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Do Nutrition Policies Matter? Assessing the Determinants of Nutritional Quality of Inventory at Food Banks



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# Do Nutrition Policies Matter?

## Assessing the Determinants of Nutritional Quality of Inventory at Food Banks

A dissertation submitted in partial satisfaction of the

requirements for the degree of Doctor of Philosophy

in Community Health Sciences

by

Sarah Roth

2020

ABSTRACT OF THE DISSERTATION

Do Nutrition Policies Matter? Assessing the Determinants of Nutritional Quality of Inventory at Food Banks

by

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Doctor of Philosophy in Community Health Sciences

University of California Los Angeles, 2020

Professor Michael L. Prelip, Chair

Food insecurity is associated with reduced quality of life as well as poor mental and physical health outcomes including, reduced diet quality and increased risk of diet-related, chronic disease. Food banks provide communities with a critical resource to address food insecurity. Moreover, as a sector of the food system that feeds 46.5 million of the country's most vulnerable people, the charitable food system has great potential to promote healthy eating. However, food banks rely on food and beverage donations from individuals and industry oversupply to stock their inventory, offering these organizations little autonomy over distributed foods. Accordingly, households that rely on the charitable food system to supplement their food supply find it difficult to establish a nutritious diet from the energy-dense, nutritionally empty, non-perishable food items routinely donated. While food banks

have sought to improve the nutritional quality of their inventory, there is limited research assessing the drivers and impact of these efforts.

This dissertation examines the influences on and implications of food banks' efforts to improve the healthfulness of food distributed at food banks through an embedded mixed-methods approach consisting of two interrelated studies. Studies One and Two use an embedded mixed- methods approach to assess efforts to improve nutritional quality of inventory at food banks. Guided by Resource Dependence theory, Diffusion of Innovation theory, and the Social Ecological Model, the research considers both organizational and contextual factors that shape organizational behavior.

Study One examined the determinants of nutrition policy and practice adoption among food banks and the relationship of policy and practice adoption to nutritional quality of food bank inventory using data collected in the 2017 MAZON National Food Bank Survey Assessment of Nutrition Practices and Policies, as well as publicly available data from the U.S. Census Bureau, U.S. Department of Agriculture, and the U.S. Internal Revenue Service. Overall, the findings showed that organizational and contextual characteristics of food banks helped to explain the adoption of nutrition-based food banking strategies and measures of inventory quality. Notably, this study found that nutrition-focused food banking strategies were associated with inventory quality. Food banks with no formal or informal nutrition policy had higher mean percentages of unhealthy inventory compared to food banks with informal nutrition policies. Additionally, reliance on donations was significantly related to unhealthy inventory such that each one percent increase in donated inventory was associated with an average increase of 0.97% in unhealthy inventory. Location in the U.S., organizational size,

service area size, and the political conservativeness of the region were also salient determinants.

Study Two explored how organizations within the charitable food system responded to recent trends to improve the nutritional quality of food bank inventory using data collected from a descriptive case study with an adopter and non-adopter food bank and in-depth interviews with representatives from nation-level key stakeholders. National stakeholders in the charitable food system described a sense of progress that had been made in recent years to promote the distribution of healthier foods both ideologically and operationally. Despite this progress, participants reported continued challenges embedded in the structure of the charitable food system that would continue to make the distribution of nutritionally dense foods difficult. While participants also described ongoing efforts to address these challenges, many of the proposed changes were incremental and did not tackle the larger systemic issues.

With respect to the case study, findings showed that despite differences in nutrition-strategy adoption status, both case study sites were actively prioritizing the sourcing and distribution of healthier foods. Interviewees at both food banks described similar motivations to increase distribution of healthier foods that came from a desire to better serve clients as well as increased pressure from Feeding America, the national food bank association, and the food system. While interviewees at both food banks described a number of logistical and capacity challenges related to the distribution of fresh foods, they also reported improvements in previously described infrastructure challenges. Relationships were a central focus of the organizations' work and the interviewees at food banks were focused on the need to develop pantries for the changing inventory streams. Food and beverage donor interviewees identified

health concerns related to charitable food system users but were mainly focused on waste diversion and supporting the local community.

Findings from this dissertation use multiple perspectives to advance our understanding of healthy eating promotion at food banks, with the anticipation that improving the nutritional quality at food banks will have ripple effects throughout the charitable food system. Given the high costs associated with the distribution of healthier foods, efforts to implement and scale may benefit from identifying ways to sustainably maintain nutrition-focused food banking strategies. Food banks are central to efforts to improve nutritional quality of food distributed through the charitable food system. Challenging the old paradigm that prioritizes quantity over quality and employing strategies to source and distribute nutritional foods can facilitate these efforts. Ultimately, the findings of this research serve to advance efforts to alleviate systematic disparities in health outcomes faced by food-insecure individuals.

The dissertation of Sarah Roth is approved.

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## Table of Contents


Introduction ..... 1

Chapter 1: Background and Significance ..... 1

Food Insecurity and Health ..... 8

Conceptualizing and Measuring Food Insecurity ..... 18

Prevalence of Food Insecurity in the U.S. ..... 19

A Brief History of Food Assistance in the U.S. ..... 23

Food Assistance in the U.S. Today ..... 25

The Charitable Food System ..... 28

Food Banks and Nutrition ..... 37

Summary ..... 42

Chapter 2: Theory ..... 45

Resource Dependence Theory ..... 46

Diffusion of Innovation Theory ..... 50

Social Ecological Model ..... 53

Conceptual Framework ..... 57

Chapter 3: Research Aims ..... 63

Study One ..... 63

Study Two ..... 65

Chapter 4: Methods ..... 67

Study One – Quantitative ..... 67

Study Two - Qualitative ..... 84

Mixed Methods ..... 94

Chapter 5: Quantitative Study Results and Discussion ..... 96

Population Characteristics ..... 96

Sample Characteristics and Outcome Variables ..... 98

Questions 1.1 and 1.2 Results ..... 101

Questions 1.3 and 1.4 Results ..... 105

Discussion ..... 114

Chapter 6: Qualitative Study Results and Discussion ..... 122

National Stakeholder Key Informant Interviews: Participant Characteristics ..... 122

National Stakeholder Key Informant Results ..... 122

Case Overviews and Interviewee Characteristics ..... 134

Case Study Results ..... 138

Discussion ..... 160

Chapter 7: Conclusion ..... 172

Integrated Findings and Recommendations ..... 172

Strengths ..... 176

Limitations ..... 178

Conclusion ..... 180

Appendix A – MAZON National Food Bank Survey ..... 183

Appendix B: Additional Information on Missing Data ..... 190

Appendix C1: Additional Tables: Research Questions 1.1 and 1.2 ..... 197

Appendix C2: Additional Tables: Research Questions 1.3 and 1.4 ..... 198

Appendix D1: Additional Interview Guides ..... 202

Appendix D2: Qualitative Study Code Book ..... 204

References ..... 209

# List of Tables

Table 1.1: Federal Nutrition Assistance Programs..... 27

Table 4.1: List of Variables ..... 76

Table 4.2: Pearson Pairwise Correlation Matrix for Continuous Variables ..... 80

Table 4.3: Cramer's V Correlation Matrix for Categorical Variables ..... 80

Table 4.2: Case Study Food Bank Interview Guide ..... 91

Table 5.1: Differences in Food Bank Characteristics by Respondent Status (n=316)..... 97

Table 5.2: Characteristics of the Sample (n=189)..... 99

Table 5.3: Summary of Questions 1.1 and 1.2 Outcome Variables (n=179) ..... 100

Table 5.5: Characteristics of the Sample in Total and by Nutrition Tracking System and Nutrition Policy Adoption Status (n=178)..... 102

Table 5.6: Logistic Regression Models Predicting Nutrition Tracking System Adoption (N=178) ..... 103

Table 5.7: Logistic Regression Models Predicting Nutrition Policy Adoption (n=176)..... 105

Table 5.8: Characteristics of the Sample for Questions 1.3 and 1.4 in Total and Mean Differences in Healthy and Unhealthy Inventory by Sample Characteristics (n=176)..... 107

Table 5.9: Linear Regression Models Predicting Healthful Inventory (n=172)..... 110

Table 5.10: Linear Regression Models Predicting Unhealthful Inventory (N=161)..... 112

Table 6.1: Characteristics of Key Informant Interview Participants..... 122

Table 6.2: Interviewee Characteristics of Non-Adopter Case..... 135

Table 6.3: Interviewee Characteristics of Adopter Case..... 136

Table 6.4: Findings and Select Quotations from Case Study Interviews ..... 156

Table B.1: Differences in Food Bank Characteristics by Missingness Status on Nutrition Policy191

Table B.2: Differences in Food Bank Characteristics by Missingness Status on Nutrition Tracking System..... 192

Table B.3: Differences in Food Bank Characteristics by Missingness Status on Healthful Inventory..... 193

Table B.4: Differences in Food Bank Characteristics by Missingness Status on Unhealthy Inventory..... 194

Table C1.1: Logistic Regression Models Predicting Alternative Measure of Nutrition Policy .... 197

Table C2.1: Linear Regression Model of Nutrition Policy Adoption Predicting Log Transformed Unhealthful Inventory (n=158) ..... 198

# List of Figures

Figure 1.1: Conceptualization of Food Insecurity and Its Association with Health Outcomes .... 15

Figure 1.2 Trends in Prevalence Rates of Food Insecurity and Very Low Food Security in U.S. Households, 1995-2017 ..... 20

Figure 1.3: Percent of Food Insecure Households by Income Level ..... 29

Figure 1.4: Sources of Food and Channels of Food Distribution in the Charitable Food System. 34

Figure: 2.1: Organizations as Interdependent Agents ..... 48

Figure 2.2: Five Stages in the Innovation Process in an Organization ..... 52

Figure 2.3: Social Ecological Model ..... 55

Figure 2.4: Concept Framework of Contextual Factors and Organizational Characteristics shaping the Nutritional Quality of Food Bank Inventory ..... 58

Figure 4.1: Histogram of Healthful Inventory ..... 78

Figure 4.2: Histogram of Log Transformed Unhealthful Inventory ..... 79

Figure B.1: Patterns of Missingness ..... 190

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# Introduction

Food insecurity – the lack of physical, social, or economic access to safe, sufficient, nutritious food necessary for a healthy, active life - remains a persistent concern in the United States (U.S.). In 2017 an estimated one in eight (40 million people) Americans lives in a food insecure household, a household wherein at least one resident is food insecure (Coleman-Jensen et al., 2017b). More recently food insecurity has increased dramatically across the country as communities have shut down in efforts to curb the spread of the novel corona virus. According to a report from the Brookings Institute, more than 20% of U.S. households are food insecure (Bauer, 2020). This is nearly twice the prevalence of food insecurity typically found in the U.S. which estimates show at around 12% since the measurement began in 1995 (Coleman-Jensen et al., 2017b; Department of Health and Human Services & Office of Disease Prevention and Health Promotion, 2010; Economic Research Service & United States Department of Agriculture, 2018). Child food insecurity has also risen dramatically since the start of the pandemic with approximately one in five households of mothers with children age 12 and under reporting that their children were not eating enough (Bauer, 2020).

Food insecurity remains a critical public health issue not just because of its strong association with poor health outcomes, including poor diet quality and increased risk for diet-related chronic diseases (Gundersen & Ziliak, 2015), but also because of its association with social and economic burdens (Brown et al., 2007). A 2009 report estimated that food insecurity in the U.S. costs an estimated $90 billion dollars per year in increased medical expenditures, decreased educational attainment and worker productivity, and investment into the charitable

food system (Brown et al., 2007). However, for many, these concerns are secondary to the moral outrage of persistent, widespread food insecurity in the world's largest economy (Chilton & Rose, 2009).

Food insecurity among children and adults is associated with decreased physical and mental health outcomes as well as reduced quality of life (Cook et al., 2004; Gundersen & Ziliak, 2015). Food insecurity is also associated with several diet-related diseases and their risk factors including higher prevalence of diabetes, poorer glycemic control, metabolic syndrome, and increased cardiovascular disease risk among food insecure adults as well as increased body mass index among food insecure women (Ford, 2013; Gooding et al., 2012; Seligman, Davis, et al., 2010; Seligman, Laraia, et al., 2010). Considerable evidence also links food insecurity to decreased diet quality (Hanson & Connor, 2014; Leung et al., 2014). Prolonged periods of restricted food choice, as well as the potentially limited ability to maintain a healthy diet, contribute to the health consequences of food insecurity.

In response to food insecurity, the U.S. Department of Agriculture administers 15 domestic food and nutrition programs designed to support food acquisition among food insecure Americans serving approximately 25% of the U.S. population (Eilender, 2016; Oliveira, 2016). Although the majority of nutrition assistance in the U.S. comes from public assistance programs (Bread for the World, 2015), the charitable food system has seen increased demands on its services in terms of number of clients and frequency of usage in recent years (Echevarria et al., 2009; Weinfield et al., 2014). As schools have closed (a critical outlet for feeding children) and millions of people have lost their job in recent months, many have turned to the charitable food network to supplement household food supplies (Morello, 2020; Reiley, 2020). In an

average year, an estimated 46.5 million food insecure Americans rely on the charitable food system to supplement their household food needs (Weinfield et al., 2014). In this unprecedented time, as many as 17.1 million more people may seek support from the charitable food system (Hake, 2020). However, while public and private food assistance programs offer essential support in acquiring food, they do not always support adequate diet quality (Andreyeva et al., 2015; Bazerghi et al., 2016; Lyles et al., 2013; Simmet et al., 2017).

Intended as a short-term solution for economically and/or socially disadvantaged individuals, the charitable food system (food banks, food pantries, soup kitchens) fills the gap between unmet community need and public assistance (Caruso, 2013). The charitable food system is a complex and sophisticated system comprised of a network of suppliers, warehouses, transportation, philanthropic organizations, anti-hunger advocates, and volunteers (E. Campbell et al., 2013). These organizations tend to be non-profit (often faith-based) organizations that rely heavily on donated food and labor to maintain their operations (Caruso, 2013). Programs in this system are designed to provide food on a *temporary and supplemental basis* at no cost to those accessing assistance (Caruso, 2013).

Food banks are situated at the center of the charitable food system acquiring food from government programs and donations from private businesses and individuals and redistributing their inventory to direct-service sites such as soup kitchens and food pantries. In food pantries, this frequently consists of prepackaged bags of donated food items intended to last a given number of days (Middleton, Mehta, McNaughton, & Booth, 2018; Tarasuk, Dachner, & Loopstra, 2014). Soup kitchens and other meal programs use donated foods to prepare meals for on-site consumption (Caruso, 2013). Thus, unlike the array of choices available to customers

through mainstream retail food outlets, charitable food system clients are limited with respect to the types, quantity, and nutritional composition of foods they receive (M. Ross et al., 2013).

Traditionally, food banks have relied on donations of surplus foods and beverages from individuals and industry to stock their inventory (Middleton, Mehta, McNaughton, & Booth, 2018; Roman, 2017). Within this traditional paradigm, food banks have focused on quantity over quality, seeking to maximize the amount of food distributed and measuring organizational output and success in terms of pounds of food donated (Roman, 2017). However, the dependence on donations offers food banks little autonomy over distributed foods as they disperse based on the donations received. Moreover, given that the current food supply contains excess foods and beverages that are both nutritionally empty and energy-dense (Miller, Reedy, Kirkpatrick, & Krebs-Smith, 2015), this suggests that the nutritional quality of food bank inventory may be lacking (Simmet et al., 2017). Knowing that charitable food users have limited choice with respect to the food they receive, the focus on quantity over quality overlooks the influential role of food banks in shaping the food environment of food insecure individuals. Furthermore, this perspective, quantity over quality, ignores the close relationship between diet and disease (M. B. Schwartz & Brownell, 2007).

With increased attention around high rates of obesity and chronic disease alongside increased demand for food banking services after the 2008 global economic crisis, leaders in the food bank sector are shifting strategies to incorporate improved access to healthy foods as a key component of the work their organizations do (Elmes et al., 2016). Yet, examinations of nutritional quality in the charitable food system have focused on the individual food boxes provided by direct-service organizations rather than analyzing the quality of inventory at the

food bank-level (Simmet et al., 2017). This is important because an average of 65% of inventory at the 58,000 feeding programs across the country comes from food bank distributions (Weinfield et al., 2014). As assessing inventory quality at each of these 58,000 sites may not be feasible, gaining a better understanding of nutritional quality at the food bank-level will provide deeper insight into the nutritional quality of food in the charitable food system as a whole. Moreover, it remains unclear if the adoption of these strategies is associated with healthier food inventory and, hence, improvements in the quality of food distributed to vulnerable populations. Thus, examining the impact of these strategies on the nutritional quality of inventory will facilitate a better understanding of the promotion of healthy eating within the charitable food system.

In this dissertation, I conducted two interrelated studies that used quantitative and qualitative methods to assess the influences on and implications of food banks efforts to improve the nutritional quality of food distributed. Given that populations served by the charitable food system and food banks are some of the most vulnerable members of our society, improving the quality of food distributed through the charitable food system may help improve diet quality and reduce chronic disease risk and consequences among charitable food system users. In Study 1 I used quantitative data obtained from a national sample of 196 food banks in the MAZON National Food Bank Survey and Assessment of Nutrition Policies and Practices to:

> **Aim 1**: Examine the adoption of nutrition policies and procedures to improve nutritional quality among food banks and their relationship to nutritional quality of food bank inventory.

In Study Two I used qualitative data collected from two case studies with food banks as well as in-depth interviews with key-stakeholders in the charitable food system to:

**Aim 2**: Understand how organizations within the charitable food system have responded to recent trends to improve the nutritional quality of food bank inventory.

Studies One and Two employ an embedded mixed-methods study design to examine organizational change efforts to improve nutritional quality of inventory at food banks. Three principles motivated the selections of a mixed-methods study design: 1) complementary, or to assess coinciding and unique facets of a phenomena; 2) expansion, or to expand the range of understanding in a project; and 3) initiation, the opportunity to explore emergent or contradictory perspectives (Creswell & Plano Clark, 2018). Decades of research and public health interventions have endeavored to understand and improve eating behaviors and diet quality with limited success (Black et al., 2017; Bull et al., 2014). Acknowledging the importance of context and environment in shaping diet (Larson & Story, 2009), this dissertation proposes to incorporate quantitative and qualitative data to establish a better comprehension of healthy eating promotion within the charitable food system.

Diet and nutrition play an essential role in the prevention of obesity and chronic disease (Boeing et al., 2012; Wang et al., 2014; World Health Organization, 2003). As a modifiable correlate of chronic disease, improving dietary patterns has the potential to produce substantial gains for population health and well-being. However, sustained changes in dietary behavior that would reduce disease risk have been difficult to achieve (Black et al., 2017; Bull et al., 2014; Thomson & Ravia, 2011). As a sector of the food system that feeds some of the country's most disadvantaged families, the charitable food system has the opportunity to

promote healthy eating and prevent diet-related disease. However, the dependence on the donation of surplus food and beverages from corporate food retailers and manufacturers may inhibit the distribution of high nutritional quality foods.

This research evaluated food banks' current efforts to promote healthy eating by assessing how the predominant nutrition promotion strategies employed by food banks are associated with the healthfulness of inventory. Additionally, this research examined the interdependent relationships between food banks, their corporate donors, and the direct food service organizations they serve to understand how these connections affect food banks' ability to make change around nutritional quality of their inventory.

In the first chapter, I outline a review of the literature on food insecurity, food assistance, and the charitable food systems. In Chapter 2, I describe the theories motivating the study and present a conceptual framework for understanding the relationship between nutrition strategies and nutrition quality at food banks. In Chapter 3, I provide a brief overview of the research aims and hypothesis of the two dissertation studies. I describe the data and methodology for each study in the fourth chapter. I present the results and a discussion of findings from Study One in Chapter 5. In Chapter 6, I describe the results and findings from Study Two. In the final chapter, I integrate the findings from both studies, present a set of recommendations to better implement and scale nutrition-focused food banking strategies, and discuss the strengths and limitations of the dissertation studies.

# Chapter 1: Background and Significance

## Food Insecurity and Health

Food insecurity has negative impacts on health and well-being beyond the effects of the poverty that generally causes it (Gundersen & Ziliak, 2015; Stuff et al., 2004; Vozoris & Tarasuk, 2003). Food insecurity among children and adults is associated with decreased physical and mental health outcomes, increased rates of depression, as well as reduced quality of life (Cook et al., 2004; Gundersen & Ziliak, 2015). Some evidence suggests that this relationship happens on a gradient – as food insecurity increases health worsens (Cook et al., 2004; Tarasuk et al., 2015). At the same time, poor health contributes to increased risk of food insecurity (Balistreri, 2012; Noonan et al., 2016; Tarasuk et al., 2013). Seligman and Schillinger (2010) hypothesize a cyclical relationship between food insecurity and poor health. For low-income individuals, experiencing food insecurity increases the likelihood of poor diet and makes the self-management of health conditions more challenging. Poor management of health conditions leads to increased health care spending and medication costs which further exacerbates financial instability and food security (Seligman & Schillinger, 2010). This may make it difficult for individuals to exit the cycle once they have entered it.

Households experiencing food insecurity live in a state of uncertainty around food availability (C. Campbell, 1991). To cope with this uncertainty, people employ a variety of strategies, such as altering eating habits or foregoing meals entirely (Bickel et al., 2000). Prolonged periods of restricted food choice, as well as the potentially limited ability to maintain a healthy diet contribute to the health consequences of food insecurity. In addition, food

insecurity acts as a chronic stressor, independent of poverty, further compounding the negative consequences of food insecurity on health (C. E. Ross & Hill, 2013).

Numerous studies have shown that children in households suffering from food insecurity are more likely to have poor health (Gundersen & Ziliak, 2015). Even mild food insecurity has been demonstrated to be detrimental to child health (Schmeer & Piperata, 2017). For children experiencing food insecurity, the negative consequences may include increased risk of anemia (Eicher-Miller et al., 2009; Skalicky et al., 2005), frequent headaches and stomachaches (Alaimo, Olson, Frongillo, et al., 2001), cognitive issues (Alaimo, Olson, & Frongillo, 2001; Zaslow et al., 2009), hospitalizations (Cook et al., 2004), and poor oral health (Chi et al., 2014; Muirhead et al., 2009). Children experiencing food insecurity also show worse behavioral health outcomes (Huang et al., 2010; McIntyre et al., 2013; Melchior et al., 2012). Food insecurity's negative impact on the home emotional environment may help to explain the relationship between food inadequacy and poor mental health outcomes among children (Gill et al., 2018; Huang et al., 2010).

Among older adults, those aged 50 years and older, food insecurity has been linked to poor health and poor mental health outcomes such as lower cognitive function (Gao et al., 2009) as well as increased risk of frailty (Pérez-Zepeda et al., 2016), osteoporosis (Lyles et al., 2014), and depression (Laraia et al., 2009; Ziliak et al., 2008). In addition, studies of food insecure older adults have found that this group is at increased risk for experiencing limitations in activities of daily living compared to their food-secure peers (Ziliak et al., 2008) and cost-related medication underuse, (i.e., reducing, skipping, delaying, or using lower-cost medications to compensate for lack of financial resources) (Afulani et al., 2015). However, the

cross-sectional design of much of the research examining the relationship between food insecurity and health makes it difficult to determinate the causal relationship between the two.

Food insecurity is also positively associated with poor health outcomes among non-senior adults (Gundersen & Ziliak, 2015). Food insecure adults report increased rates of being in fair or poor health (Stuff et al., 2004; Vozoris & Tarasuk, 2003), poor sleep outcomes (Ding et al., 2015), and systematically increased levels of health care spending relative to severity of household food insecurity (Tarasuk et al., 2015). Food insecure adults are also at increased risk for poor mental health outcomes (Casey et al., 2004; Heflin et al., 2005; Heflin & Ziliak, 2008; Hromi-Fiedler et al., 2011; Ziliak et al., 2008) and diet-related chronic disease (Seligman, Bindman, Vittinghoff, Kanaya, & Kushel, 2007;(Seligman, Davis, et al., 2010) (Parker et al., 2010);(Ford, 2013).

A systematic review of food security among women in high-income countries finds strong evidence supporting a link between food insecurity and poor mental health, namely increased risk of depression, anxiety and stress (Maynard et al., 2018). This relationship holds for men as well (Bruening et al., 2017; M. S. Martin et al., 2016; Weaver & Hadley, 2009). Studies using longitudinal data to assess the relationship between food insecurity and poor mental health outcomes find that association appears to be bidirectional with food insecurity increasing risk of poor emotional health, and poor mental health increasing the risk of food insecurity (Bruening et al., 2017; Maynard et al., 2018).

In addition to the health outcomes described above, food insecurity is associated with several diet-related diseases and risk factors including higher prevalence of diabetes (Seligman

et al., 2007), poorer glycemic control (Seligman, Davis, et al., 2010), metabolic syndrome (Parker et al., 2010), increased cardiovascular disease risk (Ford, 2013), and increased body mass index among food insecure women (Gooding et al., 2012; Jilcott et al., 2011; Seligman, Laraia, et al., 2010). On the surface, the relationship between diet-related diseases and food insecurity may seem paradoxical. These health conditions are often associated with excessive caloric consumption, whereas food insecurity is associated with undernutrition (i.e., insufficient intake of energy and nutrients necessary to maintain good health) (Dietz, 1995; Maleta, 2006). However, coping mechanisms employed during food inadequacy in combination with constrained dietary options of lesser nutritional value, contribute to diet-related disease among food insecure individuals (Dietz, 1995; Laraia, 2013). Further, food insecurity is a chronic stressor (Hamelin et al., 1999; Laraia et al., 2006) and linked to the consumption of more highly palatable foods (i.e., foods high in salt, sugar, and fat) (Torres & Nowson, 2007).

*Food Insecurity and Diet Quality*

One factor driving in the relationship between food insecurity and chronic disease may be diet quality. Considerable evidence links food insecurity to decreased diet quality (Hanson & Connor, 2014; Leung et al., 2014). A nationally-representative study of low-income adults found that compared to those who were food secure, lower food security was significantly associated with lower Healthy Eating Index scores, a measure of diet quality that assesses how well a set of foods meets dietary guideline recommendations (Leung et al., 2014). Moreover, very low food security (i.e., those with multiple indications of food acquisition problems) was significantly associated with higher intakes of high fat dairy products, salty snacks, sugar-sweetened beverages, fewer servings of vegetables, and more servings of red and processed meats (Leung

et al., 2014). Similarly, a systematic review of dietary quality and food insecurity among U.S. children and adults found that compared to food secure adults, food insecure adults eat fewer vegetables, fruits, and dairy products and have lower intake of vitamins A and B-6, calcium, magnesium, and zinc (Hanson & Connor, 2014). Food insecurity was less consistently associated with lower diet quality in children indicating that the burdens of food insecurity may not be equally distributed among all members of the household as parents may parents shield children from compromised diet quality (Hanson & Connor, 2014).

*Participation in Food Assistance Programs and Diet Quality*

Each year millions of food insecure Americans participate in one of 15 nutrition assistance programs administered by the federal government. Participation in federal food assistance programs has been shown to attenuate associations between food insecurity and fair/poor health (Cook et al., 2004). Evidence from the three largest federal nutrition assistance programs indicate that while participation in these programs supports sufficient calorie intake, their impact on diet quality is mixed. Participants in the Supplemental Nutrition Assistance (SNAP) program, the largest federal nutritional assistance program, tend to consume enough calories to sustain themselves (Andreyeva et al., 2015). Moreover, the caloric consumption of SNAP participants does not systematically differ from income-eligible or higher-income nonparticipants (Andreyeva et al., 2015). However, numerous studies suggest that SNAP participants have overall lower diet quality compared to higher-income nonparticipants (Andreyeva et al., 2015; Basiotis et al., 1998; Gregory et al., 2013; Whiteman et al., 2018). Further, the diet quality of SNAP participants appears to worsen in the last 10 days of the month when resources diminish (Whiteman et al., 2018).

Conversely, participation in the Women, Infants, and Children program has a positive effect on household diet quality (Basiotis et al., 1998; Tester et al., 2016). Similarly, recent research has shown participation in the National School Lunch program has a positive impact diet quality (Au et al., 2016; Landry et al., 2018) especially for the most nutritionally disadvantaged students (Smith, 2016). Regulations resulting from the 2010 Healthy Hunger-Free Kids Act require that school lunches meet the Dietary Guidelines for Americans. However, these regulations do not apply to food brought from home. This may help explain differences in diet quality for those participating in school lunch programs (Au et al., 2016). Nevertheless, the nutritional quality of school lunches significantly varies by school (Joyce et al., 2018).

The non-profit, charitable food system also supports food acquisition in food insecure households. Traditionally, direct food service organizations within the charitable food system distribute donated food to their clients. There are two main types of direct food service organizations: food pantries and soup kitchens. In food pantries, food supplementation often consists of prepackaged bags of donated food items intended to last a given number of days, commonly three to five days (Middleton et al., 2018; Tarasuk et al., 2014). Soup kitchens and other meal programs use donated foods to prepare meals for on-site consumption (Caruso, 2013). However, households relying on the charitable food system for food assistance may find it difficult to establish a nutritious diet from the non-perishable food items routinely distributed (Garthwaite et al., 2015; Thompson et al., 2018).

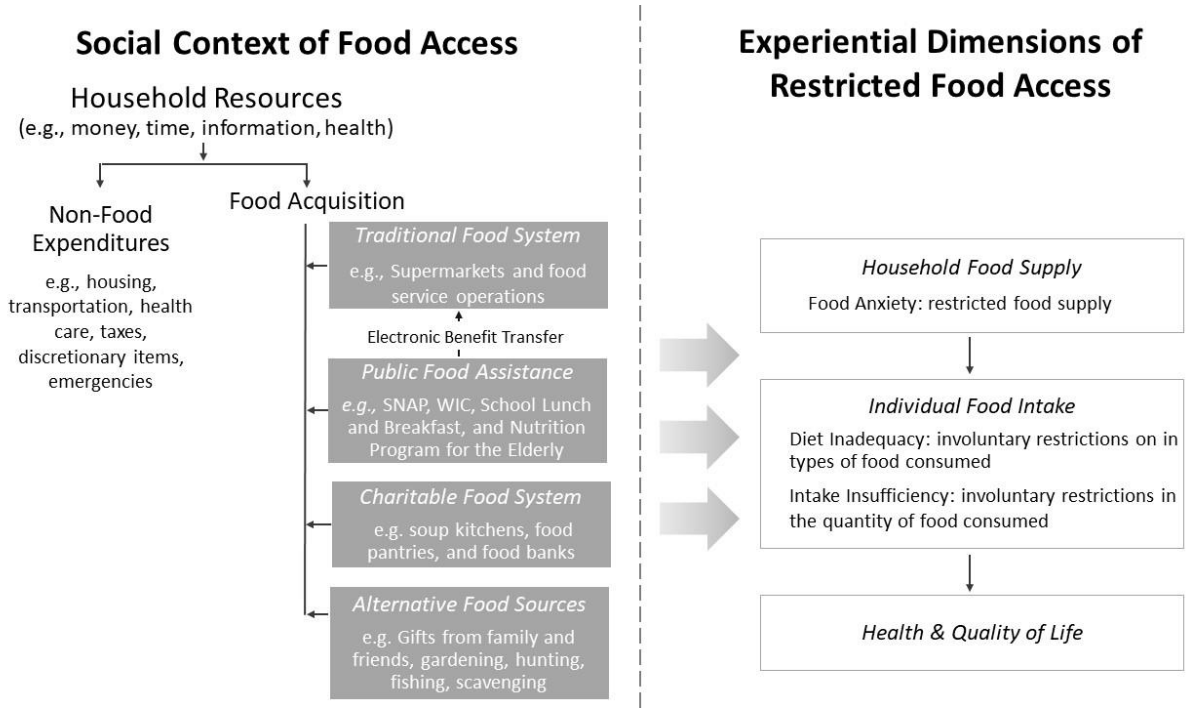
Systematic reviews of the nutritional quality of food provided by food pantries have found that large variations exist in the supply of calories, food groups, and nutrients (Simmet et al., 2017) with limited provision of dairy, vegetables, and fruits (Bazerghi et al., 2016). Similarly,

studies of soup kitchens and other meal provision programs have found that these programs help vulnerable populations meet their energy needs and improve nutritional intake (Li et al., 2009; Sprake et al., 2014; Tarasuk et al., 2009). Yet, the meals provided tend to be energy dense, higher in fat, sugar, and salt, and low in micronutrients (Lyles et al., 2013; Pelham-Burn et al., 2014; Sisson & Lown, 2011).

*Coping with Food Insecurity*

An understanding of the coping strategies associated with food insecurity can further illuminate the relationship between food insecurity and health. Figure 1.1 depicts the social context of food access as well as the experiential dimensions of food access. In terms of the social context, food insecure households must determine how they will allocate resources between food acquisition and other household needs. Food acquisition may come for a few different sources including the traditional food system, public food assistance, the charitable food system, or alternative food sources (C. Campbell, 1991). Restricted food access results in experiences of food anxiety, diet inadequacy, and/or intake insufficiency which threaten overall health and well-being (C. Campbell, 1991).

Figure 1.1: Conceptualization of Food Insecurity and Its Association with Health Outcomes




Adapted from (C. Campbell, 1991)

Food insecure households employ a variety of strategies to cope with inadequate food supply (Kempson et al., 2003). As food hardship becomes increasingly severe so do the accompanying responses. Anxiety about meeting food needs progresses from decreased quality and variety of food, to reducing the amount of food available to adults, and finally to decreasing the amount of food available for children (Bickel et al., 2000). For food insecure households reductions in quality and variety may include the substitution of more expensive, nutrient-dense foods such as fruits and vegetables for less expensive energy-dense, nutrient-poor foods high in added sugars, salts, and fats (Otero et al., 2015). Food insecure individuals also may overconsume in times of adequacy while reducing portions or skipping meals entirely during periods of inadequacy (Kendall et al., 1996).

Beyond food-coping strategies, households must allocate resources between food acquisition and other non-food expenditures. These decisions also impinge on health and diet. For example, households may prioritize buying food over other competing demands such as medication or medical care (Billimek & Sorkin, 2012; Seligman, Davis, et al., 2010). Similar to food-related coping strategies, financial coping strategies occur on a spectrum ranging from reliance on savings, support from friends and families, and increased work effort to use of credit through payday or pawn shop loans or pawn shops (Bartfeld & Collins, 2017).

Food insecure households also seek out alternative sources of food. Their efforts may include participating in public food assistance programs, obtaining gifts from social support networks, and acquiring food from gardening, hunting, fishing and/or scavenging (C. Campbell, 1991; De Marco et al., 2009). Many food insecure household also rely on the charitable food system to support household food acquisition (Weinfield et al., 2014). However, due to its structure, clients of the charitable food system clients have limited choice with respect to the types, quantity, and nutritional composition of foods they receive whereas consumers in mainstream retail food sector can choose from a wider selection of food options, (M. Ross et al., 2013).

*Identifying the Gaps*

For many food insecure households accessing the charitable food system is a last resort (Middleton, Mehta, McNaughton, & Booth, 2018). Yet, a growing number of people look to the charitable food system to supplement their household food acquisition (Berner & O'Brien, 2004; Mabli et al., 2014; Morello, 2020; Weinfield et al., 2014). And, increasingly, clients of the charitable food system rely on this assistance on a chronic basis (Bartfeld & Collins, 2017; Neter

et al., 2014; Weinfield et al., 2014). A national survey of food pantry users found that more than 50% of clients reported accessing the charitable food system six or more months during the previous year (Echevarria et al., 2009). Moreover, the unprecedented rise in unemployment during the global pandemic may result in an increase in the number of households that regularly rely on the charitable food system (Hake, 2020; Morello, 2020). These trends suggest that the needs of clients of the charitable food system extend beyond short-term hunger alleviation. Although designed to provide nutrition assistance on a temporary and supplemental basis, the charitable food system has now become a consistent food source for the chronically hungry, a role it was never designed to assume (Echevarria et al., 2009; Elmes et al., 2016). Accordingly, greater focus should be placed on meeting the nutritional needs of typical users who are high need.

Given that diets consisting of energy-rich, nutrient-poor foods lead to higher risks of obesity and chronic disease (U.S. Department of Agriculture & U.S. Department of Health and Human Services, 2010), it is essential that organizations supplying foods to low-income families offer health-promoting foods that address not only the hunger needs but also the health and nutrition needs of the population being served. However, little is known about the nutritional quality of food distributed through the charitable food system. Most examinations of nutritional quality in the charitable food system have focused on the individual food boxes provided by direct-service organizations rather than the system as a whole (Simmet et al., 2017). In recent decades, efforts have been made to improve the nutritional quality of inventory in the charitable food system (Elmes et al., 2016). Nevertheless, dependency on food and beverage donations, the high costs of healthier foods, and limited infrastructure (e.g.,

refrigeration and storage) have made healthier food acquisition a challenge in the charitable food system (E. Campbell et al., 2013; Handforth et al., 2013; M. Ross et al., 2013).

## Conceptualizing and Measuring Food Insecurity

In response to global food crises happening at the time, the United Nations first defined the concept of food security as the "ability to meet aggregate food needs in a consistent way" at the 1974 World Food Conference (*Trade Reforms and Food Security: Conceptualizing the Linakages*, 2003). Used primarily by the field of international development, this definition implied that food security was an issue of global food supply availability measured at the national and/or regional level with implications for agricultural production and global food markets (M. Anderson & Cook, 1999; Maxwell, 1996). However, Sen (1981) pointed out that hunger results from not *having* enough food not solely because there is an insufficient supply of food. Accordingly, the definition of food insecurity was expanded to include a lack of secure provisions at the household and individual level (Wunderlich et al., 2006). Today, the United Nations defines food insecurity as the lack of access to safe, sufficient, nutritious food necessary for a healthy, active life (Food and Agricultural Organization of the United Nations, 2018).

