

Barriers to food security as explained by community members in two small Appalachian towns  
in rural North Carolina: A behind-the-scenes view through focus group interviews

by

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## **Abstract**

*Objective:* The purpose of this study was to broadly describe food insecurity as it relates to rural populations then to identify and explain the barriers for rural community members to accessing adequate, healthy, and desirable foods in an original study.

*Design:* This qualitative study is divided into a literature review and an original study that uses data from three focus groups obtained in a larger, mixed-methods study.

*Setting:* Interviews were conducted by a trained qualitative researcher. This study was accomplished in conjunction between Appalachian State University and two United Methodist Churches (UMCs) in two small towns nestled in rural Appalachia.

*Subjects:* Participants were selected among local community members that either attended or administered the local food pantry or soup kitchen hosted by either of the two UMCs. They ranged in age from young to older adult community members, and their unique viewpoints were made up of both those seeking aid and those delivering it.

*Results:* Multiple barriers to food access and contributors to food insecurity were identified across participants and interviews. Themes included limited availability of homegrown and local foods, the high cost for healthy foods, inadequate food and nutrition resources, trouble navigating the food environment, knowledge gaps, and social stigma, among a few other minor themes.

*Conclusions:* The multiple barriers identified here are characteristic of rural communities and show that much work is to be done to more fully address food insecurity in locations such as these. In addition to political and economic reform, many local solutions are possible using local resources. This study joins many others that illuminate the need for local and environmental solutions to food insecurity in rural areas.

## **Chapter 1**

Rural food insecurity in the United States

*A review*

## **1. Introduction**

Food insecurity affects Americans of all demographics and stations in life. Some groups are more heavily affected than others, and while it is a minority of the population that does not have adequate food access, the problem has far reaching consequences for physical and psychological health, morbidity and mortality, economic productivity, growth and development, quality of life, and social progress, among other areas. This paper seeks to define food insecurity; look at how it is measured; identify disparities, especially as it relates to rural populations; explore possible solutions; and introduce an original study in a rural, church-based population.

The Economic Research Service (ERS), under the United States Department of Agriculture (USDA), has several screening tools used to measure food security. The ERS uses the U.S. Adult Food Security Survey Module, which includes ten questions concerning the amount and quality of food that respondents purchase, the practice of skipping meals, anxiety over purchasing food, and weight loss due to insufficient access to food (USDA, ERS, 2017). The underlying theme of these questions includes a lack of resources necessary to purchase food. This does not include the purposeful limitation of food that occurs, for example, in people with eating disorders or who fast for religious purposes (Coleman-Jensen, Rabbitt, Gregory, & Singh, 2016). An additional eight questions are added for households with children that specifically address children's access to food, and these 18 questions are referred to as the U.S. Household Food Security Survey Module (USDA, ERS, 2017). It is possible for children to be food secure while parents and other members of the household are not, leading to the need to specifically assess children (Coleman-Jensen et al., 2016). The

ERS also publishes self-administered versions, versions in other languages, and versions to address different research needs.

The USDA defines food security in four categories ranging from high food security to very low food security based on answers given to the modules described in the previous paragraph (USDA, ERS, 2016). Households with high food security do not report or indicate any limitations in food access. The next category, marginal food security, means that households report one to two indications of food-access problems, like anxiety over food access, with little disruption in intake. These two domains are classified as “food security.” The next category, the first of two that define “food insecurity,” is low food security, which results from households reporting a reduced variety, quality, or desirability of their diet without reduced quantity. Finally, very low food security is indicated in respondents with multiple limitations in food access, disrupted diet patterns, and reduced food intake. This is the most severe category, and hunger frequently accompanies this stage.

The Current Population Survey (CPS) is a survey conducted each month jointly by the U.S. Census Bureau and U.S. Bureau of Labor Statistics (U. S. Census Bureau, 2015). It focuses on American workers and education, but supplemental questions are added monthly to inform other organizations. In December 2015, a representative sample of 53,000 households was chosen for the CPS, and 39,948 households completed the Food Security Supplement that was included (Coleman-Jensen et al., 2016). The USDA uses this information to generate a report about the food security status of U.S. citizens each year, which will also be used to provide a background to the food security environment of the U.S. in this report.

For several years before 2008, rates of food insecurity stayed relatively constant in the United States; however, between 2007 and 2008, rates of food insecurity rose dramatically from 11.1% to 14.6% of households (Coleman-Jensen et al., 2016). This sharp increase is likely a reflection of the start of the economic recession (Gundersen, Kreider, & Pepper, 2011). For the years following 2008 up until 2011, the rates continued rising or stayed relatively constant from year to year. It was not until 2011 that rates steadily and significantly decreased from 14.9% of households to 12.7% in 2015. It is important to note that these numbers reflect the percent of households where food insecurity was present for at least some members at some point during the 12 previous months. On average, these 12.7% of households were food insecure for seven months out of the year. Fortunately, 2015 saw the largest decrease from the previous year in rates of food insecure households since 1999 and currently has the lowest measured percentage since 2007 (Coleman-Jensen et al., 2016). While this is quite an accomplishment, there are disparities in rates of food insecurity. The populations that are more heavily affected may need special attention in addressing and improving their access to a healthful, adequate diet.

## **2. Demographics and Determinants of Food Insecurity**

Many populations experience food insecurity at higher or lower rates than national averages. Groups that experience lower food insecurity (higher food security) include married couples with children, households without children, households with more than one adult, households with elderly people, elderly who live alone, Whites and races other than Blacks and Hispanics, those making 185% of the federal poverty line or more, and households in the Northeastern and Western U. S. (Coleman-Jensen et al., 2016).

Unfortunately, many populations experience higher rates of food insecurity than national averages. These include households with children, households with children under six years, households with children that are headed by single males or females, men or women that live alone, Blacks and Hispanics, and households taking in less than 185% of the federal poverty line. Children are disproportionately affected, as seen by the fact that 16.6% of households with children less than 18 years old are food insecure. Additionally, 38.3% of those living under the federal poverty line are food insecure. Inequity also exists based on location. Households in the South had a rate of food insecurity of 13.3%, higher than households in the West, Midwest, and Northeast. Significantly for this paper, 15.4% of rural households, compared with 12.2% in metropolitan areas and 12.7% nationally, are food insecure (Coleman-Jensen et al., 2016). Because rural populations are at a higher risk than people living in non-rural areas, special solutions and an increased effort may be needed to resolve food access issues for this population.

### **3. Challenges for Rural Populations**

Rural households who face food insecurity have concerns that exceed the general consequences discussed so far. While food deserts can affect food insecure people in both urban and rural environments, rural considerations will be discussed here. In addition to the location of food in comparison to rural households, there are also concerns with the distance and adequacy of health care and access to transportation. Distrust of physicians and researchers is also common. One final problem faced by rural communities includes physical inactivity due to problems with the built environment, location and concentration of spaces to be active, and other concerns such as safety.



### *3.1. Food Deserts*

Research on food deserts shows mixed results for rural communities. According to Morton and Blanchard (2007), a food desert may be defined as a county where residents live farther than ten miles from a large food retailer. Of 418 counties in the United States that are food deserts, 98% are in nonmetropolitan areas (Morton & Blanchard, 2007). In general, rural communities have lower populations than suburban or urban areas, and, therefore, it makes sense that there would be fewer large food retailers. This assumption holds for many rural communities but is challenged by research in others. Morris, Neuhauser, and Campbell (1992) found that there were 3.8 supermarkets per rural county versus 29 in urban counties while fresh fruits and vegetables were less available in small or medium stores than in large grocery stores. In a nationwide study, Blanchard and Lyson (2006), using data from the 2000 Census and 1999 Zip Code Business Patterns and using Geographic Information System (GIS) mapping software, calculated distances to supermarkets or supercenters from metropolitan and rural counties. They found that very rural counties, without a town of greater than 2,500 people, had very low access to large grocery stores. This is in comparison to metropolitan areas, where 95% of the population lives within ten miles of supercenters. Additionally, in rural counties with towns of 10,000 people or more that are not located near urban counties, there is higher access to supermarkets than the national average, which could be detrimental if large grocers compete with smaller food stores. Importantly, access to large grocery stores changes based on the region of the United States. As an example, Western counties with large urban populations have more food deserts while very rural, Southern counties have greater access to large grocery stores than average. This underscores the need for unique solutions among different populations.

The studies above were more dated than other studies available today, but their findings are still relevant. Recent studies that focused on the perspectives of local, rural communities corroborate many of the results. Morton and Blanchard (2007) surveyed 1,500 individuals living in food deserts in rural Iowa and found that, despite a majority of respondents feeling there were adequate grocery stores in their area, most lived more than 20 miles from a large supercenter. One study, conducted by Carnahan, Zimmermann, and Peacock (2016), was performed in seven rural Illinois counties, and focus group interviews with local women showed multiple issues that prevented them from accessing adequate, healthy food. For example, participants reported that there were insufficient grocery stores and that travel times to stores with healthy foods were extensive. Women also noted their reliance on alternative shopping locations, like grocery stores, convenience stores, or fast food restaurants, despite the fact that they offered unhealthy options. Andress and Fitch (2016) performed a study in which 30 rural women participating in the WIC program in West Virginia participated in focus group interviews. The women reported a lack of quality in grocery stores that they could access and the need to visit multiple grocery stores to find deals. Finally, many could not afford transportation, communities often lacked sidewalks, and some women shopped at more expensive grocery stores because of proximity.

