

Addressing Food Insecurity: Nutrient and Social Network Analysis of  
Urban Church Food Pantries

by

Tracy Elizabeth Noerper

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Dissertation Committee:  
Dr. Andrew Owusu, Chair  
Dr. Norman L. Weatherby  
Dr. Janet M. Colson

I dedicate this manuscript to my wonderful, loving husband Rob and our two sons, Ian and Christian. All of this, every bit, is for them.

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## **ABSTRACT**

Food insecurity, defined as having limited or uncertain access to adequate and safe food, is a chronic problem for many Americans. Individuals who are food insecure can have poorer nutrient intakes which could lead to or exacerbate chronic disease. Food pantries are part of a multi-pronged approach to help food insecure households access emergency foods and maintain normal and healthy eating patterns. Existing studies suggest that food pantry items are typically deficient in vitamins A and C, calcium and possibly other nutrients such as fiber, vitamin D and potassium. The majority of food pantries in existence today are administered by churches. The purpose of this research is to explore the social networks of urban church food pantries, evaluate church pantry demographics and analyze the nutrient content of pantry food packages.

Results of the social network analysis found that medium-sized churches with membership between 100 and 299 had the greatest number of social network ties between church pantries and the zip codes they serve.

Demographic results showed that the average church had approximately 400 members with an average age of 48 years old. Of the 96 churches in the sample, 17 (20.24%) were affiliated with the Methodist denomination. Caucasian (white) was the primary race in 62% of church memberships. Forty-six churches indicated they currently had an on-site food pantry.

Nutritional analysis of 18 churches providing pre-made food bags revealed that the dairy and fruit food groups were lacking, and met minimum dietary

recommendations for less than 2 and 3 days, respectively. Calcium, vitamins A and C were also found in low levels. Protein and total grain food group servings were found to each meet minimum dietary recommendations for at least 10 days. The amounts of sodium and added sugars found in pantry bag foods were considerable and would meet maximum daily limits for 10 and 15 days, respectively.

Future research of church food pantries should focus on reducing barriers that limit the distribution of fruit and dairy food groups. Research should further investigate the social networks of church pantries to ensure that the most vulnerable urban populations are not being underserved.

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## LIST OF ABBREVIATIONS

INQ.....	Index of Nutritional Quality
MDE.....	Minimum Days Equivalent
USDA.....	United States Department of Agriculture
SPSS.....	Statistical Package for the Social Sciences
RDA.....	Recommended Dietary Allowance
TAEFP.....	The Emergency Food Assistance Program
ERS.....	Economic Research Service
FRAC.....	Food Research and Action Center
CVR.....	Content Validity Ratio
MTSU.....	Middle Tennessee State University
IRB.....	Institutional Review Board
NWS.....	Nutrition and Weight Status
G.....	Grams
MG.....	Milligrams
IU.....	International Units
DRV.....	Daily Reference Values (DRV)
RDI.....	Reference Daily Intakes (RDI)
DV.....	Daily Values
SNAP.....	Supplemental Nutrition Assistance Program

## CHAPTER ONE: INTRODUCTION

Food insecurity in America is problematic at both a community and individual level. National data from the United States Department of Agriculture (USDA) indicates 12.3% of U.S. households were food insecure in 2016 (Coleman-Jensen, Rabbitt, Gregory, & Singh, 2017). This was essentially unchanged from the 12.7% of U.S. households who were food insecure in 2015 (Coleman-Jensen, Rabbitt, Gregory, & Singh, 2016). In Tennessee, food insecurity rates reach 17% of the state population and Davison County (Metro Nashville) also falls at 17% of the population (Robert Wood Johnson, 2017).

In the past, the words “hunger” and “food insecurity” were used interchangeably. There are however, formal definitions in place to distinguish between these terms. Prior to 2006, USDA defined hunger as, "the uneasy or painful sensation caused by lack of food." The USDA no longer uses the term hunger but instead favors the language of food insecurity. In 1990, Anderson introduced the concept of food insecurity. Since 2006, the definition of food insecurity used by USDA is, “the limited or uncertain availability of nutritionally adequate and safe foods or limited or uncertain ability to acquire acceptable foods in socially acceptable ways” (Wunderlich & Norwood, 2006; Coleman-Jensen, Gregory, & Rabbitt, 2017). Food security is essentially the opposite of food insecurity and is categorized as few to no “reported indications of food-

access problems or limitations” (Wunderlich & Norwood, 2006; Coleman-Jensen, et al., 2017).

Each year USDA analyzes and reports food security data as collected by the U.S. Census Bureau as part of the Current Population Survey. The food security survey asks, “one adult respondent per household questions about experiences and behaviors that indicate food insecurity, such as being unable to afford balanced meals, cutting the size of meals, or being hungry because of too little money for food” (Coleman-Jensen et al., 2017). The food security status of the household is then determined based on the number of food insecure conditions reported “yes” by the household. Therefore, food insecurity is a calculation based on the number of negative household experiences over the last 12 months (Table 1). Households affirming “yes” for at least three conditions in a 12 month period are deemed “food insecure” per the USDA definition (Economic Research Service, 2012). The aspect of hunger is incorporated and measured within the USDA food insecurity definitions (Wunderlich & Norwood, 2006).

There are national programs in place to combat food insecurity. For example, The Emergency Food Assistance Program (TEFAP) which is a Federal program established by The Emergency Food Assistance Act of 1983. The emergency food program was designed to “help reduce federal food inventories while assisting low-income persons” (United States Department of Agriculture (USDA), 2017). Administered by states, TEFAP allows supplemental foods to be provided to low-income individuals through approved distributing agencies such as food banks, which then distribute foods to local soup kitchens and food

pantries that directly serve the public. In the fiscal year 2017, 316 million dollars for food purchases was made available to TEFAP agencies (USDA, 2017).

Table 1

Definitions Used to Establish Food Security and Insecurity

Term	Definition
Food Security:	
High food security (0 “yes” responses)	Households had no reported indications of food access problems or limitations.
Marginal food security (1-2 “yes” responses)	Households had one or two reported indications, typically of anxiety over food sufficiency or shortage of food in the house. Little or no indication of changes in diets or food intake.
Food Insecurity:	
Low food security (3-5 “yes” responses)	Households had reports of reduced quality, variety, or desirability of diet. Little or no indication of reduced food intake.
Very low food security (6-10 “yes” responses)	Households had reports of multiple indications of disrupted eating patterns and reduced food intake.

*Note.* Adapted from “Definitions of Food Insecurity” from Coleman-Jensen et al., 2017.



Addressing food insecurity are the vital nutrition resources found in food pantries and food banks. A food pantry distributes foods directly to individuals whereas a food bank typically functions as a warehouse for collecting, sorting and distributing foods to other agencies for use with the public (Hoisington, Manore, & Raab, 2011). Foods from these sources are often referred to as “emergency” foods. Food pantries can be either public or private organizations and do not typically receive TEFAP food products unless the pantry meets certain criteria such as client income eligibility (USDA, 2017). Some estimates put pantry numbers across the U.S. at roughly 33,500 locations not including soup kitchens and emergency shelters (Robaina & Martin, 2013).

A recent report by the Michigan Fitness Foundation (2017), indicates that the vast majority of emergency food pantries (88%) are operated by faith-based or church groups. The Foundation further reported that these pantries have been supported by churches for many years and even decades. One in four of those pantries have been providing emergency food for more than 30 years and nearly seven in ten (67%) have been providing emergency food for more than 10 years. Daponte (2000) reported similar estimates of 75% of pantries generally being affiliated with a religious organization.

Churches are not newcomers to the arena of health promotion. Eng and Hatch (1991) describe the role of the church as a helping system for individuals and the community. The placement of community health programs within churches has many advantages. Churches can play a vital role in addressing “economic, civic, political and social welfare concerns” especially since they are

viewed as having a great deal of community legitimacy with solid organizational structures (Chatters, Levin, & Ellison, 1998). Churches have found success identifying members of at-risk populations, making health education and health prevention efforts effective (Chatters et al., 1998).

Churches are involved in a variety of health ministries including those focusing on food insecurity. A 2009 national Presbyterian Church survey evaluating membership practices found that 94% of church members donated food to a food pantry, soup kitchen or emergency food assistance program, and 88% of those members gave money to support food pantries, soup kitchens or a similar program (Marcum, 2011). In a survey focusing on congregational practices of Presbyterian Churches, larger congregations ( > 300 members) were found to be involved in more types of hunger ministries than smaller ( < 100 members) and medium-sized congregations (100 - 299 members) (Marcum, 2012).

Food pantries typically offer a variety of foods to the clients they serve. Previous studies examined the nutritional profiles of foods from both food banks and food pantries. Unfortunately, food bags are often missing or limited in food groups such as dairy foods as well as fruits and vegetables (Akobundu, Cohen, Laus, Schulte, & Soussloff, 2004). Inadequate food options of dairy, fruits, and vegetables can lead to deficits in nutrients such as calcium, vitamin A and C. Food bank research by Cotugna (1994) found similar food group limitations within the milk and dairy groups followed by the vegetable group as the next most limited. A recent systematic review also confirms the limitation of food

pantry bag nutritional quality with milk products, vitamins A and C, and calcium being provided in particularly low amounts (Simmet, Depa, Tinnemann, & Stroebele-Benschop, 2017b).

It is important to understand the nutritional adequacy of pantry foods in relationship to current nutrient recommendations. National nutrition recommendations are outlined in the *Dietary Guidelines for Americans*. The most recent recommendations are the *2015-2020 Dietary Guidelines for Americans* which highlight the need to include more fruits and vegetables in the diets of Americans (U.S. Department of Health and Human Services, 2015). Food pantry and food bank offerings are typically lacking in at least one of these important food groups (e.g. fruits, vegetables, dairy) therefore it is vital to continue to seek ways to improve food offerings food pantries and become more in line with the *Dietary Guidelines* recommendations.

Nutrition adequacy of church pantry foods can be evaluated in a variety of ways. One evaluation method is the Minimum Days Equivalent (MDE) calculation and is defined as, “the number of days that the pantry bag contents will provide the minimum number of servings from each food group” as recommended by MyPlate (Akobundu et al., 2004). MyPlate is the visual icon representing the recommendations set forth in the *Dietary Guidelines for Americans* (U.S. Department of Health and Human Services, 2015). The MyPlate food groups are grains, fruits, vegetables, protein, and dairy. The MDE value is calculated by dividing the number of MyPlate food group servings provided in the food pantry bag by the minimum recommended food group servings.

Another method of nutrition analysis is the Index of Nutritional Quality (INQ) which measures the amount of a nutrient in a food relative to the food's energy content, using the known standard for each nutrient (Akobundu et al., 2004; Drewnowski, 2005; Hansen & Wyse, 1980). Hansen and Wise (1980) published the formula and Akobundu et al., (2004) applied the INQ calculation to food pantry bags. The INQ nutrient standard is either the Daily Reference Value (DRV) and/or Reference Daily Intake (RDI). Each nutrient is computed separately. Drewnowski (2005) expressed this calculation per 2,000 calories as the "ratio between the amount of a nutrient in a portion that meets energy needs and the recommended allowance for that nutrient also based on 2000 kcal." This research study used 1,000 calories as the standard since it allows for more flexibility in its application for intake among various populations. The formula for the INQ calculation, adapted from Drewnowski (2005), is as follows with X = amount of nutrient in pantry bag; Y = nutrient reference value; C = total calories in the pantry bag:

$$\frac{X/Y}{C/1000}$$

The nutrients included in the INQ calculations are those on the current nutrition facts panel with a reference value (U.S. Food and Drug Administration, 2004). The Daily Reference Values (DRV) and Reference Daily Intakes (RDI), known collectively as Daily Values (DVs) are outlined in Table 2. Daily Values indicate how much of a nutrient is present in one serving of a food (U.S. Food

and Drug Administration, 2004). The DRVs and RDIs are a set of reference values, which vary by age and gender, and are used to plan and assess nutrient intakes of healthy people (National Institutes of Health, 2018).

Table 2

Nutrient Reference Standards for Index of Nutritional Quality (INQ)  
Calculations

Food Component	Daily Value
Total Fat	65 grams (g)
Saturated Fat	20 g
Cholesterol	300 milligrams (mg)
Sodium	2400 mg
Total Carbohydrate	300 g
Dietary Fiber	25 g
Protein	50 g
Vitamin A	5000 IU (International Units)
Vitamin C	60 mg
Iron	18 mg

*Note.* FDA, 2004.

Although revisions have been approved to the current nutrition facts panel (e.g. adding potassium and vitamin D and removing vitamins C and A) the changes will not go into effect until summer of 2018; post completion of this

study. Therefore, nutrients reported on the current nutrition facts panel will be used as a reference for the nutrient analysis in this study (U.S. Food & Drug Administration, 2016). Specific nutrients to be identified and analyzed for the INQ values are total fat, saturated fat, cholesterol, sodium, total carbohydrate, dietary fiber, protein, vitamin A, vitamin C, calcium and iron.

### **Significance of the Problem**

In 2016, 15.6 million households reported food insecurity (Coleman-Jensen et al., 2017). Many of those households turn to food pantries to provide emergency food and nutrition for the family members. As the nutritional offerings of multi-site church food pantries have not had a comprehensive analysis there is lack of data on nutrition provided through these specific venues. This study will evaluate the demographics of urban church food pantries and the extent to which multi-site, church-based food pantries meet current dietary food and nutrient recommendations.

### **Purpose of the Study**

Current evidence indicates that most food pantry bags do not meet dietary recommendations as outlined by *The Dietary Guidelines for Americans* (U.S. Department of Health and Human Services, 2015). By documenting the nutritional provisions offered through church pantry food bags, the nutritional impact of these pantries can be better understood. Despite an extensive literature review, no multi-site studies were found specific to church food pantries, therefore further investigation on this topic is warranted. The purposes

of this cross-sectional, population-based research study in Nashville, Tennessee are:

- to investigate the prevalence of food pantries located in urban churches,
- to examine the degree to which urban Nashville church food pantries are connected by the clients they serve as explained by the social network theory, and
- to explore the extent to which nutrient and food group profiles of pantry foods bags distributed by urban churches meet nutritional recommendations.

### **Research Questions**

Research questions for the study include:

1. What are the demographic characteristics of churches with on-site food pantries in Nashville, Tennessee?
2. What is the degree to which church food pantries are connected by the clients they serve as explained by the social network theory?
3. What is the extent to which food groups contained in the church food pantry bags attain minimum MyPlate food group serving recommendations?
4. What is the relationship between MyPlate minimum food group servings (*grains = 6 ounce (oz.); vegetables = 2.5 cups; fruits = 2 cups; dairy = 3 cups; protein 5.5 oz. per day*) included in church food pantry bags to the Minimum Days Equivalent (MDE) value?

5. To what extent do the foods provided by church food pantry bags meet macro- and micro-nutrient recommendations?

### **Research Hypotheses**

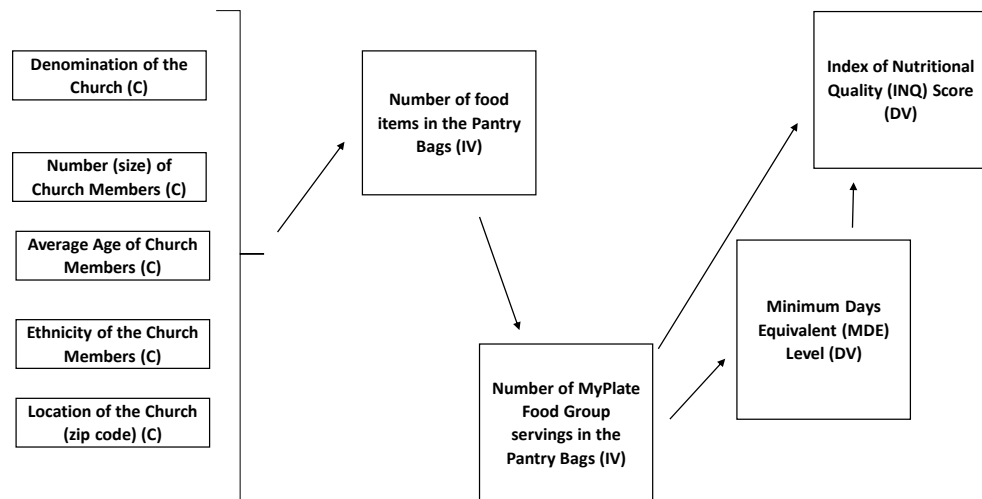
Based on the literature review, it is hypothesized that:

1. By using zip code data, larger sized churches (e.g. nodes) ( $n = \geq 300$ ) will have more social network connections (e.g. ties) to the zip codes they serve (e.g. nodes) than medium-sized ( $n = 100$  to 299 members) and smaller ( $n = < 100$  members) churches within an urban church food pantries in Nashville, TN.
2. When controlling for size (number of members) of the church, age of church members, ethnicity of church members, denomination of the church, location (zip code) of the church, and number of items in the food bag, the food pantry bags daily food group servings are likely to meet minimum MyPlate food group serving recommendations.
3. When controlling for size (number of members) of the church, age of church members, ethnicity of church members, denomination of the church, location (zip code) of the church, and number of items in the food bag, the higher the MyPlate food group daily serving amounts, the more likely that the food bag will meet a 3-day Minimum Days Equivalent (MDE) value.
4. When controlling for size (number of members) of the church, age of church members, ethnicity of church members, denomination of the church, location (zip code) of the church, and number of items in the food bag, pantry foods bags with



higher MDE values are more likely to have an acceptable Index of Nutritional Quality (INQ) scores than pantry food bags with lower MDE values.

A path diagram is included (Figure 1) to illustrate the hypothesized connections between the variables.



*Figure 1.* Hypothesized relationships between Urban Church Food Pantry control variables (C), independent variables (IV) and dependent variables (DV).

## CHAPTER TWO: REVIEW OF LITERATURE

### Food Insecurity

**Who are the food insecure.** Nationally, food security statistics are reported by the USDA Economic Research Service (ERS). The most recent data indicate that the estimated percent of U.S. household that were food insecure in 2016 was “12.3 percent which was essentially unchanged from 2015 (12.7 percent), but continued a downward trend from a high of 14.9 percent in 2014” (Coleman-Jensen et al., 2017). The USDA further notes that recent food insecurity prevalence levels are still above the 2007 pre-recessionary level of 11.1%. Trends throughout the country show higher rates of food insecurity are more common in large cities and for households with incomes that fall near or below the poverty line (Coleman-Jensen, Gregory, & Singh, 2014). Geographically, food insecurity prevalence is higher in southern U.S. states versus other areas of the country (Coleman-Jensen et al., 2016; Coleman-Jensen et al., 2017).

In Middle Tennessee, 2013 U.S. Census data presents Davidson County with an estimated population of 658,602 people. The U.S. Mayors Report (2013) points out that almost 20% of residents were below the poverty line making 113,658 Nashville inhabitants potentially food insecure. Twenty-one percent of Nashvillians requesting food assistance in 2013, were classified as employed, nine percent were elderly and nine percent were homeless (The U.S. Conference of Mayors, 2013). The most recent U.S. Mayors Report (2016) outlines that the

budget for emergency food assistance in Nashville was \$1,800,000 which represents an increase of six percent from 2015. The report specified that 7,686,782 pounds of emergency food were distributed in Nashville between September 2015 and August 2016. This was an increase of six percent over the previous reporting period. Nashvillians requesting the distributed emergency foods were 70% in families, 20% elderly, 6% homeless and 40% employed.

Other segments of the population are not immune to food insecurity as well. Wax and Stankorb (2016) reveal that nearly 15% of military families with children 5 years and younger were considered food insecure. Populations including young adults with disabilities, households with special needs children, households with persons having diabetes and households with person having depression all indicate prevalence of food insecurity (Brucker & Nord, 2016; Knight, Probst, Liese, Sercy, & Jones, 2016; Pinard, Calloway, Fricke, & Yaroch, 2015; Rose-Jacobs et al., 2016; Wax & Stankorb, 2016). In contrast, lower levels of food insecurity are seen with those individuals who are homeowners, had completed high school or those aged > 60 years old and older (Rose, 1999).