Historically, the term hunger has been used synonymously with food insecurity. In the 1960s, hunger – defined as discomfort, weakness, illness, or pain caused by a long-term lack of food – took on a wider meaning to encompass food access and socioeconomic deprivation related to food (Wunderlich, Norwood, & National Research Council, 2006). However, in the 1990s a conceptual consensus emerged in the U.S. distinguishing the physiological experience of nutritional deprivation and the social phenomena inadequate food access (S. A. Anderson,

1990). The term food insecurity was adopted in the U.S. as the term used to describe inadequate food access with hunger as a potential, but not necessary, consequence of food insecurity (S. A. Anderson, 1990; Wunderlich et al., 2006).

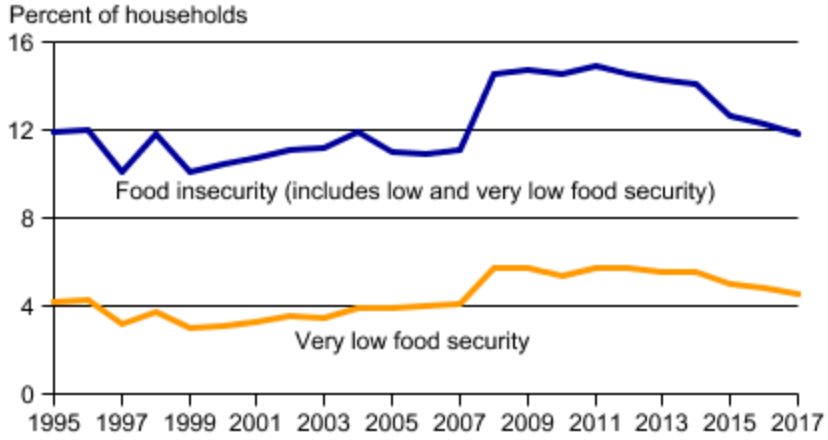
Today, the U.S. Department of Agriculture defines food insecure households as those, at times, unable to acquire adequate food for one or more household members because of insufficient resources for food (Bickel et al., 2000). Since 1995, data from the Household Food Security Scale have been used to report national food insecurity prevalence and to monitor the effects of food assistance programs on household food security (Rabbitt, 2018). The Household Food Security Scale survey consists of 18 questions that assess a households' subjective experience of food insecurity (Kennedy, 2002). Depending on the number of food-insecure conditions and behaviors reported, households are classified as either food secure, having low food security, or very low food security (Coleman-Jensen et al., 2017b). Households classified as having low food security have reported multiple indications of food acquisition problems (e.g., worried whether food would run out, food bought didn't last and didn't have money to get more) and reduced diet quality (e.g., unable to afford a balanced meals), but typically have reported few, if any, indications of reduced food intake (Bickel et al., 2000). Whereas, households classified as having very low food security have reported that the food intake of some household members was reduced and normal eating patterns disrupted at times during the year due to limited resources (Bickel et al., 2000).

## Prevalence of Food Insecurity in the U.S.

Food insecurity remains a persistent concern in the U.S. In 2016, 16 million households, or 12% of U.S. households, experienced food insecurity at some point during the year

(Coleman-Jensen et al., 2017b). Additionally, 4.9% of U.S. households (6.1 million households) experienced very low food security at some point during 2016. Following the 2008 economic recession, from 2011 to 2019 there was a continued downward trend in household food insecurity from a high of 14.9% in 2011. Nevertheless, the prevalence of food insecurity in the U.S. in the last decade has remained above the 2007 pre-recession level of 11% (Coleman-Jensen et al., 2017b). Food insecurity prevalence has spiked again in recent weeks as millions of people have lost employment during the global pandemic (Bauer, 2020; Hake, 2020). Prior to the coronavirus outbreak, the U.S. had made little advancement in the Healthy People 2020 goal to reduce household food security to 6% of the population, seeing little change in overall rates of food insecurity since measurement began in 1995 (Department of Health and Human Services & Office of Disease Prevention and Health Promotion, 2010; Economic Research Service & U.S. Department of Agriculture, 2018).

Figure 1.2 Trends in Prevalence Rates of Food Insecurity and Very Low Food Security in U.S. Households, 1995-2017




Note: Prevalence rates for 1996 and 1997 were adjusted for the estimated effects of differences in data collection screening protocols used in those years.

Source: (Economic Research Service & U.S. Department of Agriculture, 2018)

For most U.S. households experiencing very low food insecurity, the condition is recurrent (Coleman-Jensen et al., 2017b). On average, households that were insecure at some time during the year were food insecure in seven months during the year (Coleman-Jensen et al., 2017b). Similarly, households that reported very low food security experienced the associated conditions, on average, in seven months during the year (Coleman-Jensen et al., 2017b). A smaller subset – approximately one-fourth of food-insecure households (2.4 million households) and one-third of households (2.03 million households) with very low food insecurity – experience these conditions frequently or chronically/every month (Coleman-Jensen et al., 2017b).

Food insecurity is inherently intertwined with income with low-income households remaining particularly vulnerable to food insecurity. For example, 38% of households with annual incomes below the federal poverty level reported food insecurity, as compared with six percent of those with incomes at or above 185% of the poverty line (Coleman-Jensen et al., 2017b). The demographic patterns of food insecurity in U.S. closely align with patterns of poverty in the U.S. Household race/ethnicity is associated with food insecurity. Rates of food insecurity for both Black and Hispanic households were nearly twice that of non-Hispanic white households (Coleman-Jensen et al., 2017b). Household structure also has a relationship to patterns of food insecurity in the U.S. The rates of food insecurity were substantially higher for households headed by a single women (31.6%) or a single man (21.7%) as compared to dual-parent households (9.9%) (Coleman-Jensen et al., 2017b). Geography also shapes patterns of food insecurity in the U.S. Food insecurity prevalence is higher among households located in principal cities (14.2%) and rural areas (15.0%) compared to households living in suburbs and

metropolitan areas outside of principal cities (9.5%) (Coleman-Jensen et al., 2017b). In addition, the prevalence of food insecurity is higher for households located in the Southern U.S. (13.5%) compared to the Northeast (10.8%), West (11.5%), and Midwest (12.2%) (Coleman-Jensen et al., 2017b). The prevalence of very low food security in various types of households followed a pattern similar to that observed for food insecurity.

Studies of prevalence patterns of food insecurity among low-income households indicate that other factors beyond poverty also may contribute to food insecurity. While the probability of food insecurity declines as income increases, only an estimated 65% of households near the federal poverty line are food insecure (Gundersen et al., 2011). Conversely, a non-trivial proportion of households above the poverty line experience food insecurity (Gundersen et al., 2011). More than 20% of households with incomes at 200% of the Federal Poverty Line experience food insecurity (Gundersen et al., 2011). Having constrained access to liquid assets as well as high levels of income volatility contribute to the risk of food insecurity (Leete & Bania, 2010; Ribar & Hamrick, 2003). Independent of poverty, some sociodemographic factors also contribute to the increased risk of food insecurity. For example, controlling for income among households with children having an incarcerated parent, an immigrant parent, a disabled parent, complicated household structures, changing residencies, as well as declines in maternal or child health increase the risk of food insecurity (Committee on National Statistics et al., 2013; Cox & Wallace, 2013; Jacknowitz et al., 2015). Other studies have found racial/ethnic disparities in food insecurity persist after controlling for economic factors (Bartfeld & Collins, 2017; Gundersen, 2008; Langellier et al., 2012; Odoms-Young & Bruce, 2018).

## A Brief History of Food Assistance in the U.S.

Federal food programs in the U.S. have their roots in the Great Depression. Enormous agricultural surpluses during the 1920s troubled the farming sector, resulting in a stark contrast between waste and hunger in the 1930s (Poppendieck, 2014). In response, the Hoover and Roosevelt administrations developed programs to reallocate surplus farm products to people in need. For example, the U.S. Department of Agriculture purchased and then donated surplus agricultural commodities items directly to schools, helping both farmers and children in schools. In addition, the food stamp program allowed individuals to purchase surplus agricultural products at local grocery stores. This program allowed those who qualified for relief to purchase orange stamps equivalent to their normal food expenditure (U.S. Department of Agriculture, 2018). For each $1 worth of orange stamps purchased, individuals would receive $0.50 in blue stamps (U.S. Department of Agriculture, 2018). Blue stamps could be used to purchased agricultural surplus items specified by the U.S. Department of Agriculture (U.S. Department of Agriculture, 2018).

In the early 1960s government representatives from rural districts intent on increasing farm subsidies for their constituents "traded" with representatives from urban districts who sought increased funding for food assistance programs. This trade resulted in the modern Food Stamp Program (Poppendieck, 2014). The program was predominantly designed to support farmers and initial provisions of the program proved inadequate in preventing poverty-related malnutrition (Poppendieck, 2014). After several prominent senators at the time saw the devastating results of hunger in the Mississippi delta region in the late 1960s, anti-poverty

activist successfully fought to expand eligibility, increase benefits, and establish the rights of applicants and recipients of the Food Stamps program (Poppendieck, 1999a).

Economic recession in the early 1980s coupled with dramatic cuts in social spending under the Regan administration shifted the provision of food assistance in the U.S. once again (Poppendieck, 1999a, 2014). During this era, the poverty rate rose from 12% in the 1970s to a peak of 15% in 1983 (Chaudry et al., 2016). The widespread hardship of many Americans at this time was intensified and made visible by the combination of increased need and reduced social provisions. In response to this increased need, churches, other charitable organizations, and individuals expanded the number of food pantries and soup kitchens and increased the number of people that they served. As a result, the charitable food system rapidly expanded. A 1983 survey by the Center for Budget and Policy Priorities found that more than half of the agencies in its survey of 16 areas of the country reported that the number of food baskets or free meals that they provided had increased 50% or more between February 1982 and February 1983 with nearly a third of agencies reported doubling their services (Porter Bishop, 1983). The creation of food banks further fueled the expansion of the charitable food system (Poppendieck, 2014).

Modern day food banking emerged in the late 1960s. As a volunteer for a local mission in Phoenix, Arizona, John van Hegel saw the need for a steady food supply source at its soup kitchen (Riches, 2018). A local woman, who salvaged food from grocery store dumpsters to feed her family, suggested to van Hegel that he reallocate surplus food from being wasted to those in need (Riches, 2018). Van Hegel recruited volunteers to do just that - gleaning fruit from unpicked fruit trees and contacting local food stores to donate edible but unsaleable food. This ultimately lead to the creation of St. Mary's food bank - a depot where surplus food could

be collected, organized, warehoused, and then distributed to organizations feeding the poor (Riches, 2018).

Soon groups in other states followed, adopting the faith-based, grassroots, warehouse food banking model developed by van Hegel in Phoenix in response to local food insecurity (Riches, 2018). The food bank model was further institutionalized when Feeding America, a national association for food banks, formally incorporated in 1979 (Riches, 2018). Several federal legislative acts in the late 1970s and early 1980s also supported the growth of the food bank model: funding the establishment of food banks, creating tax deductions for the donation of surplus foods, protecting corporations from liability related to food donations, as well as supplying U.S. Department of Agriculture commodities to charitable food organizations (Riches, 2018). Today, more than 200 food banks currently operate in the U.S. distributing food to an estimated 58,000 food programs serving 46.5 million individuals annually (Weinfield et al., 2014).

## Food Assistance in the U.S. Today

Food insecure households rely on both public and private food assistance to help maintain their food supply. The charitable food system is highly visible with food drives, fundraisers, and volunteer opportunities common in many communities (Poppendieck, 1997); however, the majority of nutrition assistance in the U.S. comes from government provisions. A report from Bread for the World, a Christian anti-hunger organization, found that the only one in 20 bags of food assistance comes from a charitable organization with the government providing the other 19 (Bread for the World, 2015). In 2013, the charitable system distributed an estimated $5.2 billion worth of food whereas the U.S. Department of Agriculture expenditures totaled $102.5

billion (Bread for the World, 2015). Similarly, the number of people participating in public nutrition assistance programs dwarfs the number of those participating in private food assistance programs. The Supplemental Nutrition Assistance Program (SNAP) serves an average of 42 million individuals each month whereas the charitable food system sees an estimated 17 million unique clients each month (Oliveira, 2016; Weinfield et al., 2014). Nevertheless, as economic precarity increases, so too does the number of people utilizing the charitable food system to supplement household food acquisition on a chronic basis (Bartfeld & Collins, 2017; Berner & O'Brien, 2004; Mabli et al., 2014; Weinfield et al., 2014). This increased demand on the charitable food system has been made highly visible by the global pandemic as numbers of individuals seeking supplemental nutrition assistance from pantries has grown dramatically (Morello, 2020; Reiley, 2020).

### *Federal Nutrition Assistance Programs*

The U.S. Department of Agriculture administers 15 domestic food and nutrition assistance programs (Oliveira, 2016). These programs include the three largest programs, SNAP; the Special Supplemental Nutrition Program for Women, Infants, Children (WIC); and the National School Lunch programs along with a variety of other food assistance programs. Combined spending for all federal nutrition assistance programs totaled $98.6 billion in fiscal year 2017 (Oliveira, 2018). SNAP accounted for 69% of all federal food and nutrition spending in 2017 (Oliveira, 2018).

The federal government allocates funding for nutrition assistance programs to states. The states oversee and manage the program according to federal guidelines (Eilender, 2016), including the application process. Eligibility for participation in federal nutrition assistance

programs varies by program (Eilender, 2016). Unlike most means-tested benefit programs, SNAP is broadly available to low-income households where the monthly income is at or below 130% of poverty line (about $2,213 a month or $26,600 a year) (The Center on Budget and Policy Priorities, 2016). Participation in other programs such as WIC and the National School Lunch Program is restricted to particular groups such as pregnant women or school children (Eilender, 2016). Table 1.1 lists all fifteen federal nutrition assistance programs alongside a description of each program, the state agency that administers the program, the number of people served, and amount of federal dollars spent.

Table 1.1: Federal Nutrition Assistance Programs

| Program | Description | State Administrative Agency | FY 17<br>Population Served | FY 17<br>Federal Dollars Spent* |
|---|---|---|---|---|
| Supplemental Nutrition Assistance Program (SNAP) | Enables low-income families to purchase nutritious food | Department of Health and Human Services | 42.2 million individuals | $68 Billion |
| National School Lunch Program (NSLP) | Provides low-cost or free nutritious lunch to children in school | Department of Education | 30 million children | $13.6 Billion |
| Special Supplemental Program for Women, Infants, and Children (WIC)<br><br>**Including WIC Farmer's Market Nutrition Program (FMNP)* | Provides nutritious foods, nutrition education, and referrals to health and other social services to low-income women, and infants and children up to age 5 who are at nutritional risk | Department of Agriculture; Department of Health | 7.3 million women, infants, and children | $5.6 Billion<br><br>*(Includes food costs, nutrition services, administrative cost)* |
| WIC Farmer's Market Nutrition Program (FMNP)<br><br>**FMNP operates in 36 states, District of Columbia, Guam, Puerto Rico, Virgin Islands, and six Indian Tribal Organizations* | Provides vouchers for WIC recipients to redeem at participating Farmers' Markets | Department of Human Services | 1.7 million WIC participants in FY16 | $21 Million in FY16 |
| Child and Adult Care Food Program (CACFP) | Provides nutritious meals to children and elderly individuals in day-care settings | Department of Education; Department of Health; Department of Human Services | 4.5 million children and adults | $3.5 Billion |
| National School Breakfast Program (SBP) | Provides low-cost or free nutritious breakfast to children in school | Department of Education | 14.7 million children | $4.3 Billion |

| | | | | |
|---|---|---|---|---|
| **Summer Food Service Program (SFSP)** | Provides free meals and snacks to children under age 18 when school is not in session | Department of Education | 2.6 million children and youth *(Average daily attendance)* | $482 Million |
| **Senior Farmers' Markets Nutrition Program (SFMNP)** ***SFMNP operates in 42 states, the District of Columbia, Puerto Rico, and seven Indian Tribal Organizations*** | Provides low-income seniors with coupons that can be exchanged for eligible foods at farmers' markets, roadside stands, and community supported agriculture programs | Department of Aging; Department of Agriculture; Department of Health; Department of Human Service | 816,207 in FY16 | $20.3 Million in FY16 |
| **Fresh Fruit and Vegetable Program** | Provides free fresh fruits and vegetables throughout the school day in elementary schools | Department of Education | N/A | $17.2 Million |
| **Special Milk Program** | Provides milk to children in schools and childcare institutions not participating in other child nutrition programs | Department of Education | 41 million half-pints per month *(Individuals served not calculated)* | $8 Million |
| **The Emergency Food Assistance Program (TEFAP)** | Makes commodity food available to State agencies, which in turn distribute the food to non-profit community agencies which assist low-income persons | Department of Agriculture; Department of Education; Department of Health; Department of Human Services | 824 million pounds of food distributed *(Individuals served not calculated)* | $661 Million |
| **Commodity Supplemental Food Assistance Program (CSFP)** ***CSFP operates in 49 states, the District of Columbia, Puerto Rico, and three Indian Tribal Organizations.*** | Provides commodity foods to low-income elderly persons at least 60 years of age. Women, infants, and children who were certified and receiving CSFP benefits as of February 6, 2014 can continue to receive assistance until they are no longer eligible under the program rules in effect on February 6, 2014. | Department of Agriculture; Department of Education; Department of Health; Department of Human Services | 630,000 individuals | $204 Million |
| **Food Distribution Program on Indian Reservations (FDPIR)** | Provides commodity foods to low-income households, including the elderly, living on Indian reservations and to Native American families residing near reservations | Individual Tribal Authorities | 90,000 individuals | $122 million |

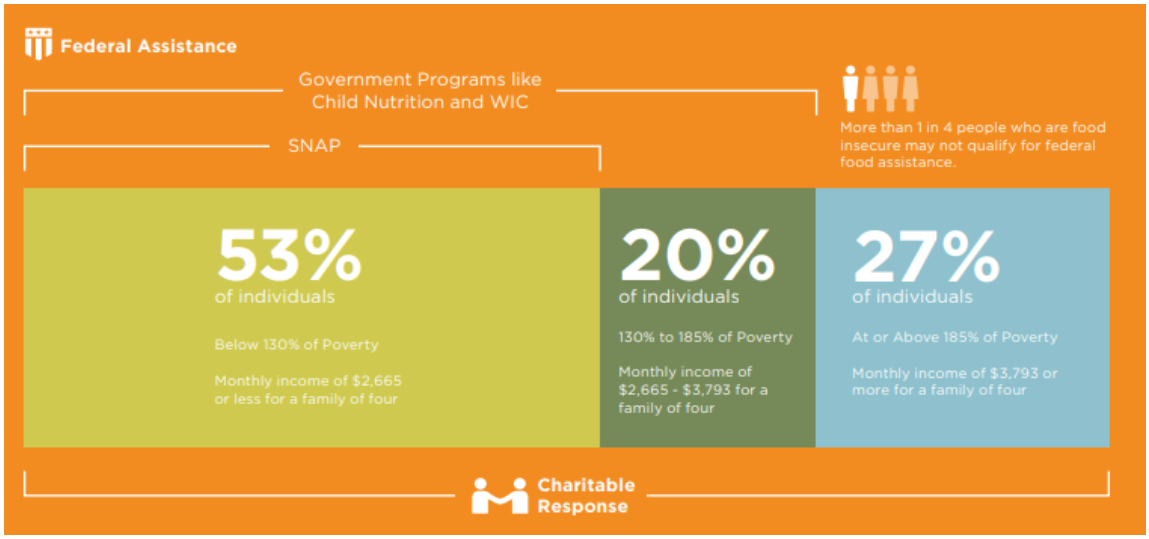
Source: (National Conference of State Legislators, 2018)

## The Charitable Food System

Decades-long efforts to erode government social safety nets coupled with an increase in the number of workers with precarious employment and stagnant wages, and wavering support for federal nutrition assistance programs have transformed household food insecurity in the U.S. from an emergency issue to a chronic concern (Powers, 2016). Thus, despite the essential

support provided by federal nutrition assistance programs – gaps in the provision of these services persist (Medlin & McDonald, 2018). Figure 1.3 depicts the percent of food insecure individuals by income level. More than 25% of food insecure households may not qualify for federal food assistance programs as the eligibility requirements of each program limit the number of families who can receive benefits (Coleman-Jensen, Rabbitt, Gregory, & Singh, 2017). Further, these programs are frequently under threat as opponents of federal nutrition assistance programs fight to further limit program eligibility (Fessler, 2019; Reiley, 2019).

Figure 1.3: Percent of Food Insecure Households by Income Level




Source: (Medlin & McDonald, 2018)

Moreover, while participation in the SNAP program reduces the likelihood of food insecurity, it does not completely eliminate food insecurity for all households since SNAP benefits do not always buy an adequate amount of food for food insecure households (Nord & Golla, 2009; Ratcliffe & McKernan, 2010). Timeliness may also be a concern. For example, SNAP benefits can take up to 30 days to process which may be an issue for those with immediate food needs

(Project Bread, n.d.). To fill the gaps in food needs left by these programs, many households turn to the charitable food system.

The charitable food system represents the non-profit sector's efforts to address hunger and food insecurity among low-income individuals and households. As a society, the U.S. frequently depends on the non-governmental sector as an essential vehicle for social betterment (Wright, 2001). In contrast, similarly wealthy nations, such as the United Kingdom, rely on government to collect and redistributed tax dollars to fund public entitlements for social betterment (Wright, 2001). The U.S. approach stems from long-standing beliefs that government should have constrained power and play a limited role in social improvement (Hall, 2016). Today, more than 1.5 million non-profit organizations are registered with the Internal Revenue Services in the U.S. working on broad array of issues such as education, arts, civil rights, health care, and human services (McKeever, 2019).

Among the social issues non-profit organizations seek to address, hunger stands out. Food is not only essential to human survival; but it is also deeply embedded in our cultural and social interactions (Riches, 2018). The powerful role of food in human existence and social experiences compels us to action to address hunger (Poppendieck, 1999a; Riches, 2018). Religious ideologies and secular arguments (e.g., Maslow's hierarchy of needs) heighten this impetus for action (Poppendieck, 1999a). So much so, that according to one poll, 79% of U.S. households have contributed to the fight against hunger – making it one of the few social issues that Americans agree upon across the ideological spectrum (Fisher & Jayaraman, 2018a; Poppendieck, 1995). Millions of Americans participate in charitable efforts to alleviate hunger through the donation of time, money, or food (Poppendieck, 1995). Each month nearly two

million volunteers donate more than 8.4 million hours of time to food programs dedicated to hunger alleviation (Weinfield et al., 2014). The emotional and ethical impact of hunger as a social issue underpins the success of the charitable food system (Poppendieck, 1999a).

The charitable food system in the U.S. is a complex and sophisticated system comprised of a network of suppliers, warehouses, transportation, philanthropic organizations, anti-hunger advocates, and numerous volunteers (E. Campbell et al., 2013). The system is also unplanned. Pantries, soup kitchens, and food banks emerge wherever someone is moved to create them (Poppendieck, 1999a). Typically, organizations in the charitable food system are nonprofit or faith-based organizations staffed by volunteers (Caruso, 2013). Programs in this system are designed to provide food on a *temporary and supplemental basis* at no cost to those accessing assistance. For this reason, the charitable food system is sometimes referred to as the emergency food system. Unlike public nutrition assistance program, charitable food programs place few eligibility requirements on people seeking services (Caruso, 2013).

Each year, the charitable food system provides food assistance to an estimated 1 in 8 Americans in 15.5 million households (Weinfield et al., 2014). Many of whom seek services repeatedly throughout the year (Weinfield et al., 2014). According to a 2009 report by Feeding America, 54% of clients had visited a food pantry for at least six months in the prior year with more than one-third of all clients reporting visiting a food pantry at least monthly (Echevarria et al., 2009). Clients who visited food pantries monthly also reported that this occurred on average for more than 28 consecutive months (Echevarria et al., 2009). Among those aged 65 and over, more than half of respondents reported recurrent use of the charitable food system

having visited a pantry at least once a month every month of the previous year (Echevarria et al., 2009).

Individuals using the charitable food system range from infants to seniors. Nearly 40% of households contain at least one child, and 33% contain at least one senior (Weinfield et al., 2014). Charitable food system clients come from a diverse array of racial/ethnic backgrounds and education levels (Weinfield et al., 2014). Approximately 50% of clients identify as White with another 30% identifying as Black or African American, and another 10% identifying as Hispanic/Latino (Weinfield et al., 2014). Individuals accessing this system also tend to be poor. More than 70% of households surveyed in the 2014 Hunger in America report fell at or below 100% of Federal Poverty Level (Weinfield et al., 2014). Households utilizing the charitable food system also report health concerns. More than 50% of households has a member with high blood pressure, and in 33% of households, a member has been diagnosed with diabetes (Weinfield et al., 2014). Additionally, 23% of households report that no members have health insurance coverage, and 60% of households report having unpaid medical bills (Weinfield et al., 2014).

The charitable food system serves people who do not qualify for federal nutrition assistance programs (e.g., those who exceed means thresholds to qualify, non-citizens) as well as those who qualify but do not receive assistance (e.g., those unaware that they qualify, those unwilling or unable to complete the bureaucratic process) (Poppendieck, 1999b). In addition, because public food assistance is designed to serve as a supplement, clients whose household nutrition needs extend beyond what public assistance also rely on the charitable food system (Poppendieck, 1999b). The majority of charitable food system clients receive some form of

federal food assistance. More than half of individuals utilizing the largest charitable food network in the U.S. also receives SNAP benefits (Weinfield et al., 2014). And among households with school-aged children, more than 90% of families participate in the free or reduced-price lunch programs (Weinfield et al., 2014).

The charitable food system offers food assistance through two types of programs: soup kitchens and food pantries. Soup kitchens provide prepared meals for individuals and families to eat on site (Caruso, 2013). Food pantries distribute food and groceries to be consumed off-site, usually for at-home preparation (Caruso, 2013). In 2014, the charitable food system consisted of more than 58,000 food programs, including nearly 19,000 soup kitchens and more than 39,000 food pantries (Weinfield et al., 2014). Food banks are situated at the center of this charitable system acquiring food from donations and government programs and redistributing recovered food to direct-service sites.

Figure 1.4 depicts how surplus food makes it way to clients through the charitable food system. Food banks are "large, warehouse style facilities that receive bulk donations from food manufacturers and retailers, and sometimes from the government, and redistributes them to soup kitchens and pantries" (Poppendieck, 2014, p. 183). More simply, food banks are non-profit, warehouse, and trucking operations that connect those who have food to those agencies who directly provide it to those who need it (Fisher & Jayaraman, 2018a).

The majority (80%) of food banks in the U.S. belong to the Feeding America network (Gundersen et al., 2011). Feeding American is the nation's largest domestic hunger-relief organization serving as a central organizing hub for food banks across the country. The 200 member food banks in the network pay a sliding scale fee to Feeding America based on the size

of the organization (Fisher & Jayaraman, 2018a). In exchange, Feeding America facilitates food donations, raises funds, and provides technical assistance to the food banks in its network (Fisher & Jayaraman, 2018a).

Figure 1.4: Sources of Food and Channels of Food Distribution in the Charitable Food System

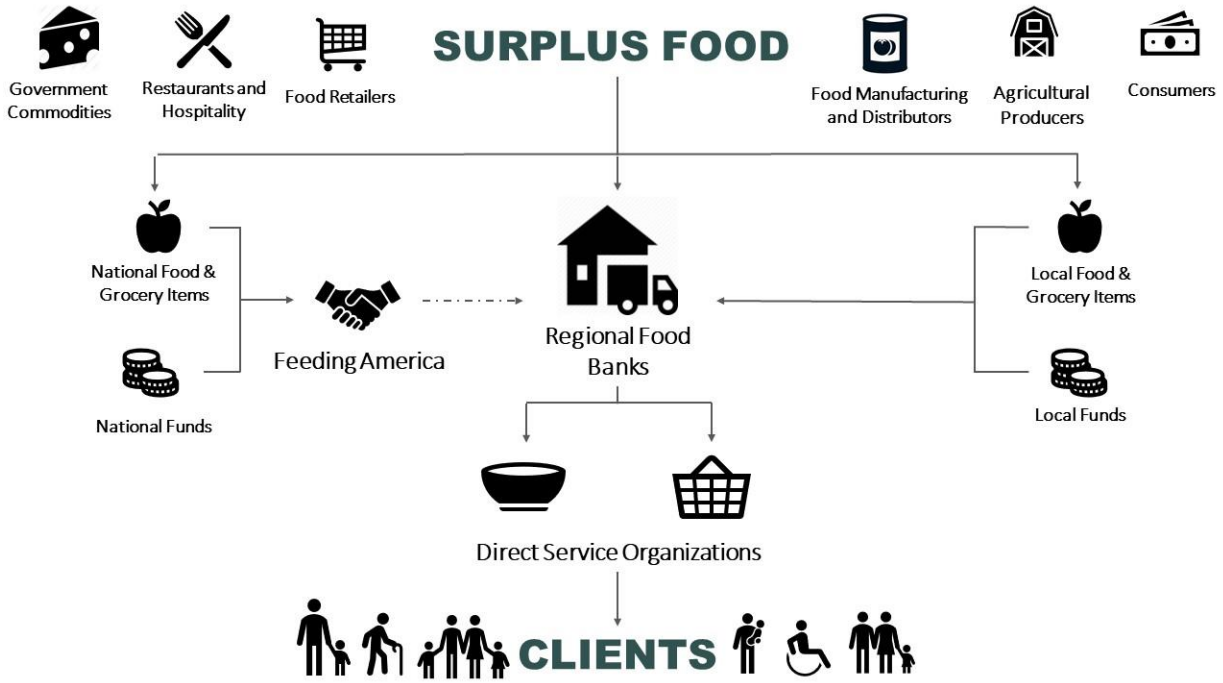



Figure adapted from (Weinfield et al., 2014)

Membership in Feeding America also establishes standardized operating procedures around things like food handling (Fisher & Jayaraman, 2018a). Despite the standards imposed on food banks by Feeding America and government entities, immense variation exists between each organization with respect to its food sourcing, political stances (e.g., advocating for SNAP, viewing healthy food as a right and not a privilege) and programming (e.g., gleaning programs, school backpack programs, and mobile pantries (Elmes et al., 2016; Fisher & Jayaraman, 2018a). Among other factors, the size, geographic service area (including area need and cost to operate), and availability of resources (including food and funds), leadership, and history shape

the organizational disposition and operations of each food bank (Fisher & Jayaraman, 2018a; Rivera et al., 2016).

Food bank inventories are made up of a combination of donations and foods acquired through their institutional purchases (E. Campbell et al., 2013). Food banks collect donations from a variety of manufacturing and retail outlets. Often, the nature of these sources is contingent upon the geographic location of the food bank and the makeup of the surrounding food processing and agricultural industries (Fisher & Jayaraman, 2018a). Donations include unsellable products from supermarkets; food manufacturer surplus; excess, blemished, or undersized produce; as well as prepared food recovered from caterers or restaurants, and canned food drives (Fisher & Jayaraman, 2018a). Much of this food would end up as landfill if not channeled through the charitable food system (Caruso, 2013). As such the charitable food system has a reputation as a food waste prevention option. Increasingly, food banks have adopted waste reduction or food rescue as a component of their mission and identity (Poppendieck, 1999a).

Corporations and businesses that donate food and beverages to food banks benefit in several ways. First and foremost, firms have economic incentives to donate surplus food and beverage items (Fisher & Jayaraman, 2018b). Corporate donors receive an enhanced tax deduction for food and beverage donated to charitable organizations (Fisher & Jayaraman, 2018a). The tax deduction outlined by Internal Revenue Code 170(e)(3) allows corporations to deduct an amount equal to its costs plus up to 50% of its normal profit (Thomas & Arnold, 2015). The Congressional Budget Office estimates that this results in approximately $189.6 million in tax deductions per year, based on a tax year average from 2013 to 2022

(Congressional Budget Office, 2012). An equally important incentive, donating to food banks also provides a convenient mechanism for manufacturers and retailers to donate their products safely and efficiently to one location and allows companies to receive a single tax deduction for their goods rather than dealing with requests and receipts from multiple parties (E. Campbell et al., 2013).

These donations also express a company's values and social responsibility (Fisher & Jayaraman, 2018b). Goodwill earned through this type of corporate philanthropy often offers a company increased access and prestige (e.g., non-profit leaders may speak more positively - or avoid speaking negatively - about a corporate donor), bolstered reputation, and supports their community business interests (Fisher & Jayaraman, 2018b). Since the 1990s corporate philanthropy has become increasingly strategic in this way, deployed as a tool to not only benefit a specific cause, but also to support a company's core business objectives (Fisher & Jayaraman, 2018b).

In addition to supporting the charitable food system through tax deductions, the U.S. government also supplies food to the charitable food system through The Emergency Food Assistance Program (TEFAP). Designed to help reduce federal food inventories while assisting low-income persons, the program began distributing commodity foods in 1981 (Food and Nutrition Services & U.S. Department of Agriculture, 2017). Today, TEFAP continues to distribute commodity foods including canned and fresh fruits and vegetables, fresh and dried eggs, meat, poultry, fish, milk and cheese, pasta products, and cereal (Food and Nutrition Services & U.S. Department of Agriculture, 2017). In addition, the program also provides funding to support the administrative aspects of the distribution and storage of donated food

products. In 2017, Congress appropriated 375.4 million dollars to administer and purchase food through the TEFAP program (Food and Nutrition Services & U.S. Department of Agriculture, 2017).

Maximizing food and beverage donations from government and corporations behooves food banks as traditionally, food banks have measured their output or success in terms of pounds of food donated (Roman, 2017). Yet, this perspective overlooks the close relationship between food insecurity, diet, and disease (M. B. Schwartz & Brownell, 2007). Using weight to assess success has advantages. One, food banks can easily measure weight. And, two, weight is a clear indicator of output, easily understood by donors (Roman, 2017). But, using total pounds distributed as a measure of success obscures any assessment of quality of distributed food. For instance, soda weighs more than the same volume of leafy greens which would translate into greater output for a food bank. Maintaining total weight as the only indicator of output may then discourage a food bank from banning or reducing soda from its inventory. In response, some food banks have refined their measures of output. This adjustment includes categorizing inventory by its nutritional profile to more clearly depict distribution. For example, the Capital Area Food Bank in Washington, D.C. refined its measures of output assessing distributed pounds of produce per person as well as pounds of healthy food distributed (Roman, 2017).

## Food Banks and Nutrition

Food banks rely on food and beverage donations from individuals and industry oversupply to stock their inventory, offering organizations little autonomy over distributed foods (Middleton et al., 2018). Furthermore, because food bank inventory is made up of the food system surplus and the current food supply contains excess foods and beverages that are

both nutritionally empty and energy-dense (Miller et al., 2015), the nutritional quality of food bank inventory may be lacking (Simmet et al., 2017). However, with increased attention around rising obesity rates in the U.S. and increased demand for food banking services following the 2008 global economic crisis, leaders in the system have begun shifting strategies to incorporate improved access to healthy foods as a key aspect of the work they do (Elmes et al., 2016).

As a sector of the food system that feeds some of the country's most disadvantaged families, the charitable food system has the opportunity to promote healthy eating and help prevent diet-related disease. Yet, to date few studies have systematically examined the nutritional quality of food within the emergency food system. Examinations of nutritional quality in the charitable food system have focused on the individual food boxes provided by direct-service organizations (Simmet et al., 2017) rather than analyzing the quality of inventory at the food bank-level. Given that about 65% of inventory distributed through feeding programs across the country comes from food banks and the limited feasibility of assessing inventory quality at each of these 58,000 sites, examining nutritional quality at the food bank-level would provide deeper insight into the nutritional quality of food in the charitable food system as a whole (Weinfield et al., 2014).

A study of one food bank in the Pacific Northwest found that two-thirds of the inventory could be categorized into one of five categories: grains, fruits, vegetables, milk, and meat/beans (Hoisington et al., 2011). Among these categories, a greater percentage of the inventory consisted of vegetables and meat/beans as compared to fruits and dairy. The other 33% of inventory consisted of a combination of foods from the following categories – condiments, variety (e.g., miscellaneous canned, boxed and fresh foods, unknown food group), combination

(e.g., noodle casseroles and soups), and discretionary (e.g., desserts, sodas, and snack foods) (Hoisington et al., 2011). A second study examined the nutritional quality of inventory for six food banks in California from 2007 to 2010 (M. Ross et al., 2013). Ross and colleagues found a substantial increase in fruits and vegetables at food banks both in terms of total weight and relative weight (i.e., as a percentage of total pounds) over the three-year study period. Interestingly, food banks in the study reported that these changes were not a result of nutrition policy adoption or participation in nutrition initiatives; rather, the increase in fresh produce was a result of brokered relationships with regional agricultural producers as well as decreased donations from food processers due to increased efficiencies in food manufacturing and production (M. Ross et al., 2013).

In their attempts to transform the nutritional quality of inventory, food banks in the U.S. have employed several different approaches. A mixed methods study of 49 purposively sampled, Feeding America-affiliated food banks found that agencies reported two predominate responses to improving nutritional quality of inventory: 1) establishing a nutrition profiling system and 2) adopting a nutrition policy (Handforth et al., 2013). In addition, food banks have worked to innovate their donation streams to increase access to fresh produce from locally-produced agriculture (Vitiello et al., 2015).

Nutrition profiling systems are based on ranking system or algorithm that quantitatively scores the nutritional value of distributed food with the aim of supporting food banks to identify and source healthful foods (Feeding America, 2015). Nutrition profiling systems can range from simple systems such as Foods to Encourage which divides foods into food groups and tracks the percent of inventory by weight belonging to each food group (Gallington &

Kimball, 2015). These simple systems require no software and minimal training (Gallington & Kimball, 2015). Other more complex systems, such as Choose Healthy Options Program (CHOP), score foods based on nutrition information from the nutrition label and track inventory scores. The more complex programs require software and staff training to operate (Gallington & Kimball, 2015).

