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To have and have not: Household determinants of food insecurity by age in a sample of Iowa food pantry recipients

Kristin Marie Towers
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To have and have not: Household determinants of food insecurity by age in a sample of Iowa food pantry recipients

by

Kristin Marie Towers

A thesis submitted to the graduate faculty in partial fulfillment of the requirements for the degree of

MASTER OF SCIENCE

Major: Human Development and Family Studies

Program of Study Committee:
Steven Garasky, Major Professor
Peter Martin
Kimberly Greder

Iowa State University
Ames, Iowa
2009
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Abstract

As the United States population ages and their healthcare needs grow it is necessary to examine health-related issues experienced by this population. Food insecurity is one such issue impacting not only older adults but the general population as well. Working to better understand determinants of food insecurity and what factors may protect against it may help in the fight against it.

Cross-sectional data from a survey studying food pantry clients living in four Iowa counties were used to (1) explore what household characteristics may increase the likelihood of experiencing food insecurity and (2) identify what resources may protect against it. The sample was divided into two age groups, those younger than age sixty and those age sixty and older, allowing for a deeper understanding of how food security may differ between age groups. Binary logistic regression was performed to assess the relationship between the dependent variable, household food security status, and multiple independent variables including health status, income, home ownership, employment, employment of household members, Supplemental Nutrition Assistance Program (SNAP) participation, housing assistance participation, and food pantry clients. Control variables included in the regression analysis were total number of household members, and the age, gender, and education of the respondent.

Hypotheses were partially confirmed. Independent variables significantly related to the household’s food security status included the health status of the respondent, household income, SNAP participation, food pantry participation, receiving housing assistance, and the gender and age of the respondent. Respondent health status was the only independent variable significant for both age groups potentially indicating the costs of meeting one’s health care needs may impact
meeting the household’s food needs regardless of the age of the household head (i.e., the survey respondent). It should be noted that it is possible that other relationships between the independent variables and food security existed; however, they occurred to such a small degree that they were not captured in the regression results. Despite limitations such as the sample being drawn through convenience sampling and generally lacking representativeness, these findings do offer guidance for future research.
CHAPTER 1: INTRODUCTION

Objective of the Study

The purpose of this study is to investigate the relationships among household characteristics and food insecurity as experienced by households in Iowa. Additionally, the study examines how certain household resources such as income and/or participation in various assistance programs, including the Food Stamp Program\(^1\), food pantries, and housing assistance, may influence food security status. A more in-depth examination investigates how these relationships may differ when comparing households with survey respondents who were age sixty years and older and those with respondents younger than sixty. Although research shows that older adults are less likely to experience food insecurity compared to those who are younger, the rapid growth of the older population paired with the severity of the consequences of food insecurity for this group result in this being an issue of concern.

Significance of the Study

Although older adults are more food secure than the general population, the issue of food insecurity among older adults is important for several reasons. First, it is necessary to investigate the experiences of older adults as a result of the numerous additional risks for further health complications they face (Lee & Frongillo, 2001). Older adults already utilize health, medical, and other services more than the general population. An inability to receive adequate nutrition may only lead to additional physical, emotional and/or economic hardships. This impacts not only the individual, but the individual’s formal and informal caregivers, as well as the health care system and economy as a whole (Lee & Frongillo, 2001).

Also, demographic changes related to older adults make this issue necessary for examination. Currently older adults, or those age 60 and older, make up about 20% of the U.S. population, but by the

\(^1\) As of October 2008, the federal Food Stamp Program is now referred to as Supplemental Nutrition Assistance Program (SNAP).
year 2025 this percentage is expected to reach 28%; this totals about 70 million older adults, which is twice the number of American elderly that were living in the United States in 1996 (Sharkey, 2008). Iowa, the state in which this study was conducted, has historically been ranked among the states with the highest proportions of older adults, ranking second in the nation in the percentage of individuals over age 85 and fourth in the percentage of individuals age 65 and older (Census Bureau, 2009). This is of special concern as many of the estimated 75 million aging baby boomers composing this group lack sufficient retirement funds and are therefore at risk to becoming impoverished (Cawthorne, 2008). Furthermore, it is expected that certain elderly subpopulations are on the rise as the number of elderly grow; these include minorities, the poor, those living alone, and the ratio of women to men (Sharkey, 2008). This will no doubt put a strain on public health care as those depending on public assistance continue to experience serious health problems and utilize health services. Currently, the proportion of elderly categorized as at risk for adverse health outcomes and high service utilization is between 5-10% of the Medicare population, however, they account for a much higher proportion of the population's total healthcare utilization with estimates as high as 60% (Sharkey, 2008). This is of great concern because as the aging population grows so do their health care needs.

**Theoretical Background**

This research employs a systems theoretical perspective in order to understand the behavior and functioning of families. In this framework, a system is a set of objects, as well as the relationships between these objects and their attributes (White & Klein, 2008). Many sociologists recognize the family as an open, self-regulating, goal-seeking, ongoing system (Broderick, 1993). However, individual families are distinguishable by their unique structural features, such as size, composition, and complexity, as well as the characteristics of individual members including age, gender, and health (Broderick, 1993).
A system is also distinguishable from its environment. Systems have boundaries, which act to control the flow of both information and energy between the system and its environment (White & Klein, 2008). The degree of permeability of these boundaries is one way in which a system can be defined; for example, an open system has less separation between itself and its environment and as a result is less private (White & Klein, 2008). On the other hand, an example of a more closed system would be an elderly person choosing not to enroll in SNAP due to privacy issues; this could be a result of stigma associated with the program and not wanting others to know about the difficulty they face in providing food for themselves.

The family system also interacts with other systems outside of it, creating a hierarchy (Boss, Doherty, LaRossa, Scumm, & Steinmetz, 1999). For example, when a person applies for SNAP benefits the family system is interacting with the community system. Those systems within the family, such as the marital couple, are known as subsystems, while those larger than the family, such as the community, are referred to as suprasystems (Boss et al., 1999). These suprasystems, or the larger environment surrounding the family system, also act to differentiate the family system through features that include the sociocultural and historical context in which the system exists (Broderick, 1993).

A key assumption of systems theory is that feedback occurs between systems. That is, the behavior of a system affects its surrounding environment and the surrounding environment affects the system (White & Klein, 2008). This creates feedback between the system and its environment, resulting in exchanges of inputs and outputs (White & Klein, 2008). The way in which systems exchange inputs and outputs is one way of conceptualizing the household’s relationship with its political environment. Broderick (1993) recognizes that policy decisions are made on various levels, including national government, state government, local governments, and even private businesses, all of which affect the family either directly or indirectly. This allows us to consider public policy as a suprasystem surrounding the household. Changes or new developments in public policy can affect a household in many ways, such as the benefits they may
receive, the rights they may have, or the eligibility requirements they may need to meet. In turn, the household affects the public policy process. This may occur through lobbying, voting, and participation in research, including providing data for this study. These exchanges create feedback between policymakers and the public.

An additional concept, equilibrium, describes the balance of inputs and outputs of the system. Homeostasis is maintained through constant feedback transforming the system’s output into system inputs under the control of boundaries. An example of equilibrium within a family is the balance of income and expenditures. Households must be able to limit their expenses from exceeding their income in order to avoid falling into debt. Should this equilibrium become disrupted conflict in the system arises (White & Klein, 2008).

Systems theory operates under several other central assumptions which help us to understand how certain factors may influence the household’s ability to meet their needs. First, it is assumed that all parts of the system are interconnected (White & Klein, 2008). This means that should one system experience a change the other parts of the system are impacted as well. For example, if there is a change in SNAP eligibility requirements, potentially eligible households would be affected as would current program participants should their level of benefits change. Additionally, microsystems are capable of affecting macrosystems as well. A second central assumption is that the system is greater than the sum of its parts. Within the family system, this means that couples or families living together are more than just a collection of individuals living under one roof; as a group they offer benefits to each other such as social support, protection, and companionship (White & Klein, 2008).

Other concepts related to systems theory are variety, adaptability and viability. Variety describes the system’s ability to use available resources to adapt to change or meet newly developing environmental demands (White & Klein, 2008). When living in a constantly changing environment, those systems with
more diverse resources have more options in adapting to change or new demands while those with fewer resources are less equipped, lacking the requisite flexibility or variety. Related to this, a central proposition of systems theory is that the adaptability and viability of a family is positively related to the level of variety in the system and therefore negatively related to conflict and tension in the system (White & Klein, 2008). This means that if one family possesses the willingness and resources such as emergency savings to deal with an unexpected expenditure they will be better able to adapt and will experience less conflict in comparison to a family that does not have the available resources to adapt.

It is necessary to state that although elderly individuals frequently live either by themselves or with only one other person they can still be viewed as a system as they possess many of the same characteristics as a “traditional” family system. For example, an individual living alone is distinguishable from his or her environment, must maintain equilibrium within his or her household, and strives to achieve variety in order to meet environmental demands. Additionally, an elderly individual interacts with his or her environment in much the same way as a traditional family. For instance, he or she must maintain boundaries, as well as exchange input, output and feedback from their surrounding suprasystems. For example, a food insecure elderly person’s system may receive input from their environment in the form of eligibility requirements for public assistance programs. In turn, she or he may exchange output with that entity in applying for that program’s benefits creating a feedback loop.
CHAPTER 2: REVIEW OF THE LITERATURE

Geriatric nutrition is becoming a growing issue as the number of aging adults and elderly individuals in the United States continues to rise. Inadequate nutrition among older adults is becoming a more serious problem as well, especially for those considered to be low-income or in poverty. In 2008, 9.7% of those ages 65 and older had incomes below the poverty line in comparison to 13.2% of the general population (DeNavas-Walt, Proctor, & Smith, 2009). However, if considering income-to-poverty ratios we may better capture those living with incomes near the poverty line as well; as a result, rates for the two groups are more similar. For that same year, the proportion of elderly at or below 125% of the poverty line was 15.9% in comparison to 17.9% for the general population. In fact, those 65 and older were more likely to have incomes at or below 125% of the poverty line than those between the ages of 35 and 64 years old, with only children and young adults more often experiencing incomes in this category (DeNavas-Walt et al., 2009). Additionally, in 2004 the annual median income for elderly households was $24,509, compared to $44,389 for all households (Food Bank for NYC, 2005). This means that although older adults may not be considered impoverished as frequently, they still struggle from limited incomes. Furthermore, the evidence relating poor nutrition and food insecurity to serious health consequences, overall health status, and the utilization of healthcare services is extensive. As a result, concern is mounting regarding how we will meet the growing health care and service needs of this population, especially for those with financial constraints.

Food Insecurity

Food security is defined as having access at all times to enough food to support a healthy, active life; this includes the availability of nutritionally adequate food as well as the ability to obtain personally desirable food in a socially acceptable manner (Campbell, 1991). Conversely, food insecurity is the “limited or uncertain availability of nutritionally adequate and safe foods or limited or uncertain ability to acquire acceptable foods in socially accepted ways” (Bickel, Nord, Price, Hamilton, & Cook, 2000, p. 6).
Households who experience food insecurity can be further categorized into two groups; low food security and very low food security. Individuals who experience low food security often experience uncertainty in access to food or reduced diet quality, variety or desirability; however, these households rarely experience disruption of normal eating patterns. Those who experience more severe food shortages are classified as being very low food secure, which is identified by frequently reduced food intake and disrupted eating patterns (Bickel et al., 2000).

**Measurement**

The instrument most commonly used to measure food security is the Household Food Security Survey Module (HFSSM; Wunderlich & Norwood, 2006). The HFSSM is just one portion of a larger instrument administered annually in the Current Population Survey (CPS), the Food Security Supplement. One of the primary objectives of the HFSSM is to provide a means for monitoring the estimated annual prevalence of food insecurity both nationally and state by state. These data allow for more informed decision-making by policy makers and for program development (Wunderlich & Norwood, 2006). The standard 18-item module, or core module, is able to capture the various combinations of experiences, behaviors, and food conditions for each level of food security observed currently in the U.S. using a variety of indicators (Bickel et al., 2000). These indicators fall into six general categories: anxiety regarding the household food budget and/or food supply, the experience of not having enough food and being unable to obtain more, perceptions of inadequate food consumption, adjustments made to normative food use, instances of reduced intake by the adults in the household, and instances of reduced food intake for children in the household (Bickel et al., 2000).

A shorter version of this module is frequently used when survey time and space is limited (Bickel et al., 2000). This version, consisting of a six question subset, is more easily implemented and readily interpretable. This allows for easier use on the local level and for more direct comparisons with the
standard benchmark USDA published national- and state-level statistics. Testing of the six indicators used in the subset shows only a slight loss in sensitivity and specificity in comparison to the core module (Bickel et al., 2000, see Appendix B).

Previous research has been conducted to test the validity of the HFFSM and it has been concluded that the HFFSM provides accurate and valid measurements of food security in the general population (Bickel et al., 2000). However, a report issued by the USDA does recognize that the core module does not capture all aspects of the conceptual definition of food insecurity but merely the central dimensions. Some elements of food insecurity, such as food safety, nutritional quality, and social acceptability of food acquisition are not captured. Additionally, questions in the module are phrased to emphasize financial limitations as the source of insecure conditions; this results in the failure to capture other sources of food insecurity including reduced mobility, disability, or impaired function for those who are ill or elderly (Bickel et al., 2000).