Some studies do produce contradictory results. For example, Garasky, Morton, and Greder (2006) surveyed households in two rural Iowa counties and found that respondents felt there were adequate grocery stores, prices were fair, and that transportation was not an issue. However, those who reported transportation problems or that there were inadequate grocery stores and high prices were more food insecure. Additionally, shopping outside of the county was associated with food security. Garasky, Morton, and Greder (2004) surveyed

and interviewed food pantry clients in four counties in Iowa to compare rural, suburban, and urban perceptions. Even though rural respondents were more likely to report that there were not enough grocery stores, foods were not affordable, and that they had inadequate transportation, rural households were actually more food secure than suburban or urban households. This is another example of the need for individualized attention in different rural communities.

### *3.2. Health Care*

Rural populations face many difficulties in accessing health care. A literature review conducted by Douthit, Kiv, Dwolatzky, and Biswas (2015) found 34 articles focusing on disparities in rural access to health care and differences between rural and urban populations in care-seeking behaviors. First of all, rural populations are more worried about stigma, discrimination, and confidentiality. Rural populations are less likely to seek care and likely to feel discrimination during visits, especially minorities and those of high vulnerability, like HIV patients. Secondly, providers are seen as friends or neighbors, so the traditional doctor-patient relationship is complicated. Also, as discussed previously in this paper, transportation is an issue because of far distances from care. Some other special problems identified included lower rates of vaccinations in rural areas and being more likely to seek extreme treatments due to closer proximity than milder care. A fifth theme is a lack of services. There are fewer clinics and hospitals in rural areas along with fewer specialists because health care industries are encouraged to place facilities where they will be profitable. Other problems included a general lack of mental health services and a lower concentration of assisted living facilities in rural areas. A sixth theme is that of Internet access. Whereas

information sharing and communication between providers is useful, a majority of United States citizens without Internet live in rural areas. Another theme includes disparities in insurance coverage between rural and urban areas. Finally, it was found that there are higher poverty and negative coping strategies in rural areas, including foregoing food, delaying care, and medication scrimping.

Other studies corroborate these findings. In Alaska and New Mexico, using addresses in a provider list and current Census data, Johnson, Brems, Warner, and Roberts (2006) identified the density of different care providers in rural versus urban areas. A disparity ratio was also calculated by dividing the number of rural people seen per provider by the number of urban people seen per provider. For all 13 categories of providers, there was a disparity ratio higher than 1.0, meaning that for every type of provider, there were more providers per capita in urban than rural areas. Another significant finding was that disparities were higher for providers with higher education levels. As an example, there was little disparity among physician's assistants, with a disparity ratio close to 1.0, versus OB/GYN physicians who had a ratio of 9.71 in Alaska. In another study, Wong and Regan (2009) conducted interviews with 50 focus group participants in British Columbia. Respondents reported a low continuity of care, meaning there was high turnover with physicians. The doctor patient relationship is important in establishing trust, but it was difficult to maintain lasting relationships. There was also low efficiency in the health care system. For example, participants would have to travel long distances to have a recurring prescription filled or drive to specialized clinics for basic procedures. Transportation, costly gasoline, and large travel times were also problems, including safety concerns with traveling long distances because of a lack of specialized care.

Practitioners who wish to intervene in rural communities must realize that trust is an important aspect behind successful care. Chipp et al. (2011) conducted focus group interviews with physicians and found that poor past experiences, high turnover, and problems with confidentiality all may hinder trust in the health care system. Because there are limited resources, physicians also reported feelings of isolation and taking on multiple roles. Finally, engaging with community members, leaders, and elders was seen as very important in making relationships. Without establishing these relationships, the professional work may not be meaningful. Pugh (2007) discussed the dual relationships practitioners have with rural clients. He notes that integrity is seen as important in rural communities, and this becomes more important as the physician interacts with people outside of a professional setting more frequently. Doctors mention interacting with patients in personal settings, so anonymity may be difficult to maintain in certain tight-knit communities.

As mentioned above, transportation is a major problem for rural people. Arcury et al. (2005) conducted survey interviews in 1,059 households across 12 rural counties in North Carolina on health care utilization and mapping data. They found that living farther from regular care facilities was associated with fewer regular care visits. Having a driver's license resulted in more regular and chronic care visits, and those with family members using public transportation had more chronic care visits. In another study using data from Medicare recipients across five states, Chan, Hart, and Goodman (2006) assessed the use of care and travel times. It was found that those living in rural areas travelled two to three times farther than urban counterparts to see specialists, and those with chronic conditions travelled the farthest. Living in rural areas restricts access to health care because of distance, transportation, limited access, and employee turnover.

### *3.3. Community Trust*

Trust is essential in rural communities in research settings. Dibartolo and McCrone (2003) note that older rural participants often feel distrust of outsiders as well as the researcher motives and research concepts. In another article focusing on rural youth, it was noted that building relationships may be time consuming but is very rewarding (Leyshon, 2002). Leyshon (2002) claims that this will take time outside of the research setting in order to build trust with the community. The article also mentioned that rural youth will be more willing to participate and that researchers will better understand the community, leading to efficient research. Leyshon (2002) spent over three months in the community before conducting any interviews. Frerichs et al. (2017) interviewed community stakeholders and researchers, and all stakeholder groups reported authentic communication and reciprocal relationships as most important to building trust. Stakeholders also rated communication to resolve problems as very important, unlike health care workers and researchers. In one final project, researchers focused on aspects of trust in a Community Based Participatory Research (CBPR) study with American Indians (Christopher, Watts, McCormick, & Young, 2008). They discussed the fact that building trust in the community increased feelings of safety and respect and created a stronger partnership. Relationships are important to rural participants.

### *3.4. Physical Activity*

Physical activity (PA) in rural settings has been an intense area of research focus. Multiple literature reviews will be discussed here as well as some specific studies that support their findings. In one such literature review, Frost et al. (2010) assessed the built environment and physical activity. Barriers to PA included traffic, safety, and uneven roads

as well as the lack of sidewalks, indoor facilities, transportation, and parks. Increases in physical activity were positively associated with good aesthetics of the countryside or local area, feelings of safety, and the presence of trails, parks, recreational facilities, and walk-able destinations. Brownson et al. (2000) found that in rural Missouri, low-income rural participants reported increased levels of walking when walking trails were made available to them. Some other findings from Frost et al. (2010) include mixed results on street lighting, sidewalks, and traffic flow. In another review by Umstatted Meyer et al. (2016), 26 studies from the United States and Canada focused on rural policy and environmental interventions. Common barriers to intervene included staff turnover as well as lack of buy-in, community and organizational support, resources, and political will. Common interventions included improving walking-related infrastructure and increasing extracurricular activity. They also found that schools are important for both children and adults because rural communities lack other facilities. Hansen, Umstatted Meyer, Lenardson, and Hartley (2015) noted that schools are important for rural children because other opportunities for activity are sparsely located and less available. They also found that environmental extremes of some rural locations make indoor facilities necessary. Other barriers included fear of other people, dogs, and traffic. For many reasons, rural environments are not conducive to PA.

Joens-Matre et al. (2008) found that, although urban children exercised less, rural children had the highest BMIs and rates of overweight. In an interesting study conducted by Parks, Housemann, and Brownson (2003), using 1,818 telephone surveys, it was found that rural residents were least likely to meet PA recommendations compared to urban and suburban populations. When more spaces for exercise were available, participants were more likely to meet PA recommendations. Unfortunately, rural participants were most likely

to report having only one or no places to exercise. Martin et al. (2005) used Behavioral Risk Factor Surveillance System (BRFSS) data on 126,824 people to categorize them by rural or urban location, PA levels, and region of the country. Overall, physical inactivity was highest in the most rural category and lowest in the urban categories. Rural southerners were the most inactive, while in the West, urban people were less likely to be active than rural people. This is one more example of why tailored interventions are necessary. Overall, meeting the guidelines was more common in the most urban category and less common in the two rural categories. Similarly, Wilcox, Castro, King, Housemann, and Brownson (2000) conducted telephone interviews with 2,912 urban or rural women; rural women were more likely to be sedentary, especially in the South. In the West, though, rural women were more active. Urban women were more likely to report the presence of sidewalks, streetlights, facilities, and seeing others exercise whereas rural women reported seeing more stray dogs. One positive finding for rural populations was that the crime was less likely in rural environments. Eyler (2003) conducted a study where 1,000 white women in rural Illinois and Missouri were interviewed via telephone, and the three top barriers to PA were remoteness of the area, lack of facilities, and lack of sidewalks. Important factors that increased the odds to exercise included being in a higher income category and being employed. Additionally, attending religious services increased the likelihood of meeting recommendations. Overall, rural populations have lower access to facilities, more environmental extremes, and worse infrastructure.



#### **4. Consequences of Food Insecurity**

There are many negative consequences of food insecurity related to health and wellbeing. There are some conflicting results in the literature, but many studies have found reduced diet quality and increased disease outcomes. The discrepancies may occur for several reasons, such as the population studied and participation in governmental and community assistance programs, among other reasons. These will be discussed here.