A 2013 survey of 49 food banks in the U.S. found that only 16% of food banks utilized some sort of nutrition profiling system with more than half of food banks using common sense in order to identity nutritious foods (Handforth et al., 2013). Users of nutrition profiling systems reported that these systems helped to demonstrate to funders and other outside parties the current status of nutritional quality in inventory (Handforth et al., 2013). In contrast, users of nutritional profiling systems also felt that substantial nutrition expertise was necessary to make these systems sustainable (Handforth et al., 2013). Food bank staff reported uncertainty around identifying nutritious foods and the aspects of nutritional quality that should be prioritized within food bank inventory. Additionally, the different nutrition ranking systems used by food banks lack consistency in terms of design and measurement. For example, some rankings base nutrient values per 100 calories or per 100 grams while others base calculations on the serving size listed on the nutrient label. The lack of consistency between systems can create confusion between system stakeholders (e.g., staff, volunteers, donors, and clients) as to what constitutes a “healthy” vs. “unhealthy” item (M. Schwartz et al., 2020). Additional research is needed to understand how food banks are (or are not) utilizing nutrition tracking systems to improve the nutritional quality of inventory (E. Campbell et al., 2013).

Nutrition policies at food banks aim to increase healthful food and/or decrease unhealthy foods. Food banks commonly adopt nutrition policies to eliminate specific products such as soda or candy from its inventory. Although some cities have adopted regulations that inform policy adoption at some food banks (e.g., reduction of trans fats), most food banks determine their own policies (Handforth et al., 2013). Yet, less than one third reported having a policy or guideline to decrease food and beverages with minimal nutritional value (E. Campbell et al., 2013). Moreover, only a small minority of food banks extended their nutrition policies to include food groups such as whole grains, meat, fish or poultry, and dairy (E. Campbell et al., 2013). Further, many food banks reported being unable to fully implement their nutrition policies or guidelines (E. Campbell et al., 2013). One of the primary concerns for food banks that had not yet adopted nutrition policies was donor loss and limiting client choice. Also, as the inventory changes increasing capacity to transport and store fresh foods at food banks and partner agencies an important consideration (E. Campbell et al., 2013).

*Identifying the Gaps*

In recent years the number and frequency of clients utilizing the charitable food system has increased (Echevarria et al., 2009; Weinfield et al., 2014). This demand has continued to rise as the economic slowdown resulting from the COVID-19 pandemic has left numerous households food insecure (Bauer, 2020; Morello, 2020). Moreover, charitable food system clients tend to be low income and have high rates of health concerns (Weinfield et al., 2014). Although diet plays an essential role in shaping health outcomes (Dietz et al., 2016; Schwingshackl & Hoffmann, 2015), little research beyond the few studies cited above has

examined the nutritional quality of food distributed through food banks, central depots within the charitable food system.

Despite this gap in the literature, leaders in the sector have begun implementing organizational strategies to improve the nutritional quality of food bank inventory namely, implementing nutritional tracking systems and nutrition policy (Elmes et al., 2016; M. Ross et al., 2013). Yet, little is known about the factors that influence food bank adoption of these nutrition policies and procedures. Moreover, the impact of nutrition policies and procedures on food bank inventory remains unclear. Only one study has examined the relationship between nutrition policies and inventory quality among six California food banks, finding no association between the two (M. Ross et al., 2013). One reason for this finding may be the gap between adoption and implementation (Rogers, 2003b). Food banks cite several barriers to the adoption of these strategies: lack of infrastructure and capacity, fear of donor loss, pushback from board members and other organizational leaders, as well as, a desire to maintain client choice (E. Campbell et al., 2013; Handforth et al., 2013; M. Ross et al., 2013). These barriers may prevent food banks from fully implementing adopted nutrition policies and procedures. These barriers suggest the need for additional research to understand how these barriers affect the adoption and implementation of these strategies and hence, the capacity of food banks to change their inventory quality.

## Summary

Food insecurity has negative impacts on health and well-being beyond the effects of the poverty that generally causes it (Gundersen & Ziliak, 2015; Stuff et al., 2004; Vozoris & Tarasuk, 2003). Among the negative health outcomes associated with food insecurity considerable

evidence links food insecurity to decreased diet quality and increased risk of diet-related chronic diseases (Hanson & Connor, 2014; Leung et al., 2014). Public and private food assistance programs offer essential support in acquiring food yet may not support adequate diet quality (Andreyeva et al., 2015; Bazerghi et al., 2016; Lyles et al., 2013; Simmet et al., 2017).

As a sector of the food system that feeds some of the country's most disadvantaged families, the charitable food system has the opportunity to promote healthy eating and prevent diet-related disease. Although designed to provide food on a temporary and supplemental basis, the charitable food system has experienced increased demand in terms of total number of users as well as frequency of use. But, unlike the array of choices available to consumers through the mainstream food retail sector, clients of the charitable food system have limited choice with respect to the types, quantity, and nutritional composition of foods they receive from pantries, soup kitchens, and other feeding programs (M. Ross et al., 2013). This places a greater burden on food banks to distribute food of high nutritional quality. Although leaders in the field have initiated efforts to address the nutritional quality of their inventory, the impact of these efforts remains unclear. There is a need to understand the factors underpinning the efforts of food banks to improve the quality of food distributed as well as the effectiveness of these efforts. Ultimately, understanding the factors that facilitate the improvement of the quality of food distributed through the charitable food system may alleviate systematic disparities in health outcomes faced by food-insecure individuals.

The next chapter provides a description of the theories motivating the dissertation. In addition, an integrated conceptual framework for examining the determinants of nutritional quality at food banks is presented in the following chapter.

# Chapter 2: Theory

The dissertation explores the influences on and implications of food banks' efforts to improve the nutritional quality of food available at food banks. Historically, food banks have worked to maximize the amount of food distributed to those in need without consideration of inventory quality (Roman, 2017). However, heightened awareness around the connection between diet and disease, coupled with increased use of food banks, has led to a concerted change effort focused on improving access to healthy foods (Echevarria et al., 2009; Elmes et al., 2016). In undertaking these efforts to improve the nutritional quality of inventory, food banks have embarked on a process of organizational change.

Organizational change theories seek to describe the processes through which change occurs (Burke, 2010b). Organizations change daily, and these changes are, predominantly, incremental and unplanned (Burke, 2010b). Organizational change can also be transformational resulting in a reinvention of the organization (Coleman & Thomas, 2017). Early models of organizational change described a process of planned change in which a change agent (typically a person or group with authority, e.g., CEO, top management team, or outside consultant group) introduced change in a deliberate way (Hatch, 1997a). However, continuous, rapid change in external environments (e.g., products markets, technology and society) requires dynamic organizations (Coleman & Thomas, 2017; Dobbs et al., 2016) and, accordingly, dynamic theories of change to describe and explain constantly changing organizations (Hatch, 1997a). Subsequent theories of organizational change have emerged that incorporate the role of forces in the external environment in directing change (Hatch, 1997a).

The theories described here emphasize both organizational and environmental factors in conceptualizing processes of change (i.e. *how* change is adopted and implemented) (Burke, 2010a). This chapter begins with a discussion of resource dependence theory. The following sections discuss diffusion of innovation theory and the social ecological framework. Finally, the last section describes the conceptual framework that unites these theories in an integrated model that will be used to assess the factors that shape the nutritional quality of food bank inventory.

## Resource Dependence Theory

Resource dependence theory describes the motivations underpinning organizational behavior as a product of ensuring survival and enhancing autonomy while also maintaining stability in its exchange relationships with outside organizations (Davis & Cobb, 2010). As described in the previous chapter, food banks are centrally situated within the charitable food system reallocating surplus food and beverages donations from individuals, corporations, and the state to direct food service providers who distribute to food insecure individuals (Caruso, 2013). Food banks are highly dependent on corporate food and beverage donors for maintaining inventory (Middleton et al., 2018). Food banks are also beholden to the needs of the direct food service organizations they serve (Handforth et al., 2013; M. Ross et al., 2013). This network of relationships between donors, food banks, and direct food service organizations shapes food banks' ability to undergo changes in inventory quality. For example, food banks cite fear of donor loss and inadequate infrastructure at receiving organizations as barriers to improving nutritional quality of distributed food (Handforth et al., 2013; M. Ross et al., 2013). Resource dependence theory helps to elucidate how these relationships shape

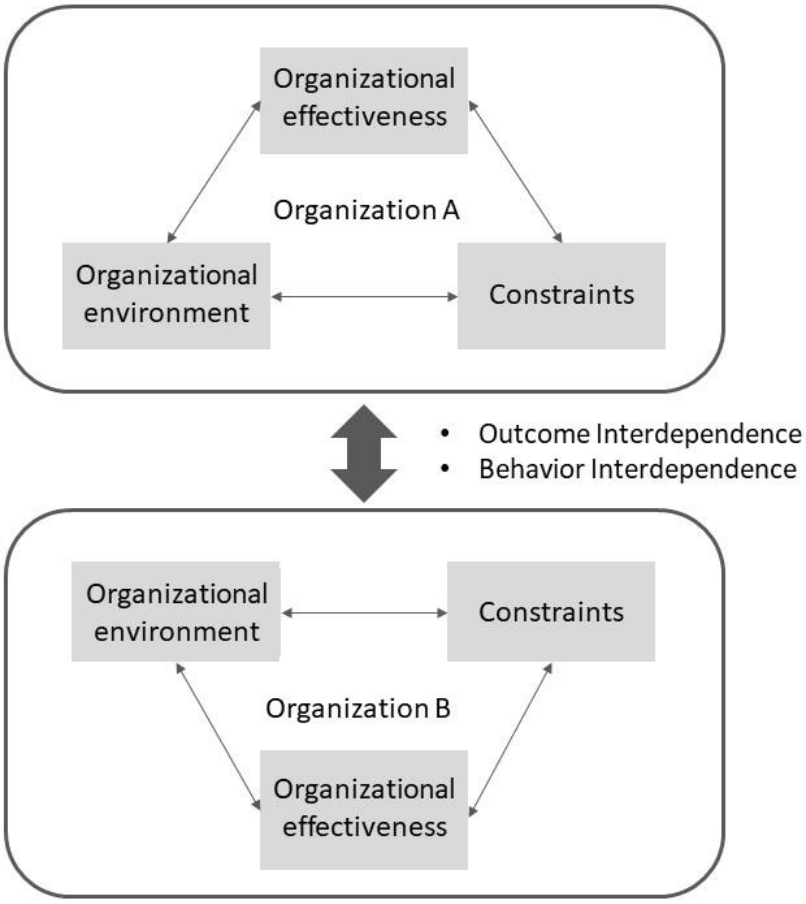
inventory quality. Resource dependence theory also provides a framework for understanding how these organizational relationships must be negotiated when making decisions to implement changes in nutritional quality at the food bank level.

Building on the work of previous scholars (Blau, 1986; Emerson, 1962; Jacobs, 1974), Pfeffer and Salancik (2003) posited resource dependence theory as a framework for understanding how environmental contexts affect organizational decision making behavior (Pfeffer & Salancik, 2003b). Resource dependence theory hypothesizes that organizations are the fundamental unit of analysis for understanding the relationship between corporations and society (Pfeffer & Salancik, 2003b). First used to describe organization actions around mergers and board composition (Pfeffer & Salancik, 2003b), the use of resource dependence theory as a central framework for the formation of interorganizational arrangements has spread to a variety of other disciplines outside of management including sociology, education, public policy, and health care (Davis & Cobb, 2010).

According to the theory, organizational survival is contingent upon the acquisition and maintenance of resources (e.g., financial and physical resources, information) (Pfeffer & Salancik, 2003b). However, since no organization is entirely self-contained, it depends on other organizations for its required resources (Pfeffer & Salancik, 2003b). Organizations prioritize dependency management for resources that are both critical (i.e., necessary for operations) and/or scare (i.e., insufficiently available) because they create the strongest power base for other network actors (Hatch, 1997b). As illustrated in Figure 2.1, organizations strive to improve organizational effectiveness (thereby ensuring survival) while maintaining the organizational

environment (which requires stable access to resources) and reducing constraints (via increased autonomy). To achieve these aims Organization A depends upon Organization B and vice versa.

Figure: 2.1: Organizations as Interdependent Agents




*Source:* (Delke, 2015)

Resource dependence theory consist of three main principles: (1) social context matters; (2) organizations employ strategies to increase their autonomy and pursue their interests; and (3) power is essential to understanding the actions of organizations (Davis & Cobb, 2010).

The contextual factors surrounding an organization shape its behavior (Hillman et al., 2009). According to Pfeffer and Salancik (2003), the actions of organizations stem less from internal dynamics or the values and beliefs of its leaders; but rather, are driven by the

situations in which organizations are embedded and the pressures and constraints resulting from those situations (Pfeffer & Salancik, 2003b). This contrasts with previous organizational theories which attributed organizational outcomes to individuals' actions (Pfeffer & Salancik, 2003a). In addition, organizations are not entirely self-contained. They are limited by a network of interdependencies with other organizations (Hatch, 1997b). Thus, uncertainty among the organizations upon which organization relies on creates uncertainty for that organization (Pfeffer & Salancik, 2003b). Accordingly, organizations aim to reduce dependencies on other organizations by increasing autonomy; but these actions never completely stop dependence and inevitably create new patterns of dependence and interdependence (Davis & Cobb, 2010; Pfeffer & Salancik, 2003b). This dynamic produces inter- and intra-organizational power which, in turn, impacts organizational behavior (Hillman et al., 2009; Pfeffer & Salancik, 2003b).

Within the non-profit sector, organizations face pressure to meet objectives and deliver social value. To achieve these goals, non-profit organizations rely on resources obtained outside of the organization (Murray, 2010). The non-profit sector is increasingly competitive with limited resources and a growing number of new entrants to the sector (Bingham & Walters, 2013). As such, some non-profits seek out relationships with corporate partners in order to generate the resources required to achieve their desired social outcomes (Berger, 2006). Corporate contributions include financial donations as well as in-kind donations of goods and services (Froelich, 1999). However, differences in organizational characteristics as well as asymmetric power structures between corporate-non-profit partners, make these partnerships unique within resource dependence theory (Lefroy & Tsarenko, 2014). Corporate contributions can vary greatly year-to year (Grønbjerg, 1993). At the same time, non-profit organizations may

be unable to easily duplicate the resources supplied by their corporate donors and are, thereby, highly dependent upon these organizations (Al-Tabbaa et al., 2014; Hudock, 1995; Polonsky et al., 2004). Thus, for the non-profit organizations reliant upon corporate contributions, shifting corporate giving patterns contribute to revenue and resource volatility and goal displacement, or the alteration of goals and/or activities to satisfy the desire of donors (Froelich, 1999).

One critique of resource dependence theory argues that it focuses too much on transaction interdependence between organizations. In focusing on this interdependence, resource dependence theory discounts other important environmental factors that shape organizational outcomes. One such factor included in this critique is the importance of place (e.g., geography and physical location) on interorganizational relations. Kono and colleagues argue, "Contemporary organization and class theory are written as if corporations, their administrative and productive activities, and their leaders are not situated in a physical world" (Kono et al., 1998, p. 865). Yet, certainly the geography of an organization affects its relationships and outcomes (Friedland & Palmer, 1984). For example, organizations headquartered in the same region are more likely to share common board of directors members (Kono et al., 1998). Despite this critique, research suggests that resource dependence remains a factor even when incorporating considerations for physical location (Kono et al., 1998).

## Diffusion of Innovation Theory

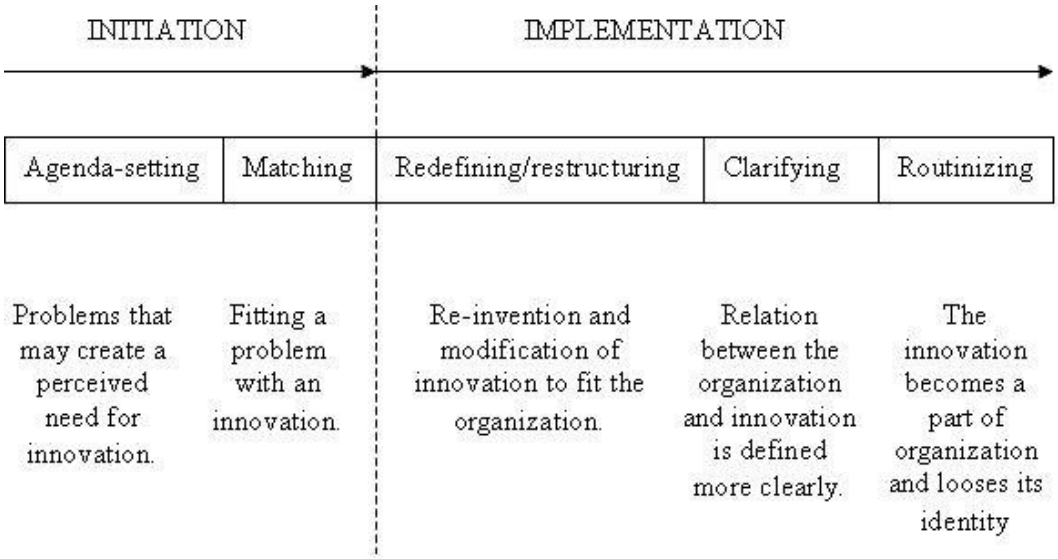
In response to increased awareness of diet-related chronic-disease risk among food insecure populations, food bank leaders have embarked on efforts to change the nutritional quality of their inventory at an organizational level (Elmes et al., 2016). This includes the

adoptions of two innovations in the field: nutrition policy and nutrition tracking systems. Within the field of public health, understanding the steps and processes by which public health innovations are disseminated and adopted by organizations is of particular interest to achieve potential population health impact (Oldenburg & Glanz, 2008). Diffusion of innovation theory provides a framework for understanding the process by which organizations undergo change.

The diffusion of innovation theory describes the process by which innovation - a new idea, practice, or object - gets communicated through certain channels to members of a given social system (Rogers, 2003a). According to the theory, both the characteristics of the innovation and the characteristics of the potential adopting organizations are important factors in the diffusion process (Oldenburg & Glanz, 2008; Rogers, 2003a). Over the last sixty years, a variety of conceptual and research traditions has contributed to the development of diffusion theory (Glanz, Rogers 2003). Used to describe the diffusion of a wide range of innovations from agricultural technology to consumer products and policy reform, diffusion of innovations theory is frequently used within the field of public health (Oldenburg & Glanz, 2008).

According to Rogers (2003b), an organizations tendency toward change comes from three main characteristics: individual (leader) qualities, the internal qualities of the organizations, and the external context surrounding the organization (Batras et al., 2014; Rogers, 2003b). Within these larger categories, Rogers further describes sub-characteristics (e.g., organization size and change leadership), which can positively or negatively affect the organizations capacity for innovation. For example, organizational leaders with a positive attitude toward change and larger organizations are more open to innovation (Rogers, 2003b).

Figure 2.2: Five Stages in the Innovation Process in an Organization




Source: (Rogers, 2003a)

According to Rogers, the diffusion of innovation process occurs in five stages which are grouped more broadly into the initiation phase and the implementation phase. This is a key distinction. The decision to adopt or not adopt an innovation separates the initiation stage from the implementation stage. The compatibility of the innovation with the values, beliefs, and past experiences of individuals within an organization helps determine the decision to adopt (Batras et al., 2014; Rogers, 2003a). However, making the decision to adopt an innovation does not mean implementation necessarily follows (Rogers, 2003b).

Figure 2.2 depicts the five stages of the innovation process as described in diffusion of innovation theory. In the initiation phase, the organization identifies a need (stage 1) and tests concepts (stage 2). In the implementation phase the organization redefines and restructures the innovation (stage 3), clarifies the innovation for broad use and understanding (stage 4), and, finally, routinizes the innovation into standard practice (stage 5) (Batras et al., 2014;

Rogers, 2003a). Subsequent stages in the innovation process cannot occur until the earlier stages are completed (Rogers, 2003a).

One limitation of diffusion of innovation theory is its minimal attention around differences in innovation characteristics and types. This is an important consideration as the determinants of the adoption of innovations differ by innovation type (Wolfe, 1994). Moreover, innovation attributes influence the rates and patterns of innovation diffusion within an organization. For example, when studies have differentiated between technological and administrative innovations several differences have emerged. First, organizational qualities better predict the adoption of technological versus administrative innovations while individual (leader) qualities equivalently predict both technological and administrative innovations (Damanpour, 1987; Kimberly & Evanisko, 1981). Second, the innovation process differs for administrative and technical innovations. Administrative innovations often use a top-down approach and technological innovations use a bottom-up approach (Daft, 1978). Nevertheless, diffusion of innovation theory provides a unique set of focal points for understanding the process of change (Ashley, 2009). Because the framework outlined by diffusion of innovation helps to reveal determinants of adoption of an intervention (change) it is ideally suited for this research.

## Social Ecological Model

Previous research from Fisher and Jayaraman (2018) found that despite the standards imposed on food banks by Feeding America and government entities, immense variation exists between each organization with respect to its food sourcing, political stances, and programming (Fisher & Jayaraman, 2018). According to Fisher and Jayaraman, factors that

shape these variations in food bank operation include the size, geographic service area, leadership, history, and the organizational disposition of each food bank (Fisher & Jayaraman, 2018). Accordingly, organizational and contextual factors may also shape food banks' decisions to adopt nutrition policy and/or tracking systems. The social ecological model can be used to understand how sociocultural contextual factors and physical environments influence health (Sallis et al., 2008). Positing that organizations are nested within a larger physical, social, economic, political, and cultural context, the social ecological model suggests that these influence interact across levels which, in turn, shapes organizational behavior (Stokols, 1992, 1996).

Uri Bronfenbrenner first articulated the theory during the 1970s to explain the process of human development (Bronfenbrenner, 1977; Rosa & Tudge, 2013). Bronfenbrenner argued that available theory at the time failed to seriously account for the social context in which people lived resulting in a dearth of appropriate research (Bronfenbrenner, 1979; Rosa & Tudge, 2013). In 1988, McLeroy and colleagues expanded on Bronfenbrenner's earlier work describing an ecological perspective on health promotion. Health promotion research and efforts at that time focused on individually-oriented behavior change strategies and neglected the social causes underpinning illness and disease (McLeroy et al., 1988). The framework proposed by McLeroy et al. directs attention to behavior at the individual-level as well as the broader environmental factors that shape behavior (McLeroy et al., 1988).

As shown in figure 2.3, the first principle of the social ecological model posits that individuals are embedded within multi-layered, social systems and physical environments. McLeroy and colleagues proposed five-levels of influence on health: intrapersonal,

interpersonal, institutional, community, and public policy (1988). Intrapersonal factors consist of individual characteristics including knowledge, attitudes and skills (McLeroy et al., 1988). The interpersonal level consists of interactions between formal and informal systems of social support such as family, friends, and work colleagues (McLeroy et al., 1988). Organizational factors describe the characteristics of institutions and the formal (and informal) rules and regulations that govern these institutions (McLeroy et al., 1988). The community level describes the relationships and networks between organizations and social institutions (McLeroy et al., 1988). Finally, public policy factors consist of the set of policies, laws, and regulations at the local, state, and national level (McLeroy et al., 1988).

Figure 2.3: Social Ecological Model


Source: (Glanz, 2012)

The second principle of the social ecological model describes how the interactions between individuals and environments underpin health outcomes. Moreover, the second principle of the framework emphasizes that these interactions are bidirectional and reinforcing

(Golden & Earp, 2012). In other words, individual behaviors shape, and are shape by, the social context. This is a cyclical process, whereby the physical and social characteristics of the environment directly influence behavior and, at the same time, the individuals modify their surroundings through individual and collective action (Stokols, 1992). Stokels further argues that the characteristics of the environment have a cumulative effect on health building up over time (Golden & Earp, 2012; Stokols, 1992). Similarly, organizations are nested within a larger physical, social, economic, political, and cultural context which shapes their behavior (Stokols, 1992, 1996). At the same time, organizational behavior shapes the large social context in an ongoing process.

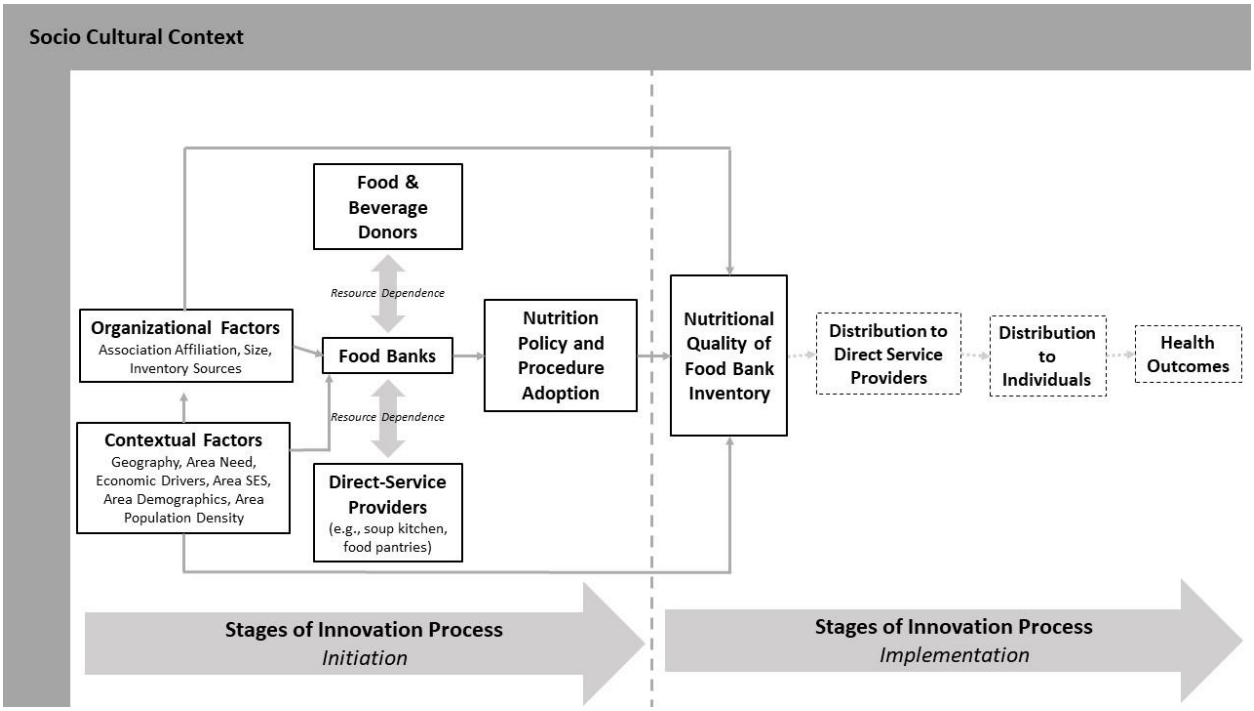
Its focus on multiple levels of influence is a key strength of the social ecological model (Sallis et al., 2008). This focus broadens the scope of understanding around a given behavior and increases options for intervention. However, despite calls to address upper levels of social ecological influence on behavior to achieve a more enduring health impact, health promotion interventions still tend to remain focused on individual- and interpersonal-levels as levers of change (Golden & Earp, 2012). Another weakness of the ecological model is the lack of specificity with respect to which levels or variables within a given level are most influential on achieving the behavior of interest (Sallis et al., 2008). This places greater onus on the researcher to identify critical factors relevant to a given behavior. Nevertheless, the social ecological model is commonly used as a framework for understanding the food environment and is appropriate for use with the research aims.

## Conceptual Framework

The integrated conceptual framework presented in this section draws upon resource dependence theory, diffusion of innovation theory, and the socioecological model to describe how contextual and organizational characteristics influence food banks' efforts to undergo a change process, improving the nutritional quality of its inventory. Resource dependence and diffusion of innovation theories emphasize the importance of organizational and contextual factors in understanding the behavior of organizations and focus more closely on the organizational level. In contrast, the social ecological model focuses the broader sociohistorical environment in which an organization is nested.

As shown in Figure 2.4, organizational characteristics of food banks such as size, membership affiliation, and inventory sources affect their ability to adopt and implement policies and practices to improve nutritional quality (Fisher & Jayaraman, 2018a). Similarly, the contextual factors of a food bank affect its organizational characteristics as well as its ability to adopt and implement policies and practices to improve nutrition quality. Previous research has identified area need and available resources as key contextual factors shaping food banks operations (Rivera et al., 2016). The contextual factors identified in this framework were selected accordingly. Additionally, this framework illustrates that organizational and contextual factors have a direct relationship with the healthfulness of inventory quality.

Figure 2.4: Concept Framework of Contextual Factors and Organizational Characteristics shaping the Nutritional Quality of Food Bank Inventory




Food banks' dependent relationship with food and beverage donors and direct service providers also affects food banks' capacity to adopt and implement policies and procedures to improve nutritional quality of their inventory. Their dependence on external organizations for resources, both in terms of inventory as well as operating budgets, is depicted in the conceptual framework with a double-headed arrow between the food bank and each of the organization groups. The arrows at the bottom of the diagram coupled with the dashed line through the middle of the framework emphasizes the distinction between initiation stage (i.e., making the decision to adopt a strategy) and the implementation stage (i.e., incorporating the strategy into regular business practice). Nutrition policies and procedures that are adopted and implemented also impact the nutritional quality of food bank inventory. Food banks then distribute to their inventory to direct food service providers who, in turn, distribute the food to

in-need individuals. I predict that this chain of relationships, subsequently, affects the health outcomes of individuals who ultimately receive food from the food banks' inventory. The connection between the distribution to direct food service providers and individuals, as well as the connection to health outcomes, are depicted with dotted lines as they will not be tested in this dissertation. The conceptual framework shown here also acknowledges that the broader sociohistorical context (e.g. policy, culture, and norms) shapes the structure, composition, and nature of the charitable food system.

The influence of organizational and contextual factors on food banks' policy and procedure adoption and inventory quality draws on resource dependence theory, diffusion of innovation, theory and the social ecological model. Ecological systems theory posits that behavior shapes, and is shaped by, a nested series of subsystems (Bronfenbrenner, 1977; McLeroy et al., 1988). The framework shown here makes this relationship more explicit by depicting the relationship between the community and organizational levels and their influence on efforts to improve healthfulness of inventory. The framework also proposes that organizational factors may influence organizational behavior in different ways depending on contextual factors. Additionally, the integrated framework situates the whole process within the broader sociohistorical context which influences the provision of supplemental nutrition assistance through the charitable food system. It also depicts the ways in which food banks, and other actors within the charitable food system, do or do not prioritize nutritional quality as an important aspect of distributed food.

Building on resource dependence theory, the integrated conceptual framework also makes explicit the dependent relationships between food banks, food and beverage donors,

and direct-services providers. Resource dependence theory describes organizational behavior as a product of ensuring survival and increasing autonomy while also maintaining stability with the external organizations it depends on for resources (Davis & Cobb, 2010). Because food banks depend on food and beverage donors as well as direct food service organizations, their capacity to adopt and implement strategies to improve nutritional quality are influenced by this network of relationships.

The integrated conceptual framework also draws on the diffusion of innovation theory. Diffusion of innovation theory suggests that organizational and contextual factors help determine organizational tendency toward change (Rogers, 2003b). In addition, the theory articulates a series of stages in the innovation process (Batras et al., 2014). Among these Rogers, clearly separates the initiation and implementation stages. The integrated framework also makes an explicit distinction between the initiation stage, where an organization makes the decision to adopt or not adopt an innovation, and the implementation stage, where an innovation becomes an accepted and routinized aspect of the organization (Rogers, 2003b). Furthermore, the conceptual framework depicts the impact of organizational and contextual factors as well as its network of relationships with donors and direct service providers on the initiation and implementation stages.

Study One of the dissertation examines determinants (e.g., organization size, inventory sources, area socioeconomic status, population density) of nutrition practice and policy adoption and the relationship between strategy adoption and the nutritional quality of food bank inventory. Motivated by the assumption that organizational and contextual factors are associated with organizational behavior, the research questions in this study seek to identify

which factors are associated with the adoption of nutrition policies and procedures. In addition, this study seeks to examine if adopting nutrition policies or practices is related to nutritional quality of inventory. Identifying the determinants of nutrition policy and practice adoption as well as the relationship of adopting these strategies on nutritional quality may facilitate future efforts to promote healthy eating within the charitable food system.

Study Two of the dissertation seeks to understand how organizations within the charitable food system have adapted to recent efforts to improve the nutritional quality of food bank inventory. This aim specifically looks at the network of relationships between food and beverage donors, food banks, and direct food service organizations. Resource dependence theory describes how dependency on external organizations for resources shapes organizational behavior. Given that the asymmetric power of corporations and non-profits influences the behavior of non-profit organizations (Froelich, 1999), developing a deeper knowledge of relationship between the network of organizations within the charitable food system will facilitate an understanding of food banks' efforts to improve the nutritional quality of inventory and, ultimately, health outcomes. In addition, this aim seeks to elucidate to what extent food banks with adopted nutrition policies implement said policies. The results of the qualitative study will deepen the understanding the processes between initiation and implementation described in diffusion of innovation theory.

Overall, the integrated conceptual framework is well adapted to successfully guide the research aims. The two studies contribute to our understanding of nutrition promotion within the charitable food system and how food banks adopt and implement change. By integrating both characteristics of the context and the organization, in addition to aspects of the larger

sociocultural environment, this framework provides a foundation for the study aims and related research questions presented in the next chapter.

# Chapter 3: Research Aims

This chapter provides an overview of the aims of the two dissertation studies, including research questions and hypotheses. Chapter 4 will discuss data sources, variable details, and analyses.

**Primary Research Question:** What are the influences on and implications of food banks' efforts to improve the nutritional quality of food distributed?

This research examines efforts to promote healthy eating within the charitable food system from multiple perspectives incorporating organizational and contextual characteristics as well as the viewpoint of organizations who donate to and receive donations from food banks. Study One examines multiple outcomes including nutrition policy adoption, nutrition tracking system adoption, and nutritional quality of inventory. Study Two explores the promotion of healthy eating in the charitable food system more broadly.

## Study One

**Study Aim:** To examine the determinants of organizational strategy adoption among food banks and the relationship of strategy adoption to the nutritional quality of food bank inventory. To assess this aim, I have identified the following research questions:

**Question 1.1:** To what extent do organizational and contextual factors explain nutrition policy adoption among food banks?

**Question 1.2:** To what extent do organizational and contextual factors explain nutrition tracking system adoption among food banks?

**Question 1.3**: To what extent does nutrition policy adoption explain nutritional quality of food bank inventory?

**Question 1.4**: To what extent does nutrition tracking system adoption explain nutritional quality of food bank inventory?

I will address the first study aim by testing the following research hypotheses:

**Hypothesis 1:** Organizational (e.g., size, inventory stream) and contextual (e.g., area socioeconomic status, population density) factors will be associated with nutrition policy adoption at food banks.

**Hypothesis 2:** Organizational and contextual factors will be associated with nutrition tracking system adoption at food banks.

**Hypothesis 3:** Nutrition policy adoption is positively associated with the nutritional quality of available food at food banks

**Hypothesis 4:** Nutrition tracking system adoption is positively associated with the nutritional quality of available food at food banks

**Support for Hypotheses:** The conceptual framework draws from diffusion of innovation theory which emphasizes the influence of internal qualities and external contexts on organizations capacity toward change. Previous research indicates that organizational and contextual differences in food bank characteristics shape food bank operations (Fisher & Jayaraman, 2018). In particular, Feeding America has identified service area size, area need (e.g., the number of food insecure individual in a region), cost to operate, and availability of resources, including food and funds, within a food bank's service area as a key set of environmental characteristics affecting food bank operations (Rivera et al., 2016). As such, I

hypothesize that characteristics of the organization and the surrounding context will have a relationship with food banks adoption of organizational strategies related to improving nutritional quality of inventory. Although the decision to adopt innovation does not necessarily indicate that the innovation will be implemented, adoption of nutrition policies and practices indicates an openness toward change (Rogers, 2003b). Moreover, adoption of nutrition policies and procedures is a necessary step preceding implementation (Rogers, 2003b). As such, I anticipate that food banks that have adopted these policies or practices will have more healthful inventory than food banks that have not adopted these policies or practices.

## Study Two

**Study Aim:** To understand how organizations within the charitable food system have responded to recent trends to improve the nutritional quality of food bank inventory. To address this study aim, I have identified the following research questions:

**Question 2.1:** How is healthy eating promoted within the charitable food sector?

**Question 2.1a:** What are the barriers and facilitators?

**Question 2.1b:** How does the promotion of healthy eating affect relationships with donors, recipients, funders, board members, and volunteers?

**Question 2.2:** How are efforts to promote healthy eating implemented and sustained?

**Question 2.3:** What innovations (if any) are happening in the sector to promote healthy eating?

As shown in the conceptual framework, while organizational and contextual characteristics of food banks are directly related to nutritional quality of inventory, the healthfulness of distributed food is also shaped by food banks' relationships with food and

beverage donors and direct food service organizations. Moreover, these relationships are situated within a larger physical, social, economic, political, and cultural context which deeply shape organizational behavior (Stokols, 1992, 1996). Study Two aims to understand how these resource dependent relationships shape efforts to improve nutrition quality of food bank inventory by incorporating multiple perspectives including donor and recipient organizations as well as food banks. In addition, this aim seeks to understand macro-level influences that affect the capacity of food banks to undergo processes of change related to improving the nutritional quality of inventory. Finally, this aim seeks to deepen the understanding of the processes between adoption and implementation.

# Chapter 4: Methods

This chapter describes the data sources and analytic approaches employed in this dissertation. Using an embedded mixed methods design, the dissertation combines the collection, analysis, and synthesis of quantitative and qualitative data within a traditional quantitative (or qualitative) research framework. In an embedded research design, one source of data provides a complement to the other and allows for an extension of the range of inquiry to answer a different, but related research question for which a single data type is insufficient (Creswell & Plano Clark, 2018; Greene et al., 1989). I begin the chapter by outlining the quantitative methods used in Study One followed by a description of the qualitative methods used in Study Two. The chapter concludes with a description of my approach for linking the qualitative and quantitative results.