Other research provides evidence that the HFFSM fails to capture food insecurity in elderly households, resulting in an underestimation of the number of elderly who are food insecure (Lee & Frongillo, 2001; Wolfe, Frongillo, & Valois, 2003; Wolfe, Olson, Kendall, & Frongillo, 1996). Lee and Frongillo (2001) add that this underestimation occurs as a result of the unique “physical and socioeconomic conditions, perceptions, attitudes, and experiences throughout their life toward food problems” (pp. S98). Demonstrating this, most national studies that utilize the HFSSM consistently show lower food security rates for older adults in comparison to the general population. Locally conducted surveys focused exclusively on elderly food security, however, more often demonstrate a higher prevalence of food insecurity. This suggests that instruments including more concepts related to the experiences of older adults more accurately reflect their food security status (Lee & Frongillo, 2001). As a result, Wolfe, Frongillo and Valois (2003) have recommended an augmented HFSSM be used for measuring food security in older adults in order to better capture the influences these distinctive characteristics may have
on their perception of food security. The two main shortcomings they found were that the instrument did not capture the increased anxiety related to acquiring certain foods required for their health, such as those needed for therapeutic diets and, again, that the current module fails to address non-financial constraints to accessing foods, such as disability (Wolfe et al., 2003).

**Statistics**

Despite arguments that the HFSSM is inadequate at measuring food insecurity in older adults, it still provides the best national estimates available. In 2007, 88.9% of the general population was food secure while 11.1% were insecure at least once throughout the year (Nord, Andrews, & Carlson, 2008). Specifically for older adults, 6.5%, or nearly two million people, experienced food insecurity while 93.5% were food secure (Nord et al., 2008). It is likely that the lower food insecurity rate for older adults is partially attributable to the lower poverty rates for this population (Nord, 2002). As a result, when only considering the food security status of those below 130 percent of the poverty line the differences in food insecurity are less great. In 2007, 34.2% of all households with low incomes (below 130 percent of the poverty line) experienced food insecurity while 20.7% of households with an elderly member with incomes 130% below the poverty line experienced food insecurity (Nord et al., 2008).

**Table 2.1. Food Security Rates by Population, 2007**

<table>
<thead>
<tr>
<th>Food Security Status</th>
<th>General Population</th>
<th>Elderly</th>
<th>General Population Below 130% of Poverty Line</th>
<th>Elderly Below 130% of Poverty Line</th>
</tr>
</thead>
<tbody>
<tr>
<td>Food Secure</td>
<td>88.9%</td>
<td>93.5%</td>
<td>66.8%</td>
<td>79.3%</td>
</tr>
<tr>
<td>Food Insecure</td>
<td>11.1%</td>
<td>6.5%</td>
<td>34.2%</td>
<td>20.7%</td>
</tr>
<tr>
<td>Low Food Security</td>
<td>7.0%</td>
<td>4.1%</td>
<td>20.5%</td>
<td>12.6%</td>
</tr>
<tr>
<td>Very Low Food Security</td>
<td>4.1%</td>
<td>2.4%</td>
<td>13.6%</td>
<td>8.1%</td>
</tr>
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*Note.* Source: Nord et al., 2008
Causes of Food Insecurity

Identifying the root of food insecurity is necessary in order to understand its consequences, as well as to identify and develop programs and policies to combat it. Certain demographic variables have been identified as factors influencing whether a household experiences food insecurity. Evidence suggests that households with higher incomes, headed by a high school graduate, with at least one elderly household member and owning a home are least likely to be food insecure (Yen, Andrews, Chen, & Eastwood, 2008). Conversely, additional research has identified other common demographic variables that increase the risk of food insecurity. These include low and unstable income, unemployment and unstable employment, disability, family disruption, and a lack of community and extended family support (Nord & Andrews, 2003). According to Memmen, Bauer, & Richards (2009), food insecure households often tend to spend more on housing with about half of these households often forced to choose between purchasing food and making rent, mortgage, or utility payments.

Causes as Experienced by older adults

These risk-factors are not surprising when considered in the context of life for older adults. For instance, their income is often limited with many depending on pension and Social Security benefits, with the majority of seniors not working or retired. In fact, according to a report from 2005, over 65% of those 65 and over depend on Social Security for at least half of their income, while one-third rely on Social Security for over 90% of their income (Chapman & Ettlinger, 2005). An even larger proportion of older adults depend on Social Security; of those ages 75 and over almost three-in-four households rely on Social Security for over half of their income. This shows that the majority of older adults depend on Social Security benefits to maintain a basic quality of life. This is of special concern for two reasons. First, the current rate of savings for this elderly generation is historically low. Furthermore, as the aging population grows an ever-growing strain is placed on the Social Security system; if benefit levels were to drop many
households would struggle (Chapman & Ettlinger, 2005). Additionally, reliance on fixed-incomes provided through Social Security and pension plans results in elderly households struggling to make ends meet as basic cost of living increases (Food Bank of NYC, 2005). Although a rising cost of living may present challenges for all households, this is especially problematic for older households.

Further adding to this, as described earlier, often older adults experience disability or other functional limitations. Research shows that of those noninstitutionalized adults aged 65 and older 16% report having one or more chronic disabilities with most experiencing chronic health problems as well (Wolfe et al., 1996). This may result not only in difficulty accessing food and/or assistance, but in increased health and medical needs as well. Lastly, too often older adults experience social isolation. As a result, older adults may be limited in the availability of friends or other community members as further sources of support in accessing food. Research by Walker and Beauchene (1991) supports this by demonstrating a link between social isolation and dietary inadequacy.

In addition to lacking money to purchase food products, older adults face unique barriers less often experienced by other age groups in accessing enough food and adequate nutrition. Research has shown that food insecurity in older adults may result from one or more of the following: functional impairments, health problems, and/or limitations in the availability, affordability, and accessibility of food (Lee & Frongillo, 2001). Wolfe, Frongillo and Valois (2003) add that additional contributing factors include a lack of mobility due to a lack of transportation and an inability to use food because of health problems or disability. “Food use” describes issues related to food preparation, gaining access to food, and the ability to eat food available within the household (Lee & Frongillo, 2001). Food use is recognized as a vital component in maintaining food security and those who experience obstacles to food use are more likely to be classified as food insecure (Lee & Frongillo, 2001).
Also, as a result of health problems many elders require special diets with specific food needs (Wolfe et al., 1996); an example of this is those diagnosed with diabetes requiring diets low in sugar. Requiring these special diets often results in increased anxiety related to accessing needed foods, which is found to be higher in older adults in comparison to nonelderly. It is believed that this is because older adults are more aware of the influence their diet has on their health as well as any diet-related problems they may experience (Wolfe et al., 1996).

A new phenomenon attracting recent attention related to nutrition in older adults is commonly referred to as the anorexia of aging (Morley, 2001). This term has been coined to describe the decrease in food intake as individual’s age, not only in those experiencing health problems but those in good health as well. Often an increase in body weight is paired with this decrease in food intake as a result of a decline in physical activity and resting metabolic rate as well as a decreased ability in the body to break down fat that is experienced as one ages. Although a decrease in caloric intake may appear to be an appropriate response to the decrease in activity and slowed metabolism characteristic of aging, it often results in malnutrition (Morley, 2001).

The reasons for the physiologically driven decline in food intake are multifaceted (Morley, 2001). One factor identified in determining food intake is the decreased ability to taste foods, resulting in decreased palatability. Palatability is the introspective process of evaluating food based on pleasurable qualities. This is an important factor in determining the likelihood a person is to eat something and the amount they are likely to eat; the more pleasure a person experiences when eating something the more they are to continue to consume that food, both on that occasion and in the future. According to Morley (2001), virtually everyone experiences a decline in taste sensitivity as they age. This is likely because olfactory sensitivity, which is arguably the most important factor in determining taste, is known to decrease as we age. According to research, these factors play a significant role in reducing the quality of nutrients ingested due to altered food preferences as we age. Additionally, changes in the rate of gastrointestinal
emptying result in earlier saturation; as we age, gastric emptying of large meals is delayed. This means that as these changes occur older individuals begin to feel fuller faster, which leads to a decrease in food consumption and resultant nutrient intake. Additionally, because eating is often a social activity, older adults who live alone often experience a decrease in interest in eating meals when they are eating by themselves (Morley, 2001).

**Consequences of Food Insecurity**

According to Cass and Bower (1989), obtaining adequate nutrition is vital in promoting optimal physical and mental functioning in order to achieve the highest quality of life. When adequate nutrition is not obtained an array of consequences often follow. One challenge to examining the consequences of food insecurity not only in older adults but in the general population is that it is often difficult to distinguish food insecurity’s health-related consequences from those of its common risk factors, such as poverty (Siefert, Heflin, Corcoran, & Williams, 2004). Still, Hamelin, Habicht, and Beaudry (1999) have identified numerous consequences at the household level that fall into three general categories. The first of these, physical impairment, involves the experience of hunger, depleted energy sources, and illness. The second area, psychological suffering, includes increased stress levels and being forced to violate or go against societal norms and values. The final type of consequence of food insecurity is sociofamilial perturbations. This involves the modification of eating patterns or rituals, a disruption in household dynamics, and being forced to make changes in food acquisition and management strategies.

These consequences are found to be manifested in a variety of ways. For instance, someone experiencing high levels of stress or depleted energy intake may have difficulty focusing at work or school resulting in decreased performance. Additionally, as a result of the disruption to family dynamics it is common to experience irritability, anger, and strained relationships. In addition, Hamelin, Habicht and Beaudry (1999) identify various consequences of food insecurity on the societal level. These include:
impaired learning both in children and adults, a loss of productivity, increased healthcare, decreased constructive participation in social life, a threat to community harmony, as well as the promotion of socioeconomic inequalities and the potential decline of social and economic development (1999).

Consequences as Experienced by older adults

Food insecurity often results in a variety of consequences especially pertaining to older adults. According to Fuller-Thomson and Redmond (2008), food insecurity may result in both personal and social costs including the exacerbation of disease and disability, depression, strain to the individual and caregiver, increased hospitalization and use of healthcare services, and premature mortality. Research shows that nearly one in five older adults report having one or more chronic disabilities in addition to often experiencing chronic health problems (Wolfe et al., 1996). These disabilities and health problems may either be caused by or worsened by poor nutrition resulting from food insecurity. According to Sharkey (2008), poor nutrition may result in functional impairment which is often an antecedent to functional disability. Additionally, functional disability is a predictor of further decline in function, an increased number of acute illnesses and other health problems, as well as an increased likelihood for nursing home placement and increased risk of death. Poor nutrition may either trigger or accelerate functional decline through weight loss, loss of muscle mass and decreased strength, a decline in activity, and decreased walking speed and balance (Sharkey, 2008).

Elderly malnutrition may have significant consequences for national health-care costs. According to the Food Bank for NYC (2005), this is due to an increased need for costly prescription drugs, physician visits, and hospitalizations for malnourished older adults. As might be expected, the prevention of malnutrition is often significantly less expensive than paying for the consequences. For example, evidence suggests that the cost of staying in a hospital for one night is equal to the cost of supplying home-delivered meals to an individual for an entire year. Additionally, one year’s worth of meals costs only $1,325,
whereas one year’s worth of nursing home care costs approximately $40,000 (Food Bank for NYC, 2005). Clearly, the consequences of food insecurity can be costly.

Research shows that although most individuals over the age of 70 are reported to have good to excellent health, 80% of noninstitutionalized older individuals could improve one or more chronic conditions through proper nutrition (Posner, Jette, Smith, & Miller, 1993). Additionally, it has been estimated that between one third and one half of elderly individuals’ medical problems can be directly linked to poor nutrition (Cass & Bower, 1989). Clearly, if obtaining adequate nutrition is such a challenge for all older adults, it is no surprise that food insecure older adults suffer even more so due to inadequate nutrition. Lee and Frongillo (2001) also found that older adults who are food insecure are more likely to report less desirable health statuses and are at a higher nutritional risk. Even when controlling for several factors such as age, gender, race, education, and functional impairment, research shows food insecure elders to be 2.33 times more likely to self-report fair/poor health status and poor nutrition (Lee & Frongillo, 2001). Similarly, Cass and Bower (1989) have identified a positive correlation between poor nutrition and low income, suggesting that inadequate nutrition is more often experienced in households with limited financial resources.

Elderly who experience food insufficiency are found to consume significantly less nutrients than elderly who are food secure. Lee and Frongillo (2001) found that food insecure elders demonstrated significantly less intake of 12 nutrients, including energy, iron, zinc, Vitamins B-6 & B-12, protein, niacin, and riboflavin. It was also found that regardless of security status, the majority of older people fail to consume the recommended daily allowance (RDA) for 8 nutrients, including calcium, energy, and zinc. However, food insecure elders were even less likely to reach RDA levels, for some nutrients only consuming about two-thirds of RDAs. These findings are consistent with and further confirm the results of numerous preceding studies (Lee & Frongillo, 2001). For instance, Rose and Oliveira (1997) found that older adults who experience food insecurity are twice as likely to consume just 50% of the RDA for iron and
protein. Furthermore, on average, regardless of food security status, elders consume just 58% of their recommended dietary intake. Klesges et al., (2001) found that in a study of women, those who were food insecure were significantly more likely to experience anemia as a result of iron deficiency as well as lower levels of albumin.

Guthrie and Lin (2002) found that many older adults experience chronic nutrition-related health problems such as diabetes and high blood pressure. According to Sharkey (2008), older adults require additional micronutrients as a result of several health changes as we age. Common experiences include a decline in immune functioning, intestinal absorption, skin synthesis, renal hydroxylation, metabolic efficiency, and lowered estrogen levels. Additionally, aging persons experience a decline in the ability to secrete stomach acids as well as an increased use of pharmaceuticals, which both may affect the individual’s ability to absorb micronutrients (Sharkey, 2008).