##### *4.1. Diet Quality*

Diet quality may be negatively affected by food insecurity. Several studies report that being food insecure compared with being food secure has deleterious effects. For example, food insecure diabetics had non-significantly lower fruit and vegetable intake (Lyles et al., 2013), and food insecure children had non-significantly lower intakes of fruit, fruit juice, and vegetables (Lorson, Melgar-Quinonez, & Taylor, 2009). In a similar finding, Neumark-Sztainer, Wall, Perry, & Story (2010) found a strong correlation between family food security and availability of fruits and vegetables for adolescents. Additionally, food insecure households and adults score significantly lower on indices measuring diet quality (Leung, Epel, Ritchie, Crawford, & Laraia, 2014; Robaina & Martin, 2013). Leung et al. (2014) found that very low food secure adults consumed more high fat dairy, salty snacks, sugar-sweetened beverages, and red and processed meat, while eating fewer vegetables. Several studies find that food insecure populations have lower nutrient intakes than food secure populations (Leung et al., 2014; Rose & Oliveira, 1997; Lee & Frongillo, 2001). Mello et al. (2010) surveyed low-income adults and found that food insecure adults were significantly more likely to have dietary patterns leading to higher fat intakes ( $p=0.0027$ ). Similarly,

Sharpe, Whitaker, Alia, Wilcox, and Hutto (2016) found food insecure women to feel less confident to eat a low fat diet and more likely to engage in emotional eating. Veterans who were food insecure were also found to be more likely to consume fast food and soda (Becerra, Hassija, & Becerra, 2016). Finally, one group of food insecure elderly had lower skinfold thickness and inadequate eating habits (Lee & Frongillo, 2001). Common themes from these studies include lower intakes of healthful foods, like fruits and vegetables; higher intakes of processed foods, like soda or red meat; lower nutrient intakes; and poorer behavior.

There are a few studies (Leung et al., 2014; Mello et al., 2010; Gamba, Leung, Guendelman, Lahiff, & Laraia, 2016; Duffy, Zizza, Jacoby, & Tayie, 2009) that found either no difference in diet quality between food secure and insecure populations or that food insecure individuals had better diet quality than the food secure. Overall, the literature supports the view that food insecurity is associated with and may cause negative behaviors, lower diet quality, and lower nutrient intakes.

#### *4.2. Obesity*

Chronic disease has also been indicated as a consequence of food insecurity. This may be mediated through the negative effects food insecurity imposes on diet quality, though other factors may be present. Many chronic diseases have been associated with food insecurity, and obesity has been one of the largest focus areas for researchers. Bhattacharya, Currie, and Haider (2004) report that non-elderly adults who are food insecure are more likely to be obese. This association occurs more frequently in some population groups than others. For example, some studies found that this association is especially true in women

(Franklin, Jones, Love, Puckett, & Macklin, 2012; Adams, Grummer-Strawn, & Chavez, 2003; Townsend, Peerson, Love, Achterberg, & Murphy, 2001). Laraia, Siega-Riz, and Gundersen (2010) show that food insecurity was significantly associated with pregravid obesity and higher gestational weight gain. Some other mediators identified included adolescence, gender, marital status, stress, and participation in Food Stamp assistance (Franklin et al., 2012). While Drewnowski and Specter (2004) note that children are frequently shielded by parents from food insecurity, Jyoti, Frongillo, and Jones (2005) found that children in food insecure households gained more weight than food secure children. Drewnowski and Specter (2004) report multiple reasons behind the link between food insecurity and obesity, including that processed, energy-dense foods are cheaper than fresher, healthier foods; that low-income individuals are more likely to buy energy-dense foods; and that biologically, humans prefer energy-dense foods in times of food scarcity. On a related note, Bhattacharya et al. (2004) found that food insecure elderly individuals were actually more likely to be at a lower BMI because they had inadequate access to food. This is a special concern for elderly individuals who are more prone to feeling the effects of malnutrition. Only one study identified in this review found that food insecurity was not a significant predictor of obesity in some population, though food insecure individuals were non-significantly more likely to be overweight or obese (Robaina & Martin, 2013). While some population groups may not be affected, and while some studies find no significant associations or causality, there is a general agreement among researchers that food insecurity can lead to obesity.

### *4.3. Chronic Disease*

Food insecurity is also associated with other chronic diseases and their associated negative symptoms. For example, food insufficient seniors were significantly more likely to self-report fair or poor health than food sufficient elderly (Lee, & Frongillo, 2001). Additionally, according to Berkowitz, Seligman, and Choudhry (2014), food insecure adults were more likely to have more chronic conditions in general. More specifically, food insecurity is associated with a higher likelihood of having diabetes (Seligman, Bindman, Vittinghoff, Kanaya, & Kushel, 2007; Banerjee et al., 2017), higher HbA1C levels (Lyles et al., 2013; Seligman, Davis, Schillinger, & Wolf, 2010a), laboratory values diagnostic of diabetes (Seligman, Laraia, & Kushel, 2010b), hypoglycemia-related emergency room visits and poor blood glucose self-monitoring (Seligman et al., 2010a), and gestational diabetes (Laraia et al., 2010). As mentioned above, energy dense foods are cheaper than fresher, nutrient dense choices. Therefore, Jernigan et al. (2017) reported that people with inadequate access to quality foods were more likely to have diabetes. Negative cardiovascular health does not escape the effects of food insecurity. Research shows that food insecurity is associated with self-reported hyperlipidemia (Seligman et al., 2010b), a decreased likelihood of good cardiovascular health (Saiz et al., 2016), and lower HDL levels in women (Shin, Bautista, Walsh, Malecki, & Nieto, 2015). On a related note, food insecurity may also contribute to hypertension and has been associated with measured hypertension (Banerjee et al., 2017; Seligman et al., 2010b; Jernigan et al., 2017) and self-reported hypertension (Irving, Njai, & Siegel, 2014; Seligman et al., 2010b). Finally, food insecure individuals are more likely to develop albuminuria and end stage renal disease in addition to having a higher dietary acid load (Banerjee et al., 2017).

Many of these people who have chronic conditions require medications for medical management. Unfortunately, food insecure households often have lower incomes and, therefore, lower access to medical care. Adults who reported food insecurity were more likely to report medication underuse (Berkowitz et al., 2014), which is also known as medication “scrimping.” This has also occurred with diabetic (Knight, Probst, Liese, Sercy, & Jones, 2016) and cancer (Simmons, Modesitt, Brody, & Leggin, 2006) patients. Many food insecure people must choose between purchasing one necessity over another.

#### *4.4. Social and Developmental Disadvantages*

Outside of the physical effects of food insecurity, including reduced diet quality and chronic diseases, psychological and social consequences have also been reported. Food insecurity has been significantly associated with depression or depressive symptoms in mothers (Melchior et al., 2009), women (Heflin, Siefert, & Williams, 2005), and cancer patients (Simmons et al., 2006). In addition, according to Hamelin, Habicht, and Beaudry (1999) there are also associations with lower quality of life, decreased participation in social life, social exclusion, loss of productivity, among other problems. In children, learning is inhibited and transfer of knowledge from parent to child is reduced. Jyoti et al. (2005) found that food insecure children also have lower mathematics and reading scores. Children who are food insecure have also been linked to a higher likelihood of having iron deficiency anemia (Skalicky et al., 2006), behavior problems (Whitaker, Phillips, & Orzol, 2006; Melchior et al., 2009), and poor health (Chilton et al., 2009). Other studies, like one conducted by Bhattacharya, Currie, and Haider (2004), find no differences between food secure and insecure children on weight or nutritional outcomes and report that evidence on

children is mixed. Because relatives may shield children, it is possible that they do not fully feel the physical effects of food insecurity but that they are more affected socially and developmentally.

## **5. Potential Solutions**

### *5.1. Government Assistance*

As mentioned previously in this report, there are disparities among the food insecure. Men or women who live alone or who are single parents, Hispanics, Blacks, and rural people are all at higher risk. Those who are most affected, though, include those who make less than 185% of the poverty line (Coleman-Jensen et al., 2016). Governmental aid is one method to assist these people who are food insecure. One of the most widely known governmental programs, under the Food and Nutrition Service (FNS), is the Supplemental Nutrition Assistance Program (SNAP), previously known as Food Stamps. Common groups of people who benefit include homeless people, the elderly or disabled, those who are unemployed, those who work for low wages or work part-time, and those receiving public assistance. At a local SNAP office, government employees make calculations based on household size, income level, assets, deductions, and age. They will then use this information to deduct each family's unique value from the maximum allotment for the household size. An Electronic Benefit Transfer (EBT) card is issued to the household with which they may buy food or seeds to grow food. Because SNAP is an entitlement program, as many people who are eligible and apply will receive benefits (USDA, FNS, 2017b). SNAP provided assistance to 44.6% of food insecure households in 2015 (Coleman-Jensen et al., 2016). Multiple studies note that participating in SNAP decreases food insecurity (Mabli & Ohls, 2015; Ratcliffe,

McKernan, & Zhang, 2011). Nord and Golla (2009) found that food insecurity drastically increased during the months prior to entrance into SNAP but that rates quickly dropped after entry. Unfortunately, Nguyen, Shuval, Njike, and Katz (2014) found that SNAP participants had lower diet quality than non-participants. SNAP benefits are restricted somewhat, since SNAP benefits cannot be redeemed to purchase tobacco, alcohol, pet food, household products, hot foods, medicines, or vitamins. However, while SNAP improves food security, changes in purchase requirements may be warranted beyond these more lenient standards.

Another program that makes up the United State's public hunger safety net includes the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) under the FNS. This program provides nutrition support to pregnant women, postpartum and breastfeeding mothers, and children up to five years of age. Participants receive benefits after being seen at a WIC agency to determine residency, income level, and nutritional risk. WIC provides funds on an EBT card that allows purchases of certain food groups, including breakfast and infant cereal, baby food and formula, whole grain products, dairy, fruits and vegetables, yogurt, cheese, legumes, eggs, nuts, fish, and other designated nutritious foods. WIC also provides nutrition education and medical screening (USDA, FNS, 2017c). Several studies note how successful WIC is at improving nutrition status. One such study, conducted by Metallinos-Katsaras, Gorman, Wilde, and Kallio (2011), found that each additional WIC visit reduced food insecurity and that entering the program earlier prenatally improved food security. Herman, Harrison, Afifi, and Jenks (2004) found that WIC participants use benefits to buy higher quality foods, and Tester, Leung, and Crawford (2016) showed that WIC participants had better dietary scores than non-participants. Finally, the USDA and FNS

(2013) note that WIC is cost effective and improves birthing and diet outcomes, immunization rates, feeding practices, and cognitive development.