## Study One – Quantitative

Using data from the sources described below, Study One examines **the determinants of nutrition policy and practice adoption among food banks and the relationship of policy and practice adoption to nutritional quality of food bank inventory** by answering the following research questions:

Question 1.1: To what extent do organizational and contextual factors explain nutrition policy adoption among food banks?

Question 1.2**:** To what extent do organizational and contextual factors explain nutrition tracking system adoption among food banks?

Question 1.3: To what extent does nutrition policy adoption explain nutritional quality of food bank inventory?

Question 1.4: To what extent does nutrition tracking system adoption explain nutritional quality of food bank inventory?

### *Study One – Data Sources*

Study One examines both the organizational and contextual factors associated with nutrition policy and procedure adoption among food banks. To assess the research questions outlined in Study One, I combined data collected in the 2017 MAZON National Food Bank Survey Assessment of Nutrition Practices and Policies with publicly-available data from the U.S. Census Bureau, U.S. Department of Agriculture, and the U.S. Internal Revenue Service. Data from the MAZON National Food Bank Survey Assessment of Nutrition Practices provide information on the organizational characteristics of food banks, nutrition policy and practice adoption, as well as healthfulness of inventory. The other data sources described in this section provide additional organizational and contextual information related to the region in which each food bank operates.

#### Data Source 1: MAZON National Food Bank Survey Assessment of Nutrition Policies and Practices

The national survey collected data on food bank nutrition policies and procedures and has been used to examine the association between these policies and practices and the distribution of food bank inventory (Feldman & Schwartz, 2018). The target population for this survey was every food bank in the U.S. A food bank is defined as an organization that serves agencies such as food pantries, soup kitchens, or any other meal providers, and MAZON identified 310 U.S. food banks. Because a comprehensive list of food banks in the U.S. was not

readily available, MAZON developed its own list of food banks identifying Feeding America members and affiliates as well as independently-operated organizations. They then conducted an internet search for websites of independent food banks in each state to identify non-Feeding America affiliated sites. The Institutional Review Board at the University of Connecticut determined that the data collection was non-human subjects research and deemed it exempt from review.

In May 2017, a MAZON staff member sent an invitation to complete the survey and the survey link to the Chief Executive Officers, Chief Operation Officers, and nutrition managers (if applicable) of each identified food bank. Survey instructions requested that survey recipients coordinate with one another so that only one representative from each organization would complete the survey. Participation was voluntary and there was no monetary incentive for participation. A reminder email was sent to non-responders two weeks after the initial invitations were sent. An additional individual email reminder was sent to non-responders three weeks after the initial invitation. A total of 196 (63%) of food banks completed the survey.

The survey included 22 items related to food bank inventory, formal and informal nutrition policies and procedures, the use of nutrition tracking systems, efforts to educate donors, and challenges encountered. The survey took approximately 20 minutes to complete and was administered via SurveyMonkey. The survey instrument is provided in Appendix A1. A table of participating food banks' characteristics is presented in Chapter 5.

### Data Source 2: U.S. Census Bureau Databases

I obtained regional and county-level data from publicly available databases created by the U.S. Census Bureau. The Census Bureau collects a broad range of data about the population

of the U.S. including data related to demographics, housing, workforce, and the economy. The Census Bureau also defines geographic areas within the U.S. to facilitate adding context to and making meaning from statistical data. The U.S. Census Bureau defines geographic regional boundaries that subdivide the country; each census region consists of a grouping of states. There are four defined regions within the U.S. – Northeast, South, Midwest, and West. Area data from the 2010 Census Geographic regions were matched to all food banks based on the state where each food bank is located. The U.S. Census Bureau also provides data on the total area encompassed in each U.S. county. Area data were matched to each food bank based on the counties encompassed in each food bank's service area. Additionally, county-level data were obtained from the 2017 American Community Survey 5-year estimates. The American Community Survey is a national survey conducted annually by the U.S. Census Bureau that collects social, economic, housing, and demographic characteristics of the population (U.S. Census Bureau, 2017b). Data from the 2017 American Community Survey 5-year estimates provided county-level socioeconomic position and racial/ethnic make-up. I matched these characteristics to each food bank based on the counties comprising each food bank's service area.

### Data Source 3: U.S. Department of Agriculture Economic Research Services Public Databases

I obtained county-level data from the publicly-available databases created by the U.S. Department of Agriculture's Economic Research Services. Economic Research Services collects data on a broad range of economic and policy topics including agriculture, food, the environment, and rural America to conduct high-quality, objective research to inform and enhance public and private decision making. This dissertation used the 2013 Rural-Urban

Continuum Codes, which are the most recent data made available by Economic Research Services. The 2013 Rural-Urban Continuum Codes form a classification scheme that distinguishes metropolitan counties by the population size of their metropolitan area, and nonmetropolitan counties by degree of urbanization and adjacency to metropolitan areas. Area characteristics were matched to each food bank based on the counties comprising each food bank's service area.

### Data Source 4: Charity Navigator Internal Revenue Service Form 990s

The U.S. Internal Revenue Service requires tax-exempt organizations to make publicly available each year's tax return information in a Form 990. The Form 990 tax return includes the previous year's revenue as well as other information about the organization such as number of board members and number of volunteers. Charity Navigator is a website that aggregates and makes publicly available basic data from 1.8 million non-profit organizations in the U.S., including revenue data from Form 990s (Charity Navigator, 2018). Revenue data from fiscal year 2017 were matched to all food banks by name.

### Data Source 5: Massachusetts Institute of Technology Election Data Science Lab County Presidential Election Returns 2000-2016

The Massachusetts Institute of Technology Election Data Science Lab collects publicly available, non-partisan U.S. election data. The County Presidential Election Returns 2000-2016 dataset contains county-level returns for presidential elections from 2000 to 2016 (MIT Election Data and Science Lab, 2018). Presidential election results from 2016 were matched to each food bank based on the counties comprising each food bank's service area.

### Data Source 6: Feeding America Map the Meal Gap

Each year Feeding America provides an annual estimate of food insecure populations by county and congressional district in its Map the Meal Gap report (Feeding America, 2017a) . These publicly available data are searchable by state, county, district, and food bank. Searching by food bank provides a list of counties served by each food bank. Counties served by each food bank in 2017 were matched to each food bank by name.

## *Study One – Variables*

### Unit of Analysis

*Service Area:* To further understand the context in which each food bank operates, I was able to determine each food bank's service area, the counties where it distributes inventory. To construct each food bank's service area, I first used the food bank search tool from the 2017 Map the Meal Gap. Using the search tool, I was able to determine the service area of 211 of the 310 food banks in the population. For those food banks not included in the Map the Meal Gap database, I visited individual food bank websites to identify the service area. Using this approach, I determined the service areas for 89 food banks. If the service area was unclear on the individual food bank's website, I contacted food banks by phone or email to ascertain the counties they serve (10 food banks). I aggregated contextual variables to the service area-level for analysis. Table 4.1 provides a descriptive list of the variables used in the analyses.

### Dependent Variables

*Nutrition Policy Adoption:* Respondents were asked if their food bank had formal, written nutrition policies to promote the distribution of healthful foods and beverages. Participants could respond yes or no.

*Nutrition Tracking System Adoption:* Respondents were asked if their food bank utilizes a system to track nutritional quality of its inventory and which system it uses. These systems rank foods based on specific ingredients or nutrient criteria. Participants could select from three commonly used nutrition ranking systems: "Broad Foods to Encourage (F2E)", "Detailed Foods to Encourage (DF2E)", "Choose Healthy Options Program (CHOP)"; or respond with "Customized tracking system" or "Do not currently use a system to track nutritional quality of inventory". I dichotomized responses into yes for those food banks that reported using F2E, DF2E, CHOP, or a customized tracking system and no for those that reported they did not currently use a system to track nutritional quality.

*Healthful Inventory*: As an indicator of healthful inventory, respondents were asked to estimate the percentage of their food bank's annually distributed inventory for fruits and vegetables (fresh produce). The possible responses were from 0 percent to 100 percent in 5 percent increments, except for the bottom of the scale, which included 1-2%, 3-4%, and 5-10%. If the response was one of the ranges (i.e., 1-2%, 3-4%) the mean value was used (i.e., 1.5%, 3.5%).

*Unhealthful Inventory*: As an indicator of unhealthful inventory, respondents were asked to estimate the percentage of their food bank's annually distributed inventory for each of the following categories: soda; other sugar-sweetened beverages (e.g., energy/sports drinks, fruit drinks, bottled coffee/tea drinks, etc.); sweet snack foods and desserts (e.g., cookies, cakes, bakery products, etc.); savory snack foods (e.g., crackers, chips, etc.); and candy. The possible responses were from 0 percent to 100 percent in 5 percent increments, except for the bottom of the scale, which included 1-2%, 3-4%, and 5-10%. If the response was one of the ranges (i.e.,

1-2%, 3-4%), I used the mean value (i.e., 1.5%, 3.5%). I then summed the responses in each category.

### Independent Variables

*Nutrition Tracking System Adoption:* For Research Questions 1.3 and 1.4, I used the nutrition tracking system as an independent variable. This measure is the same as described above in the dependent variable section.

*Nutrition Policy Category:* For Research Questions 1.3 and 1.4, I used the nutrition policy category as an independent variable. Respondents were asked if their food bank had formal, written nutrition policies to promote the distribution of healthful foods and beverages. Participants could respond yes or no. Respondents who did not have a formal written nutrition policy were then asked if their food banks had an informal nutrition policy to promote the distribution of healthful foods and beverages. Participants could respond yes or no. I categorized responses as formal nutrition policy for those who responded "yes" to the first item, informal nutrition policy for those who responded "yes" to the second item, and none for those who answered "no" to both items.

*Affiliation*: I categorized food banks as either independent or member affiliated if they belong to the Feeding America Association.

*Food Bank Size*: This is a categorical variable and is defined as the annual revenue for the organization in the 2017 fiscal year. I divided food bank sizes into three categories (Small, Medium, Large) based on terciles. Small food banks had revenues less than or equal to $11,700,000, medium food banks had revenues between $11,700,000 and $31,600,000, and large food banks had revenues greater than $31,600,000.

*Inventory stream:* This continuous variable is the percent of inventory stream comprised of donations. Respondents were asked to estimate the composition of their inventory for the following categories: purchased, donated, and government. Respondents were asked to report percentages such that the total percentage equaled 100.

*Service Area Size:* This is a categorical variable defined as the total square miles (both land and water) included in all the counties in a service area. I then divided the service area sizes into two categories (Small vs. Large) based on Feeding America's Methodology for Creating Environmental Peer Groups (Feeding America, n.d.). Small service areas are less than 10,000 square miles and large service areas are those greater than 10,000 square miles

*U.S. Region*: This is a categorical variable and is defined as the region in the U.S. where the food bank is located (West vs. Midwest vs. Northeast vs. South)

*County Geography*: These are continuous variables defined as the urbanization in the area the food bank serves, calculated using the 2013 Rural-Urban Continuum Codes (USDA Economic Research Services, 2019). For each food bank, the variables consist of the percent of the population living in each region type (i.e., metropolitan, non-metropolitan, and rural) divided by the total population across all of the counties included in its service area.

*Food Donor Environment*: Respondents were asked to identify all of the characteristics that best described their food bank's geographic location and/or procurement opportunities from the following categories: Agriculturally rich (e.g., your food bank procures from local/regional farms), Agriculturally poor, Neither agriculturally rich nor poor, Manufacturing rich (e.g., your food bank procures from manufacturing plants, processors, and producers), Manufacturing poor, Neither manufacturing rich nor poor, Retail rich (e.g., your food bank

procures from Stater Bros, Ralphs, Kroger's, Walmart, Amazon, etc.), Retail poor, Neither retail rich nor poor, Food Service/Convenience rich (e.g., your food bank procures from Starbucks, Panera, 7-11, etc.), Food Service/Convenience poor, Neither food service/convenience rich nor poor.

*Area Need:* This is a continuous variable defined as the percent of households in the service are receiving SNAP benefits (U.S. Census Bureau, 2017b). I included this variable in the analyses as an indicator of area food insecurity and need for supplemental nutrition assistance.

*Racial/Ethnic Diversity:* This is a continuous variable defined as the percent of the population in the service area that identifies as non-Hispanic white (U.S. Census Bureau, 2017a).

*Area Socioeconomic Position*: This is a continuous variable defined as the percent of the population in the service area living below the federal poverty line (U.S. Census Bureau, 2017a).

*Conservativeness:* This is a continuous variable defined as the percent of the of voters in the service area that voted Republican in the 2016 presidential election.

Table 4.1: List of Variables

| Variable | Definition | Source |
|---|---|---|
| **Dependent Variables** | | |
| Nutrition Policy Adoption | Dichotomous (Yes vs. No) | 2017 MAZON National Food Bank Survey Assessment of Nutrition Policies and Practices |
| Nutrition Tracking System Adoption | Dichotomous (Yes vs. No) | 2017 MAZON National Food Bank Survey Assessment of Nutrition Policies and Practices |
| Healthful Inventory | % of fresh produce distributed annually | 2017 MAZON National Food Bank Survey Assessment of Nutrition Policies and Practices |
| Unhealthful Inventory | % of SSBs, soda, candy, and sweet and salty snacks distributed annually | 2017 MAZON National Food Bank Survey |

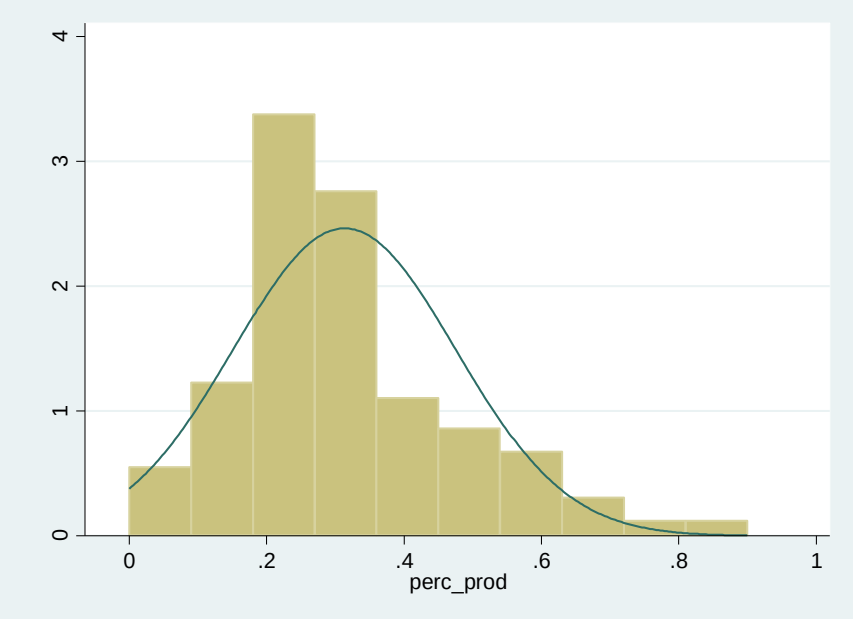
| | | |
|---|---|---|
| | | Assessment of Nutrition Policies and Practices |
| **Organizational Factors** | | |
| Affiliation | Dichotomous – Feeding America membership (Yes vs. No) | 2017 MAZON National Food Bank Survey<br>Assessment of Nutrition Policies and Practices |
| Food Bank Size | Categorical – Annual revenue (Small vs. Medium vs. Large) | Fiscal Year 2017 - 990 Form |
| Service Area Size | Dichotomous – Total distribution area (Small vs. Large) | U.S. Census Bureau |
| Inventory Streams | Continuous - % of donated inventory | 2017 MAZON National Food Bank Survey<br>Assessment of Nutrition Policies and Practices |
| **Contextual Factors** | | |
| U.S. Region | Categorical – location in the U.S. (West vs. Midwest vs. Northeast vs. South) | U.S. Census Bureau |
| County Geography | Continuous - % of service area consisting of metropolitan, non-metropolitan, and rural regions | 2013 Rural-Urban Continuum Codes |
| Food Donor Environment | Categorical – types of food retailers in region (Agriculturally rich vs. poor vs. neither, Manufacturing rich vs. poor vs. neither, Retail rich vs. poor vs. neither, Food service/convenience rich vs. poor vs. neither) | 2017 MAZON National Food Bank Survey<br>Assessment of Nutrition Policies and Practices |
| Area need | Continuous - % of households in service area receiving Supplemental Nutrition Assistance Program (SNAP) benefits. | 2017 American Community Survey 5-year estimates |
| Racial/Ethnic Diversity | Continuous - % non-Hispanic white in service area | 2017 American Community Survey 5-year estimates |
| Socioeconomic Position | Continuous - % of individuals in service area living below the Federal Poverty Line | 2017 American Community Survey 5-year estimates |
| Political Conservativeness | Continuous - % of individuals in the service area who voted republican in the 2016 presidential election | Massachusetts Institute of Technology Election Data Science Lab County Presidential Election Returns 2000-2016 |

*Study One – Statistical Analysis*

First, I examined the distribution and normality of all continuous variables using descriptive statistics such as histograms, means, and standard deviations. I then assessed the

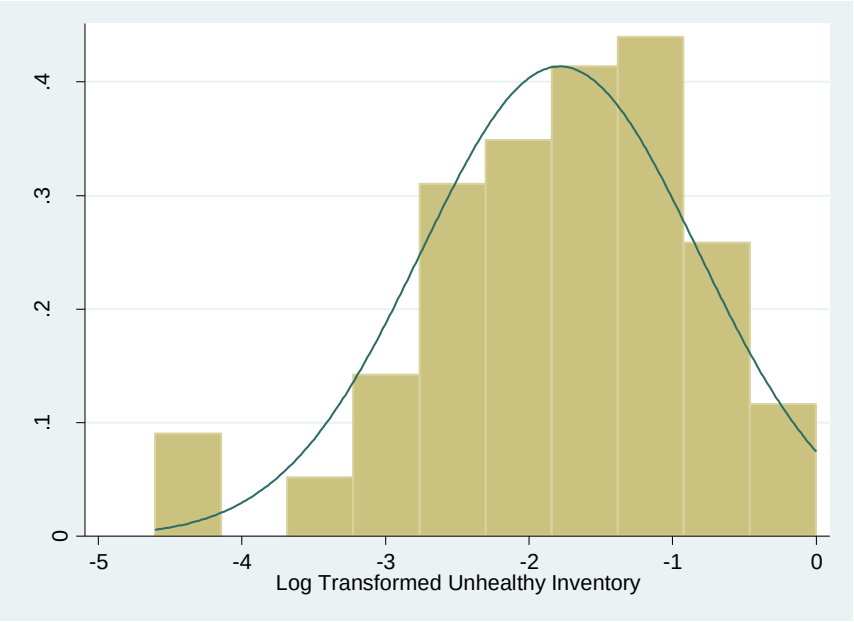
frequency distributions of categorical variables. A Shapiro-Wilk's normality test indicated that both healthful and unhealthful inventory had non-normal distributions. However, a histogram analysis of the healthful inventory variable (shown in Figure 4.1) indicated that the variable was sufficiently normal for use in a linear regression analysis. Given that this variable uses self-reported data, we would expect clustering around percentage estimates shown in the figure.

Figure 4.1: Histogram of Healthful Inventory




I used a log transformation of the unhealthful inventory variables to address non-normality of the variable. Prior to transforming the variable, values of 0 were changed to 0.01 to maintain these data points after the log transformation. In addition, two food banks reported a summed value greater than 100% for their unhealthy inventory. Because inventory percentages cannot equal more than 100, these values were changed to 1. A histogram of the transformed variable is shown in Figure 4.2.

Figure 4.2: Histogram of Log Transformed Unhealthful Inventory




As shown in Tables 4.2 and 4.3, I assessed the variable correlation using a Pearson product-moment correlation matrix for continuous variables and a Cramer's V for categorical variables. Due to high levels of correlation between the county geography variables ($r_{metro,nonmetro} = -0.88$; $r_{metro,rural} = -0.50$), the socioeconomic position and need variables ($r_{SEP,need} = 0.76$), and the conservativeness and racial ethnic diversity variables ($r_{conservativeness,racial\ ethnic\ diversity} = -0.49$), the following variables were dropped from the analyses: nonmetro, rural, socioeconomic position, and racial/ethnic diversity. I then used descriptive statistics to summarize characteristics of the sample.

Table 4.2: Pearson Pairwise Correlation Matrix for Continuous Variables

| Variables | Inventory Stream | Metropolitan | Non-Metropolitan | Rural | Area Need | Racial/ Ethnic Diversity | Political Conservativeness | Area Socioeconomic Position |
|---|---|---|---|---|---|---|---|---|
| Inventory Stream | 1.00 | | | | | | | |
| Metropolitan | -0.08 | 1.00 | | | | | | |
| Non-Metropolitan | 0.05 | **-0.88*** ** | 1.00 | | | | | |
| Rural | 0.08 | **-0.50*** ** | 0.04 | 1.00 | | | | |
| Area Need | -0.11 | -0.22*** | 0.19*** | 0.11 | 1.00 | | | |
| Racial/Ethnic Diversity | 0.09 | 0.33*** | -0.35*** | -0.06 | 0.09 | 1.00 | | |
| Political Conservativeness | -0.10 | **-0.41*** ** | 0.28*** | 0.34*** | 0.20*** | **-0.49*** ** | 1.00 | |
| Area Socioeconomic Position | -0.08 | -0.26*** | 0.22*** | 0.15** | **0.77*** ** | 0.27*** | 0.17** | 1.00 |

* p<0.05, ** p<0.01, *** p<0.001, bold font was used for correlations of modest effect size (R>0.40)

Table 4.3: Cramer's V Correlation Matrix for Categorical Variables

| Variables | Service Area Size | Affiliation | Food Bank Size | U.S. Region | Agricultural | Manufacturing | Retail | Convenience |
|---|---|---|---|---|---|---|---|---|
| Service Area Size | -- | | | | | | | |
| Affiliation | 0.12* | -- | | | | | | |
| Food Bank Size | **0.38*** ** | 0.23*** | -- | | | | | |
| U.S. Region | 0.21** | 0.20** | 0.12 | -- | | | | |
| Agricultural | 0.14 | 0.02 | 0.04 | 0.14 | -- | | | |
| Manufacturing | 0.25** | 0.16 | 0.26*** | 0.17 | 0.25*** | -- | | |
| Retail | 0.14 | **0.36*** ** | 0.23*** | 0.14 | 0.19** | | -- | |
| Convenience | 0.18* | 0.20* | 0.22** | 0.20* | 0.28*** | 0.24*** | 0.30*** | -- |

* p<0.05, ** p<0.01, *** p<0.001 Chi-squared test used to assess significance, bold font was used for correlations of moderate association (0.3<V<0.5)

To assess Question 1.1 (to what extent do organizational and contextual factors explain nutrition policy adoption among food banks), I used one outcome variable: nutrition policy adoption. I used a logistic regression model to determine the relationship between contextual factors and the likelihood of nutrition policy adoption. Prior to analysis, I removed the retail food environment variable from the analysis due to insufficient subgroup size. Bivariate tests assessed the relationship between the outcome and each independent variable. After the bivariate analyses, I removed the agricultural and food service/convenience food donor environment from the models to increase degrees of freedom and improve model parsimony. In addition, the inventory stream, area need, county geography, and conservativeness variables were scaled by 100 to address unstable coefficient estimates in the bivariate analysis. Next, a I fit a full logistic regression model to include all covariates. I restricted the analysis to observations that had no missing data on the outcome or any of the covariates, which reduced the sample size to 176 (Appendix B includes additional information on missing observations).

I used the same statistical approach described above to assess Question 1.2 (to what extent do organizational and contextual factors explain nutrition tracking system adoption among food banks) for the outcome variable: nutrition tracking system adoption. Similarly, I restricted the analysis to observations that had no missing data on the outcome or any of the covariates, which reduced the sample size to 178.

To assess Question 1.3 (to what extent does nutrition policy adoption explain nutritional quality of food bank inventory), I used two outcome variables: percent of healthful inventory and percent of unhealthful inventory. Prior to analysis, I removed the manufacturing, retail, and food service/convenience food environment variables from the analysis due to insufficient

subgroup size. I then used linear regression models to test the relationship between nutrition policy adoption and nutritional quality of food bank inventory. First, I assessed the relationship between each outcome of interest using simple bivariate tests. Then, I fit full models including all covariates. To facilitate interpretation of the model, I mean-centered continuous covariates and scaled by 100.

To assess Question 1.4 (to what extent does nutrition tracking system adoption explain nutritional quality of food bank inventory), I used two outcome variables: percent of healthful inventory and percent of unhealthful inventory. Prior to analysis I removed the manufacturing, retail, and food service/convenience food environment variables from the analysis due to insufficient subgroup size. I used linear regression models to test the relationship between nutrition tracking system adoption and nutritional quality of food bank inventory. First, I used simple bivariate test to assess the relationship between each outcome of interest. Finally, I fit full models including all covariates. To facilitate interpretation of the model, I mean-centered continuous covariates and scaled by 100.

Finally, because the resulting statistical models from Questions 1.3 and 1.4 showed similar coefficient estimates and patterns of significance, I combined the two models predicting healthful inventory and unhealthful inventory, respectively (see Appendix C2). I restricted the analysis to observations that had no missing data on the outcome or any of the covariates, which reduced the sample size to 172 for healthful inventory and 158 for unhealthful inventory.

## Study Two - Qualitative

### *Study Two – Overview*

In Study Two, I conducted a descriptive case study with two food banks and interviews with representatives from national-level key stakeholder groups. Case studies are in-depth explorations that use multiple perspectives to explore the complexity and uniqueness of a particular unit (e.g., institution, policy, or system) in a 'real life' context (Simons, 2012). The case study considers two cases: an adopter and a non-adopter of nutrition policies and practices. Data for the case studies come from in-depth interviews with food bank staff, board members, partner agency representatives, and corporate food and beverage donors, as well as from document reviews. In addition, I collected in-depth, qualitative interview data from representatives of national key stakeholder groups within the charitable food system including academic researchers, advocacy organizations, charity networks, and food bank associations. This study aims to **understand how organizations within the charitable food system have responded to recent trends to improve the nutritional quality of food bank inventory** by answering the following research questions:

Question 2.1**:** How is healthy eating promoted within the charitable food sector?

Question 2.1a**:** What are the barriers and facilitators?

Question 2.1b: How does the promotion of healthy eating affect relationships with donors, recipients, funders, board members, volunteers?

Question 2.2: How are efforts to promote healthy eating implemented and sustained?

Question 2.3**:** What innovations (if any) are happening in the sector to promote healthy eating?

## *Study Two - Participants*

### *Case Selection*

To examine how food banks have responded to recent trends to improve the nutritional quality of food bank inventory, I used data collected from two case studies: an adopter and non-adopter food bank (i.e., a food bank with a nutrition policy and tracking system and one without, respectively). The primary purpose of a case study "is to generate in-depth understanding of a specific topic (as in a thesis), program, policy, institution or system to generate knowledge" (Simons, 2012, p. 20). The deep understanding generated from a case study serves to explore 1) the subjective significance of a process or event, and (2) the connections and pathways that underpin the process or event (Woodside, 2010). Strengths of the case study approach include the possibility of including multiple perspectives and its use in exploring the process and dynamics of change (Simons, 2012). A case study methodology was suitable to this study because the primary aim was to understand how different organizational entities within the charitable food system have responded to recent efforts to change food bank inventory.

I identified potential cases from the pool of 196 food banks that participated in the MAZON National Food Bank Survey Assessment of Nutrition Practices and Policies (Feldman & Schwartz, 2018). I purposively selected three cases based their conformity to one of three types: full-adopter, semi-adopter, and non-adopter. I split food banks into these three groups based on their responses to the survey. I categorized food banks as full adopters if they reported having both a formal, written nutrition policy and nutrition ranking system, semi-adopters had either a nutrition policy or a ranking system, and non-adopters had neither. To

cull the sample, food banks that were independent and had autonomy over their inventory choices and food banks that were partner distribution organizations (i.e., under the oversight of a larger, more established food bank) were removed as potential cases. Experts in the field of food banking (e.g., staff members at national organizations that worked closely with numerous food banks across the country) provided further guidance to identify sites that were 1) non-usual suspects (i.e., food banks that were not regularly featured in research or showcased for their nutrition efforts); and 2) would make good selections for case study sites. I then selected one food bank from each category to participate in the research study.

A senior staff member at MAZON invited the chief executive officer from each food bank to participate via a phone. If the chief executive officer expressed interest in participating in the case study, I contacted the individual to arrange a convenient time to schedule the interview and to identify the additional staff members, board members, partner agency representatives, as well as representatives from the food bank's food and beverage donors that could participate in the case study. The chief executive officer then provided the contact information for each case study interviewee and I contacted the individual to arrange a convenient time to schedule the interview. The interviews took place from November 2019 – April 2020.

The University of California Los Angeles Institutional Review Board determined this study as non-human subject research and deemed it exempt from review. Due to ethical concerns around data collection during the coronavirus pandemic, I decided to drop the third case. During this time, food banks saw an immense increase in demand and a decrease in volunteers and inventory as a result of the pandemic (Reiley, 2020). Accordingly, I decided it

was unethical to distract food bank staff at this time and inappropriate to continue data collection.

### *Key Informant Participants*

Additional data for the second aim of my dissertation came from semi-structured, in-depth interviews with 10 national key stakeholders connected to the charitable food system, including representatives from health advocacy organizations, a charity network that distributes food and beverages through its pantries, academic researchers, and food bank association staff members. Qualitative sample sizes are usually small because 1) observed phenomena need only occur once to be included in analysis; 2) the approach does not require sufficient power to make statistical inferences as in quantitative analysis; and 3) the rich data generated in qualitative approaches requires intensive resources to analyze (Ritchie & Lewis, 2003). Accordingly, qualitative sample sizes typically are kept to a reasonable small scale. The number of interviews I conducted aligns with the recommendation that studies employing individual interviews conduct no more interviews than needed to manage the complexity of the analytic task (Ritchie & Lewis, 2003; Vasileiou et al., 2018). Information redundancy (i.e., when adding additional sampling units no longer contributes new perspectives or information) determined the total number of participants interviewed (Lincoln & Guba, 1985; Vasileiou et al., 2018).

I purposively selected food bank representatives to represent different key stakeholder groups working on inventory change in the charitable food system. In partnership with a senior staff member at MAZON, we identified the following stakeholder groups: academic researchers, policy advocates, national food bank association staff members, representatives of direct

service organizations, and food and beverage donors. Several attempts were made to interview a representative of a food and beverage donor; however, no one from this sector was willing to be interviewed for the study. A senior staff member at MAZON invited key stakeholders from all organizations to participate via email. If the representative expressed interest in participating in the interview, I contacted the individual to schedule the interview. For individuals who did not respond, two additional follow-up attempts occurred by email. A senior staff member at MAZON emailed three food and beverage donors she had met previously at conferences related to the charitable food system. One of the representatives responded to the to the email and agreed to find out additional information about the study but ultimately declined to participate.

### *Study Two – Data Collection Procedures*

#### *Interviews*

Semi-structured interviews took place using the VoIP (Voice over Internet Protocol) software Zoom. Participants provided verbal consent prior to beginning the interview and were informed that they were able to terminate the interview at any time. Interviews were digitally recorded and lasted approximately 60 minutes. I conducted each interview and took notes throughout each interview. I also completed a short memo following each interview to document any immediate reactions or observations that were relevant to analysis. I reviewed these memos prior to coding.

Semi-structured interview guides rely on a set series of questions as a loose conversation guide (Hesse-Biber, 2017). The semi-structured interview guide is open-ended, allowing the participant to respond in the manner that he or she chooses, potentially

disagreeing with questions or raising new ones (Rubin & Rubin, 2011). This methodological approach seeks to center the data on the experience of the participants. This is important for the aims of this study, where the dynamics of change within food banks are being explored from multiple perspectives including partner agencies as well as food and beverage donors. This is also important in qualitative research to minimize the researcher's preconceived notions about the research problem. Additionally, in-depth interviewing with a semi-structured interview guide allowed flexibility in data collection as the interview guide could be adapted to incorporate new categories as they emerged during interviews.

I developed the semi-structured interview guides shown in Tables 4.2 and 4.3 based on a review of the existing literature described in Chapter 1 and feedback from two experienced public health community researchers (additional interview guides modified for partner organizations and food and beverage donors are in Appendix D1). The semi-structured interview guide centered on three research areas: 1) understanding how organizations within the charitable food system promote healthy eating, including barriers, facilitators, and its effect on relationship with dependent organizations; 2) exploring how efforts to promote healthy eating are implemented and sustained; and 3) describing any innovations in the sector that have resulted from the promotion of healthy eating. Prior to beginning interviews with key stakeholders and food bank representatives, I reviewed the interview guide and demographic questions with an expert familiar with the field to assess the timing appropriateness of the guide.

At the conclusion of each interview, I collected demographic information for each participant. This information included gender, current title, number of years under current title,

number of years at current organization, and number of years working in this sector. I used these data to describe the sample. I assigned each participant a unique code to protect confidentiality and labeled all data with this unique code.

*Document Reviews*

I reviewed administrative documents connected to each case including nutrition policies, website, impact reports, and strategic plans. I used the documents to provide additional details on the context in which the interviewees operate as well as historical insight on each case site's efforts to improve the nutritional quality of distributed food.

Table 4.2: Case Study Food Bank Interview Guide

1. How does the promotion of healthy eating fit within the mission/values/priorities of your organization?
    - *Has your mission changed over time to reflect this?*
2. How does your organization promote healthy eating?
    - *Have you implemented any new practices/programs (e.g., built relationships with new donors, generated different sources of revenue, new distribution channels) in efforts to promote healthy eating among charitable food clients?*
    - *Any policies related to nutrition and wellness?*
3. How would you describe to the nutritional quality of your inventory currently?
4. In what ways is your organization working to improve the nutritional profile of its inventory?
    - *Specific organizational strategies?*
    - *How do you know you if inventory is improving?*
        i. *Do you set goals?*
        ii. *Regular (annual and/or quarterly) monitoring and evaluation?*
5. How did you come to have these efforts to improve inventory?
    - *Who championed these efforts for the organization? (e.g., clients, agencies, board, etc.)*
6. How has the implementation of these efforts been successful?
7. What challenges have you faced (and may still be facing) in efforts to shift inventory quality?
    - *Are you ever faced with needing to handle unwanted, unhealthy food & beverage donations? How do you grapple with such issues?*
    - *Do you feel like you have a sense of how much you spend to dispose of these items? Both in terms of hard (disposal fees) and soft (volunteer time) costs?*
8. How have you coordinated your efforts to improve inventory with your member agencies?
    - *Food & Beverage donors?*
9. How have these efforts affected your relationship with your member agencies?
    - *Food & beverage donors*
    - *Financial funders (know that some food & beverage donors do both)*
    - *Partner agencies*
    - *Board Members?*
    - *Other stakeholders (e.g., church leaders, politicians)*
10. How do you manage competing priorities?
    - *How does nutrition compare among the other food bank initiatives (e.g., equity, root cause, economic development, capital campaigns)?*
11. What additional changes would you like your organization to make around the composition of food bank inventory?
    - *What would help your organization achieve these changes?*
12. Anything else you would like to share?

Table 4.3: Key Informant Semi-Structured Interview Guide

1. What is your opinion about the role of the charitable food system in addressing concerns around client health?
2. Based on the momentum in the field around the promotion of nutrition and healthy eating in the last several years, how would you describe where we are now?
3. What have been the most impactful practices and meaningful changes for improving nutritional quality of inventory within the charitable food system?
4. What are the greatest challenges system-wide in terms of shifting nutritional quality of food distributed through the charitable food system?
    - *Do you see a difference between perceived barriers and real barriers?*
5. How do efforts to improve the nutritional profile of food bank inventory affect relationships between organizations/key stakeholders (e.g., food banks, member agencies, food and beverage donors, funders) within the charitable food systems?
    - *Other stakeholders?*
    - *How do you see food and beverage donors responding to this shift towards a focus on nutrition and healthy eating in the charitable food system?*
    - *How do you see member agencies responding to this shift towards a focus on nutrition and healthy eating in the charitable food system?*
    - *As a leader in the field, how have you (or your organization) had to adapt?*
6. Do you see food banks expanding, sustaining or implementing additional efforts to promote healthy eating in the future? How so? Or Why not?
    - *What would help food banks achieve these plans?*
7. As a leader in the field, what changes have you made or are still making to better meet the needs of the charitable food organizations?
    - *How have you (or your organization) had to adapt?*
8. In an ideal world, what's your vision for the charitable food system with respect to healthy eating and nutrition?
    - *Are these changes feasible?*
        i. *Are there aspects of this visions that are unrealistic/unattainable*
    - *What are the barriers to realizing this vision?*
    - *What's the next frontier/wave of change?*
9. Anything else you would like to share?

### *Study* Two - Analysis

Interviews were transcribed verbatim from the digital recording and each transcript was validated for accuracy. A secure transcription service (www.transcriptionpanda.com) completed

the transcription and validation of interview audio recordings. I coded and analyzed the data using Dedoose version 8.1 (SocioCultural Research Consultants, LLC, 2018).

I analyzed the transcripts using the constant comparison analysis method employed in the qualitative descriptive approach. A qualitative descriptive analytic approach is appropriate when a straightforward description of a phenomena is desired (Sandelowski, 2000). In particular, this methodological approach can facilitate an understanding of the *who*, *what*, and *where* of events, which provides a "comprehensive study of an event in the everyday terms of those events" (Sandelowski, 2000, p. 336). Unlike high-inference qualitative approaches, such as phenomenology or grounded theory, qualitative description is less interpretative and remains closer to the data (Colorafi & Evans, 2016). This approach often allows participants to use their own words to describe the event (Sandelowski, 2000). This methodological approach was appropriate for the study as the primary aim was to understand efforts to promote healthful inventory from the perspective of stakeholders in the charitable food system.

