unity	Alexander	Green Beans	Strawberries, Pineapples	Corn, Carrots

Pseudonym	City of Residence	County of Residence	Current Consumed Dried Legumes (Beans and Peas)	Current Consumed Fresh Fruits	Current Consumed Fresh Vegetables
Monique	Mounds	Pulaski	Green Beans, White Beans	Watermelon, Cantaloupe Strawberries, Bananas Grapes, Cherries, Pineapples	Greens
Nelson	Mounds	Pulaski	Crowder Peas, Black Eyed Peas Pinto Beans, Purple Hull Pole Beans, Bunch Beans Butter Beans	Grapes, Watermelons, Peaches Pears, Plums, Oranges	Greens, Sweet Potatoes, Cucumbers Corn, Tomatoes, Onions, Okras, Lettuce Squash, Cabbages, Beets
Oliver	Mounds	Pulaski	White Beans, Black eyed peas	Apples, Oranges, Grapes, Cantaloupe, Watermelon	Turnip greens, Green beans, Broccoli, Cauliflower
Pierre	New Grand Chain	Pulaski	Black Beans, Green Beans Sweet Peas, Lima Beans Great Northern Beans Black Eyed Peas, Snap Peas	Blackberries, Watermelon, Grape Cantaloupes, Strawberries, Pears Apples, Plums	Zucchini, Squash, Greens, Spinach, Carrots, Cabbage
Quinn	Olmsted	Pulaski	Red Beans, Black Eyed Peas, Black Beans, Navy Beans	Strawberries, Peaches, Grapes	Tomatoes, Avocados, Onions, Kales, Romaine Lettuce
Rachel	Perks	Pulaski	Pinto Beans, Black Beans	Strawberries, Grapes, Kiwi Watermelons, Peaches Oranges, Apples, Cantaloupes	Corn, Potatoes, Carrots, Lettuce Tomatoes, Spinach
Steven	Pulaski	Pulaski	Great Northern Beans	Grapes	Mixed Vegetables
Tamara	Pulaski	Pulaski	Lima Beans Great Northern Beans	Bananas, Grapes, Oranges	Potatoes, Collard Greens, Cabbage, Cucumber, Carrots, Lettuce, Tomatoes
Ulonda	Pulaski	Pulaski	White Beans, Brown Beans Green Beans, Pinto Beans Pole Beans, Crowder Peas, Purple Hull Beans	Mangoes, Cantaloupes, Papaya	Cabbage, Cucumbers, Broccoli, Corn, Lettuce, Greens, Eggplants, Tomatoes Peppers-Jalapeno, Cayenne, Habanero
Vashti	Ullin	Pulaski	Green Beans	None	Greens, Cabbage, Broccoli, Cauliflower, Tomatoes, Potatoes, Onions, Corn
Willow	Ullin	Pulaski	Mixed Beans, Greens Beans Lima Beans, Crowder Beans Butter Beans	Pineapple, Grapefruit, Bananas, Apples, Peaches, Strawberries Oranges	Broccoli, Corn
Xandra	Villa Ridge	Pulaski	Great Northern Beans, Brown Pinto Beans, Green Beans, Crowder Peas, Purple Hull Beans	Bananas, Apples, Pineapples	Spinach, Lettuce, Tomatoes, Okra, Onions, Kale, Turnip Greens, Broccoli, Mustard Greens

Dried legumes were an important part of the diet for the people interviewed. Beans were a current staple in the households of the people interviewed. Willow makes certain that her house is stocked with beans. She suggests beans are an affordable meal.

> You know something? I don't run out of beans. I, you know, that's something I keep in my house. … It's always in my house. I buy up a certain amount of beans and keep them in my house at all time. … So beans, any time you tryin' to make pay day to the next day? You always got some beans!

Willow's sentiment regarding dried legumes (beans and peas) was shared by other participants. Black-eyed peas are consumed for good luck as Francis said, "yeah, black-eyed peas that's like a celebration to us ... black-eyed peas so you get good luck. Eat all the black-eyed peas on this certain day." Black-eyed peas are a cultural tradition for many African-Americans and people living in the southern regions of the United States.

Dried legumes (beans and peas) were considered a staple item in several households during the childhoods of the people interviewed, as well. Angela said, "we ate so many [beans] when we growed up." One woman mentioned that her mother prepared meals of butter beans to fill up her and her seven brothers when the respondent was a child. Another woman noted that stews and beans were hearty meals used by her mother to fill up her family. Preparation of these stews and beans were used to save time for the working and busy mothers, as the respondents reminisced on their childhoods.

An aversion to beans among four respondents began during childhood. One gentleman mentioned that he does not want the brown beans in his house. Other respondents had an immense distain for brown butter beans saying, "I hated them bastards," (Quinn) and "girl, them things was nasty. I did not like butter beans. They tasted like, I don't know … they was so

thick. They just nasty. I don't eat them now," (Rachel). Brown butter beans have been eliminated from the diets of several people.

Fruit as a preferred snack provided by parents to their children emerged as a prominent theme. As Heather, a mother of 3 young children said,

> we try to get it in at least every day. Yeah, like if we had a gang of bananas on the counter they be gone in like one day, literally. They [her children] could eat that all day long for a snack, breakfast, lunch, dinner, whatever they will tear some fruit up.

Heather explained how she and her children make an effort to eat fruit, everyday. She emphasized that, most importantly her children liked fruit.

Likewise, Nelson made an effort to limit the amount of junk food his son consumed. He substituted the junk food with fruit. "Now we got snacks that we do. We do like grapes, you know fruits and substitute to keep him from eating a lot of junk food." Grapes and strawberries were also mentioned by other parents.

Just as fruit was an important component of meals for Heather and her family so were vegetables as she said,

> yeah, cause I try to cook them every, you know, with a meal. I think that's only right, you know, that's well that's how I was taught, a vegetable a day chase the doctor away or some mess they say. That's the story I tell them…

Illia commented on greens and cabbage, "well me, I can eat greens and cabbage all day. Yes, I can eat that all day. Even my kids. My daughter, she loves every green vegetable. My son do too. He loves greens and he loves cabbage. They don't really too much fool with tomatoes. Basically anything I don't eat." Illia's children model her behavior of eating specific vegetables like greens and cabbage. Nelson not only substituted the junk food with fruit for his son, but modeled healthy eating behavior with vegetables for children in his former employment setting.

> And like eatin' in the school, we talkin' about the veggies and stuff, they don't want to eat they veggies. I sit down at the table with them and I say 'mm…look at that, see that piece right there pick that up and put it in my hand'. They pick it up and put it in my hand and I say 'Mmmmm that is so good' and I look over at another one and I say, see 'he..she..she's eating theirs you know, and finally those kids will start eatin' their veggies.

Nelson's former position in the school allowed him the opportunity to work with children and encourage them to eat vegetables.

When Xandra was asked about the frequency in which she consumes fresh vegetables, she said, "every day, cause' even breakfast sometimes I may have greens and cornbread for breakfast." Greens were not a meal limited to lunch or dinner. Xandra ate greens for breakfast. Carmen described 4 different green leafy vegetables that she consumes,

> I mix up collard and mustard together. But I love kale and also collard green. I eat cabbage, you know, and I use them like in a stir fry. And like I say, I get my vegetables in, zucchini and squash, stuff like that you know.

Culturally-preferred foods remain a dietary staple among the individuals interviewed. As Quinn so poignantly stated, "greens and cornbread, you know, all of the native type things that black people grew up with," remain in the diets of nearly all of the respondents. Just as beans and peas like black-eyed peas are a cultural staple consumed by respondents, green leafy vegetables like cabbage, collards, turnips, mustards, and kale were also staples. Fruit was also a snack for the children. Modeling behavior of eating vegetables was common among the adults for children.

Decision-Making About Food Selection

Factors that explored decision-making about food selection among the respondents also emerged in the interviews. The respondents identified personal health conditions and health conditions common among the African-American community related to diet. The individuals interviewed spoke about: specific modifications to diet, changes in diet to address health problems, family history and food practices, and cultural traditions and food choices.

Healthy foods in diets were important for many respondents. The difference in the foods consumed as adults, "I try to eat more healthier now, than I did when I was growin' up," commonly resonated among the participants, as Eugene exclaims. Nelson summarizes the sentiments of the participants best regarding the connection between health and diet when he said, "what it all boils down to is, I'll say to eat has a lot to do with the way people's health is." The two themes that emerged with regard to eating healthy are specific modifications to diet and changes in diet to address health problems.

Specific Modifications to Food Practices

Respondents such as Pierre, Willow, Genell, and Eugene described creative means for modifying traditionally southern and African-American methods of food preparation. These modifications to food practices included healthier ways of food preparation such as: a change in seasonings and flavors, bake, grill, steam and less fried foods, the use of vegetable and olive oils, and eating smaller portion sizes.

Pierre limited the amount of salt he consumes by using fresh vegetables. Pierre said, "I like more fresh flavor … try to get all my flavor out of bell pepper and onions and stuff like that. … Fresh vegetables, yep. I actually get the flavor from the vegetables." Willow uses smoked turkey instead of pork and suggested that, "if you fix it right, it still tastes the same." Genell and

Pierre described how they bake, grill, and steam their foods more than they fry. Grease and lard have been replaced with vegetable and olive oils in food preparation by many of the respondents.

Eating smaller portion sizes emerged as a modification to food practices by the respondents in the study. One woman recalled being required to eat what was served to her as a child, "back then they used to like pile your plate up and say eat it or you ain't gonna eat it at all." She described the large portion sizes she received as a child. She was required to eat what was given to her or not eat anything at all. Another woman explained how wastefulness was unacceptable in her household, "momma put it on the plate, you eat it, you know, don't nothing go to the garbage." This woman was required to eat all the food on her plate. She recognized that as a child the additional calories consumed were lost by physical activity. As an adult she was less physically active; therefore, she burned less calories and ate smaller portion sizes. Willow eats smaller portions as well. She uses a salad plate for her meals to decrease her portion sizes. Several people ate smaller portion sizes to modify their food practices.

Changes in Diets to Address Health Problems

Health conditions such as diabetes, high blood pressure, strokes, heart attacks, and being overweight were frequently mentioned among the individuals interviewed. Carmen, Angela, Nelson, Francis, and Quinn changed their diets to address specific health problems. They recognized the health effects of consuming too much pork, salt, and sugar have and changed their diets to improve their health. For example, Carmen acknowledged the impact of pork and salt consumption on her own health and that of the African-American community.

> The seasoning is mostly did with beef, you know, and, and less pork, less salt, because of the high blood pressure that I do deal with. And like I say, a lot of the seasons, like herbs and stuff like that, Mrs. Dash, you know, to kind of get you away from that salt. That's one of the big factors with us, you know, common within African American, you know, family, we won't leave that salt shaker alone and it's killing us, you know.

Carmen made changes to her diet by using beef, turkey, and oxtails instead of pork and seasoning with herbs and Mrs. Dash instead of salt. Angela changed her eating habits to improve her health by eating less pork and beef,

> yeah, I mean, I'm eating healthier now than I did, cause then, back then, I mean, it was whatever, you know… but, yeah I changed, but I changed my eating habits because of my health and I, sometime I think I waited too late but I guess it's never too late though to change it. But I can tell the change in, I mean, the way I feel and everything cause I, I got high blood pressure and I'm a diabetic.

Angela highlights that it is never too late to make changes to improve health. She also recognized the change in the way she feels as a result of changing her eating habits. Moreover, Nelson described how he attributes the healthy food he eats to recovery from a stroke and heart attack,

> you put something in your body that's not suppose to be there then later on it might show up. And it makes you unhealthy. The doctor told me after my stroke and my heart attack. They sent me to rehab and by the time I got ready to get outta there, I told em' I said think I wanna go back there. … So they started studying me a little more and he said we can't really tell why you recovered in the way that you're recovern'. So they started searchin' how I live, and all that, they wanted to know that, so... And the way that I eat, I say that it all goes back to that.

Additionally, Francis identifies his strategy to addressing his risks for high blood pressure as well as losing weight by closely examining what, how, and the amount of food he consumes.