The FNS also funds another key program called the National School Lunch Program that provides subsidized meals at public and non-profit schools. Children from families making less than 130% or 185% of the poverty line qualify for free and reduced-priced meals, respectively. The government provides a certain amount of money per student based on their status as free, reduced price, or full price meals. Schools may also receive surplus food from the USDA. In return, the schools ensure that they meet certain federally mandated nutrition guidelines based on the most current Dietary Guidelines for Americans. During 2012, 31.6 million children received meals through this program (USDA, FNS, 2016a). Participation in this program has been shown to reduce food insecurity (Huang & Barnidge, 2016) and improve health outcomes (Gundersen, Kreider, & Pepper, 2012). The program also goes through periodic changes to improve itself, such as recent changes that led to an increase in the selection of fruit and consumption of vegetables and entrées in participating children (Cohen, Richardson, Parker, Catalano, & Rimm, 2014). However, one study identified did not show improved well-being (Dunifon & Kowaleski-Jones, 2003). The FNS also funds at least ten other programs that provide money or food for different populations to receive nutritious foods. Some programs focus on providing meals and community to elderly people, while others focus on providing fruits, vegetables, or milk to children. Money is also provided for emergency food assistance in local food pantries and soup kitchens, farmers market subsidies, and Native Americans (USDA, FNS, 2016b). Overall, these programs provide food and assistance to millions of Americans every year.



## *5.2. Education*

Education may be a powerful tool that can increase food security or behaviors that ease burdens on food insecure families. Additionally, after education programs are completed, families may continue to benefit without the need of recurring resource inputs. A study by Grutzmacher, Braun, and Anderson (2004) used data from 315 rural mothers and found that mothers in households that were food secure had higher food-related skills, including budgeting, managing bills, and stretching groceries. There are examples of intervention studies that assess the impact of education on food security. One such example from May, Brady, Offelen, and Johnson (2014) includes a nutrition education course that focused on cooking and shopping skills with rural, low-income parents in Minnesota. Using a pre-post survey to analyze the study, they found that participants increased their daily fruit and vegetable consumption, healthy food preparation and exercise behaviors, and self-efficacy to plan and prepare a healthy meal and prepare food items from scratch.

There are not many studies that assess the impact of nutrition education specifically on rural, food insecure residents. However, there are many studies that assess the impact on food insecure or low-income individuals in general. Kaiser et al. (2015) conducted a study with 3,744 SNAP or SNAP eligible Californians who participated in the Plan, Shop, Save, and Cook program. The program included four one-hour classes over one month addressing label reading, cooking, planning meals, and comparing prices. Participants also completed a pre-post questionnaire that assessed food resource management skills as well as food security status by asking how often participants ran out of food. It was found that one month after the intervention, participants with greater resource management skills ran out of food less often, an association that was significant for SNAP participants ( $p=0.001$ ). In another study, which

was conducted by Dannefer et al. (2015) in NYC farmers markets, researchers assessed the impact of the Stellar Farmers Market (SFM) program. This program was funded by SNAP-Ed, a program under SNAP that provides education. At 18 different markets, a team consisting of a nutritionist, a culinary educator, and a translator conducted classes that included a USDA-approved nutrition education lesson, a cooking example, and taste testing. Participants received \$2.00 coupons to spend at the farmers market for participating. Researchers split participants into three groups based on the number of classes they completed, including a group each where participants had attended no classes, one class, or two or more classes. The participants who attended two or more classes had significantly higher reported fruit and vegetable intake, were significantly more likely to try new fruits and vegetables and view eating produce as important, and had a significantly higher self-efficacy to prepare fruits and vegetables. Also, 97% of the participants who attended two or more classes purchased more fruits and vegetables, 93% prepared recipes at home, and 89% reported increased cooking skills. Finally, Eicher-Miller, Mason, Abbott, McCabe, and Boushey (2009) conducted the Food Stamp Nutrition Education program in Indiana with women in their homes or community locations. Compared to a control group that only completed the pre-post questionnaire, the participants who participated in the education program that focused on food insecurity and nutrition had a significant improvement in food insecurity ( $p=0.03$ ). Education is a powerful tool that can increase food security and improve diet quality that requires no additional resources after course completion.

### 5.3. *Community and Alternative Solutions*

Despite all of these public assistance programs, food insecurity still exists. Outside of large system changes like stimulating economic opportunity for low income families or encouraging farmers to grow cheaper, nutritious foods, local communities provide an additional layer to the public safety net. Specialized solutions are required for particular rural populations. Some possible solutions include food pantries, soup kitchens, community gardening, and partnerships with farmers.

#### 5.3.1. *Food Banks, Food Pantries, and Soup Kitchens*

The Emergency Food Assistance Program (TEFAP) is a governmental program run by the USDA (USDA, FNS, 2015). It purchases foods and distributes them to States and food banks, which then distribute these foods to pantries, churches, or soup kitchens. This is part of the public safety net, which provides “emergency” foods to those in need. These foods are meant to be available when families cannot meet their food needs. Other examples include *Meals on Wheels*, school children backpack food programs, and private and non-profit agencies. However, Riches (2002) argues that food banks are not adequate to address the deeper causes of food insecurity. Rather, he notes that food variety and quality are lacking in pantries, and this does not translate to a healthy diet. Additionally, food banks take responsibility away from the government to provide food to its citizens. Besides this possible detrimental effect, rural food pantries may also have other problems. Morton, Bitto, Oakland, and Sand (2008) found that rural households use food pantries and soup kitchens less often than urban participants and that rural households are more likely to cope with food insecurity by sharing resources socially. Additionally, some are coming to rely on food

banks and other emergency services to meet their daily needs rather than using them as emergency services, as intended (Weinfield, Mills, & Borger, 2014). Nooney et al. (2013) compared food pantry use and food insecurity in a rural community in 2012 with results from a study in 2004. They found that while the stigma commonly associated with food assistance in rural communities was lower after the recession due to increased necessity, food insecurity was higher despite higher SNAP and food pantry participation. Therefore, food assistance in its current form is not adequate in rural communities.

This is not to say that food banks, pantries, soup kitchens, and other relief programs do not perform a valuable service for many. Martin, Wu, Wolff, Colantonio, and Grady (2013) found that an innovative food pantry called Freshplace in Hartford, CT was successful in increasing fruit and vegetable intake and self-sufficiency while lowering rates of food insecurity. However, this food pantry was highly comprehensive, allowing members to choose what foods would be offered and attend self-development courses. Additionally, Olson, Rauschenbach, Frongillo, and Kendall (1997) compared differences between food insecure and secure women living in New York and found that food insecure women were much more likely to use pantries or use commodity foods. Finally, there are many non-profits that provide assistance. Feeding America, a nationwide network of food banks, provides three billion pounds of food and serves 37 million people annually (Echevarria, Santos, Waxman, Engelhard, & Vecchio, 2011). Care and Share, a smaller network in Southern Colorado, provided 19 million meals and distributed 23.7 million pounds of food in 2015 (Annual Reports, 2016). So, food assistance in this form ameliorates food insecurity but does not solve it.

### *5.3.2. Faith-Based Solutions and Community Gardening*

Partnering with local churches and community organizations is another way that stakeholders can improve the food environment. Roncarolo, Bisset, and Potvin (2016) discerned the short-term outcome differences between traditional interventions that provide immediate food and nutrition to the food insecure and innovative interventions that support community engagement and self-efficacy in obtaining nutrition. They found that food banks and similar “traditional” emergency services increase food security in the short term because their purpose is to provide emergency assistance. Additionally, innovative strategies like community gardens and kitchens do not support short-term benefits. These innovative strategies improve food security in the long term after community and trust have been built among the interveners and the community. This being said, community gardening is a viable option for supporting rural families, and this often occurs with the help of faith-based organizations.

Churches are in a unique position to alleviate food insecurity in rural populations. De Marco et al. (2014) conducted a CBPR study in which researchers from UNC Chapel Hill partnered with a Black church in rural North Carolina in a traditional tobacco farming area. Together, researchers, community partners, and church members applied for grants and received funding for the Harvest of Hope program, during which 38 garden workdays were hosted over 12 months. At any one point, 26 adults and 18 youth church members attended workshops. Adults expressed joy in the fellowship they received among each other and the researchers, and the youth expressed pleasure in learning something new. Many had never learned any skills associated with working outside. Increased trust in the community was developed over time. Finally, researchers saw themselves as integral in mobilizing the

church's resources to bring about positive change for the members. In another study, Carney et al. (2012) facilitated an academic-community partnership named Harvest Fiesta that was brought about by The Next Door Inc. and Oregon Health & Science University. It focused on creating family gardens among Hispanic farm workers living in rural Oregon. A total of 42 families enrolled in the program in which meetings were hosted where participants received materials and took lessons focused on gardening and protecting oneself from pesticide exposure during the workday. A pre/post survey on gardening, demographics, vegetable intake, and food insecurity was used to assess the program. Adults and children consuming vegetables "several times per day" increased from 18.2% to 84.8% ( $p < 0.001$ ) and 24.0% to 64.0% ( $p = 0.003$ ), respectively. Also, "sometimes" or "frequently" worrying about running out of food in the last month dropped from 31.2% to 3.1% ( $p = 0.006$ ). Finally, 94.9% of participants reported that the garden helped the health of the family, and the largest benefits seen were increased PA and economic advantages.