Before completing the interviews, I began preliminary analysis by taking notes on each interview. This process allowed me to reflect on the data and apply this understanding to subsequent interviews. I then read through each transcript to deepen my familiarity with the data and to facilitate the coding process (Hesse-Biber, 2017).

I coded the first transcript using an initial codebook developed from the theoretical framework described in Chapter 2 and the semi-structured interview guides (Rubin & Rubin, 2011). I iteratively revised the codebook as I added emergent codes to the codebook. I finalized the codebook after coding all 25 interviews (see Appendix D2). I then used the revised codebook to analyze the transcripts a second time. The second iteration of coding used pattern

coding to collapse codes into a smaller number of categories. I then conducted a sub-analysis of select codes including progress, barriers to inventory change, coordination, and the future of inventory change. I selected these four categories based on the research questions (a priori) and from early analysis. To facilitate the analysis process, I used memo writing throughout the analysis to capture my thoughts on the codes, categories, and relationships between the categories (Hesse-Biber, 2017). I reviewed interview memos and participant responses to the demographic questionnaire prior to coding each interview. This helped to ground me in the participants' perspectives. I also used the responses to the demographic questionnaire to describe the sample.

As proposed by Miles and Huberman (1994), I used within- and cross-case conceptually clustered matrices displays to chart the data. Data displays allow for comparisons, detection of differences, as well as the identification of patterns, themes, and trends (Miles & Huberman, 1994). I developed a within-case display for each food bank site, which consisted of a brief description of each site interviewee's responses in the following categories: motivations for inventory change, barriers and facilitators to inventory change, coordination of inventory change, and attitudes toward inventory change. I selected these four categories based on the research questions (a priori) and from early analysis. I then derived a cross-case display from the two within-case displays. I studied the cross-case display to compare and contrast the experience of inventory change between the two cases.

## Mixed Methods

As described previously, the dissertation employed an embedded mixed methods research design, which combined the collection and analysis of quantitative and qualitative

data within a traditional quantitative research framework. Several factors informed the selection of this study design. First, a mixed-methods approach is complementary, elaborating and enhancing the results of from one method with the results from the other (Greene et al., 1989). Second, this approach is expansive, extending the range on inquiry by employing different methods for different components of the inquiry (Greene et al., 1989). Third, a mixed methods approach allows for initiation, seeking the discovery of contradiction, paradoxes, and/or fresh perspectives (Greene et al., 1989).

Several factors underpinned the decision to integrate the data and findings from the quantitative surveys and qualitative interviews. Combining both quantitative and qualitative results can triangulate findings such that both are jointly corroborated (Bryman, 2006). In addition, this approach offers completeness, establishing a more thorough account of the research findings (Bryman, 2006). The integration of data and findings using a mixed methods approach allowed for the results of one study to help explain the findings in the other (Bryman, 2006). Accordingly, the dissertation integrated the quantitative and qualitative results in multiple ways. The findings from Study One helped to modify and/or add to the proposed interview guide to capture additional depth around interesting or conflicting findings. Salient findings from Study Two were used to inform the variables included in the quantitative models from Study One, to improve model fit, and to incorporate any omitted variables that emerged from the interviews. In addition, I considered the findings of Study One and Study Two together to establish a more comprehensive understanding of efforts to promote healthy eating within food banks and the charitable food system more broadly.

# Chapter 5: Quantitative Study Results and Discussion

## Population Characteristics

Table 5.1 presents descriptive statistics of the food bank population by respondent status. Of the 316 Food Banks in the sampling frame 190 (60%) responded to the MAZON National Food Bank Survey Assessment of Nutrition Practices and Policies. Survey nonrespondents were more likely than respondents to be unaffiliated and smaller in size. All else equal, respondents had higher odds of Feeding America membership compared to non-respondents.

A majority (85.1%) of food banks were affiliated with Feeding America. More than half of the food banks were located in the Southern (32.3%) or the Western (31.6%) regions of the U.S. Fewer food banks were located in the Midwestern (21.3%) and Northeastern (14.8%) regions of the U.S. Approximately two-thirds of the food banks had small service area sizes. Food bank service areas consisted primary of metropolitan counties (58%), followed by non-metropolitan counties (33%), and rural counties (9.1%). On average, 13% of households in food banks service areas receive SNAP benefits and 15% of individuals in these service areas live below the Federal Poverty Line. About half of voters in the food bank service areas voted Republican in the 2016 presidential election and one third of individuals living in the food bank service identify as non-Hispanic White.

Table 5.1: Differences in Food Bank Characteristics by Respondent Status (n=316)

| | Total (n=316) | | Non-Respondents (n=126) | | Respondents (n=190) | |
|---|---|---|---|---|---|---|
| | Mean or % | SD | Mean or % | SD | Mean or % | SD |
| *Organizational* | | | | | | |
| Affiliation with Feeding America | | | | | | |
| Yes | 85.1 | -- | 77.8 | -- | 90.0*** | -- |
| No | 14.9 | -- | 22.2 | -- | 10.0 | -- |
| Size | | | | | | |
| Small | 33.3 | -- | 42.5 | -- | 27.5* | -- |
| Medium | 33.3 | -- | 29.2 | -- | 36.0 | -- |
| Large | 33.3 | -- | 28.3 | -- | 36.5 | -- |
| Service Area Size | | | | | | |
| Small | 65.7 | -- | 64.2 | | 66.7 | |
| Large | 34.3 | -- | 35.8 | | 33.3 | |
| *Contextual* | | | | | | |
| U.S. Region | | | | | | |
| Midwest | 21.3 | -- | 20.8 | -- | 21.6 | -- |
| Northeast | 14.8 | -- | 13.3 | -- | 15.8 | -- |
| South | 32.3 | -- | 33.3 | -- | 31.6 | -- |
| West | 31.6 | -- | 32.5 | -- | 31.1 | -- |
| Rural | 0.091 | 0.18 | 0.085 | 0.18 | 0.10 | 0.18 |
| Non-metro | 0.33 | 0.33 | | | | |
| Metropolitan | 0.58 | 0.39 | 0.55 | 0.40 | 0.60 | 0.37 |
| Socioeconomic Position | 0.15 | 0.04 | 0.15 | 0.047 | 0.15 | 0.041 |
| Area Need | 0.13 | 0.05 | 0.13 | 0.046 | 0.13 | 0.045 |
| Racial/Ethnic Diversity | 0.68 | 0.19 | 0.69 | 0.18 | 0.67 | 0.20 |
| Political | 0.50 | 0.13 | | | | |
| Conservativeness | | | 0.52 | 0.13 | 0.49 | 0.14 |

* p<0.05, ** p<0.01, *** p<0.001

Tests for differences between respondents and non-respondents were performed using Chi-squared tests and T-tests. Note: Because of missing data, some summary statistics presented here were calculated with a smaller sample size than reported in the table. Percentages may not sum to 100 due to rounding.

## Sample Characteristics and Outcome Variables

Study One aimed to examine the determinants of nutrition policy and practice adoption among food banks and the relationship of policy and practice adoption to nutritional quality of food bank inventory. A summary of the sample is shown in Table 5.2. The majority of food banks were members of Feeding America. A little more than one third of food banks were large or medium in size. On average, 59% (SD=0.21) of inventory for food banks in the sample came from donations. However, donation ranged widely from 5% to 100%. Regarding the food donor environment, food banks reported being predominantly agriculturally and food retail rich. Conversely, most food banks reported being food manufacturing and food service/convenience poor.

With respect to the contextual characteristics, approximately a third of food banks were located in the Western and Southern regions of the U.S. with another 21.7% located in the Midwest and 15.9% in the Northeast. On average, about one tenth of individuals living in the sample food banks' service areas lived in rural counties. A greater average percentage of individuals lived in non-metropolitan (31%, SD=0.31) or metropolitan (60%, SD=0.37) counties. The mean proportion of households in food banks services areas receiving SNAP benefits was 13% (SD=0.05) and 15% (SD=0.04) of individuals lived bellowed the Federal Poverty Line. Individuals living in sample food banks' service areas largely identified as white with an average of 68% (SD=0.20) individual identifying as non-Hispanic, White. An average of 49% (SD=0.14) of voters in sample food bank service areas voted Republican in the 2016 presidential election.

Table 5.2: Characteristics of the Sample (n=189)

| Characteristics | Mean (SD) or % | Min | Max |
|---|---|---|---|
| *Organizational* | | | |
| Affiliation | | | |
| No | 10.1 | | |
| Yes | 89.9 | | |
| Food Bank Size | | | |
| Small | 27.7 | | |
| Medium | 36.2 | | |
| Large | 36.2 | | |
| Inventory Stream | 0.59 (0.21) | 0.05 | 1.0 |
| Service Area Size | | | |
| Small | 66.7 | | |
| Large | 33.3 | | |
| *Food Donor Environment* | | | |
| Agriculture | | | |
| Poor | 39.7 | | |
| Neither | 10.1 | | |
| Rich | 50.3 | | |
| Food Manufacturing | | | |
| Poor | 60.9 | | |
| Neither | 15.9 | | |
| Rich | 23.3 | | |
| Food Retail | | | |
| Poor | 20.1 | | |
| Neither | 13.2 | | |
| Rich | 66.7 | | |
| Food Convenience | | | |
| Poor | 43.4 | | |
| Neither | 29.6 | | |
| Rich | 27.0 | | |
| *Contextual* | | | |
| U.S. Region | | | |
| Midwest | 21.7 | | |
| Northeast | 15.9 | | |
| South | 31.2 | | |
| West | 31.2 | | |
| Rural | 0.095 (0.21) | 0 | 0.93 |
| Non-Metropolitan | 0.31 (0.31) | 0 | 1 |
| Metropolitan | 0.60 (0.37) | 0 | 1 |
| Socioeconomic Position | 0.15 (0.04) | 0.048 | 0.32 |
| Area Need | 0.13 (0.05) | 0.027 | 0.29 |

| | | | |
|---|---|---|---|
| Racial/Ethnic Diversity | 0.68 (0.20) | 0.075 | 0.95 |
| Political Conservativeness | 0.49 (0.14) | 0.11 | 0.79 |

Note: Because of missing data, some summary statistics presented here were calculated with a smaller sample size than reported in the table. Percentages may not sum to 100 due to rounding.

Table 5.3 presents a summary of the outcome variables for Study One. Approximately one third of food banks in the sample reported having a formal nutrition policy with another two thirds reporting that they had no formal nutrition policy. A little less than half of food banks in the sample reported having a nutrition tracking system. With respect to inventory, sample food banks reported that an average of 32% (SD=0.16) of inventory consisted of fresh fruits and vegetables. Healthful inventory percentages at food banks ranged from 0 to 90. Conversely, an average of 25% (SD=0.23) of inventory at sample food banks was unhealthful. Unhealthy inventory percentages ranged from 0 to 100.

Table 5.3: Summary of Outcome Variables (n=179)

| Outcome | Mean (SD) or % | Min | Max |
|---|---|---|---|
| Nutrition Policy | | | |
| No | 53.6 | | |
| Yes | 46.4 | | |
| Nutrition Tracking System | | | |
| No | 52.3 | | |
| Yes | 47.7 | | |
| Healthful Inventory | 0.32 (0.16) | 0.0 | 0.90 |
| Unhealthful Inventory | 0.24 (0.20) | 0.0 | 1.0 |

Note: Because of missing data, some summary statistics presented here were calculated with a smaller sample size than reported in the table. Percentages may not sum to 100 due to rounding.

## Questions 1.1 and 1.2 Results

Research Questions 1.1 (To what extent do organizational and contextual factors explain nutrition policy adoption among food banks?) and 1.2 (To what extent do organizational and contextual factors explain nutrition tracking system adoption among food banks?) assessed the determinants of nutrition policy and practice adoption among food banks. Table 5.4 shows differences in the sample in total and by nutrition tracking system and nutrition policy adoption status. Table 5.5 presents the results of the analyses for Questions 1.1 and 1.2, which are shown as logistic regression models predicting the outcomes of nutrition policy adoption and nutrition tracking system adoption.

Large food banks were significantly more likely to report having a nutrition tracking system. Food banks with nutrition tracking systems had significantly lower average area need as well as lower mean levels of political conservativeness. In addition, food banks that reported a convenience rich food donor environment were more likely to have a nutrition tracking system. Similarly, food banks that reported a convenience rich food donor environment were also significantly more likely to have a formal nutrition policy. Food banks located in the Western region of the U.S. were significantly more likely to have nutrition policies. Likewise, food banks with nutrition policies were located in communities with significantly lower average number of households receiving SNAP benefits, lower mean levels of political conservativeness, and higher mean percentages of metropolitan counties in their service areas.

Table 5.5: Characteristics of the Sample in Total and by Nutrition Tracking System and Nutrition Policy Adoption Status (n=178)

| | Total | Tracking | | Policy | |
|---|---|---|---|---|---|
| Characteristics | (n=178) Mean (SD) or % | No (n=94) Mean (SD) or % | Yes (n=82) Mean (SD) or % | No (n=115) Mean (SD) or % | Yes (n=59) Mean (SD) or % |
| *Organizational* | | | | | |
| Organization Size | | | | | |
| Small | 26.7 | 36.8 | 14.5*** | 29.9 | 20.3 |
| Medium | 35.8 | 42.1 | 30.1 | 37.6 | 33.9 |
| Large | 37.5 | 21.1 | 55.4 | 32.5 | 45.8 |
| Inventory Stream | 0.60 (0.20) | 0.59 (0.22) | 0.60 (0.20) | 0.58 (0.22) | 0.62 (0.18) |
| Service Area Size | | | | | |
| Small | 65.7 | 70.5 | 60.2 | 70.1 | 57.6 |
| Large | 34.3 | 29.5 | 39.8 | 29.9 | 42.4 |
| *Food Donor Environment* | | | | | |
| Food Convenience | | | | | |
| Poor | 42.6 | 49.0 | 37.1* | 47.5 | 36.1* |
| Neither | 30.1 | 33.3 | 27.0 | 32.0 | 24.6 |
| Rich | 27.3 | 17.7 | 36.0 | 20.5 | 39.3 |
| *Contextual* | | | | | |
| U.S. Region | | | | | |
| Midwest | 22.2 | 19.3 | 21.8 | 25.4 | 13.6** |
| Northeast | 16.5 | 22.9 | 16.8 | 19.5 | 11.9 |
| South | 30.1 | 26.5 | 30.7 | 32.2 | 27.1 |
| West | 31.3 | 31.3 | 30.7 | 22.9 | 47.5 |
| Metropolitan | 0.60 (0.38) | 0.57 (0.39) | 0.64 (0.35) | 0.56 (0.38) | 0.68 0.35* |
| Area Need | 0.13 (0.046) | 0.14 (0.047) | 0.12 (0.044)* | 0.14 (0.046) | 0.12 (0.043)** |
| Political Conservativeness | 0.49 (0.14) | 0.51 (0.14) | 0.47 (0.14)* | 0.513 (0.14) | 0.442 (0.13)** |

* p<0.05, ** p<0.01, *** p<0.001

Because of missing data, some summary statistics presented here were calculated with a smaller sample size than reported in the table. Percentages may not sum to 100 due to rounding. Tests for differences between nutrition tracking system adopters and non-adopters and nutrition policy adopters and non-adopters were performed using Chi-squared tests.

Table 5.6 presents three models predicting nutrition tracking system adoption. The first model contains solely organizational characteristics. The second model predicts nutrition

tracking system adoption using organizational and food donor environment characteristics. The third model contains organization, food donor environment, and contextual determinants. Across all three models, food bank size was significantly associated with nutrition tracking system adoption. All else equal, both small and medium sized food banks had lower odds - (OR 0.15 CI 0.051, 0.46) and (OR 0.27 CI 0.11, 0.65), respectively - of adopting a nutrition tracking system as compared to large food banks. Area need was also marginally associated with nutrition tracking system adoption (OR 0.93 CI 0.85, 1.01).

Table 5.6: Logistic Regression Models Predicting Nutrition Tracking System Adoption (N=178)

| Characteristics | Model 1<br>OR (95% CI) | Model 2<br>OR (95% CI) | Model 3<br>OR (95% CI) |
|---|---|---|---|
| *Organizational* | | | |
| Organization Size | | | |
| Small | 0.12 (0.047, 0.32)*** | 0.15 (0.054, 0.39)*** | 0.15 (0.051, 0.46)*** |
| Medium | 0.24 (0.11, 0.53)*** | 0.28 (0.12, 0.64)** | 0.27 (0.11, 0.65)** |
| Large (ref) | | | |
| Inventory Stream | 1.0 (0.98, 1.01) | 1.0 (0.98, 1.01) | 0.997 (0.98, 1.02) |
| Service Area Size | | | |
| Small (ref) | | | |
| Large | 0.78 (0.37, 1.63) | 0.85 (0.40, 1.8) | 1.08 (0.42, 2.76) |
| Food Donor Environment | | | |
| Food Convenience | | | |
| Poor | | 1.22 (0.55, 2.7) | 1.28 (0.54, 3.02) |
| Neither (ref) | | | |
| Rich | | 2.00 (0.83, 4.82) | 2.17 (0.86, 5.47) |
| *Contextual* | | | |
| U.S. Region | | | |
| Midwest | | | 0.64 (0.22, 1.83) |
| Northeast | | | 1.98 (0.68, 5.71) |
| South | | | 0.67 (0.24, 1.88) |
| West (ref) | | | |
| Metropolitan | | | 1.00 (0.99, 1.01) |
| Area Need | | | 0.93 (0.86, 1.01)+ |
| Political Conservativeness | | | 1.00 (0.97, 1.03) |

[ł] p<0.10, * p<0.05, ** p<0.01, *** p<0.001

Three logistic regression models predicting nutrition policy adoption are presented in Table 5.7. All else equal, food banks with large service areas had higher odds (OR 3.61, 95% CI 1.32, 9.84) of nutrition policy adoption as compared to food banks with small service areas. In the full model, service area size was significantly associated with formal nutrition policy adoption such that food banks with large service areas as compared to those with small services area had higher odds of adopting a tracking system (OR: 3.61 CI 1.32, 9.84). Additionally, food banks located in the Midwestern region of the U.S. had significantly lower odds (OR 0.29, CI 0.0958, 0.897) of reporting nutrition policy adoption as compared to food banks in the Western region of the U.S.

Table 5.7: Logistic Regression Models Predicting Nutrition Policy Adoption (n=176)

| Characteristics | Model 1 OR (95% CI) | Model 2 OR (95% CI) | Model 3 OR (95% CI) |
|---|---|---|---|
| *Organizational* | | | |
| Organization Size | | | |
| Small | 0.61 (0.24, 1.51) | 0.85 (0.32, 2.25) | 1.09 (0.35, 3.41) |
| Medium | 0.74 (0.34, 1.60) | 1.01 (0.44, 2.29) | 1.26 (0.50, 3.17) |
| Large (ref) | | | |
| Inventory Stream | 1.00 (0.99, 1.02) | 1.00 (0.99, 1.02) | 1.0 (0.98, 1.02) |
| Service Area Size | | | |
| Small (ref) | | | |
| Large | 1.42 (0.70, 2.90) | 1.67 (0.79, 3.50) | 3.61 (1.32, 9.84)* |
| Food Donor Environment | | | |
| Food Convenience | | | |
| Poor | | 1.16 (0.51, 2.65) | 1.17 (0.46, 2.96) |
| Neither (ref) | | | |
| Rich | | 2.79 (1.15, 6.76)* | 2.51 (0.95, 6.59) |
| *Contextual* | | | |
| U.S. Region | | | |
| Midwest | | | 0.29 (0.096, 0.90) * |
| Northeast | | | 0.33 (0.11, 1.02) |
| South | | | 0.57 (0.21, 1.57) |
| West (ref) | | | |
| Metropolitan | | | 1.01 (0.99, 1.02) |
| Area Need | | | 0.93 (0.85, 1.01) |
| Political Conservativeness | | | 0.97 (0.94, 1.01) |
| Intercept | | | |

ǂ p<0.10, * p<0.05, ** p<0.01, *** p<0.001

## Questions 1.3 and 1.4 Results

Research Questions 1.3 (To what extent does nutrition policy adoption explain nutritional quality of food bank inventory?) and 1.4 (To what extent does nutrition tracking system adoption explain nutritional quality of food bank inventory?) examine the relationship of policy and practice adoption to nutritional quality of food bank inventory. Table 5.8 presents the characteristics of the sample for Questions 1.3 and 1.4 in total and differences in healthy and unhealthy inventory by the sample characteristics. More than half of food banks in the

sample had a formal nutrition policy with another 34.3% reporting an informal nutrition policy and 9.9% reporting no nutrition policy. More than half of food banks reported having no nutrition tracking system. The other characteristics presented in table follow trends described above.

In the bivariate analysis, there were significant differences in averages of healthful inventory by agricultural food donor environments and U.S. region. Those food banks that reported being in neither an agriculturally-rich nor agriculturally-poor food donor environment had lower means of healthy inventory as compared to the other two groups. Food banks in the Western region of the U.S. had a higher mean of healthy inventory compared to food banks located in the other three regions. The level of metropolitan, area need, and political conservativeness of a food bank's service area also significantly predicted healthy inventory in the bivariate analysis.

Table 5.8: Characteristics of the Sample for Questions 1.3 and 1.4 in Total and Mean Differences in Healthy and Unhealthy Inventory by Sample Characteristics (n=176)

| | Total | Healthy | Unhealthy |
|---|---|---|---|
| Characteristics | Mean (SD) or % | Healthy Inventory Mean (SD) or $\beta$(SE) n=172 | Unhealthy Inventory Mean (SD) or $\beta$(SE) n=161 |
| *Organizational* | | | |
| Nutrition Policy | | | |
| None | 9.9 | 0.29 (0.20) | 0.43 (0.30)*** |
| Informal | 34.3 | 0.34 (0.15) | 0.20 (0.16) |
| Formal | 55.8 | 0.30 (0.15) | 0.23 (0.23) |
| Nutrition Tracking System | | | |
| No | 52.3 | 0.29 (0.17)+ | 0.28 (0.23)* |
| Yes | 47.7 | 0.34 (0.15) | 0.20 (0.15) |
| Organization Size | | | |
| Small | 26.7 | 0.28 (0.16) | 0.25 (0.24) |
| Medium | 36.1 | 0.31 (0.18) | 0.25 (0.22) |
| Large | 37.2 | 0.34 (0.13) | 0.22 (0.15) |
| Inventory Stream | 0.59 (0.20) | 0.10(0.59)+ | 0.11 (0.08) |
| Service Area Size | | | |
| Small | 66.3 | 0.33 (0.17) | 0.23 (0.21) |
| Large | 33.7 | 0.29 (0.13) | 0.26 (0.19) |
| *Food Donor Environment* | | | |
| Agriculture | | | |
| Poor | 39.5 | 0.32 (0.16)* | 0.24 (0.22) |
| Neither | 10.5 | 0.22 (0.12) | 0.31 (0.23) |
| Rich | 50.0 | 0.33 (0.16) | 0.22 (0.17) |
| *Contextual* | | | |
| U.S. Region | | | |
| Midwest | 20.9 | 0.28 (0.12)*** | 0.29 (0.21)** |
| Northeast | 17.4 | 0.30 (0.17) | 0.19 (0.14) |
| South | 29.7 | 0.27 (0.15) | 0.30 (0.23) |
| West | 32.0 | 0.39 (0.16) | 0.18 (0.17) |
| Metropolitan | 0.61 (0.37) | 0.11(0.031)** | 0.028 (0.04) |
| Area Need | 0.13 (0.046) | -0.60(0.26)* | 0.74 (0.35)* |
| Political Conservativeness | 0.49 (0.14) | -0.42(0.080)*** | 0.37 (0.11)** |

* p<0.05, ** p<0.01, *** p<0.001

Note: Percentages may not sum to 100 due to rounding. Tests for differences in healthy inventory and unhealthy inventory by sample characteristics were performed using T-test, ANOVA, and linear regression.

Significant mean differences in unhealthy inventory were seen for nutrition policy. Food banks with no nutrition policy had a significantly higher average percentage of unhealthy inventory compared to food banks with informal or formal policies. Similarly, food banks with no nutrition tracking system had a significantly higher average of unhealthy inventory compared to food banks with a nutrition tracking system. In addition, there were significant differences in unhealthy inventory means by U.S. region, area need, and political conservativeness.

Table 5.9 presents four nested linear regression models predicting healthy inventory. The first model examines the relationship between the two primary predictors, nutrition tracking system adoption and nutrition policy adoption, and the outcome, healthful inventory. The second model includes the primary predictors along with other organizational characteristics. The third model builds on model two with the addition of a food donor environment variable. Finally, model four predicts healthful inventory using all co-variates.

In the full model, none of the organizational factors, including having a nutrition policy or nutrition tracking system, were significantly associated with fresh fruit and vegetable inventory quantities. However, several contextual characteristics were associated with healthful inventory. Comparing levels of healthful inventory among food banks of similar organizational and contextual characteristics, the percentage of healthy inventory was on average 8.7% lower for food banks that reported being in a neither agriculturally rich nor agriculturally poor food donor environment as compared to those in agriculturally rich food donor environments. Similarly, as compared to food banks located in the Western U.S., food banks in the Midwest, South, and Northeast had significantly lower average percentages of

fresh fruits and vegetables (7.0%, 9.4%, and 8.2%, respectively). In addition, each unit increase in political conservativeness above the mean was associated with an average decrease of 0.26% in healthful inventory.

Similar to Table 5.9, Table 5.10 presents the results of four linear regression models for the logarithmic transformed outcome, unhealthy inventory. Across all four models, nutrition policy adoption was positively associated with unhealthy inventory. Considering unhealthy inventory percentages among food banks with similar organizational and contextual characteristics in Model 4, food banks with no nutrition policy had an average 105% increase in the geometric mean of unhealthy inventory compared to those with an informal nutrition policy. There were no significant differences between food banks with formal and informal nutrition policies nor food banks with and without a nutrition tracking system. In the full model, inventory stream was also significantly associated with unhealthy inventory such that each one percent increase above the mean percentage of donated inventory was associated with an average increase of 0.13% in unhealthy inventory. Contextual factors were also significantly associated with unhealthy inventory. Each percent increase in above average percentage of political conservativeness of the service area was associated with an average increase of 0.26% in unhealthy inventory. Location in the U.S. was also significant with food banks located in the South, as compared to those in the West, associated with a 63% increase in the geometric mean of unhealthy inventory.

Table 5.9: Linear Regression Models Predicting Healthful Inventory (n=172)

| | Characteristics | Model 1 $\beta$ (SE) | Model 2 $\beta$ (SE) | Model 3 $\beta$ (SE) | Model 4 $\beta$ (SE) |
|---|---|---|---|---|---|
| *Organizational* | | | | | |
| | Nutrition Policy | | | | |
| | None | -0.00076 (0.042) | 0.010 (0.043) | 0.0086 (0.043) | -0.0056 (0.040) |
| | Informal (ref) | | | | |
| | Formal | 0.024 (0.027) | 0.028 (0.027) | 0.024 (0.027) | -0.026 (0.027) |
| | Nutrition Tracking System | | | | |
| | No (ref) | | | | |
| | Yes | 0.0373 (0.0260) | 0.026 (0.028) | 0.020 (0.028) | 0.022 (0.026) |
| | Organization Size | | | | |
| | Small | | -0.047 (0.036) | -0.045 (0.036) | -0.026 (0.037) |
| | Medium | | -0.025 (0.031) | -0.0210(0.031) | 0.0033 (0.030) |
| | Large (ref) | | | | |
| | Inventory Stream | | 0.00082 (0.00063) | 0.00087 (0.00062) | 0.00029 (0.00061) |
| | Service Area Size | | | | |
| | Small (ref) | | | | |
| | Large | | -0.055 (0.028)* | -0.046 (0.028) | 0.012 (0.031) |
| *Food Donor Environment* | | | | | |
| | Agriculture | | | | |
| | Poor | | | -0.0096 (0.026) | 0.0017 (0.024) |
| | Neither | | | -0.091 (0.041)* | -0.087 (0.039)* |
| | Rich (ref) | | | | |
| *Contextual* | | | | | |
| | U.S. Region | | | | |
| | Midwest | | | | -0.070 (0.035)* |
| | Northeast | | | | -0.094 (0.036)** |
| | South | | | | -0.082 (0.033)* |

| | | | | |
|---|---|---|---|---|
| | West (ref) | | | |
| | | | | 0.00051 |
| | Metropolitan | | | (0.00039) |
| | | | | -0.00111 |
| | Area Need | | | (0.0027) |
| | Political | | | -0.0026 |
| | Conservativeness | | | (0.0010)* |
| | | | 0.33 | |
| Intercept | | 0.29 (0.019)*** | (0.033)*** | 0.35 (0.034)*** | 0.38 (0.041)*** |

+p<0.10, * p<0.05, ** p<0.01, *** p<0.001

Table 5.10: Linear Regression Models Predicting Log Transformed Unhealthful Inventory (N=161)

| | Characteristics | Model 1 $\beta$ (SE) | Model 2 $\beta$ (SE) | Model 3 $\beta$ (SE) | Model 4 $\beta$ (SE) |
|---|---|---|---|---|---|
| *Organizational* | | | | | |
| | Nutrition Policy | | | | |
| | None | 0.64 (0.25)* | 0.671 (0.247)** | 0.71 (0.25)** | 0.72 (0.24)** |
| | Informal (ref) | | | | |
| | Formal | -0.0079 (0.17) | -0.066 (0.16) | -0.054 (0.16) | 0.12 (0.17) |
| | Nutrition Tracking System | | | | |
| | No (ref) | | | | |
| | Yes | -0.20 (0.16) | -0.18 (0.17) | -0.15 (0.17) | -0.12 (0.16) |
| | Organization Size | | | | |
| | Small | | 0.14 (0.21) | 0.15 (0.21) | 0.15 (0.22) |
| | Medium | | 0.17 (0.19) | 0.16 (0.19) | 0.067 (0.18) |
| | Large (ref) | | | | |
| | Inventory Stream | | 0.0096 (0.0037)* | 0.0093 (0.0037)* | 0.013 (0.0037)*** |
| | Service Area Size | | | | |
| | Small (ref) | | | | |
| | Large | | 0.29 (0.16)+ | 0.27 (0.17) | 0.16 (0.18) |
| *Food Donor Environment* | | | | | |
| | Agriculture | | | | |
| | Poor | | | -0.089 (0.15) | -0.13 (0.15) |
| | Neither | | | 0.25 (0.24) | 0.27 (0.23) |
| | Rich (ref) | | | | |
| *Contextual* | | | | | |
| | U.S. Region | | | | |
| | Midwest | | | | 0.34 (0.21) |
| | Northeast | | | | 0.29 (0.23) |
| | South | | | | 0.49 (0.20)* |

| | | | | |
|---|---|---|---|---|
| West (ref) | | | | |
| Metropolitan | | | | 0.0031 (0.0024) |
| Area Need | | | | 0.0043 (0.017) |
| | | | | 0.018 |
| Political Conservativeness | | | | (0.0062)** |
| Intercept | -1.77 (0.12)*** | -1.95 (0.19)*** | -1.96 (0.20)*** | -2.22 (0.25)*** |

+p<0.10, * p<0.05, ** p<0.01, *** p<0.001

## Discussion

Previous research concluded that in order to effectively meet the needs of the vulnerable individuals served by the charitable food system, more research was needed to identify characteristics of food banks successfully implementing nutrition-based initiatives (Handforth et al., 2013). Previous research examining factors associated with the adoption of nutrition-focused strategies at food banks are limited and have predominantly used qualitative methods (E. Campbell et al., 2013; Handforth et al., 2013; Wetherill, White, Rivera, et al., 2019; Wetherill, White, & Seligman, 2019b). This study expands upon the prior studies by employing quantitative data methods to analyze the organizational and contextual determinants of adoption of nutrition policies and nutrition tracking systems among a national sample of food banks. The results of this study show that organizational and contextual characteristics of food banks are not only related to the adoption of nutrition-focused strategies but also are connected to inventory quality. In addition, the findings of this study demonstrate the significant association between nutrition policy adoption and inventory quality at food banks, providing preliminary evidence to support the impact of nutrition-based initiatives on the nutritional quality of food distributed at food banks.

The analyses for Research Questions 1.1 (To what extent do organizational and contextual factors explain nutrition policy adoption among food banks?) and 1.2 (To what extent do organizational and contextual factors explain nutrition tracking system adoption among food banks?) revealed that the determinants of the two nutrition-based strategies differed. Food bank size, as determined by annual revenue, was the only organizational characteristic significantly associated with nutrition tracking system adoption. Compared to

large banks, both small- and medium-sized food banks had lower odds of nutrition tracking system adoption. Staff capacity may be one factor contributing to these differences. Food quality ranking systems can be labor intensive, requiring multiple data entry points per each ranked food or beverage (Seidel et al., 2015). In addition, food bank leaders have cited concern around the lack of personnel with nutrition expertise as a barrier to nutrition tracking system adoption (E. Campbell et al., 2013; Handforth et al., 2013). A national survey of food banks in 2013 found that only 41% reported having access to nutrition expertise (on staff or in their network) and only 33% had someone with nutrition expertise and time to rate the nutrition of inventory, train staff, educate clients, and communicate with stakeholders (E. Campbell et al., 2013). While access to nutrition expertise may have grown in recent years as nutrition-focused food banking has become more prevalent, limited resources may continue to constrain the ability of lower resourced food banks to access these resources. Supporters of efforts to improve the nutritional quality of inventory should acknowledge this barrier for lower resourced food banks and seek to develop ranking systems that use minimal staff and require minimal expertise to implement. Additional research exploring the implementation of such efforts would help to facilitate nutrition ranking system adoption among small and medium sized food banks.

Area need was also a marginally significant predictor of tracking system adoption. Food banks with higher rates of food insecurity in their service area had lower odds of nutrition tracking system adoption. This finding may be due, in part, to pressure to meet distribution benchmarks. One of the core metrics Feeding America uses to assess the food banks in the network is meals per person in need (MPIN). This metric uses the meal equivalency of 1 meal =

1.2 pounds of food (regardless of food type) to set annual distribution goals for each food bank in the network based on area need (Fisher, 2019). Failing to meet this metric may result in lost territory or a revoked contract with Feeding America (Fisher, 2019). Previous research has pointed out that this method perversely prioritizes distribution over other types of advocacy (Lohnes, 2019). Similarly, the need to meet this metric may deter food banks in high need areas from a focus on nutrition-focused strategies over increasing distribution. This finding points to the need to collaborate with Feeding America to incorporate the distribution of nutritious inventory as part of its annual assessment of food banks.

With respect to nutritional policy, the size of a food bank's service area was the only organizational characteristic significantly and positively associated with adoption. In accordance with resource dependence theory, organizations balance their internal interests with the need to preserve relationships with the organizations on which they rely for survival (Pfeffer & Salancik, 2003b). In the non-profit sector, highly reliant organizations sometimes alter their goals and activities to satisfy the wishes of their donors (Froelich, 1999). The descriptive characteristics of this study show that food banks are highly reliant on food and beverage donors for maintaining operations with a mean average of 59% of the inventory stream coming from donations. Larger service areas may provide food banks a wider array of donors and resources on which to draw. Fear of donor loss is one of the primary reasons food bank leaders report as the reason for not adopting a nutrition policy (E. Campbell et al., 2013; Handforth et al., 2013); consequently, food banks with larger service areas may be less reliant on a particular donor and more empowered to adjust inventory.

U.S. region was also significantly associated with nutrition policy adoption. Effective nutrition policy implementation requires political and public will (Cullerton et al., 2016). In line with the social ecological model, regional differences in food access, food preferences, and diet sources may shape the willingness of food banks to adopt policy. Research examining food shopping and diet quality have found significant regional differences with better outcomes for food banks in the West and Northeast relative to those in the Midwest and Southern regions (Kant & Graubard, 2018; Vadiveloo et al., 2019). Reflecting their own food habits and culture, food bank staff and leaders in these regions may be less focused on enacting nutrition policy. Additionally, greater access to healthier food such as fresh produce may make a food bank more willing to adopt healthy nutrition policy. A prior study found that food banks in California have successfully connected to regional agricultural producers, taking advantage of the region's long growing seasons and ample agricultural sector (E. Campbell et al., 2013).

The analyses of research questions 1.3 (To what extent does nutrition policy adoption explain nutritional quality of food bank inventory?) and 1.4 (To what extent does nutrition tracking system adoption explain nutritional quality of food bank inventory?) showed that nutrition policies but not nutrition tracking systems had a significant association with nutrition quality. Compared to food banks with an informal nutrition policy, food banks with no formal or informal nutrition policy had a significantly higher mean percentages of unhealthy inventory. In contrast to prior studies (M. Ross et al., 2013), this finding suggests that nutrition policies may be a useful tool in shaping inventory quality, specifically with respect to reducing unhealthy food items such as soda, sugar-sweetened beverages, candy, and sweet and salty snacks. The finding has important implications for identifying effective strategies to improve nutritional

quality of inventory at food banks. Notably, less than 10% of the food banks surveyed reported having no type (formal or informal) nutrition policy. Diffusion of innovation theory categorizes the last group to adopt an innovation, the laggards, as traditionalist (Rogers, 2003a). In the charitable food system context, this traditionalist mindset can translate into accepting any and all donations to distribute to those in need (E. Campbell et al., 2015). Understanding this perspective, may help to explain why these food banks have higher average percentages of unhealthy inventory. Future research should explore strategies for effectively engaging this group of food banks.

Interestingly, there was no statistical difference found between inventory quality for food banks with informal nutrition policies and food banks with formal nutrition policies. The descriptive characteristics of the sample show that the percent of food banks with formal nutrition policies has increased dramatically since this was last assessed in 2013 from 7% to 55% (E. Campbell et al., 2013). Yet, recent data indicate that food banks still face barriers to adopting formal nutrition policies (Wetherill, White, & Seligman, 2019a). In spite of these barriers, current research also suggests that food banks are increasingly focused on distributing healthier inventory (Wetherill, White, & Seligman, 2019a). Likewise, the results of this study suggest that food banks with informal policies may be equally engaged in nutrition-focused food banking.