> I'm older and I gotta watch what I eat, how I eat, and the amount I eat. … it's to keep me from havin' high blood pressure and I got bad knees, and I gotta stand a certain way cause I used to weigh 240 pounds and now I weigh 190.

Francis lost nearly 50 pounds with what he responded as, "by pullin back and not eatin' as much." He suggests that his strategy in monitoring the food he eats and eating less resulted in weight loss.

Angela limited their sugar intake by drinking less sodas. Along with eating less pork and beef to improve her health, Angela attributes the elimination of soda to controlling her diabetes,

> and like I was, you know, I said I was a diabetic and high blood pressure and soon as I stopped drinking sodas my sugar went down. You know, and I'm constantly checking, I'm constantly checking, I ain't had to take a shot in about almost a month because I stopped drinking sodas. So now I'm reading everything on the back of these juices, how much sugar, how much sodium and everything in it.

Angela informs herself by reading the nutrition facts labels with particular attention to sugar and sodium. Angela recalled eating a lot of sweets as a child and providing her own children with sweets everyday as they were growing up; however, she has since limited her intake of sweets saying, "I don't, I don't fool with it [sweets] too much."

Family History and Food Practices

Several of the respondents have families who have lived in the area for 3 to 4 generations. The participants spoke of parents, grandparents, and great-grandparents who moved to Alexander County and Pulaski County, Illinois from southern states like Arkansas, Louisiana, Mississippi, Missouri, Oklahoma, and Kentucky. The influences of southern and African-American ways of living, particularly traditions of eating emerged in the interviews.

Pork was a common part of the meals as respondents recalled eating, "the pig from the rooter to the tooter," that included pig ears and pig feet in their youth. Meals with pork generally consisted of pork bacon typical for breakfast, bologna for lunch, and pork chops for dinner. As adults, many individuals interviewed are eliminating or limiting the amount of pork they consume to improve health.

It was overwhelming noted that grandmothers and mothers were responsible for food preparation during the participants formative years. There was also an agreement that the food prepared by these women was good. When questioned why the food tasted so good, Francis

said, "I guess cause love and carin' and the fact that you know you have a meal comin'." Heather was diligent in providing balance meals that included fruit and vegetables for her family. She emphasized additional ingredients in her food, "I just, I don't know, put a lot of care in it, a lot of love in it I guess." Love and care were frequently associated with meals and food preparation. In general, respondents had fond memories about the foods and meals of their childhood and maintained them in their current diets. There was an overall agreement that the foods prepared by mothers and grandmothers were good, so good that, "she [mother] could make water taste good." Although the same types of foods and meals that grandmothers and mothers prepared were maintained; innovations in food preparation were observed during the interviews. Maintaining the same quality (taste) and preparation techniques of her mother and traditional foods were important for Carmen as she stated, "I found another way to season and still be able to get that same kind of quality that my momma, you know, brought me up on, but like I say it's a little more healthy believe it or not." Monique also expressed how she ate the same types of foods as her grandmother when she said, "I grew up with my grandma eating the same things that she do." Family history was an important aspect of food choices for the respondents.

Cultural Traditions and Food Choices

"Back when I was growin' up, everybody had gardens," proclaimed Devin. Many recalled fruit trees and gardens as a common means of obtaining fresh fruits and vegetables. Several grandfathers and fathers of the individuals interviewed raised livestock and farmed the land. The meat and fresh produce were used to sustain their livelihood and for household meals. This legacy was enacted through the gardens that some of the study participants raised, currently. Respondents observations about gardening extended beyond their own family experiences, but to the community as well.

Respondents believed growing gardens to be a safe alternative to eating fresh produce that is not treated with hormones or chemicals. Nelson hired men to pull and chop the weeds of his 1.5 acre garden in lieu of chemically treating it. He suggested eating fresh produce to be the reason all 15 of his brothers and sisters are alive today. Moreover, Nelson finds comfort in growing his own food:

> you go shoppin', you look in the T.V. or in the paper about the food that we're eating and come out of the stores and there is always something come up that is wrong. Something wrong with the food, that's why I do that [points to garden] there's no chemicals out there. Here I grow it, I know it's fresh. It ain't got no chemicals on it. So I feel safe eatin' it. You know.

This excerpt articulates Nelson's concern with chemicals in the food. He obtained his information about food warnings from various forms of media, television and newspaper. Nelson ensures the safety of his produce by growing his own food without the use of chemicals.

Variations in healthy eating

When asked what advice they have for people in the area to get or eat healthy foods, four individuals specifically said they do not eat healthy.

Researcher:	"What advice do you have for other people in the area on how to get (eat) healthy foods?"
Steven:	"I ain't got no advice. I don't eat healthy, so I can't tell no …"
Tamara:	"I can't give them no advice on how to get healthy foods, cause sometimes I don't get healthy foods!"
Lender:	[Laughs] "I don't know. I don't do too much healthy myself, so."
Katie:	"I ain't got none because I don't even eat healthy."

The interview data of the self-proclaimed unhealthy eaters was investigated to determine if there were differences in demographics, the foods they ate, or shopping habits of other respondents. Steven, a 38 year old single man from Pulaski, receives food benefits and is the only person who eats meals/food in his household. His current breakfast generally consists of

eggs and bacon. Steven's lunch is generally composed of left over dinner; moreover, his dinner is often unplanned and inconsistent. When Steven was asked about the composition of his current dinners, he responded,

> I don't know! It all depends! I'm a single man, I might go out to eat. You know I'm single, you know, I don't eat every day at home, you know I just eat…you know…? I don't know what I'm gonna cook! You know… I might go out to eat, or I might go to a buddy house and eat or I might come home and eat. You know what I mean? You know? I don't have no schedule, cause.

He explained that he might eat out [at a restaurant], a friend's house, or at home. Steven suggests that his single status allows him to be flexible in where he eats. He also spoke about slow cooking northern white and brown beans with pig feet in a crock pot, once a month. He prefers to eat fruit cocktail and mixed vegetables in a can, although Steven does eat grapes and stews with vegetables. Steven described his discontent with the taste and quality of fruit, "cause the rest of the stuff ain't even got no taste to it and stuff. Plums and stuff. Either too over-riped or ain't-riped. Ain't got no flavor to em', no taste to em', they ain't sweet." He observed that the fruit are over-riped, under-ripe, or lacked flavor. Price was an important factor in where Steven purchased his food as he shopped at Arnold Grocery Store in Alexander County and two "Big Box Stores" in Union County, IL and Cape Girardeau County, MO.

"I don't do breakfast. … I don't do lunch! … I eat dinner! I snack all day! … Chips, soda, fruits [chuckles]," said Tamara a 61 year old female from Pulaski. Similar to Steven, Tamara is single and is the sole person who eats meals/food in the household; however, she does eat more variety of beans, fruits, and vegetables than Steven. Tamara has a family member who grows and shares fresh vegetables and peppers with her. Her family also provides Tamara with transportation to the various food venues (stores) where she shops such as Ellis Big Box Store in Union County, IL and Free Big Box Store in Union County, IL. She also shops locally

at the Brandon Farmers Market and Dixon Grocery Store in Pulaski, County, IL as convenience was the greatest influence in where Tamara shopped.

Lender, is a 36 year old mother from Unity in Alexander County, detailed how she eats pre-packaged foods and meals that can be prepared quickly, "I eat more fast [food] and microwave stuff because I'm always on the go [laughs]. But growing up we used to always have meals prepared and everything so we be able to sit down at the table meals." Lender's current microwave foods differed from meals during her childhood that were prepared and eaten at a table. She explained that limited time and her schedule were factors that determined her eating foods that she, "throw(s) in the microwave, hot pockets and stuff like that." Lender purchases the foods she eats at Arnold Grocery Store in Alexander County, IL, at two "Big Box Stores" in Union County, IL one of which is Ellis, and David and Houghton "Big Box Store" in Cape Girardeau County, Cape Girardeau, MO. Price was not an influence in where Lender shopped for food, but availability was an important factor. Lender said, "Uhh the avail uhh I don't know [chuckles]. I don't too much, I don't really too much care about the prices. If I'm hungry, I'm gon' eat. … So I'd say the availability."

"I ain't got none [advice] because I don't even eat healthy," said Katie. She is a 41 year old mother who lives in Thebes, Alexander County and receives food benefits as do the three other respondents who said they do not eat healthy. The beans, fresh fruits, and fresh vegetables that Katie consumes are: white beans, pork and beans, watermelons, peaches, cantaloupes, grapes, strawberries, bananas, cucumbers, squash, greens, okra, and corn. She eats pork for breakfast and lunch. Katie's breakfast generally consists of bacon and sausage; moreover, her

lunch generally consists of ham sandwiches and chips. She shopped at stores in Alexander and Pulaski County, Arnold Grocery Store, Cornell Grocery Store, and Dixon Grocery Store. Katie also shopped at "Big Box Stores" in Union County, IL and sometimes in Cape Girardeau County, MO. Katie sometimes got food from a pantry in Alexander County. Fresh produce was obtained from her brother's garden. She got, "greens from him. Greens and cucumbers. Sometimes, [he have] watermelons. Sometimes cantaloupes. And okra and corn."

Price was an important to Katie the selection of stores to shop. She said, "I just go to all of them to see which one has the better deal. Or something, I might need from the store and this store ain't got it." Katie spoke about her consumption of a number fruits and vegetables; however, she described eating unhealthy. Three of the self-proclaimed unhealthy eaters spoke of consuming healthy foods.

Availability, Price, and Quality

The factors that contribute to where the respondents shop as well as the characteristics of their nutrition environment were explored. The respondents described the availability of the foods they desire in the stores where they shop. Some people settle for the foods available in the various food venues (stores) as did Pierre. Pierre said, "I don't always find what I want sometime, I just settle." Settling for the convenience of what is available in the nutrition environment was a common practice for the respondents.

Seven of the people interviewed believed Alexander County and Pulaski County stores to have higher prices than stores in counties with larger chain stores. Carmen explained what she believed to be the rationale for higher prices in the Alexander County and Pulaski County stores,

> because the, the local vendors can't afford to lower their prices no lower, you know. And then there's always a catch 22 to that, the people ain't got nowhere else to shop at so you got to pay for this if you want it.

Carmen described the challenge the local vendors encounter in lowering their prices, yet the irony in people without transportation settling for the availability, prices, and quality in the local small grocery stores.

Pierre described three incidents in which he purchased poor quality items in a Pulaski County grocery store.

> and I used to get food there, yeah. But then you got to be real careful cause I got some stuff from there, man, it had, dated 1996, man. I'm like, man what the … that was s box cereal. [laughter] He gave me my money back. … Some of the stuff they had in they freezer was old, man. Let me see, they had some frozen waffles. Right, you open the box up, man, you wonder why they taste like cardboard. Like man, look at the date. They were all outdated.

The final incident in which Pierre described poor quality was a can of outdated biscuits. On three separate occasions the box cereal, frozen waffles, and biscuits that Pierre purchased in a local grocery store were outdated. Nelson, Francis, and Carmen all agreed that the quality of fresh fruits and fresh vegetables were better at large stores or "Big Box Stores" because of the stocking turnover of the items. Francis spoke about the better quality in "Big Box Stores" when he said,

> [Big Box Stores], cause they move a lot of 'em. And the places that move a lot of food keep the freshest vegetables. And if you go to a place that ain't you would not get the freshest vegetables. … I think they move they food quicker and all the food be fresher.

Better quality fresh produce was also thought to be found in the gardens and directly from the farms by other participants. Willow described the best quality produce, "in the ground [laughs] at your farmer's market and in the garden, is the best variety of all cause the food is depleted. There's no nutrition in there, it just looks pretty." Xandra echoed Willow's comment when she said, "uh, I probably get the best quality in my garden then I do anywhere else."