**Causes of food insecurity.** Causes of food insecurity are complex and multifaceted. Research identifies income as, “one of the most important determinates of food insecurity and hunger” (Rose, 1999). When incomes are below the poverty level, food insecurity rates rise. It is important to note that income-based measures do not accurately depict food insecurity at times because there are large geographical differences in housing prices, food prices, taxes and/or health care (Rose, 1999). Further, these income-based measures

do not take into account sudden changes in family dynamics such as gaining a household member, loss of a job or loss of SNAP (Supplemental Nutrition Assistance Program) benefits. A 2016 report stated that, “unemployment, poverty and race are direct causes of food insecurity, while income causes food insecurity via poverty. Unemployment is a common cause for both food insecurity and poverty” (Dharmasena, Bessler, & Todd).

USDA data suggest the prevalence of food insecurity is related to factors such as unemployment, inflation and the price of food (Nord, Coleman-Jensen, & Gregory, 2014). In Nashville, causes of hunger have been attributed to a variety of factors including low wages, high housing costs and high healthcare costs (The U.S. Conference of Mayors, 2013). Food insecurity has also been linked to participating in SNAP and not having health insurance (Alaimo, Briefel, Frongillo Jr, & Olson, 1998).

**Healthy People 2020 objectives related to food insecurity.** The *Healthy People 2020* document, from the U.S. Department of Health and Human Services, describes the “national prevention framework for building a healthier nation” (2011). *Healthy People 2020* includes two objectives relating to food insecurity. These sections located in the Nutrition and Weight Status (NWS) topic area are subsequently numbered NWS-12 and NWS-13. The NWS-12 objective targets children with a goal of “eliminating children with very low food security from 1.3% (2008) to 0.2 percent.” The NWS-13 objective identifies household food insecurity with a goal of reducing it from “14.6% (2008) to 6.0% and in doing so reduce hunger by the end of the decade.” Progress is being made towards

meeting both food insecurity objectives with 2016 prevalence of very low food security among children at 0.8% (NWS-12), and household food insecurity at 12.3% (NWS-13) (Coleman-Jensen et al., 2017). Food pantries can play a role in helping to achieve these objectives, but longer-term solutions are needed to make further headway in reducing food insecurity for future generations.

**The growing need of food assistance.** Due to economic factors, many Americans are in need of public food resources beyond SNAP (previously food stamps), free/reduced school lunches and/or the Special Supplemental Nutrition Program for Women's, Infants and Children (WIC) program. In the late 1970s and 1980s, private charitable groups and faith-based organizations created "emergency" food assistance programs such as food banks, food pantries, soup kitchens and shelters to help those in need (Martin, Wu, Wolff, Colantonio, & Grady, 2013). Emergency food is food that is a last resort and often bridges the gap between public food safety net systems.

Food banks, soup kitchens and food pantries are typically private emergency foods sources (Robaina & Martin, 2013). Food banks can be described as the warehousing agency or source which distributes emergency foods. Food pantries and soup kitchens distribute foods directly to clients. Utilization of these sources typically reach only one-third of food insufficient households, which makes utilization a poor and underestimated indicator of true need (Vozoris & Tarasuk, 2003).

Food banks and pantries were originally created to address infrequent or one-time need. Food banks and pantries are now part of more regular and

ongoing strategies to supplement monthly shortfalls in food. In a report of New York food pantries and soup kitchens, 60% ran out of food which was up from 48% the year prior due to increased demand and requests for food assistance (Agovino, 2014).

As many as 72.9% food insecure households and 40.4% with very low food insecurity, visited food pantries routinely, and they were more likely to do so if they had children living in the household (Neter, Dijkstra, Visser, & Brouwer, 2014). Some estimates put chronic food pantry users at over 60% visiting a pantry at least once per week (Robaina & Martin, 2013). Food pantries have become a very real and ongoing strategy for many households who are unable to or have limited financial abilities to put food on their table each day. Many food pantry clients report spending up to 22% of their total budget on food (Algert, Reibel, & Renvall, 2006).

**How food insecurity impacts health.** Both physical and mental health can become compromised when a person or household experiences food insecurity. Food insecurity can lead to health risks due in part to lack of proper nutrition and stressors relating to accessing food. Individuals from households that are food insecure report poor or fair health in addition to multiple chronic conditions such as hypertension, hyperlipidemia and diabetes (Seligman, Laraia, & Kushel, 2010). Knight et al, (2016) report that approximately one in six adults with diabetes are food insecure and close to half (45.6%) of diabetics report medication scrimping by either reducing, delaying or avoiding medication due to financial limitations.

In research with children, those in food insecure households were significantly more likely to have a poorer health status and experience more frequent illness including stomachaches, headaches and frequent colds (Alaimo, Olson, Frongillo Jr, & Briefel, 2001).

A strong health-related factor associated with food insecurity is obesity. A number of studies detail the connection between these issues. For example, Martin and Ferris (2007) identified that “food insecure adults were significantly more likely to be obese as those who were food secure.” Another study reports that 31.7% of pantry clientele were overweight, 29.8% were obese, and 10.2% morbidly obese (Robaina & Martin, 2013). Data analyzed from the 2009 Behavioral Risk Factor Surveillance System (BRFSS) found “one in three food insecure adults were obese” (Pan, Sherry, Njai, & Blanck, 2012). A 2012 review of literature found multiple studies confirming that food insecurity and obesity are strongly correlated and particularly so in women (Franklin et al.). Lastly, a study of California women found that 31% of food insecure women were obese versus only 16% of food secure women (Adams, Grummer-Strawn, & Chavez, 2003). High prevalence of obesity is particularly troubling as being a female-headed household is one of the greatest risk-factors of food insecurity.

Individuals from food insecure households are also at risk for mental health issues such as depression and distress (Vozoris & Tarasuk, 2003). A 2015 study found a relationship between depression and food insecurity among both men and women, and a higher prevalence of depressive symptoms with increasing rates of food insecurity (Leung, Epel, Willett, Rimm, & Laraia). Pinard

and colleagues (2015) further support this connection by indicating that families who reported higher levels of depression were more likely to also report higher levels of household food insecurity.

**Nutritional implications of food insecurity.** Food insecurity has been associated to a poor diet quality which is linked to chronic disease and obesity. Nutrient-dense foods (e.g. lean meats, dairy, whole grains, fruits and vegetables) are often pricey and less accessible in low-income neighborhoods.

Research indicates that food insecurity is associated with characteristics of poor diet quality, which are linked to an increased risk of chronic disease (Leung, Epel, Ritchie, Crawford, & Laraia, 2014). Duffy, Zizza, Jacoby & Tayie (2009), also reported lower diet quality for Alabama women accessing pantry foods.

Drewnowski and Specter (2004) explored the relationship with poverty and food insecurity and found an association between “lower food expenditures, lower fruit and vegetable intake, and lower diet quality.” They indicate that an inverse relationship between energy density and energy costs occurs where “energy dense foods (e.g. refined grains, added sugars or fats) represent a lower-cost to the consumer.” These lower-cost, less nutrient-dense foods may lead individuals into consuming more added sugars and fats, having overall higher energy intakes, and thus pose an increased risk of becoming overweight and obese (Drewnowski, 2004).

According to a systematic review of 16 articles assessing food pantry users found that their diet quality did not meet current nutrient recommendations.



Dietary quality of those food pantry clients were found inadequate for intakes of energy, fruits, vegetables, dairy products and calcium (Simmet, Depa, Tinnemann, & Stroebele-Benschop, 2017a).

### **Food Pantries**

**Who are pantry users.** Demographics of a typical food pantry client vary, but prior research provides some indication of those who frequently access food pantries. Pantry clients are predominately black and female (Clancy, Bowering, & Poppendieck, 1991; Robaina & Martin, 2013). They also tend to have low education levels, are in single-headed households and often unemployed (Daponte, Lewis, Sanders, & Taylor, 1998; Robaina & Martin, 2013).

Wright et al. (2017) reports that food insecure individuals can actually become more food secure by visiting a food pantry one time per year. However, visiting pantries multiple times does not improve food security, because increased pantry use may indicate a more severe food insecurity status (Wright, et al., 2017).

**Nutrition in food pantries.** Food pantry bags are typically intended to provide a three day's food supply for an individual (Starkey, 1994). Generally the caloric content of pantry food bags are adequate; however, key nutrients are often missing (Akobundu et al., 2004). When foods from pantries are analyzed for meeting broad food group recommendations, often the fruit and milk or dairy groups are deficient (Akobundu et al., 2004; Hoisington et al., 2011). This absence would stand to reason as perishable foods such as fruits and dairy

products are typically limited due to storage and handling issues within pantries. Canned fruits and shelf-stable or powdered milks are certainly available at retail; however, the inadequacy noted in the milk and fruit food groups suggest they are donated in fewer quantity or the size of those donated items are smaller.

When pantry bags are evaluated for specific nutrients, apart from food groups, the missing food groups of fruits and dairy lead to lower available nutrients such as calcium, vitamins A, C and D (Akobundu et al., 2004; Starkey, 1994). A recent systematic review strengthens this body of research suggesting that food pantry bags do not meet recommendations for milk products, vitamins A and C, and calcium which were provided in particularly low amounts in food pantry bags (Simmet et al., 2017b).

**What pantry clients say about pantry foods.** Food pantries are, for the most part, “dependent upon the quality and quantity of foods donated” (Akobundu et al., 2004). Donated items are often outside the control of pantries leaving less flexibility in meeting nutritional needs of pantry clients. Food pantries are also likely to receive expired foods, damaged foods or foods without a label further limiting nutritional choices of clients. Many pantry donors do not consider nutrition or other client dietary limitations when donating foods (Verpy, Smith, & Reicks, 2003). Healthy food donation lists are currently available, however the knowledge of these lists by pantry operators is unknown.

Pantries that allow the clients to choose or “shop” for the foods they want, as opposed to pre-selected bags, saw clients more often choose items such as peanut butter, cheese, meat, orange juice and margarine (Greger et al., 2002).

These choices improved the vitamin A and C content of their pantry bags.

Allowing clients to choose their preferred foods, as foods are available to do so, could boost the nutritional make-up of pantry bags.

Clients receiving pantry foods do have opinions on what types of foods they would like to have more and less of in their pantry bags. Verpy et al., (2003) interview 31 food pantry clients and found that they are looking for more choice in their foods, high food safety standards, and improvements in the assortment of foods they receive, for example foods appropriate for various ages as well as ethnic groups. Those same focus group clients specifically stated that they desired additional fresh dairy products (not powdered), more seasonal vegetables and fruits, and more meat products. Dairy and meat products were both desired and perceived as necessities especially in homes with children. Foods that meet certain functional criteria such as those compatible with lactose intolerance, allergies or medical conditions were also preferred. Pantry foods that reflect religious beliefs and ethnic preferences are also wanted from food pantry clients such as vegetarians or certain immigrant populations (Verpy et al., 2003).

In regards to client choice versus pre-made food pantry packages, clients indicate that partial choice food pantries are in essence the same as pre-packed food pantry models (Zakari, 2012). Pre-packaged food packages limit choice for the clients. The choice-centered food pantry model allows clients to feel more independent and in control (Zakari, 2012).

Alteration of food pantry bags contents or delivery methods would theoretically be achievable. Education of and discussions with pantry operators

would be needed in order to accommodate special dietary requests and/or ways to improve client choice.

**Food sources of food pantries.** Food banks and food pantries acquire their foods in various ways. Understanding food sources of food pantries are important. Research indicates that food banks gain food mostly from donations and less from commodity sources or direct purchases (Hoisington et al., 2011). Pantry foods come from diverse sources, and are often donated or come from food banks. According to Daponte (2000), food pantries receive food from food banks and other sources. One study by Robaina & Martin (2013) analyzed data from two Connecticut food pantries run by churches and found that they received at least a portion of their foods from their regional food bank. Another study of two church food pantries did not indicate the source of their pantry foods (Greger et al., 2002).

Geographical location may impact the source of food for a given pantry. Research done by Friedman (1991) described urban pantry food sources as being from a food bank compared to rural pantry locations which did not have access to this larger food bank network and had to rely on local foods. The 2016 U.S. Mayors report lists sources of emergency foods distributed within Nashville as mostly from grocery stores (68%) followed by emergency food assistance (11%), individual donations (6%) and purchased food sources (15%).

Verpy and colleagues (2003) interviewed food pantry donors of whom were mainly church members involved in food drives. Their study indicates that donors do not typically consider nutrition as a factor when deciding which foods

to donate. Donors did say they were influenced by the knowledge that hungry people, including children, were in need of food and wanted to help people specifically in their own community (Verpy et al., 2003).

A study of nutritional profiles of donated pantry foods showed that those foods accounted for more than half of a client's dietary intake including overall calories, carbohydrates, vitamin B<sub>6</sub> and select minerals (Mousa & Freeland-Graves, 2018). The same study revealed that fiber, vitamin C, fat soluble vitamins, calcium, magnesium and potassium levels from those donated pantry foods did not meet nutrient recommendation (Mousa & Freeland-Graves, 2018).

Nutrition and overall variety of pantry foods have been shown to fluctuate from pantry to pantry, even within the same city (Andersen et al., 2017).

Andersen and colleagues describe pantry food selections ranging from 35 to 115 different products. Grain foods were found to be the "most predominant food type at all pantries" with fruit and dairy products representing the least proportion (2017).

Food pantry sources can potentially impact the nutritional content of foods that are offered to clients. To better understand the connection between church-based food pantries, their food sources and how that impacts nutrition, more research is needed. An additional way to understand the role of the urban church in addressing the complex issue of food insecurity is through a social network analysis of churches administering food pantries and the areas throughout the city they serve.

## Theory

**Types of social networks.** Examining social networks is important as it helps to explain the connectedness of individuals, groups or communities. It is also useful in demonstrating the potential that lies within networks and between networks. Social networks can be explained as the system of relationships in which people are embedded or connected. In other words, the terms “social network” or “social support” are conceptual approaches that describe the structure, function or type of a social relationship (Glanz, Rimer, & Viswanath, 2008, p. 190).

Structures of social networks include aspects such as the characteristics of the network (e.g. formal or informal), extent to which they are reciprocal in their giving and receiving, extent to which they serve many functions within the network, the extent to which network members are demographically similar (aka homogeneous), and/or the extent to which they have geographical dispersion meaning how members live in proximity to each other (Glanz et al., 2008, p. 191).

Within a social network there can be a variety of support types. Social network support can be formal (e.g. healthcare professionals) or informal (e.g. family, friends, coworkers), include emotional support (e.g. provide attachment and intimacy), tangible support (e.g. provide direct aid or services) or informational support (e.g. provide information or advice) (Schaefer, Coyne, & Lazarus, 1981). Social network support can also vary in duration with either long-term or short-term support as well as vary by location or geography (Glanz et al.,

2008, p. 192). For example, support from social networks may look different depending upon a rural versus urban setting. One study described low-income, rural, elderly women as regularly accepting help from a food pantry, whereas urban, low-income, elderly women utilize food pantry support on a more emergency basis (Wolfe, Olson, Kendall, & Frongillo, 1996).

Fully defining or describing a social network can be challenging because the relationships are often complex. When evaluating social networks, it is the relationships that are often analyzed. The relationships are viewed in terms of “nodes” which are individuals, actors or points as well as the connecting “ties” which are the relationships between the nodes. This type of analysis uses relational data (Scott, 1991, p. 3). Once evaluated, networks can describe who is connected to whom (nodes) within the population and the manner of relationships (ties) (Krause, Croft, & James, 2007). The structural cohesion of social networks can be viewed in terms of the number, length and strength of paths that connect within a network. Social network data that are relational can be entered into computer modeling programs, such as UCInet 6 Network Analysis Software to create a visual matrix for network analysis (Borgatti, Everett, & Freeman, 2002; Scott, 1991).

**Social networks and support in food insecurity.** Research continues to explore the connection between social networks, social support and food insecurity. One study found no marked association between social support and food insecurity among Oregon residents (De Marco & Thorburn, 2009). Other studies do however suggest a connection between social networks and food

insecurity. For example, in 2002 elderly women indicated a mechanism of social support relating to food acquisition as well as informational and emotional support for help in following modified dietary plans (Pierce, Sheehan, & Ferris). Similarly, Frongillo, et al. (2003), describe social support within an elderly neighborhood through a “bread fairy” who visits a local pantry and then distributes day-old bread to needy homes. Women in WIC households were found to have an inverse relationship between food insecurity, perceived health status and social networks (Walker, Holben, Kropf, Holcomb, & Anderson, 2007). Research of food insecure children in urban after-school programs found that they borrow money or food and eat with other families as a way to acquire food through their informal social networks (Connell, Lofton, Yadrick, & Rehner, 2005). Social capital, “a measure of trust, reciprocity and social networks,” has been shown to be “positively associated with household food security” (Martin, Rogers, Cook, & Joseph, 2004). Households with higher social capital (including social networks) were less likely to experience hunger. Research of food insecure female-headed households found that women achieved better or equal economic status, and better nutritional security due to their social ties than households led by men within that sample (Lemke, Vorster, van Rensburg, & Ziche, 2003).

Scant amounts of research is available describing social networks of emergency food providers who serve the food insecure. Detailing food pantry “connectedness” through social network analysis can assist policymakers and researchers to ensure maximum effectiveness of the food safety net system.



There is paucity of research connecting urban church food pantries and social networks, therefore additional research is needed in this area.

**The role of the church in social networks.** The church functions as a respected and trusted network which seeks to meet the needs of its members and the community. Churches have a long-standing practice within communities to address health promotion and disease prevention (Chatters et al., 1998). Church-based health promotions efforts can reach broad populations and have the potential for reducing health disparities and influencing behaviors (Campbell et al., 2007). Studying church networks can help researchers analyze and identify social linkages and the exchange of community resources. This area of research also allows for the ability to identify and strengthen these networks therefore enhancing the community's capacity (Israel, 1985).

Churches are sources of natural helpers which ultimately facilitate health interventions and strengthen networks (Israel, 1985). Churches have deep ties within communities in which they are found. Research also shows that a "history of volunteerism in most churches has been shown to strengthen health promotion programs" within churches (Yeary, Klos, & Linnan, 2012). For example, the "Body and Soul" effort which specifically tested the impact of a dietary intervention when delivered by volunteer members through African-American churches.

Other researchers have also found significant increases in fruit and vegetable consumption as a result of dietary interventions (Resnicow et al., 2004). Another study focusing on fruit and vegetable consumption of black

church members found that after two years of the intervention there was significant increase in produce intake (Campbell et al., 2007). A nutrition education initiative through churches called, “Eat to Life” aimed to increase intake of fruits and vegetables, concluded that churches are an “excellent setting to implement and evaluate health promotion programs” (Resnicow et al., 2001).

Over a decade ago it was estimated that anywhere from 57% to 78% of churches were involved in health-related activities, and regardless of church size approximately 55% of churches offered food pantries (DeHaven, Hunter, Wilder, Walton, & Berry, 2004). More recently, a 2017 report from the Michigan Fitness Foundation found that churches are highly involved in food ministries with close to 90% offering some type of food pantry on site (Michigan Fitness Foundation). Clearly, the church is a trusted network in which people turn to for support and aid.

### **Summary**

Churches are important links between those who are food insecure and access to healthy, safe foods in times of need. Documenting the social networks of church pantries can provide a better understanding of how churches serve a city and its residents.

Reducing food insecurity is also an important public health objective as outlined by *Healthy People 2020* (U.S. Department of Health and Human Services, 2015). Churches support this national public health goal through their food pantry efforts and the provision of emergency foods.

Past research has raised concern about the nutritional adequacy of food pantry foods. Examining church food pantry nutrition can provide additional insight into the nutritional adequacy of pantry bags, as well as the opportunity to make recommendations needed for pantry food improvements. This research study is also in line with current dietetic recommendations concerning food insecurity to “map and evaluate community processes” as well as “document the nutritional value of emergency foods and donor practices” as outlined by The Academy of Nutrition and Dietetics (Holben & Marshall, 2017).

## CHAPTER THREE: METHODS

### **Purpose**

The purpose of this cross-sectional, population-based research study was to investigate the prevalence of food pantries located in urban churches, describe the degree to which urban church food pantries are connected to the clients they serve as explained by the social network theory, and to explore the nutrient and food group profiles of pantry foods bags distributed by urban churches. Primary data will be used for this assessment.

### **Preliminary Research Study**

A preliminary research study of urban food pantries was conducted in 2015 using a web-based survey. The target population of the study included churches, temples and synagogues (collectively referred to as “churches”) in Nashville. The purpose of the study was to determine the extent to which Nashville churches had on-site food pantries (Noerper, 2015). Data collection was approved through the Middle Tennessee State University (MTSU) Institutional Review Board (IRB) with approval #15-237 [Appendix A].