Assistance Programs

Statistics show that of those elderly who are food insecure, 40% receive some sort of food assistance (Nord, 2002). A variety of federal assistance programs have been established to combat food insecurity. These programs are essential in filling income gaps for senior households, as research shows seniors will frequently pay housing and healthcare expenses before purchasing food (Food Bank of NYC, 2005). Examples of these programs include the Elderly Nutrition Program, the National School Lunch Program, the School Breakfast Program, the Special Supplemental Nutrition Program for Women, Infants, & Children (WIC), the Child and Adult Care Food Program, and perhaps most recognizable, SNAP (Robertson & Summers, 2000; Oliveira, 2009). Of all the Food and Nutrition Assistance Programs (FNAP), the largest portion of the allocated budget is devoted to SNAP; of the $60.7 billion spent in fiscal year (FY) 2008, $37.5 billion, or 62%, was spent on SNAP. Additionally, in 2008 over 28 million people received SNAP benefits each month, with an average monthly benefit of $101.53 per person (Oliveira, 2009).
### Table 2.2.  
**Federal Nutrition Assistance Programs, FY 2008**

<table>
<thead>
<tr>
<th>Program</th>
<th>Average participation (in millions)</th>
<th>Average benefit</th>
<th>Total annual expenditure (in billions)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SNAP</td>
<td>28.4</td>
<td>101.53</td>
<td>37.5</td>
</tr>
<tr>
<td>WIC</td>
<td>8.3</td>
<td>43.55</td>
<td>6.2</td>
</tr>
<tr>
<td>National School Lunch Program</td>
<td>30.5 (meals daily)</td>
<td>NA</td>
<td>9.3</td>
</tr>
<tr>
<td>School Breakfast Program</td>
<td>10.6 (meals daily)</td>
<td>NA</td>
<td>2.4</td>
</tr>
<tr>
<td>Child &amp; Adult Care Food Program</td>
<td>1.9 (billion meals)</td>
<td>NA</td>
<td>2.2</td>
</tr>
</tbody>
</table>

*Note. Source: Oliveira, 2009.*

**Supplemental Nutrition Assistance Program (SNAP)**

Despite the large amount of money supporting this program and the number of people participating, it was estimated in 2003 that only 56% of those eligible in the United States receive SNAP benefits (Castner & Schirm, 2005). Previous research has identified different groups that are more likely than others to participate in SNAP. Predictor variables identified by Biggerstaff, Morros, and Nichols-Casebolt (2002) include being a child under the age of eighteen, being a single parent, having low education, being a minority, being a woman, and being unemployed. Further evidence suggests that households with higher incomes, headed by a high school graduate, with at least one elderly household member and owning a home are also less likely to receive SNAP benefits (Algert, Reibel, & Renvall, 2006).

It has also been found that certain age cohorts are less likely than others to participate. In fact, repeated studies have found that older adults are less likely to participate than any other age group (Fuller-Thomson & Redmond, 2008). Reports show that less than one third of those elderly who are eligible receive SNAP benefits. Additionally, the participation rate of those nonelderly who are eligible is twice as high as compared to the general population participation rate (Fuller-Thomson & Redmond, 2008). As a result, although those aged 60 and above account for nearly one fifth of the United States population, they account for only one-tenth of SNAP recipients (Haider, Jacknowitz, & Schoeni, 2003). Additionally, although national participation in the SNAP program by older adults is low, it is even lower in the state of Iowa.
Research by Cunnyngham (2008) found that Iowa was one of just twelve states with a lower rate of participation of older adults in comparison to the national rate for all five years in which the study was conducted (2002 through 2006).

**Reasons for Nonparticipation**

Numerous studies have focused their efforts on identifying reasons for low program participation rates in SNAP. According to Martin, Cook, Rogers and Joseph (2003), it is important to identify why some choose to utilize food assistance and others do not in order to develop appropriate programs and policies to better address the needs of those eligible. It is hoped that through this we may increase participation rates and consequently improve the food security status of more households. First, barriers to information and confusion regarding eligibility, level of benefits, and program policies discourage potential participants from applying (Fuller-Thomson & Redmond, 2008). Many times these individuals simply feel that they do not need assistance or that the level of benefit would be inadequate. One study conducted by the Food and Nutrition Service found that the likelihood of participation increases as the level of benefit increases (Food and Nutrition Service, 2003). In fact, the ratio of benefits for participants in comparison to nonparticipants is estimated to be 1.21:1 (Food and Nutrition Service, 2003). Related to this, often individuals’ assumptions regarding the complexity of the application process and documentation requirements to determine eligibility may result in nonparticipation (Fuller-Thomson & Redmond, 2008). Furthermore, certain other obstacles may further discourage participation. These obstacles include a lack of transportation or difficulty reaching program administration offices as well as language barriers (Fuller-Thomson & Redmond, 2008). Lastly, a fear of being stigmatized for seeking social assistance often discourages individuals from seeking food assistance (Fuller-Thomson & Redmond, 2008).

In addition to these reasons for nonparticipation there are additional participation related issues experienced by older adults. First, older adults are likely to believe they are ineligible to receive benefits or
will receive a low level of benefit as a result of their owning significant assets and receiving steady income (Haider et al., 2003); however, these beliefs are often untrue. First, home ownership and most retirement plans are not counted against households as resources in determining eligibility. Additionally, benefits are often higher than expected. Monthly benefit levels are computed by subtracting 30% of the household net income from the maximum benefit allotment established by the USDA for that household’s size. Although older adults tend to live in smaller households, maximum benefit levels for smaller households can still add to household resources; for household of one up to $200 may be received per month and for households of two up to $367 may be received per month.

Additionally, some older adults may no longer have driver’s licenses or experience a disability which may keep them from reaching administration offices. Perhaps one of the most pronounced causes for nonparticipation for older adults in comparison to the general population is the sense of stigmatization. It has been argued that the perception of government assistance for older adults differs somewhat from that of younger generations (Greder, Garasky, Jensen, & Morton, 2002); this is said to be especially true for those who lived during the Depression era when “welfare” was for those who were especially needy. Lee and Frongillo (2001) agree, arguing that those who experienced the Great Depression have differing perceptions regarding what “being in need” really is. Additionally, many seniors were raised with a sense of pride in weathering hard times and place high value on the ability to be self-sufficient and responsible for meeting one’s own needs (Quandt, Arcury, McDonald, Bell, & Vitolins, 2001). As a result, this stigma is produced through a combination of factors including the individual’s life history, situation, and social audience (Fuller-Thomson & Redmond, 2008).

Haider, Jacknowitz, & Schoeni (2003) argue that it is important to understand the significance of this stigmatization to better project participation rates for the future. If this aversion to reliance on public assistance is a strong deterrent for the current elderly cohort, however it is less prevalent in the next cohort of elderly, we could expect a dramatic increase in participation rates and as a result must prepare for
increased SNAP spending as well as heavier participant caseloads (Haider et al., 2003). Gundersen and Ziliak (2008) argue that understanding participation rates by cohort is important because the next cohort to retire is the first to have grown up with SNAP in existence, resulting in its being more accepted as an appropriate means of assistance. SNAP became the national program that we know it today in 1974, which is just when the baby boomers were reaching young adulthood. In their research, Gundersen and Ziliak (2008) found that participation in SNAP by age groups is shaped like an upside down "U", with highest participation in middle adulthood and, overall, younger cohorts demonstrating higher participation in comparison to the oldest cohorts.

This becomes even more relevant when we consider the imminent aging of the vast baby boomer population; this factor may result in an even larger increase in eligible individuals and households than expected. If the same proportion of nonelderly who currently receive SNAP benefits were to be enrolled in the program as they reach old age, the number of elderly enrolled would reach 6 million by 2030, or twenty five percent of the number of total participants (Haider et al., 2003). This is nearly double the amount expected when holding age constant; when eliminating cohort considerations it is expected that those participating who are elderly will climb to 2.11 million in 2010 and by 2030 is expected to reach only 3.36 million (Haider et al., 2003).

**Food Pantries**

To help fill the food security gap additional food assistance programs have been established. More specifically, an extensive network of food pantries has been developed to aid those in need, offering assistance in the form of groceries to be prepared in the home. Food pantries often depend on food from local sources and private donations, and sometimes receive food from food banks or larger community-based warehouses (Daponte, 2000). Hours of operation for community food pantries often vary, as do eligibility requirements and the numbers of times per month clients are allowed to receive food (Ohls &
Saleem-Ismail, 2002). Food pantries also rely heavily on community volunteer labor. In fact, ninety percent of food pantries use volunteers in some way and seventy-five percent are staffed entirely through volunteers. This is likely because over two-thirds of food pantries are administered through faith-based organizations (Ohls & Saleem-Ismail, 2002).

One of the most recognizable food pantry networks in the United States is Feeding America (FA), formerly known as Americans Second Harvest (Cohen, Kim, & Ohls, 2006). In 2006, it was estimated that between 22 and 25 million unduplicated persons visited one of FA’s 29,700 food pantries. It should be noted that these numbers are most likely an undercount of those served, as there are numerous food pantries in existence outside of the FA network. In comparison to SNAP use, food pantry participation is somewhat low; however, it is on the rise. When polling food pantries in their network, FA found that 64.6% of pantries experienced a rise in clients served between 2001 and 2005 (Cohen et al., 2006).

Much has been learned about those who visit food pantries through FA. For example, most households visiting food pantries are small. The average client household size is 2.7 persons with two-thirds housing between one and three members and just 4% housing more than six household members (Cohen et al., 2006). Of those who utilize food pantries an estimated 70% are food insecure (39.1% are low food secure and 31.1% are very low food secure). Being food insecure results in difficult decisions regarding how to spend the household’s limited income. According to FA reports, 45% of patrons have to choose between purchasing food and paying utility bills, 37% must choose between food and paying rent, 34% choose between food and purchasing medicine, and 20% experience all three of these scenarios (Cohen et al., 2006).

Those who utilize food pantries are also found to be poorly educated, earning low incomes, and are in poor health. Of all client households, 39.6% had less than a high school education; this is over double the rate of the general population for not completing high school, which is 15.4% (Cohen et al.,
The average monthly and annual incomes were just $890 and $11,560, which is no surprise when only a reported one-third of these households had one or more adults employed at that time. Further compounding the problems of these families, one in three households reported having at least one member in poor health (Cohen et al., 2006).

One population especially at risk for experiencing poor health is older adults. Nearly one quarter of households visiting FA food pantries have an elderly member. Of those households with an elderly household member, 52.7% are food insecure, with 36.6% categorized as having low food insecurity and 16.1% being very low food secure (Cohen et al., 2006). Clearly, many families who receive SNAP benefits still require additional assistance. Somewhat surprising, however, is that although nine out of ten of all households utilizing food pantries are eligible for SNAP benefits less than half receive them; similarly, only 27% of those who receive SNAP benefits also receive food from community programs (Briefel et al. 2003; Nord et al., 2008). Research shows that elderly participants of local programs most often use these programs to substitute for, rather than supplement, participating in federal assistance programs, leaving them solely relying on food pantries for food assistance. It is estimated that only one half of households with seniors combine food assistance sources compared with two-thirds of all households (Briefel et al., 2003).

Much has been learned about those households that utilize food pantries to supplement their SNAP benefits; this helps us to better understand the relationship between different forms of food assistance programs. Of all FA clients, 36% receive SNAP benefits, 67% have applied, and 7.3% had received them in the past twelve months (Cohen et al., 2006). Many of those who visited food pantries and received SNAP benefits had participated in SNAP for an extended time; the average number of weeks clients had received SNAP benefits was 203.2 weeks (almost four years) and 49% had received benefits for over two years. It seems that households often seek emergency food assistance because their SNAP benefits do not last the entire month. According to FA the average number of weeks during the month over
which SNAP benefits last is 2.4. Additionally, 81.8% of households had their SNAP benefits last three weeks or less (Cohen et al., 2006).

The Emergency Food Assistance Program (TEFAP)

Food banks such as FA receive the majority of their food items through the Emergency Food Assistance Program (TEFAP; Food and Nutrition Service, 2009). Under TEFAP the USDA is able to purchase commodity foods and distribute them to families with low incomes through local agencies. The USDA determines how much each state should receive based on each state’s unemployment and poverty rates. Each state then distributes food to food banks, with each responsible for determining eligibility in their service area. This allows for those in need to be best reached. These food commodities are then either distributed as food packages or used in prepared meals in congregate settings. In FY 2008, over $178 million worth of commodities were distributed through TEFAP. In FY 2009, a significant increase in funding has been seen. A total of $399.5 million has been provided for purchasing food with an additional $74.5 million appropriated for administrative support for State and local agencies; this includes funds for the storage and distribution of commodity foods (Food and Nutrition Service, 2009).

Housing Assistance

Another form of assistance sometimes received by those who visit food pantries is housing assistance. According to FA, about one in five food pantry clients receive public housing assistance (Cohen et al., 2006). Housing assistance takes several forms, one of which is public housing. Through public housing eligible low-income, elderly and disabled individuals and families are provided with more affordable rental housing (HUD, 2007). Rent for those who are eligible is determined as a percentage of the household’s gross annual income and takes into consideration the number of dependents, elderly, and disabled individuals within the household. Additionally, there is no time limit placed on households participating in the public housing program. The program is administered through the Department of
Housing and Urban Development (HUD), which provides technical and professional assistance in the administration of public housing. More directly managing the units are local housing agencies (HAs). Approximately 3,300 HAs can be found throughout the United States, providing housing to approximately 1.2 million households living in their units (HUD, 2007).

Another form of housing assistance is the Housing Choice Voucher Program, commonly known as Section 8 (HUD, n.d.). Through this program, families with low incomes, older adults, and the disabled are given a larger selection of privately owned rental housing to choose from as households are able to select from rental housing and are not limited to units in subsidized housing projects. These vouchers are provided through local public housing agencies (PHA), which receive funds from HUD for administration. Once housing that is found to meet health and safety standards is selected, the PHA provides the landlord a housing subsidy on behalf of the participating household. The family is then responsible for paying for the difference between the rent charged and the amount provided through the program; this is usually about 30% of the household’s monthly adjusted gross income. Eligibility is determined by the total annual gross income and family size; generally the family’s income must be less than or equal to 50% of the median income for the county or metropolitan area in which they seek residency. The demand for housing assistance is quite high and as a result often exceeds the limited resources provided by HUD. Therefore, long waiting lists are common. Still, 1.4 million households are provided assistance in the United States through this program (HUD, n.d.), many of which experience food insecurity as well.
Research Question and Hypotheses

In an effort to better understand food insecurity and identify strategies for its prevention we must identify what characteristics and resources may keep families from experiencing it. Based on systems theory and findings from previous research, three hypotheses have been formulated to guide this study. Each hypothesis is summarized below, including a brief description and a listing of variables that will be examined in order to test the hypothesis.