Ursula and Pierre detailed the same unique challenge of shopping at the Alexander County and Pulaski County stores,

> … they overprice, they closed, they don't, they close up, you know, 6:00, 5:00, so after 5:00 you got to go to either Carbondale [Illinois], Cape [Girardeau, MO] or Kentucky. And that's two other states, and you also go to those two other states instead of Carbondale because its cheaper gas. … yeah, well store wise everything close around about – 5:00 yeah, anything other than that you'll, you have to get it from a service station there. And that's definitely high cause they definitely gonna charge you for the convenience

Pierre described that the hours of the stores in Alexander County and Pulaski County are inconvenient for some of the people living in the counties; consequently, the residents have to travel to Illinois counties north of Alexander County and Pulaski County, like Union County and Jackson County as well as to Missouri, or Kentucky to purchase the desired foods. Transportation is needed to travel the distance to stores outside of the counties of residence. Carmen spoke about transportation being an issue as a lot of people do not have drivers licenses and there is not a form of public transportation in the area. The service station or gas station was an alternative to purchase food, but Pierre believed the prices to be higher at the gas stations.

All of the people interviewed traveled outside of Alexander County and Pulaski County to food venues or stores to obtain some of the foods they eat. Often these food venues were located in different cities, counties, and even states from the study participants place of residence. Tables 8 and 9 display the counties of the food venues frequented and the distances traveled for each person interviewed by county. People residing in Alexander County traveled a mean of 29 miles to food venues or stores. People residing in Pulaski County traveled a mean of 40 miles. It was common for people to shop in adjacent counties of Union County and Jackson County, Illinois, though these venues were 20 to 40 miles north of Alexander County and Pulaski County. Respondents also used stores in the neighboring states of Missouri and Kentucky.

Table 8. Location of Food Venues Frequented by Alexander County Participants

Pseudonym	City of Residence	County of Residence	County of Food Venues	Type of Food Venues	Distance to Food Venues (approx. miles)
Angela	Hodges Park	Alexander	Cape Girardeau County, MO	Big Box Store	25
			Scott County, MO	Big Box Store	40
Buchanan	Hodges Park	Alexander	Alexander County, IL	Grocery Store	16
			Union County, IL	Big Box Store	20
			Cape Girardeau County, MO	Big Box Store	25
Carmen	Klondike	Alexander	Alexander County, IL	Grocery Store	6
			Pulaski County, IL	Grocery Store	11
			Scott County, MO	Big Box Store	30
			Cape Girardeau County, MO	Big Box Store	39
Devin	Sandusky	Alexander	Jackson County, IL	Big Box Store	40
			Cape Girardeau County, MO	Big Box Store	25
Eugene	Sandusky	Alexander	Cape Girardeau County, MO	Big Box Store	25
			Jackson County, IL	Big Box Store	40
Francis	Tamms	Alexander	Alexander County, IL	Grocery Store	19
			Pulaski County, IL	Grocery Store	13
			Union County, IL	Big Box Store	18
			Cape Girardeau County, MO	Big Box Store	33
Genell	Tamms	Alexander	Union County, IL	Grocery Store	18
			Cape Girardeau County, MO	Big Box Store	22
Heather	Thebes	Alexander	Cape Girardeau County, MO	Big Box Store	12
Illia	Thebes	Alexander	Alexander County, IL	Grocery Store	24
			Pulaski County, IL	Grocery Store	18
			Cape Girardeau County, MO	Big Box Store	12
Jasmine	Thebes	Alexander	Pulaski County, IL	Grocery Store	18
			Jackson County, IL	Grocery Store	47
			Cape Girardeau County, MO	Big Box Store	12
Katie	Thebes	Alexander	Alexander County, IL	Grocery Store	12
			Pulaski County, IL	Grocery Store	18
			Union County, IL	Big Box Store	26
			Cape Girardeau, MO	Big Box Store	12
Lender	Unity	Alexander	Alexander County, IL	Grocery Store	13
			Cape Girardeau County, MO	Big Box Store	25
			Union County, IL	Big Box Store	24
			Mean miles traveled per person:		29

Table 9. Location of Food Venues Frequented by Pulaski County Participants

Pseudonym	City of Residence	County of Residence	County of Food Venues		Distance to Food Venues (approx. miles)
Monique	Mounds	Pulaski	Pulaski County, IL	Grocery Stores	0
			Alexander County, IL	Grocery Stores	8
			Union County, IL	Grocery Stores	28
			Cape Girardeau County, MO	Big Box Store	29
			Scott County, MO	Big Box Store	36
Nelson	Mounds	Pulaski	Pulaski County, IL	Grocery Store	0
			Cape Girardeau County, MO	Big Box Store	29
			Scott County, MO	Big Box Store	36
Pierre	New Grand Chain	Pulaski	Pulaski County, IL	Grocery Store	15
			Union County, IL	Big Box Store	23
			Cape Girardeau County, MO	Big Box Store	40
			McCracken County, KY	Big Box Store	34
Quinn	Olmsted	Pulaski	Cape Girardeau County, MO	Big Box Store	37
Rachel	Perks	Pulaski	Union County, IL	Big Box Store	18
			Jackson County, IL	Big Box Store	36
			Massac County, IL	Big Box Store	27
			Cape Girardeau County, MO	Big Box Store	37
Steven	Pulaski	Pulaski	Alexander County, IL	Grocery Store	16
			Cape Girardeau County, MO	Big Box Store	29
			Union County, IL	Big Box Store	20
Tamara	Pulaski	Pulaski	Pulaski County, IL	Grocery Store	0
			Union County, IL	Big Box Store	20
Ursula	Pulaski	Pulaski	Union County, IL	Big Box Store	20
			Massac County, IL	Big Box Store	35
			McCracken County, KY	Big Box Store	48
			Cape Girardeau County, MO	Big Box Store	29
Vashti	Ullin	Pulaski	Pulaski County, IL	Grocery Store	4
			Union County, IL	Big Box Store	16
			Williamson County, IL	Big Box Store	39
			Cape Girardeau County, MO	Big Box Store	29
Willow	Ullin	Pulaski	Union County, IL	Big Box Store	16
			Jackson County, IL	Big Box Store	36
			Williamson County, IL	Big Box Store	39
			Mississippi County, MO	Big Box Store	30
Xandra	Villa Ridge	Pulaski	Alexander County, IL	Grocery Store	14
			Pulaski County, IL	Grocery Store	8
			Union County, IL	Grocery Store	35
			Cape Girardeau County, MO	Big Box Store	34
			Mississippi County, MO	Big Box Store	16
			Mean miles traveled per person:		40

Empirical Characteristics of the Nutrition Environment

The influence of the empirical characteristics of the nutrition environment on the respondents' food selection and shopping were ascertained. Twenty-nine food venues, in Alexander County and Pulaski County, Illinois were initially identified for assessment regarding availability, price, and quality of dried legumes (beans and peas), fresh fruits, and fresh vegetables. NEMS-S assessments in the stores occurred from July 2, 2012 to August 10, 2012. None of the food venues (stores) in the study refused the assessment. Of the 10 grocery stores initially identified only six were actually open for business. All 3 of the "dollar" stores identified were open for business. Ten of the 12 gas stations-convenience stores-food marts were in operation. Two meat markets were out of business. One store classified as a meat market was determined to be a gas station after an on-site observation. It was open for business. The two farmers markets identified were open for business (Table 10). The 6 most commonly mentioned food venues (stores) outside of Alexander County and Pulaski County were assessed with NEMS-S (Table 11). Two food venues (stores) were located in Union County, Illinois, and four in Cape Girardeau County, MO. A new category of large stores called "Big Box Stores" was used to describe these 6 stores (Sharkey et al. 2010).

The customized NEMS-S was used to assess the "culturally-preferred foods," dried legumes (beans and peas), fresh fruits, and fresh vegetables initially identified from the literature. Additional dried legumes (beans), fresh fruits, and fresh vegetables identified during the interviews were assessed, as well. Added food items were white beans, great northern beans and navy beans, and lima beans, large and baby. Additional fresh fruits assessed were grapes, bananas, apples, and peaches. Pumpkins are a culturally-preferred food, but were not included in the analysis due to the season in which the assessment was conducted. Five foods commonly

cited by respondents were not included in the assessment. Black beans, green beans, tomatoes, corn, and cucumbers were mentioned by respondents, but were not included in the NEMS-S assessment which began before these five items emerged as important foods in respondents' interviews. There were a total of 27 stores assessed with NEMS-S in the study.

Table 10. Food Venues (Stores) in Alexander County and Pulaski County, Illinois

Store Pseudonym	Store ID	County	Accept Food Benefits	Status
Grocery Store				
Arnold Grocery Store	01-1-01-001	Alexander	Yes	Open
Brown Grocery Store	02-1-01-004	Pulaski	NA	Out of Business
Cornell Grocery Store	02-1-01-006	Pulaski	Yes	Open
Dixon Grocery Store	02-1-01-008	Pulaski	Yes	Open
Edward Grocery Store	02-1-01-009	Pulaski	Yes	Open
Franklin Grocery Store	02-1-01-011	Pulaski	Yes	Open
Gantt Grocery Store	01-1-01-013	Alexander	Yes	Open
Hightower Grocery Store	02-1-01-015	Pulaski	NA	Out of Business
Ivy Grocery Store	02-2-01-018	Pulaski	NA	Restaurant
Howard Learning Center	02-1-01-019	Pulaski	NA	Learning Institution
"dollar" Store				
Kenney "dollar" Store	01-1-02-020	Alexander	Yes	Open
LeConte "dollar" Store	01-1-02-021	Alexander	Yes	Open
Morris "dollar" Store	02-1-02-022	Pulaski	Yes	Open
Gas Station-Convenience Store-Food Mart				
Niemeyer Convenience Store	01-1-03-023	Alexander	Yes	Open
Overton Convenience Store	02-1-03-024	Pulaski	Yes	Open
Pang Gas Station	02-1-03-025	Pulaski	No	Open
Quincy Food Mart	02-1-03-026	Pulaski	No	Open
Rutherford Food Mart	01-1-03-027	Alexander	No	Open
Simon Food Mart	02-1-03-028	Pulaski	No	Open
Taylor Gas Station	02-1-03-029	Pulaski	No	Open
Uceny Gas Station	02-1-03-030	Pulaski	NA	Out of Business
Violet Gas Station	02-1-03-031	Pulaski	NA	Does not exist
Wade Gas Station	01-1-03-032	Alexander	No	Open
Xavier Gas Station	02-1-03-033	Pulaski	No	Open
Young Gas Station	01-1-04-034	Alexander	Yes	Open
Meat Market				
Zane Meat Market	01-1-04-035	Alexander	NA	Out of Business
Allen Meat Market	01-1-04-002	Alexander	NA	Out of Business
Farmers Market				
Brandon Farmers Market	02-1-05-003	Pulaski	Yes	Open
Cordell Farmers Market	02-1-05-005	Pulaski	Yes	Open

NA – Not Applicable

Table 11. Most Commonly Frequented Big Box Stores Outside of Alexander County and Pulaski County, Illinois

Store Pseudonym	Store ID	County	Accept Food Benefits	Status
David Big Box Store	04-1-06-007	Cape Girardeau County, MO	Yes	Open
Ellis Big Box Store	03-1-06-010	Union County, IL	Yes	Open
Free Big Box Store	03-1-06-012	Union County, IL	Yes	Open
Georgia Big Box Store	04-1-06-014	Cape Girardeau County, MO	Yes	Open
Houghton Big Box Store	04-1-06-016	Cape Girardeau County, MO	Yes	Open
Isis Big Box Store	04-1-06-017	Cape Girardeau County, MO	Yes	Open

Grocery Stores

The availability and quality scores of dried legumes (beans and peas), fresh fruits, and fresh vegetables at the grocery stores in Alexander County and Pulaski County are displayed in Table 12. Four of the 6 open grocery stores were located in Pulaski County. Two stores were in Alexander County. Dixon Grocery Store had the highest combined availability and quality score of all the grocery stores. It also had the highest availability score. The grocery store with the lowest combined availability and quality score was Franklin Grocery Store. Four of the 6 or 67% of the grocery stores had the maximum quality scores.