The sample population of the preliminary study were churches with zip codes ( $n = 30$ ) in Nashville. The initial sample size included a 908 church email database that was constructed by the primary investigator of which 474 were valid email addresses. The churches in the database were identified through the online Yellow Pages in December, 2014. The term “church” for the purpose of this study is referred to as a place of worship including temples, mosques and

synagogues per the Internal Revenue Service (2015) generic definition. Similarly, but outside the narrative of this research, is a related term “faith-based organization.” A faith-based organization can be more broadly defined as a charitable organization with religious affiliations (Bielefeld & Cleveland, 2013).

A 37-item electronic survey instrument was sent, via Survey Monkey, to the 474 valid church emails. The survey questions were evaluated for readability by subject matter experts. All efforts, within reason, were made to keep the information of the survey record private and confidential. Each survey was identified with a unique number. Four \$50 gift cards were offered and awarded as incentives for completion of the survey. Gift cards winners were randomly selected from churches that completed and returned the survey. Gift cards were intended to be used by churches to support their hunger ministry efforts. There were no costs associated with participation in the preliminary research study.

Of the 474 churches receiving the survey instrument, fifty-nine (12.5%) churches completed and returned it. Of the 59 responding churches, 58 accepted participation in the research and one declined. Twenty-two (37.9%), of the 58 participating churches, were identified as having an on-site food pantry. Between August 2015 and February 2016, those on-site pantries were visited and food pantry nutrition data was collected from nineteen churches. After multiple attempts to contact the remaining three sites, they were deemed non-responsive and received no visit. Through the site visits it was established that a total of nine pantries provided pre-made food bags and those bags were nutritionally

analyzed. The food bag data collected from the pantry visits were recorded in both photographic and written formats.

### **Current Research Study**

Through the pantry site visits conducted in the preliminary study plus internet searches for food pantries, 49 additional Nashville churches with potential food pantries were identified. The primary investigator, utilizing the snowball sampling method, contacted and visited church food pantries in order to collect additional data for a more robust data analysis. Data collection was approved through MTSU IRB with approval #18-1082 [Appendix B].

Three anticipated benefits of the study were identified: 1) a more thorough documentation of the extent to which urban churches offer on-site food pantries, 2) understanding of the connectedness of church food pantries to the clients they serve through their social networks, and 3) evaluation of the food and nutrient profiles of the pantry foods provided by urban churches.

Churches were initially contacted (email or phone call) to verify if they did, in fact, have an on-site food pantry. The phone script to the churches is provided [Appendix C]. Churches in the snowball sample were provided a web-based survey instrument [Appendix D] about their church and pantry practices.

Information obtained from the web-based surveys were compiled and analyzed for demographic data. If a church was identified as having a food on-site pantry, then the investigator attempted to visit the pantry. The pantry visit assisted in documenting the exact foods provided in a typical pantry bag in both written and photographic formats which could then be analyzed for their nutritional content.

Nutritional analysis of the pantry food bag was conducted for the MyPlate food groups (protein, grains, vegetables, fruit and dairy) and nutrients (total fat, saturated fat, *trans*-fat, cholesterol, sodium, total carbohydrate, dietary fiber, protein, vitamin A, vitamin C, calcium and iron).

The pantry visits of selected churches were also used to establish reliability of the survey instrument through the test/retest data collection method. This analysis is described in a later section entitled, “Survey Instrumentation and Data Entry.”

### **Study Population**

The study population was 49 urban churches in Nashville, Tennessee, known to have an on-site food pantry as identified through the preliminary research process. The churches were from a variety of geographic locations (e.g. zip codes) and denominations.

### **Study Design**

The research design of this study is a population-based, cross-sectional study using a snowball sampling method of urban church food pantries in Nashville, Tennessee.

### **Survey Instrumentation and Data Entry**

The survey instrument (aka questionnaire) was created by the investigator using original and previously published content (Thomas, 2007). The church food pantry survey instrument [Appendix D] contained 38 items. The survey instrument was modified only slightly from the version used in the preliminary study. No gift card incentive for survey completion was used in this study.

The survey instrument collected demographic data including name of the church, church zip code, denomination, average weekly attendance, racial mix and average age of the members. Pantry specific demographics include zip codes that the pantry serves, monthly distribution of pantry foods, sources of pantry food acquisition, dates and times the pantry are available, additional resources pantry clients can receive (cash, gift cards, recipes, nutrition education, etc.), years the pantry has existed, personnel responsible for pantry maintenance, number of days the pantry foods are intended to feed individuals, depletion of pantry foods and how holiday times impact the food contents of the pantry food bags. EpiData version 3.1 was used for data entry (Lauritsen, Bruus, & The EpiData Association, 2008).

Social network ties between church food pantries and clients were described utilizing UCINet software (UCINET 6) to graphically illustrate the relationships between the churches and the zip codes that urban pantries serve (Borgatti et al., 2002). The nodes were identified as the churches and zip codes. The ties were the relationships between the nodes. These relationships including centrality, or the contribution the nodes make to the network structure, was expressed through a sociogram (e.g. visual graphic) (Borgatti, Everett, & Johnson, 2013; Hanneman & Riddle, 2015). This analysis quantified the extent to which churches are addressing food insecurity in specific zip code areas of Nashville.

Psychometrics properties of the survey instrument were assessed for reliability as well as face and content validity. Readability of the survey



instrument was also assessed. Twenty-two subject matter experts were utilized as part of the psychometric analysis.

### **Readability, Validity and Reliability of the Questionnaire**

Readability of the instrument was evaluated by subject matter experts. To test for face validity, subject matter experts were asked to evaluate a draft of the survey instrument and review it for clarity, language use, and cultural relevance (Dharod, Croom, & Sady, 2013).

Content validity of the survey instrument was calculated through a Content Validity Ratio (CVR) score (Lawshe, 1975). To establish the CVR score, subject matter experts rated the survey items as either “essential”, “useful but not essential” or “not necessary”. Using those score tallies, the ratio score was computed using the CVR formula with mean scores for each item. The resulting CVR item or question scores ranged from +1 to -1 with positive values indicating 50% of judges rated the item as essential and negative values indicating 50% of judges rated the item as non-essential. Results of the CVR are reported.

Reliability of the survey instrument was assessed through test/retest measures for the consistency of church answers to the survey instrument over time. A goal of 10% ( $n = 10$ ) of randomly chosen churches was set to be included in the test/retest analysis. Those churches were asked the same series of questions from the survey instrument in verbal interviews during the pantry site visits (Fisher, 1992). A simple randomization method to select the churches for the test/retest procedure was chosen through the use of a computerized random number generator. A target follow-up date to those test/retest churches was set

to occur within five days after the online survey instrument completion. Reliability of the test/retest scores were evaluated with agreement statistics. Analysis of the test/retest data were performed using the following variables: main religion of church, normal practice of pantry bag distribution, pantry bag modification depending upon holiday times, and whether or not the church had a pantry. Number and percent agreement between test/retest was reported with 80% agreement specified as acceptable.

Threats to external validity were minimized through a variety of methods including utilizing multisite data collection, employing the same recruitment techniques for each pantry, and by having the primary investigator collect all data (Hoisington, Shultz, & Butkus, 2002). Additionally, pantry food visits did not occur during holiday periods as contents of the pantry food bags can be altered causing a shift in the food and nutrient profiles.

One limitation impacting the nutritional analysis was the one-time collection of pantry bag foods for analysis. To account for this, mean values are reported for an average of food groups and nutrients provided by the church food pantry bags.

### **Analysis Plan**

**Nutrient analysis.** A variety of nutritional parameters were used to evaluate the nutrient contents of the food bags. First, during the site visit to the church food pantries, each food item in the pantry bag was documented by brand name, size and amount. Nutritional profiles of the foods were computed for target nutrients using the FoodWorks® (version 17) nutrient analysis software (The

Nutrition Company, 2013). The FoodWorks® database consists of more than 38,000 food references. If complete data for the food to be analyzed was not available in the database, then the most similar food product was used or exact label information was added into the database as a new food. Specific nutrients for analysis were protein, total fat, saturated fat, total carbohydrate, sodium, fiber, calcium, iron, vitamin C, vitamin A and cholesterol. These nutrients were selected as they are the primary nutrients of the current nutrition facts panel or food label (Akobundu et al., 2004; Starkey, 1994; U.S. Food and Drug Administration, 2004). Once the nutrient analysis was computed, the values were compared to the Daily Value (DV) standard of nutritional reference for children four or more years of age and adults. Mean values for the food group category and specific nutrient were reported (Akobundu et al., 2004). Nutrient and food group analysis was based on the edible portion of pantry foods.

Second, nutrient density was assessed with the calculation of the Index of Nutritional Quality (INQ) (Akobundu et al., 2004; Drewnowski, 2005; Hansen & Wyse, 1980). In this method, the nutrient content of the food bag was computed then compared with the standard reference value for that nutrient and then adjusted per 1,000 calories of intake. Within the INQ score, values equal to or greater than 1.0 indicated individuals consuming pantry foods in sufficient quantities to meet energy needs will also achieve the recommended level(s) for that particular nutrient(s). INQ levels below a value of 1.0 indicated that the foods do not contain nutrients sufficient to meet recommendations. For nutrients such

as cholesterol, fat, *trans*-fat, saturated fat and sodium a lower INQ value is desirable (Akobundu et al., 2004).

Third, the food bag contents were evaluated based on the number of MyPlate food group servings the bags contained. MyPlate is the food icon used by the *2015 Dietary Guidelines for Americans* to visually depict the type and proportion of foods recommended for a healthy diet (U.S. Department of Health and Human Services, 2015). Each pantry food item was assigned to one of the five food groups from MyPlate (e.g. Grains, Fruits, Vegetables, Protein and Dairy) by utilizing the SuperTracker function at the MyPlate website. Cup or cup-equivalents were used to quantify foods from the fruit, vegetable and dairy food groups while ounces (oz.) or ounce-equivalents were used for the protein and grain food groups (Hoisington et al., 2011).

Three nutritional components of the *Dietary Guidelines* are “Daily Limits”. Daily limits are the amounts that people should not exceed each day. Daily limits were included for added sugars, saturated fat and sodium with values of 50 grams, 22 grams and 2300 milligrams, respectively. Mean and median values of MyPlate food group servings, as well as Daily Limits, were determined and reported.

Fourth, a Minimum Day’s Equivalent (MDE) value of foods in the pantry bags was tabulated. The MDE is an outcome measure for the number of days that the pantry bag contents will provide the minimum number of servings from each MyPlate food group. The MDE is calculated by dividing the number of servings in a food group by the minimum recommended MyPlate servings

(Akobundu et al., 2004). Minimum food group serving sizes for the food groups were based on the MyPlate 2,000 calorie per day recommendations as follows: Fruits – 2 cups per day; Vegetables – 2.5 cups per day; Dairy - 3 cups per day; Grains – 6 oz. per day; Protein foods – 5.5 oz. per day. The MDE values are reported in mean and median forms.

Testing of hypotheses #2, #3 and #4 included the use of food group and nutrient analysis data as well as MDE and INQ calculations.

**Social network analysis.** Hypothesis #1 analyzed the social network relationships of the pantries through the zip codes urban churches serve by using the UCINET 6 software (Borgatti et al., 2002). A sociogram or visual matrix was developed for the church pantries including node, ties and centrality data points. Results were reported and a visual sociogram was created.

**Statistical analysis.** Descriptive statistics were computed using SPSS version 24 (IBM Corp., 2016). Prevalence estimates of church food pantries was calculated and reported along levels of the following variables: average number and age of church members, zip code of the church, main religion (denomination) of church, and primary race of church members. If churches had an on-site food pantry, then means and standard deviations for number of bags provided each month, days/times of pantry operation, and number of days the pantry bags will feed individuals were reported. Additional variables such as sources of food acquisition, pantry staffing, manner in which pantry bags are assembled for clients (e.g. freely assembled versus pre-made), and length of time that the food pantry has been in service were also calculated and reported. Reporting of these

indicators fulfilled research question one. There is no stated hypothesis for research question one.

The nutritional content of the pantry food bags were computed using the Food Works© diet analysis software (e.g. a 14.5 oz. can of drained, cooked green beans, no fat added equals 61 calories, 3 grams of protein, 14 gr of carbohydrate, 6 grams dietary fiber, 3.7 mg of iron, etc.). The Food Tracker function from the MyPlate SuperTracker website ([www.choosemyplate.gov](http://www.choosemyplate.gov)) was utilized to specify food group servings of pantry food bags (e.g. a 14.5 oz. can of drained, cooked green beans, no fat added, equals 2 cups of vegetables). Means, standard deviations and median serving sizes of the MyPlate food groups (grains, dairy, fruit, vegetable, protein) and daily limit nutrients (added sugars, saturated fat and sodium) were reported. Minimum Days Equivalent (MDE) values were reported as means, standard deviations and medians for those same food groups. Using the macro- and micro-nutrient analysis from Food Works©, the Index of Nutritional Quality (INQ) scores were calculated and reported as means, standard deviations and medians for the following 11 nutrients on the current nutrition facts panel (aka food label): total fat, saturated fat, cholesterol, sodium, total carbohydrate, fiber, protein, vitamin A, vitamin C, calcium, and iron.

Hypothesis #2 was initially to be tested using multiple logistic regression to examine the relationship between the continuous independent variable (IV) of the MyPlate food group minimum daily servings (grains = 6 oz.; vegetables = 2.5 cups; fruits = 2 cups; dairy = 3 cups; protein 5.5 oz.; added sugars = 50 grams;

saturated fat = 22 grams; sodium 2300 mg) and the categorical dependent variable (DV) of meeting the minimum MyPlate food group serving recommendations (yes/no). After analysis of the variables, it was determined that mean values would answer hypothesis #2.

Hypothesis #3 was initially to be tested using multiple logistic regression to examine the relationship between the continuous IV of MyPlate food group minimum daily servings (grains = 6 oz.; vegetables = 2.5 cups; fruits = 2 cups; dairy = 3 cups; protein 5.5 oz.; added sugars = 50 grams; saturated fat = 22 grams; sodium 2300 mg) provided in the pantry food bag and the categorical DV of MDE values (e.g. number of days that the bag contents will provide the minimum number of servings from each food group as recommended by MyPlate) meeting or not meeting the 3-day minimum food group servings. After analysis of the variables, it was determined that mean values would answer hypothesis #3.

Hypothesis #4 was initially to be tested using multiple logistic regression to examine the relationship between the continuous IV of the Minimum Days Equivalent score and the categorical DV of an acceptable or not acceptable INQ scores (e.g. INQ score is the nutrient content of the food bag compared with a standard reference adjusted per 1,000 calories). Acceptable INQ scores are  $1 \geq$  for protein, fiber, iron, vitamin A, vitamin C, calcium, total carbohydrate or INQ scores of  $< 1$  for total fat, saturated fat, cholesterol, and sodium. Due to multicollinearity within the variables, the dependent variable was changed from a categorical variable (acceptable or not acceptable INQ scores) to a continuous

variable (percentage of nutrient INQ scores). Using both continuous independent and dependent variables, regression statistics were computed for the 11 INQ nutrient values in hypothesis #4.



## CHAPTER FOUR: RESULTS

The primary purpose of the current study was to investigate the prevalence of food pantries located in urban churches, describe the degree to which urban church food pantries are connected through the clients they serve as explained by the social network theory, and to explore the nutrient and food group profiles of pantry foods bags distributed by urban churches.

### **Study Participants**

The snowball sample of the 2017-2018 church pantry sites totaled 45. Churches were contacted via telephone, email or an in-person visit to confirm if they, in fact, had an on-site food pantry. Through this outreach, four additional church food pantry sites were identified as potentially having an on-site church pantry. For the 2017-2018 data collection period, 49 total pantries were identified in the sample population. After attempts to contacting all 49 church sites, three were excluded from the sample because they were outside the Nashville zip code areas. An additional 12 churches were excluded because they were unresponsive to inquiries after multiple attempts to reach them. Therefore, 15 total church sites were excluded. A total of 34 church sites were included in the 2017-2018 data collection period.

Of the 34 churches in the 2017-2018 sample size, one site declined participation in the research and nine sites indicated they did not have a pantry. Twenty-four churches indicated either through survey reporting or phone calls they had an on-site pantry. Twenty-two of the 34 churches were visited by the

researcher. Upon completion of the visits and outreach to all churches in the sample size, nine of the church sites visited were found to have pre-made food bags. These nine church having pantries with pre-made client food bags had the contents documented in both written and photographic formats for subsequent analysis.

The 2015-2016 data collection period from the preliminary study began with 908 churches in a database the researcher compiled. Of the 908 churches, 474 had valid email addresses to receive the electronic questionnaire over food pantry practices. Fifty-nine churches responded to the electronic questionnaire. Of those responding, one church declined participation and 36 churches indicated they had no food pantry on-site. Twenty-two churches indicated they had a food pantry on their premises. Of those 22, a total of 19 churches were visited with three being unable to be reached. From the 19 sites visited, nine of the church sites offered clients pre-made food bags. The nine churches having pantries with pre-made food bags had the contents documented in both written and photographic formats for subsequent analysis.

When combining the 2015-2016 and the 2017-2018 data collection time periods, the total sample size for the study was 93 total churches. Of those 46 churches had on-site pantries and 18 food pantry pre-made bags were included for nutrient analysis.

### **Readability, Validity and Reliability of the Questionnaire**

Psychometrics properties of the survey instrument (aka questionnaire) were analyzed for reliability and validity. Twenty-two subject matter experts with

backgrounds in nutrition, family and consumer science or religious/pastoral competencies agreed to be evaluators. Experts were asked to review the survey items at face value for readability, clarity, language use and cultural relevance. All 22 subject matter experts approved the use of the research questionnaire based on face validity and readability.

Content validity was evaluated by the same 22-member subject matter expert panel and calculation of a Content Validity Ratio (CVR) score was determined. The 38-item survey instrument was provided to the expert panel who individually scored each question as either essential, useful but not essential or not necessary. A mean CVR value for each item was calculated and then divided by the 38-item number of survey questions. The CVR value for entire survey was determined to be 0.66. The CVR recommended guidelines published by Pennington (2003), indicate the minimum CVR for 20 judges should be 0.42. Based on the minimum recommended CVR, 0.66 is adequate to establish content validity for the survey instrument.

Reliability was evaluated with agreement statistics. A test/retest format was used during the 2017-2018 data collection time period and data was collected from nine churches. This did not meet the goal of 10 churches set forth for the test/retest sample. Test/Retest data was gathered on churches an average of 16 days apart, which did not meet the goal of a five day test/retest measure. Analysis of the test/retest data was performed using the following variables: main religion of church, normal practice of pantry bag distribution, pantry bag modification depending upon holiday times, and whether or not the

church had an on-site pantry. Results indicate 88.99% agreement for the main religion of church variable; 88.89% agreement for the normal practice of pantry bag distribution; 88.89% agreement for pantry bag modification depending upon holiday times and 100% agreement on whether or not the church had an on-site pantry. These results meet or exceed the 80% agreement level for acceptability.

Based on the above analysis of readability, validity and reliability, the results indicate that the questionnaire demonstrates adequate psychometric properties for use as an assessment instrument regarding church food pantries.

### **Data Management**

The web-based questionnaire was sent to churches via Survey Monkey. Church responses were coded and entered into the data management software, EpiData version 3.1 (Lauritsen et al., 2008). The codebook generated from EpiData is found in Appendix E.

### **Demographics**

**Church demographics.** There were 93 churches who completed some or all of the electronic survey providing demographic information and food pantry practices. Table 3 shows descriptive characteristics of churches included in the sample. The average number of church membership was 393 members. The average age of church members was 47.4 years old.

Table 3

Characteristics of Urban Churches in Food Pantry Sample ( $N = 93$ )

Characteristic	<i>M</i>	<i>SD</i>
Number of Church Members	393.01	882.25
Average Age of Church Members	47.73	10.93
	<i>n</i>	%
Main Denomination		
Baptist	16	19.05
Methodist	17	20.24
Presbyterian	10	11.90
Church of Christ	9	10.71
Episcopal	4	4.76
Non-Denominational	8	9.52
Other	20	23.81
Primary Race of Church		
Caucasian (White)	45	61.60
African-American (Black)	17	23.30
Hispanic and Other	11	15.10
On-site Food Pantry		
Yes	46	54.80
No	38	45.20

The main denominations represented in the sample (Table 3) were Methodist (20.2%), Baptist (19%), Presbyterian (11.9%), Church of Christ (10.7%), Non-Denominational (9.5%) and Episcopal (4.8%). The category of “Other” (23.8%) included religions such as American Methodist Episcopal, Lutheran, Roman Catholic, etc.