There are many examples of church gardens that fall outside of the scope of CBPR and other research projects. For example, The Big Garden is a group of 70 community gardens sponsored by the United Methodist Church (UMC) (Dunlap-Berg, 2017). This program supports church gardens in metropolitan Omaha and rural communities throughout Nebraska and Kansas. Another example includes rural churches supported through the Duke Endowment in North Carolina with a partnership including Duke Divinity School and the UMC (Webb III, 2017). The endowment has awarded \$3.6 billion in grants, 12% of which goes toward rural church development. This money supports community gardens in churches in food deserts, develops church food pantries, and supports statewide agricultural development and conferences. One example of a church that the endowment supports is the

Anathoth Garden, which was awarded a \$30,000 grant. The church garden grows myriad fruits and vegetables, supports beehives, has potlucks and playgrounds for adults and children alike, and spreads fellowship in the community.

In one study, researchers show that church-based interventions are appropriate for rural populations outside of the scope of food insecurity. Tussing-Humphreys, Thomson, Mayo, and Edmond (2013) split eight African American churches in rural areas of the Lower Mississippi Delta between intervention or control groups. Committees were created with pastors, their wives, and three to five church members. The intervention group received newsletters and had six monthly meetings that lasted 60 minutes that focused on increasing fruits, vegetables, low fat dairy, and whole grains; decreasing solid fats, added sugars, and sodium; and increasing exercise. The control group only received bimonthly newsletters on colds, stress, and food safety. Parameters measured included the 2005 HEI score calculated from a FFQ, a PA survey, and measurement of anthropometrics, blood lipids, and blood glucose. The study found that there were no differences between the control and intervention group for HEI scores or clinical and anthropometric outcomes. However, the intervention group saw an increase in self-reported PA. Additionally, in a subset of intervention participants with high participation, increases in all reported outcomes were significant over the control, including all components of the HEI score.

### *5.3.3. Farmers Markets*

There are other ways that rural food insecure people can obtain food. A good example of a non-traditional method of increasing access to healthy produce is support of local farmers markets. For example, a recent, growing trend allows SNAP recipients to use

their monthly allotment at markets that accept EBT payment. Between 2008 and 2016, there has been a 638.5% increase in redemption of SNAP benefits at farmers markets, which equates to an increase from \$2,740,236 to \$20,235,869 (USDA, FNS, 2017a). Kropf, Holben, Holcomb, and Anderson (2007) assessed the difference between women living in Athens County, Ohio who either received WIC or both received WIC and participated in the WIC Farmers' Market Nutrition Program (FMNP), which provides vouchers to spend at farmers markets. They found that the women who participated in the FMNP had a significantly higher vegetable intake over those in WIC alone. Also, 30.8% of those in the FMNP perceived their diet to be "Very Good or Excellent" compared to 15.9% of those who participated in WIC alone. In another study, McCracken, Sage, and Sage (2012) assessed the redemption of senior and WIC FMNP vouchers and SNAP redemption in farmers markets in rural and urban areas of Washington. They found that amounts redeemed through WIC and senior FMNP vouchers were at least three times greater in food deserts. Also, while some farmers markets in rural areas accepted vouchers or SNAP benefits, none of the rural farmers markets located in food deserts accepted them. This is compared to the 10 out of 15 urban farmers markets in food deserts that accepted benefits. These benefits increased the purchase of fruits and vegetables in the food insecure, but many rural people do not have access to farmers markets that accept benefits.

#### *5.4. Corner and Convenience Stores*

As discussed previously, rural populations often have lower access to supermarkets than urban communities. However, rural populations often have higher access to convenience stores. Liese, Weis, Pluto, Smith, and Lawson (2007) conducted a study in



Orangeburg County, SC, where 66.8% of the population is rural, to identify the types of stores and their product lines. They used The Licensed Food Service Facilities Database to identify all stores selling food in the county and checked these stores in person, adding to the list when they found additional stores. They also interviewed managers and checked availability of certain vegetables, fruits, grains, dairy, and meat or meat substitutes. They found that 74% of the stores were convenience stores while only 16% and 10% were supermarkets or grocery stores, respectively. They also found that supermarkets contained the vast majority of items, grocery stores contained around half of the items, and many convenience stores carried few or no surveyed items. In another study in two rural counties in Texas, Bustillos, Sharkey, Anding, and McIntosh (2009) found that supermarkets carried the widest selection of healthy foods, grocery stores carried a lower variety of fresh fruits and vegetables, and that convenience stores rarely carried fresh fruits and vegetables. However, they found that “dollar” stores carried the best variety of canned fruits and vegetables and whole grains and cereal products.

Because rural areas may house a large number of convenience stores, it is possible to use these already existent locations to increase access to fruits and vegetables for food insecure individuals living in rural areas. Multiple studies have assessed the feasibility of working with restaurant- and store- owners to improve selection. In one study in two rural communities in the Midwest, researchers chose one community each to serve as the intervention or control site (Martínez-Donate et al., 2015). One month after the program, an average of 5.4 and 7.5 interventions were still in place at restaurants and supermarkets, respectively. About 60% of customers were reached, and the food environment scores of the intervention restaurants increased significantly over the control. In another study in rural

Maryland, four small stores served as a control and four as intervention sites (Steeves, Penniston, Rowan, Steeves, & Gittelsohn, 2015). Through promotion of stocking 12 healthy items, researchers assessed the acceptability of changes six months after the program. They found that intervention storeowners kept stocking healthy items and that managers' perceptions of their ability to sell healthy foods increased. Almaguer, Law, and Young (2014) discussed a study in which the Philadelphia Corner Store Initiative and the Food Trust asked corner stores to commit to stocking healthier items and supported stores by donating shelving and refrigeration units. Though conducted in an urban area, they found that 660 stores enrolled, 25,000 healthier products were stocked, 478,000 customers were reached, a 60% increase in produce sales was seen, and participating stores saw increases in revenue. Finally, Gittelsohn, Rowan, and Gadhoke (2012) conducted a literature review and identified 11 urban and five rural convenience store intervention studies. Interventions commonly focused on promoting healthy foods, health promotion and marketing strategies, community engagement, store improvements, employee training, and pricing strategies. In most studies that measured each variable, sales of promoted foods increased, consumers were more likely to purchase intervention foods, store availability of healthy foods increased, health-related knowledge increased among consumers, and consumers had an increased recognition of healthy foods. Unfortunately, no changes in BMI or obesity were seen in the studies that measured it. Overall, intervening in small stores that already exist can be a cheap, easy way to increase availability and consumption of healthy foods for rural people.

### *5.5. Other Interventions*

There are other non-traditional coping strategies that food insecure, rural populations use to obtain food. The Alaskan government notes that hunting and fishing for most rural residents are essential for the populations' nutrition, food security, and economic safety (Subsistence Hunting, 2017). They call this subsistence hunting or fishing, and it is highly necessary for many. Olson et al. (1997) found that rural food insecure women are just as likely to garden, hunt, or fish as food secure women; however, it may be more of a necessity for rural women. They also found that the rural food insecure women were more likely to borrow money or have friends and family bring food to them. This is a common theme among rural populations. Ahluwalia, Dodds, and Baligh (1998) conducted focus groups among 141 participants. Though the study did not focus on rural people, they found that participants used family, friends, and neighbors for food assistance, information, and emotional support. Unfortunately, De Marco, Thorburn, and Kue (2009) found that while both urban and rural food insecure or low-income participants traded or shared food among family and friends, rural participants were much more likely to experience social isolation. During focus group interviews, many rural participants expressed that in times of need, they had no one to reach out to, unlike urban participants. Therefore, one strategy to improve food security among rural food insecure people, as discussed above, is to support interventions that build community and social networks.

## **6. Conclusion**

This paper has introduced food insecurity, especially as it relates to rural populations. In rural populations, food insecurity is compounded with other concerns. Food deserts place

strain on rural people to obtain adequate, healthy food. Health care may also be harder to obtain due to far distances to facilities, disparities in health insurance, lack of specialists, and high turnover. Rural people may also place distrust in those who are tasked with helping them. Finally, rural people face challenges with PA because there are fewer resources in the built environment along with many social and personal barriers. Lack of transportation may also play a role in reducing access to food and services. Overall, food insecurity has been associated with lower diet quality and higher incidences of obesity, chronic disease, and social or developmental problems. To compound these factors, different regions and populations face different challenges and have differing needs. A common theme among many studies included in this paper is the need for individualized interventions that address the unique needs of different areas. Outside of governmental aid and policy change, unique solutions to problems include education, food pantries or soup kitchens, community gardens, faith-based interventions, farmers markets, support of local convenience stores, and support of a sense of community.

This literature review has discussed food insecurity in the rural population. Next, an original research article is presented where focus group interviews with 24 members of two rural communities identify themes of food insecurity and barriers that community members face. Participants included both community members who received church aid in the form of meals and a food pantry as well as key stakeholders in two churches.

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## **Chapter 2**

Barriers to food security as explained by community members in two small Appalachian towns in rural North Carolina: A behind-the-scenes view through focus group interviews



Barriers to food security as explained by community members in two small Appalachian towns in rural North Carolina: A behind-the-scenes view through focus group interviews

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## **Conflict of Interest**

None

## **Authorship**

Conner Wallace was responsible for transcribing the second of three focus group interviews. Additionally, he read and coded transcripts and met with Lanae Ball, Adam Hege, and Cami Hubbard to confirm themes through the constant comparative method. In addition to this, he was responsible for writing and organizing the bulk of this paper. Lanae Ball, Adam Hege, and Richard Christiana were responsible for designing this study, including the focus group

interview questions and overall study design. Adam Hege and Lanae Ball also worked to secure funding for this study. Through Adam Hege and Jennifer Hege's connection between the university and one of the UMCs, the partnership that underpinned the project was made possible. It was also through the work of Howard Flemming that the church-university partnership was created. Finally, Cami Hubbard and Danielle Truesdale both transcribed one transcript each from focus group interviews one and three, respectively.