The store with the lowest availability score was Edward Grocery Store while Franklin Grocery Store had the lowest quality score among all the grocery stores in Alexander County and Pulaski County. Dried red beans and kidney beans were not sold in any of the grocery stores. The prices of the food items proved difficult to evaluate because many stores offered several different sizes of products and the prices varied among the food items as well as the stores. Prices for the food items in the grocery stores are in Appendix G. The grocery stores generally had the highest priced food items among the 5 types of venues assessed in the study.

Table 12. Availability and Quality Scores at Food Venues in Alexander County and Pulaski County

Store Pseudonym	Store ID	County	Available Score 0 to 9	Quality Score 0 to 6
Arnold Grocery Store	01-1-01-001	Alexander	5	6
Brown Grocery Store	02-1-01-004	Pulaski	Out of Business	Out of Business
Cornell Grocery Store	02-1-01-006	Pulaski	6	6
Dixon Grocery Store	02-1-01-008	Pulaski	7	6
Edward Grocery Store	02-1-01-009	Pulaski	4	5
Franklin Grocery Store	02-1-01-011	Pulaski	5	3
Gantt Grocery Store	01-1-01-013	Alexander	6	6
Hightower Grocery Store	02-1-01-015	Pulaski	Out of Business	Out of Business
Ivy Grocery Store	02-2-01-018	Pulaski	Restaurant	Restaurant
Howard Learning Center	02-1-01-019	Pulaski	Learning Institution	Learning Institution
Grocery Stores		Mean (Standard Deviation)	5.5(1.0)	5.3(1.2)
Kenney "dollar" Store	01-1-02-020	Alexander	1	NA
LeConte "dollar" Store	01-1-02-021	Alexander	1	NA
Morris "dollar" Store	02-1-02-022	Pulaski	1	NA
"dollar" Stores		Mean (Standard Deviation)	1(0)	NA
Niemeyer Convenience Store	01-1-03-023	Alexander	1	NA
Overton Convenience Store	02-1-03-024	Pulaski	1	NA
Pang Gas Station	02-1-03-025	Pulaski	0	NA
Quincy Food Mart	02-1-03-026	Pulaski	0	NA
Rutherford Food Mart	01-1-03-027	Alexander	1	NA
Simon Food Mart	02-1-03-028	Pulaski	1	NA
Taylor Gas Station	02-1-03-029	Pulaski	0	NA
Uceny Gas Station	02-1-03-030	Pulaski	Out of Business	Out of Business
Violet Gas Station	02-1-03-031	Pulaski	Did not exist	Did not exist
Wade Gas Station	01-1-03-032	Alexander	0	NA
Xavier Gas Station	02-1-03-033	Pulaski	0	NA
Young Gas Station	01-1-04-034	Alexander	2	3
Gas Stations-Convenience Stores-Food Marts		Mean (Standard Deviation)	0.6(.7)	3
Zane Meat Market	01-1-04-035	Alexander	Out of Business	Out of Business
Allen Meat Market	01-1-04-002	Alexander	Out of Business	Out of Business
Meat Markets		Mean (Standard Deviation)		
Brandon Farmers Market	02-1-05-003	Pulaski	2	6
Cordell Farmers Market	02-1-05-005	Pulaski	1	3
Farmers Markets		Mean (Standard Deviation)	1.5(.7)	4.5(2.1)

"dollar" Stores

The "dollar" stores did not sell fresh fruits or fresh vegetables; however, dried legumes (beans) were available in all three stores. The varieties of dried legumes (beans) were limited in the "dollar" stores. Two varieties, pinto beans and great northern beans, of the total 7 varieties were available in all three stores. Each store received 1 point of a total 9 points for having 2 of the 7 varieties of beans. The quality of the dried legumes (beans an peas) was not assessed. The prices for pinto beans and great northern beans were the same in Kenney "dollar" Store and LeConte "dollar" Store. Bean prices were slightly lower at the "dollar" store in Pulaski County, Morris "dollar" Store (Appendix H).

Gas Stations-Convenience Stores-Food Marts

The gas stations-convenience stores-food marts were limited in the offering of the culturally-preferred foods sought during the assessments. Three of the venues assessed were located in Alexander County and two in Pulaski County. Four gas station-convenience store-food marts sold dried legumes (beans and peas) and received one of a maximum nine points, each for availability. Red beans, large lima beans, and baby lima beans were not sold at these stores. One gas station sold dried legumes (beans and peas) and lettuce; therefore, it received 2 of a maximum 9 points for availability.

The prices for the dried legumes (beans and peas) are displayed in Appendix I. Two of the gas stations-convenience stores-food marts sold expired items. The bag of kidney beans sold at Rutherford Food Mart was expired as of February 2, 2012 approximately 5 months from the date of the assessment. Black-eyed peas sold at Simon Food Mart were dusty and had an expiration of December 16, 2010. The black-eyed peas were sold 28 months from the date of the assessment. Young Gas Station was the only store of its type to sell fresh produce.

Farmers Markets

There are two farmers markets in Pulaski County, Brandon Farmers Market and Cordell Farmers Market. Neither of the farmers markets sold dried legumes (beans and peas). Brandon Farmers Market received a total of 2 points for availability. One point was received for having 2 of the 7 varieties of fruits. One point was also received for having 5 of the 12 varieties of vegetables. Brandon Farmers Market had the most variety of fresh fruits and fresh vegetables available between the two farmers markets. The quality of all the fruits and vegetables at Brandon Farmers Market was acceptable; therefore, the produce received the maximum 6 points. Produce from Brandon Farmers Market was grown at a large local family farm.

Cordell Farmers Market did not sell any dried legumes (beans and peas) or vegetables. The market had 2 of the 7 varieties of fruits. It received one point for the 2 varieties of fresh fruit and 3 points for acceptable quality. Cordell Farmers Market was different than Brandon Farmers Market as it was a home-based business in which the owner sold produce from the basement and a back yard pick-up truck grown on family land. Prices for the food items in the farmers markets are in Appendix J

Big Box Store

Two Big Box Stores were in Union County, Illinois and 4 were in Cape Girardeau County, Missouri. Isis Big Box Store in Cape Girardeau County, MO obtained a perfect score in both availability and quality. Isis sold every variety of dried legumes (beans), fresh fruit, and fresh vegetables. The quality of the fresh fruits and vegetables was acceptable with the exception of the carrots; nonetheless, Isis received the maximum 6 points for the quality. Isis "Big Box Store" was the only food venue (store) of the total 27 food venues (stores) assessed with NEMS-S to receive a perfect score. All of the "Big Box Stores" scored the maximum

points for quality. Houghton Big Box Store received the lowest combined availability and quality score of all the Big Box Stores. It also had the lowest availability score if all the Big Box Stores. Appendix K. displays the prices of the food items in "Big Box Stores". These food venues (stores) generally had the lowest priced dried legumes (beans and peas), fresh fruits, and fresh vegetables among the 5 types of venues assessed.

Table 19. Availability and Quality Scores of Big Box Stores Frequented in Union County, Illinois and Cape Girardeau County, MO.

Store Pseudonym	**Store ID**	**County**	**Availability Score 0 to 9**	**Quality Score 0 to 6**
David Big Store	04-1-06-007	Cape Girardeau County, MO	8	6
Ellis Big Store	03-1-06-010	Union County, IL	6	6
Free Big Store	03-1-06-012	Union County, IL	7	6
Georgia Big Store	04-1-06-014	Cape Girardeau County, MO	7	6
Houghton Big Store	04-1-06-016	Cape Girardeau County, MO	5	6
Isis Big Store	04-1-06-017	Cape Girardeau County, MO	9	6
		Mean (Standard Deviation)	7(1.14)	6(0)

Challenges of the Rural Nutrition Environment Managed

There were unique challenges that the rurality of the study area presented for respondents in acquiring the foods they consumed. The individuals interviewed in the study exemplified a resiliency in managing the challenges of the nutrition environment. They used several alternative means to get the foods they eat: coordinating shopping trips, carpooling, gardens, community sharing that included giving and receiving, roadside markets and mobile sources, and obtaining food from pantries or give-a-ways. The long distances traveled to obtain food from the Big Box Stores outside of the counties of residency were a challenge. These trips were often coordinated with visits to the doctor, or the pharmacy, employment related travel, shopping for clothes, or visits to relatives. Respondents offered various other suggestions such as a list of items needed from the store before the shopping trip was cited by a number people. Ursula said, "I actually make a list, a menu, and I find out what's on sale," before traveling to the store. Nelson also said he made a list of items he needed before traveling to the store,

> It's a trip from here over there you know. You talkin' like 25 or 30 miles. You don't want to go and come home to find out that you didn't get this or you didn't get that cause otherwise, 'ah man I forgot to get that, but if you know what you need, you see you need and you stop what chu' doin and you go and write on that note I got a thing on the house hanging on my wall.

Carmen and Jasmine suggested that rural residents of the nutrition environment should shop monthly to manage the distances traveled to the obtain food. Carmen emphasized the cost savings.

> The younger mom she's shopping every day. She's not, you know, going in there shopping for a month according to what she got to work with. She's shopping every day and it takes, for two weeks it takes a whole month of what her budget is, but if she would shop for a month she would be able to hold out until she got her next, you know, link or food stamps, whatever you want to call it.

Moreover, Jasmine focused on buying in bulk to ease the challenges in the rural nutrition

environment.

> I think like in an area like this, you know, like a lot of people, they, they shop as they go, you know, like on a daily basis, like they'll just go to the store and get something when they need it. I think that they should always go, you know, like once a month and, you know, stock up on what they need. That way, you know, it's better for them in an area like this cause transportation, if you don't have no way to get out, you know.

Shopping once may present an unique challenge in that the fresh produce may spoil during the month between trips to the store.

The majority of the people interviewed drove themselves to the store. Carpooling was a common method of getting to the store in these communities and those who drove often spoke about taking other people to the store in an exchange for gas money. Angela paid for rides to the store and her story exemplified a variety of common challenges.

> I had a Chrysler 300 and I blanked out and hit a transfer truck … by the grace of God I didn't get hurt. I got a busted lip and bruises and stuff and that was it and that was just by the grace of God though, I mean, He's watching out for me. But now, you know, I'll use my son's car or whatever, I did use that car and believe it or not they hit a, last Friday, both of them hit a deer, two hours after one another; one hit one, my oldest son hit a deer first, then my middle boy hit a deer two hours after he did. Yep, so but now I'm looking for me another car cause I have a lot of responsibilities, I mean, I have to shop for my house, I have to shop for my mother house and I got a son I shop for him. So I have a lot of responsibilities so I can't stand, I can't be without a car. … I have to pay somebody anywhere from $12 to $25 to $30. … Even if they be going right straight to the store they still expect you to pay for gas, so.

Angela's situation is particularly challenging as her responsibilities for shopping also included three households: her own, her mother, and her son. Angela remained optimistic despite the adversity she encountered related to transportation. She also accepted that she had to pay for rides to the store. Angela, like other residents in Alexander and Pulaski, were resilient in the negotiation of the nutrition environment limits to obtain healthy, culturally-preferred foods.

Garden

It was common for the participants to recall their parents, other family members, and neighbors having farms or gardens where fresh produce was available during their formative years. They told vivid stories where "storing" or shopping trips to the store were few and the land met their food needs. Fruit trees, a variety of berries that grew wild (like dewberries, mulberries, and blackberries), wild leafy greens like poke, other homegrown vegetables like cabbage, okra, and meats like rabbits, squirrels, and raccoons were components of meals. Growing produce was "livelihood" for many of the participant's families when they were children. With roots in Mississippi, Nelson shared how his parents and 15 siblings rented land and raised food.

> Yes, uh, when I say renters, there's a process down there they call half and half. With the other on the man's farm and we raised his food. So he got half and we got half. So we had to take our half…and that's what we had to live off of. And the other half was his because he owned the property. … So, it was kinda a hard process but it was a way of life. We learned how to live like that. Being a young black man and being in the cotton fields in Mississippi all your life you was waitin' until you go North. Everybody went North. To try to get better jobs, well everything.