The majority of churches had members with a primary race of Caucasian (61.6%). African-American church memberships represented 23.3% of the sample and Hispanic/Other races were 15.1%.

The zip code 37209 (Tennessee State University/Old Charlotte Pike area) with nine churches (10.2%) represented the greatest number of churches in one zip code. The next zip code with 9.1% ( $n = 8$ ) of sample churches was 37208 (North Nashville/Germantown). The third and fourth most recorded zip codes was zip code 37115 (Madison) with seven churches (8%), while six churches (6.8%) were located in the 37076 (Hermitage) zip code.

Food pantry client screening practices and documentation varied from church to church. Thirty churches (71.7%) in the sample reported that they ask pantry clients who they are. Twenty-seven churches (58.7%) said they document where clients live. Churches report typically not asking clients why they were in need (73.9%) or for proof of their need (76.1%). Only 10 churches (21.7%) indicated they asked if clients were referred to them.

**Pantry demographics.** When asked if churches had an on-site food pantry, 46 (54.8%) indicated that they did and 38 (45.2%) indicated that they did

not (Table 3). Of those churches without pantries, 27 (79.4%) indicated that they were “somewhat unlikely” or “very unlikely” to start a pantry within the next year.

Most pantry food bags (63.42%) were provided to clients in the form of a standardized food bag (Table 4). Seventeen percent (17.07%) of churches allowed the clients to “shop” for their foods or freely assemble their own food pantry bag according to client preferences. The remaining 19.51% of churches allowed clients to select some or all of their own foods within the parameters of a standardized list.

The average number of food bags given out per month was 115.77 (Table 4). The average number of days a pantry was open each month is 11.81 days. The average number of hours a pantry was open is 55.47 per month. The days and times vary of pantry availability vary from every day during “normal” work hours to selected days/times during the week. Few ( $n = 4$ ) pantries indicated accessibility on the weekends. As comparison, Greger (2002) reported that church-affiliated pantries in Wisconsin were open to clients four to five days per week for approximately nine hours per week. This study found that Nashville pantries were open each week an average of three days and 13.87 hours.

Pantries indicated a moderate amount of fluctuation in food bag contents based on holiday times. One-fourth of pantries report that pantry bag contents change during holiday periods (Table 4).

Pantry bag analysis further indicates that there were 434 total food items available from the 18 food pantry sites. On average there were 24.11 ( $SD \pm 9.5$ ) food items per bag. The average number of calories per pantry bag was

18,817.39 ( $SD \pm 8,632.61$ ). The pantry bag providing the least number of food items ( $n = 9$ ) and calories was from a Methodist church and contained 1,649 calories. The pantry bag with the most food items ( $n = 42$ ), also from a Methodist church, contained 23,387 calories. The pantry bag containing the most overall calories contained 21 food items, 36,418 calories, and was from a Church of Christ.

Churches report that pantry foods were intended to last an individual approximately 9.81 days ( $SD \pm 8.17$ ). During the church site visits, some churches verbally indicated that the pantry bag contents were supposed to feed an individual based on the number of meals versus a certain number of days. Based on the number of days indicated in this study, a family of three could consume the average pantry bag contents for three days.

Sources of church pantry foods varied between purchased, church garden, donated by members, received from a food bank or “other” sources. Churches reported overlapping sources with few only having one primary pantry food source (Table 4). The greatest number of churches reported that they received pantry foods donated by church members (73.81%). Of those same 46 churches with pantries, six reported 100% of their pantry foods were donated by church members while 12 churches reported no foods were donated by members. Fifty-two percent of churches with pantries reported receiving foods from food banks, while 48% reported purchasing some pantry foods. Nineteen churches said they received no foods from food banks, while six churches reported 100% of their pantry foods came from food banks. Only one church



reported purchasing 100% of their pantry foods. Church gardens were the pantry source that the fewest churches indicated utilizing. Only two churches, less than 5% of the sample, indicated gardens were a pantry food source and they were less than 15% of their source which indicates gardens supply only a very small portion of pantry foods in urban settings. When church pantry sites who received donated foods and food bank foods were compared with client screening practices, they each reported asking who they were and where the clients lived but few asked about client need or proof of need. This results indicates that pantries track the names and address of individuals but few request any proof of why an individual or family is requesting the food bag.

Pantries do provide perishable foods to clients at times. Twenty-three percent (23.8%) of pantries reported “always” giving perishable foods to clients while 14.3% offer perishable foods “most of the time” and 16.7% offer perishable foods “sometimes.” Overall, more than half of church pantries reported giving away perishable foods at some point in addition to shelf-stable foods to pantry clients.

Pantries report almost never (94.9%) giving out cash or gift cards (76.3%) along with pantry food bags. Pantries also indicate they typically never distribute nutrition education information (71.1%) or recipes (69%) along with pantry foods. Churches do indicate that between “sometimes”, “most of the time” or “always” (48.7%) SNAP (aka food stamp) enrollment information is provided along with pantry foods.

Table 4

Characteristics of Food Pantries in Urban Churches ( $N = 46$ )

Characteristic	<i>M</i>	<i>SD</i>
Average number of bags given out each month	115.77	160.85
Average number of days pantry is open each month	11.81	6.60
Average number of hours pantry is open each month	55.47	55.79
Average number of days pantry bags feed Individuals	9.81	8.17
	<i>n</i>	%
Sources of pantry foods <sup>a</sup>		
Donated by church members	31	73.81
Received from food bank(s)	22	52.38
Purchased	20	48.78
Church garden	2	4.88
Other	15	36.59
How food pantry bags are provided to clients		
A standardized bag is given	26	63.42
Clients freely assemble their own food bag	7	17.07
Clients assemble all or some of their food bag per a standardized list	8	19.51
Change in pantry bag contents during holidays		
Yes	9	25.00
No	27	75.00

*Note.* <sup>a</sup>Churches could indicate more than one food source.

Eight churches (20%) said their pantry has been existence between one and five years while 15 churches (37.5%) indicated their food pantry has existed between six and 10 years. Fifteen percent of churches ( $n = 6$ ) have pantries that have existed from 11 to 15 years, and 12.5% of churches ( $n = 5$ ) had pantries existing between 21 and 25 years. Only three churches (7.5%) said their food pantry has been around for more than 26 years.

Food pantry staffing occurs more often on a weekly basis as opposed to monthly or quarterly. More churches ( $n = 31$ ) indicate volunteers are used in maintaining the pantry than paid-church staff ( $n = 13$ ).

The zip code 37076 (Hermitage) was served the most (12.5%) by Nashville church pantries. The next most served Nashville zip code (9.4%) was 37209 (Tennessee State University/Germantown). The third most served Nashville zip code was a tie between three zip codes. Those zip codes were 37203 (Downtown), 37206 (East Nashville) and 37207 (Brick Church Pike), each with 6.3% of churches indicating they service those areas.

### **Social Networks of Church Pantries**

Church food pantries and the zip codes they serve were analyzed with the social network software called UCINET (Borgatti et al., 2002). A total of 53 nodes (23 churches and 30 zip codes) and 148 ties were indicated by the analysis. The network analysis results are depicted in Figure 2, which visually details the relationships between church food pantries and the zip codes they serve. The ties are the black lines between the nodes. The zip codes (nodes) that churches serve are indicated by the orange boxes. The church pantries (nodes) are



The hypothesized social network relationship (hypothesis #1) was that larger sized churches would have more social network connections (e.g. ties) in who they serve than medium-sized and smaller churches within urban church food pantries in Nashville, TN. The social network analysis showed that large churches had 31 ties, medium churches had 98 ties and small churches had 19 ties. The two center churches with the most ties (greatest centrality) were medium-sized churches with zip codes in Donelson (37214) and North Nashville (37208). Based on the UCINET analysis hypothesis #1 is rejected.

### **Nutritional Adequacy of Church Food Pantry Bags**

**Food groups.** Eighteen church pantries provided pre-made food bags which were analyzed for their nutritional content. Results of the analysis found that most food group servings were supplied from the pantry bags were from the grain group (77.14 servings) as shown in Table 5. Previous research has also shown grains to be the most abundant food group in pantry bags (Akobundu et al., 2004; Derrickson, Widodo, & Jarosz, 1994; Friedman, 1991; Starkey, 1994). The total grain group combined both whole and refined grains. If consumed in recommended amounts by the MyPlate and Dietary Guidelines, the grain group with a 6 ounce per day reference value would last pantry clients the longest number of days at almost 13 days (12.86). This value is expressed as the Minimum Days Equivalent (MDE). Specific foods which churches distributed from the grain group included cereal, rice, pasta (noodles/spaghetti), crackers, pancake and cornbread mix. The primary whole grain foods pantry bags included were brown rice, oatmeal, popcorn, whole grain pasta, and ready-to-eat cereal.

Table 5

## Food Group Servings and Minimum Days Equivalent of Foods in Church Pantry Bags

	Food Group Servings (N = 18)			Minimum Days Equivalent <sup>a</sup> (N = 18)		
	<i>Mean</i>	<i>SD</i>	<i>Median</i>	<i>Mean</i>	<i>SD</i>	<i>Median</i>
Total Grains <sup>b</sup>	77.14	52.60	76.25	12.86	8.77	12.71
Whole Grains <sup>b</sup>	11.83	8.62	10.25	3.94	2.87	3.42
Refined Grains <sup>b</sup>	65.31	50.49	59.00	21.77	16.83	19.67
Dairy <sup>c</sup>	4.89	3.33	4.38	1.63	1.11	1.46
Fruits <sup>c</sup>	5.15	8.00	2.13	2.58	4.00	4.00
Vegetables <sup>c</sup>	19.24	9.59	18.63	7.69	3.84	7.45
Protein <sup>b</sup>	55.01	29.43	53.50	10.00	5.35	9.73
<i>Daily Limits<sup>d</sup></i>						
Added Sugars <sup>e</sup>	526.06	583.01	337.00	10.52	11.66	6.74
Saturated Fats <sup>e</sup>	142.31	85.56	124.50	6.47	3.89	5.66
Sodium <sup>f</sup>	36,054.39	13,414.21	35,948.00	15.68	5.83	15.63

*Note.* <sup>a</sup>Minimum Days Equivalent is the number of days the bag contents will provide the minimum number of MyPlate food group servings. <sup>b</sup>In ounces. <sup>c</sup>In cups. <sup>d</sup>"Daily Limits" values for Added Sugars are from MyPlate. Saturated Fats and Sodium values are from Food Works™ analysis. <sup>e</sup>In grams. <sup>f</sup>In milligrams.

The next longest MDE would be the protein group meeting the minimum 5.5 ounce daily dietary recommendation for 10 days. Protein foods found in the church pantry bags included canned meats (chicken, tuna, salmon), peanut butter, ham (canned and frozen) and Vienna sausages.

The vegetable group had 19.24 average servings (cups) in the pantry bags with a MDE value of 7.69. Vegetables primarily provided in the pantry bags were canned vegetables (e.g. green beans, corn, tomatoes), soups, beans (dry and canned), and canned chili with beans.

The pantry bags were very low in the fruit group choices. The fruit group had 5.15 average servings (cups) and a MDE value of 2.58 days of meeting the reference value of 2 cups per day. This result is only a ½ cup above the reference value. Overall, the bags ranged in fruit servings from zero to 28.5 servings. The zero fruit serving pantry bags were from Methodist, Disciples of Christ and Presbyterian denominations, while a non-denominational church pantry offered the 28.5 fruit servings. Canned fruits (peaches and fruit cocktail), raisins and juice were the fruits typically provided in the pantry bags.

The fewest number of food group servings came from the dairy food group with only 4.89 total servings. Bags ranged in dairy servings from zero in a non-denominational church to 11 servings in a Church of Christ food bag. The dairy group had a mean value of 1.63 servings for the Minimum Days Equivalent (MDE) calculation. This value does not meet the 3-cup minimum food group per day serving recommendation. Similar pantry nutritional analysis have been previously reported with the grain group offering the highest MDE and the dairy

group having the lowest MDE value (Akobundu et al., 2004; Derrickson et al., 1994; Friedman, 1991; Starkey, 1994). Pantry foods from the dairy group included powdered milk, shelf-stable milk and mashed potato mixes. Scant amounts of dairy servings came from the analysis of foods in edible portion, such as the milk used in boxed macaroni and cheese mix or pudding mixes.

In this study, the dairy group had the lowest MDE followed by the fruit group. Akobundu et al., (2004) found these values switched with the fruit group having the lowest MDE value. In either instance, both the fruit and dairy were the food groups offered in lowest amounts in the church food bags. Primary fruit group foods included in pantry bags were applesauce, fruit juice, raisins and canned fruits (e.g. peaches, pears, etc.)

The category, “Daily Limits” were analyzed for its three nutrients as represented in MyPlate. Daily limits and their reference values are listed for added sugars (50 grams), saturated fat (22 grams) and sodium (2300 mg). Daily limits analysis of added sugars (Table 5) were calculated from the MyPlate SuperTracker function, while the saturated fat and sodium values were computed from the Food Works© nutrient analysis software.

When food pantry bags were analyzed against the daily limits for added sugars, saturated fat and sodium, the highest amount was contributed from the added sugars category (526.06 grams) with an MDE value of 10.5 days’ worth of added sugar. Added sugars in the pantry bags came from foods such as cookies, cupcakes, cheesecake, candy and powdered mixes (e.g. boxed pudding, drink mixes, etc.). Saturated fat levels totaled an average of 142.31 grams with an



MDE value of 6.5 days. Pantry bag sources of saturated fats were typically canned meats (e.g. Vienna sausages), canned entrees (e.g. chili, ravioli or spaghetti with meatballs, etc.), peanut butter and dessert foods (e.g. cookies, cheesecake). Sodium amounts totaled an average of 36,054.39 milligrams with an MDE daily limit value of 15.68 days. Significant sources of sodium in the pantry bags were canned meats (e.g. Vienna sausages, ham/pork), crackers, canned entrees (e.g. ravioli and meatballs, chili) and ready-to-eat cereal. Overall, the daily limits categories of added sugar, saturated fat and sodium of foods in the pantry bags would last anywhere from 6.47 to 15.68 days above the recommended limit.

Hypothesis #2 stated, when controlling for size (number of members) of the church, age of church members, ethnicity of church members, denomination of the church, location (zip code) of the church, and number of items in the food bag, the food pantry bags daily food group servings are likely to achieve minimum MyPlate food group serving size recommendations. Data presented in Table 5 was used to evaluate this hypothesis and no further statistical analysis was needed. All the food groups met the minimum MyPlate food group serving sizes (minimum servings for food groups are grains = 6 ounce (oz.); vegetables = 2.5 cups; fruits = 2 cups; dairy = 3 cups; protein 5.5 oz. per day) and therefore hypothesis #2 can be accepted.

Research indicates that pantry bag foods are intended to last an individual for approximately three days (Starkey, 1994). Nashville churches in this study reported that pantry bag foods were intended to feed individuals for 9.81 days.

When mean food group servings were computed based on the three-day threshold found in the literature, all food groups met the minimum daily serving size *Dietary Guidelines* recommendations except fruit and dairy with only 1.72 cups and 1.63 cups, respectively. When mean food group servings were computed based on the 9.81 day threshold of Nashville pantries, all food groups met the minimum daily food group serving *Dietary Guidelines* recommendations except dairy servings at .5 cups and fruit servings at .5 cups.

Hypothesis #3 stated when controlling for size (number of members) of the church, age of church members, ethnicity of church members, denomination of the church, location (zip code) of the church, and number of items in the food bag, the higher the food group MyPlate daily serving amounts, the more likely that the food bag will meet a 3-day Minimum Days Equivalent (MDE) value. This hypothesis can also be evaluated using data found in Table 5. The proposed statistical analysis was not needed to evaluate this hypothesis. Results indicate that food groups with higher food group servings such as total grains, protein and vegetables reached a higher number of Minimum Days Equivalents. The dairy and fruit groups each had lower overall food group mean serving calculations and also had fewer MDEs. Hypothesis #3 can be accepted as true.

**Nutrients.** Individual nutrients were analyzed using the Index of Nutritional Quality (INQ) calculation. Protein had an average INQ level of .72 which was the highest nutrient value and closest to the nutritional adequacy score of  $\geq 1$ . Pantry foods were found to be of low nutritional adequacy for fiber, total carbohydrate, protein, vitamin A, vitamin C, calcium and iron (Table 6). Previous

research (Akobundu et al., 2004) showed similar results with low INQ scores for vitamin A, vitamin C, and calcium. Greger (2002) similarly reported data with low levels of vitamin A, vitamin C, iron and calcium in food packets from two church pantries.

Table 6

Index of Nutritional Quality<sup>a</sup> Scores of Foods in Church Pantry Bags (*N* = 18)

Nutrient	<i>Mean</i>	<i>SD</i>	<i>Median</i>
Total Fat	0.49	0.11	0.49
Saturated Fat	0.39	0.12	0.35
Cholesterol	0.15	0.10	0.12
Total Carbohydrate	0.49	0.06	0.49
Dietary Fiber	0.55	0.12	0.56
Protein	0.72	0.12	0.70
Sodium	0.85	0.19	0.82
Vitamin A <sup>b</sup>	0.42	0.38	0.26
Vitamin C	0.41	0.35	0.28
Calcium	0.25	0.07	0.25
Iron	0.59	0.22	0.54

*Note.* <sup>a</sup>INQ is calculated as the nutrient content of foods per 1,000 calories compared with a standard nutrient reference value. <sup>b</sup>Vitamin A is expressed in International Units (IU).

Total fat, saturated fat, cholesterol and sodium levels were within INQ recommended values with each INQ value  $< 1$  (Table 6).

Denomination specific INQ analysis revealed that Methodist church pantries ( $N = 4$ ) had levels above the group means for Iron (.80), Protein (.79) and Fiber (.62). The Church of Christ pantries ( $N = 6$ ) had INQ levels above the group average for total carbohydrate (.51) and vitamin A (.45). The Baptist churches in the pantry sample ( $N = 3$ ) had INQ levels above the group average for vitamin A (.55), fiber (.60) and total carbohydrate (.50). Of these three denominations, the average sodium level of the Methodist church pantries was the highest at 1.01 which is above the recommended INQ value of  $< 1$ . The lowest INQ overall value for these three denominations was the mean cholesterol INQ value of .9 for Baptist church pantries. This level is well below the  $< 1$  recommended INQ value for cholesterol.

**Linear regression predicting percentage of Index of Nutritional Quality.** Hypothesis #4 stated that when controlling for size (number of members) of the church, age of church members, ethnicity of church members, denomination of the church, location (zip code) of the church, and number of items in the food bag, the pantry foods bags with higher MDE values are more likely to have an acceptable Index of Nutritional Quality (INQ) score (e.g. acceptable  $1 \geq$  protein, total carbohydrate, dietary fiber, iron, vitamin A, vitamin C and calcium as acceptable while  $< 1$  for total fat, saturated fats, cholesterol and sodium). This hypothesis was intended to be analyzed with binary logistic regression with the dependent variable of INQ scores either “meeting” or “not

meeting” nutrient adequacy for 18 pantries based on food group and demographic independent continuous variables. For this statistical analysis unfortunately INQ values either “all met” or “all didn’t meet” the adequacy scores, resulting in no variation in the binary scores. SPSS indicated that at least “two non-missing” values were needed to process the analysis.

In light of this, INQ values were computed based on the percentage that they met acceptable INQ scores (a continuous variable). Hypothesis #4 was rewritten to say, “when controlling for weekly church attendance, age of church members, number of food items in the pantry bags and main church religion, the nutritional content of the pantry food bags is related to percent INQ levels.”

Due to the small sample of size of only 18 church food pantries in the analysis, there was a large amount of multicollinearity among the independent variables. Multicollinearity occurs when, “two or more predictors are measuring overlapping or similar information” (Barrett, Morgan, Leech, & Gloeckner, 2012). To continue the investigation into the relationship between nutrients and/or food groups and independent variables, a multiple linear regression model was used to develop a main effects model for predicting the continuous, dependent variable of percentage (%) of the Index of Nutritional Quality (INQ) score from continuous independent variables.