### **Ethical Standards Disclosure**

This study was declared exempt by the Institutional Review Board of Appalachian State University, and participants were provided an opportunity to consent to their participation. Once focus group recordings were transcribed verbatim, the recordings were erased to assure anonymity of research participants.

## **Abstract**

*Objective:* The purpose of this study was to identify and explain the barriers for rural community members to accessing adequate, healthy, and desirable foods.

*Design:* This qualitative study uses data from three focus groups obtained in a larger, mixed-methods study.

*Setting:* Interviews were conducted by a trained qualitative researcher. This study was accomplished in conjunction between Appalachian State University and two United Methodist Churches (UMCs) in two small towns nestled in rural Appalachia.

*Subjects:* Participants were selected among local community members that either attended or administered the local food pantry or soup kitchen hosted by either of the two UMCs. They ranged in age from young to older adult community members, and their unique viewpoints were made up of both those seeking aid and those delivering it.

*Results:* Multiple barriers to food access and contributors to food insecurity were identified across participants and interviews. Themes included limited availability of homegrown and local foods, the high cost for healthy foods, inadequate food and nutrition resources, trouble navigating the food environment, knowledge gaps, and social stigma, among a few other minor themes.

*Conclusions:* The multiple barriers identified here are characteristic of rural communities and show that much work is to be done to more fully address food insecurity in locations such as these. In addition to political and economic reform, many local solutions are possible using local resources. This study joins many others that illuminate the need for local and environmental solutions to food insecurity in rural areas.

**Keywords:** Rural, Food Insecurity, Barriers to Access, Local Food, Homegrown, High Cost, Nutrition Assistance, Social Stigma, Nutrition Education, Transportation Issues, Bureaucracy Surrounding Assistance, Healthy Food, Appalachia, North Carolina, Food Pantries, Soup Kitchens, Community Safety Net

## **1. Introduction**

Food insecurity is defined by the Economic Research Service (ERS), a branch of the U.S. Department of Agriculture (USDA), on a scale based on the answers households give to questions concerning their food access from the U.S. Household Food Security Survey Module (USDA, ERS, 2017). The guide equates food security with answers giving little to no indications that household members have limited access to food. While they may report anxiety over food shortages, no changes to the diet occur. By contrast, those who are food insecure report multiple indications of inadequate access to enough food of high quality and desirability. There may be reduced food intake and changed eating patterns (USDA, ERS, 2016). Recently, Coleman-Jensen, Rabbitt, Gregory, and Singh (2016) created a report using U.S. Census Data that found that 15.4% of rural households are food insecure, compared to 12.7% of all U.S. households, meaning that while roughly one in eight American households have trouble accessing enough food, the same is true for one in seven in rural locations.

Barriers such as a lack of resources and knowledge, disability, among others make accessing food more difficult. However, rural populations face barriers that are less common in urban environments. Transportation is a common problem for those living in rural areas. Andress and Fitch (2016) performed focus group interviews with rural women and found that sidewalks, part of the built environment, were inadequate. Another study, by Garasky, Morton, and Greder (2004), found that rural respondents were more likely to report that transportation was an issue than suburban or urban participants. Another key problem, which is related to transportation, is food deserts. Morton and Blanchard (2007) state that a county is a food desert if residents live farther than ten miles from a large food retailer, and 98% of food desert counties in the United States are in nonmetropolitan areas. Carnahan,

Zimmermann, and Peacock (2016) have shown that in rural Illinois, participants felt that there were insufficient grocery stores and travel times were too high. Another problem for rural populations is cost. Liese, Weis, Pluto, Smith, and Lawson (2007) conducted a study in rural SC and found that foods were much more expensive at convenience stores than large grocery stores, even though the former were more common. Food deserts are a common problem in rural counties.

Researchers have shown that food insecurity is associated with lower quality diets. For example, Lyles et al. (2013) found that food insecure diabetic patients had significantly lower fruit and vegetable intake, while Leung, Epel, Ritchie, Crawford, and Laraia (2014) found that very low food secure adults consumed more salty snacks, high fat dairy, sugary beverages, and processed meat. Additionally, food insecurity may also affect one's ability to eat healthfully. Sharpe, Whitaker, Alia, Wilcox, and Hutto (2016) found that food insecure women were more likely to engage in emotional eating. Food insecurity has frequently and strongly been associated with lower diet quality.

Obesity and chronic disease have also been researched extensively. Multiple studies show an association of food insecurity with obesity in women (Franklin, Jones, Love, Puckett, & Macklin, 2012; Adams, Grummer-Strawn, & Chavez, 2003) and food insecure adults in general (Bhattacharya, Currie, & Haider, 2004). In addition, food insecure populations have been found to be more likely to have diabetes (Seligman, Bindman, Vittinghoff, Kanaya, & Kushel, 2007), higher HbA1C levels (Seligman, Davis, Schillinger, & Wolf, 2010), hypertension (Jernigan et al., 2017), end stage renal disease (Banerjee et al., 2017), and hyperlipidemia (Seligman, Laraia, & Kushel, 2010). Unfortunately, because many of these diseases require medical management, food insecure people may struggle to afford

medications. Medication underuse has been found in those who are food insecure (Knight, Probst, Liese, Sercy, & Jones, 2016; Berkowitz, Seligman, and Choudhry, 2014). Finally, food insecurity may cause social and psychological problems and has been significantly associated with depression in mothers (Melchior et al., 2009) and cancer patients (Simmons et al., 2006). Additionally, behavior problems (Whitaker, Phillips, & Orzol, 2006) and lower academic scores (Jyoti et al., 2005) have been found in food insecure children.

By obtaining the realities that rural community members face, policy makers and key stakeholders might meaningfully address real problems. The focus group participants here are essential in understanding why some members of the community are not receiving enough high quality food. Because interviewees included soup kitchen leaders and food insecure members of the community, the need of this community can be elucidated from both sides. Participants discussed both why food access is an issue and possible solutions that would work for them. Therefore, the purpose of this study was to identify barriers to food access among a population of focus group participants in rural North Carolina to fully inform what barriers need to be overcome to address rural food insecurity.

## **2. Methods**

### *2.1. Research Design and Setting*

In spring, 2016, two United Methodist Churches (UMCs) in neighboring, rural North Carolina towns in the Appalachian Mountains decided to collaboratively address food insecurity. The two towns have populations of approximately 5,000 and 1,000 in a county of just above 82,000 (U.S. Census Bureau, 2016). In this county, only 76.7% of people attained a high school degree or higher, versus 85.8% in North Carolina. When comparing those with



a bachelor's degree or higher, 13.7% of residents meet the criteria, which is much lower than the state's 28.4%. Additionally, 15.1% of those under 65 live without health insurance, compared to the 13.1% for the rest of North Carolina, and the poverty rate is 16.2%, nearly 3% higher than the United States' average (U.S. Census Bureau, 2017). This rural area is in need of assistance in multiple public health areas, especially food security.

Prior to partnering, the churches worked separately to address food insecurity with a local food pantry at one location and a weekly free meal offered by the other. The larger church had also implemented a community garden. After collaborating, church leaders decided that they needed technical and evaluative assistance from university researchers. Both church leaders and university researchers placed a high value in hearing from local community members. The present study stems from a larger, mixed-method study that included surveying churchgoers and interviewing churchgoers and key stakeholders. In this paper, in order to gather perspectives on what barriers to food access were present, we use three focus group interviews that were conducted among 24 people who either received church aid or were key community and church stakeholders.

## *2.2. Participants*

Focus group participants were selected among people using either the food pantry at one of the churches or weekly community meals held at the other. Researchers sought participants from diverse backgrounds to more fully inform on the food environment. The first focus group (n = 6) included older participants using the church food pantry. It was anticipated that this group would give insights into barriers to food access for the aging in a rural community. The second focus group (n = 10), which was intended to include both those

who attended the free church meal and church members who prepared and served the weekly community meal, had a majority of people seeking access to the meal rather than church members. Participants ranged from young to older adults. Finally, the third focus group (n = 8), which took place at the weekly church outreach meal, had a mixture of church and other community members. It was possible to obtain more of an emphasis on the perspectives from church officials and community stakeholders. The makeup of this group also involved young and older adults.

### *2.3. Focus group design/content*

Researchers developed five core open-ended questions with probing questions following them that were asked in each focus group, though the first and fifth questions did not focus on food insecurity. The second question addressed issues with, or barriers to, accessing nutritious food in the community and the reasons behind these issues. The third question inquired into whether the community provided enough access to nutritious food. Included in this question was the stipulation on who in the community was at the highest risk of not having access to enough nutritious food. The fourth question, which ended the discussion on food security, focused on whether participants thought that people in their community had enough food, regardless of the healthfulness of the food. Participants were also asked why some did not have enough food and who they saw that were most affected by hunger. All focus groups were conducted by a trained qualitative researcher (AH) and lasted approximately 45 minutes. A \$10 cash incentive was provided at the end of focus group sessions, and all focus groups were recorded for future transcription.

#### *2.4. Data analysis*

Audio-taped focus groups were transcribed verbatim by three university students (CH, CW, DT) who were studying public health or nutrition. After transcription, two of the researchers (AH and LB) and two of the students (CH and CW) identified possible themes by independently reviewing and coding transcripts. Additionally, each member selected quotes that were representative of each theme. After individual analysis, the group of researchers and students met in person and utilized constant comparison to verify themes that each had discerned. It was found that there were minimal differences in interpretations. After this meeting, the four team members privately reviewed and confirmed the final themes. The findings indicate and highlight numerous underlying factors related to the issue of food insecurity in this rural area.