Nutrition policy adoption was not associated with healthy inventory. While food banks commonly have nutrition policies that 1) restrict unhealthy donations and/or 2) require purchasing dollars to go to nutritious foods (Wetherill, White, & Seligman, 2019b), food banks employ a number of other strategies beyond policy to source fruit and vegetables (Wetherill,

White, Rivera, et al., 2019). Thus, policy may be an important, but unnecessary, step toward increasing healthy inventory.

In addition, having a nutrition tracking system was not associated with either inventory quality measure. The lack of consistency between the different nutrition tracking systems commonly used may contribute to this finding. Multiple nutrition tracking systems exist for ranking inventory including Foods to Encourage (F2E), the Choose Healthy Options Program (CHOP), Supporting Wellness at Pantries (SWAP), and a variety of other customized systems. These systems vary in their ability to detail inventory stocks and use different bases for ranking (e.g., serving size: 100 grams or 100 calories) (K. S. Martin et al., 2018; M. Schwartz et al., 2020). The diversity of tracking systems results in inconsistency in defining which foods are "healthy". Inconsistencies in tracking system rigor may underpin the resulting null findings. Reckoning with this ongoing issue in the field, the Robert Wood Johnson Foundation's Healthy Eating Research Center recently convened a panel of experts to create a standardized set of nutrition guidelines for food banks to use. As the standardized guidelines become more widely used, future research should revisit the relationship between nutrition tracking systems adoption and inventory quality.

Beyond nutrition policy and tracking system adoption, several organizational and contextual factors helped to explain inventory quality. Analyses showed that mean percentages of unhealthy inventory significantly increased as percent of inventory stream made up of food and beverage donations increased. In alignment with resource dependence theory, food bank reliance on donors shapes inventory quality. As such, food banks that are more highly reliant on donations may be less willing or less able to reduce unhealthy inventory for fear of losing

donors. Previous literature substantiates this result, pointing to the fear of jeopardizing relationships with national or community donors as a primary reason for not adopting nutrition-focused strategies (E. Campbell et al., 2015; Handforth et al., 2013; Wetherill, White, & Seligman, 2019a).

Food bank location in the U.S. was also significantly related to inventory quality. Relative to food banks in the Western U.S., food banks in the South, Northeast, and Midwest had a significantly lower mean percentage of inventory consisting of fresh fruits and vegetables. This finding aligns with prior research in which food bank leaders have identified regional difficulty in sourcing fresh fruits and vegetables (Wetherill, White, Rivera, et al., 2019). The high transportation costs and the high risk of product deterioration can prohibit food banks from sourcing fresh produce outside of their region (Wetherill, White, Rivera, et al., 2019). Conversely, as described above, food banks in California have reported successfully taking advantage of the large agricultural sector and conducive growing environment (E. Campbell et al., 2013). Food bank leaders have described multiple strategies to increase the sourcing of fresh produce such as transportation subsidies, state purchasing cooperatives, connection to new donors, and local growing initiatives (Wetherill, White, Rivera, et al., 2019). Future research should assess the impact of these strategies in the regions where it is more difficult to source fresh produce. In addition, future research also may want to account for produce variety, as previous research has also identified this as a challenge (M. Ross et al., 2013).

The political conservativeness of the service area was associated with both inventory quality measures. More highly conservative areas had lower mean percentages of healthy food and higher mean percentages of unhealthy foods. These findings may stem from prevalent

neoliberal ideologies that prize liberty, independence, and individual autonomy (Magnusson, 2015). Many conservatives are wary of "nanny state" regulations over diet and feel that people should have full choice when it comes to what they eat and drink (Magnusson, 2015). In addition, the U.S. is increasingly polarized along cultural lines that not only align with political affiliation but also geographic region, race, ethnicity, class, gender, and education levels (Baldassarri & Gelman, 2008; Bishop, 2009; DiMaggio et al., 1996). These partisan divisions extend beyond politics to include numerous aspects of daily life such as cultural tastes, lifestyle choices, and consumer preferences (Shi et al., 2017). Given how profoundly food is embedded in our culture (Parasecoli, 2019), it follows that the partisanship divide may extend into food bank operations. The direction of the associations found here align with previous work connecting the promotion of healthy foods and nutrition to more left-leaning, liberal entities (Finn, 2017; Nestle, 2019).

# Chapter 6: Qualitative Study Results and Discussion

## National Stakeholder Key Informant Interviews: Participant Characteristics

Table 6.1 provides the characteristics of the national stakeholders that participated in key informant interviews. All 12 participants identified as female. Three of the 11 participants worked at nutrition advocacy organizations. Two of the 11 participants worked at a health advocacy organization. Three of the participants worked for research institutions. Two participants worked for the food bank network and one participant worked for a network of food pantries. On average, participants had spent 4.5 years in their current role and 11.5 years in the industry.

Table 6.1: Characteristics of Key Informant Interview Participants

| **Sector** | **Years at Current Role** | **Years in the Industry** | **Gender** |
|---|---|---|---|
| Health Advocacy | 2 | 13 | Female |
| Pantry Network | 2 | 20 | Female |
| Nutrition Advocacy | <1 | 19 | Female |
| Health Advocacy | 2 | 7 | Female |
| Research | 1 | 10 | Female |
| Research | 14 | 13 | Female |
| Research | 13 | 12 | Female |
| Food Bank Network | 1 | 10 | Female |
| Food Bank Network | 9 | 9 | Female |
| Nutrition Advocacy* | <1 | 4 | Female |
| Nutrition Advocacy* | 4 | 10 | Female |

*Indicates that the interviewees were interviewed together

## National Stakeholder Key Informant Results

Study Two aimed to examine how organizations within the charitable food system have responded to recent trends to improve the nutritional quality of food bank inventory by

exploring the attitudes, practices, relationships, barriers, facilitators, and innovations related to inventory change. The analysis of the national stakeholder provides an overview of the inventory change process for the system as a whole. The findings from the key informant interviews were identified during qualitative analysis are presented in three categories: 1) progress toward inventory change; 2) challenges to inventory change; and 3) the future of inventory change and described in detail below.

*Progress Toward Inventory Change:*

All of the participants agreed that the charitable food system has some role to play in the promotion of client health. With respect to nutrition, participants described an ideological consolidation in the field around the distribution of healthier foods. Participants cited an increased understanding of the relationships between food insecurity, diet and health; the work of advocacy organizations such as the Partnership for a Healthier America and MAZON; a new generation of food bank leaders focused on health; as well as the support and buy-in from Feeding America as key factors underpinning the momentum for improving the nutritional quality of food distributed through the charitable food system. This collective interest had pushed the sector past old paradigms which emphasized the right to food (*any* kind of food) toward the distribution of healthier foods. Although tension on the topic persisted:

> *"There is tremendous, although not universal, recognition that the charitable food system needs to take its role as a provider of food to a really high-risk population seriously. And what that has meant is that there is widespread interest in distributing not just any calorie, but in distributing nutritious calories."*

There was disagreement among the participants as to what impact these efforts may have on client health. Some participants felt that the effect of nutrition efforts on overall client health

was limited because the food provided by the charitable food system made up a small percentage of clients' overall diet. Conversely, other participants indicated that increased reliance on the charitable food system by food insecure households and the influence it has as a key food environment for clients made the distribution of healthier foods an imperative. One participant described this accordingly,

> *"I feel like it's sort of like with power comes responsibility, so if you are the one providing the food, once you've done that, you take on the responsibility for doing a good job about this. And you can't pretend that you're just like this intermediary and that you don't hold any responsibility for the impact of what you're doing. And so, I think a lot of the people who feel that way just don't appreciate the seriousness of the health consequences of a poor diet."*

Beyond the philosophical shift toward nutrition-focused food banking, participants described real progress that had been made to distribute healthier foods. Investments in necessary infrastructure, identification of new donation sources, efforts of individual food banks, and the backing of Feeding America had led to a significant increase in the distribution of meat, poultry, dairy, and fresh produce. Participants also reported that progress had been made to reduce the distribution of certain unhealthy items, namely sugar-sweetened beverages and sodas.

However, many felt that more progress was needed. Participants reported an uneven advancement in nutrition focus among foods banks. Some felt this was due to ideological opposition from food banks while others explained that the change process required intensive investment:

> *"If a food bank is understaffed and low-resourced and there isn't necessarily the time or capacity or feeling of the time and capacity to sit and do that strategic thinking of "How do we change the way that we do our work?" and those are really adaptive challenges, and those are tricky, then you of course do what you're really good at, and things stay the same."*

Some participants felt that rural food banks were particularly disadvantaged in these efforts because of their limited food and beverage donor options. For the system as a whole, making additional progress in supplying healthier foods required *"going beyond the low hanging fruit"* and posed major operational challenges for the field. Several participants also discussed an ambiguous end goal of these efforts. From a nutrition standpoint, participants felt increasing the distribution of perishable foods and produce while decreasing candy, sugar-sweetened beverages, and snack foods were reasonable goals. But participants expressed uncertainty around the extent to which the system should restrict the distribution of unhealthy foods and how it should handle foods that fall outside of those categories (non-whole grains, high fat meats, etc.).

> *"I just don't know... Again, I don't know what the end game is for us...is it the best case scenario when there's no access to any "unhealthy" food, right? Or is it a good balance? I mean, what is the ultimate goal?"*
>
> *"I mean, there's all these foods that we would encourage, right? And then we have these foods that we would absolutely discourage. We don't want people to eat sugar-sweetened beverages. We don't want them to be eating sugar-filled soda or candy and snack foods that are high in sodium, right? There's just kind of easy distinction. But ultimately, the thing that is frustrating and I don't know if we'll ever be able to fully deal with is that there's all this food in the middle that maybe it's particularly high in sodium and relatively high in fat that is non-perishable food that will always be part of the system."*

### *Challenges for Inventory Change*

Participants identified several structural issues that presented barriers to inventory change efforts. Again, these challenges were both philosophical and real. As one participant summarized,

> *"And that's where you get into much more difficult conversations around the increased costs of these foods, the lower weight of these foods, the challenges with talking to donors about what foods they do and do not want, the sort of philosophical challenges*

*around, should food banks be purchasing food, or should we only be gleaning food out of the system that wouldn't otherwise be sold."*

Part of the struggle lay in the how the system had been established. Although participants described increased acceptance of the idea of nutrition-focused food banking and expanded efforts to distribute healthier foods, they also explained that formation and identity of the charitable food system were rooted in entirely different goals:

*"The …primary challenge is the literally structural formation of food banking. That food banks came about as a result of there being excess food that was not commercially viable, that was being wasted. And there was of course at that time a really strong movement to capture that food and redistribute it to those who are in need."*

For some participants, waste diversion remained a salient aspect of the charitable food system mission,

*"Well, the reality is, that means we're turning down all this non-nutritious food, because we're getting it whether we want it or not. So, do we tell them to bury all of the brownies and cookies in landfill because we won't distribute them versus everybody deserves a cookie now and then?"*

This systemic structure of diverting food that would otherwise be thrown away to those in need, has also kept operation costs relatively low for food banks. Several participants noted that the distribution of foods with higher nutritional quality would substantially increase operations costs due to the need to purchase food as well as the necessary investment in the infrastructure needed to transport, store, and distribute perishable items.

Participants also pointed to the use of poundage as a measure of impact as a structural challenge to increasing the nutrition quality of inventory. Both food and beverage donors and food banks are motivated to increase the number of pounds that go through the system making it more difficult to focus on healthier foods. One participant explained,

> *"Retailers are incentivized to give more, not better. So, underlying all of this is the fact that the metric that we have used to celebrate the success of the emergency food system is sort of keeping these institutions from making these changes…"*

For food banks, this impact measure, the number of meals distributed (where each meal is equivalent to 1.2 pounds of food), is woven into their organizational identity. One participant described this phenomenon,

> *"Yeah, it's kind of like an unwritten thing. It's more just, 'Oh, you distribute...' Like, if you were to meet... Oftentimes, you've probably heard this. A food bank introduces themselves. They're like, 'Hi, I'm [Name]. I work in health and nutrition at,' you know, 'blah-blah-blah food bank. We distribute six million meals a year which come to eight whatever poundage, and we're this amount of square footage.' Like, that's how they talk about themselves, and so it's kind of seen as, 'Whoa!'"*

However, participants pointed out that the use of this metric obscures the types of food that are getting distributed. Often, the nutritionally-dense foods weigh less than unhealthy food items like soda. Thus, a shift toward the distribution of healthier foods seems to lessen food banks impact. One participant described this conundrum accordingly,

> *"So, again, if you're talking about meeting the need, and exceeding performance or more impact, more impact, the way they talk about it now is meals – more meals, more pounds. More pounds, more pounds. But if they make a decision to no longer accept soda, it could be ten million pounds. And all of sudden, the conversation you have had with your donors around your impact changes. And you can't actually say, "We have increased our poundage," or, 'We served ten million more meals.' You might say, 'There are ten million less meals.' [Laughs] Because the donors don't know the nuance that the meals would have been Pepsi."*

Participants described another key structural factor impinging on efforts to increase the distribution of healthier foods: the reliance on food and beverage donations. As food and beverage donations (versus purchased foods) continue to make up the largest source of inventory for the charitable food system, leaving food banks *"at the mercy of donations"*. Many participants felt that the nutritional quality of food available in the charitable food system was

reflective of the food system, for better and for worse. Some felt that the U.S. food system had become healthier in recent years and that some of the improvements seen in charitable food system inventory was attributable to this change. Increased availability of healthy foods in the food system provided an opportunity on which organizations in the charitable food system could capitalize:

> *"I think it's important that we understand that the charitable food system often has to be very reactive because they have such limited resources. And so, it's very challenging sometimes to counteract bad trends in the food system, but at the same time it's a real opportunity to leverage good trends…within food system more broadly."*

While others felt the way that the charitable food system was embedded within the larger food system presented an ongoing challenge for the system, as one participant described,

> *"The whole idea of how food banks work creates a… Well, one, it enables retailers. It sort of gives them an out to continue to carry these things even though they may not be in the interest of public health generally. And there is still that constant mechanism of that food feeding back into the [inventory] stream, including baked foods. Sugar and baked goods are produced daily in copious excess because of the way that our food system privileges cheap food."*

Some participants felt that this bidirectional relationship between the charitable food system and the broader food system presented an opportunity; if organizations within the charitable food system stopped accepting these unwanted, unhealthy donations, companies may ultimately reduce production of these items. Other participants felt that these items were too valuable and would be channeled to different outlets such as directly to pantries or to dollar stores.

### *The Future of Inventory Change*

For many of the participants, the ultimate vision for the charitable food system was providing a range of foods similar to what is available in grocery stores:

> *"Yeah, really broadly that clients of the charitable food system have access to the full range of nutritionally dense healthy foods that anyone who has means to purchase whatever healthy food they want at a grocery store would."*

Some of the participants felt that this could be best achieved by improving SNAP benefits and reducing the role of the charitable food system as a regular source of food for food insecure households:

> *"Everybody just wants to go to the grocery store and buy their own food. So that would be ideal, but I don't see that happening anytime then."*

However, those who supported this idea also suggested that the expansion of the SNAP program seemed unlikely. Thus, they felt that continued efforts to improve the nutritional quality of distributed foods was important.

Despite the structural challenges in the charitable food system, participants described more incremental efforts to further the progress of nutrition-focused food banking. Participants hoped these changes would lead to an institutionalization of nutrition-focused banking where the availability of nutritionally dense foods was the *"norm rather than an exception"*

> *"That it's almost kind of getting food banks a facelift, where they're no longer seeing this like this dumping ground for Halloween candy and soda and sheet cakes and whatever, but actually that there's a commitment to wanting to give high-quality nutritious food to food banks to making sure that what they distribute is maybe even better or more nutritious than what you can buy at a grocery store. Junk food is cheap. You don't ever hear people complaining about the price of junk food. So, if people with limited resources to spend on food if they can feel secure in getting their staple, nutritious food from a place like a food bank, I think that would go a long way to supporting health and improved diet quality for people who are relying on food banks and other nutrition support."*

One example of a larger progression effort that many participants discussed was the Robert Wood Johnson Foundation Healthy Eating Research Nutrition Guidelines that were published

during data collection. The three-tiered nutrition ranking system developed by an expert panel offered food banks more in-depth insight on the nutritional quality of inventory compared to the Foods to Encourage (F2E) ranking system currently employed by Feeding America. Participants were hopeful that Feeding America would replace F2E with the new guidelines. Along with the new nutritional ranking system, participants mentioned distributing meal kits of fresh ingredients ready to cook like Blue Apron, increased use of "nudge" strategies (i.e., strategies that use positive reinforcement and indirect suggestion to influence decision making and behavior) throughout the system, additional partnerships with hospitals and other health organizations, as well as narrowing networks (i.e., reducing the number of pantries that a food bank works with to better focus resources and efforts). However, a few participants pointed out that without any structural change many of the challenges that participants identified would continue to impede efforts to distribute healthier inventory. One participant explained,

> *"Nobody is trying to change the structure. And I'm not either…And [no one] I'm aware of, is advocating blowing up the whole system. But we do have to be honest and acknowledge that as long as you have a system supplied by retailers who routinely overstock refined carbohydrates, when we know that one of the challenges is to reduce the number of refined carbohydrates. That is going to be an ongoing structural problem for food banks.*

In order to continue efforts around nutrition-focused food banking, participants talked about the coordination needed to engage clients, pantries, and food and beverage donors to increase both the supply and demand of healthier foods. Participants described demand-side initiatives such as nutrition education, nudge programs, and better data to understand client needs and preferences. Participants also felt that food and beverage donor stakeholders were amenable to these efforts, although the asks to this stakeholder group may need to change:

*"I do think that the donor community is willing. By that I should say the food industry has potential to engage at a deeper level if we can help them in a way that isn't just asking them for money. I do think that there's other systems that really could be helpful. We're starting to tap into the food transportation and storage system and the logistics systems that are out there to help reduce cost and increase distribution and provide, address some of these challenges. Those are the kind of partners that we can bring to this, that are going to enable a much greater impact."*

Participants also discussed the need to change regulations to better coordinate with food and beverage donors.

*"To fix the system, you have to fix the rules. So, maybe if we could in some way... This is where regulations come into play. So, if we could provide added benefit for donating healthier foods, that of course means you have to have retailers be able to distinguish in some way those foods. Or even provide like a tax write off for trashing junk or something. I hate to say it. Or maybe they're penalized for donating junk."*

Other participants mentioned policies that make it easier for agricultural donors to donate and provide liability protection were other means of incentivizing the donation of healthier items.

As the references to tax policy suggest, participants also pointed to the importance of coordinating with the government to improve nutritional quality of distributed foods. Because charitable food has become a regular food acquisition strategy for food insecure households, participants felt that the government could better support the charitable food system with financial resources. One participant described this,

*"I think there's still a large portion of people and policymakers who think that food banks are just like last resorts for people, or maybe a place that they turn to once a month or something just to fill these very short-term gaps in food assistance, but that's actually not really the case and hasn't been for a while...I think longer term we need to be just more honest about the roles that they play and create a system where they're not constantly playing catch-up but rather they have the resources they need to meet the demand that they face on a regular basis but, obviously, also during a pandemic."*

Part of these coordination efforts also include the government as a supplier of inventory. While recent trade mitigation issues had inundated food banks with fresh produce and meat, it had

also created capacity issues in terms of storage and distribution. Moreover, participants highlighted that regularly donated foods from the government do not necessarily align with the goal of nutrition-focused food banking,

> *"And then there's also commodity boxes, especially for the elderly. Those commodity boxes that are not necessarily the best items. I mean, we're talking about commodities and not fresh fruits and vegetables and not whole grains and things like that. So, if we had buy in at that level as well to kind of jump start things, I think that would definitely help."*

While participants expressed hope that nutrition would continue to be a focus for the charitable food system, participants also saw other issues potentially overshadowing these efforts. One participant felt that as the conversations around nutrition became more difficult, the natural tendency was to look for a new cause,

> *"I think one of the problems in the nonprofit sector is the second it gets hard, people jump to something new."*

Additionally, several participants talked about the increased focused on addressing the underlying cause of hunger among organizations in the charitable food system. They described the charitable food system as a key touchpoint where vulnerable populations could be connected to social services above and beyond the supplemental nutrition received at a food pantry. One participant described this shift,

> *"there has been a movement among the network to really think about how the assets and the infrastructure of the network can be used to solve greater social issues. So, either to apply those resources to help solve some of the social determinants that we see among population like housing and security, like financial literacy, like job accessibility. And that has become I would say a bigger focus of… It has sort of risen to a greater prominence at this point than even nutrition."*

Others mentioned that the pressures exerted on the system by the coronavirus pandemic could potentially detract from nutrition efforts.

*Summary*

National Stakeholders in the charitable food system described a sense of progress that had been made in recent years to promote the distribution of healthier foods. This progress included both ideological and operational shifts in the way that food banks and other organizations in the system operate. Despite this progress, the end goal of these efforts remained unclear to many of the participants. Moreover, participants described continued challenges embedded in the structure of the charitable food system that would continue to make the distribution of nutritionally-dense foods difficult. While participants also described ongoing efforts to address these challenges, many of the proposed changes were incremental and did not tackle the larger systemic issues. Participants discussed one important step forward, the Robert Wood Johnson Foundation Healthy Eating Research Nutrition Guidelines which participants hoped would offer standardized metrics for assessing nutritional quality. Participants also cited continued coordination with food and beverage donors as well as increased engagement with government entities as essential aspects of moving nutrition-focused food banking forward. Finally, although the participants hoped that improved nutrition would continue to be an important focus in the charitable food system, they expressed concerns that other issues may overshadow these efforts.

## Case Overviews and Interviewee Characteristics

In examining the attitudes, practices, relationships, barriers and facilitators to inventory change, study two aimed to understand organizational responses to efforts to improve nutritional quality of food distributed in the charitable food system. In contrast to the national stakeholder key informant interview, the case study results provide a more in-depth understanding of the inventory change process at the food bank level to provide a more nuance understanding of the phenomena.

### *Non-adopter Food Bank*

The food bank for the non-adopter case was located in the Midwest region of the U.S. The food bank was medium sized with annual revenue between $11.7 million and $31.6 million and served a small service area less than ten thousand square miles consisting of 16 counties. Populations in the service area were whiter (90%) than the national average (73%) and lived either in non-metropolitan regions (59%) or metropolitan regions (41%). Rates of household SNAP benefits receipt and poverty were similar to national averages with about 10% of households in the service area getting SNAP benefits and 12% of individuals living below the federal poverty level. Nationwide 12.6% of households receive SNAP and 14.6% of individuals live below the federal poverty line. Half of voters in the service area were conservative, a figure slightly above the national average of 46%.

According to data fromthe MAZON National Food Bank Survey and Assessment of Nutrition Policies and Practices survey, 60% of this food bank's inventory comes from donations, 20% of their inventory consists of fresh fruits and vegetables, and 25% of their inventory is made up of unhealthy items such as sugar-sweetened beverages, candy, sweet

snacks, and salty snacks. The survey respondent characterized their service area food environment as agriculture, retail, and manufacturing rich and neither convenience rich nor poor. The food bank operates eight different types of distribution programs including its own food pantry, agency distribution to more than 150 sites, a kid's café, a mobile pantry, elderly nutrition, a backpack program, a summer feeding program, and SNAP application assistance. Through these programs this food bank distributed more than 8 million pounds of food in 2019.

Table 6.2 provides characteristics of the interviewees from the non-adopter case study. Two of the eight interviewees represented food and beverage donors that gave to the food bank. The job titles of food and beverage donor representatives were plant controller and food safety and quality assurance coordinator. Of the five food bank interviewees, four were staff members and one was a board member. Job titles for food bank staff included director of engagement, partner capacity manager, executive director, and director of operations. One interviewee represented a partner organization affiliated with the food bank. Six of the eight interviewees identified as female. On average, interviewees had spent 8.5 years in their current role, and 9.9 years in the industry.

Table 6.2: Interviewee Characteristics of Non-Adopter Case

| **Sector** | **Job Title** | **Years at Current Role** | **Years in the Industry** | **Gender** |
|---|---|---|---|---|
| Food & Beverage Donor | Plant Controller | 22 | 22 | Female |
| Food & Beverage Donor | Food Safety and Quality Assurance Coordinator | 7 | 7 | Male |
| Food Bank | Director of Engagement | 3 | 9 | Female |
| Food Bank | Partner Capacity Manager | >1 | 2.5 | Female |
| Food Bank | Board Member | 8 | 8 | Male |
| Food Bank | Executive Director | 21 | 27 | Female |
| Food Bank | Director of Operations | 5 | 8 | Female |

| | | | | |
|---|---|---|---|---|
| Partner Organization | Food Pantry Operator | 1 | 5 | Female |

*Adopter Food Bank*

The food bank for the adopter case was located in the Southern region of the U.S. The food bank was large sized with annual revenue $31.6 million and served a large service area greater than ten thousand square miles consisting of 35 counties. The greatest percentage of the population living in the service area lived in rural regions (43%), followed by metropolitan (28%) and non-metropolitan (28%). Compared to the national average the food banks services area was less white (55% vs. 73%) and less conservative (43% vs. 46%). The service area rates of households receiving SNAP benefits (10%) and the percentage of individuals living below the federal poverty line (12%) was similar to the national average, 12.6% and 14.6%, respectively. Survey respondents characterized their service area food environment as agriculture, retail, and convenience rich and manufacturing poor.

According to the food bank's responses to the MAZON National Food Bank Survey and Assessment of Nutrition Policies and Practices, 70% of their inventory came from donations, 20% of inventory consisted of fresh fruits and vegetables, and 13.5% of inventory was made up of unhealthy items such as sugar-sweetened beverages, candy, sweet snacks, and salty snacks. The food bank operates nine different types of programs including its own meal production training program, a food farmacy, multiple mobile pantries, elderly nutrition, a backpack program, and a summer feeding programs. In 2017 this food bank distributed more that 16.7 million "meals" through these programs.

Table 6.3: Interviewee Characteristics of Adopter Case

| Sector | Job Title | Years at Current Job Title | Years in the Sector | Gender |
|---|---|---|---|---|
| Food Bank | President and Chief Executive Officer | 38 | 40 | Female |
| Food Bank | IT/Data Director | 10 | 12 | Male |
| Food Bank | Community Initiatives Manager Health & Outcomes Services | >1 | >1 | Female |
| Food & Beverage Donor/Food Bank | Corporate Affairs Manager, Board Member | 2.5 | 7.5 | Female |
| Food Bank | Food Resourcing Manager | 21 | 21 | Female |
| Partner Organization | Food Pantry Operator | 11 | 11 | Female |
| Partner Organization* | Food Pantry Operator | 10 | 19 | Female |
| Partner Organization* | Food Pantry Operator | 10 | 19 | Male |

*Indicates that the interviewees were interviewed together

Table 6.3 provides characteristics of the interviewees. Half of the interviewees were staff members at the adopter food bank. Job titles for food bank staff included president and chief executive officer, IT/data director, community initiatives manager health & outcomes services, and food resourcing manager. One interviewee represented both the food bank board of directors as well as a retail food and beverage donor. Her title was corporate affairs manager. Three interviewees represented two different partner organizations as food pantry operators. Six of the eight interviewees identified as female. On average, interviewees had spent 12.9 years in their current role, and 16.3 years in the industry.

## Case Study Results

The findings from the case study are presented in four categories 1) motivations for inventory change; 2) barriers and facilitators of inventory change; 3) coordination efforts between organizations in the charitable food system to support inventory change; and 4) attitudes around inventory change. These four categories were selected in response to the research questions (a priori) and preliminary analysis.

### *Motivations for Inventory Change*

The impetus to shift inventory quality emanated from both top-down and bottom-up factors. From the bottom, interviewees cited considerations for client demand and health as main drivers of inventory change. From the top, food banks representatives described Feeding America incentive structures, shrinking donations streams, and general sense of movement in the field toward healthier inventory as primary determinants of inventory change.

For both case sites an understanding of the health, needs, and preferences of the client helped to motivate the shift from shelf-stable products to an increased amount of healthier, fresh foods. Representatives from food banks, pantries, and food and beverage donors all expressed concerns for client health as a driver for the desire to distribute more nutritious inventory. According to the CEO at the Adopter food bank,

> *"[W]e needed to also recognize and then strategize for the number of individuals that were experiencing high blood pressure and type two diabetes, based on 100 American studies through Feeding America. We knew that we had 69% of individuals, according to the last Hunger in America study, in our service area had high blood pressure. And, 42% had type two diabetes. So, we knew that there was, you know, we know the healthcare system has recognized now, that the consumption of food and the diet of individuals has a direct impact on their health long term. So, that caused us to include things in our strategic plan that we didn't include previously."*

*Adopter Food Bank CEO*

Food and beverage donors also made connections between the food they donated and the health of the client, but expressed little agency over the process,

> *"The people that are going to these food banks for food don't need high-calorie sugar and fat stuff. They need the protein, you know… And, yeah, I would love if we could donate more protein and stuff like that..."*

*Non-adopter Food Bank Donor*

*"I guess it makes me feel better that I'm donating healthy food. [Laughs] But really, it's what we make, so that's all we have."*

*Non-adopter Food Bank Donor*

Additionally, food bank staff and pantry operators at both case sites acknowledged that clients preferred fresh produce akin to what they would get in a grocery store, but often could not afford these items in a retail environment. As the CEO at the non-adopter food bank pointed out,

> *"[W]hen somebody comes to a food pantry, they want the same thing that everybody else wants, but they just can't always afford it, whether it's protein, dairy, produce, all those kinds of things. So if we can source that and provide that with them, that's money that they don't have to go to the grocery store and spend. And it saves…they can still eat healthy, provide their families with the good meals, and still have the resources to pay their rent, pay their utilities, a car payment, have money if their car breaks down, that kind of thing."*

*Non-adopter Food Bank Pantry Operator*

Pantry operators who participated in a fresh produce distribution program were similarly motivated by their clients' desire for fresh foods, with the added benefit of stretching the pantry budget, a "win-win" for the pantry,

> *"We have been providing cans of food and various things like that. So when [the adopter food bank] asked us if we wanted to be involved in their nudge program, which was to get fresh food into the homes of the people that we were serving, we were very, very excited to do that because it's a more expensive way to have to put food for the people,*

*and, as a food pantry, we have to watch our pennies. So therefore, the fresh food is not only liked by us to be able to pass it out but the receivers, themselves, are just overwhelmed with happiness at being able to get this.*

*Adopter Food Bank Pantry Operator*

In describing the top-down influences on inventory shifts, both case sites again expressed similar experiences. Feeding America had a large influence on food banks' motivations for sourcing healthier inventory. The national organization's introduction of metrics tied to the distribution of nutritious foods as well as the increased availability of funding for nutrition strategies pushed food banks to move this direction:

"*So, a lot of that is driven down from Feeding America. So, they started tracking what's called Foods to Encourage. And so they started benchmarking food banks on their Foods to Encourage score. And obviously the more healthy the item is the more points you get towards your Foods to Encourage score. And then so everybody is trying to get more healthy items into the hands of clients."*

*Non-adopter Food Bank Staff*

Declining donations from traditional food and beverage donors has also pushed food banks toward healthier inventory. Food bank representatives as well as food and beverage donors described increased industry competition which resulted in efforts by food retailers and manufacturers to reduce waste that had previously gone to food banks as food and beverage donations. This change presented an opportunity for food banks to identify new donors who can provide healthier product. A staff member from the non-adopter food bank illustrated this point,

*"[T]he other thing would be is that our food sourcing… I'm aware at one time it was manufacturers with shelf-stable food like Kellogg's or something. They were getting better with their practices and we were seeing… "Okay, we're not getting the food in," so we needed to do something different and that kind of just went hand-in-hand."*

*Non-adopter Food Bank Staff*

Finally, food bank representatives at both sites expressed a general sentiment that the food bank model was moving away from the traditional inventory consisting of shelf-stable items toward the distribution of fresh foods and produce:

*"And shelf stable is not really where food banks are going. We're rescuing produce…"*

*Non-adopter Food Bank Staff*

Similarly, the CEO at the adopter food bank described this movement as an "awakening in the field after hearing peers discuss their efforts to change inventory:

> *"I remember being in a national meeting and the food bankers saying openly in the meeting, 'We're just not taking this anymore.' And, there was this awe in the room like, 'Oh, my gosh. If we don't take that, we're not going to get anything from this donor ever again.' So, that was an awakening moment in our industry. That was several years ago."*
>
> *Adopter Food Bank CEO*

Unlike the food bank staff, the motivations expressed by food and beverage donor representatives were not focused on shifting the nutrition quality of donated items. Rather, food and beverage donors were primarily concerned with their own operations and liability risks from donated foods. As one food and donor representative stated,

> *"There's not a whole lot that goes into it unless it's, like, a risky item that we'd be anxious about, about giving to... I guess"*
>
> *Non-adopter Food Bank Donor*

Their motivations for donating product to food banks centered on waste diversion and supporting the local community. As the representative from a food and beverage donor to the adopter food bank outlined,

> *"Okay, as far as my company, our major charitable initiative is called Zero Hunger| Zero Waste. We have a goal to end hunger in our local communities and eliminate waste in our stores by 2025. We have done that by really streamlining our giving to support hunger relief efforts, and really focus on our waste efforts in our stores, so plastic, cardboard and food waste."*

*Adopter Food Bank Donor*

Food and beverage donors also sought to support the local communities in which the corporations operated. A food and beverage donor representative described this sentiment when explaining why her company had partnered with the non-adopter food bank:

> *"We like to work with those two agencies to kind of help the area we physically are in. And finally, I reached out to them and they were interested in a donation from us, and we've just kind of continued a relationship, I guess."*

*Non-adopter Food Bank Donor*

### *Barriers and Facilitators to Inventory Change*

Food bank representatives described numerous barriers to sourcing and distributing healthier inventory. One barrier cited by interviewees was client preferences. Some interviewees felt that clients were not interested in fresh produce because of limited interest in food preparation and limited knowledge,

> *"A lot of clients just want something fast and easy and they want to get on with their life. And teaching them how to cook from scratch and stuff is a bit of a challenge sometimes. But you do what you can do."*

*Non-adopter Food Bank Board Member*

Other interviewees felt it was not the client preferences, but the pantry operator preference that presented a barrier,

> *"people who run pantries…tend to shop for what they want, not what their client wants. That's not a bad thing, but, sometimes, people might miss out because it's not available at the pantry."*

*Non-adopter Food Bank CEO*

For pantry operators of pantries partnered with the adopter food bank, clients were typically happy with the expanded produce option but explained that unfamiliar items such as eggplant were difficult to distribute because clients did not know how to prepare these items,

*"we've gone through…a learning process of how… to move some things that are harder to move, like eggplant, and there's some things we didn't know that to do with it."*

*Adopter Food Bank Pantry Operator*

For these sites, providing recipes for unfamiliar items helped to facilitate their distribution. The fresh food items that food banks have focused on in recent years also presented a logistical challenge requiring many more inputs (e.g., time, money, labor) than the traditional shelf-stable items. Food bank representatives reported that nutritious foods were more expensive and more difficult to access, especially outside of the growing season. An adopter food bank staff member described these issues:

*"Well, there's quite a few challenges. I mean, just the whole fact that we have to raise money to keep doing this. Because really good healthy food is expensive. And it's finicky about storage. So, you have to keep all of that, the refrigerators, the coolers, the trucks, the warehouse, they all have to be maintained so that you can keep that product and distribute that product. There's a whole infrastructure that has to go in behind that that you got to pay for. Of course, you have to have people to handle it, so you got to pay for that."*

*Adopter Food Bank Staff Member*

Moreover, fresh foods had a shorter shelf life and needed to be distributed more quickly. They also require more staff and volunteer labor to ensure product quality.

*"They're also basically rescuing most, if not all of it, so the quality can sometimes vary. That's a struggle because we have to have volunteers on certain days to be able to get that out of the big bag so it doesn't start spoiling."*

*Non-adopter Food Bank Staff*

As inventory has changed, the food banks and pantries also described overcoming key infrastructure challenges such as transportation and refrigeration:

*"The transportation was fine because they bring it to us because they…there's a few pantries out in our county and so…they'll bring it."*

*Adopter Food Bank Pantry Operator*

*"But one of the main things, probably the biggest impact for our food bank, has been … six years ago our new building, which allowed us to provide more fresh produce and stuff, which has really helped achieve that mission."*

*Non-adopter Food Bank CEO*

However, both case sites described new capacity challenges they were facing as they sought to improve nutritional quality of inventory. For the adopter food bank, this manifested as the need for an improved inventory tracking system coupled with a deep investment in the food bank's technology to support nutrition tracking because as the CEO noted,

*"First we have to have the policy, then we have to have someone to enforce the policy, right?"*

*Adopter Food Bank CEO*

For the adopter food bank to take the next step in nutrition policy enforcement, they felt they needed to move beyond the Foods to Encourage tracking system supported by Feeding America toward a nutrition tracking system that provided more detailed data about their distributions. A product is considered a "food to encourage" if it falls into one of the 13 broad categories outlined by Feeding America (e.g., cereal, dairy, juice, vegetables, etc.) and is tracked by poundage. More detailed nutrition ranking systems may look at added sugars and fiber per serving, for example, providing more in-depth nutritional information. As one staff member explained,

*"Because it's not good enough to say, "Well, I distributed a million pounds of produce. And we're hitting a 65% goal." Because we've been doing that for years, and we still have people coming back to us saying, "What are you doing about nutritious food?" Right? So, this is the thing that will not die. So, if you really want real data and you want the real numbers, then we need better technology and better funding for that technology so that we can put scanners in place, people in place, warehouse systems in place, back end databases, UPC databases that give us nutritional info."*

*Adopter Food Bank Staff*

Interviewees at the adopter food bank noted that this technology would require substantial money and resources to launch. Being in a rural region and serving a high-poverty population hampered their ability to take these next steps:

> *"but we can't get there so quickly because we don't have the resources. It's not that we don't want to...we just don't have the capacity to do it quickly."*
>
> *Adopter Food Bank CEO*

The non-adopter food bank also expressed concerns about capacity and a need to address new issues as they "pop-up". Ongoing trade negotiations between the U.S. and China, left the site inundated with agricultural products. While the food bank appreciated access to these products (which often consisted of fresh produce and meat), the food bank struggled to distribute the large amounts of food received,

> *"It's all in good faith, but it creates issues at the food bank level, for sure, with capacity."*
>
> *Non-adopter Food Bank CEO*

Additionally, the coronavirus pandemic left the non-adopter food bank struggling to adjust,

> *"Right now, our biggest challenge is we changed our organization, basically, on a dime because of the pandemic and we can't shelter in place, we have to be at work because there's people that need food."*
>
> *Non-adopter Food Bank CEO*

The constant array of issues that arose took up a substantial amount of organizational bandwidth which distracted from food sourcing efforts:

> *"Everything that we've done as far as food sourcing has been completely reactive. We go on the [Feeding America] portal and, "What's available to us? Okay, we'll take it." We haven't been able to be proactive in what we take very much."*
>
> *Non-adopter Food Bank Staff*

To address these concerns, the non-adopter food bank had recently reorganized its staff and hired a staff member who could focus on sourcing.