The main effects model with the best fit contained the following independent variables: average age of the church members, average number of members attending church weekly, main religion of the church and number of food items in the pantry bags. The preceding key explanatory variables were

included in the analysis in order to best achieve a consistent predictive model for regression statistics. The chosen variables presented the most complete descriptive data set of church pantries. They also were selected since they identified the main church demographic variables collected to evaluate relationships between the main church variables and pantry bag nutrition. The number of food items in the pantry bag was also selected as an independent variable to better understand its relationship to overall food pantry bag nutrition adequacy. The categorical variable of church zip code was not included in the model. The variable of “Main Church Religion” was recoded as “Methodist” and “Not Methodist.” The variable “Race” (White and Not-White) was not included in the main effects model as it caused the beta (standardized) coefficient values to consistently be above .70. High beta coefficients indicate a high correlation among independent variables rather than a high correlation between independent and dependent variables. The results of each of the multiple linear regression analysis of each nutrient predicting percent Index of Nutritional Quality (INQ) are presented in Tables 7 through 12.

**Total fat.** Using an alpha score of .05, the main effects model explained 9.6% ( $R^2 = .096$ ) of the total variability in percent total fat INQ level,  $F(4.13) = .346$ ,  $MSE = 151.1$ ,  $p = 0.842$ . According to Cohen (1988) this results falls between a typical and smaller than typical effect size. There were no significant independent variable predictors of percent total fat INQ level. In the model, the combination of control variables were not related to the percent total fat INQ level (Table 7). Average total fat INQ percentage was 49% which did meet the

threshold value of less than 100% needed to indicate total fat adequacy in the pantry food bags per 1,000 calories.

**Saturated fat.** Using an alpha score of .05, the main effects model explained 26.1% ( $R^2 = .261$ ) of the total variability in percent saturated fat INQ level,  $F(4, 13) = 1.147$ ,  $MSE = 139.81$ ,  $p = 0.378$ . According to Cohen (1988) this result is a larger than typical effect size. There were no significant independent variable predictors of percent saturated fat INQ level. In the model, the combination of control variables were not related to the percent saturated fat INQ level (Table 8). Average saturated fat INQ percentage was 39% which did meet the threshold value of less than 100% needed to indicate saturated fat adequacy in the pantry food bags per 1,000 calories.

**Cholesterol.** Using an alpha score of .05, the main effects model explained 12.9% ( $R^2 = .129$ ) of the total variability in percent cholesterol INQ level,  $F(4, 13) = .486$ ,  $MSE = 112.53$ ,  $p = 0.748$ . According to Cohen (1988) this result is a typical effect size. There were no significant independent variable predictors of percent cholesterol INQ level. In the model, the combination of control variables were not related to the percent cholesterol INQ level (Table 9). Average cholesterol INQ percentage was 15% which did meet the threshold value of less than 100% needed to indicate cholesterol adequacy in the pantry food bags per 1,000 calories.

**Total carbohydrate.** Using an alpha score of .05, the main effects model explained 14.1% ( $R^2 = .141$ ) of the total variability in percent total carbohydrate INQ level,  $F(4, 13) = .533$ ,  $MSE = 45.396$ ,  $p = 0.714$ . According to Cohen (1988)

this result is a typical effect size. There were no significant independent variable predictors of percent total carbohydrate INQ level. In the model, the combination of control variables were not related to the percent total carbohydrate INQ level (Table 10). Average total carbohydrate INQ percentage was 49% which did not meet or exceed the 100% threshold needed to indicate total carbohydrate adequacy in the pantry food bags per 1,000 calories.

**Fiber.** Using an alpha score of .05, the main effects model explained 10.1% ( $R^2 = .101$ ) of the total variability in percent fiber INQ level,  $F(4.13) = .367$ ,  $MSE = 183.61$ ,  $p = 0.828$ . According to Cohen (1988) this result falls between a smaller than typical and typical effect size. There were no significant independent variable predictors of percent fiber INQ level. In the model, the combination of control variables were not related to the percent fiber INQ level (Table 11). Average fiber INQ percentage was 55% which did not meet or exceed the 100% threshold needed to indicate fiber adequacy in the pantry food bags per 1,000 calories.

**Protein.** Using an alpha score of .05, the main effects model explained 18.4% ( $R^2 = .184$ ) of the total variability in percent protein INQ level,  $F(4.13) = .732$ ,  $MSE = 148.4$ ,  $p = 0.586$ . According to Cohen (1988) this result is a typical effect size. There were no significant independent variable predictors of percent protein INQ level. In the model, the combination of control variables were not related to the percent protein INQ level (Table 12). Average protein INQ percentage was 72% which did not meet or exceed the 100% threshold needed to indicate protein adequacy in the pantry food bags per 1,000 calories.



**Sodium.** Using an alpha score of .05, the main effects model explained 26.2% ( $R^2 = .262$ ) of the total variability in percent sodium INQ level,  $F(4,13) = 1.156$ ,  $MSE = 339.95$ ,  $p = 0.374$ . According to Cohen (1988) this result is a larger than typical effect size. There were no significant independent variable predictors of percent sodium INQ level (Table 13). In the model, the combination of control variables was not related to the percent sodium INQ level. Average sodium INQ percentage was 85% which did meet the threshold value of less than 100% needed to indicate sodium adequacy in the pantry food bags per 1,000 calories.

**Vitamin A.** Using an alpha score of .05, the main effects model explained 60.9% ( $R^2 = .609$ ) of the total variability in percent vitamin A INQ level,  $F(4,13) = 1.156$ ,  $MSE = 729.87$ ,  $p = 0.011$ . According to Cohen (1988) this result is a much larger than typical effect size. The variable “number of food items in the pantry bags” significantly predicted the percent vitamin A INQ level when all four variables were included (Table 14). In the model, when controlling for other variables, the number of food items in the pantry bags were significantly related to percent vitamin A INQ level. Average vitamin A INQ percentage was 42% which did not meet or exceed the 100% threshold needed to indicate vitamin A adequacy in the pantry food bags per 1,000 calories.

**Vitamin C.** Using an alpha score of .05, the main effects model explained 9.2% ( $R^2 = .092$ ) of the total variability in percent vitamin C INQ level,  $F(4,13) = .328$ ,  $MSE = 1428.32$ ,  $p = 0.854$ . According to Cohen (1988) this result is a between a typical and smaller than typical effect size. In the model, the combination of control variables were not related to the percent vitamin C INQ

level. In the model there were no significant independent variable predictors of percent vitamin C INQ level (Table 15). Average vitamin C INQ percentage was 41% which did not meet or exceed the 100% threshold needed to indicate vitamin C adequacy in the pantry food bags per 1,000 calories.

**Calcium.** Using an alpha score of .05, the main effects model explained 26.5% ( $R^2 = .265$ ) of the total variability in percent calcium INQ level,  $F(4,13) = 1.173$ ,  $MSE = 51.40$ ,  $p = 0.368$ . According to Cohen (1988) this result is a larger than typical effect size. In the model, the combination of control variables were not related to the percent calcium INQ level. In the model there were no significant independent variable predictors of the percent calcium INQ level (Table 16). Average calcium INQ percentage was 25% which did not meet or exceed the 100% threshold needed to indicate calcium adequacy in the pantry food bags per 1,000 calories.

**Iron.** Using an alpha score of .05, the main effects model explained 51.4% ( $R^2 = .514$ ) of the total variability in percent iron INQ level,  $F(4,13) = 3.434$ ,  $MSE = 306.02$ ,  $p = 0.040$ . According to Cohen (1988) this result is a larger than typical effect size. The variable “main church religion” was found to significantly predict the percent iron INQ level when all four variables were included (Table 17). In the model, when controlling for other variables, the main church religion was significantly related to percent iron INQ level. Average iron INQ percentage was 59% which did not meet or exceed the 100% threshold needed to indicate iron adequacy in the pantry food bags per 1,000 calories.

Overall the combination of the model variables in the regression analyses significantly predicted the dependent variables of percent INQ levels for both vitamin A and iron when all the control variables were present. In the model for vitamin A, the variable “number of food items in the pantry bag” significantly predicted percentage of vitamin A INQ level with the value of  $p = 0.011$  (Table 14). For the nutrient iron, the variable “main church religion” was a significant predictor of percentage of iron INQ with the value of  $p = .003$  (Table 17). The amended hypothesis #4 can be accepted as true for the nutrients of vitamin A and iron as being related to percent INQ levels.

Table 7

Summary of Hierarchical Regression Analysis for Variables Predicting Percentage of Total Fat Index of Nutritional Quality (INQ) ( $N = 18$ )

Variable	<i>b</i>	SE <i>b</i>	$\beta$	<i>t</i>	<i>p</i>
Main Effects:					
Constant	38.78	17.64		2.20	0.047
Weekly Church Attendance	<.001	<.001	0.16	0.41	0.686
Age of Church Members	0.14	0.15	0.29	0.97	0.348
Number of Food Items in Pantry Bags	-0.32	0.42	-0.27	-0.76	0.460
Main Church Religion					
Not Methodist	4.87	9.29	0.18	0.53	0.608
Methodist	(reference)				

Note.  $R^2 = .096$  ( $p = 0.842$ ).

Table 8

Summary of Hierarchical Regression Analysis for Variables Predicting Percentage of Saturated Fat Index of Nutritional Quality (INQ) ( $N = 18$ )

Variable	<i>b</i>	SE <i>b</i>	$\beta$	<i>t</i>	<i>p</i>
Main Effects:					
Constant	27.49	16.96		1.62	0.129
Weekly Church Attendance	<.001	<.001	-0.28	-0.79	0.443
Age of Church Members	0.28	0.14	0.53	1.98	0.070
Number of Food Items in Pantry Bags	0.09	0.41	0.07	0.23	0.823
Main Church Religion					
Not Methodist	-3.93	8.93	-0.14	-0.44	0.668
Methodist	(reference)				

Note.  $R^2 = .261$  ( $p = 0.378$ ).

Table 9

Summary of Hierarchical Regression Analysis for Variables Predicting Percentage of Cholesterol Index of Nutritional Quality (INQ) ( $N = 18$ )

Variable	<i>b</i>	SE <i>b</i>	$\beta$	<i>t</i>	<i>p</i>
Constant	22.03	15.22		1.45	0.172
Weekly Church Attendance	<-.001	<.001	-0.18	-0.46	0.650
Age of Church Members	0.09	0.13	0.21	0.72	0.483
Number of Food Items in Pantry Bags	0.07	0.37	0.07	0.19	0.852
Main Church Religion					
Not Methodist	-7.67	8.01	-0.33	-0.96	0.356
Methodist	(reference)				

Note.  $R^2 = .129$  ( $p = 0.748$ ).

Table 10

Summary of Hierarchical Regression Analysis for Variables Predicting Percentage of Total Carbohydrate Index of Nutritional Quality (INQ) ( $N = 18$ )

Variable	$b$	SE $b$	$\beta$	$t$	$p$
Main Effects:					
Constant	55.75	9.67		5.77	<.001
Weekly Church Attendance	<-.001	<.001	-0.16	-0.41	0.686
Age of Church Members	-0.10	0.08	-0.37	-1.28	0.225
Number of Food Items in Pantry Bags	0.14	0.23	0.21	0.62	0.547
Main Church Religion					
Not Methodist	-1.90	5.09	-0.13	-0.37	0.715
Methodist	(reference)				

Note.  $R^2 = .141$  ( $p = 0.714$ ).

Table 11

Summary of Hierarchical Regression Analysis for Variables Predicting Percentage of Fiber Index of Nutritional Quality (INQ) ( $N = 18$ )

Variable	<i>b</i>	SE <i>b</i>	$\beta$	<i>t</i>	<i>p</i>
Main Effects:					
Constant	64.72	19.44		3.33	0.005
Weekly Church Attendance	<.001	<.001	0.03	0.08	0.940
Age of Church Members	0.04	0.16	0.07	0.25	0.804
Number of Food Items in Pantry Bags	0.08	0.47	0.06	0.18	0.862
Main Church Religion					
Not Methodist	-7.91	10.24	-0.27	-0.77	0.453
Methodist	(reference)				

Note.  $R^2 = 0.101$  ( $p = .828$ ).



Table 12

Summary of Hierarchical Regression Analysis for Variables Predicting Percentage of Protein Index of Nutritional Quality (INQ) ( $N = 18$ )

Variable	<i>b</i>	SE <i>b</i>	$\beta$	<i>t</i>	<i>p</i>
Main Effects:					
Constant	82.18	17.48		4.70	<.001
Weekly Church Attendance	<.001	<.001	0.14	0.39	0.704
Age of Church Members	0.09	0.15	0.17	0.62	0.548
Number of Food Items in Pantry Bags	-0.20	0.42	-0.16	-0.48	0.636
Main Church Religion					
Not Methodist	-6.52	9.20	-0.24	-0.71	0.491
Methodist	(reference)				

Note.  $R^2 = .184$  ( $p = 0.586$ ).

Table 13

Summary of Hierarchical Regression Analysis for Variables Predicting Percentage of Sodium Index of Nutritional Quality (INQ) ( $N = 18$ )

Variable	$b$	SE $b$	$\beta$	$t$	$p$
Main Effects:					
Constant	133.54	26.45		5.05	<.001
Weekly Church Attendance	<-.001	<.001	-0.21	-0.58	0.571
Age of Church Members	-0.13	0.22	-0.16	-0.61	0.552
Number of Food Items in Pantry Bags	0.44	0.64	0.22	0.70	0.499
Main Church Religion					
Not Methodist	-28.07	13.93	-0.64	-2.02	0.065
Methodist	(reference)				

Note.  $R^2 = .262$  ( $p = 0.374$ ).

Table 14

Summary of Hierarchical Regression Analysis for Variables Predicting Percentage of Vitamin A<sup>a</sup> Index of Nutritional Quality (INQ) ( $N = 18$ )

Variable	<i>b</i>	SE <i>b</i>	$\beta$	<i>t</i>	<i>p</i>
Main Effects:					
Constant	11.57	38.76		0.30	0.770
Weekly Church Attendance	<.001	<.001	0.41	1.58	0.139
Age of Church Members	-0.13	0.32	-0.08	-0.39	0.705
Number of Food Items in Pantry Bags	2.05	0.93	0.52	2.21	0.046
Main Church Religion					
Not Methodist	-8.54	20.41	-0.10	-0.42	0.683
Methodist	(reference)				

Note.  $R^2 = 0.609$  ( $p = .011$ ). <sup>a</sup> Expressed as International Units (IU).

Table 15

Summary of Hierarchical Regression Analysis for Variables Predicting Percentage of Vitamin C Index of Nutritional Quality (INQ) ( $N = 18$ )

Variable	$b$	SE $b$	$\beta$	$t$	$p$
Main Effects:					
Constant	95.60	54.22		1.76	0.101
Weekly Church Attendance	<-.001	<.001	-0.07	-0.17	0.871
Age of Church Members	-0.44	0.45	-0.29	-0.98	0.345
Number of Food Items in Pantry Bags	0.29	1.30	0.08	0.23	0.825
Main Church Religion					
Not Methodist	-19.37	28.55	-0.24	-0.68	0.509
Methodist	(reference)				

Note.  $R^2 = .092$  ( $p = 0.854$ ).

Table 16

Summary of Hierarchical Regression Analysis for Variables Predicting Percentage of Calcium Index of Nutritional Quality (INQ) ( $N = 18$ )

Variable	<i>b</i>	SE <i>b</i>	$\beta$	<i>t</i>	<i>p</i>
Main Effects:					
Constant	24.17	10.29		2.35	0.035
Weekly Church Attendance	<.001	<.001	0.32	0.91	0.381
Age of Church Members	-0.04	0.09	-0.12	-0.44	0.665
Number of Food Items in Pantry Bags	0.23	0.25	0.29	0.92	0.375
Main Church Religion					
Not Methodist	-1.84	5.42	-0.11	-0.34	0.739
Methodist	(reference)				

Note.  $R^2 = .265$  ( $p = 0.368$ ).

Table 17

Summary of Hierarchical Regression Analysis for Variables Predicting Percentage of Iron Index of Nutritional Quality (INQ) ( $N = 18$ )

Variable	$b$	SE $b$	$\beta$	$t$	$p$
Main Effects:					
Constant	115.83	25.10		4.62	<.001
Weekly Church Attendance	<-.001	<.001	-0.57	-2.00	0.067
Age of Church Members	0.03	0.21	0.03	0.12	0.906
Number of Food Items in Pantry Bags	1.20	0.60	0.52	1.99	0.068
Main Church Religion					
Not Methodist Methodist	-47.41 (reference)	13.22	-0.93	-3.59	0.003

Note.  $R^2 = .514$  ( $p = 0.040$ ).

## CHAPTER FIVE: DISCUSSION

Urban churches are an important community resource for providing emergency foods to those in need. Social networks of church food pantries were an undiscovered component of urban community networks serving this population. Through social network analysis, this research study has added to the body of knowledge on community connections through urban church food pantries finding that church size is not a limiting factor in serving many zip codes.

The current study also observed that urban church food pantries in Nashville, Tennessee, provide a variety of food options to clients via food pantry bags. Overall, foods from the fruit and dairy food groups were found in particularly low amounts in church pantry bags. With minor alternations to the bag contents, fruit and dairy options can be improved, therefore boosting food group servings and concurrently increasing overall nutrients such as calcium, vitamin A, Vitamin C, and fiber. Since food insecure populations are at risk for low nutrients such as calcium, vitamin A, and vitamin C, it is imperative to seek strategies to improve those offerings in food pantry bags (Rose & Oliveira, 1997).

Many food pantries rely on shelf-stable foods in cans or boxes which may be a limiting factor when it comes to nutrition. To overcome this potential barrier, dietary recommendations could include the following practical suggestions. Shelf-stable milk, sardines, ready-to-eat cereal (e.g. Total, Malt-O-Meal, Raisin Bran, Cornflakes, etc.), almonds and sardines could be requested from church members or food banks in order to boost calcium totals. Many pantry recipient's

report that they would like more milk and cheese products in their pantry bags, but do not want non-fat dry milk (Greger et al., 2002). To improve vitamin C profiles of the pantry bags, foods such as applesauce enriched with vitamin C, guava juice, grapefruit juice, canned mango and canned pineapple could be added. It should be noted that caution has been raised about promoting fruit juice as a fruit serving to food insecure populations since excess fruit juice consumption is not recommended for children (Heyman & Abrams, 2017; Mello et al., 2010). Canned carrots, sweet potatoes and spinach could be added to the pantry bags to boost vitamin A levels. Many of the foods previously mentioned could also boost dietary fiber levels in addition to foods such as oatmeal, dried beans and legumes, nuts, brown rice, and dried fruits. Also, if churches have gardens, fresh fruits or vegetables could easily be added to pantry bags to boost overall micronutrient totals.

Food pantry donors have indicated that they do not “consciously consider nutrition” when they decide what foods to donate to pantries (Verpy et al., 2003). As the majority of church food pantry foods are donated then including a specific request to church members, or community members, to donate certain types of foods could be an easy solution to adding the aforementioned foods to pantry shelf supplies.

### **Limitations**

There are several limitations to this study worth noting. One limitation of the study was that the nutrient analysis was performed based on the edible portion of pantry bag foods. Dry products (e.g. pasta, rice, etc.) as well as



dry/boxed entrees or sides were converted to edible portion. The dry/boxed entrees required additional ingredients to be added into the nutrient calculations. This is considered a limitation because those additional foods added to the overall nutritional profiles which were not originally present in the food bags.

The dry/boxed entrees (e.g. Hamburger Helper®) requiring additional ingredients in order to prepare the recipe (e.g. hamburger meat and milk) included items which are often cut out of the budget as a coping strategy in households that are food insecure (Hoisington et al., 2002). The small prevalence of these foods found in the church pantry bags was typically boxed macaroni and cheese dinners, cornbread mixes, Tuna Helper™, and Hamburger Helper™. Previous research indicates these types of boxed items were found to make up less than 9% of pantry bag contents (Companion, 2010). This study found similar results with 8% ( $n = 36$ ) of items in this category. It is worth noting that these prepared item ingredients could slightly inflate the nutritional analysis for protein and iron from the meat items and dairy and calcium from the milk components.

Another limitation of the study was the small sample size ( $n=18$ ) available for the nutrient and food group analyses. This small sample size limited the analysis of the control variables in the logistic regression. Additional data is needed for further research into predictors of church food pantry food group and nutrient values.