Research Question.

What characteristics and resources contribute to the food security of households utilizing food pantries in Iowa?

Hypotheses.

It is hypothesized that relationships will be found between the following characteristics and the food security statuses in households visiting food pantries in Iowa:

A. The health status of the respondent is hypothesized to be related to the household’s food insecurity status such that a respondent in fair or poor health is more likely to reside in a household that is food insecure compared to a respondent that is not in fair or poor health (i.e., is in excellent, very good or good health). Survey respondents, the assumed heads of households, who indicate experiencing less desirable health are expected to more often experience food insecurity. The variable used to examine this relationship is the health variable. While this study investigates the uni-directional relationship of health affecting food security status, it is acknowledged that the relationship between health and food insecurity is bi-directional. This means that those who experience food insecurity are at increased risk for poor health and those in poor health are at increased risk for experiencing food insecurity. The health consequences of food insecurity were
previously discussed in detail, however, according to Campbell (1991), food insecurity may be both a consequence of food insecurity as well as a predictor. Regardless of which is the cause and which is the effect, a relationship between the two is expected. Health may be related to food insecurity due to a variety of factors. It is expected that this occurs because these individuals may spend more on health care or medication, may be less likely to work resulting in decreased income, and may experience additional barriers in obtaining food.

B. *The household’s financial resources are hypothesized to be related to the household’s food insecurity status such that a household with fewer resources is more likely to be food insecure compared to a household with greater resources.* It is hypothesized that when controlling for other variables increased levels of financial resources will result in increased food security. Variables examined related to this hypothesis include income, home ownership, employment, and employment of household members. As stated earlier, households who receive higher incomes and own their own homes are less likely to be food insecure (Yen et al., 2008). Therefore, a household that receives adequate income and possesses significant assets will less frequently struggle to meet their food needs. Nord and Andrews (2003) confirm the importance of income reporting that those with low and unstable incomes are more likely to be food insecure. They also add that those who are unemployed are at higher risk as well. This supports the researcher’s argument that employment of either the respondent or other household members may offer additional resources. For example, employment may result in certain employee benefits, such as health insurance. If health insurance is provided through employment the family does not have to utilize their own income to purchase health insurance privately.

C. *The household’s participation in assistance programs is hypothesized to be related to the household’s food insecurity status such that a household participating in more programs is less likely to be food insecure compared to a household participating in fewer programs.* It is expected that increased household participation in assistance programs will be related to increased levels of
food security. Variables related to this examination include SNAP participation, food pantry participation, and housing assistance participation. SNAP participation is expected to increase food security. This is because the household’s participation allows them to receive benefits, further contributing to the household’s resources. It is also expected that those who receive some form of housing assistance are less likely to experience food insecurity. According to Memmen et al. (2009), those who spend more of their income on housing costs are more often food insecure. Therefore, those who receive housing assistance should experience decreased housing costs and are therefore be able to devote more of their income to purchasing food. Lastly, it is expected that those who frequently utilize food pantries are less at risk for food insecurity. This is because these households are able to obtain food that they might not otherwise be able to obtain through their own means, further contributing to the household’s resources.

The remaining variables included in the analysis were control variables. These variables include total number of household members, age, gender, and education. Use of these variables allows for a more precise examination of the variables related to the specified hypotheses.
Figure 1. Conceptual Model of Hypotheses

Health

Household Financial Resources
- Income
- Employment
- HH Member Employment
- Home Ownership

Public Assistance Participation
- SNAP participation
- Food pantry participation
- Housing assistance participation

Household Food Security Status
CHAPTER 3: MATERIALS AND METHODS

The following information describes the data used in this study, with particular focus on those variables used as the dependent and independent variables in the analysis. Descriptions and frequencies of these variables can be found in Appendix C.

Description of Data

The data used in this study were obtained from a purposeful study of Iowa food pantry clients conducted by a research team in the Department of Human Development and Family Studies of Iowa State University. Their research was funded through the Iowa Nutrition Network, the Iowa Department of Public Health, and the USDA Food Stamp Nutrition Education Program.

For the food pantry study, questionnaires were distributed to food pantry clients living in four Iowa counties: Blackhawk, Polk, Scott and Woodbury. Staff at participating food pantries were asked to distribute surveys to all adults who received food from their pantry. Five waves of data were collected between the Spring of 2007 and the Spring of 2009. Information gathered from pantry clients related to their food security status, participation in assistance programs, the local food environment, employment and income, and personal characteristics. Data for this study are derived from responses to questions asked in these questionnaires. The questionnaires followed a similar format from wave to wave although small changes were made to the questionnaires over time. The questionnaires for each wave are provided in Appendix D, Appendix E, and Appendix F. Iowa State University Institutional Research Board approval of this study is provided in Appendix G.
Measures and Sample Characteristics

A total of 4,593 questionnaires were completed over the five time periods. Survey participants were divided into two age categories for this study. The first age group (N=3922) consists of those who indicated they were less than 60 years of age at the time the survey was completed. The second group (N=671) consists of those aged sixty and older. Age sixty was used as the determinant of elderly status for this study in an effort to best coincide with the classification of elderly status utilized by the United States Department of Agriculture in determining eligibility for SNAP (Food and Nutrition Service, 2000).

Table 3.1  Sample Sizes per Data Collection Period by Age Group

<table>
<thead>
<tr>
<th></th>
<th>Young (&lt; 60 yrs of age)</th>
<th>Old (≥ 60 yrs of age)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spring 2007</td>
<td>1228</td>
<td>176</td>
</tr>
<tr>
<td>Fall 2007</td>
<td>659</td>
<td>115</td>
</tr>
<tr>
<td>Spring 2008</td>
<td>607</td>
<td>139</td>
</tr>
<tr>
<td>Fall 2008</td>
<td>457</td>
<td>40</td>
</tr>
<tr>
<td>Spring 2009</td>
<td>971</td>
<td>201</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>3922</strong></td>
<td><strong>671</strong></td>
</tr>
</tbody>
</table>

Age was measured by asking respondents how old they were at the time of the completion of the questionnaire. Only those who indicated they were eighteen years of age or older were included in this study. The average age of all participants was 44.29 years with a median age of 45, a standard deviation of 15.9 years, and a range of 18-97. To no surprise, the group of those age sixty and older was more likely to indicate a higher age (M=70.58, SD=8.7) than the group of those younger than age sixty (M=40.11, SD=15.9), t(4327)=68.19, p<.001. See Table 3.2.

Total Household Members Respondents were asked, in addition to oneself, how many household members they had with age categories divided into four groups; “other adults ages 18-65”, “other adults
ages 65+”, “children ages 0-4”, and “children ages 5-17”. They were then able to indicate “0”, “1”, “2”, “3”, “4”, or “5+”. The total used for this variable was found by summing these responses and adding one to include the respondent. If a participant indicated “5+” it was treated as 5. The average number of household members for all participants was 2.60 members, with a median of 2, a standard deviation of 1.88 and a range of 1-21. Households with a nonelderly respondent tended to be significantly larger (M=2.78, SD=1.92), when compared to what was indicated by elderly respondents (M=1.55, SD=1.13), t(4464)=15.95, p<.001.

**Gender** was coded as 1=male and 2=female. For both the older and younger age groups there were similar proportions of women compared to men. Of all nonelderly respondents, 68.6% (2592 of 3777) were female and 31.4% (1185 of 3777) were male. Of all elderly respondents, 68.1% (445 of 653) were female and 31.9% (208 of 653) were male. The difference in the proportion of women and men in each group was not statistically significant.

**Education** Respondents were asked ‘How much education have you completed?’ with the option of responding 8th grade or less, 9th – 11th grade, GED, High School Diploma, Technical certificate, and some college. Later waves added the option of ‘College degree’ (see Appendix F). This variable was recoded as ‘less than high school education’, with a value of 1, ‘high school education or equivalent’, with a value of 2, and ‘some sort of college or technical school education’, with a value of 3. Older survey respondents tended to be less educated (M=1.90, SD=.70) compared to respondents in the younger group (M=2.07, SD=.71), t(813)=5.52, p<.001. Of those under age 60 (N=3220) 21.7% (701) had less than a high school education, 49.2% (1585) earned their high school diploma or GED, and 29.0% (934) had received some sort of college or technical school education. Of those aged 60 and older (N=600), 29.8% (179) had less than a high school education, 50.0% (302) earned their High School diploma or GED, and 19.4% (119) had received some sort of college or technical school education.
Dummy variables were then created for the regression analysis; ‘high school or equivalent’ was used as the zero point and not included in the logistic regression while ‘less than high school’ and ‘more than high school’ were. For interpretation we are then able to compare whether having less than a high school education or more than a high school education increases or decreases the likelihood of being food insecure relative to having a high school degree or equivalent.

Table 3.2  
*Descriptive Statistics for Control Variables*

<table>
<thead>
<tr>
<th>Variable</th>
<th>N</th>
<th>Mean</th>
<th>Median</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>All</td>
<td>4329</td>
<td>44.29</td>
<td>43</td>
<td>18-97</td>
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<tr>
<td>Young</td>
<td>3659</td>
<td>40.11</td>
<td>40</td>
<td>18-59</td>
</tr>
<tr>
<td>Old</td>
<td>671</td>
<td>70.58</td>
<td>69</td>
<td>60-97</td>
</tr>
<tr>
<td>Total HH Members</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>All</td>
<td>4466</td>
<td>2.60</td>
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<tr>
<td>Young</td>
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<td>2.78</td>
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<td>1-21</td>
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<tr>
<td>Old</td>
<td>662</td>
<td>1.55</td>
<td>1</td>
<td>1-12</td>
</tr>
<tr>
<td>Gender (male=1, female=2)</td>
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<td>4430</td>
<td>1.69</td>
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<td>1-2</td>
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<tr>
<td>Young</td>
<td>3777</td>
<td>1.69</td>
<td>2</td>
<td>1-2</td>
</tr>
<tr>
<td>Old</td>
<td>653</td>
<td>1.68</td>
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<td>1-2</td>
</tr>
<tr>
<td>Education (1=&lt;HS, 2= =HS, 3&gt;HS)</td>
<td></td>
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<td>All</td>
<td>4249</td>
<td>2.04</td>
<td>2</td>
<td>1-3</td>
</tr>
<tr>
<td>Young</td>
<td>3649</td>
<td>2.07</td>
<td>2</td>
<td>1-3</td>
</tr>
<tr>
<td>Old</td>
<td>600</td>
<td>1.90</td>
<td>2</td>
<td>1-3</td>
</tr>
</tbody>
</table>

Health is a self-rated response when asked “What would you say your overall health is?”. Possible responses included “excellent”, “very good”, “good”, “fair”, and “poor”. To no surprise, older respondents were significantly more likely to report poor health (M=.52, SD=.50) than younger respondents (M=.30,
In the younger age group (N=3700), 8.9% (331) reported poor health, 28.8% (1104) reported fair health, 43.1% (1594) reported good health, 13.9% (516) reported very good health and 4.2% (155) reported excellent health. For those over the age of 60 (N=571), 4.5% (27) reported poor health, 40.7% (249) reported fair health, 36.4% (223) reported good health, 10.1% (62) reported very good health, and just 1.5% (10) reported excellent health. See Table 3.3.

This variable was recoded into a dichotomous variable in effect asking ‘Do you have fair or poor health?’, therefore, those who indicated fair or poor when completing the survey were affirmative (=1) while those with excellent, very good, or good health were considered not (=0). In other words, as conveyed in the recoded variable, 37.7% of the younger age group and 44.7% of the older group reported having either fair or poor health.

<table>
<thead>
<tr>
<th>Table 3.3</th>
<th>Descriptive Statistics for the Variable Health</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
</tr>
<tr>
<td>All</td>
<td>4312</td>
</tr>
<tr>
<td>Young</td>
<td>3700</td>
</tr>
<tr>
<td>Old</td>
<td>612</td>
</tr>
</tbody>
</table>

**Average household income** is the total amount of money from all sources and from all members of the household per month. Possible responses included <$500, $500-999, $1000-1499, $1500-1999, $2000-2500, and >$2500. For best use in the statistical analysis, these responses were recoded to create a continuous variable. This was achieved by replacing each interval with the midpoint for each variable; the midpoints were $250, $750, $1250, $1750, $2250, and $3000. Similar average monthly incomes were reported for both age groups although those under the age of 60 were more likely to indicate lower incomes (M=780, SD=750) than were those age sixty and over (M=935, SD=750), t(887)=−7.63, p<.001. For those age sixty and over (N=574), 9.9% (N=57) had monthly incomes of $250, 56.4% (N=324) had monthly incomes of $750, 22.8% (N=131) had monthly incomes of $1,250, 8.5% (N=49) had monthly incomes of
$1,750, 2.1% (N=12) had monthly incomes of $2,250, and .2% (N=1) had monthly incomes of $3,000. For those under sixty years of age (N=3074), 31.5% (N=968) had incomes of $250, 44.1% (N=1357) had incomes of $750, 14.0% (N=429) had incomes of $1,250, 8.2% (N=252) had incomes of $1,750, 1.9% (N=57) had incomes of $2,250, and .3% (N=11) had incomes of $3,000. Additionally, to increase the ease in interpretation of the logistic regression results these midpoints were divided by 1000. This means that when interpreting the results rather than thinking ‘for every dollar increase in income the likelihood of insecurity decreases x amount’ we instead think ‘for every one thousand dollar increase in income the likelihood of food insecurity decreases x amount’. See Table 3.4.