### **3. Results**

Multiple themes emerged showing the factors that contribute to food insecurity in this rural population. Generally, these themes encompass social, personal, economic, environmental, and political perspectives that limit food access.

#### *3.1. Lack of local and homegrown foods*

Many participants expressed dissatisfaction with the organization of farmers markets. Participants noted that farmers markets are less available by timing, location, and marketing than grocery stores and that some food is not grown in the area. A common trend throughout focus groups included the possible role of farmers in helping to alleviate hunger.

#1: People don't know where the farmers markets are. .... It's not publicized.

#2: And like, tomatoes, they're coming from Mexico and everywhere else...not locally grown. Most of the farmers market stuff is brought in.

One subtheme involves individuals in the community. Many participants noticed that while they gardened in the past, most families no longer grow significant portions of their food. Additionally, older participants have observed a decline in gardening skills in newer generations. Gardening could be helpful in both providing fresh produce and in providing a cheaper alternative to groceries.

We used to can a lot more, but they don't grow. They don't have grown food anymore. ... My grandchildren, we grow some things in pots, but it's just for them. They think it's amazing. ... We've lost that art ... to be self-sufficient.

### *3.2. High cost of healthy foods*

Two subthemes were identified relating to the high cost of healthy foods. Healthier foods are perceived to be more expensive while less healthy foods are seen as more affordable. Second, additional costs are associated with healthier foods, including time and skills like shopping, processing, and cooking meals. Additionally, many participants mentioned that fresh produce is perishable. It will be wasted, or more effort must be used to preserve the food.

When you're on a limited budget, fresh foods, the healthy food, are too expensive, but the junk food is less expensive. So, you can buy a bunch of junk food, and make that money stretch. But you're getting fat on the junk food.

We have a lot of fast foods. ... It's easy to go to McDonald's and get hamburgers... instead of cooking. Back then we used to cook a lot of vegetables and... what's good for you.

### *3.3. Inadequate food and nutrition resources and benefits*

This was the largest of the themes and a primary problem for these participants.

While the setting may have been confounding, since participants came from a church hosting community meals and the researcher inquired about barriers to food security, this was a large focus across participants in all three groups. This theme was divided into three subthemes. First of all, many participants expressed that governmental benefits were lacking.

And Food Stamps—they've cut them back so that even a whole family doesn't get what they need. ... And a single person like myself: who can live a whole month on \$20 worth of Food Stamps?

#1: How much in Food Stamps do you get?

#2: \$114.

#1: How much food will that give you?

#2: I can't get no meat because a pound of hamburger meat is six dollars. ... TV dinners, macaroni cheese, crackers. ... Most of it is unhealthy food, but it's something to eat.

The second subtheme showed that while participants use supplemental or emergency assistance, it is inadequate. Many soup kitchens and food pantries stock unhealthy foods due to affordability, and donations may be unhealthy. Secondly, these organizations are not designed to meet such a large need in the community.

I know sometimes when I go for my boxes of food ... they put in mostly what I call 'junk foods'—cookies, candies,...crackers,... with peanut butter and all that on there. ... It's not actual ... food... for everyday consumption.

Churches look at it as Crisis Assistance that we're here to get you through a rough spot. But the greatest need is people that need supplemental assistance. 'I need this all the time, every week.' ... Helping agencies struggle because they're not really set up for that.

The third subtheme is the juggling of health care, insurance, gas, rent or mortgage, among other costs that compete for food dollars.

My husband [has] got now all this medication for his stomach. ... One of em, ... was \$200 out of pocket. And my husband said to me, “you shouldn’t a bought it...I would have done without... If it’s ... above \$50, do not buy it.”

I’d have access to ... better quality food, the fruits and vegetables that I love, but my health insurance is killing me.

#### *3.4. Trouble navigating the food environment*

Trouble navigating the food environment includes difficulty in overcoming the built environment, vulnerable populations, and bureaucratic barriers. First, transportation is a major issue in rural locations. The first quote below shows the perseverance one must possess to work or obtain food when transportation is limited. The second quote notes the other financial obligations that transportation carries.

I’m walking. ... I don’t have a vehicle or anything. So, I got no other choice. You either got to get out there and walk if you want it bad enough, or you don’t.

They can’t get there from here. Lenoir is not that far away, but it is far away for gas money. ... That leads to other things like insurance, a cost of a car.

The second subtheme includes vulnerable populations. Children were frequently noted as being at a disadvantage based on parental purchasing behaviors, including food

choices and spending resources on alcohol. Other vulnerable populations included disabled people and seniors, who may have to stop driving due to the costs related to owning a car and declining abilities to perform physical work.

There is a large amount of seniors that don't have the access [to healthy foods] because they either had to quit drivin, because of whatever health issue they have, or they've never driven.

Other vulnerable populations include anyone with impairments that lower cognitive, physical, or social abilities, which inhibit traveling and planning. As the woman mentions below, a blind man would have more trouble than someone with sight.

I remember a gentleman ... [who] was blind, and how easy was it for him to get one location to another? ...He used public transportation, but still. If you're incapacitated in some way, shape, or form ... If you can't get to that location, you can't get there.

Finally, bureaucracy surrounding receiving benefits or visiting food pantries and church meals can be overwhelming. Participants discussed that the mobile food pantries always run out of food because people can come unhindered. In the second quote, they discuss having to bring several documents that one would otherwise not carry. This is especially problematic for homeless people who might not possess these documents.



#1: Those mobile food pantries, you don't have any paperwork, right?

#2: Right. So, you can go to the mobile food pantry and still go to [name of specific community food pantry] in the same month. ... You can go to a couple mobile food pantries because ... they designed it that way intentionally.

#1: To get help, unless you go to a church, there's so many steps. You have to do this first. You have to have an ID do this.

#2: You have to go through an Act of Congress.

#3: ... You have to have that paper with your address, ... social security card, ... information on a landlord, ... run through a list of all your bills.

### *3.5. Knowledge Gaps*

In general, participants noted that knowledge is important across a large range of topics. Three common subthemes were chosen, and representative quotes are seen below. Participants called attention to the need for nutrition and cooking education. Additionally, changing family dynamics hinder some people. As seniors age and their children leave home, many are left alone. Additionally, some had trouble when moving to a rural area with finding grocery stores and supplemental assistance.

I think that the education of what is healthy and what is not healthy is a very pressing problem. ... No offense to the church ... but I know that something better for us to have had would have been fresh vegetables, not anything fried. So, I think education is a big, big part of it.

I think what would help is if you could educate the people on how to use ... healthy things. [Kale is] one of the best things you could possibly eat. But I stayed away from that stuff. ... If you eat it raw, it tastes terrible. ... But once you learn what to do with it ... you can learn that.

I have to do it because there's nobody there ... to do anything for me. ... I can't send somebody to the store. I can't get in the car and just take off ... like I did. My kids live in other states.

### *3.6. Social Stigma*

Finally, social stigma associated with receiving aid was a major deterrent for both children and adults.

#1: I think some of it's got to do with pride. We got a neighbor who's got a bunch of kids, and they won't ask for nothin.

#2: ... I won't ask for anything. I'd have to be dying before I'd ask.

They identify the kids that get the free meals and ... those kids get teased ... at school because that's the way kids are and the way people are in general. They know the kids that are getting subsidized and ... free food. So, it's a social issue ... especially for children. ... It's like a persecution thing.

It was important to us, when we developed this [name of local soup kitchen], for this not to be where the poor people eat. It's where we all eat! Nobody pays. ... Everybody eats here and we're fellowshiping. ... A lot of others, though, like the soup kitchen, there is a stigma for showing up ... to get a meal. You know, that's where the poor people are.

### *3.7. Other Themes*

Several other themes, including distrust in the community; absence of economic opportunity; and mental health for homeless people, drug and alcohol addicts, and veterans was brought up, but there was not space here to discuss them at length. Distrust in the government may have been a novel finding here. Distrust is well documented in rural settings, but most studies have focused on distrust with the healthcare system and researchers. In this study, participants commonly expressed distrust in governmental regulations on farmers, grocery stores, and restaurants in donating food. Also, distrust in those who abuse the welfare system by obtaining food and benefits that they do not need or by selling benefits for drugs and alcohol prevented a few participants from seeking aid. This was not a main focus of this paper, though, because distrust alone was not a main barrier that actually prevented most people from accessing food and benefits. Along with inadequate

benefits, many expressed that they wanted to purchase more or better food, but unemployment or low pay limited household income. Lastly, mental health usually came up when participants were discussing concern for children. Veterans were highly discussed in one focus group, and diminished mental health may lower the ability to apply for benefits, purchase and prepare foods, and free oneself from addiction. However, many of these themes apply to both urban and rural environments, were not discussed at length, or were limited to one focus group, so they were not fully discussed.

## **4. Discussion**

### *4.1. Summary of results*

These results line up strongly with other studies. These participants felt that the lack of homegrown foods and limited access to local farmers and markets lowered the amounts of produce that they could access. Additionally, the cost of healthier foods was seen as much higher than processed and fast foods. Participants also reported a lack of resources and benefits, including a lack of economic opportunity, income, SNAP, and other benefits like health insurance or disability. Additionally, these participants had trouble navigating the food environment, meaning that transportation was difficult for some, while others had difficulty in the process of receiving benefits, including bringing necessary materials and knowing how to apply for of benefits. Knowledge gaps were various and included a lack of cooking, shopping, nutrition, and gardening knowledge. Finally, stigma was a major concern expressed throughout the interviews. This was expressed as waiting to apply for benefits until there was no other choice as well as feeling unwelcome. There was also a concern for schoolchildren who feel uncomfortable receiving free and reduced lunch.