Nelson described the sharecropping process his family endured in renting land in Mississippi. They raised food and shared half of the food with the landowner. Nelson and 5 other participants maintained the tradition of growing their own food.

Ulonda's grandfather farmed and shipped produce to other areas. Along with her uncle, she carried a similar tradition by growing a garden. She grew cabbage, broccoli, jalapeno and cayenne peppers, corn, tomato, lettuce, greens, eggplant, and cucumber. Ulonda was so fascinated by the broccoli that she grew that she took a picture of it. She said, "I looked at the grocery store and the broccoli, like a $1.99 for one bunch, and that bunch wasn't as big as the bunch I had on mine so I took a picture of it, I was pretty proud of it."

Foods from the garden were generally appreciated for its quality. Mild winters in Southern Illinois allowed greens to be grown all year for one of the participants. Freezing home grown fruits and vegetables like greens, green beans, broccoli, okra, tomatoes, and crowder peas for the winter was a practice. One home even had two deep freezers used to store foods, especially foods from the garden.

Challenges to Garden

Gardens were a common observation among the respondents, whether they gardened themselves or not, as a way to obtain fresh produce in these rural southern Illinois counties; however, various challenges made it difficult. Six women expressed challenges encountered to growing their own garden such as tilling the land to prepare it for planting. Quinn articulated her frustration and disappointment in starting her garden when she said,

> well, I was gonna do that this year again. I've got at least damn near $100 worth of seeds I done bought. So everybody I know, like my brother and my sister-in-law, they said, well somebody's doing my garden. I say, okay when he gets through, send him over here. He never gets here. People just, I don't know what happens, and so I, with my dumb butt I be sitting and waiting. Then thing you know, the season, it's too late.

Assistance was also needed to put a fence around the garden to keep the rabbits, deers, and playing children from destroying the produce in the garden. The land to plant a garden was needed by Illia who lived in public housing and was interested in growing her food. For Monique, her busy schedule that consisted of school, caring for her children, and work left her little time to garden, "school, kids, work. I just ain't got time. … To me it's time consuming, and I don't have that much time to be tending to no garden, you know what I mean?!" The demands of the three responsibilities did not allow the time it took to nurture a garden. Monique acquired fresh produce from her grandmother,

> well, like now being its summer time and the farmers are selling their stuff, my grandma, that's where she gets a lot of her stuff from and if she has some leftover she, you know, she gives it to us.

Community sharing by giving and receiving

Sharing the produce grown in the gardens was a common practice. This practice of sharing was reciprocal as those interviewed emphasized both the giving and receiving of home-grown items. Sharing evoked a sense of community and closeness for those who gave and received.

> One thing you know about this area, this neighborhood when we have the gardens, you know after the gardens are raise, what we do we take each other food. See everybody have something different in the garden. … And what we do is, everybody brings something. So girl I have some greens, I was thinkin' about chu'. And they bring you back a couple of greens. And girl I have tomatoes and cucumbers I thought about chu! You know, so we do that!

This exchange, described by Willow, demonstrated the social networks in the community used to navigate the nutrition environment. In another instance of community sharing, a woman received bell peppers from an older gentlemen with a farm. She stuffed and cooked the peppers and returned them to the gentleman as a meal. This reciprocal act of sharing also demonstrates the community closeness. Homegrown vegetables were given to the churches to donate to members as another example of sharing. The vegetables grown in the gardens were also given to family members in different cities by those who grew gardens. The social networks of sharing expanded beyond families and community, but to different cities and states as Nelson's brothers and sisters travel to get the produce from his garden.

Moreover, two people spoke of ways their social networks provided opportunities to obtain vegetables. They were notified by a friend of a friend or a co-worker's daughter who planted fields or large patches of mustard greens, turnip greens, kale, and spinach that the greens were ready to be picked. The individuals were allowed to pick as much of the greens as they

desired at no cost. There was also knowledge within the community of who sold the best homegrown fruits and vegetables. For example, Ursula said,

> well I mean, if you live in this community you know that it's strawberry season, and we know that Mr. [Wade] has the best strawberries. He has the best in southern Illinois, so people drive to buy a flat of strawberries or two or whatever.

Resilience was displayed in the reciprocal sharing, giving and receiving, of fresh fruits and vegetables in these communities to navigate the nutrition environment. Social networks were also utilized to obtain fresh fruits and fresh vegetables.

Roadside Stands and Mobile Sources

Roadside stands and mobile food sources, which were common in summer months, yielded yet another chance to acquire fresh fruits and fresh vegetables for the respondents. Tent covered stands or pick-up trucks were, "located all along the surrounding towns and stuff … You know, they get the things out their garden and they set on the side of the road and they sell them," said Carmen.

Ulonda described how her uncle sold watermelons on his motorcycle with a basket that held four or five watermelons or a trailer if he had more watermelons. Her uncle traveled to cities like Cairo, Mounds, Mounds City, Ullin, Pulaski, and even the parking lot of a local learning institution to sell his watermelons as well as cantaloupes. This mobile source of fresh fruits and vegetables were reminiscent of Xandra's childhood as she recalled a man selling vegetables from a horse and wagon.

Pantries

Finally, six respondents identified pantries or give-a-ways as a means of acquiring food. Three different types of food pantries were used by the respondents: traditional food pantry, food pantry that prepared meals, and a commodity van. The traditional food pantries were places

where people could obtain uncooked food free of charge. Three women stated that they sometimes obtain food from a pantry. One woman said, "I have been to the one up here, but I don't go often." Angela's mother obtained food from the pantry and Angela cooked the food. Angela said, "when I prepare meals I prepare for them two [mother and father] down there too cause she's, she don't no longer cook, so." Angela referred to her mother no longer cooking food. Eugene obtained food from a second type of food pantry. The food at this pantry was prepared meals. He noted that the meals were for senior citizens. Illia and Heather described the commodity van or a mobile food pantry as another opportunity to obtain food free of charge. Illia spoke of the commodity van,

> they take donations from other people and they like come out here, I would probably like to say once a month and they give us beans, fruits, canned vegetables far as corn and stuff, bread, ketchup. Basically whatever they had donated to them then they would give to us.

Food pantries and give-a-ways were yet another way in which respondents exemplified a resiliency in navigating the nutrition environment.

Triangulation

Triangulation of multiple methods and multiple data sources were used in the study. The data collected with the interview eligibility form was compared with the data collected in the in-depth semi-structured interviews. Respondents spoke of specific family members during the interviews. The number and relationship of people who ate meals/food in the household was verified with the interview data collected from the respondents. Food venues (stores) were identified with multiple data sources, USDA SNAP Retailer Locator, Illinois Department of Agriculture, and www.yellowbook.com. The venues were also identified with on-site observations and during interviews as respondents named closed stores and stores where they purchased food.

Respondents settled for the convenience of availability of the foods in the counties were they resided, but found alternative means to acquire food. The mean availability score of the grocery stores, "dollar" stores, gas stations-convenience stores-food marts, and farmers markets were 5.5, 1, 0.6, and 1.5 respectively. Moreover, the "Big Box Stores" had a mean availability score of 7 which was higher than the other types of venues. As the "Big Box Stores" were located in Union County, Illinois and Cape Girardeau County, MO the respondents were accurate in the suggesting that the "Big Box Stores" availability was greater than the other venues. Respondents also suggested that the prices of foods were higher in the venues located in Alexander County and Pulaski County, Illinois. The price data collected during the assessments confirmed that the food prices in Alexander County and Pulaski County were generally higher than the prices in the "Big Box Stores" in Union County, Illinois and Cape Girardeau County, Missouri.

The individuals interviewed spoke of outdated foods and poorer quality dried legumes (beans and peas), fresh vegetables, and fresh fruits in the grocery stores. They also suggested that the "Big Box Stores" and the gardens had better quality foods. The grocery stores had a mean quality score of 5.3 of a total 6 points or 67% of them scored the highest points for quality. The "Big Box Stores" had a mean quality score of 6. The quality score for the "Big Box Stores" was the highest score in all 6 of the stores. The interview data and the data collected with the NEMS-S were similar regarding quality. Triangulation of data collection methods gave depth and dimensionality that allowed comparing of results from the multiple methods.

CHAPTER FIVE

SUMMARY, CONCLUSIONS, DISCUSSION, AND RECOMMENDATIONS

Purpose

The purpose of this study was to examine how African-American residents of a rural food desert navigate their nutrition environment to obtain the foods they eat. Residents' own perceptions of the nutrition environment, their food choices, and strategies for obtaining preferred foods were explored.

Research Questions

1) What foods are respondents eating?
2) To what extent are foods identified by researchers as healthy, culturally-preferred foods a part of the respondents regular diet?
3) What factors contribute to decision-making regarding food selection?
4) What factors contribute to where respondents shop?
5) What are specific characteristics of the nutrition environment: availability, price, and quality?
6) In what ways do the empirical characteristics of the nutrition environment (availability, price, and quality) influence the respondents' food selection and shopping?
7) How, if at all, do participants negotiate the limits of their nutrition environment to obtain healthy, culturally-preferred foods?

Summary

A food desert is defined as "a low-income census tract where a substantial number or share of residents has low access to a supermarket or large grocery store," (USDA, ERS, 2011).

Much research has explored food access and availability in urban areas that qualify as food deserts; far less attention has been given to the rural nutrition environment. Even less attention has been given to the African-American nutrition environment particularly in rural areas. Food "has provided one of the few vehicles through which Blacks have been able to preserve their African heritage," (Whit, 2007; Mendes, 1971). Exploring the nutrition environment in a rural African-American community can provide both cultural and dietary insight. The purpose of this study was to examine how African-American residents of a rural food desert navigate their nutrition environment to obtain the foods they eat.

A cross-sectional mixed method design was used for this study. Twenty-four in-depth interviews with 17 African-American women and 7 African-American men living in Alexander County and Pulaski County in rural southern Illinois were conducted between June 2, 2012 and June 28, 2012. All had been identified as the primary purchasers and preparers of foods in their households, self-identified as African American or Black, residents of Alexander County and Pulaski County (Illinois) longer than 5 years (excluding Cairo), and over 21 years of age. The qualitative data collected in this study was used to inform the quantitative methods in that the most commonly cited food venues outside of the two counties and the most commonly cited African-American culturally-preferred fresh fruits, fresh vegetables, and dried legumes (beans and peas) were assessed with the customized Nutrition Environment Measurement Survey-Stores (NEMS-S). African-American culturally-preferred dried legumes (beans and peas), fresh fruits, and fresh vegetables identified in the literature were also included in the study. A total of 27 food venues (stores) were assessed with NEMS-S between July 2, 2012 and August 10, 2012. The most commonly cited food venues (stores) outside of Alexander County, Pulaski County

were in Union County, Illinois and Cape Girardeau County, Missouri. A new category for 6 food venue (stores) was identified in the two counties as "Big Box Stores".

Such culturally-preferred foods as black-eyed peas and green leafy vegetables like cabbage, collards, turnips, mustards, and kale remain a dietary staple among the individuals interviewed. Fruit was often given as a snack to children of the respondents. Additionally, adults modeling behavior of eating vegetables was common for the children. The respondents described changes in diet to address health problems like diabetes, high blood pressure, strokes, heart attacks, and being overweight. Moreover, specific modifications to diet were made to traditionally southern and African-American methods of food preparation. Family history and food practices that maintained the same flavors as remembered in childhood were important. Additionally, cultural traditions like gardening, particularly without chemicals, were important to the respondents.

The respondents often settled for the food available in the study area which sometimes meant lesser quality of food for some respondents. It was commonly mentioned that the prices in food venues (stores) in Alexander County and Pulaski County were higher priced than venues in other counties. The quality of food in "Big Box Stores" and fresh produce grown in gardens were believed to be of better quality.