**Home ownership** Whether households owned their home was determined by first asking whether they lived in a single family house, mobile home, or apartment. In the 2007 waves all respondents were then asked ‘Do you own or rent’. This question changed in later waves; participants in 2008 and 2009 who indicated they lived in a single family home were then asked the follow-up question of ‘Do you own or rent?’. Follow-up questions were also asked of those living in mobile homes, but this information was not included in these analyses because of the complexity of this issue; many residing in mobile homes could own their mobile home and rent the lot it is located on or vice versa. Additionally, the portion of those living in mobile homes was relatively small. It was also assumed that those who lived in apartments rented rather than owned their residence. Therefore, only those who reported living in a single family home and owning the home were considered to be home owners. All other respondents were considered to not own a home. For this variable, home owners were coded as 1 and those who did not own their home were coded as 0. A larger percentage of elderly tended to own their single family home (M=.16, SD=.37) than did those in the younger group (M=.13, SD=.33), t(4265)= -2.59, p<.001. Of those living in a single family home, 57.7% (109 of 671) of the older group reported owning their home in comparison to 35.86% of nonelderly (452 of 3596).
**Employment** status was captured by a single-item measure asking participants ‘Do you work at a paid job?’ with the option of answering either yes (coded as 1) or no (coded as 0). Although unemployment was high for both age groups, it is not surprising that the older age group (M=.09, SD=) was much less likely to indicate that they currently worked for pay than the younger age group (M=.30, SD=), t(3994)=-10.27, p<.001. For the younger age group (N=3427), 29.9% (N=1023) worked and 70.1% (N=2404) did not. For the older group (N=569), 8.0% (N=54) worked and 76.8% (N=515) did not.

**HH Member Employment** Whether others in the household were employed was captured by a measure asking respondents the yes (coded as 1) or no (coded as 0) question, ‘Does anyone else in your household work at a paid job?’. Perhaps in part to both an increased likelihood of having a retired spouse and an increased likelihood of having a small household size (e.g., many older adults lived alone), very few elderly reported having others in the household employed (M=.07, SD=.26) in comparison to the younger group (M=.21, SD=.41), t(3695)=-7.33, p<.001. Just 7.2% (N=35) of those in the older age group (N=484) had other members earning wages while about three times as many (21.4%; N=689) in the younger age group (N=3213) indicated having additional wage-earners in their household. The mean response of those over sixty was slightly higher than those of the other two groups although the standard deviation was much lower.
Table 3.4  
*Descriptive Statistics for Household Resource Variables*

<table>
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<th>N</th>
<th>Mean</th>
<th>Median</th>
<th>Range</th>
</tr>
</thead>
<tbody>
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<td><strong>Avg. Monthly HH Income</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>All</td>
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<td>805</td>
<td>750</td>
<td>250-3000</td>
</tr>
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<td>780</td>
<td>750</td>
<td>250-3000</td>
</tr>
<tr>
<td>Old</td>
<td>574</td>
<td>935</td>
<td>750</td>
<td>.25-3.00</td>
</tr>
<tr>
<td><strong>Home Ownership</strong></td>
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<td></td>
<td></td>
</tr>
<tr>
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<td>4267</td>
<td>.13</td>
<td>0</td>
<td>0-1</td>
</tr>
<tr>
<td>Young</td>
<td>3596</td>
<td>.13</td>
<td>0</td>
<td>0-1</td>
</tr>
<tr>
<td>Old</td>
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<td>.16</td>
<td>0</td>
<td>0-1</td>
</tr>
<tr>
<td><strong>Employment</strong></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>All</td>
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<td>0</td>
<td>0-1</td>
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<td>0-1</td>
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<td>0</td>
<td>0-1</td>
</tr>
<tr>
<td><strong>HH Member Employment</strong></td>
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<td></td>
</tr>
<tr>
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<td>3697</td>
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<td>0</td>
<td>0-1</td>
</tr>
<tr>
<td>Young</td>
<td>3213</td>
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<td>0-1</td>
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<tr>
<td>Old</td>
<td>484</td>
<td>.07</td>
<td>0</td>
<td>0-1</td>
</tr>
</tbody>
</table>

**SNAP Participation** was a single-item measure which asked the respondent whether they currently receive SNAP benefits, had in the past, or had never received SNAP benefits. Consistent with the literature, the older sample (N=603) was much more likely to have never received SNAP benefits than the younger sample (N=2667). In the older sample 43.3% (N=261) currently received SNAP benefits, 25.5% (N=154) had in the past, and 31.2% (N=188) had never. In the nonelderly 55.8% (N=1045) currently received SNAP benefits, 30.7% (N=1124) had in the past, and 13.6% (N=498) had never. As shown in Table 3.5., the mean for the older population was larger, or closer to three, indicating that they more often indicated not presently receiving SNAP benefits. See Table 3.5.
For the logistic regression this variable was recoded into a dichotomous variable, where those who responded that they had received SNAP benefits in the past but not currently as well as those who had never received SNAP benefits were both categorized as 'no, I do not currently receive SNAP benefits' and those who did currently were still treated as 'yes'. This means that for those over sixty, 43.3% (N=261) currently received SNAP benefits and 56.7% (342) did not and for those younger than sixty, 39.2% (N=1045) currently received SNAP benefits and 60.8% did not. In other words, elderly respondents were significantly less likely to receive SNAP benefits (M=1.88, SD=.86) than were nonelderly respondents (M=1.58, SD=.72), t(813)=5.73, p<.001.

**Food Pantry Participation** How often respondents received emergency food assistance was found by asking ‘How many times have you used food pantries in the past twelve months?’ Possible responses were 1, 2-3, 4-6, 7-9, and 10+. Nevertheless, respondents at times indicated ‘0’ visits by providing a write-in response; these responses were included as well. These responses were then recoded into 0, 1 and range midpoints of 2.5, 5, 8, and 15. This was done in order to create continuous variable for analytic purposes.

A larger proportion of older adults (M=8.81, SD=5.81) who visited food pantries reported doing so more frequently when compared to the younger age group (M=5.79, SD=5.35), t(3692)=-11.74, p<.001. For the older adults (N=511), 43.8% (N=224) indicated visiting a food pantry 10 or more times in the past twelve months compared to just 22.3% (N=711) for those younger than sixty (N=3183). A similar proportion of elderly (12.5%; N=64) and nonelderly (9.0%; N=286) reported visiting a pantry 7-9 times. Differences in rates for those visiting 4-6 times were also small; 14.7% (N=75) of elderly and 17.1% (N=543) of nonelderly indicated using a food pantry at this frequency. Those younger than sixty years of age were more likely to indicate having visited the pantry that number of times for the remaining categories. For this age group, 23.9% (N=762) indicated visiting a pantry 2-3 times in the past twelve months, 26.5% (N=843) indicated visiting just once, and 1.2% (N=38) indicated not having visited a food pantry. For those
age sixty and older 14.9% (N=76) had visited a pantry 2-3 times, 13.1% (N=67) had visited a pantry just once, and 1.0% (N=5) reported not having visited one.

**Housing Assistance Participation** was indicated by checking the box labeled ‘Housing assistance (section 8, public housing)’ when asked ‘Which income sources does your household currently receive?’ and given a series of public assistance program and other options. This measure was coded so any missing data (e.g., respondent did not check any sources of income) was treated as ‘no’. It was found that older adults (M=.13, SD=.34) were more likely to receive housing assistance compared to the nonelderly group (M=.08, SD=.27), t(4591)=−4.50, p<.001. For the older group (N=671), 13.4% (N=90) indicated receiving housing assistance compared to 8.1% (N=317) for the younger group (N=3922).

**Table 3.5  Descriptive Statistics for Assistance Participation Variables**

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Mean</th>
<th>Median</th>
<th>Range</th>
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</thead>
<tbody>
<tr>
<td><strong>SNAP Participation</strong></td>
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<td>All</td>
<td>4270</td>
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<td>Young</td>
<td>3667</td>
<td>1.58</td>
<td>1</td>
<td>1-3</td>
</tr>
<tr>
<td>Old</td>
<td>603</td>
<td>1.88</td>
<td>2</td>
<td>1-3</td>
</tr>
<tr>
<td><strong>Food Pantry Participation</strong></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>All</td>
<td>3694</td>
<td>6.20</td>
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<td>0-15</td>
</tr>
<tr>
<td>Young</td>
<td>3183</td>
<td>5.79</td>
<td>2.5</td>
<td>0-15</td>
</tr>
<tr>
<td>Old</td>
<td>511</td>
<td>8.81</td>
<td>8.0</td>
<td>0-15</td>
</tr>
<tr>
<td><strong>Housing Assistance Participation</strong></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>All</td>
<td>4593</td>
<td>.09</td>
<td>0</td>
<td>0-1</td>
</tr>
<tr>
<td>Young</td>
<td>3922</td>
<td>.08</td>
<td>0</td>
<td>0-1</td>
</tr>
<tr>
<td>Old</td>
<td>671</td>
<td>.13</td>
<td>0</td>
<td>0-1</td>
</tr>
</tbody>
</table>

**Food Security Status** was determined by summing responses to a series of six questions, known as the short form food security module, developed by the USDA to determine household food security. These questions are a subset of a longer 18 question module. Previous testing of this instrument has
shown that the shorter version demonstrates “reasonably high specificity and sensitivity and minimal bias with respect to the 18-item measure” (Bickel et al., 2000, p. 60). Testing has shown that these six questions provide the strongest available measure for most accurately classifying household food security status (Bickel, et al. 2000). For this study, internal reliability testing of the six questions resulted in a Cronbach’s Alpha of .638. Questions related to behaviors and experiences often experienced by those who may have difficulty meeting their household food needs. Respondents were categorized into one of three groups depending on the number of affirmative (“yes”) responses given. Categories included “food secure” (yes to 0 to 1 questions), “low food security” (yes to 2-4 questions), and “very low food security” (yes to 5-6 questions). Consistent with previous research reported by the USDA, those in the younger age group were less likely to be food secure (M=.91, SD=.29) than did the older group (M=.71, SD=.45), t(4484)=14.7, p<.001. For the younger group (N=3388), 8.9% (343) were food insecure, 33.7% (1295) were low food secure, and 57.3% (2202) were very low food secure. In the older group (N=646), 28.6% (185) were food secure, 36.8% (238) were low food security, and 34.5% (223) were very low food security. Following practices used by the USDA in measuring food insecurity (Nord, Andrews & Carlson, 2008), this measure was then transformed into a dichotomous variable, indicating whether the household was food insecure or not by combining low food security and very low food security into one category. As expected, the mean for those under sixty was higher. That is, the younger group was more often food insecure.

<table>
<thead>
<tr>
<th>Table 3.6</th>
<th>Descriptive Statistics for the Variable Food Security Status</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
</tr>
<tr>
<td>All</td>
<td>4486</td>
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<tr>
<td>Young</td>
<td>3840</td>
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<td>Old</td>
<td>646</td>
</tr>
</tbody>
</table>
Statistical Procedures

A logit model was used as the statistical procedure in this study. The unit of analysis that was examined was the household. A logit model is used to reveal the relationship between a dichotomous dependent variable (the household being food secure or food insecure) and one or more independent variables (Garson, 2009). Logit models are similar to linear regression models in that they allow for this examination. However, one difference essential for use in this study is the logit model allows for the use of a categorical variable dependent variable, rather than being limited to the use of continuous or interval variables. This is especially problematic when the dependent variable is qualitative and not quantitative, as is often the case in social research. Additionally, logistic regression, unlike linear regression, does not assume a linear relationship between the dependent and independent variables and does not require normally distributed variables (Garson, 2009). Furthermore, rather than estimating the ordinary least squares of coefficients as in linear regression, in logistic regression maximum likelihood estimation is calculated. This means that rather than trying to minimize the sum of squared distances between data points on the regression line we instead seek to maximize the log likelihood of predicting the observed values of the dependent variable using the observed values of the independent variables (Garson, 2009).

In a logit model the dependent variable is expressed as the natural log of the odds of being categorized in one category as opposed the other (Garson, 2009). Therefore, an odd expresses the ratio between the frequency of those in one category against the frequency of not being in that category. This odd is dependent on the independent variables used in the particular logit model. This means the impact of the predictor variable may be explained in terms of odds ratios. Parameter estimates known as logit coefficients are also calculated through the use of a logit model. These coefficients are estimators of the change in the dependent variable caused by a unit change in the independent variable (Garson, 2009). Therefore, a positive logit coefficient suggests that the presence of the independent variable would
increase the odds of the dependent variable, and conversely, a negative logit coefficient would decrease the odds.

The logistic equation predicts the log odds of the dependent variable, food insecurity, occurring. The equation is as follows:

\[ z = b_0 + b_1x_1 + b_2x_2 + \ldots + b_kx_k \]

where \( z \) is the logit, \( b_0 \) is the constant, “\( x \)” represents the independent variables, “\( b \)” terms are the parameter estimates, or logistic regression coefficients, and “\( k \)” is the number of independent variables (Garson, 2009).

In binary logistic regression the ‘1’ value of the dependent variable is predicted using the category given a ‘0’ value as a reference (Garson, 2009). Therefore, when examining the dependent variable of food security what is being predicted is whether the household is classified as food insecure or not (0=food secure, 1 =food insecure). As a result, the model reveals the natural log of the odds of being food insecure as opposed to not being food insecure, otherwise recognized as food secure. In this logit model the influence of twelve independent variables on these odds is examined: gender, age, total number of household members, health, education, income, SNAP enrollment, housing assistance enrollment, food pantry participation, home ownership, employment, and employment of household members.
CHAPTER 4: RESULTS

Findings

Tables 3.7 and 3.8 report the descriptive statistics of the final sample used in regression analysis. Final sample sizes (N=2144 for those younger than sixty, N=358 for those sixty and older) were reduced by removing those observations with missing data in any variable used in the regression analysis. However, it can be seen that variation between the total sample and final sample is minimal. The mean and median age of the respondents are slightly lower for the final sample. Otherwise, as demonstrated in Tables 3.7 and 3.8, the means, medians, and standard deviations for the other variables, including the dependent variable food security status, are similar, and all ranges were identical between samples.