#### *4.2. Comparison to other studies*

The results of this study align with many other studies. The lack of local and homegrown foods is a common barrier among rural participants. Buck-McFadyen (2015) conducted in-depth interviews with women in rural Canada, and found that several relied on gardening and preserving produce. In focus group interviews by Yeh et al. (2008), older adult participants from rural North Carolina and urban Connecticut described a transition from when they were younger in which free, homegrown produce has been replaced with expensive produce in grocery stores. Additionally, buying local foods from farmers markets is a growing trend. Between 2008 and 2016, there has been a 638.5% increase in SNAP benefit redemption at farmers markets (USDA, FNS, 2017). McCracken, Sage, and Sage (2012) assessed the redemption of senior and SNAP Women, Infants, and Children (WIC) Farmers Market Nutrition Program (FMNP) vouchers and SNAP throughout urban and rural Washington. They found that redemption through the FMNP programs was three times higher in food deserts. Unfortunately, none of the rural farmers markets in food deserts accepted SNAP benefits, in comparison to 66% of urban farmers markets that did. While local and homegrown foods present a viable solution for food insecure individuals, these practices are less available for rural people.

The high cost of healthy foods is another barrier for rural, food insecure people. Liese et al. (2007) found that foods in rural South Carolina were much more costly in convenience stores, which are more available in rural areas. In a quantitative study, Hardin-Fanning and Rayens (2015) compared the costs of different foods in a rural food desert county versus urban and impoverished counties in Kentucky. They found that average cost was highest and nutritious foods were significantly more costly in the rural county. In one

last mixed-methods study, Valdez, Ramírez, Estrada, Grassi, and Nathan (2016) found that, though produce was plentiful in rural Central California, Latinos employed agriculturally still reported that the cost was too high.

Inadequate food and nutrition resources and benefits is another theme, though there are not many papers about food insecurity and benefit levels as they relate specifically to rural populations. One review by Dinour, Bergen, and Yeh (2007) discusses the food stamp cycle, which is the tendency of those who receive SNAP to overeat after receiving benefits then to under consume when resources deplete. A report by Furman, Munoz, and Black (2015) found that current SNAP benefit levels are inadequate for families, as evidenced by declines in energy intake by ten to 25% over the course of the month. Families must also decide to pay for certain necessities over others. Andress and Fitch (2016) conducted focus group interviews in rural West Virginia and found that respondents often ran out of WIC benefits, chose between paying bills and buying food, and planned shopping trips around benefit receipt. Additionally, some pantries and soup kitchens struggle to provide high quality foods. Hoisington, Manore, and Raab (2011) found that one third of foods distributed by the Oregon Food Bank were condiments, baking supplies, discretionary foods, or combination foods and that fruit and milk were lacking. Two studies (Duffy, Zizza, Jacoby, & Tayie, 2009; Robaina & Martin, 2013) have found that food pantry users do not have high diet qualities. Overall, those who are food insecure struggle with the current amount of benefits they receive, and assistance from food pantries and soup kitchens may provide low quality foods.

Trouble navigating the food environment has also been described in the literature. Transportation and food deserts are well-characterized barriers for rural people. Several

studies (Andress & Fitch, 2016; Garasky et al., 2004; Carnahan et al., 2016) discuss rural participants and their lack of transportation, inadequacy in the built environment, and long travel times. Disability also reduces access to the food environment. Webber, Sobal, and Dollahite (2007) interviewed 28 families and found that grocery shoppers must possess stamina, flexibility, and strength. Without these physical abilities, which diminish with chronic disease and disability, shopping becomes more difficult and households must rely on others. Additionally, disabilities such as blindness, deafness, and difficulty breathing hinder transportation as well as increase stigma when publically shopping. In another study, by Wolfe, Olson, Kendall, and Frongillo (1996), 41 seniors from rural New York were interviewed. Due to chronic disease and physical disability, shopping for and preparing foods became more difficult. One finding in the current study not found in the literature is the concern for children, who must rely on parents for food access. Finally, the bureaucracy surrounding receiving aid has been described. FitzSimons, Weill, and Parker (2004) note that many families are unaware that they could receive benefits and that having to physically visit the office lowers access to working adults. In a focus group based study by De Marco, Thorburn, and Kue (2009), participants expressed that the paperwork and hassle of dealing with governmental offices makes applying for benefits difficult. Christaldi and Castellanos (2014), who also conducted focus group interviews, found that food pantries were inadequate in that they had inopportune operating hours, that they could only be accessed infrequently, and that there were too few options.

Knowledge gaps increase barriers to a multitude of health problems, including access to nutritious foods. An exhaustive report by the “Committee on Examination” (2013) summarizes multiple studies showing that low-income people know that healthy eating is

important, but SNAP participants report low confidence in their ability to prepare healthy foods. Planning, shopping, and preparation are necessary skills for healthful eating. Additionally, they found that level of self-confidence translates into the quality of the diet. De Marco et al. (2009) found that participants have difficulty in determining their eligibility and in applying for benefits. Better knowledge of different assistance programs seemed to determine which ones people applied to. In a literature review by Gorton, Bullen, and Mhurchu (2010), nutrition knowledge as well as food preparation and financial skills were found to be essential for food security. Withers and Burns (2013) discuss Seed to Supper, a community project that teaches gardening skills to low-income people living in Portland. In this urban environment, gardening classes and community engagement increased food security through increased food literacy, gardening skills, and community. In one final study, Gundersen and Garasky (2012) used telephone interview data to determine the effects of household financial management skills on food insecurity. They found that both the use of specific financial management skills, and confidence in those skills, were significantly, negatively associated with food insecurity. In multiple areas, knowledge improves food security.

Finally, social stigma is another well-documented feeling in rural environments. De Marco et al. (2009), in private interviews, found that rural participants reported that stigma and embarrassment were primary reasons that participants would not use soup kitchens or food pantries. In contrast, Wolfe et al. (1996) found that rural seniors felt stigma associated with receiving governmental assistance, though this did not carry over to soup kitchens or pantries. Contrarily, urban participants expressed the need for more governmental benefits. In another study, Smith and Morton (2009) reported that some rural communities perceived



use of SNAP and food pantries as undesirable. In an exhaustive report by Gabor, Williams, Bellamy, and Hardison (2002), focus groups among seniors in Washington showed that stigma and pride were the primary reasons participants did not apply for Food Stamps. Zekeri (2007) interviewed rural, Black, Alabaman mothers and found that they preferred employment to welfare for their livelihood. Stigma and pride are major deterrents from seeking assistance, as rural people do not want to appear that they are greedy, desperate, or lazy.

#### *4.3. Strengths/Limitations*

One major strength of this study includes the multiple areas of expertise that the research team possessed. Professors and students working on this project had backgrounds in community nutrition, public health, and exercise science. Overall, each supported the other members with their respective knowledge when developing themes. Additionally, the question guide had a primary focus on food insecurity, so the transcripts hosted a wealth of information concerning this issue in the community. Another strength was the agreement across three different interviews with community members with roles varying from members in need of aid to those providing it. Of the quotes involved in this study, eight came from FG1, six from FG2, and seven from FG3. There was a good distribution of information, and stakeholders and those receiving aid both supported themes.

One limitation of this project could be a lack of quantitative data and computer coding of the transcripts. While all researchers came to similar conclusions, software coding could further support the findings. Another limitation might include the close relationship the interviewer had in the church community before the study commenced. If any

participants had a good idea of the research topic and held the interviewer in high esteem, there could have been a tendency to provide information that aided the researcher.

Additionally, though the study locations were in small towns, the sample size was very small and stemmed from those already receiving aid. While this may have increased their ability to discuss the needs of the community as they relate to assistance, it also may have made the data less generalizable to other locations, though other studies do agree with findings here.

#### *4.4. Discuss future research needs and possible intervention*

One novel finding here was that distrust in the government and community create frustration with the food environment, so more research should be conducted to discover if this translates to lower food security. Developing community trust and giving rural participants a voice might dissolve this barrier, even if no policy changes were made to alleviate the underlying cause. Other research projects might include investigating whether giving more nutrition benefits increased food security more. Additionally, designing assistance that has a lower tendency to cause stigma would be useful in rural communities. As one member said, they designed their program so that all members ate for free, regardless of need. Finding more ways to reduce stigma could increase access to resources that are already available.

More research is needed on food pantries and soup kitchens in rural environments to determine which ameliorate food insecurity the most. It would be useful to know why some pantries are preferable over others, what their donation and food purchasing strategies are, and how they make themselves more available to the community. In addition to private and community assistance, public assistance is of critical importance in rural areas. SNAP

benefits have been shown to improve food security, yet participants here still feel that the amount is inadequate for a healthy, desirable diet. Due to the state of political change during recent events, it is likely that SNAP funding will be reduced. This change would devastate rural communities that rely on this food assistance. Finally, it would be interesting to see if providing solutions specifically requested by this community could increase food security. For example, if a local government changed laws surrounding food donation by restaurants or if a health extension office provided nutrition education on topics requested by the community, would this increase access to food?

#### *4.5. Conclusion*

Several barriers identified here agree with many other studies. This includes a lack of local and homegrown food combined with expensive foods sold in stores. Additionally, inadequate benefits and employment reduce the resources available for food. As in many other rural locations, trouble navigating the environment and social stigma make obtaining food and benefits more difficult. Finally, nutrition education could be a key solution in increasing this communities' ability to utilize resources it already has. Overall, many barriers to food security were identified here by both stakeholders and the food insecure. These problems must be addressed in order to increase the welfare of rural communities such as these.

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