## **Future Research Recommendations**

Recommendations for future food pantry research is wide-ranging and can focus around a variety themes. Research should focus on identifying barriers to adding dairy, fruit and whole grains food groups into church pantry bags. Understanding barriers that would allow clients to self-select foods for church pantry bags could also be examined since pantry clients report wanting choice in food selection. Future research should also seek insight into how churches accommodate special dietary needs (e.g. diabetic diets, low sodium diets, etc.) from those seeking pantry foods. Some have called for research on the “seasonal variability in emergency food assistance” (Starkey, 1994). Since the current research study indicated that 25% of church pantries altered pantry foods to some extent during holiday times, it could be beneficial to understand how those changes impact overall nutrition of pantry foods. Lastly, further research is needed in order to evaluate if current church food pantry social networks are ensuring that vulnerable populations are not being underserved.

In conclusion, church food pantries are an important community resource to help food insecure individuals and households access safe and healthy food. As more nutrient-dense foods are added to food bags, overall nutrient profiles can be improved. With a few modifications, food pantry bags can offer clients healthy, well-balanced nutrition.

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**APPENDICES**

## APPENDIX A: IRB Approval Letter 2015



4/3/2015

Investigator(s): Tracy Noerper and Andrew Owusu  
Department: Health and Human Performance  
Investigator(s) Email: tracy.noerper@mtsu.edu; Andrew.owusu@mtsu.edu

Protocol Title: "Nutritional implications and social ties of Church-based urban food pantries "

Protocol Number: 15-237

Dear Investigator(s),

The MTSU Institutional Review Board, or a representative of the IRB, has reviewed the research proposal identified above. The MTSU IRB or its representative has determined that the study poses minimal risk to participants and qualifies for an expedited review under 45 CFR 46.110 and 21 CFR 56.110, and you have satisfactorily addressed all of the points brought up during the review.

Approval is granted for one (1) year from the date of this letter for **1000 (ONE THOUSAND)** participants.

Please note that any unanticipated harms to participants or adverse events must be reported to the Office of Compliance at (615) 494-8918. Any change to the protocol must be submitted to the IRB before implementing this change.

You will need to submit an end-of-project form to the Office of Compliance upon completion of your research located on the IRB website. Complete research means that you have finished collecting and analyzing data. **Should you not finish your research within the one (1) year period, you must submit a Progress Report and request a continuation prior to the expiration date.** Please allow time for review and requested revisions. Failure to submit a Progress Report and request for continuation will automatically result in cancellation of your research study. Therefore, you will not be able to use any data and/or collect any data. Your study expires **4/4/2016**.

According to MTSU Policy, a researcher is defined as anyone who works with data or has contact with participants. Anyone meeting this definition needs to be listed on the protocol and needs to complete the required training. **If you add researchers to an approved project, please forward an updated list of researchers to the Office of Compliance before they begin to work on the project.**

All research materials must be retained by the PI or faculty advisor (if the PI is a student) for at least three (3) years after study completion and then destroyed in a manner that maintains confidentiality and anonymity.

Sincerely,

Institutional Review Board  
Middle Tennessee State University

## APPENDIX B: IRB Approval Letter 2017

**IRB**  
**INSTITUTIONAL REVIEW BOARD**  
 Office of Research Compliance,  
 010A Sam Ingram Building,  
 2269 Middle Tennessee Blvd  
 Murfreesboro, TN 37129



### IRBN007 – EXEMPTION DETERMINATION NOTICE

Sunday, November 05, 2017

Investigator(s): Tracy Noerper; Andrew Owusu  
 Investigator(s) Email(s): Tracy.Noerper@MTSU.edu; andrew.owusu@mtsu.edu  
 Department: Health and Human Performance

Study Title: Addressing Food Insecurity: Nutrient & Social Network Analysis of  
 Urban Church Food Pantries  
 Protocol ID: 18-1082

Dear Investigator(s),

The above identified research proposal has been reviewed by the MTSU Institutional Review Board (IRB) through the EXEMPT review mechanism under 45 CFR 46.101(b)(2) within the research category (2) *Educational Tests*. A summary of the IRB action and other particulars in regard to this protocol application is tabulated as shown below:

IRB Action	EXEMPT from further IRB review***	
Date of expiration	NOT APPLICABLE	
Participant Size	50 (Fifty)	
Participant Pool	Adults Age 18+	
Mandatory Restrictions	1. Participants must be age 18+ 2. Informed consent must be obtained 3. Identifiable data may not be collected/stored with participant responses	
Additional Restrictions	None at this time	
Comments	None at this time	
Amendments	Date	Post-Approval Amendments
		None at this time

\*\*\*This exemption determination only allows above defined protocol from further IRB review such as continuing review. However, the following post-approval requirements still apply:

- Addition/removal of subject population should not be implemented without IRB approval
- Change in investigators must be notified and approved
- Modifications to procedures must be clearly articulated in an addendum request and the proposed changes must not be incorporated without an approval
- Be advised that the proposed change must comply within the requirements for exemption
- Changes to the research location must be approved – appropriate permission letter(s) from external institutions must accompany the addendum request form



### **APPENDIX C: Telephone Script to Churches**

Hello. My name is Tracy Noerper. I am a Dietitian and PhD student at MTSU conducting research on what churches are doing to help feed the hungry in Nashville. Would there be someone at the church who I could ask a few questions about this important work your church is doing?

Great! I was wondering, does your church have an on-site food pantry?

*(If "Yes" to above then ask)* How does the church give out or distribute the pantry food?

*(If the answer to the above is that the pantry food is given out in bags then ask)* I would be very interested in visiting your church to learn more about your pantry and see the pantry. Would there be a convenient day and time I could come by? Also, would there be an email address I could get to send you a brief electronic survey about your pantry practices? I won't share or sell your email address. It will be used purely for research purposes. Once you get the online survey you can decide whether you want to complete it or not.

*(If no on-site food pantry or if the food is NOT given out in bags then ask)* Would it be possible to get an email address so I could send you a brief electronic survey in order to collect a little more information about what your church is doing with the pantry? I won't share or sell your email address. It will be used purely for research purposes. Once you get the online survey you can decide whether you want to complete it or not.

Thank you again for your time. I really appreciate your help! Good bye.

**APPENDIX D: Survey to Churches for Food Pantry Research****All Churches (Churches, Temples, Synagogues):**

**1) What is the name of your church, congregation, temple or synagogue?**

Enter name

**2) What is your role at the church, congregation, temple or synagogue (e.g. pastor, priest, volunteer, secretary, minister, deacon, etc.?)**

Enter Role

**3) What is the 5 digit zip code of your church?**

Enter 5 digit zip code

**4) What is the primary denomination of your church, congregation, temple or synagogue?**

Baptist

Disciples of Christ

Episcopal

Lutheran

Methodist

Quaker

Presbyterian

Roman Catholic

Church of Christ

Unitarian/Universalist

Buddhism

Hinduism

Islam

Judaism

Taoism

Other (please specify)

Don't Know

**5) What is your approximate weekly attendance?**

Enter numeral

**6) Describe the primary race of your church?**

White (Caucasian),

Black (or African American),

Hispanic (or Latino),

Asian,

Native Hawaiian (or Other Pacific Islander),

American Indian or Alaska Native,

Multiracial,  
Other  
Don't Know

**7) What is the average age of your church members?**

Enter numeral  
Don't Know

**8) During a year, how often does your church send FOOD to an off-site food pantry or food bank (such as Second Harvest)?**

Never,  
Once a Week,  
Once a Month,  
Once a Quarter,  
Once a Year,  
Don't Know

**9) During a year, how often does your church send MONEY to an off-site food pantry or food bank (such as Second Harvest)?**

Never,  
Once a Week,  
Once a Month,  
Once a Quarter,  
Once a Year,  
Don't Know

**10) If you support (with either food or money) an off-site food pantry or food bank at least once a year, how many total years have you supported it?**

Less than 1 year,  
1-5 years,  
6-10 years,  
11-15 years,  
16-20 years,  
21-25 years,  
26-30 years,  
31 year or greater  
We do not currently support an off-site food pantry  
Don't Know

**11a) Do you have a food pantry located on your church property (i.e. on-site)?**

YES  
NO

**11b) [If NO to Question #10] How likely is it that an on-site food pantry would be started within the next year?**

- Very Likely
- Somewhat Likely
- Not sure
- Somewhat Unlikely
- Very Unlikely
- Don't Know

**11c) Thank you for your time!**

**Remaining Question Only for Churches that say [YES] to an on-site food pantry in Question #11a**

**12) What are the days and times that the food pantry is open to clients?**

- Enter Days
- Enter Times
- Don't Know

**13) How many years has your on-site church pantry been in existence?**

- Less than 1 year,
- 1-5 years,
- 6-10 years,
- 11-15 years,
- 16-20 years,
- 21-25 years,
- 26-30 years,
- 31 years or greater
- Don't Know

**14) What are the zip codes of the people that the church pantry serves?  
Check all that apply.**

- 37011 - Antioch
- 37013 - Antioch
- 37027 - Brentwood
- 37072 - Goodlettsville
- 37076 - Hermitage
- 37080 - Joelton
- 37115 - Madison
- 37138 - Old Hickory
- 37189 - Whites Creek
- 37201 - Downtown
- 37203 - Downtown
- 37204 - Berry Hill

37205 - Belle Meade  
 37206 - East Nashville  
 37207 – Brick Church Pike  
 37208 – North Nashville/Germantown  
 37209 – TSU/Old Charlotte Pike  
 37210 – South Nashville/Elm Hill Pike/Trevecca  
 37211 – Zoo/Elysian Fields/Old Hickory Blvd  
 37212 – Vanderbilt/Hillsboro Village  
 37213 - Edgefield  
 37214 – Opryland/Donelson/Airport  
 37215 – Forrest Hills  
 37216 - Inglewood  
 37217 –Percy Priest Lake/Airport  
 37218 - Bordeaux  
 37219 - Downtown  
 37220 – Crieve Hall  
 37221 - Bellevue  
 37228 – Metro Center  
 We do not keep track of the zip codes

**15) Which one (1) zip code do you serve the most? (Choose only one)**

37011 - Antioch  
 37013 - Antioch  
 37027 - Brentwood  
 37072 - Goodlettsville  
 37076 - Hermitage  
 37080 - Joelton  
 37115 - Madison  
 37138 - Old Hickory  
 37189 - Whites Creek  
 37201 - Downtown  
 37203 - Downtown  
 37204 - Berry Hill  
 37205 - Belle Meade  
 37206 - East Nashville  
 37207 – Brick Church Pike  
 37208 – North Nashville/Germantown  
 37209 – TSU/Old Charlotte Pike  
 37210 – South Nashville/Elm Hill Pike/Trevecca  
 37211 – Zoo/Elysian Fields/Old Hickory Blvd  
 37212 – Vanderbilt/Hillsboro Village  
 37213 - Edgefield  
 37214 – Opryland/Donelson/Airport  
 37215 – Forrest Hills  
 37216 - Inglewood

37217 –Percy Priest Lake/Airport  
 37218 - Bordeaux  
 37219 - Downtown  
 37220 – Crieve Hall  
 37221 - Bellevue  
 37228 – Metro Center  
 We do not keep track of the zip codes

**16) On average, how many pantry food bags or food boxes are given out each month?**

Enter Numeral  
 Don't Know

**17) Food pantry bags are provided based on \_\_\_\_\_?**

Individual requests  
 Family requests  
 Vehicle Car Load requests  
 Other (please specify)  
 Don't Know

**18) Which of the following best describes your current food pantry's normal practice for client screening? (Select all that apply)**

We ask.... Who they are  
 We ask.... Where they live  
 We ask... Why they are in need  
 We ask... Proof of need (i.e. income documentation)  
 We ask... If they were referred to us  
 Other (please specify)  
 Don't know

**19) Indicate the percentage of pantry food acquired by the following sources. (All answer choices must total up to 100 %.)**

Donated by church members \_\_\_\_\_%

Received from a food bank (i.e. Second Harvest) \_\_\_\_\_%

Purchased \_\_\_\_\_%

Church Garden \_\_\_\_\_%

Sources other than church members, food banks, purchased or church gardens \_\_\_\_\_%

**20) How often are church members asked for FOOD donations specifically for the food pantry?**

Each week,  
Each Month,  
Once a Quarter,  
Once a Year,  
Never,  
Don't Know

**21) How often are church members asked for money donations specifically for the food pantry?**

Each week,  
Each Month,  
Once a Quarter,  
Once a Year,  
Never,  
Don't Know

**22) How often is a paid church staff member in charge of the maintenance (stocking food, paperwork, etc.) of the food pantry?**

Each week,  
Each Month,  
Once a Quarter,  
Once a Year,  
Never,  
Don't Know

**23) How often is a volunteer (non-paid staff) in charge of the maintenance (stocking food, paperwork, etc.) of the food pantry?**

Each week,  
Each Month,  
Once a Quarter,  
Once a Year,  
Never,  
Don't Know

**24) Has the number of people requesting food donations \_\_\_\_\_ in the last year?**

Increased,  
Decreased,  
Stayed about the Same  
Don't Know

**25) How often are the food pantry clients offered some type of nutrition education (i.e. handout, pamphlet, etc.) along with the foods they receive?**

- Sometimes
- Most of the time
- Always
- Never
- Don't Know

**26) How often are the food pantry clients offered a recipe(s) along with the foods they receive?**

- Sometimes
- Most of the time
- Always
- Never
- Don't Know

**27) How often are the food pantry clients offered information about community food programs (such as Women, Infants & Children (WIC) or Food Stamps) along with the foods they receive?**

- Sometimes
- Most of the time
- Always
- Never
- Don't Know

**28) How often are the food pantry clients offered GIFT CARDS along with the food bags to purchase fresh or perishable food products?**

- Sometimes
- Most of the time
- Always
- Never
- Don't Know

**29) How often are the food pantry clients offered CASH along with the food bags to purchase fresh or perishable food products?**

- Sometimes
- Most of the time
- Always
- Never
- Don't Know



**30) How often are the food pantry clients offered REFRIGERATED or PERISHABLE FOODS along with the food bags they receive?**

- Sometimes
- Most of the time
- Always
- Never
- Don't Know

**31a) Which of the below best describes your food pantry's normal practices?**

- A standardized box or bag of food is given.
- Clients are permitted to freely assemble their own food bag from whatever goods are available.
- Clients are permitted to freely assemble their own food bag according to a set formula.
- Clients may pick out a small portion of what they are given and the rest is according to a standardized list.
- Don't Know

**31b) {If "A standardized box or bag of food is given." is selected in 31a, then ask} Who decides what foods go into the standardized box or bag?**

- A church staff member decides
- A church volunteer decides
- A committee decides
- Don't Know
- Other (please specify)

**32) Which of the below best describes your food pantry's normal practices for how often a client can return for a food bag?**

- As often as they need help
- By a set schedule (e.g. more than once a month)
- Once per month or every 30 days
- By a set schedule (e.g. longer than once a month)
- Don't Know

**33) What percentage of people that come to the food pantry return again at some point?**

- 0% of the time
- 1-10%
- 11-20%
- 21-30%
- 31-40%
- 41-50%
- 51-60%

61-70%

71-80%

81-90%

91-100%

We do not keep track of those people returning to the pantry

Don't Know

**34) How many days are the pantry bags or boxes intended to feed an individual?**

Indicate number of days the pantry bags or boxes are intended to feed an individual.

Don't Know

**35) How often does the pantry run out of food each month?**

Sometimes

Most of the time

Always

Never

Don't Know

**36) Do the pantry food bags or boxes change depending upon any religious or secular holiday (i.e. Passover, Kwanzaa, Easter, Thanksgiving, etc.)?**

YES

NO

Don't Know

## APPENDIX E: Codebook from EPIDATA

### CODEBOOK

Report generated 22. May 2018 7:10 PM

Data file: I:\Dissertation Folder\DATA\EpiData\Data Entry\Pantry  
 Data\_UseThis.rec  
 File\_label: Tracy Noerper's Dissertation Data Entry  
 File date: 8. May 2018 9:02 PM  
 Checks applied: Yes (Last revision 3. May 2018 1:35 PM)

Number of fields: 116

Records total: 103  
 Deleted records: 1  
 Used in codebook: 102 records

churchid ----- Church ID  
 Number

type: Number  
 range/legal: 1-95

missing: 0/102  
 range: [1 ; 94]  
 unique values: 93

mean: 47.9314  
 std. dev.: 27.0244

vstdate ----- Date of pantry  
 visit

type: Date (mdy)

missing: 52/102  
 range: [08/07/2015 ; 02/22/2018]  
 unique values: 31

svydate ----- Date survey was  
 completed

type: Date (mdy)

missing: 0/102  
 range: [05/13/2015 ; 03/07/2018]  
 unique values: 37

testtype ----- Pretest or  
 Posttest

type: Number  
 value labels: label\_testtype  
 range/legal: 1,2,3

missing: 0/102  
 range: [1 ; 3]  
 unique values: 3

tabulation:	Freq.	Pct.	Value	Label
	9	8.8	1	Test
	9	8.8	2	Retest
	84	82.4	3	NA

dataclctr ----- Data Collector time  
period

type: Number  
value labels: label\_dataclctr  
range/legal: 1,2

missing: 0/102  
range: [1 ; 2]  
unique values: 2

tabulation:	Freq.	Pct.	Value	Label
	59	57.8	1	2015/2016
	43	42.2	2	2017/2018

acptdcln ----- Accept or Decline Participation in the  
study

type: Number  
value labels: label\_acptdcln  
range/legal: 1,2

missing: 0/102  
range: [1 ; 2]  
unique values: 2

tabulation:	Freq.	Pct.	Value	Label
	100	98.0	1	accept
	2	2.0	2	decline

zipcode ----- What is the 5 digit zip code of your  
church

type: Number  
value labels: label\_zipcode  
range/legal: 1-33,88,99

missing: 2/102  
range: [2 ; 99]  
unique values: 28

tabulation:	Freq.	Pct.	Value	Label
	6	5.9	2	37013 - Antioch
	6	5.9	5	37076 - Hermitage
	1	1.0	6	37080 - Joelton
	7	6.9	7	37115 - Madison
	1	1.0	9	37189 - Whites Creek
	2	2.0	.	
	6	5.9	11	37203 - Downtown
	2	2.0	12	37204 - Berry Hill
	3	2.9	13	37205 - Belle Meade
	5	4.9	14	37206 - East Nashville
	5	4.9	15	37207 - Brick Church Pike
	8	7.8	16	37208 - North

Nashville/Germanto

10	9.8	17	37209 - TSU/Old Charlotte Pike
3	2.9	18	37210 - South Nashville/Elm

Hill Pike/Trevecca

4	3.9	19	37211 - Zoo/Elysian Fields/Old
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H

3	2.9	20	37212 - Vanderbilt/Hillsboro
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Vil

Opryland/Donelson/Airpor	4	3.9	22	37214 -
	3	2.9	23	37215 - Forrest Hills
	4	3.9	24	37216 - Inglewood
	2	2.0	25	37217 - Percy Priest
Lake/Airport				
	2	2.0	26	37218 - Bordeaux
	3	2.9	27	37219 - Downtown
	1	1.0	28	37220 - Crieve Hall
	3	2.9	29	37221 - Bellevue
	2	2.0	31	37075 - Hendersonville
	1	1.0	32	37087 - Lebanon
	2	2.0	33	37069 - Franklin
	3	2.9	99	No Response

mainrelg --- What is the primary denomination/religion of your church, congregat

type: Number  
value labels: label\_mainrelg  
range/legal: 1-21,88,99  
missing: 2/102  
range: [1 ; 99]  
unique values: 18

tabulation:	Freq.	Pct.	Value	Label
	19	18.6	1	Baptist
	2	2.0	2	Disciples of Christ
	5	4.9	3	Episcopal
	1	1.0	4	Lutheran
	17	16.7	5	Methodist
	1	1.0	6	Quaker
	10	9.8	7	Presbyterian
	2	2.0	8	Roman Catholic
	10	9.8	9	Church of Christ
	2	2.0	.	.
	1	1.0	10	Unitarian/Universalist
	11	10.8	16	Non-denomination
	2	2.0	17	Inter-denomination
	2	2.0	18	Seventh Day Adventist
	2	2.0	19	Nazarene
	3	2.9	20	AME
	5	4.9	21	Other
	7	6.9	99	No Response

wklyatnd ----- Approximately what is your weekly attendance?