Table 3.7  Descriptive Statistics for Final Sample, younger than sixty

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<th>Median</th>
<th>SD</th>
</tr>
</thead>
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<td></td>
<td>Total</td>
<td>Final</td>
<td>Total</td>
</tr>
<tr>
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<td>43</td>
</tr>
<tr>
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</tr>
<tr>
<td>Gender</td>
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<td>1.69</td>
<td>2</td>
</tr>
<tr>
<td>HH Income</td>
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<td>.75</td>
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<tr>
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<td>HH Emp.</td>
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</tr>
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</tr>
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<tr>
<td>Pantry Partic.</td>
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<td>2.5</td>
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<td>Housing Ass.</td>
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<td>.10</td>
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<td>Food Security</td>
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</tbody>
</table>

Note.  N = 2144
## Table 3.8 Descriptive Statistics for Final Sample, age sixty and older

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<th>Final</th>
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<th>Final</th>
<th>SD Total</th>
<th>Final</th>
</tr>
</thead>
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<td>69</td>
<td>68</td>
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<td>1</td>
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<td>.48</td>
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<td>.75</td>
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<td>1</td>
<td>.45</td>
<td>.43</td>
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</table>

Note. N = 358

The results of the logistic regressions are reported for the younger group and for the older group on the next page. Only one of the variables, health status, was found to be significantly related to food security in both age groups. Poor health was found to increase the risk of food insecurity for both groups, however, as might be expected, the effect size was larger for the older age group. For those age sixty and older, those who experienced poor health were 3.76 times more likely to experience food insecurity when controlling for other variables (p<.001). For those younger than sixty, poor health was still a significant risk factor. For this age group, those experienced poor health were 55% more likely to experience food insecurity than those who did not report poor health (p=.03), when controlling for other variables.

### Younger age group

For those in the younger age group four additional variables examined in the regression analysis were found to be significantly related to food insecurity. These include gender, income, receiving housing
assistance, and food pantry participation. For those under sixty, a female respondent had a 39% ($p=.02$) lower likelihood of residing in a food insecurity household when controlling for other variables. Additionally, for households in this group, for every $1,000$ increase in income the risk of food insecurity decreased by 52% ($p<.001$), controlling for other variables. For the younger group having received housing assistance also decreased the likelihood of being food insecure by 41% ($p=.03$) when controlling for other variables. An additional resource that was found to decrease the risk of food insecurity for the younger age group was food pantry participation. For this group, every additional food pantry visit decreased the risk of food insecurity by 3% ($p=.02$).

**Older age group**

For the older age group two additional variables were identified as significantly related to food security. These include age and SNAP participation. For those over sixty, each additional year of age resulted in a 6% ($p=.001$) decrease in risk of being food insecure when controlling for other variables. SNAP participation was found to be significantly related to an increased likelihood of food insecurity, rather than decreasing it as one might expect. In fact those who received SNAP benefits were two times more likely to be food insecure ($p=.02$) when controlling for other variables.

The remaining four variables were found to be nonsignificant for both groups. These include total number of household members, education, employment, and home ownership.
### Table 4.1
Logistic Regression of the Probability of the Dependent Variable, “being food insecure”, for Those Younger than Sixty Years of Age (N=2144).

<table>
<thead>
<tr>
<th>Variable</th>
<th>Parameter Estimate</th>
<th>Standard error</th>
<th>Wald test</th>
<th>Approximate significance</th>
<th>Exp(B)</th>
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<tr>
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<td>.00</td>
<td>.48***</td>
</tr>
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Model $X^2$ \(= 51.85\)  
Model significance \(= .00\)  
Degrees of freedom \(= 13\)  
Pseudo $R^2$ \(= .06\)

$^* p < 0.05$.  $^** p < 0.01$.  $^{** *} p < 0.001$. 
Table 4.2  *Logistic Regression of the Probability of the Dependent Variable, “being food insecure”, for those sixty years of age or older (N=358).*

<table>
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<th>Standard error</th>
<th>Wald test</th>
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<tr>
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<td>0.26</td>
<td>0.64</td>
</tr>
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</table>

*Model X² 63.10  Model significance 0.00  Degrees of freedom 13  Pseudo R² 0.24

*p < 0.05. **p < 0.01. ***p < 0.001.
CHAPTER 5: DISCUSSION OF RESULTS

There were three hypotheses being tested in this study. First, poor health was expected to increase the likelihood of experiencing food insecurity. Second, those who were employed, had higher incomes, and had significant assets were expected to be less likely to experience food insecurity. Third, those households who participate in assistance programs were expected to be more food secure due to an increase in household resources. Below each hypothesis is discussed in more detail in relationship to the logistic regression results.

Health

Poor health was significantly related to increased risk of food insecurity for both age groups. Previous research has identified poor health as both a predictor of food insecurity as well as a consequence (Campbell, 1991; Fuller-Thomson & Redmond, 2008; Lee & Frongillo, 2001). As a result, it is difficult to determine if households are food insecure because they experience health problems or if they experience health problems as a consequence of food insecurity. Nevertheless, a continued focus on the reciprocal relationship between poor health and food insecurity is necessary.

Health issues are especially pertinent to older adults due to the unique nutrition and health needs they often have, such as requiring therapeutic diets (Fuller-Thomson & Redmond, 2008; Lee & Frongillo, 2001; Wolfe et al. 1996). The impact of poor nutrition is especially high for this age group due to their often already chronic health problems such as acute illness or functional impairment. These pre-existing diseases and/or disabilities may be exacerbated due to individuals’ food needs not being met. This may result in dire consequences such as decreased functioning or disability, premature institutionalization, and increased risk of death (Sharkey, 2008). Due to the seriousness of these consequences, geriatric nutrition and the special needs of food insecure older adults should be emphasized in both research and practice.
Income and Resources

Income

The only variable examined under the income and resources hypothesis found to be significantly related to food insecurity when controlling for other variables was income, and even then it was only significant for younger households. Senior households did not tend to be as affected by income. For every $1,000 increase in income per month, the risk of food insecurity for household headed by someone younger than sixty was cut in half. This means that this amount of money is great enough to significantly reduce the likelihood of being food insecurity. It is likely, however, that although the regression results do not reflect it, senior households benefited from higher incomes as well. Based on research by Yen, Andrews, Chen and Eastwood (2008), which suggests that households with higher incomes are less likely to be food insecure, it is expected that the food security of all households was increased through increased income. However, this increase was less significant in the households of older adults; it may be that unlike the younger group, the benefits of greater income to the older group were not great enough to be a significant factor in determining a household’s food security status.

Assistance Participation

SNAP Participation

For older adults, it was found that those who received SNAP benefits were approximately twice as likely to be considered food insecure. Although this result was unexpected, an explanation can be formulated. Consistent with previous research (e.g., Wilde, 2007), it is likely that households who are most food insecure or are most likely to lack financial resources are more likely to seek participate in SNAP. As discussed previously, there are numerous reasons for the nonparticipation of seniors to participate in SNAP. However, if the benefit of participation outweighs the costs, in other words, if the need is great enough, needy households will apply. This means that those who are more food secure are less likely to
feel the need to participate in this program and those who are more desperate financially are more willing to seek assistance.

Although on the surface it appears that participation in SNAP increases food insecurity this is not necessarily the case. It should not be interpreted that participation in this program is not beneficial. Participating households likely receive needed resources that lessen the severity of food insecurity experienced, although it is not reflected in this study. According to Wilde (2007), this suggests that measurement of food insecurity fails to adequately capture the magnitude of the effect of food stamps on food insecurity. Replicating measurement practices of the USDA (Nord, Andrews & Carlson, 2008), this analysis only categorized respondents as food secure or not food secure; the severity of food insecurity was not captured. Again, it is also likely that only the most financially desperate households apply for SNAP. Therefore, it could be expected that food insecurity would be high among these participants.

Related to this, it is also possible that younger households received less in SNAP benefits and this is why regression results were not statistically significant for this group. Those younger than sixty may have gained needed resources through their participation. However, the level of benefit may not have been large enough to change the household’s food security radically enough to go from being food insecure to food secure. The most severe households may not have been struggling as much as they had without this assistance, however, the data do not capture this.

**Food Pantry Participation**

Younger households were also found to significantly benefit from frequent food pantry visits although older households did not. It was not surprising that households who visited the food pantry more were less likely to be food insecure, due to their receiving increased resources. However, what was not expected is that this relationship was not found to be statistically significant for older households. It is likely that this is because, although senior households who receive food from food pantries benefit from these
additional resources, the effect of these grocery packages is less great. Receiving commodity packages may help elderly households somewhat, however, not enough to cause a change in their food security status. This means that although households of all ages benefit from this extra resource, it is more likely to result in a significant change for younger households rather than older households.

**Housing Assistance**

Results showed that households in the younger age group who participated in the housing assistance program had a reduced risk of being food insecure. However, this was not true for older adults, despite the fact that they were about 5% more likely to participate in the program. One reason for this may be that younger households could have received greater levels of benefits. The data being used in this study do not measure the level of benefits received, only whether a household participates in the program or not. If younger households do in fact receive more, these additional resources are more likely to change the food security status of these households. If older households receive less in benefits, the impact these benefits have on the ability of the household to free up more resources to purchase enough food would be less great. Therefore, the level of benefit being received is a major consideration to be made when understanding whether participation in an assistance program will impact food security status significantly.
CHAPTER 6: CONCLUSIONS

Summary & Major Findings

There were two central objectives of this study. First, an investigation of the relationship among household characteristics and food insecurity in households in Iowa was performed. Second, the relationship between household food security and the resources of these households, including income, assets, and assistance benefits, was examined. Special attention was paid towards how the presence of these factors affected older households. Although older adults experience lower rates of food insecurity, the issue is of concern due to the health issues already experienced by this population as well as the rapid growth of this group.

Data used in this study were obtained from a convenience sample of food pantry clients living in four Iowa counties. Again, the dependent variable examined in this study was household food security status. Independent variables identified for this study included health status, income, home ownership, employment, employment of household members, SNAP participation, housing assistance participation, and food pantry participation. Control variables included total number of household members, and the age, gender, and education of the survey respondent.

Through binary logistic regression analysis it was found that health was significantly related to food security status for all households. Several variables were also found to be significantly related to food security, however, only for certain age groups. For the younger age group, gender, income, food pantry participation, and receiving housing assistance were also significantly related to food security. For the older age group, in addition to health, age and SNAP participation were significantly related.

Although the first hypothesis, that poor health would be related to food insecurity, was confirmed, the remaining two hypotheses related to household resources and assistance participation were only partially confirmed. It is likely that this is due to a lack of sensitivity of the dependent variable, food security.
It is likely that all households benefited from increased resources; however, the relationship of variables to food security was only statistically significant for some.

**Limitations of the Study**

The most obvious of the limitations to this study is the nature of the sample. As a convenience sample, although surveying food pantry clients in Iowa allows us to better examine the experience of those who are most resource needy locally, there are drawbacks to using this sample. Most notably, the generalizability of these findings is likely lacking. Although comparisons can be made between the reports of Feeding America and the experience of their food pantry recipients and the reports of those used in this study, it cannot be assumed that the findings of this study are representative of all food insecure Americans.

An additional weakness of this study is the lack of questions related more specifically to the household resources that may alleviate food insecurity. This is due to the use of a secondary data set and the resultant inability to tailor the instrument to this researcher’s study. Although an adequate sense of the experiences of these households can be gathered through the instrument used, additional questioning or probing in certain areas may have been beneficial. For example, knowing the approximate level of public assistance benefits received by each household may have allowed for a deeper understanding of how the relationship between assistance participation and food insecurity may vary depending on how much assistance is received. These data could be potentially valuable as they would allow for a greater explanation of the dependent variable being examined.

A last limitation to this study was the sample size. Although the initial sample size was adequate for this study, after removing all cases with missing values for the logistic regression analysis the sample was reduced substantially. If a larger sample had been collected, a sample that may have identified effect sizes with more precision would have remained even after removing cases with missing data.
Implications for Policy and Practice

Clearly, improving the nutrition of those experiencing food insecurity could offer significant benefits. Increased intake of nutrients high in nutritional quality can both alleviate the severity of food insecurity and improve health. By increasing targeted efforts for those who are food insecure through community health and nutrition initiatives these problems may be best addressed. Although the importance of proper nutrition is stressed in components of federal programs such as the Supplemental Nutrition Assistance Program or through guidelines limiting the types of foods that may be distributed through food banks, more emphasis is needed. While administrators of public assistance programs may be able to control what types of foods are distributed or purchased through their programs, families are left to do as they wish when purchasing other food products with their own resources. For this reason, it is important to give food insecure families the tools they need to make healthy choices when purchasing food and preparing meals for their household.

Ensuring that households have opportunities to obtain healthy food is important as well. Although providing families with additional food regardless of the quality will increase their food security somewhat, to best improve the health of these households it is important to stress the nutrient value of foods. One challenge is that more affordable food products are often less nutritious. As a result, households are more likely to choose cheaper, less healthy food options and are less likely to choose more expensive, healthier food options. By identifying ways to provide foods that are affordable yet still high in nutritious value, households will also be able to improve nutrition and, as a result, improve health.

Placing more emphasis on improving the health of those who experience food insecurity offers societal benefits as well. It comes to no surprise that those who experience better health are less likely to require costly health services or institutionalized care. Additionally, as a result of those who experience food insecurity often lacking the financial resources to pay for health care privately, improving the health of this population has the potential to significantly decrease government healthcare spending and strain on programs such as Medicare and Medicaid. As a result, the importance of improving the nutrition of seniors...
should be stressed. Evidence shows that preventing malnourishment in this population may prevent poor health and resultant increased health care spending down the road. This population is especially at risk for poor health as a consequence of inadequate nutrition; therefore, the prospect of improving the health of this population through improvements in diet is especially promising.