The limited resources available to the adopter food bank also contributed to another challenge - a feeling of impotence. In general, the limited availability of food and beverage donors in the region inhibited their ability to "be choosy". While they could control the inventory that they purchased with grant funds, these programs only served a small percentage of their clientele. Yet, when it came to their general distribution, the paucity of regional resources combined with their compliance mandate from Feeding America pushed forced them to compromise on food quality,

> *"We have very little food. So, in order for us to meet that MPIN [meals per individual in need] requirement in the contract of Feeding America, sometimes we have to compromise the quality of that food. Or, we're out of compliance.*
>
> *Adopter Food Bank CEO*

Their food and beverage donor representative also expressed helplessness with respect to donations,

> *"[W]e can't really control the customer's purchase. Our food rescue program is the food that doesn't get purchased or that isn't sold after it's marked down."*
>
> *Adopter Food Bank Donor*

This left the food bank feeling like they had to, "take what they could get."

Conversely, both sites identified several factors that facilitated the distribution of healthier inventory. Finding new sources of inventory and funding was essential to these efforts. The adopter food bank had recently partnered with the local healthcare system to fund a food farmacy which distributed healthy foods to patients with chronic disease. This funding also enabled the adopter food bank to hire a full-time staff member with a Master's degree in Public Health. In addition, interviewees at both sites reported collaborating with other food banks in their areas to set up purchasing co-ops for produce. Both sites also described working

with local farmers and agricultural producers to secure donations for things like fresh produce and milk. The non-adopter food bank relied on AmeriCorps volunteers to spearhead their partnership with local agricultural producers. A staff member described all the different strategies used to procure these donations,

> *"They may be talking to farmers about, "Hey, when you've gone and picked everything if there is stuff still left in the field, we'll go glean it. Or if you sell at a farmer's market, our AmeriCorps team is going out and rescuing what's left at the end of the market." ... We have some contract farming going on where we'll pay seven cents a pound if they'll grow two acres of squash for us or things like that."*
>
> *Non-adopter Food Bank Staff*

A state tax credit for local producers further facilitated local agricultural donations at the non-adopter food bank.

Another important facilitator for the food bank sites has been setting explicit goals around inventory. Interviewees descried goal setting as a first step toward shifting inventory quality:

> *"So, yeah, the first thing is we made it part of our strategic plan to source those items."*
>
> *Non-adopter Food Bank CEO*

For the adopter food bank this felt like a monumental shift,

> *"It was the first time in our food bank's history that it wasn't getting more food to more people. It wasn't building capacity. For the first time in our history, we were looking at program implementation that would improve the quality of life for the individuals that we serve…"*
>
> *Adopter Food Bank CEO*

Setting this goal in the strategic plan spurred the organization's partnership with local healthcare organizations and led to new programmatic outreach focused specifically on the distribution of nutritious foods.

Staff members at the adopter food bank also identified the leadership of their CEO as an important facilitator of inventory change. She described her own buy-in process thusly,

*"I think the executive leadership, so myself, and the board, had decided, based on National conversations and local experiences, that this was the right thing to do."*

*Adopter Food Bank CEO*

The buy-in of the executive leadership propelled the efforts of the rest of the food bank staff:

> *"So, [the CEO] came back from Chicago with the mandate and said, "We will make it, so. And realistically, over our strategic plan timeframe, what can we do?" Right? So, our director of operations, our programs people, finance, development, we all got together and said, "Well, okay, here's what we can afford. Here's what we get. Here's what we could conceivably do." And that's basically everybody was on board with it... It wasn't a matter of choice. It was a matter of just getting it done."*
>
> *Adopter Food Bank Staff*

### *Coordination of Inventory Change*

Relationships were central to the work that the case study interviewees described. Pantry operators, food and beverage donors, as well as food bank staff members all discussed relationships as a fundamental aspect of operations. For the food pantry operators, their relationship with clients was most salient,

> *"We're not just a food pantry. We care about the people. And when people come and they say, "Well, this was so easy. Everybody was so nice. You know, they talked to me. We laughed. And I forgot that I was really needing help."*
>
> *Adopter Food Bank Pantry Operator*

Pantry operators also shared anecdotes of clients bringing in food from their garden or food had made from pantry items to illustrate the bidirectional relationship between the two groups. For the food and beverage donors having a close relationship with the food bank was important,

> *"We're a year-round partner that continuously support our food bank partners and other charities year after year after year. We're consistent, we're always there, we're not just the one-donation-and-gone-type of company…We're a constant supporter, year after year after year, that our food bank partners can rely on, and I think that they really appreciate that."*
>
> *Adopter Food Bank Donor*

However, other food and beverage donor interviewees were less engaged. One donor representative described an open invitation to visit the food bank that she had not yet accepted. For food bank staff, solid relationships with their food and beverage donors was critical. For the adopter food bank these relationships were essential for changing inventory. Close connections with their retail donors enabled them to "talk to them from one side" to solicit more nutritious items. Food bank staff also described the importance of their rapport with pantries. A staff member at the non-adopter food bank described her attempts to build relationships with their partner organizations as enjoyable but also a promoter of getting work accomplished,

> *"And so, that's been nice, to be able to just...not pressure. It's not a site visit, I'm not checking all your compliances, we're just sitting down and just talking. So, that was nice, to be able to connect with them, and hopefully, we'll move mountains in the future."*
>
> *Non-adopter Food Bank Staff*

And, although relationships were important, some staff felt that there was a missed opportunity to make a connection between organizations. As one interviewee pointed out, the health promotion process was still disjointed:

> *"I don't see us acting as a bridge from the donor to the agencies, particularly saying, 'Nutritious food needs to come from here and go to there. And this is what nutritious food is. This is how we're supposed... This is how it's supposed to be used, etc.' I don't see us being a direct hub of that information from one end to the other. We could be, but I don't see that really happening.*
>
> *Adopter Food Bank Staff*

Food bank staff viewed onboarding pantries on nutrition and the importance of promoting healthy food option as the next step in the inventory change process. As one adopter food bank staff member explained,

> *"We do have some agencies that are very aware of nutrition and want to provide the best quality product to the clients. Others, they don't really think about it. So, there's another level of education and discussion that needs to be done.*
>
> *Adopter Food Bank Staff*

The nature and capacity of partner organizations limited their ability to transition toward the distribution of healthier foods making it incumbent upon the food bank to provide further support, as a non-adopter food bank staff member described,

> *"It's just cultivating them. Most of the agencies that we have are run by retired volunteers. And it's just helping them grow with the changes, I guess. It's educating them, teaching them that this is the new world that we're moving into."*
>
> *Non-adopter Food Bank Staff*

Food banks have adopted several strategies to facilitate this education process. The adopter food bank started a member action committee comprised of partner organization leaders to help in decision-making at the food bank. The adopter food bank also mentioned conducting a capacity assessment with partner organizations to ensure they were willing to move forward with the inventory changes. Both food banks also described incentivizing partner organizations. Examples of incentives included allowing pantries to take unlimited quantities of produce, providing produce free of charge, and providing things like grants or coolers. For the non-adopter food bank, the incentives they provided came with stipulations, but they felt that this helped to engage the pantry,

*"[P]art of the stipulation is that they have to continue to get that produce from us or dairy products, obviously. So, they have benchmarks that they have to meet as well. But once they get started, they're bought in. It may take a month or two, but they get bought in pretty quickly."*

*Non-adopter Food Bank Staff*

But as one adopter staff member suggested, changes in inventory were happening regardless of pantry buy-in,

*"[J]ust the fact that we're getting the stuff in and deciding what's nutritious, what's not, categorizing it, distributing it, giving it priority. So, an agency whether they're on board with F2E [Foods to Encourage] or not is getting more F2E, whether they like it or not."*

*Adopter Food Bank Staff*

With respect to food and beverage donors, food bank staff also described their education outreach efforts. For the non-adopter food bank, the conversation with donors was described more generally as an education around the work of the food bank,

*"Yeah, I think it's…anybody we come in contact, we're educating them on our ability, of what we do and how we do it. If we don't, I mean, we're shooting ourselves in the foot. They need to understand what we do and how we do it."*

*Non-adopter Food Bank CEO*

The adopter food bank reported more explicit education efforts with their regular donors,

*"When it comes to our donors, our food procurement officers always asking for F2E product, right? We can't really control what comes through with random donations. But if we can talk to the folks that give us regular donations, we try to encourage them to give us the better F2E categories."*

*Adopter Food Bank Staff*

The staff at the adopter food bank also pushed back on the idea of donor loss,

*"It's been really rare that I've ever heard a donor just straight up tell us, "No." Because if you can convince them, show them, demonstrate to them the need then more often than not, they are more than willing to assist. They may not be able to assist as much as you hope, but they are at least able to do something.*

*Adopter Food Bank Staff*

From the food and beverage donor perspectives, representatives reported that food banks rarely pushed back on the donations they provided,

> *"On occasion, there's been a rare occasion, if there's a whole lot of pies, or sweets from the deli/bakery. They're not as excited about that just because the trend is moving towards healthier, but usually they take everything."*
>
> *Adopter Food Bank Donor*

One of the representatives described reaching out to his convenience stores to improve the donation mix if a food bank complained about receiving too many sweets. However, he also felt that even unhealthy food items were an important donation,

> *"I mean, it's good to at least donate the donuts, because they can always waste...throw them away themselves if they don't go, and technically it is sustenance in its most basic form, but still."*
>
> *Non-adopter Food Bank Donor*

### *Attitudes Toward Inventory Change*

For the non-adopter food bank, providing healthy food was not only part of their organizational mission, but also a priority for the organization. As one interviewee reported,

> *"…knowing that that's going to be healthier for our clients and our agencies to give out than a lot of the shelf-stable stuff that we were getting before. So, I mean, it's a big priority for us. I think we're at… 60% of what we give out is perishable and produce, so it's a big part."*
>
> *Non-adopter Food Bank Staff*

However, some staff at the non-adopter food bank felt that other food banks may place a greater focus on nutrition,

> *"Nutrition probably is not as high of a priority in our food bank as some. Some food banks take that a little bit higher."*
>
> *Non-adopter Food Bank Staff*

The organization's lack of restrictions on food donations underpinned these feelings. However, diverting food from the landfill and providing choice were also important priorities for the organization. Instead, they focused their health promotion efforts on the inventory streams they could control:

> *"If somebody offers me food, I'm going to take it. I'm not going to say no to it because I believe people have the choice in what they eat, but for the most part is we go out and solicit donations, we're going to try and find the healthiest."*
>
> *Non-adopter Food Bank CEO*

Staff at the adopter food bank also described healthy food distribution as mission-driven, but additionally felt that their healthcare partnership program expanded this mission,

> *"Now, that we are really looking forward to bring in this using food as medicine, that's just like an even bigger aspect of trying to…meet our mission and to just carry that out. Because people can be provided food, but if they have chronic illnesses, and they're not eating the right foods, they're never going to get better, the cost of health care is going to keep rising, and so on and so forth. I think that it really expands our mission even more by providing healthy options."*
>
> *Adopter Food Bank Staff*

Thus, while both food banks were working on improving the nutritional quality of distributed foods, they also had to balance other priorities. Ultimately, providing sustenance to food insecure household superseded concerns around nutrition,

> *"First and foremost, we feel we have an obligation to close the food gap. Get food to food insecure families. You know? That's our top priority. Our second priority is to find enough food and to be able to provide some of the right food."*
>
> *Adopter Food Bank CEO*

Food bank staff at both case study sites described a changing charitable system. However, many felt that this change was difficult and would take time. The CEO from the adopter food bank explained,

*"We were inventory solutions for years. I mean, you can't turn the Titanic around overnight. If you're an inventory solution, and when a donor calls and needs that inventory moved out of wherever it is, and you've done it for 35 years and you say one day, "We're not doing that."…I mean, we've trained the brain and we've trained our donors to say, "We need whatever you can give us." And, when they call, we go pick it up. So, that shift can't happen overnight."*

*Adopter Food Bank CEO*

Another food bank staff member further clarified; many aspects of this change process lay outside of the "wheelhouse" of the food bank.

*"We know distribution, okay? We're a distribution system. We're not an education system. We're not a, I don't know, self-improvement system, whatever you want to call it. Traditionally, we are moving this box from point A to point B. That's been our main competency. So, going outside of that is something very relatively new for food banks."*

*Adopter Food Bank Staff*

Part of the adopter's strategy for coping with change was an openness to innovation,

*"I think they're always looking for new programs and options to obtain more healthier options in food. They're very proactive and that they're out in the community a lot searching for solutions that work."*

*Adopter Food Bank CEO*

This openness was part of their identity as a food bank. The CEO described a number of different programs and models that the food bank had experimented with over the years,

*"We've been a little bit progressive and we operated a co-op at one point, and actually purchased food and moved it to consumers for a price. We've done nutrition education. We've worked with health care partners. We've tried to do a number of program implementations that have helped our individuals in our service area, to make better choices and food opportunities."*

*Adopter Food Bank CEO*

Interviewees at the non-adopter food bank also described a need for flexibility and nimbleness to changes, both those that they anticipated (the distribution of more fresh food products) and those they did not (the coronavirus pandemic).

*Case Study Results Summary*

Despite differences in nutrition strategy adoption, both sites were actively prioritizing the sourcing and distribution of healthier foods. They did this through identifying new food and beverage donors from the agricultural sector, participating in produce purchasing cooperatives, and changing their distribution models (e.g., mobile pantries, adopting a hub-and-spoke model). The Adopter food bank had also developed a partnership with a regional health care provider to distribute nutritionally-dense foods to individuals with chronic illness. Interviewees at both food banks described similar motivations to increase distribution of healthier foods that came from a desire to better serve clients as well as increased pressure from Feeding America and the food system. While interviewees at both food banks described a number of logistical and capacity challenges related to the distribution of fresh foods, they also reported improvements in previously described infrastructure challenges. Both food banks discussed goal setting and leadership as important facilitators of these efforts. Relationships were a central focus of the organizations' work and the interviewees at food banks were focused on the need to develop pantries for the changing inventory streams. Food and beverage donor interviewees identified health concerns related to charitable food system users but were mainly focused on waste diversion and supporting the local community.

| Table 6.4: Findings and Select Quotations from Case Study Interviews | | | |
|---|---|---|---|
| **Categories** | **Findings** | **Exemplars from the Adopter Food Bank** | **Exemplars from the Non-adopter Food Bank** |
| Motivation for Change | Top-Down | *"And when I think the food bank was first starting out, there was a thought that, "Yeah, we don't want to really just be distributing candy and soda and things like that." But just by virtue of the fact that a lot of the surplus product that was given to us was generally pretty good, we never really considered it an issue. Now, this started becoming a major conversation, I'd say, 6 or 7 years ago, maybe even as far as 8 years ago within the Feeding America network at large as financial donors, grantors in particular, are saying, "Well, look, we're giving you all this money and we think that the clients should have healthy food choices."* | *"I just think it's been ingrained in us. For quite a while we had a nutrition education person that was just here and that was… We did a lot of that education through the staff and that was probably like four or five years ago. And so that was kind of just bought in and we see this as where our food is going and so it's no big deal. It's just what we do, right?"* |
| | Bottom-Up | *"I know that we constantly have people wanting to be added to the program for fresh food…because it's good that more of their people with the agencies, more of their customers or clients, they're asking for fresh fruits and vegetables."* | *"That was our first goal, was to get as much fresh things as we could. Because, in talking with our clients, that is one thing that they typically don't get. So we worked hard at that."* |
| | Waste Diversion | *"We donate fresh, frozen and packaged foods, every single week, through that program. So they get some meats, and produce, and different things like that, from us, and from other grocery retailers as well, that participate in that program. So that's food that's still consumable, but it can no longer be sold in our store, as it's called food rescue."* | *"The donors, a lot of their fresh stuff that they would be donating, a lot of it is excess for them. And maybe close to not being able to use it. So I think they do their best to provide the most nutritional food. But I'm not sure if that's their main focus to determine what can come over to us either."* |
| Barriers to Inventory Change | Food Preferences | *"The only two things we've had questions on are eggplants and acorn squash. And the big thing there is because most people don't know how to cook it."* | *"You have the challenge of people like to eat a certain way and they don't always like to try new things."* |
| | Logistics | *"[W]e used to have another produce organization in the area that used to donate a lot and they haven't been donating as much. So it's about donors, and I think that's* | *"And cost is probably the primarily concerning now. You also have getting it out in a timely fashion. There are just a myriad of issues that kind of going under that."* |

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| | | *truly one of the biggest hurdles, it's just having that healthy food availability, or food in general."* | |
| | Capacity 2.0 | *"We can track it by Foods to Encourage, but we don't have the capacity; or a position, or the software, or technology to deep dive into the Foods to Encourage."* | *"We had a similar thing happen when we started getting a ton of milk from USDA. We kind of all panicked. It's one of those things that it expires, it's perishable. So, having a plan in place to get that moving quickly was a little difficult at first, but then once the agencies kind of caught on, they were great about it and they were able to distribute more, so."* |
| | Lack of Control | *"It's kind of hard to be choosy when you only get what you get."*<br><br>*"We are having some difficulty getting donations and other things like that, sometimes, it's a take what you can get type of thing."* | *N/A* |
| Facilitators of Inventory Change | New Sources of Donations | *"We have a cabbage grower that we work with, a cabbage farmer that we work with, and we do some potato drops with the society of San Andrews. We have as long as they've been in existence. So, we've gleaned from fields, and we've worked with organizations that gleaned from fields. We've worked with farmers. But, it's seasonal."* | *"[O]ur food sourcing has that Local Foods Initiative. We are a part of a couple of groups around here that are like farmers and producers, then having a big push for that."* |
| | Goal Setting | *"[S]ince Feeding America rolled this out, we have a mandate to distribute more foods to encourage than foods that are not in the Foods To Encourage categories. And we've set little goals for ourselves every year."* | *"That was our first goal, was to get as much fresh things as we could. Because, in talking with our clients, that is one thing that they typically don't get. So we worked hard at that."* |
| Coordinating Inventory Change | Relationships | *"And ensuring that we have good partners on board in the manufacturing, growing, and distribution space is going to be very important. And as a food bank, there's only so much we can do in that regard. We do have very good relationships with our donors, particularly our grocery store donors. So, we can talk to them from one side"* | *"Last fall one of our church members brought in a bunch of squash, tomatoes, and onions, and things that they had grown in their garden that were extra. And one of our clients said, "Oh, that's nice. You know what? I have some stuff that I could bring some extra." So it's really* |

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| | | | *wonderful that that person felt that they could contribute as well. I was really touched by that."* |
| | Pantry Education | *"It's not shelf stable, that sort of thing. So, you really got to hustle to get it in and get it out. So, communication is a big thing. Education of the agencies, the partner agencies, is a big thing."*<br><br>*"[W]hen information about Foods To Encourage or any nutrition initiatives or anything that's going on in the network or whatever, that all gets communicated through the board to committees including the MAC. And then if it's important enough, we will communicate it to the agencies directly, either through our annual conferences, through trainings, through emails or whatever."* | *"And we're constantly educating them. We do different education strategies all the time to get them to understand that. And making it free goes a long way. But they still have to …educate their clients and things like that. A perfect example right now is the government gave us so many dry lentils and split peas last year that we are just inundated with them. And we do a pretty good job here at the food bank educating people on how to use the, how to prepare them, and then just having our agencies take that to the next step and them educating their clients as to how to do that so that we keep that healthy product going through the pipeline."* |
| | Donor Education | *"Well, we don't think we've burnt any bridges. We have a Gatorade plant. We have one processing plant in our service area and it's Gatorade. So, we were at one point taking truckloads of their product. So, we had to share with them that we could no longer accept all those tractor truckloads that they were offering. We just made that decision not to do that. It was part FTE, but the other part was economically. We had a cost in assuming that product. A great lost, actually, in distributing that product. We feel we've had some good conversations."* | *"Yeah, I look at my job as…I mean, my management team's job is just ongoing education. We're always educating. In some ways, we're salespeople, and by that I mean, I'm really selling the mission of the food bank. So it's ongoing education of what we do and how we do it. And that we're efficient, you give the food to us, it gets to the community. It will get to the community either through one of the programs that we have or through one of our member agencies. So it's just ongoing education of what we do and how we do it, and really telling the story of how what we do affects people."*<br><br>*"Sometimes, on an individual basis, if a food bank partner reaches out to me and says, "Hey, this agency is kind of, they're getting a lot of glazers and not a lot of other stuff,"* |

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| | | | *or whatever, I will go back to the store and say, "Hey," just shoot them an email, and their district leader, and say, "Hey, just a reminder, we can donate all this stuff... so if you need a reminder of what can and can't be donated..." I'll attach it to the email, too. Just on a one-on-one, you know, an individual basis."* |
| Attitudes Toward Inventory Change | Turning around the Titanic | *"That culture and that partnership that we've had over the years has shifted a little bit. And, it takes some time to figure out what that is"* | *"But then, it's changing how that operates if you think about it, we were founded based on food waste. And a good…when we started, really, we took what companies were, and we really didn't take frozen and perishable and, now, we're almost at the exact opposite. Manufacturing changed their practices, and I think it's because they realized how much food was wasted in our country. So you have to do a 90-degree flip, but you have to be able to react to what is given to you, and you can't always…some things you can predict, but a lot of stuff you can't, and that's the hard part."* |
| | Openness | *That's why we do some program demonstration pilots to see, soft launch, to see if there's a will and a way. You know? I'm always open to new ideas and new concepts, and we've always evolved over the years into different things.*<br><br>*"You have to determine the needs of the people and what you're are going to offer through the charitable system. So, we try to scan and stay relevant to the communities we serve and operate in. And, if the community is calling for something different, if the needs have changed, and if the donor as well, financial contributor, we are finding more of them want to end or contribute to solving systemic and social problems."* | *"I think you always have to be nimble and flexible. Somewhere out there, there is a solution."*<br><br>*"One of the best parts of working in this industry is you get to be creative and innovative…Because not everybody does it the same. If you seen one food bank, you've seen one food bank. And we all do it a little bit different. We all get the opportunity to be creative, and that's the best part of the job."* |

## Discussion

The findings from this study indicate that substantial efforts have been made to improve the nutritional quality of inventory distributed through the charitable food system over the last decade. At the national level, stakeholders described clear progress in shifting attitudes as well as inventories. Similarly, interviewees at both food bank case study sites described a heavy focus on sourcing healthier foods for distribution with the increased distribution of fruit and vegetables as a key aspect of this work. Annual impact reports from Feeding America also reflect this transition. Produce distribution for the Feeding America network as a whole has grown from 5.7% of foods sourced and distributed in 2009 to nearly 36% of all foods sourced and distributed in 2019 (Feeding America, 2019; Yatzeck Farrell & Seay, 2009).

Interviewees from the adopter and non-adopter food banks reported high levels of healthy food distribution with the majority of inventory categorized as Foods to Encourage, 65% and 60%, respectively. Additionally, the food banks reported that 20% of their inventory consisted of fresh fruits and vegetables. Thus, despite differences in nutrition policy and practice adoption, the food banks seem similarly engaged in the distribution of healthier foods. To achieve this, the food banks employed similar strategies including identifying new donation sources (gleaning from fields and farmers' markets), coordinating with nearby food banks in produce purchasing co-operatives, developing new distribution models such as mobile pantries, and establishing partnerships with health care organizations. These strategies align with efforts to procure fresh produce described by other food bank executives (Wetherill, White, Rivera, et al., 2019).

In addition to these sourcing strategies, interviewees at both case study sites indicated that goal setting was an important facilitator of improving inventory quality. Recent evidence also supports this strategy (Wetherill, White, Rivera, et al., 2019). Yet, interviewees from the adopter food bank found that their nutrition ranking system did not sufficiently detail inventory for its needs. Key informants also recognized the need for better metrics to track inventory at food banks. They expressed hope that development of the new Robert Wood Johnson's Healthy Eating Research standardized nutrition guidelines would facilitate these efforts. One advantage of the recently published guidelines is that it categorizes foods based on serving size, moving away from the current standard that uses poundage (M. Schwartz et al., 2020). A more universal adoption of these guidelines would be an important change for assessing food bank inventory. As pointed out in previous work, using pounds as a measure of impact in the charitable food system creates a bias against lower weight, nutritionally dense items (Roman, 2017). The new metrics may help to reduce this bias. More research is needed to understand how food banks could best implement these new guidelines and identify ways to facilitate this process.

The findings of this study also suggest that client health is an important motivator of inventory change. Both national stakeholders and interviewees from the case studies described client health as an important factor propelling efforts to improve the nutritional quality of distributed foods. A recent study of food bank leaders by Wetherill and colleagues (2019) supports the importance of client health as an persuasive influence on changing food bank inventory. Executive leaders from food banks distributing high and intermediate levels of fruits and vegetables (i.e. more than 17% of total pounds) described health as a central component of

their organizational mission and readily identified disparities in chronic disease between charitable food system users and the general population (Wetherill, White, & Seligman, 2019a).

Yet, for some, interviewees the connection between diet, health, and the food and beverages distributed through the charitable food system remains tenuous. A few of the key stakeholders felt that that the potential for impact on client health was minimal because the supplemental nutrition assistance provided by the charitable food system made up such a small percentage of clients' overall diet. Food bank leaders distributing low percentages of fresh produce were similarly complacent (Wetherill, White, & Seligman, 2019a). Despite this reticence, recent research indicates that pantries can be influential food environments and have positive effects on diet-related outcomes including produce consumption (An et al., 2019). Moreover, data suggest that data suggests that the charitable food system has become a regular part of a food insecure household's food acquisition strategy for some households (Echevarria et al., 2009). Given the increased demand on food banks during the coronavirus pandemic and subsequent economic downturn (Morello, 2020), increased reliance on the charitable food system may expand the influence of the system on client health. Continued efforts to collect and disseminate data outlining the frequency and duration of charitable food system use among clients would also facilitate our understanding of charitable food and client health.

Interviewees across both groups readily supported initiatives to increase the amount of healthy food (e.g., fruits, vegetables, leans meats, and dairy) distributed; however, perspectives across the interviews diverged on how to manage the unhealthy items flowing through the

system. The key informants described feeling unclear about the overall goal of nutrition-focused food banking. In alignment with MyPlate recommendations, previous communication materials from Feeding America indicate a distribution goal of 50% fresh produce by 2025 (Feeding America, 2017b). But, benchmarks for reducing unhealthy food items remain more ambiguous. This ambiguity presents a challenge for food banks endeavoring to implement nutrition-food banking efforts. As described in the social ecological model, change can occur at many levels of the system (McLeroy et al., 1988). However, change efforts are more effective and more likely to be sustained when change strategies are directed at multiple levels (Embry, 2004). Without a clear direction from the national organizations leading these efforts, food banks may struggle to determine the appropriate goals at the organizational level.

Key informants described an ideological reticence around the restricted distribution of unhealthy items that hinged on three main considerations: ending hunger, waste diversion, and client choice/dignity. As participants from the national stakeholder and case study interviews mentioned, health promotion is not the sole mission of the charitable food system. Traditionally, food banks have focused on hunger alleviation (E. Campbell et al., 2015). The case study interviewees echoed this point. Addressing food insecurity and hunger in the communities they served was the first and foremost goal for the food banks in the case study. Other studies of healthy food promotion at pantries have expressed similar concerns that keeping the shelves stocked often supersedes the distribution of healthy foods (Chapnick et al., 2019).

However, this original mission envisions the charitable food system as an emergency stopgap not a long-term solution to food insecurity. And although the charitable food system

has grown tremendously in the last 25 years (Fisher & Jayaraman, 2018a), rates of food insecurity in the U.S. have remained largely unchanged (Department of Health and Human Services & Office of Disease Prevention and Health Promotion, 2010; Economic Research Service & United States Department of Agriculture, 2018; Riches, 2018). This has pushed some researchers in the field to argue that food bank leaders should shift perspectives from a food-in/food-out framing toward an understanding of food banks as a part of the larger food system where food bank leaders act as agents of social change working on issues such as increased focus on nutrition, expansion of SNAP and other government nutrition assistance programs, and addressing root causes of hunger (e.g., poverty, unemployment, and homelessness) (Elmes et al., 2016; Mook et al., 2020; Roman, 2017). Additional research assessing the impact of these endeavors may serve to further expand these efforts.

The findings of this study also suggest that waste diversion continues to be a salient aspect of the mission of some food banks. For food and beverage donor representatives, food banks provided an important outlet for their unsaleable food and beverage items. In addition, for the CEO at the non-adopter food bank waste diversion was a key facet of her organization's work. Whereas, the adopter described moving away from that mentality as a food bank. Stakeholder perspectives on food banks as a strategy for waste diversion are polarized (McIntyre et al., 2017). An estimated 30-40% of the U.S. food supply gets wasted each year and redistributing this food to hungry households is a primary food recovery strategy proposed by the Environmental Protection Agency (U.S. Department of Agriculture, 2010). Some charitable foodbank stake holders (e.g., food bank staff, Feeding America staff) stakeholders view waste diversion to the charitable food system as a "win-win" situation wherein corporate donors

avoid disposal costs and landfill tipping fees while cultivating good corporate citizenship and allowing food banks to remain cost efficient (Tarasuk & Eakin, 2005). Conversely, opponents of food waste diversion for human consumption argue that it is an essential indignity to the recipients of this food (McIntyre et al., 2017). Moreover, a reliance on corporate donations means that food assistance is limited to products that the food industry cannot retail (Tarasuk & Eakin, 2005). However, these donations are not entirely free. It costs money to transport, store, and distribute donations. Thus, further research detailing the costs associated with unwanted food and beverage donations may provide the data necessary for food banks to decline undesirable donations.

Critics of efforts to restrict the distribution of unhealthy foods also cite client choice and dignity as important considerations for food banks. For example, multiple interviewees used the example of a birthday cake to illustrate this point (e.g., if food banks banned all unhealthy food how would households reliant on the charitable food system access a birthday cake?). While the pantry operators in this study found that clients were hesitant to take certain types of unfamiliar foods such as eggplant, they also emphasized clients' desire for fresh foods. Previous studies of food pantry clients also indicate that, regardless of health status, they want the ability to select their own food items with preference for more culturally relevant foods and fresh foods such as produce, protein, and dairy products (Aragon et al., 2019; Remley et al., 2019; Verpy et al., 2003). As most food banks are removed from the client, creating participatory channels for clients to express their food needs and preferences may help organizations within the charitable food system make inventory decisions.

One of the primary differences between the case study sites was their stance on the ideological aspects of food banking. For the CEO of the non-adopter food bank, reducing food waste and maintaining client choice were essential facets of the food bank's mission. As such, while the non-adopter food bank focused its energies on sourcing healthier foods, it did not refuse any incoming donations. Conversely, Interviewees at the adopter food bank highlighted the importance of the CEO's leadership in the effort to source and distribute healthier foods. And in her own interview, the CEO described an openness for change and innovation. This perspective aligns with diffusion of innovation theory which posits that leadership qualities are one of the main characteristics driving an organizations tendency for change (Rogers, 2003b). Interestingly, although the two food banks distributed similar levels of healthy inventory, their percentage of unhealthy foods greatly differed at 25% for the non-adopter food bank and 13.5% for the adopter food bank. As the findings of Study One show, differences in inventory quality may be explained, in part, by nutrition policy adoption. The attitudes and perspectives of the food bank executives may also play an important role in shaping inventory quality (Wetherill, White, & Seligman, 2019a). Further research examining the relationship between the perspectives of food bank leadership and the nutritional quality of their inventory may help inform best practices for supporting nutrition-focused food banking.

Beyond the philosophical barriers described above, the key informants and case study interviewees described substantial challenges that persist in the distribution of healthier foods. Interviewees from the pantries and food banks included in the case studies described having overcome some of the infrastructure challenges described in the literature (E. Campbell et al., 2013). However, national stakeholders felt that this progress was unevenly distributed among

food banks across the country. Other food bank leaders have reiterated this point, citing continued capacity challenges for refrigeration and transportation of fruits and vegetables (Wetherill, White, Rivera, et al., 2019). At all levels of operation – sourcing, processing at the food bank, processing at the pantry, and distribution to the client – fresh foods require more intensive inputs than the shelf-stable foods that have historically stocked food bank shelves. Produce spoilage occurs at every stage of the supply chain between farm gate, retail stages, and diversion through the charitable food system (U.S. Department of Agriculture, 2010). Several interviewees at the non-adopter food bank described concerns around produce quality. Resolving these logistical infrastructure issues are not just a matter of operational success but also an important consideration for supporting consumption of fresh produce among charitable food system clients. Pantry clients frequently cite poor quality produce as a major impediment to fruit and vegetable consumption (Kihlstrom et al., 2019). Previous research has connected this distribution of "dead" foods to the poor as a revelation of a paternalistic attitudes, rooted in racism and classism, of the charitable food systems (Fisher & Jayaraman, 2018a; Souza, 2019).

For the case study food banks, increasing the distribution of healthier foods primarily translated into increased operation costs. While both case study food banks had successfully identified new sources of funding to help offset higher operation costs, key informants at the national level pointed out that continued progress in providing healthier food throughout the charitable food system would require substantial investment. In combination with shrinking donation streams, limited resources present an on-going challenge for food banks in meeting not only their clients' basic needs but also their nutritional needs (Bazerghi et al., 2016; Iafrati,

2018). To meet the nutritional needs of clients will require new models of operation. Food banks need increased independence from food and beverage donors which may empower foodbanks to focus their attention on the acquisition and distribution of healthier foods. Research exploring alternative models of operation that would allow food banks to sustainably pursue nutrition-focused food banking strategies could facilitate these efforts.

Increased funding and food donations from government agencies may be another possibility for supporting this transition at food banks. Several key informants and food bank staff identified the role that government could play in supporting the distribution of healthier inventory from changing tax incentive structures to providing additional monies for food bank operations. Some informants felt the expanded role of government was needed as food banks have become part of a regular strategy for food acquisition for food insecure household in the U.S. Others were more hesitant, citing a distrust of government intervention. A qualitative study of food bank leaders in England found that they similarly desired to maintain independence from government entities (Iafrati, 2018). Yet, increasing demand and limited supply forced leaders to acknowledge the possibility that they need government to sustainably maintain operations (Iafrati, 2018).

Food bank interviewees from both case study sites highlighted the need to educate pantries on the distribution of healthier food inventory. The interviewees described a spectrum of responses from pantry staff and volunteers with respect to these efforts. This was due, in part, to pantries' limited capacity. An estimated 50% of pantries across the country are volunteer operated (Weinfield et al., 2014). While some pantries, like the ones interviewed in this study, were excited to makes these changes, they felt that other pantry operators were

more reluctant to make these changes. Food bank staff interviewed for this study claimed that pantry education could facilitate these efforts and support client consumption of healthier items. Previous literature corroborates this idea. Multiple studies have found that engaging pantry staff and volunteers as partners is essential to successfully changing the pantry food environment (Byker Shanks, 2017; Chapnick et al., 2019; Jones et al., 2019). Food pantry workers act as gatekeepers to nutrition interventions (Chapnick et al., 2019; Jones et al., 2019; Remley et al., 2019) and previous pilot tests show that the pantry director's commitment to healthy food distribution is essential (K. S. Martin et al., 2018). However, as one food bank staff member noted, supporting pantries in this way lay outside of the food bank's current competencies. A systematic review of food banks' role in addressing food security found that food bank staff have insufficient training in nutrition to provide education and advice to clients (Bazerghi et al., 2016). Even though many nutrition education resources exist (Share Our Strength, 2019; U.S. Department of Agriculture, n.d.), the lack of staff training suggests that food banks may need additional assistance connecting with pantries around nutrition promotion.

At the same time, donor education is an essential aspect of nutrition-focused food banking. This study makes an important contribution to the literature by incorporating food and beverage donor perspectives on nutrition-focused food banking efforts. Although key informants believed that the donor community was open to this change, there seemed to be a critical gap in terms of donor outreach. For example, the adopter food bank described success in their conversations with food donors, but these conversations were limited in scope. In alignment with resource dependence theory, having relatively few donors in their service areas

restricted how demanding they could be. Fear of donor loss continues to be a barrier as food banks seek to implement nutrition strategies (Handforth et al., 2013; M. Ross et al., 2013; Wetherill, White, & Seligman, 2019b). Similarly, the food and beverage donor interviewees described few instances when food banks asked for healthier donations or pushed back on unhealthy donations. Moreover, the food and beverage donors expressed little control over the types of food that ended up in the donation stream. While they saw the importance of client health, other factors such as waste diversion, food safety, and business operations took priority. In all, the work of the food and beverage donors was disconnected from the work of the food bank. Yet, food and beverage donors have multiple incentives for continuing to give to the charitable food system from reduced tipping (disposal fees) (Buzby et al., 2014; Vogliano & Brown, 2016) to the corporate good will that accompanies their donations (Fisher & Jayaraman, 2018b). Research identifying successful strategies for donor outreach and education would serve to support food banks in these engagement efforts.