type: Number  
range/legal: 0-7000  
missing: 19/102  
range: [5 ; 6900]  
unique values: 44

mean: 455.4458  
std. dev.: 1093.2753

race ----- Describe the primary race of your church?

type: Number

value labels: label\_race  
 range/legal: 1-7,88,99  
 missing: 2/102  
 range: [1 ; 99]  
 unique values: 6

tabulation:	Freq.	Pct.	Value	Label
	47	46.1	1	White (Caucasian)
	20	19.6	2	Black (or African American)
	1	1.0	3	Hispanic (or Latino)
	11	10.8	7	Multiracial
	2	2.0	.	
	21	20.6	99	No Response

avgage ----- What is the average age of your church members?

type: Number  
 missing: 42/102  
 range: [25 ; 70]  
 unique values: 19  
 mean: 47.7333  
 std. dev.: 10.8380

sndfood ----- During a year, how often does your church send food to an off-site

type: Number  
 value labels: label\_sndfood  
 range/legal: 1-5,88,99  
 missing: 3/102  
 range: [1 ; 99]  
 unique values: 8

tabulation:	Freq.	Pct.	Value	Label
	45	44.1	1	Never
	9	8.8	2	Once a Week
	7	6.9	3	Once a Month
	7	6.9	4	Once a Quarter
	13	12.7	5	Once a Year
	3	2.9	.	
	1	1.0	88	Don't Know
	17	16.7	99	No Response

sndmony ----- During a year, how often does your church send money to an off-site

type: Number  
 value labels: label\_sndmony  
 range/legal: 1-5,88,99  
 missing: 3/102  
 range: [1 ; 99]  
 unique values: 8

tabulation:	Freq.	Pct.	Value	Label
	47	46.1	1	Never
	3	2.9	2	Once a Week
	11	10.8	3	Once a Month

9	8.8	4	Once a Quarter
10	9.8	5	Once a Year
2	2.0	88	Don't Know
17	16.7	99	No Response
3	2.9	.	

pantsupt ---- If you support (with either food or money) an off-site food pantry

type: Number  
value labels: label\_pantsupt  
range/legal: 1-9,88,99

missing: 3/102  
range: [1 ; 99]  
unique values: 12

tabulation:	Freq.	Pct.	Value	Label
	2	2.0	1	Less than 1 year
	9	8.8	2	1-5 years
	9	8.8	3	6-10 years
	4	3.9	4	11-15 years
	8	7.8	5	16-20 years
	2	2.0	6	21-25 years
	1	1.0	7	26-30 years
	6	5.9	8	31 years or greater
	38	37.3	9	we do not currently support an
	3	2.9	.	
	2	2.0	88	Don't Know
	18	17.6	99	No Response

sitepant ----- Do you have an on-site (located at your church) food pantry?

type: Number  
value labels: label\_sitepant  
jumps: 1>DYSOPN  
range/legal: 1,2,88,99

missing: 2/102  
range: [1 ; 99]  
unique values: 4

tabulation:	Freq.	Pct.	Value	Label
	55	53.9	1	YES
	38	37.3	2	NO
	2	2.0	.	
	7	6.9	99	No Response

futrpantr --- If you do not have an on-site food pantry, how likely is it that yo

type: Number  
value labels: label\_futrpantr  
range/legal: 1-5,88,99

missing: 57/102  
range: [2 ; 99]  
unique values: 6

tabulation:	Freq.	Pct.	Value	Label
	2	2.0	2	omewhat Likely

5	4.9	3	Not sure
4	3.9	4	Somewhat Unlikely
23	22.5	5	Very Unlikely
57	55.9	.	
11	10.8	99	No Response

dysopn ----- Number of days that the pantry is open to clients per month

type: Number  
range/legal: 0-30

missing: 74/102  
range: [2 ; 20]  
unique values: 8

tabulation:	Freq.	Pct.	Value	Label
	3	2.9	2	
	4	3.9	4	
	6	5.9	8	
	1	1.0	9	
	74	72.5	.	
	5	4.9	12	
	2	2.0	16	
	7	6.9	20	

timeopn ----- Number of hours that the pantry is open to clients per month

type: Number(1 decimals)  
range/legal: 0-200

missing: 78/102  
range: [4.0 ; 180.0]  
unique values: 19

mean: 47.1458  
std. dev.: 51.0624

opnapt ----- Pantries that are open by apt only

type: Number  
value labels: label\_opnapt  
range/legal: 1,2,88,99

missing: 48/102  
range: [1 ; 99]  
unique values: 5

tabulation:	Freq.	Pct.	Value	Label
	3	2.9	1	yes
	1	1.0	2	no
	48	47.1	.	
	2	2.0	88	Don't Know
	48	47.1	99	No Response

pantexis ----- How many years has your on-site church pantry been in existence?

type: Number  
value labels: label\_pantexis  
range/legal: 1-8,88,99



missing: 48/102  
 range: [2 ; 99]  
 unique values: 10

tabulation:	Freq.	Pct.	Value	Label
	10	9.8	2	1-5 years
	17	16.7	3	6-10 years
	6	5.9	4	11-15 years
	3	2.9	5	16-20 years
	6	5.9	6	21-25 years
	1	1.0	7	26-30 years
	2	2.0	8	31 years or greater
	48	47.1	.	
	2	2.0	88	Don't Know
	7	6.9	99	No Response

pntzips1 ----- 37011 Antioch zip code that the church pantry serves

type: Number  
 value labels: label\_pntzips1  
 range/legal: 1,2

missing: 72/102  
 range: [1 ; 2]  
 unique values: 3

tabulation:	Freq.	Pct.	Value	Label
	72	70.6	.	
	5	4.9	1	yes
	25	24.5	2	no

pntzips2 ----- 37013 - Antioch zip code that the church pantry serves

type: Number  
 value labels: label\_pntzips2  
 range/legal: 1,2

missing: 72/102  
 range: [1 ; 2]  
 unique values: 3

tabulation:	Freq.	Pct.	Value	Label
	72	70.6	.	
	5	4.9	1	yes
	25	24.5	2	no

pntzips3 ----- 37027 - Brentwood zip code that the church pantry serves

type: Number  
 value labels: label\_pntzips3  
 range/legal: 1,2

missing: 72/102  
 range: [1 ; 2]  
 unique values: 3

tabulation:	Freq.	Pct.	Value	Label
	72	70.6	.	
	2	2.0	1	yes
	28	27.5	2	no

pntzips4 ----- 37072 - Goodlettsville zip code that the church pantry serves

type: Number  
value labels: label\_pntzips4  
range/legal: 1,2

missing: 72/102  
range: [1 ; 2]  
unique values: 3

tabulation:	Freq.	Pct.	Value	Label
	72	70.6	.	
	5	4.9	1	yes
	25	24.5	2	no

pntzips5 ----- 37076 - Hermitage zip code that the church pantry serves

type: Number  
value labels: label\_pntzips5  
range/legal: 1,2

missing: 72/102  
range: [1 ; 2]  
unique values: 3

tabulation:	Freq.	Pct.	Value	Label
	72	70.6	.	
	6	5.9	1	yes
	24	23.5	2	no

pntzips6 ----- 37080 - Joelton zip code that the church pantry serves

type: Number  
value labels: label\_pntzips6  
range/legal: 1,2

missing: 72/102  
range: [1 ; 2]  
unique values: 3

tabulation:	Freq.	Pct.	Value	Label
	72	70.6	.	
	5	4.9	1	yes
	25	24.5	2	no

pntzips7 ----- 37115 - Madison zip code that the church pantry serves

type: Number  
value labels: label\_pntzips7  
range/legal: 1,2

missing: 72/102  
range: [1 ; 2]  
unique values: 3

tabulation:	Freq.	Pct.	Value	Label
	72	70.6	.	
	7	6.9	1	yes
	23	22.5	2	no

pntzi8 37138 - Old Hickory zip code that the church pantry serves

type: Number  
value labels: label\_pntzi8  
range/legal: 1,2

missing: 72/102  
range: [1 ; 2]  
unique values: 3

tabulation:	Freq.	Pct.	Value	Label
	72	70.6	.	
	5	4.9	1	yes
	25	24.5	2	no

pntzi9 37189 - Whites Creek zip code that the church pantry serves

type: Number  
value labels: label\_pntzi9  
range/legal: 1,2

missing: 72/102  
range: [1 ; 2]  
unique values: 3

tabulation:	Freq.	Pct.	Value	Label
	72	70.6	.	
	3	2.9	1	yes
	27	26.5	2	no

pntzi10 37201 - Downtown zip code that the church pantry serves

type: Number  
value labels: label\_pntzi10  
range/legal: 1,2

missing: 72/102  
range: [1 ; 2]  
unique values: 3

tabulation:	Freq.	Pct.	Value	Label
	72	70.6	.	
	5	4.9	1	yes
	25	24.5	2	no

pntzi11 37203 - Downton zip code that the church pantry serves

type: Number  
value labels: label\_pntzi11  
range/legal: 1,2

missing: 72/102  
range: [1 ; 2]  
unique values: 3

tabulation:	Freq.	Pct.	Value	Label
	72	70.6	.	
	8	7.8	1	yes
	22	21.6	2	no

pntzips12 ----- 37204 - Berry Hill zip code that the church pantry serves

type: Number  
value labels: label\_pntzips12  
range/legal: 1,2

missing: 72/102  
range: [1 ; 2]  
unique values: 3

tabulation:	Freq.	Pct.	Value	Label
	72	70.6	.	
	2	2.0	1	yes
	28	27.5	2	no

pntzips13 ----- 37205 - Belle Meade zip code that the church pantry serves

type: Number  
value labels: label\_pntzips13  
range/legal: 1,2

missing: 72/102  
range: [1 ; 2]  
unique values: 3

tabulation:	Freq.	Pct.	Value	Label
	72	70.6	.	
	2	2.0	1	yes
	28	27.5	2	no

pntzips14 ----- 37206 - East Nashville zip code that the church pantry serves

type: Number  
value labels: label\_pntzips14  
range/legal: 1,2

missing: 72/102  
range: [1 ; 2]  
unique values: 3

tabulation:	Freq.	Pct.	Value	Label
	72	70.6	.	
	12	11.8	1	yes
	18	17.6	2	no

pntzips15 ---- 37207 - Brick Church Pike zip code that the church pantry serves

type: Number  
value labels: label\_pntzips15  
range/legal: 1,2

missing: 72/102  
range: [1 ; 2]  
unique values: 3

tabulation:	Freq.	Pct.	Value	Label
	72	70.6	.	
	9	8.8	1	yes
	21	20.6	2	no

pntzi16 --- 37208 - North Nashville/Germantown zip code that the church pantry

type: Number  
value labels: label\_pntzi16  
range/legal: 1,2

missing: 72/102  
range: [1 ; 2]  
unique values: 3

tabulation:	Freq.	Pct.	Value	Label
	72	70.6	.	
	7	6.9	1	yes
	23	22.5	2	no

pntzi17 -- 37209 - TSU/Old Charlotte Pike zip code that the church pantry serv

type: Number  
value labels: label\_pntzi17  
range/legal: 1,2

missing: 72/102  
range: [1 ; 2]  
unique values: 3

tabulation:	Freq.	Pct.	Value	Label
	72	70.6	.	
	6	5.9	1	yes
	24	23.5	2	no

pntzi18 -- 37210 - South Nashville/Elm Hill Pike/Trevecca zip code that the ch

type: Number  
value labels: label\_pntzi18  
range/legal: 1,2

missing: 72/102  
range: [1 ; 2]  
unique values: 3

tabulation:	Freq.	Pct.	Value	Label
	72	70.6	.	
	5	4.9	1	yes
	25	24.5	2	no

pntzi19 -- 37211 - Zoo/Elysian Fields/Old Hickory Blvd zip code that the chur

type: Number  
value labels: label\_pntzi19  
range/legal: 1,2

missing: 72/102  
range: [1 ; 2]  
unique values: 3

tabulation:	Freq.	Pct.	Value	Label
	72	70.6	.	
	3	2.9	1	yes
	27	26.5	2	no

pntzips20 -- 37212 - Vanderbilt/Hillsboro Village zip code that the church  
pant

type: Number  
value labels: label\_pntzips20  
range/legal: 1,2

missing: 72/102  
range: [1 ; 2]  
unique values: 3

tabulation:	Freq.	Pct.	Value	Label
	72	70.6	.	
	4	3.9	1	yes
	26	25.5	2	no

pntzips21 ----- 37213 - Edgefield zip code that the church pantry  
serves

type: Number  
value labels: label\_pntzips21  
range/legal: 1,2

missing: 72/102  
range: [1 ; 2]  
unique values: 3

tabulation:	Freq.	Pct.	Value	Label
	72	70.6	.	
	4	3.9	1	yes
	26	25.5	2	no

pntzips22 -- 37214 - Opryland/Donelson/Airport zip code that the church pantry  
s

type: Number  
value labels: label\_pntzips22  
range/legal: 1,2

missing: 72/102  
range: [1 ; 2]  
unique values: 3

tabulation:	Freq.	Pct.	Value	Label
	72	70.6	.	
	3	2.9	1	yes
	27	26.5	2	no

pntzips23 ----- 37215 - Forrest Hills zip code that the church pantry  
serves

type: Number  
value labels: label\_pntzips23  
range/legal: 1,2

missing: 72/102  
range: [1 ; 2]  
unique values: 3

tabulation:	Freq.	Pct.	Value	Label
	72	70.6	.	
	2	2.0	1	yes
	28	27.5	2	no

pntzips24 ----- 37216 - Inglewood zip code that the church pantry serves

type: Number  
value labels: label\_pntzips24  
range/legal: 1,2

missing: 72/102  
range: [1 ; 2]  
unique values: 3

tabulation:	Freq.	Pct.	Value	Label
	72	70.6	.	
	10	9.8	1	yes
	20	19.6	2	no

pntzips25 -- 37217 -Percy Priest Lake/Airport zip code that the church pantry s

type: Number  
value labels: label\_pntzips25  
range/legal: 1,2

missing: 72/102  
range: [1 ; 2]  
unique values: 3

tabulation:	Freq.	Pct.	Value	Label
	72	70.6	.	
	2	2.0	1	yes
	28	27.5	2	no

pntzips26 ----- 37218 - Bordeaux zip code that the church pantry serves

type: Number  
value labels: label\_pntzips26  
range/legal: 1,2

missing: 72/102  
range: [1 ; 2]  
unique values: 3

tabulation:	Freq.	Pct.	Value	Label
	72	70.6	.	
	7	6.9	1	yes
	23	22.5	2	no

pntzips27 ----- 37219 - Downtown zip code that the church pantry serves

type: Number  
value labels: label\_pntzips27  
range/legal: 1,2

missing: 72/102  
range: [1 ; 2]  
unique values: 3

tabulation:	Freq.	Pct.	Value	Label
	72	70.6	.	
	3	2.9	1	yes
	27	26.5	2	no

pntzips28 ----- 37220 - Crieve Hall zip code that the church pantry serves

type: Number  
value labels: label\_pntzips28  
range/legal: 1,2

missing: 72/102  
range: [1 ; 2]  
unique values: 3

tabulation:	Freq.	Pct.	Value	Label
	72	70.6	.	
	2	2.0	1	yes
	28	27.5	2	no

pntzips29 ----- 37221 - Bellevue zip code that the church pantry serves

type: Number  
value labels: label\_pntzips29  
range/legal: 1,2

missing: 72/102  
range: [1 ; 2]  
unique values: 3

tabulation:	Freq.	Pct.	Value	Label
	72	70.6	.	
	3	2.9	1	yes
	27	26.5	2	no

pntzips30 ----- 37228 - Metro Center zip code that the church pantry serves

type: Number  
value labels: label\_pntzips30  
range/legal: 1,2

missing: 72/102  
range: [1 ; 2]  
unique values: 3

tabulation:	Freq.	Pct.	Value	Label
	72	70.6	.	
	5	4.9	1	yes
	25	24.5	2	no

pntzips31 ----- 37075 - Hendersonville zip code that the church pantry serves

type: Number  
value labels: label\_pntzips31  
range/legal: 1,2

missing: 83/102  
range: [2 ; 2]  
unique values: 2

tabulation:	Freq.	Pct.	Value	Label
	83	81.4	.	
	19	18.6	2	no



pntzips32 ----- 37087 - Lebanon zip code that the church pantry serves

type: Number  
value labels: label\_pntzips32  
range/legal: 1,2

missing: 100/102  
range: [2 ; 2]  
unique values: 2

tabulation:	Freq.	Pct.	Value	Label
	100	98.0	.	
	2	2.0	2	no

pntzips33 ----- 37069 - Franklin zip code that the church pantry serves

type: Number  
value labels: label\_pntzips33  
range/legal: 1,2

missing: 100/102  
range: [2 ; 2]  
unique values: 2

tabulation:	Freq.	Pct.	Value	Label
	100	98.0	.	
	2	2.0	2	no

pntzipsnt ----- We do not keep track of the area/zip code

type: Number  
value labels: label\_pntzipsnt  
range/legal: 1,2

missing: 63/102  
range: [1 ; 2]  
unique values: 3

tabulation:	Freq.	Pct.	Value	Label
	8	7.8	1	yes
	31	30.4	2	no
	63	61.8	.	

pntzmost ----- Which one (1) zip code do you serve the most?

type: Number  
value labels: label\_pntzmost  
range/legal: 1-33,36,88,99

missing: 48/102  
range: [2 ; 99]  
unique values: 21

tabulation:	Freq.	Pct.	Value	Label
	1	1.0	2	37013 - Antioch
	4	3.9	5	37076 - Hermitage
	1	1.0	6	37080 - Joelton
	1	1.0	7	37115 - Madison
	48	47.1	.	
	2	2.0	11	37203 - Downtown