The NEMS-S assessment of the availability, price, and quality of African-American culturally-preferred dried legumes (beans and peas), fresh fruits, and fresh vegetables occurred in 6 grocery stores, 3 "dollar" stores, 10 gas stations-convenience stores-food marts, 2 farmers markets, and 6 "Big Box Stores" located in Union County, IL and Cape Girardeau County, MO. The mean availability score was highest in the "Big Box Stores" (7.0) and lowest in the gas stations-convenience stores-food marts (0.6). Prices were generally the lowest in the "Big Box

Stores" and highest in the grocery stores. Additionally, the quality score for the "Big Box Stores" (6.0) was higher than the grocery stores (5.3), gas stations-convenience stores-food marts (3), and farmers market (4.5). The grocery stores in Alexander County and Pulaski County had limited availability (5.5) and an overall quality score (5.3) which was lower than the "Big Box Stores".

Coordinating shopping trips, carpooling, and gardening were a few ways the individuals interviewed managed the challenges of the nutrition environment in Alexander County and Pulaski County. Gardening consisted of a community sharing that was reciprocal, both a giving and a receiving. Other ways the respondents navigated the limits of the nutrition environment were through roadside markets, mobile sources, and obtaining food from pantries or give-a-ways.

Conclusions

Food deserts have been characterized by unhealthy eating, limited availability and access, and a low income among the people living in the area. The characterizations of these areas are somewhat accurate. This study found that despite the limitations of the nutrition environment people: were eating healthier, had more knowledgeable about healthy ways of eating than expected, were aware of and responsive to traditional African-American foodways, and resourceful in food acquisition through community and social networks.

Despite the characterization of food deserts as low access and low income; the participants settled for the convenience of the foods in the nutrition environment and were also resourceful in discovering alternative means to acquire the foods they consumed. The respondents perceptions of the rural nutrition environment were accurate in that the availability, prices, and quality were generally better in the "Big Box Stores" located outside of the

Alexander County and Pulaski County, Illinois. The rurality of the nutrition environment presented challenges in obtaining food; nonetheless, the individuals interviewed exemplified a resiliency in negotiating the challenges.

This study is unique and added dimensionality to research on the nutrition environment. This study "incorporate[d] mixed-method and community-based participatory research approaches that integrate qualitative and quantitative methodologies (such as geo-ethnography) to ensure that measures and interpretation of findings are relevant to communities," as Odoms-Young (2009) suggests about needed research in the area. The study also explored culturally-preferred foods among African-Americans in a rural setting.

Discussion

The Model of Community Nutrition Environments developed by Glanz et al. (2005) illustrates the policy, environmental, and individual factors that influence behavior or eating patterns. In the state of Illinois, two recent policies have been developed to facilitate access to produce and increase economic opportunities. The *Farmers Market-Task Force (SB1852)* primary responsibility is to assist in developing administrative regulations for farmers markets in the state of Illinois (Illinois General Assembly b, 2011). The *Illinois Local Food Entrepreneur & Cottage Food Operation Act (SB0840)* allows for the sell of specific foods made in home kitchens at farmers markets with explicit guidelines (Illinois General Assembly b, 2011). These two recent policies have potential to shape the nutrition environment in Alexander County and Pulaski County.

The community nutrition environment includes the "type, location, and accessibility of food outlets." In this study there were 5 types of food venues (stores) investigated, grocery stores, "dollar" stores, gas stations-convenience stores-food marts, farmers markets, and "Big

Box Stores" located in 4 counties and 2 states that compromised the community nutrition environment for respondents. There were also alternative means of the community nutrition environment like gardens, roadside and mobile sources, and pantries. Available healthy options and prices are factors in the consumer nutrition environment that revealed the culturally-preferred foods were more available in stores outside of the study area while prices were generally lower in the stores outside of the study area as well.

Individual factors are the socio-demographics, psychosocial factors, and individuals' perceptions about their nutrition environment. The familial, southern, African-American, and cultural history of food and farming were influences in the eating patterns of the individuals in the study. The closeness of community and social networks aided in the acquisition of food and eating patterns among the respondents. The Model of Community Nutrition Environments by Glanz et al. is applicable to describing the results of study.

Limitations of the Data Collection Process

One limitation of the study was that the NEMS-S assessment began before all the interview data was analyzed. As a result 5 foods that ultimately emerged as commonly eaten were not included in the NEMS assessment, black beans, green beans, tomatoes, corn, and cucumbers. Four of the 5 items not assessed are seasonal, summer, items. These items are also likely to be obtained informally by growing in a garden or through community sharing. In addition, none of the food venues (stores) sold pumpkins due to its seasonality. Pumpkins were removed from the customized NEMS-S assessment.

Canned beans, frozen, packaged, and dried fruits and vegetables were not assessed with NEMS-S which is a limitation in accurately capturing the extent of the nutrition environment. The study focused on dried legumes (beans and peas), fresh fruits, and fresh vegetables.

Although dried legumes (beans and peas) are more expensive than canned beans (legumes) per unit of purchase the dried legumes (beans and peas) have a longer shelf life; for canned beans (legumes) are generally eaten in one sitting. The recall of foods consumed for breakfast, lunch, and dinner as well as the types and frequency of dried legumes (beans), fresh fruits, and fresh vegetables consumed may not have accurately captured food consumption. The recall of foods in the interviews were used to engage participants in conversation regarding food and to ascertain the extent to which the culturally-preferred foods were a part of the diets.

There were record high temperatures and oppressive heat in the study area during data collection which may have limited the number of people available to approach in places where interviews were conducted. Many of the interviews were conducted outdoors. Interviews conducted near food venues (stores) were not as fruitful as interviews conducted at the laundromat or in the yards of the participants. Participants approached at the stores were either entering or exiting the store and were not eager to stop for an interview. Effort in garnering more interviews from younger individuals could have resulted in variations in food consumption. Varied means used to navigate the nutrition environment may have been discovered as well.

Inter-rater reliability of the items assessed with the NEMS-S in the stores was conducted by only one trained rater. Prior research with the NEMS-S and the FEAD-N (Food Environment Audit for Diverse Neighborhoods) have used multiple raters to ascertain the reliability of the nutrition environment (Glanz et al., 2007; Izumi et al., 2012). An additional rater was unavailable during the collection of the quantitative data. Moreover, the weight of the fresh fruits and fresh vegetables assessed were not consistent. Most of the fresh fruits and fresh vegetables were sold by the pound, but some were sold individually or in bunches. It was

difficult to compare and contrast prices among the 5 types of food venues (stores) with inconsistent weight.

The frequency and date that food items were restocked in the food venues (stores) was unknown. It is likely that assessments were conducted when shelf stock was either especially high or especially depleted. The stocking of food items may have impacted the results of the assessment.

Reflexivity and Positionality

Reflexivity is, "the process of reflecting critically on the self as researcher, the 'human as instrument'" (Lincoln & Guba, 2000). Reflexivity or positionality allows the researcher to identify biases and assumptions related to the research (Merriam, 2009). I was constantly aware of my positionality as an African-American female with a family history of over 130 years in southern Illinois. Nearly every person interviewed immediately recognized my last name and associated me with a cousin, an uncle, or my father when I introduced myself. Having family who lived in the area aided in the participants comfort, honesty, and ease during the interviews as did being an African-American female interviewing an African-American sample. In addition to my familial connections to the study area, I spent nearly three years immersing myself in the community by participating in NAACP events, attending church, teaching in an after school program, establishing a 501c3 nonprofit organization with alumni of an area high school, and organizing charity and fundraising events for a local high school.

The relationships that were developed aided in data collection. Friends in the area assisted in identifying locations where I could find study participants in the two counties and new food venues (stores) that were not identified through initial sources. Permission to conduct the NEMS-S assessment in one particular food venue (store) was denied by a store clerk. My

relationship with the Mayor of one city provided the opportunity to describe my research and to gain permission from the store owner to conduct the NEMS-S assessment in all of the food venues (stores) owned by this particular manager.

Recommendations for Health Education Practice

African-American residents living in a rural nutrition environment described traditional cultural ways of eating, strategies for healthier diets, and ways to navigate the nutrition environment. These descriptions can aid health educators to better plan, implement, and administer culturally-appropriate interventions and strategies. Health educators can identify and demonstrate healthier food substitutions and specific modifications that maintain traditional southern and African-American foodways.

Gittelsohn et al. conducted a literature review that explored the influence of interventions in small food stores on availability of food, eating, and psychosocial aspects that impact risks for chronic disease. The literature review was conducted from May 2009 to September 2010. It resulted in 16 interventions or trials, 5 or 31% of the trials were in rural populations and 7 or 44% were among an African-American population.

The interventions ranged from: the provision of more healthy foods like fresh produce and reducing the unhealthy foods, promotions and incentives for healthy foods, cooking demonstrations, and taste tests. Other interventions involved engagement of the community to craft interventions and relationship development with influential community members. Store interventions also provided education and training to the staff of small stores. With shelving and display changes of produce as well as refrigeration changes, there were structural modifications in other small store interventions. The final small store intervention focused on pricing (Gittelsohn et al., 2012).

The number of gas stations-convenience stores-food marts (10) assessed in the study were greater than the number of grocery stores (6). The gas stations-convenience stores-food marts in Alexander County and Pulaski County can find benefit from interventions that first engage a variety of community members in the development of strategies, substitution of unhealthy foods for healthier foods, and staff education and training.

An additional recommendation for health education is to empower residents to develop and strengthen social, environmental, and political factors that influence the way foods are obtained and healthy eating. Health educators can empower the residents of Alexander County and Pulaski County to develop and organize informal community and social networks used to acquire food. For example, organizing farmers markets where residents can sell their produce and perhaps developing a schedule and location for roadside or mobile sources of acquiring produce can aid in better obtaining the foods from these venues.

The six grocery stores are part of the Community Nutrition Environment in Alexander County and Pulaski County. The availability score of the African-American culturally-preferred dried legumes (beans and peas), fresh fruits, and fresh vegetables was low. Residents of the counties can work with local grocers to suggest preferred foods and improve quality in the grocery stores. Finally, Illinois and federal legislation like The Illinois Local Food Entrepreneur & Cottage Food Operation Act (SB0840), Farmers Market-Task Force (SB1852), and the 2012 Farm Bill offer further opportunities for residents to shape policy and advocate for improvements in food and rural communities.

Recommendations for Future Research

Future studies that seek to explore the rural nutrition environment among African Americans can benefit from the use of mixed methods. Qualitative methods can result in details

of foods consumed and ways to navigate the nutrition environment. Quantitative methods can describe the extent of food availability, price, and quality in the nutrition environment. More tools similar to the FEAD-N (Food Environment Audit for Diverse Neighborhoods) that are applicable to racial and ethnically diverse neighborhoods in urban areas, but also capture the unique aspects of the rural environment are needed to describe the complexity of the nutrition environment (Izumi et al., 2012).

Future research should explore the extent to which alternative means of food acquisition like pantries, roadside and mobile sources, gardens, and informal networks impact the nutrition environment. Also the contributions of restaurants and home-based food businesses in the community nutrition environment should be explored. Finally, participatory action research with residents of the rural nutrition environment and owners of various types of food venues can facilitate interventions to improve the community nutrition environment.

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APPENDICES

Appendix A Informed Consent

From: Shanell McGoy, MPH
Subject: Consent to Participate

Dear Participant:

I (participant), agree to participate in this research project conducted by Shanell L. McGoy, Student at SIUC in the Department of Health Education and Recreation.

I understand the purpose of this study is to examine how African-American residents of a rural food desert navigate their nutrition environment to obtain the foods they eat.

I understand my participation is strictly voluntary and may refuse to answer any question without penalty. I am also informed that my participation will last approximately 60 minutes.

I understand that my response to the questions will be audio/videotapes, and that these tapes will be transcribed/stores and kept for 120 days in a locked file cabinet. Afterward, these tapes will be destroyed.

I understand questions or concerns about this study are to be directed to Shanell L. McGoy, 309-370-7042, smcgoy@siu.edu or his/her advisor Dr. Kathleen Welshimer, Department of Health Education, SIUC, Carbondale, IL 62901-4632* Phone (618) 453-1863 (*4-digit SIU mailcode).

I have read the information above and any questions I asked have been answered to my satisfaction. I agree to participate in this activity and know my responses will be tape recorded. I understand a copy of this form will be made available to me for the relevant information and phone numbers.