Additionally, evidence from this study suggests that participation in assistance programs is related to increased food security. Although this relationship was statistically significant for only certain programs with certain age groups, it is difficult to argue against the potential benefit of receiving additional household resources. It is possible, however, that some programs are more beneficial in terms of reducing food insecurity than others for different segments of the population. Regardless, food insecurity is most often a symptom of poverty and by directing policy efforts towards alleviating poverty, the issue of food security may be addressed as well. By advocating for programs such as SNAP, TEFAP, and Housing Assistance, we are protecting essential resources on which families with low incomes have come to depend. By strengthening assistance programs we may also ensure a more tightly woven safety net, closing potential gaps in services for these households.

Steps may be taken for expanding the reach of certain programs as well. For instance, one problem with SNAP is nonparticipation, especially in older adults. By addressing common reasons for nonparticipation, such as a lack of knowledge of eligibility requirements, confusion regarding the application process, and feeling that it is too difficult to apply, we may better reach those in need. Taking steps to increase public awareness and simplify the application process are just two ways in which nonparticipation may be addressed. Additionally, increasing resources to other programs such as TEFAP, Public Housing, and Section Eight would allow for more individuals and families with low incomes to be reached. Again, the waiting list for Housing Assistance is often extensive, forcing many households to choose between paying housing costs and purchasing food. By increasing the availability of social assistance, and perhaps even benefit levels, the pool of resources for households in need will be expanded. Through continual
investment in these programs, families in need receive vital assistance that increases their financial resources and enables them to direct more of their income towards obtaining adequate nutrition, thus improving their household food security.

Implications for future research

There are three central recommendations for directions in future research. First, it may be beneficial to conduct a similar study using a more representative sample of study participants. A national random sampling of households may help to develop a better understanding of which factors result in an increased or decreased likelihood of being food insecure and how this might vary for different groups. For instance, although on the instrument used for this study there were no questions related to race or ethnicity, it is assumed that the vast majority of respondents were white, as representative of Iowa’s largely Caucasian population. Conducting a larger scale study using a different sample may yield important information in understanding how food insecurity may vary by racial or ethnic groups.

Related to this, it may also be beneficial to conduct a similar study but using an instrument with additional questions focusing more closely on how household resources, or a lack thereof, may contribute to food security status. Questions related to the level of benefits received may better reveal why some households benefit from participation in some programs more than others. Also, as described previously, one challenge in interpreting the results of this study is the dichotomous nature of the dependent variable, food security. More specifically, it was difficult to determine whether the presence of certain variables, such as assistance participation, actually changed the level of food security. It is possible that certain variables in fact changed food security status somewhat, however, this change was not to a large enough degree to be demonstrated in logistic regression results. If additional questions were asked regarding food security more might be understood about its severity and how it might differ for different households depending on certain other household characteristics.
The last recommendation for future research relates to exploring participation in multiple food assistance programs by households and the ways in which households may combine different forms of assistance to meet their food needs. Many times households choose to utilize numerous types of assistance in an attempt to obtain needed resources. Additionally, certain types of assistance can be more acceptable than others for some households. For instance, older adults may feel more comfortable receiving food assistance through congregate or home-delivered meals rather than participating in SNAP. Congregate and home-delivered meal programs are available to individuals age sixty and over who experience economic and/or social need (Wellman, Rosenzweig & Lloyd, 2002). As a result of not having specific income guidelines, older adults may feel more comfortable accepting assistance. Stigma for these programs is lower because participation occurs for a range of reasons (e.g., social reasons, being home-bound) rather than only because an individual is struggling financially. By further exploring which households utilize which programs and the ways in which programs may be combined we may not only identify which forms of assistance are more acceptable for certain populations, but also which are most beneficial.
APPENDIX A. SIX-ITEM, SHORT FORM HFSSM

(all questions are answered often, sometimes or never)

1. The first statement is, "The food that I bought just didn't last and I didn't have the money to get more." Was that often, sometimes or never true?

2. I couldn't afford to eat balanced meals.

3. In the last 12 months since (date 12 months ago) did you ever cut the size of your meals or skip meals because there wasn't enough money for food?

   (If any of these three questions are answered affirmatively, proceed to next question.)

4. (Referring to previous question) How often did this happen - almost every month, some months but not every month, or in only 1 or 2 months?

5. In the last 12 months, did you ever eat less than you felt you should because there wasn't enough money to buy food?

6. In the last 12 months, were you ever hungry but didn't eat because you couldn't afford enough food?
Table B.1.  
*Frequencies for Categorical Variables*

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Independent samples t-test significance: *p < 0.10, **p < 0.05, *** p < 0.01
### Independent samples t-test significance:

- *p < 0.10
- **p < 0.05
- ***p < 0.01

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Independent samples t-test significance: *p < 0.10, **p < 0.05, ***p < 0.01
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<td>%</td>
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Independent samples t-test significance: *p < 0.10, **p < 0.05, ***p < 0.01
**IOWA FOOD PANTRY QUESTIONNAIRE**

Please answer the questions below. Your participation is voluntary and confidential. Do not include your name or address. Please do not fill out this survey more than once.

**Are you:**
- ☐ Male
- ☐ Female

**Age:** ________

**How many people live in your household?**

- **Yourself:** ☑ 1
- Other adults ages 18-65:  
  - ☐ 0
  - ☑ 1
  - ☐ 2
  - ☐ 3
  - ☐ 4
  - ☐ 5+
- Other adults ages 65+:  
  - ☐ 0
  - ☑ 1
  - ☐ 2
  - ☐ 3
  - ☐ 4
  - ☐ 5+
- Children ages 0-4:  
  - ☐ 0
  - ☑ 1
  - ☐ 2
  - ☐ 3
  - ☐ 4
  - ☐ 5+
- Children ages 5-17:  
  - ☐ 0
  - ☑ 1
  - ☐ 2
  - ☐ 3
  - ☐ 4
  - ☐ 5+

**Which statement best describes the food eaten in your household in the past 12 months?**
- ☐ Enough of the kinds of food (I/we) want to eat
- ☐ Enough, but not always the kinds of food (I/we) want
- ☐ Sometimes not enough to eat
- ☐ Often not enough to eat

**Were the following two statements often, sometimes, or never true for (you/your household) in the last 12 months?**

- "The food that (I/we) bought just didn't last, and (I/we) didn't have money to get more."
  - Was that ☐ often,
  - ☐ sometimes,
  - ☐ never true?

- "(I/we) couldn’t afford to eat balanced meals."
  - Was that ☐ often,
  - ☐ sometimes,
  - ☐ never true?

**In the last 12 months, did (you/you or other adults in your household) ever cut the size of your meals or skip meals because there wasn’t enough money for food?**
- ☐ Yes
- ☑ No

**If yes, how often did this happen?**
- ☐ Almost every month,
- ☑ Some months but not every month,
- ☐ In only 1 or 2 months

**If yes, in the last 12 months, did you ever eat less than you felt you should because there wasn’t enough money to buy food?**
- ☐ Yes
- ☑ No

**If yes, in the last 12 months, were you ever hungry but didn’t eat because you couldn’t afford enough food?**
- ☐ Yes
- ☑ No
Have you or anyone in your household been told by a health professional that you/they have? (Check all that apply)

<table>
<thead>
<tr>
<th>Condition</th>
<th>Myself</th>
<th>Family Member</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diabetes</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Heart Disease</td>
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<td>Asthma</td>
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<td>Allergies</td>
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<td>☐</td>
</tr>
<tr>
<td>Lead Poisoning</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Radon Poisoning</td>
<td>☐</td>
<td>☐</td>
</tr>
</tbody>
</table>

Which income sources does your household currently receive? (Check all that apply)

☐ Wages from a job  ☐ Food Stamps  ☐ SSI for a child  ☐ Social Security
☐ Unemployment insurance  ☐ WIC benefits  ☐ SSI for an adult  ☐ SSDI benefits
☐ FIP check  ☐ Child support  ☐ Veterans Benefits  ☐ Pension
☐ Housing assistance (section 8, public housing)  ☐ Other: ______________________________

How much income do you expect your household to get this month from all sources, including wages, public assistance, food stamps, and all other cash income?

☐ Less than $500  ☐ $500-$1000  ☐ $1001-$1500  ☐ $1501-$2000  ☐ More than $2000

Would you say that your health in general is:

☐ Excellent  ☐ Very Good  ☐ Good  ☐ Fair  ☐ Poor

How much education have you completed?

☐ GED  ☐ High school diploma  ☐ Technical certificate  ☐ Some college

Have you ever received Food Stamps? (now called Food Assistance in Iowa)

☐ Yes, I do now  ☐ I used to  ☐ No, never

If I used to, the last year I was on Food Stamps was:


Have you ever received cash benefits from the FIP program?

☐ Yes, I do now  ☐ I used to  ☐ No, never

If I used to, the last year I was on FIP was:


How many minutes from the nearest grocery store are you? _________

Are there enough supermarkets and grocery stores in your community?

☐ Not enough  ☐ Enough  ☐ More than enough  ☐ I don't know

Are supermarkets and grocery stores in your community located where you feel safe?

☐ Not safe  ☐ Usually safe  ☐ Always safe  ☐ I don't know
Do supermarkets and grocery stores in your community offer affordable healthy food choices (e.g., fresh fruits and vegetables, skim milk, low fat meats, whole grains, etc.)?

- Not affordable
- Seldom affordable
- Sometimes affordable
- Always affordable
- I don’t know

Is there affordable transportation to get to supermarkets and grocery stores in your community?

- No
- Yes
- I don’t know

Are there group meals sites and home delivered meals available for elderly persons in your community?

- Not available any days
- Available Monday through Friday only
- Available 1 to 4 days a week
- Available 7 days a week

Do you work at a paid job?

- Yes
- No

If yes, how much do you earn per hour including tips?

- Less than $5.15
- $5.15
- $7.01-$8.00
- $8.01-$10.00
- $5.16-$6.00
- $6.01-$7.00
- More than $10.00

If yes, how many hours do you work each week?

- 1-10
- 11-20
- 21-39
- 40 or more

If no, how long has it been since your last job?

- 0-2 months
- 3-6 months
- 7-12 months
- More than 12 months
- Haven’t worked

Does anyone else in your household work at a paid job?

- Yes
- No

How many times have you used food pantries in the past 12 months (including today)?

- 1
- 2-3
- 4-6
- 7-9
- 10+

The following questions refer to your last visit to a food pantry. If this is your first visit, please begin answering questions on the next page.

The last time you visited a food pantry, how much of the food you were given did you eat?

- Most of it
- Much of it
- About half of it
- Little of it
- Almost none of it

Are there any items that you wish you received more of?

If yes, name one item.

Are there any items that you would prefer to not have had?

If yes, name one item.

Are there any items that you didn’t receive that you wish you did?

If yes, name one item.
Which best describes the type of housing you live in?
- Single family house
- Mobile home or trailer
- Apartment, townhouse or duplex

Do you
- Own
- Rent?

If you rent, does your rent payment include utilities?
- Yes
- No

How do you feel about your current housing?
- Very dissatisfied
- Dissatisfied
- Mixed feelings
- Satisfied
- Very satisfied

Is your current housing the right size for you and your family?
- Yes
- No

Is your current housing safe and free from hazards?
- Yes
- No

Do you feel that your current housing is affordable?
- Yes
- No

How much do you pay each month for your rent or mortgage?
$_________________

Were the following statements often, sometimes, or never true for (you/your household) in the last 12 months?

- We worried we would not have enough money for the rent/mortgage payment.
  - Was that
    - often,
    - sometimes,
    - never true?

- We worried we would not have enough money to pay for utilities.
  - Was that
    - often,
    - sometimes,
    - never true?

- We had to borrow money for the rent/mortgage payment.
  - Was that
    - often,
    - sometimes,
    - never true?

- We had to borrow money to pay for utilities.
  - Was that
    - often,
    - sometimes,
    - never true?

- We couldn’t afford our housing expenses and had to move in with family or friends.
  - Was that
    - often,
    - sometimes,
    - never true?

- We couldn’t afford our housing expenses and had to move to cheaper housing.
  - Was that
    - often,
    - sometimes,
    - never true?

Thank you for completing this form!
APPENDIX D. SPRING & FALL 2008 SURVEY INSTRUMENT

IOWA FOOD PANTRY QUESTIONNAIRE

Please answer the questions below. Your participation is voluntary and confidential. Do not include your name or address. Please do not fill out this survey more than once.

Are you: □ Male  □ Female  Age: _______

How many people live in your household?

Yourself: ✔ 1
Other adults ages 18-65: □ 0 □ 1 □ 2 □ 3 □ 4 □ 5+
Other adults ages 65+: □ 0 □ 1 □ 2 □ 3 □ 4 □ 5+
Children ages 0-4: □ 0 □ 1 □ 2 □ 3 □ 4 □ 5+
Children ages 5-17: □ 0 □ 1 □ 2 □ 3 □ 4 □ 5+

Which statement best describes the food eaten in your household in the past 12 months?

□ Enough of the kinds of food (I/we) want to eat
□ Enough, but not always the kinds of food (I/we) want
□ Sometimes not enough to eat
□ Often not enough to eat

Were the following two statements often, sometimes, or never true for (you/your household) in the last 12 months?

"The food that (I/we) bought just didn't last, and (I/we) didn't have money to get more."
Was that □ often, □ sometimes, □ never true?

"(I/we) couldn't afford to eat balanced meals."
Was that □ often, □ sometimes, □ never true?

In the last 12 months, did (you/you or other adults in your household) ever cut the size of your meals or skip meals because there wasn't enough money for food?

□ Yes  □ No

If yes, how often did this happen?

□ Almost every month, □ Some months but not every month, □ In only 1 or 2 months

If yes, in the last 12 months, did you ever eat less than you felt you should because there wasn't enough money to buy food?

□ Yes  □ No

If yes, in the last 12 months, were you ever hungry but didn't eat because you couldn't afford enough food?