	2	2.0	14	37206 - East Nashville
	2	2.0	15	37207 - Brick Church Pike
	1	1.0	16	37208 - North
Nashville/Germanto				
	3	2.9	17	37209 - TSU/Old Charlotte Pike
	1	1.0	18	37210 - South Nashville/Elm
Hil				
	1	1.0	19	37211 - Zoo/Elysian Fields/Old
H				
	1	1.0	20	37212 - Vanderbilt/Hillsboro
Vil				
	1	1.0	22	37214 -
Opryland/Donelson/Airpor				
	1	1.0	24	37216 - Inglewood
	1	1.0	26	37218 - Bordeaux
	1	1.0	28	37220 - Crieve Hall
	1	1.0	29	37221 - Bellevue
	1	1.0	30	37228 - Metro Center
	6	5.9	36	We do not keep track of the
area				
	22	21.6	99	No Response

avbagmth --- On average, how many food bags or food boxes are given out each mon

type: Number  
 range/legal: 0-700  
 missing: 62/102  
 range: [1 ; 660]  
 unique values: 30  
 mean: 113.3000  
 std. dev.: 152.5218

bagprov ----- Food pantry bags are provided based on

type: Number  
 value labels: label\_bagprov  
 range/legal: 1-5,88,99  
 missing: 47/102  
 range: [1 ; 99]  
 unique values: 6

tabulation:	Freq.	Pct.	Value	Label
	22	21.6	1	Individual requests
	20	19.6	2	Family requests
	1	1.0	4	Vehicle Car Load requests
	6	5.9	5	Other
	47	46.1	.	
	6	5.9	99	No Response

pswho ----- We ask, Who they are as normal practice for client screening

type: Number  
 value labels: label\_pswho  
 range/legal: 1,2,88,99  
 missing: 47/102  
 range: [1 ; 99]

unique values: 4

tabulation:	Freq.	Pct.	Value	Label
	40	39.2	1	yes
	11	10.8	2	no
	47	46.1	.	
	4	3.9	99	No Response

pswhere ----- We ask,Where they live as normal practice for client screening

type: Number  
value labels: label\_pswhere  
range/legal: 1,2,88,99

missing: 47/102  
range: [1 ; 99]  
unique values: 4

tabulation:	Freq.	Pct.	Value	Label
	33	32.4	1	yes
	18	17.6	2	no
	47	46.1	.	
	4	3.9	99	No Response

pswhy ----- We ask, Why they are in need as a normal practice for client screen

type: Number  
value labels: label\_pswhy  
range/legal: 1,2,88,99

missing: 47/102  
range: [1 ; 99]  
unique values: 4

tabulation:	Freq.	Pct.	Value	Label
	7	6.9	1	yes
	43	42.2	2	no
	47	46.1	.	
	5	4.9	99	No Response

psproof ---- We ask for, Proof of need (i.e. income documentation)as normal prac

type: Number  
value labels: label\_psproof  
range/legal: 1,2,88,99

missing: 47/102  
range: [1 ; 99]  
unique values: 4

tabulation:	Freq.	Pct.	Value	Label
	6	5.9	1	yes
	44	43.1	2	no
	47	46.1	.	
	5	4.9	99	No Response

psprefer ---- We ask,If they were referred to us food pantry's normal practice fo

type: Number  
value labels: label\_psprefer

range/legal: 1,2,88,99

missing: 47/102  
range: [1 ; 99]  
unique values: 4

tabulation:	Freq.	Pct.	Value	Label
	10	9.8	1	yes
	41	40.2	2	no
	47	46.1	.	
	4	3.9	99	No Response

psother ---- Other information as food pantry's normal practice for client scree

type: Number  
value labels: label\_psother  
range/legal: 1,2,88,99

missing: 48/102  
range: [1 ; 99]  
unique values: 4

tabulation:	Freq.	Pct.	Value	Label
	9	8.8	1	yes
	40	39.2	2	no
	48	47.1	.	
	5	4.9	99	No Response

pntdntd ----- Percentage of pantry foods donated by church members

type: Number  
range/legal: 0-100

missing: 54/102  
range: [0 ; 100]  
unique values: 14

tabulation:	Freq.	Pct.	Value	Label
	16	15.7	0	
	2	2.0	5	
	5	4.9	10	
	5	4.9	15	
	1	1.0	18	
	1	1.0	20	
	2	2.0	25	
	1	1.0	40	
	2	2.0	75	
	1	1.0	80	
	3	2.9	85	
	2	2.0	90	
	54	52.9	.	
	7	6.9	100	

mean: 33.9167  
std. dev.: 39.6752

ptdtdyn ----- Pantry Foods donated by church members

type: Number  
value labels: label\_ptdtdyn

range/legal: 1,2,88,99

missing: 47/102  
range: [1 ; 99]  
unique values: 4

tabulation:	Freq.	Pct.	Value	Label
	35	34.3	1	yes
	16	15.7	2	no
	47	46.1	.	
	4	3.9	99	No Response

pntfdbk ---- Percentage of pantry foods received from a food bank (i.e. Second H

type: Number  
range/legal: 0-100

missing: 54/102  
range: [0 ; 100]  
unique values: 16

mean: 36.5417  
std. dev.: 41.5812

ptfbkyn ----- Received from a food bank (i.e. Second Harvest or Others)

type: Number  
value labels: label\_ptfbkyn  
range/legal: 1,2,88,99

missing: 47/102  
range: [1 ; 99]  
unique values: 4

tabulation:	Freq.	Pct.	Value	Label
	27	26.5	1	yes
	24	23.5	2	no
	47	46.1	.	
	4	3.9	99	No Response

pntpur ----- Percentage of pantry foods purchased

type: Number  
range/legal: 0-100

missing: 54/102  
range: [0 ; 100]  
unique values: 12

tabulation:	Freq.	Pct.	Value	Label
	25	24.5	0	
	3	2.9	5	
	5	4.9	10	
	1	1.0	15	
	1	1.0	20	
	4	3.9	25	
	1	1.0	30	
	2	2.0	75	
	1	1.0	85	
	3	2.9	90	

54	52.9	.
2	2.0	100

mean: 19.4792  
std. dev.: 32.0032

ptpuryn ----- Pantry Foods  
Purchased

type: Number  
value labels: label\_ptpuryn  
range/legal: 1,2,88,99

missing: 47/102  
range: [1 ; 99]  
unique values: 4

tabulation:	Freq.	Pct.	Value	Label
	23	22.5	1	yes
	27	26.5	2	no
	47	46.1	.	
	5	4.9	99	No Response

pntgdn ----- Percentage of Pantry foods from a Church  
Garden

type: Number  
range/legal: 0-100

missing: 54/102  
range: [0 ; 15]  
unique values: 4

tabulation:	Freq.	Pct.	Value	Label
	46	45.1	0	
	1	1.0	1	
	1	1.0	15	
	54	52.9	.	

ptgdyn ----- Pantry Foods from a Church  
Garden

type: Number  
value labels: label\_ptgdyn  
range/legal: 1,2,88,99

missing: 47/102  
range: [1 ; 99]  
unique values: 4

tabulation:	Freq.	Pct.	Value	Label
	3	2.9	1	yes
	47	46.1	2	no
	47	46.1	.	
	5	4.9	99	No Response

pntothr ---- Percentage of Food Pantry sources other than church members, food  
b

type: Number  
range/legal: 0-100

missing: 54/102  
range: [0 ; 100]

unique values: 9

tabulation:	Freq.	Pct.	Value	Label
	31	30.4	0	
	1	1.0	5	
	7	6.9	10	
	1	1.0	15	
	3	2.9	20	
	2	2.0	25	
	1	1.0	65	
	54	52.9	.	
	2	2.0	100	

ptotryn ----- Sources other than church members, food banks, purchased or church

type: Number  
value labels: label\_ptotryn  
range/legal: 1,2,88,99

missing: 47/102  
range: [1 ; 99]  
unique values: 4

tabulation:	Freq.	Pct.	Value	Label
	18	17.6	1	yes
	32	31.4	2	no
	47	46.1	.	
	5	4.9	99	No Response

askfood ----- How often are church members asked for food donations specifically

type: Number  
value labels: label\_askfood  
range/legal: 1-5,88,99

missing: 48/102  
range: [1 ; 99]  
unique values: 7

tabulation:	Freq.	Pct.	Value	Label
	11	10.8	1	Never
	10	9.8	2	Each week
	7	6.9	3	Each Month
	4	3.9	4	Once a Quarter
	8	7.8	5	Once a Year
	48	47.1	.	
	14	13.7	99	No Response

askmony ---- How often are church members asked for money donations specifically

type: Number  
value labels: label\_askmony  
range/legal: 1-5,88,99

missing: 47/102  
range: [1 ; 99]  
unique values: 7

tabulation:	Freq.	Pct.	Value	Label
	19	18.6	1	Never

2	2.0	2	Each week
5	4.9	3	Each Month
3	2.9	4	Once a Quarter
7	6.9	5	Once a Year
47	46.1	.	
19	18.6	99	No Response

oftnstaf --- How often is a paid church staff member in charge of the maintenanc

type: Number  
value labels: label\_oftnstaf  
range/legal: 1-5,88,99

missing: 47/102  
range: [1 ; 99]  
unique values: 5

tabulation:	Freq.	Pct.	Value	Label
	24	23.5	1	Never
	16	15.7	2	Each week
	3	2.9	3	Each Month
	47	46.1	.	
	12	11.8	99	No Response

oftnvol ---- How often is a volunteer (non-paid staff) in charge of the maintena

type: Number  
value labels: label\_oftnvol  
range/legal: 1-5,88,99

missing: 47/102  
range: [1 ; 99]  
unique values: 6

tabulation:	Freq.	Pct.	Value	Label
	3	2.9	1	Never
	39	38.2	2	Each week
	4	3.9	3	Each Month
	3	2.9	4	Once a Quarter
	47	46.1	.	
	6	5.9	99	No Response

foodreq ---- Has the number of people requesting food donations in the last year

type: Number  
value labels: label\_foodreq  
range/legal: 1-3,88,99

missing: 47/102  
range: [1 ; 99]  
unique values: 6

tabulation:	Freq.	Pct.	Value	Label
	15	14.7	1	Increased
	1	1.0	2	Decreased
	15	14.7	3	Stayed about the Same
	47	46.1	.	
	1	1.0	88	Don't Know
	23	22.5	99	No Response



oftnedu ---- How often are the food pantry clients offered some type of nutritio

type: Number  
value labels: label\_oftnedu  
range/legal: 1-4,88,99

missing: 47/102  
range: [1 ; 99]  
unique values: 7

tabulation:	Freq.	Pct.	Value	Label
	33	32.4	1	Never
	7	6.9	2	Sometimes
	1	1.0	3	Most of the time
	6	5.9	4	Always
	47	46.1	.	
	2	2.0	88	Don't Know
	6	5.9	99	No Response

oftnrec ---- How often are the food pantry clients offered a recipe(s) along wit

type: Number  
value labels: label\_oftnrec  
range/legal: 1-4,88,99

missing: 47/102  
range: [1 ; 99]  
unique values: 7

tabulation:	Freq.	Pct.	Value	Label
	33	32.4	1	Never
	10	9.8	2	Sometimes
	3	2.9	3	Most of the time
	2	2.0	4	Always
	47	46.1	.	
	2	2.0	88	Don't Know
	5	4.9	99	No Response

oftninf ---- How often are the food pantry clients offered information on Food S

type: Number  
value labels: label\_oftninf  
range/legal: 1-4,88,99

missing: 47/102  
range: [1 ; 99]  
unique values: 7

tabulation:	Freq.	Pct.	Value	Label
	26	25.5	1	Never
	11	10.8	2	Sometimes
	6	5.9	3	Most of the time
	4	3.9	4	Always
	47	46.1	.	
	2	2.0	88	Don't Know
	6	5.9	99	No Response

oftngc ----- How often are the food pantry clients offered gift cards along with

type: Number

value labels: label\_oftngc  
range/legal: 1-4,88,99

missing: 48/102  
range: [1 ; 99]  
unique values: 5

tabulation:	Freq.	Pct.	Value	Label
	34	33.3	1	Never
	10	9.8	2	Sometimes
	1	1.0	3	Most of the time
	48	47.1	.	
	9	8.8	99	No Response

oftncsh ---- How often are the food pantry clients offered cash along with the  
f

type: Number  
value labels: label\_oftncsh  
range/legal: 1-4,88,99

missing: 47/102  
range: [1 ; 99]  
unique values: 4

tabulation:	Freq.	Pct.	Value	Label
	44	43.1	1	Never
	2	2.0	2	Sometimes
	47	46.1	.	
	9	8.8	99	No Response

oftnper ---- How often are refrigerated or perishable foods offered along with  
t

type: Number  
value labels: label\_oftnper  
range/legal: 1-4,88,99

missing: 47/102  
range: [1 ; 99]  
unique values: 6

tabulation:	Freq.	Pct.	Value	Label
	23	22.5	1	Never
	7	6.9	2	Sometimes
	8	7.8	3	Most of the time
	12	11.8	4	Always
	47	46.1	.	
	5	4.9	99	No Response

normprac --- Which of the below best describes your food pantry's normal  
practic

type: Number  
value labels: label\_normprac  
range/legal: 1-4,88,99

missing: 48/102  
range: [1 ; 99]  
unique values: 7

tabulation:	Freq.	Pct.	Value	Label
-------------	-------	------	-------	-------

foo	31	30.4	1	A standardized box or bag of
freely	8	7.8	2	Clients are permitted to
freely	8	7.8	3	Clients are permitted to
por	2	2.0	4	Clients may pick out a small
	48	47.1	.	
	1	1.0	88	Don't Know
	4	3.9	99	No Response

stndbag ---- If a standardized box or bag of food is given, who decides what goes

type: Number  
value labels: label\_stndbag  
range/legal: 1-4,88,99

missing: 60/102  
range: [1 ; 99]  
unique values: 6

tabulation:	Freq.	Pct.	Value	Label
	14	13.7	1	A church staff member
	10	9.8	2	A church volunteer
	3	2.9	3	A committee
	9	8.8	4	Other
	60	58.8	.	
	6	5.9	99	No Response

clntrtrn --- Which of the below best describes your food pantry's normal practice

type: Number  
value labels: label\_clntrtrn  
range/legal: 1-4,88,99

missing: 47/102  
range: [1 ; 99]  
unique values: 6

tabulation:	Freq.	Pct.	Value	Label
onc	13	12.7	1	As often as they need help.
days	7	6.9	2	By a set schedule (more than
o	9	8.8	3	Once per month or every 30
	18	17.6	4	By a set schedule (longer than
	47	46.1	.	
	8	7.8	99	No Response

prctrtrn --- What percentage of people that come to the food pantry return again

type: Number  
value labels: label\_prctrtrn  
range/legal: 1-12,88,99

missing: 47/102  
range: [2 ; 99]  
unique values: 13

```

tabulation:  Freq.    Pct.   Value   Label
              1      1.0     2    1-10%
              2      2.0     4    21-30%
              1      1.0     5    31-40%
              2      2.0     6    41-50%
              2      2.0     7    51-60%
              4      3.9     8    61-70%
              1      1.0     9    71-80%
             47     46.1     .
              7      6.9    10    81-90%
             11     10.8    11    91-100%
              4      3.9    12    We do not keep track of those
pe
              2      2.0    88    Don't Know
             18     17.6    99    No Response

```

daybgfd ----- How many days are the pantry bags intended to feed an individual?

```

      type: Number
range/legal: 0-30

missing: 73/102
  range: [1 ; 30]
unique values: 12

```

```

tabulation:  Freq.    Pct.   Value   Label
              3      2.9     1
              2      2.0     2
              3      2.9     3
              2      2.0     4
              4      3.9     5
              4      3.9     7
             73     71.6     .
              1      1.0    10
              6      5.9    14
              1      1.0    18
              1      1.0    21
              2      2.0    30

```

```

      mean: 9.1379
std. dev.: 7.8465

```

runout ----- How often does the pantry run out of food each month?

```

      type: Number
value labels: label_runout
range/legal: 1-4,88,99

missing: 48/102
  range: [1 ; 99]
unique values: 5

```

```

tabulation:  Freq.    Pct.   Value   Label
              32     31.4     1    Never
              15     14.7     2    Sometimes
               2      2.0     4    Always
              48     47.1     .
               5      4.9     99    No Response

```

holidbag --- Do the pantry food bags change depending upon any religious or secu

type: Number  
value labels: label\_holidbag  
range/legal: 1,2,88,99

missing: 47/102  
range: [1 ; 99]  
unique values: 4

tabulation:	Freq.	Pct.	Value	Label
	12	11.8	1	yes
	31	30.4	2	no
	47	46.1	.	
	12	11.8	99	no response

nmitnbg ----- Number of food items in the pantry bag/box

type: Number  
range/legal: 0-43

missing: 84/102  
range: [9 ; 42]  
unique values: 15

tabulation:	Freq.	Pct.	Value	Label
	1	1.0	9	
	84	82.4	.	
	1	1.0	14	
	1	1.0	15	
	1	1.0	17	
	4	3.9	18	
	1	1.0	21	
	2	2.0	24	
	1	1.0	26	
	1	1.0	28	
	1	1.0	31	
	1	1.0	33	
	1	1.0	38	
	1	1.0	40	
	1	1.0	42	

mean: 24.1111  
std. dev.: 9.2309

frtsvg ----- Fruit Servings in cups from MyPlate

type: Number(2 decimals)  
range/legal: 0-29

missing: 84/102  
range: [0.00 ; 28.50]  
unique values: 14

mean: 5.1528  
std. dev.: 7.7782

vegsvg ----- Veg Servings in cups from MyPlate

type: Number(2 decimals)

```

range/legal: 0-36
missing: 84/102
range: [0.75 ; 35.25]
unique values: 18

mean: 19.2361
std. dev.: 9.3175

dairysvg ----- Dairy Servings cups from
MyPlate
type: Number(2 decimals)
range/legal: 0-11

missing: 84/102
range: [0.00 ; 11.00]
unique values: 16

mean: 4.8889
std. dev.: 3.2363

prosvg ----- Protein Servings in ounces from
MyPlate
type: Number(2 decimals)
range/legal: 0-145

missing: 84/102
range: [7.50 ; 143.50]
unique values: 19

mean: 55.0111
std. dev.: 28.6012

whgrnsvg ----- Whole Grain Servings in ounces from
MyPlate
type: Number(2 decimals)
range/legal: 0-30

missing: 84/102
range: [0.00 ; 29.25]
unique values: 17

mean: 11.8333
std. dev.: 8.3770

regrnsvg ----- Refined Grain Servings in ounces from
MyPlate
type: Number(1 decimals)
range/legal: 0-218

missing: 84/102
range: [0.0 ; 217.5]
unique values: 18

mean: 65.3056
std. dev.: 49.0680

addsug ----- Added Sugars in grams from
MyPlate
type: Number

```

```

range/legal: 0-2422
missing: 84/102
range: [30 ; 2421]
unique values: 19

mean: 526.0556
std. dev.: 566.5844

kcal ----- Calories from Food
Works
type: Number
range/legal: 0-36420
missing: 84/102
range: [1649 ; 36418]
unique values: 19

mean: 18817.3889
std. dev.: 8389.3906

protein ----- Protein in Grams from Food
Works
type: Number(1 decimals)
range/legal: 0-994
missing: 84/102
range: [70.7 ; 993.6]
unique values: 19

mean: 644.6278
std. dev.: 242.9800

totcarb ----- Carbohydrate in grams from Food
Works
type: Number(1 decimals)
range/legal: 0-6925
missing: 84/102
range: [196.7 ; 6923.0]
unique values: 19

mean: 2858.2611
std. dev.: 1489.2305

fiber ----- Dietary Fiber in grams from Food
Works
type: Number(1 decimals)
range/legal: 0-506
missing: 84/102
range: [21.8 ; 505.4]
unique values: 19

mean: 250.9944
std. dev.: 109.4189

totsugar ----- Total Sugars in grams from Food
Works
type: Number(1 decimals)

```

```

range/legal: 0-2812
missing: 84/102
range: [70.8 ; 2811.0]
unique values: 19

mean: 812.0889
std. dev.: 646.5885

totfat ----- Total Fat in grams from Food
Works
type: Number(1 decimals)
range/legal: 0-1165

missing: 84/102
range: [72.8 ; 1160.0]
unique values: 19

mean: 572.6056
std. dev.: 248.3156

satfat ----- Saturated Fat in grams from Food
Works
type: Number(1 decimals)
range/legal: 0-410

missing: 84/102
range: [21.2 ; 409.0]
unique values: 19

mean: 142.3111
std. dev.: 83.1490

cholest ----- Cholesterol in milligrams from Food
Works
type: Number(1 decimals)
range/legal: 0-2690

missing: 84/102
range: [91.2 ; 2689.0]
unique values: 19

mean: 818.3611
std. dev.: 636.0976

tranfat ----- Trans Fatty Acids in grams from Food
Works
type: Number(3 decimals)
range/legal: 0-18

missing: 84/102
range: [0.055 ; 17.600]
unique values: 18

mean: 10.4037
std. dev.: 5.4887

calcium ----- Calcium in mg from Food
Works
type: Number(1 decimals)

```



```

range/legal: 0-8894
missing: 84/102
range: [416.9 ; 8893.0]
unique values: 19

mean: 4557.1611
std. dev.: 2339.7492

iron ----- Iron in mg from Food
Works
type: Number(1 decimals)
range/legal: 0-344
missing: 84/102
range: [13.1 ; 343.5]
unique values: 19

mean: 194.0833
std. dev.: 89.1490

potass ----- Potassium in mg from Food
Works
type: Number
range/legal: 0-37913
missing: 84/102
range: [1386 ; 37912]
unique values: 19

mean: 20064.1667
std. dev.: 7457.3810

sodium ----- Sodium in mg from Food
Works
type: Number
range/legal: 0-58431
missing: 84/102
range: [4277 ; 58430]
unique values: 19

mean: 36054.3889
std. dev.: 13036.2693

vitaiu ----- Vitamin A in IU from Food
Works
type: Number(1 decimals)
range/legal: 0-165911
missing: 84/102
range: [983.1 ; 165910.0]
unique values: 19

mean: 41144.1722
std. dev.: 43143.1248

vitarae ----- Vitamin A (RAE) in mcg from Food
Works
type: Number(1 decimals)

```

```
range/legal: 0-11335
missing: 84/102
range: [211.7 ; 11334.0]
unique values: 19

mean: 4426.1167
std. dev.: 3638.0032
```

```
vitc ----- Vitamin C in mg from Food
Works
```

```
type: Number(1 decimals)
range/legal: 0-1787

missing: 84/102
range: [80.4 ; 1786.0]
unique values: 19

mean: 438.5667
std. dev.: 447.1893
```

```
vitd ----- Vitamin D in mcg from Food
Works
```

```
type: Number(3 decimals)
range/legal: 0-62

missing: 84/102
range: [0.000 ; 61.900]
unique values: 17

mean: 15.4743
std. dev.: 21.3052
```