"I agree _____ I disagree_____to have my responses recorded on audio/video tape."

"I agree _____I disagree_____that (researcher name) may quote me in his/her paper"

_____

Participant signature and date

This project has been reviewed and approved by the SIUC Human Subjects Committee. Questions concerning your rights as a participant in this research may be addressed to the Committee Chairperson, Office of Sponsored Projects Administration, SIUC, Carbondale, IL 62901-4709. Phone (618 453 4533. Email:siuhsc@siu.edu). Thank you for taking the time to assist me in this research.

Appendix B Interview Eligibility

Demographic:

Sex: ○ Male ○ Female

Self-identified Race: ○ White ○ Black ○ Latino ○ Asian

Age: ○ _____

Residency:

County of Residence: ○ Alexander County ○ Pulaski County

City of Residence: ○ _____

Years lived in county: ○ _____

Years lived in city: ○ _____

Food and Household:

Primary Purchaser of Food in Household: ○ Yes ○ No

Primary Preparer of Food in Household: ○ Yes ○ No

Do you receive SNAP (food stamps)/LINK or other food benefits: ○Yes ○No

What are the number of people who eat meals/food in your household?

- ☐ 1-2
- ☐ 3-4
- ☐ 5-6
- ☐ 7-8
- ☐ 9-10
- ☐ more than 10

What is/are the relationship of these people to you:

- ☐ Me
- ☐ Partner
- ☐ Parents
- ☐ Siblings
- ☐ Children
- ☐ Nieces/Nephews
- ☐ Grandchildren
- ☐ No relation/Neighbors/Friends
- ☐ Other _____

Appendix C Interview Guide

Interview Questions	**Probes**
History of consuming dried legumes (beans), fresh fruits, and fresh Vegetables	
Tell me about the foods that were in your meals *growing up*.	
What kinds of things did you eat growing up?	What foods were in your typical meals: breakfast, lunch, and dinner?
Tell me about the types of *dried legumes (beans)* you ate growing up?	
Tell me about the types of *fresh fruits* you ate growing up?	
Tell me about the types of *fresh vegetables* you ate growing up?	Where did your household get these items ie. garden, store, market? Who prepared them and what do you remember most about the dried legumes (beans), fresh fruits, and fresh vegetables?
Present consumption of dried legumes (beans), fresh fruits, and fresh vegetables	
Tell me about what foods are in the meals that you currently eat: breakfast, lunch, and dinner?	
Tell me about the types of dried legumes (beans), fresh fruits, and fresh vegetables?	
Now, I want to ask you about certain kinds of dried legumes (beans), fresh fruits, and fresh vegetables?	Tell me about the types of *dried legumes (beans)* that you eat? *examples:* black-eyed peas, kidney beans, pinto beans, red beans, How often do you eat these? Tell me about the types of *fresh fruits* that you eat? *examples:* strawberries, watermelons, and cantaloupes How often do you eat these? Tell me about the types of *fresh vegetables* that you eat? *examples:* sweet potatoes, carrots, pumpkins, squash, greens-collard, mustard, turnip, spinach, lettuce, kale, cabbage, broccoli, lettuce, okra How often do you eat these?

Interview Questions	Probes
Present consumption of dried legumes (beans), fresh fruits, and fresh vegetables	
In what ways do what you eat currently differ from what/how you ate growing up?	
Describe any dental problems that prevent you from eating certain dried legumes (beans), fresh fruits, and fresh vegetables?	
If you have any dental prosthesis like partials, dentures, plates, or flippers that you currently wear, how do these affect eating dried legumes (beans), fresh fruits, and fresh vegetables?	
Food Venues and Accessibility	
Where do you generally shop for food items?	
How do you decide on which food venues (stores) to shop?	
Where do you get your dried legumes (beans), fresh fruits, and fresh vegetables?	What are the specific food venues (stores) where you shop for these items?
	Name the food venues (stores).
Why do you choose these food venues (stores)?	
What influences your choice to shop at these food venues (stores)?	Tell me about the availability, quality, and pricing of the dried legumes (beans), fresh fruits, and fresh vegetables.
	Are these stores near your home, work, school, church or other places that you frequent?
	When you usually go to these food venues (stores), do you plan to go other places?
	How do you get to the food venues?
	Type of transportation?
	Do you ever ride with other people to the food venues (stores)?
	Do you have to exchange anything for rides? payment, childcare, food, or other favors

Interview Questions	Probes
Food Venues and Accessibility	
Are there other ways (sources) you get dried legumes (beans), fresh fruits, and fresh vegetables?	Share with neighbors, grow yourself, pantries, give-a-ways
Tell me about your experiences with dried legumes (beans), fresh fruits, and fresh vegetables that are home grown?	
Tell me about the quantity of dried legumes (beans), fresh fruits, and fresh vegetables you need to feed your family?	
Tell me the things that limit you from getting dried legumes (beans), fresh fruits, and fresh vegetables?	
Are there other food items that you get from places that take more effort to access?	
Negotiate Limits of the Nutrition Environment	
Describe a time when you could not get to your regular food venue (store)?	What are reasons why you can't get to your regular food venues (stores)? What do you do when you can't get to your regular food venue (store)? How does this affect your shopping behaviors? How does this affect your food selections? How does this affect your eating patterns?
What advice do you have for other people who live in your area on how to deal with shopping?	Where to shop? Where to get the best quality?
What advice do you have other people who live in your area on how to get healthy foods?	Where to get the best price?

Appendix D Letter to Store Owners

DATE

Dear Store Manager:

I am a graduate student at Southern Illinois University Carbondale visiting stores in your area to look at the foods that people in this neighborhood have available to them. I am not an inspector or evaluator, nor am I connected with your competitors in any way. I follow strict rules to protect any information I collect and do not share individual store information with anyone. I am writing to ask your permission to spend 1 hour in your store looking at the types of foods available. I would be happy to discuss what I am doing in more detail with you. Your participation is voluntary and you may inform me at any time if you do not wish to participate. If you have questions or concerns, please contact me, Shanell L. McGoy at 309-370-7042.

Sincerely,

Shanell L. McGoy, MPH
Southern Illinois University at Carbondale
College of Education and Human Services
Department of Health Education and Recreation
smcgoy@siu.edu
(309) 370-7042

Appendix E Customized Nutrition Environment Measurement Survey – Stores (NEMS-Stores)

Measure Complete ☐

Nutrition Environment Measures Survey (NEMS)

Measure #1: DRIED LEGUMES (BEANS AND PEAS)

Rater ID: ☐ Store ID: ☐-☐-☐-☐

Date: ☐/☐/☐

Month Day Year

O Grocery Store **O** "dollar" Store **O** Gas Station-Convenience Store-Food Marts

O Meat Markets **O** Farmers Markets **O** Other type

Availability and Price

	Available		Price		Unit		Quality		Comments
Produce Item	**Yes**	**No**		**#**	**pc**	**lb**	**A**	**UA**	
1. Pinto Beans	**O**	**O**	$ ☐.☐	☐	**O**	**O**	**O**	**O**	_____ _____
2. Red Beans	**O**	**O**	$ ☐.☐	☐	**O**	**O**	**O**	**O**	_____ _____
3. Black eyed peas	**O**	**O**	$ ☐.☐	☐	**O**	**O**	**O**	**O**	_____ _____
4. Kidney Beans	**O**	**O**	$ ☐.☐	☐	**O**	**O**	**O**	**O**	_____ _____
5. Great Northern Beans	**O**	**O**	$ ☐.☐	☐	**O**	**O**	**O**	**O**	_____ _____

6. Large Lima Beans	**O O**	$ ☐ . ☐ ☐	**O O**	**O O**	_____ _____
7. Baby Lima Beans	**O O**	$ ☐ . ☐ ☐	**O O**	**O O**	_____ _____
8. Navy Beans	**O O**	$ ☐ . ☐ ☐	**O O**	**O O**	_____ _____

9. Total Types: (count # of yes responses) ☐☐

Measure Complete ☐

Nutrition Environment Measures Survey (NEMS)

Measure #2: FRESH FRUIT

Rater ID: ☐☐ Store ID: ☐☐-☐☐-☐☐-☐☐☐

Date: ☐☐/☐☐/☐☐

Month Day Year

O Grocery Store **O** "dollar" Store **O** Gas Station-Convenience Store-Food Marts

O Meat Markets **O** Farmers Markets **O** Other type

Availability and Price

Produce Item	Available Yes	Available No	Price	Unit #	Unit pc	Unit lb	Quality A	Quality UA	Comments
1. Strawberries	O	O	$ ☐.☐☐	☐	O	O	O	O	_____
2. Cantaloupe	O	O	$ ☐.☐☐	☐	O	O	O	O	_____
3. Watermelon O Seedless	O	O	$ ☐.☐☐	☐	O	O	O	O	_____
O _____									
4. Grapes O Seedless	O	O	$ ☐.☐☐	☐	O	O	O	O	_____
O _____									
5. Bananas	O	O	$ ☐.☐☐	☐	O	O	O	O	_____

6. Apples	**O** Red	**O O**	$ ☐ . ☐ ☐	**O O**	**O O**	_____
	O Green					_____
7. Peaches		**O O**	$ ☐ . ☐ ☐	**O O**	**O O**	_____
						_____

8. Total Types: (count # of yes responses) ☐ ☐

Measure Complete ☐

Nutrition Environment Measures Survey (NEMS)

Measure #3: FRESH VEGETABLES

Rater ID: ☐ Store ID: ☐-☐-☐-☐

Date: ☐/☐/☐

Month Day Year

O Grocery Store **O** "dollar" Store **O** Gas Station-Convenience Store-Food Marts

O Meat Markets **O** Farmers Markets **O** Other type

Availability and Price

Produce Item		Available Yes	Available No	Price	Unit #	Unit pc	Unit lb	Quality A	Quality UA	Comments
1. Carrots	**O** 1 lb bag	**O**	**O**	$ ☐.☐	☐	**O**	**O**	**O**	**O**	_____
	O _____									_____
2. Okra		**O**	**O**	$ ☐.☐	☐	**O**	**O**	**O**	**O**	_____
										_____
3. Broccoli		**O**	**O**	**$** ☐**.**☐	☐	**O**	**O**	**O**	**O**	_____
										_____
4. Kale		**O**	**O**	$ ☐.☐	☐	**O**	**O**	**O**	**O**	_____
										_____
5. Lettuce	**O** Green leaf	**O**	**O**	$ ☐.☐	☐	**O**	**O**	**O**	**O**	_____
	O _____									_____
6. Collard Greens		**O**	**O**	$ ☐.☐	☐	**O**	**O**	**O**	**O**	_____
										_____

7. Mustard Greens		**O O**	$ ☐ . ☐☐ ☐ **O O**	**O O**	_____ _____
8. Turnip Greens		**O O**	$ ☐ . ☐☐ ☐ **O O**	**O O**	_____ _____
9. Cabbage	**O** Head	**O O**	$ ☐ . ☐☐ ☐ **O O**	**O O**	_____
	O _____				_____
10. Spinach		**O O**	$ ☐ . ☐☐ ☐ **O O**	**O O**	_____
11. Sweet Potatoes		**O O**	$ ☐ . ☐☐ ☐ **O O**	**O O**	_____ _____
12. Pumpkins		**O O**	$ ☐ . ☐☐ ☐ **O O**	**O O**	_____
13. Squash		**O O**	$ ☐ . ☐☐ ☐ **O O**	**O O**	_____ _____

14. Total Types: (count # of yes responses) ☐☐

Appendix F Customized NEMS Scoring Sheet for Stores (Availability)

Dried Legumes (Beans and Peas)	**Fresh Fruits**	**Fresh Vegetables**
0 varieties = 0 points	0 varieties = 0 points	0 varieties = 0 points
< 4 varieties = 1 point	< 4 varieties = 1 point	< 6 varieties = 1 point
4-6 varieties = 2 points	4-6 varieties = 2 points	6-11 varieties = 2 points
7 varieties = 3 points	7 varieties = 3 points	12 varieties = 3 points