□ Yes  □ No
Have you or anyone in your household been told by a health professional that you/they have? *(Check all that apply)*

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- FIP check
- Child support
- SSI for an adult
- Pension
- Housing assistance (section 8, public housing)
- Other: _______________________

How much income do you expect your household to get this month from all sources, including wages, public assistance, food stamps, and all other cash income?

- Less than $500
- $500-$1000
- $1001-$1500
- More than $2000

Would you say that your health in general is:

- Excellent
- Very Good
- Good
- Fair
- Poor

How much education have you completed?

- 8th grade or less
- 9th-11th grade
- High school diploma
- Technical certificate
- Some college

Have you ever received Food Stamps? (now called Food Assistance in Iowa)

- Yes, I do now
- I used to
- No, never

*If I used to, the last year I was on Food Stamps was:*

- 2007
- 2006
- 2005
- 2004
- before 2004

Have you ever received cash benefits from the FIP program?

- Yes, I do now
- I used to
- No, never

*If I used to, the last year I was on FIP was:*

- 2007
- 2006
- 2005
- 2004
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How many minutes from the nearest grocery store are you? __________

Are there enough supermarkets and grocery stores in your community?

- Not enough
- Enough
- More than enough
- I don't know

Are supermarkets and grocery stores in your community located where you feel safe?

- Not safe
- Usually safe
- Always safe
- I don't know
Do supermarkets and grocery stores in your community offer affordable healthy food choices (e.g., fresh fruits and vegetables, skim milk, low fat meats, whole grains, etc.)?
- Not affordable
- Seldom affordable
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- Always affordable
- I don’t know

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- No
- Yes
- I don’t know

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- Not available any days
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- Available 1 to 4 days a week
- Available 7 days a week

Do you work at a paid job?
- Yes
- No

If yes, how much do you earn per hour including tips?
- Less than $5.15
- $5.15
- $5.16 - $6.00
- $6.01 - $7.00
- $7.01 - $8.00
- $8.01 - $10.00
- More than $10.00

If yes, how many hours do you work each week?
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- 11-20
- 21-39
- 40 or more

If no, how long has it been since your last job?
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- No

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- Yes
- No

How do you feel about your current housing?
- Very dissatisfied
- Dissatisfied
- Mixed feelings
- Satisfied
- Very satisfied

Is your current housing the right size for you and your family?
- Yes
- No

Is your current housing safe and free from hazards?
- Yes
- No

Do you feel that your current housing is affordable?
- Yes
- No

How much do you pay each month for your rent or mortgage?
$_________________

Were the following statements often, sometimes, or never true for (you/your household) in the last 12 months?

- “We worried we would not have enough money for the rent/mortgage payment.”
  - Was that
    - often,       
    - sometimes,    
    - never true?

- “We worried we would not have enough money to pay for utilities.”
  - Was that
    - often,       
    - sometimes,    
    - never true?

- “We had to borrow money for the rent/mortgage payment.”
  - Was that
    - often,       
    - sometimes,    
    - never true?

- “We had to borrow money to pay for utilities.”
  - Was that
    - often,       
    - sometimes,    
    - never true?

- “We couldn’t afford our housing expenses and had to move in with family or friends.”
  - Was that
    - often,       
    - sometimes,    
    - never true?

- “We couldn’t afford our housing expenses and had to move to cheaper housing.”
  - Was that
    - often,       
    - sometimes,    
    - never true?

Thank you for completing this form!
APPENDIX E. SPRING 2009 SURVEY INSTRUMENT

IOWA FOOD PANTRY SURVEY

Your participation in this research project by Iowa State University Extension is voluntary and confidential. You can skip any questions you do not want to answer. Do not include your name or address. Please do not fill out this survey more than once over the next 2 months.

Q01 I filled out this survey last year. _____Yes _____No

Q1. Are you:  □ Male  □ Female  Q2. How old are you? ____years

Q2a. How tall are you? ____ft ____in.  Q2b. How much do you weigh? ____ pounds

How many people live in your household besides yourself?

Q3a. Yourself:  □ 1

Q3b. Other adults ages 18-65:  □ 0 □ 1 □ 2 □ 3 □ 4 □ 5+

Q3c. Other adults ages 65+:  □ 0 □ 1 □ 2 □ 3 □ 4 □ 5+

Q3d. Children ages 0-4:  □ 0 □ 1 □ 2 □ 3 □ 4 □ 5+

Q3e. Children ages 5-17:  □ 0 □ 1 □ 2 □ 3 □ 4 □ 5+

Q4. Which statement best describes the food eaten in your household in the past 12 months?
□ Enough of the kinds of food (I/we) want to eat
□ Enough, but not always the kinds of food (I/we) want
□ Sometimes not enough to eat
□ Often not enough to eat

Were the following two statements often, sometimes, or never true for (you/your household) in the last 12 months?

Q5. "The food that (I/we) bought just didn't last, and (I/we) didn't have money to get more."
Was that  □ often, □ sometimes, □ never true?

Q6. "(I/we) couldn't afford to eat balanced meals."
Was that  □ often, □ sometimes, □ never true?

Q7. In the last 12 months, did (you/you or other adults in your household) ever cut the size of your meals or skip meals because there wasn't enough money for food?  □ Yes  □ No

Q8. If yes, how often did this happen?
□ Almost every month  □ Some months but not every month, □ In only 1 or 2 months

Q9. If yes, in the last 12 months, did you ever eat less than you felt you should because there wasn't enough money to buy food?  □ Yes  □ No

Q10. If yes, in the last 12 months, were you ever hungry but didn't eat because you couldn't afford enough food?  □ Yes  □ No
Have you or anyone in your household been told by a health professional that you/they have: *(Check all that apply)*

<table>
<thead>
<tr>
<th>Question</th>
<th>Myself</th>
<th>Household Member</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q11a. Diabetes</td>
<td>❑</td>
<td>❑</td>
</tr>
<tr>
<td>Q12a. Heart Disease</td>
<td>❑</td>
<td>❑</td>
</tr>
<tr>
<td>Q13a. High Blood Pressure</td>
<td>❑</td>
<td>❑</td>
</tr>
<tr>
<td>Q14a. Asthma</td>
<td>❑</td>
<td>❑</td>
</tr>
<tr>
<td>Q15a. Allergies</td>
<td>❑</td>
<td>❑</td>
</tr>
<tr>
<td>Q16a. Lead Poisoning</td>
<td>❑</td>
<td>❑</td>
</tr>
<tr>
<td>Q17a. Radon Poisoning</td>
<td>❑</td>
<td>❑</td>
</tr>
</tbody>
</table>

Q18. Which income sources does your household currently receive? *(Check all that apply)*

- a. ❑ Wages from a job
- b. ❑ Food Stamps/Food Assistance
- c. ❑ SSI for a child
- d. ❑ Social Security
- e. ❑ Unemployment insurance
- f. ❑ WIC benefits
- g. ❑ SSI for an adult
- h. ❑ SSDI benefits
- i. ❑ FIP check
- j. ❑ Child support
- k. ❑ Veterans benefits
- l. ❑ Pension
- m. ❑ Housing assistance (section 8, public housing)
- n. ❑ Other: __________________________

Q19. How much income do you expect your household to get this month from all sources, including wages, public assistance, Food Stamps/Food Assistance, and other cash income?

- ❑ Less than $500
- ❑ $500-$1000
- ❑ $1001-$1500
- ❑ $1501-$2000
- ❑ $2001-$2500
- ❑ More than $2500

Q20. Would you say that your health in general is:

- ❑ Excellent
- ❑ Very Good
- ❑ Good
- ❑ Fair
- ❑ Poor

Q21. How much education have you completed?

- ❑ 8th grade or less
- ❑ 9th-11th grade
- ❑ GED
- ❑ High school diploma
- ❑ Technical certificate
- ❑ Some college
- ❑ College degree

Q22. Have you ever **applied** for Food Stamps? (now called Food Assistance in Iowa)?

- ❑ Yes
- ❑ No, never

Q22a. Have you ever **received** Food Stamps/Food Assistance?

- ❑ Yes, I do now
- ❑ I used to
- ❑ No, never

Q23. If you **used to**, the last year you received Food Stamps/Food Assistance was:

- ❑ 2009
- ❑ 2008
- ❑ 2007
- ❑ 2006
- ❑ 2005
- ❑ 2004
- ❑ before 2004

Q23B. If you **don’t currently or have never received** Food Stamps/Food Assistance, why not? *(Check all that apply.)*

- ❑ It’s embarrassing
- ❑ I’m not eligible
- ❑ I don’t have transportation to get to the office to apply
- ❑ It’s not worth the paperwork and hassle
- ❑ It’s too complicated to apply
- ❑ I’m too proud
- ❑ I don’t need Food Stamps/Food Assistance. I am able to make do with what I have
- ❑ Other reasons

Q23C. If you were told you are **no longer eligible** for Food Assistance/Food Stamps, what were the reasons? *(Check all that apply.)*

- ❑ my/our income is too high
- ❑ my/our assets (e.g., vehicle) are valued too high
- ❑ I am undocumented
- ❑ I don’t have children
- ❑ Other: __________________________
Q24. Have you ever received cash benefits from the FIP program?
   - Yes, I do now
   - I used to
   - No, never

Q25. If you used to, the last year you received FIP was:
   - 2009
   - 2008
   - 2007
   - 2006
   - 2005
   - 2004
   - before 2004

Q29. Do supermarkets and grocery stores in your community offer affordable healthy food choices (e.g., fresh fruits and vegetables, skim milk, low fat meats, whole grains, etc.)?
   - Not affordable
   - Seldom affordable
   - Sometimes affordable
   - Always affordable
   - I don’t know

Q30. Is there affordable transportation to get to supermarkets and grocery stores in your community?
   - No
   - Yes
   - I don’t know

Q32. Do you work at a paid job?
   - Yes
   - No

Q33. If yes, how much do you earn per hour including tips?
   - Less than $7.25
   - $7.25
   - $7.25-$8.00
   - $8.01-$9.00
   - $9.01-$10.00
   - $10.01-$11.00
   - more than $11.00

Q34. If yes, how many hours on average do you work each week?
   - 1-10
   - 11-20
   - 21-39
   - 40 or more

Q35. If no, how long has it been since your last job?
   - 0-2 months
   - 3-6 months
   - 7-12 months
   - More than 12 months
   - I haven’t worked

Q36. Does anyone else in your household work at a paid job?
   - Yes
   - No

Q37. How many times have you received food from a pantry in the past 12 months (including today)?
   - 1 time
   - 2-3 times
   - 4-6 times
   - 7-9 times
   - 10+ times

If this is the first time you received food from a pantry, please go to Q42.

Q38. The last time you received food from a pantry, how much of the food did you eat?
   - Most of it
   - Much of it
   - About half of it
   - Little of it
   - Almost none of it

Q39. Are there any items that you wish you received more of last time?
   - Yes
   - No

   If yes, name one item. _______________________________

Q40. Are there any items that you would prefer to not have had last time?
   - Yes
   - No

   If yes, name one item. _______________________________

Q41. Are there any items that you didn't receive that you wish you did last time?
   - Yes
   - No

   If yes, please list: ____________________________________________________
Q42. Which best describes the type of housing you live in?
- Single family house
- Mobile home or trailer
- Apartment, townhouse or duplex

Q43. If you live in a single family house, do you own or rent your house?
- own
- rent

Q43B. If you live in a mobile home or trailer, do you own or rent your home/trailer?
- own
- rent

Q43C. If you live in a mobile home or trailer, do you own or rent your lot?
- own
- rent

Q44. If you rent, does your rent payment include utilities?
- Yes
- No

Q46. Is your current housing the right size for you and your family?
- Yes
- No

Q47. Is your current housing safe and free from hazards?
- Yes
- No

Q48. Do you feel that your current housing is affordable?
- Yes
- No

Q49. How much do you pay each month for your rent or mortgage?
$ ________________

Were the statements below often, sometimes, or never true for your household in the last 12 months?

Q50. “We worried we would not have enough money for the rent/mortgage payment.”
- Was that often,
- sometimes,
- never true?

Q51. “We worried we would not have enough money to pay for utilities.”
- Was that often,
- sometimes,
- never true?

Q52. “We had to borrow money for the rent/mortgage payment.”
- Was that often,
- sometimes,
- never true?

Q53. “We had to borrow money to pay for utilities.”
- Was that often,
- sometimes,
- never true?

Q54. “We couldn’t afford our housing expenses and had to move in with family or friends.”
- Was that often,
- sometimes,
- never true?

Q55. “We couldn’t afford our housing expenses and had to move to cheaper housing.”
- Was that often,
- sometimes,
- never true?
APPENDIX F. INSTITUTIONAL REVIEW BOARD APPROVAL

IOWA STATE UNIVERSITY
OF SCIENCE AND TECHNOLOGY

Date: October 28, 2009

To: Kristin Towers
528 Welch Ave. #2
Ames, IA 50014

CC: Steve Gerasky
52 LeBaron Hall

From: Roxanne Babpe, IRB Coordinator
Office for Responsible Research

Project Title: Food Pantry Survey Analysis Project
IRB ID: 09-499

The Co-Chair of the ISU Institutional Review Board has reviewed the project
noted above and determined that the project:

_____ Does not meet the definition of research: according to federal
regulations.

X Is research that does not involve human subjects: according to
federal regulations.

Accordingly, this project does not need IRB approval and you may proceed at
any time. We do, however, urge you to protect the rights of your participants in
the same ways you would if IRB approval were required. For example, best
practices include informing participants that involvement in the project is
voluntary and maintaining confidentiality as appropriate.

Please also know that any change to this project must be communicated to the
IRB to determine if the project has become research with human subjects
requiring IRB approval.
REFERENCES


Siefert, K., Heflin, C.M., Corcoran, M.E., & Williams, D.R. Food insufficiency and physical and mental health in a longitudinal survey of welfare recipients. Journal of Health and Social Behavior, 45(2), 171-186.