Customized NEMS Scoring Sheet for Stores (Quality)

Dried Legumes (Beans and Peas)	**Fresh Fruits**	**Fresh Vegetables**
-	25-49% acceptable = 1 point	25-49 acceptable = 1 point
-	50-74% = 2 points	50-74% = 2 points
-	75%+ acceptable = 3 points	75+ acceptable = 3 points

Appendix G Prices per unit of Dried Legumes (Beans and Peas), Fresh Fruits, and Fresh Vegetables in Alexander County and Pulaski County Grocery Stores

Dried Legumes (Beans and Peas)	**Arnold Grocery Store**	**Cornell Grocery Store**	**Dixon Grocery Store**	**Edward Grocery Store**	**Franklin Grocery Store**	**Gantt Grocery Store**
Pinto Beans						
One Pound	$1.69	$1.55	$1.55	$1.69	$1.45	$1.55
Two Pound		$3.09	$2.85	$3.19	$2.69	$3.09
Four Pound		$5.89				$3.99
Red Beans	-	-	-	-	-	-
Black-eyed Peas						
One Pound	$2.29	$1.79	$2.09	$2.39	$1.95	$1.79
Two Pound				$3.19		
Kidney Beans	-	-	-	-	-	-
Great Northern Beans						
One Pound		$1.49	$1.49	$1.79	$1.79	$1.49
Two Pound		$2.79		$3.19	$3.19	$2.99
Four Pound		$5.55	$5.79	$6.19	$6.19	$5.55
Navy Beans						
One Pound			$1.59	$1.89	$1.55	$1.55
Two Pound						$2.89
Large Lima Beans						
One Pound	$2.09		$1.89			$1.79
Two Pound		$3.09		$3.89		
Baby Lima Beans						
One Pound			$1.55	$1.49		$1.55

Prices of unit Fresh Fruits in Alexander County and Pulaski County Grocery Stores

Fresh Fruits	Arnold Grocery Store	Cornell Grocery Store	Dixon Grocery Store	Edward Grocery Store	Franklin Grocery Store	Gantt Grocery Store
Strawberries One Pound	$2.50	$2.99	$2.19		$2.69	$2.69
Cantaloupe Each	$1.99		$1.89		$2.69	
Watermelon Each		$5.99	$5.99			$5.99
Grapes Red One Pound		$2.99			$2.79	$3.29
Green One Pound	$2.39		$1.99			2.99
Bananas		$0.59	$0.59	$0.69	$0.79	$0.79
Apples Red One Pound	$0.50 each	$1.49	$1.29	$1.00 for 2	$1.39	$1.89
Green One Pound					$1.39	
Peaches One Pound	$1.69		$1.49		$1.69	$1.29

Prices per unit of Fresh Vegetables in Alexander County and Pulaski County Grocery Stores

Fresh Vegetables	**Arnold Grocery Store**	**Cornell Grocery Store**	**Dixon Grocery Store**	**Edward Grocery Store**	**Franklin Grocery Store**	**Gantt Grocery Store**
Carrots One pound	$1.59	$0.79	$1.39	$0.79	$1.49	$0.89
Okra One pound			$1.49			
Broccoli	$1.69 one pound	$2.89 per Floret			$3.49 per Floret	$2.99 2-3 Florets
Kale						$1.09
Lettuce Head	$1.49	$1.49	$1.19	$1.29	$1.49	$1.59 one pound
Collard Greens One pound						$1.09
Mustard Greens		$2.99				$1.09
Turnip Greens		$2.99				$1.09
Cabbage Green Red	$0.49 one pound	$0.59 one pound	$0.39 one pound	$0.39 Head	$0.59 Head	$0.59 one pound $1.29 one pound
Spinach	-	-	-	-	-	-
Sweet Potatoes One pound	$0.79	$0.89	$0.79	$0.79	$0.99	$0.69
Squash Mixed One pound Zucchini One pound Yellow One pound	$1.09					$1.89 $1.89

Appendix H Prices per Unit of Dried Legumes (Beans) at "dollar" stores

Dried Legumes (Beans)	**Kenney Dollar Store**	**LeConte Dollar Store**	**Morris Dollar Store**
Pinto Beans			
Two Pound	$2.70	$2.70	$2.50
Four Pound	$3.95	$3.95	$3.95
Great Northern Beans			
Two Pound	$2.70	$2.70	$2.65

Appendix I Prices per unit of Dried Legumes (Beans and Peas) and Vegetables at Gas Stations-Convenience Stores-Food Marts

Dried Legumes (Beans)	**Niemeyer Convenience Store**	**Overton Convenience Store**	**Rutherford Food Mart**	**Simon Food Mart**	**Young Gas Station**
Pinto Beans One Pound					$1.59
Red Beans	-	-	-	-	-
Black-eyed peas One Pound	$1.99			$1.79	
Kidney Beans One Pound			$1.59		
Great Northern Beans Two Pound				$3.89	$3.79
Navy Beans One Pound		$1.00			
Large Lima Beans	-	-	-	-	-
Baby Lima Beans	-	-	-	-	-
Fresh Vegetables Lettuce (Head)					$1.39

Appendix J Prices per unit of Fresh Fruits in Farmers Markets

Fresh Fruits		**Brandon Farmers Market**	**Cordell Farmers Market**
Strawberries		-	-
Cantaloupes	One	$2.00	$2.50
	Three	$5.00	
Watermelons		$3.50	$3.00
	Two	$6.00	
Grapes		-	-
Bananas		-	-
Apples		-	-
Peaches		-	-

Prices per unit of Fresh Vegetables in Farmers Markets

Fresh Vegetables	**Brandon Farmers Market**	**Cordell Farmers Market**
Carrots	-	-
Okra	$1.49 one pound	
Broccoli	-	-
Kale	$1.00 per bunch	
Lettuce	-	-
Collard Greens	$1.00 per bunch	
Mustard Greens		-
Turnip Greens	-	-
Cabbage		
Red	$1.00 per head	
Green	$1.50 per head	
Spinach	-	-
Sweet Potatoes	-	-
Squash	-	-
Butternut	$1.00 each	
Spaghetti	$1.00 each	
Scallop	$1.00 for two	
Squash	$1.00 for two	
Acorn	$1.00 for two	

Appendix K Prices per unit of Dried Legumes (Beans and Peas) in Big Box Stores

Dried Legumes (Beans and Peas)	David Big Box Store	Ellis Big Box Store	Free Big Box Store	Georgia Big Box Store	Houghton Big Box Store	Isis Big Box Store
Pinto Beans						
One Pound	$1.18	$1.38	$1.09	$1.19		$1.39
Two Pound	$1.88	$1.88	$2.69		$1.99	$2.49
Four Pound	$3.68	$3.68	$4.47	$4.19		
Eight Pound	$7.98	$7.98				
Twenty Pound	$17.98					
Red Beans						
One Pound	$1.58	$1.08	$1.09			$1.49
Black-eyed peas						
One Pound	$1.38	$1.58	$1.89	$1.79		$1.59
Two Pound						
Kidney Beans	1.58		$1.09			$2.19
Great Northern Beans						
One Pound	$1.38	$1.08		$1.19		$1.39
Two Pound	$2.68				$2.29	$2.69
Four Pound						
Navy Beans						
One Pound	$1.48	$1.08	$1.09			$1.59
Two Pound			$2.69			
Large Lima Beans						
One Pound	$1.58	$1.58	$1.79			
Two Pound		$2.48				$2.39
Baby Lima Beans						
One Pound	$1.48		$1.79	$1.19		$1.59

Prices per unit of Fresh Fruit in Big Box Stores

Fresh Fruits	David Big Store	Ellis Big Store	Free Big Store	Georgia Big Store	Houghton Big Store	Isis Big Store
Strawberries						
One Pound	$1.78	$1.78	$2.07	$1.97	$0.99	$2.99
Two Pounds	$2.98		$3.69			$6.99
Cantaloupe	$2.24 each		$2.29 each	$1.00 for 2	$1.69 each	$2.00 for 4
Watermelon						
Each	$3.88	$4.48	$3.99	$3.99	$3.99	$3.99
Grapes						
Red						
One Pound						
Two Pounds	$1.98	$1.98	$2.28	$1.29	$2.99	$4.99
Green						
One Pound						
Two Pounds		$1.78	$2.28	$1.29	$2.99	$4.99
Bananas						
One Pound	$0.53	$0.52	$0.59	$1.00 for 2	$0.44 each	$0.59
Apples						
Red						
One Pound						
Three Pounds	$1.57	$1.47	$1.58	$1.39	$2.79	$3.99
Green						
One Pound						
Three Pounds		$1.67	$1.58	$1.39	$2.79	$3.99
Peaches						
One Pound	$0.98 each	$1.38	$1.28	$0.89	$0.19 each	$1.99

Prices per unit of Fresh Vegetables in Big Box Stores

Fresh Vegetables	David Big Box Store	Ellis Big Box Store	Free Big Box Store	Georgia Big Box Store	Houghton Big Box Store	Isis Big Box Store
Carrots						
One Pound	$1.98	$0.78	$0.79	$1.29	$0.99	$2.99
Two Pound	$2.98			$1.49	$1.19	
Okra						
One Pound						$1.99
Broccoli						
One Pound	$1.88	$2.28 per 2 Florets	$2.49 per Floret	$2.69 per 2 Bunches	$1.59	$3.00 per 2 Bunches
Kale	$0.98 per Bunch	$0.98 per Bunch	$1.49 per Bunch			$0.99 per Bunch
Lettuce						
Head	$1.50	$1.28	$2.19	$1.49	$0.99	$1.99 One Pound
Collard Greens	$0.98 per Bunch		$1.49 per Bunch	$0.89 per Bunch		$0.99 per Bunch
Mustard Greens	$0.98 per Bunch	$0.98 per Bunch	$1.49 per Bunch			$0.99 per Bunch
Turnip Greens	$0.98 per Bunch		$1.49 per Bunch	$0.89 per Bunch		$0.99 per Bunch
Cabbage						
Green	$0.68 One Pound	$0.48 One Pound	$0.49 Head	$0.49 Head	$1.29 Head	$0.79 Head
Red						
Spinach			$1.49 per Bunch			$1.99 One Pound
Sweet Potatoes						
One Pound						
Three Pounds	$0.88	$0.88	$0.97	$0.89	$1.99	$0.99
Squash						
Yellow One Pound	$1.38		$1.00			$1.00 Each
Zucchini One Pound	$1.38		$1.00			$1.00 Each
Chayote	$0.98 Each					
Butternut One Pound	$1.18	$0.98	$1.49			$0.99 Each
Acorn One Pound	$1.18	$0.98	$1.79			$0.99 One Pound
Spaghetti One Pound	$1.18		$1.49			$0.99 Each

Appendix L Southern Illinois University Human Subjects Committee Approval Letter

SIU Southern Illinois University
CARBONDALE

HUMAN SUBJECTS COMMITTEE
OFFICE OF SPONSORED PROJECTS ADMINISTRATION
WOODY HALL – MAIL CODE 4709
900 SOUTH NORMAL AVENUE
CARBONDALE, ILLINOIS 62901

siuhsc@siu.edu
618/453-4533
618/453-8038 FAX

ospa.siu.edu/human

HSC Approval letter (exempt)

To: Shanell McGoy

From: Jane L. Swanson, Ph.D.
Chair, Human Subjects Committee

Date: May 25, 2012

Subject: *Nutrition Environment in Rural Southern Illinois: A Mixed Method Study*

Protocol Number: 12253

The revisions to the above referenced study have been approved by the SIUC Human Subjects Committee. The study is determined to be exempt according to 45 CFR 46.101(b)2. This approval does not have an expiration date; however, any future modifications to your protocol must be submitted to the Committee for review and approval prior to their implementation.

Your Form A approval is enclosed.

This institution has an Assurance on file with the USDHHS Office of Human Research Protection. The Assurance number is FWA00005334.

JS:kr

Cc: Kathleen Welshimer