In conclusion, the findings of this study show that the role of food banks in flux. Client health has become a more important focus for organizations in the charitable food system as research has highlighted the connection between food insecurity, diet, and chronic diseases. Additionally, demand on food banks has risen following the economic precarity caused by the 2008 recession and the current coronavirus pandemic. At the same time, donation streams have decreased as the changing operations of food manufacturers and retailers have reduced the waste streams typically diverted into the charitable food system. This confluence of factors has moved food banks toward sourcing and distributing healthier foods. Supporting the capacity of food banks to source and distribute healthier inventory includes improved metrics,

continuing to shift philosophies, and identifying means of sustainable operation. Additionally, increased attention to nutrition-focused food banking requires food banks to develop a different set of competencies. No longer a strictly warehouse distribution operation, food banks are increasingly responsible for educating pantries and food and beverage donors in the health promotion process. The findings of this study indicate that food banks need additional support and resources as they continue to grow into this new role.

# Chapter 7: Conclusion

## Integrated Findings and Recommendations

Taken together the findings of Studies One and Two highlight the significant progress food banks have made in the last decade to adopt nutrition-focused strategies and distribute healthier foods. As shown in the quantitative findings, nearly half of food banks reported having a formal nutrition policy and 47.7% reported having a nutrition tracking system. This represents formidable growth from prior data which found only 7% of food banks had a formal, written nutrition policy and 22% used a system to monitor nutrition quality of inventory (E. Campbell et al., 2013). The national stakeholders echoed this, describing extensive progress among food banks to promote the distribution of healthier foods, both in terms of shifting philosophies and tangible organizational change. Likewise, interviewees from both case study sites described numerous strategies to source and distribute healthier inventory, despite their differences in adopter status.

Importantly, the results of this research suggest that the adoption of nutrition strategies is related to nutritional quality of inventory. Study One showed that having an informal nutrition policy was associated with a lower mean percentage of unhealthy inventory. Findings from the case study corroborated this result with the adopter food bank reporting a lower percentage of unhealthy inventory compared to the non-adopter food bank. Moreover, interviewees at the adopter food bank described outreaching to donors to restrict donations of products such as soda. In contrast, the CEO at the non-adopter food bank described the importance of accepting all offered donations, regardless of nutritional quality.

Notably, in the quantitative study there was not a significant difference in inventory quality between food banks with formal and informal nutrition policies. The findings from the qualitative study may help to contextualize this result. Interviewees from both case study sites described the sourcing and distribution of healthier foods as something their organizations were pursuing. In addition, they described nutrition-based food banking as the future of food banking. Beyond policy adoption, food bank staff identified several other strategies for increasing the distribution of healthier foods such as partnering with the healthcare sector, gleaning, and participating in purchasing co-operatives. Recent research identified similar strategies at other food banks (Wetherill, White, & Seligman, 2019b). However, more research is needed to explicitly examine these different approaches and assess their relationship to inventory quality.

As indicated by the national stakeholders and supported by the quantitative findings, available resources can limit the ability of food banks to implement nutrition-focused food banking strategies. Food bank size and area need were both related to the adoption of nutrition tracking systems. The qualitative results emphasized cost as a major barrier to the promotion of distribution of healthier foods given that these foods are more expensive to purchase, store and distribute. However, food bank size was not associated with measures of inventory quality. This finding contradicts those of Study Two in which national stakeholders pointed to disparities in food bank resources as a major driver of differences in inventory quality. Accordingly, other organizational resources not captured in these analyses may be more salient to inventory quality. Future research should explore what types of organizational resources are most highly connected to inventory in order to best support these efforts.

The findings of the dissertation also suggest that organizational dependence, especially on food and beverage donors, shape food banks' ability to change the nutritional quality of their inventory. In Study One, reliance on donations was positively associated with unhealthy inventory percentages. Likewise, food banks with smaller service areas had lower odds of nutrition policy adoption. Study One showed that the percent of inventory comprised of donations was positively associated with unhealthy inventory. Interviewees from the adopter food bank described how the lack of available food and beverage donors limited their ability to source healthy foods. Moreover, the donation of healthy foods was not a top priority for food and beverage donors. Yet, the national stakeholders felt that food and beverage donors were willing to engage in these efforts, but possibly in different capacities (i.e., providing transportation support rather than food donations). The disconnect between the national and local perspective suggests that food banks may need more support engaging in donor outreach. Advocates of nutrition-focused food banking should continue to connect with food and beverage donors at the national level to facilitate coordination with this constituency group. At the local level, advocates can provide additional training and technical assistance, specifically focused on donor education, to food banks staff who wish to have these conversations with local partners.

Finally, the findings from this dissertation highlight the opportunity to make additional progress to increase the nutritional quality of food distributed through the charitable food system. Food insecure households face numerous disparities in terms of their health and well-being including poor diet quality and increased risk for diet-related chronic diseases (Gundersen & Ziliak, 2015). Given that food insecure households increasingly rely on the charitable food

system for nutrition assistance (Echevarria et al., 2009; Morello, 2020), improving the nutritional quality of food distributed may lead to meaningful improvements in health and well-being among a vulnerable population group. Efforts to scale nutrition-focused strategies to food banks across the country by advocacy groups, like the Partnership for a Healthier America's Healthy Hunger Relief, may serve to support under resourced food banks (Partnership for a Healthier America, 2016). Evaluation of this program should seek to enroll and specifically examine its impact on a wide range of food banks. Similarly, researchers should examine the rollout of the new Healthy Eating Research nutrition guidelines and closely monitor the ability of less resourced food banks to implement this ranking system. Feeding America may also have a role in bolstering food banks' ability to adopt nutrition-focused strategies. As described by the executive at the adopter food bank, struggles to meet their Meal Per Person in Need quota meant that, at times, the food bank had to focus on pounds over nutritional quality. Altering contractual benchmarks to focus on the distribution of healthier foods over quantities distributed is another means of facilitating these efforts. Additionally, advocates of nutrition-focused food banking may want to examine alternative operational models in the charitable food system. The findings of this dissertation show a system under increased pressure due to rising demand and decreasing donor streams. While nutrition-focused food banking strategies seem to be the new normal in food banking, the increased cost associated with these efforts add an additional strain on resources. Identifying the means to sustainably source and distribute healthier foods is important to maintaining these efforts.

Food insecurity and its associated health outcomes remain a critical public health issue. With approximately 1 in 8 Americans affected by food insecurity each year (Coleman-Jensen et

al., 2017b) and rates increasing dramatically during the pandemic (Bauer, 2020; US Census Bureau, 2020), food insecurity's relationship to diet quality and chronic disease should not be ignored. Food banks and the charitable food system represent key strategies for food acquisition among food insecure households. Although they provide a small percent of nutrition assistance in the U.S. relative to federal programs, more than 45 million individuals use the charitable food system in an average year (Weinfield et al., 2014). And, this number is expected to increase by as much as 17.1 million people this year as families seek essential support in this time of economic upheaval (Hake, 2020). The increased demand for and reliance on the charitable food system during this health crisis emphasizes the need to make available high quality, nutritionally dense foods to those in need. Food banks are central to efforts to improve nutritional quality of food distributed through the charitable food system. Challenging the old paradigm that prioritizes quantity over quality and employing strategies to source and distribute nutritional foods can facilitate these efforts. In turn, this change has the potential to prevent and reduce negative health outcomes among charitable food system users.

## Strengths

By examining the influence on and the implications of efforts to improve nutritional quality of food bank inventory, the dissertation addressed an important public health issue, namely, disparities in diet quality and chronic disease faced by charitable food system users. This research added to the limited literature on the promotion of healthy eating within food banks and provided a deeper understanding of these efforts aimed at improving the healthfulness of food received by users of the charitable food system.

It is noteworthy that this is the first national survey to examine food bank nutrition policies and procedures (Feldman & Schwartz, 2018). Given the central role of food banks, collecting surplus foods and reallocating these items to direct food service providers, the findings from the quantitative study provide important insights for the field. The findings from the dissertation provide a better understanding of the types of food available in the charitable food system, the prevalence of nutrition policy and practice adoption, and the relationship between the two. In addition, these findings point to organizational and contextual characteristics of food banks that shape the adoption of nutrition-focused food banking strategies as well as nutritional quality of inventory.

Both studies in the dissertation draw from multiple data sources to examine influences on and implications of efforts to improve the nutritional quality of inventory at food banks. Study One incorporates organizational and contextual variables from multiple datasets to examine a broader set of factors underpinning this phenomenon. Additionally, Study Two collects primary qualitative data, from the national and local level, allowing for a deeper understanding of healthy eating promotion in the charitable food system from multiple perspectives. Further, the use of a semi-structured interview guide allowed flexibility in data collection as the interview guide could be adapted to incorporate new categories as they emerged during interviews. Employing a qualitative descriptive approach to analyze these data allowed me to stay closer to the data and allowed the participants to share their views in their own voice.

Leveraging multiple perspectives from the charitable food system including food bank staff, corporate food and beverage donor representatives, and food pantry operators, the

dissertation research used an embedded mixed methods approach to integrate the findings from the quantitative and qualitative studies. This approach allowed for the inclusion of secondary research questions within the predominant quantitative study. Moreover, combining the findings from the qualitative and quantitative studies provided for a more comprehensive account of the research findings, triangulation of results, and allowed for the findings from one study to explain the other.

The results of the dissertation can help inform food banks, food bank associations (e.g., Feeding America), food and beverage donors, direct food service organizations, and charitable food system advocates how to better promote healthy eating within the charitable food system through the planning and implementation of programs, the adoption of policies and procedures, and the allocation of resources. Uniquely, the dissertation research sought to incorporate the views of multiple actors within the charitable food system including food and beverage donors, food bank staff, and pantry operators. By examining the relationships between these organizations, the dissertation findings provide insight as to how the system can move toward the distribution of healthier foods. The two studies contribute to research on the impact of the charitable food system on the health of food insecure individuals. Moreover, the findings of the dissertation offer a more nuanced understanding of how the food environment within food banks, and charitable food system more broadly, can be shifted to promote healthy eating.

## Limitations

As with all research, the two studies have limitations. Namely, the quantitative data set used for analysis in Study One is cross-sectional and therefore shows the association between

variables rather than causation. In addition, the sample size was small due to the relatively small population of food banks in the county. Sample size was reduced further for certain outcomes which could contribute to biased findings based on those who elected to respondent to those items. Moreover, analysis of missingness in the sample showed that respondents to the survey were more likely to be Feeding America members than non-respondents, and thus, the experience of independent food banks may not be fully captured here.

In addition, the measures used to assess nutritional quality of inventory are self-reported and, as such, is subject to recall and social desirability bias. However, few nutrition tracking systems are sufficiently implemented at this point in time to provide reliable, quantitative information about the nutritional quality of food bank inventory (Feldman & Schwartz, 2018). There may also be omitted variables not captured in the survey that explain any associations between nutrition policy and procedure adoption and nutritional quality of inventory. For example, the qualitative data indicated that food bank leadership is an influential factor on inventory change processes. Further, the measures of nutrition policy and procedure adoption and nutritional quality of inventory may not have fully captured the intended constructs (e.g., nutrition tracking system vary widely in their ability to rank nutritional quality).

Participants in the national stakeholder key informant interviews and case study interviewees consisted of a small subsample of actors within the charitable food system. As such, the findings from Study Two are limited in their generalizability. In addition, data collection for the case studies was cut short due to the coronavirus pandemic and led to the omission of a semi-adopter case perspective. This further limited the generalizability of the study. My perspective as a researcher may have also biased the results of the qualitative study;

however, using multiple sources of data and employing a mixed methods approach served to triangulate findings and offset this concern. Finally, the intense nature of the case study data collection also contributed to the risk of sample bias in terms of those participants who were willing to take on the additional requirements of participating in the studies compared to those who are not.

## Conclusion

Taken together, the two studies conducted in this dissertation provide a meaningful contribution to understanding efforts to promote healthy eating from a social ecological perspective. As a sector of the food system that feeds some of the country's most disadvantaged families, in terms of health and resources, the charitable food system has the opportunity to promote healthy eating and reduce diet-related disease. Accordingly, food banks have begun adopting organizational strategies to improve the nutritional quality of inventory in the last decade (Elmes et al., 2016; M. Ross et al., 2013). Yet, little is known about the impact of these efforts as well as the organization and contextual characteristics associated with nutrition-focused food banking. This dissertation attempts to address this gap by leveraging multiple sources of data and diverse perspectives to advance our understanding of the movement to shift the food environment within food banks as well as within the charitable food system more broadly.

Importantly, the findings from Study One and Study Two highlight the potential impact nutrition-focused strategies may have on inventory quality. Findings from the qualitative study showed a negative relationship between nutrition policy adoption and percent of inventory made up on unhealthy food items. These results were corroborated in the qualitative study as

highlighted by the meaningful differences in unhealthy inventory between the adopter and non-adopter food bank. Coupled with the tremendous momentum in the field to implement nutrition-focused food banking strategies, the findings of this dissertation point to a dynamic moment in the nutritional quality of food in the charitable food system.

Additionally, this dissertation contributes to our understanding of the organizational and contextual factors associated with efforts to improve the nutritional quality of inventory at food banks. Similarly, organizational and contextual factors were also found to be associated with nutritional quality of inventory. Again, the results of the qualitative study substantiate these results with differences in leadership driving differences in efforts to promote healthy eating at the adopter and non-adopter food bank case study sites. These findings emphasize previous research which has described how the organizational characteristics of food banks along with the attributes of the environment in which they work shape operations (Fisher & Jayaraman, 2018a).

The findings of the dissertation also deepen our understanding of organizational dependence on food banks' ability to make inventory changes. In alignment with resource dependence theory, results from the qualitative and quantitative study support the claim that dependence on the donation of surplus food and beverages from corporate food retailers and manufacturers inhibits the distribution of high nutritional quality foods. In Study One increased percent inventory received from donations was positively associated with mean percentage of unhealthy inventory. Likewise, the case study interviewees described how a lack of donors in their service area limited their access to healthy foods. The qualitative findings also emphasized the importance of coordination with partner agencies. As the role of food banks shifts to bridge

the space between donors and distributions, food banks need more capacity in terms of funds, expertise, and technical assistance to achieve these aims.

Demand on the charitable food system has continued to rise following the 2008 economic crisis (Echevarria et al., 2009). Over the duration of this research project, demand for charitable food spiked further as households experienced increased food insecurity during the coronavirus pandemic (Hake, 2020; Morello, 2020). Heightened demand on food banks during this ongoing health crises, draws even more attention to the relationship between the charitable food system and client health. The findings of this dissertation are timely and relevant for promoting health among a vulnerable population. Ultimately, a deeper understanding of nutrition-focused food banking can support food banks efforts to promote healthy eating with the anticipation that improving the nutritional quality at food banks will have ripple effects throughout the charitable food system helping to alleviate systematic disparities in health outcomes faced by food-insecure individuals.

# Appendix A – MAZON National Food Bank Survey

*Confidential*

**National Food Bank Survey**
**Assessment of Nutrition Policies and Practices**
**May 2017**

**1. Introduction**

As the economy continues its slow recovery from the Great Recession, tens of millions of food-insecure Americans continue to rely upon the charitable food system as a critical source of nourishment; the same population disproportionately impacted by obesity, type 2 diabetes and other diet-related diseases. In response, food banks nationwide have been working at the intersection of hunger and health, making nutrition an organization-wide priority. And while the scope and scale of strategies employed by food banks vary, the majority are distributing significantly more fresh produce and doing what they can to become stronger community resources for nutrition and health. The goal of this survey is to gather and assess where food banks are today with regard to nutrition policies and practices influencing the acquisition and distribution of more nutritious food. Our hope is for this data to be used by food banks and key stakeholders to continue these critical conversations and propel further progress in our collective efforts to build healthy, hunger free communities.

***2. Survey Logistics**

1. Please fill in the following:
Name:
Email:
Food Bank:

*Staff Position/Title:

- o Chief Executive Officer/President/Executive Director
- o Food Bank Director (program of a larger organization such as a CAP) Chief Operating Officer
- o Vice President of Operations
- o Director of Operations or Operations Manager
- o Director of Procurement
- o Warehouse Manager

Nutrition Manager
Other (please specify)

*** 3. Please estimate the rough percentage that comprise the following streams of your inventory (total should equal 100%):**

%

Purchased:
Donated:
Government:

** Required Questions*

**4. Please indicate which of the following characteristics best apply to your food bank's geographic location and/or procurement opportunities: (Please check all that apply)**

- ☐ Agriculturally rich (e.g. your food bank procures from local/regional farms)
- ☐ Agriculturally poor
- ☐ Manufacturing rich (e.g. your food bank procures from manufacturing plants, processors, and producers)
- ☐ Manufacturing poor
- ☐ Retail rich (e.g. your food bank procures from Stater Bros., Ralphs, Kroger, Walmart, Amazon, etc.)
- ☐ Retail poor
- ☐ Food Service/Convenient rich (e.g. your food bank procures from Starbucks, Panera Bread, 7-11, etc.)
- ☐ Food Service/Convenient poor

Optional: Additional comments

*** 5. If possible, please provide a rough estimate of the percentage of your inventory for the following products distributed annually: (Please note: we recognize that this may be difficult to estimate based on the level of detail captured in your system, but even a rough, ballpark guess would be helpful and appreciated)**

| | % of inventory |
|---|---|
| Fruits and vegetables (fresh produce) | |
| Soda | |
| Other sugar-sweetened beverages (e.g. energy/sports drinks, fruit drinks, bottled coffee/tea drinks, etc.) | |
| Sweet snack foods and desserts (e.g. cookies, cakes, bakery, etc.) | |
| Savory snack foods (e.g. crackers, chips, etc.) | |
| Candy | |

Optional: Additional comments

**6. Please indicate if your food bank utilizes a system to track the nutritional quality of its inventory and which system you use: (Please check all that apply)**

- ☐ Broad Foods to Encourage (F2E)
- ☐ Detailed Foods to Encourage (F2E)
- ☐ Choose Healthy Options Program (CHOP), a comprehensive inventory and nutrition tracking system that promotes the acquisition, distribution and consumption of nutritious food through the charitable food system
- ☐ Customized tracking system (please provide name of system below) Actively looking for a system
- ☐ Do not currently utilize a system to track the nutritional quality of inventory

Optional: If you use a customized tracking system, please provide the name and/or brief description below

*** 7. Does your food bank have a formal, written nutrition policy as part of its efforts to promote the distribution of healthful foods and beverages? Please note: if you do not currently have a formal policy, you will have an opportunity later in the survey to indicate whether your food bank has informal nutrition guidelines or plans in the works to adopt a formal nutrition policy.**

- o Yes
- o No

*If No, participants will be directed to respond to a similar set of questions related to whether they have informal nutrition guidelines.*

***8. If Yes, would you be willing to share a copy of your nutrition policy? If so, may we get in touch with you using the contact information collected earlier in the survey?**

- o Yes
- o No

***9. Please indicate which stream(s) of inventory apply to your nutrition policy: (Please check all that apply)**

- ☐ Purchased
- ☐ Donated
- ☐ Government
- ☐ All of the above

***10. Does your nutrition policy also include a formal ban on the distribution of certain products (e.g. soda, candy)? Please indicate "yes" even if your current policy includes a phased-in implementation plan to ban the distribution of certain products over the next few years.**

- o Yes
- o No

**11. If Yes, which of the following products have been banned from distribution? Please note: this question also applies to food banks with a phased-in implementation plan, banning certain products from distribution over the next few years. (Please check all that apply)**

- ☐ Soda
- ☐ Other sugar-sweetened beverages (e.g. energy/sports drinks, fruit drinks, bottled coffee/tea drinks, etc.)
- ☐ Sweet Snack Foods and Desserts (e.g. cookies, cakes, bakery, etc.)
- ☐ Savory Snack Foods (e.g. crackers, chips, etc.)
- ☐ Candy
- ☐ All of the above

Other (please specify)

*** 12. Does your food bank continue to accept food and beverage donations of products that have been banned from distribution? (Please note: this question refers to full load/full palette donations, not salvage/mixed loads.)**

- o Yes
- o No

Optional: Additional comments

***13. If Yes, please indicate which of the following practices your food bank employs to handle its unwanted donated products that have been banned from distribution? (Please check all that apply)**

- ☐ Dispose of unwanted food and beverages (throw away)
- ☐ Recycle unwanted canned and/or bottled beverages
- ☐ Compost unwanted products
- ☐ Redirect unwanted products to other regional food banks
- ☐ Donate unwanted beverages to local drug recovery programs
- ☐ None of the above

Optional: Additional comments and/or other practices

**14. Has your nutrition policy and greater focus on health and wellness impacted your food bank in any of the following ways that are generally considered positive: (Please check all that apply)**

- ☐ Improved culture of health and wellness at the food bank (among board, staff, volunteers)
- ☐ Incorporated nutrition and health as part of your organization's mission, vision, values and/or strategic plan
- ☐ Increased use of nutrition and health messaging in communications and marketing
- ☐ Increased grant and funding opportunities
- ☐ Hired staff with public health and nutrition expertise

- ☐ Recruited board member with public health and nutrition background
- ☐ Strengthened relations with member agencies who embraced the food bank's nutrition policy
- ☐ Influenced member agencies to promote nutrition, health and wellness
- ☐ Influenced member agencies to adopt their own nutrition policies
- ☐ Established partnerships with health care sector (e.g. food insecurity screenings/referrals, etc.)
- ☐ Increased partnerships with local and/or regional produce farmers
- ☐ Strengthened relations with existing food and beverage donors through aligned conversations about your nutrition policy and stronger focus on quality of food distributed
- ☐ Secured new food and beverage donors to meet the nutrition standards of your policy
- ☐ None of the above

Optional: Additional comments and/or other positive ways your food bank has been impacted

**15. Has your food bank experienced any of the following challenges due to the implementation of your nutrition policy (recognizing that you may have anticipated and prepared for some of these challenges)? (Please check all that apply)**

- ☐ Required to increase budget for purchased foods
- ☐ Faced difficulty knowing how to handle unwanted food and beverage donations
- ☐ Lost highly valued food and beverage donor(s)
- ☐ Pushback from existing food and beverage donor(s)
- ☐ Staff pushback
- ☐ Volunteer pushback
- ☐ Member agency pushback
- ☐ None of the above

Optional: Other challenges and/or additional comments

**16. Has your nutrition policy impacted your food and beverage donations in any way over the past year? (Please note: this question refers to full load/full palette donations, not salvage/mixed loads.)**

- o Donations increased
- o Donations decreased, though we **anticipated this** and aligned our sourcing strategy and organizational goals accordingly
- o Donations decreased, though we **did not anticipate this**
- o Donations remained the same

Optional: Additional comments

**17. Has your nutrition policy impacted your food bank's poundage in any way over the past year?**

- Total pounds increased
- Total pounds decreased, though we anticipated this and aligned our sourcing strategy and organizational goals accordingly
- Total pounds decreased, though we did not anticipate this
- Total pounds remained the same

Optional: Additional comments

***18. Has your food bank begun to educate *local/regional* donors about the kinds of foods and beverages you would like to acquire more/less of in your efforts to distribute more nutritious foods to those you serve?**

- Yes
- No

**19. If Yes, please indicate if the responses from your donors were mostly:**

- positive
- negative
- neutral

Optional: Additional comments

***20. Has your food bank begun to educate *national* donors about the kinds of foods and beverages you would like to acquire more/less of in your efforts to distribute more nutritious foods to those you serve?**

- Yes
- No

**21. If Yes, please indicate if the responses from your donors were mostly:**

- positive
- negative
- neutral

Optional: Additional comments

***22. Would you be willing to share your donor education strategies, materials and/or resources? If so, may we get in touch with you using the contact information collected earlier in the survey?**

- Yes
- No

# Thank you for your participation!

**If you have any further questions, please contact Marla Feldman, Senior Program Director**
**MAZON: A Jewish Response to Hunger**
**mfeldman@mazon.org**

# Appendix B: Additional Information on Missing Data

Figure B.1: Patterns of Missingness

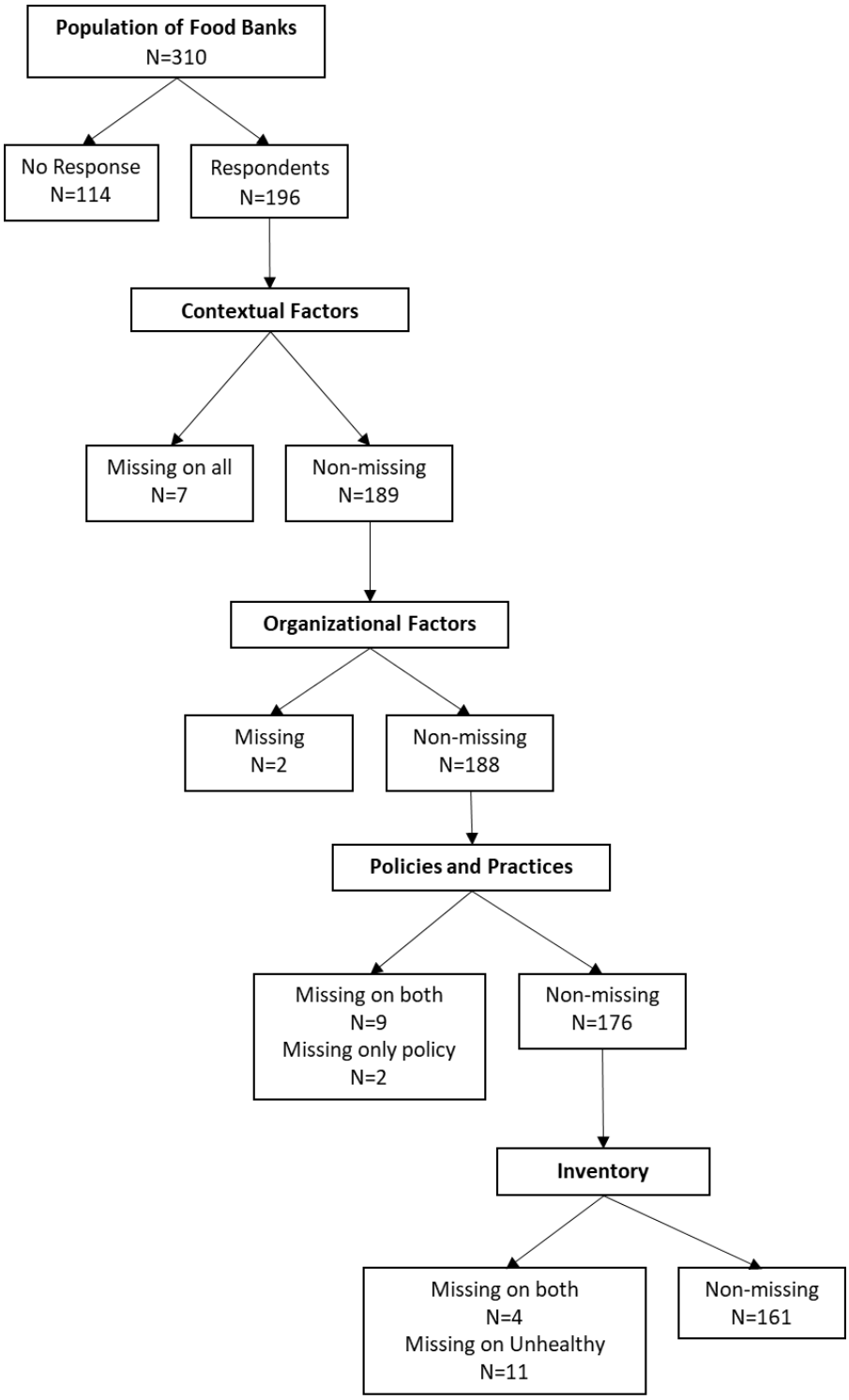

Table B.1: Differences in Food Bank Characteristics by Missingness Status on Nutrition Policy

| Characteristics | Total (n=189) Mean (SD) or % | Missing (n=10) Mean (SD) or % | Non-Missing (n=176) Mean (SD) or % |
|---|---|---|---|
| *Organizational* | | | |
| Affiliation | | | |
| No | 10.1 | 30.0 | 8.9* |
| Yes | 89.9 | 70.0 | 91.1 |
| Size | | | |
| Small | 27.7 | 50.0 | 26.4 |
| Medium | 36.2 | 30.0 | 36.5 |
| Large | 36.2 | 20.0 | 37.1 |
| Inventory Stream | 0.59 (0.21) | 0.45 (0.24) | 0.60 (0.20)* |
| Service Area Size | | | |
| Small | 66.7 | 80.0 | 65.9 |
| Large | 33.3 | 20.0 | 34.1 |
| *Contextual* | | | |
| U.S. Region | | | |
| Midwest | 21.7 | 20.0 | 21.8 |
| Northeast | 15.9 | 0.0 | 17.0 |
| South | 31.2 | 40.0 | 31.0 |
| West | 31.2 | 40.0 | 31.0 |
| *Food Donor Environment* | | | |
| Agricultural | | | |
| Poor | 39.7 | 40.0 | 39.7 |
| Neither | 10.1 | 0.0 | 10.6 |
| Rich | 50.3 | 60.0 | 49.7 |
| Food Manufacturing | | | |
| Poor | 60.9 | 80.0 | 60.9 |
| Neither | 15.9 | 20.0 | 15.9 |
| Rich | 23.3 | 0.0 | 23.3 |
| Food Retail | | | |
| Poor | 20.1 | 20.0 | 20.1 |
| Neither | 13.2 | 20.0 | 12.9 |
| Rich | 66.7 | 60.0 | 67.0 |
| Food Convenience | | | |
| Poor | 43.4 | 40.0 | 43.6 |
| Neither | 29.6 | 30.0 | 29.6 |
| Rich | 27.0 | 30.0 | 26.8 |

| | | | |
|---|---|---|---|
| Rural | 0.095 (0.18) | 0.049 (0.096) | 0.097 (0.19) |
| Non-metro | 0.31 (0.31) | 0.46 (0.38) | 0.30 (0.31) |
| Metro | 0.60 (0.37) | 0.49 (0.39) | 0.60 (0.37) |
| Socioeconomic Position | 0.15 (0.041) | 0.15 (0.020) | 0.15 (0.042) |
| Area Need | 0.13 (0.045) | 0.13 (0.034) | 0.13 (0.046) |
| Racial/Ethnic Diversity | 0.68 (0.20) | 0.75 (0.11) | 0.67 (0.20) |
| Political Conservativeness | 0.49 (0.14) | 0.48 (0.094) | 0.49 (0.14) |

* p<0.05, ** p<0.01, *** p<0.001

Tests for differences between respondents and non-respondents were performed using Chi-squared tests and T-tests. Because of missing data, some summary statistics presented here were calculated with a smaller sample size than reported in the table. Percentages may not sum to 100 due to rounding.

Table B.2: Differences in Food Bank Characteristics by Missingness Status on Nutrition Tracking System

| Characteristics | Total (n=189) Mean (SD) or % | Missing (n=12) Mean (SD) or % | Non-Missing (n=179) Mean (SD) or % |
|---|---|---|---|
| *Organizational* | | | |
| Affiliation | | | |
| No | 10.1 | 33.3 | 8.5** |
| Yes | 89.9 | 66.7 | 91.5 |
| Food Bank Size | | | |
| Small | 27.7 | 41.7 | 26.7 |
| Medium | 36.2 | 33.3 | 36.4 |
| Large | 36.2 | 25.0 | 36.9 |
| Inventory Stream | 0.59 (0.21) | 0.52 (0.28) | 0.59 (0.20) |
| Service Area Size | | | |
| Small | 66.7 | 75.0 | 66.1 |
| Large | 33.3 | 25.0 | 33.9 |
| *Contextual* | | | |
| U.S. Region | | | |
| Midwest | 21.7 | 25.0 | 21.5 |
| Northeast | 15.9 | 0.0 | 17.0 |
| South | 31.2 | 41.7 | 30.5 |
| West | 31.2 | 33.3 | 31.1 |
| *Food Donor Environment* | | | |
| Agricultural | | | |
| Poor | 39.7 | 41.7 | 39.6 |
| Neither | 10.1 | 0 | 10.7 |

| | | | |
|---|---|---|---|
| Rich | 50.3 | 58.3 | 49.7 |
| Food Manufacturing | | | |
| Poor | 60.9 | 66.7 | 60.5 |
| Neither | 15.9 | 16.7 | 15.8 |
| Rich | 23.3 | 16.7 | 23.7 |
| Food Retail | | | |
| Poor | 20.1 | 16.7 | 20.3 |
| Neither | 13.2 | 25.0 | 12.4 |
| Rich | 66.7 | 58.3 | 67.2 |
| Food Convenience | | | |
| Poor | 43.4 | 33.3 | 44.1 |
| Neither | 29.6 | 41.7 | 28.8 |
| Rich | 27.0 | 25.0 | 27.1 |
| Rural | 0.095 (0.18) | 0.041 (0.089) | 0.098 (0.19) |
| Non-metropolitan | 0.31 (0.31) | 0.43 (0.35) | 0.30 (0.31) |
| Metropolitan | 0.60 (0.37) | 0.53 (0.36) | 0.60 (0.37) |
| Area Socioeconomic Position | 0.15 (0.041) | 0.15 (0.019) | 0.15 (0.014) |
| Area Need | 0.13 (0.045) | 0.13 (0.031) | 0.13 (0.046) |
| Racial/Ethnic Diversity | 0.68 (0.20) | 0.74 (0.13) | 0.67 (0.20) |
| Political Conservativeness | 0.49 (0.14) | 0.49 (0.096) | 0.49 (0.14) |

* p<0.05, ** p<0.01, *** p<0.001

Tests for differences between respondents and non-respondents were performed using Chi-squared tests and T-tests. Because of missing data, some summary statistics presented here were calculated with a smaller sample size than reported in the table. Percentages may not sum to 100 due to rounding.

Table B.3: Differences in Food Bank Characteristics by Missingness Status on Healthful Inventory

| Characteristics | Total (n=189) Mean (SD) or % | Missing (n=12) Mean (SD) or % | Non-Missing (n=177) Mean (SD) or % |
|---|---|---|---|
| Affiliation | | | |
| No | 10.1 | 16.7 | 9.6 |
| Yes | 89.9 | 83.3 | 90.4 |
| Food Bank Size | | | |
| Small | 27.7 | 41.7 | 26.7 |
| Medium | 36.2 | 41.7 | 35.8 |
| Large | 36.2 | 16.7 | 37.5 |
| Inventory Stream | 0.59 (0.21) | 0.52 (0.19) | 0.59 (0.21) |
| Service Area Size | | | |
| Small | 66.7 | 66.7 | 66.7 |

| | | | |
|---|---|---|---|
| Large | 33.3 | 33.3 | 33.3 |
| *Contextual* | | | |
| U.S. Region | | | |
| Midwest | 21.7 | 33.3 | 20.9 |
| Northeast | 15.9 | 0.0 | 17.0 |
| South | 31.2 | 41.7 | 30.5 |
| West | 31.2 | 25.0 | 31.6 |
| *Food Donor Environment* | | | |
| Agricultural | | | |
| Poor | 39.7 | 33.3 | 40.1 |
| Neither | 10.1 | 8.3 | 10.2 |
| Rich | 50.3 | 58.3 | 49.7 |
| Food Manufacturing | | | |
| Poor | 60.9 | 75.0 | 59.9 |
| Neither | 15.9 | 16.7 | 15.8 |
| Rich | 23.3 | 8.3 | 24.3 |
| Food Retail | | | |
| Poor | 20.1 | 16.7 | 20.3 |
| Neither | 13.2 | 8.3 | 13.6 |
| Rich | 66.7 | 75.0 | 66.1 |
| Food Convenience | | | |
| Poor | 43.4 | 41.2 | 43.5 |
| Neither | 29.6 | 33.3 | 29.4 |
| Rich | 27.0 | 25.0 | 27.1 |
| Rural | 0.095 (0.18) | 0.15 (0.26) | 0.091 (0.18) |
| Non-metro | 0.31 (0.31) | 0.46 (0.35) | 0.30 (0.25) |
| Metro | 0.60 (0.37) | 0.39 (0.35) | 0.61 (0.37) |
| Socioeconomic Position | 0.15 (0.041) | 0.15 (0.021) | 0.15 (0.042) |
| Area Need | 0.13 (0.045) | 0.13 (0.032) | 0.13 (0.046) |
| Racial/Ethnic Diversity | 0.68 (0.20) | 0.74 (0.10) | 0.67 (0.20) |
| Political Conservativeness | 0.49 (0.14) | 0.52 (0.097) | 0.49 (0.14) |

* p<0.05, ** p<0.01, *** p<0.001

Tests for differences between respondents and non-respondents were performed using Chi-squared tests and T-tests. Because of missing data, some summary statistics presented here were calculated with a smaller sample size than reported in the table. Percentages may not sum to 100 due to rounding.

Table B.4: Differences in Food Bank Characteristics by Missingness Status on Unhealthy Inventory

| Characteristics | Total (n=189) | Missing (n=24) | Non-Missing (n=165) |
|---|---|---|---|

| | Mean (SD) or % | Mean (SD) or % | Mean (SD) or % |
|---|---|---|---|
| *Organizational* | | | |
| Affiliation | | | |
| No | 10.1 | 16.7 | 9.1 |
| Yes | 89.9 | 83.3 | 90.9 |
| Size | | | |
| Small | 27.7 | 33.3 | 26.8 |
| Medium | 36.2 | 45.8 | 34.8 |
| Large | 36.2 | 20.8 | 38.4 |
| Inventory Stream | 0.59 (0.21) | 0.60 (0.20) | 0.59 (0.21) |
| Service Area Size | | | |
| Small | 66.7 | 75.0 | 65.5 |
| Large | 33.3 | 25.0 | 34.6 |
| *Contextual* | | | |
| U.S. Region | | | |
| Midwest | 21.7 | 16.7 | 22.4 |
| Northeast | 15.9 | 16.7 | 15.8 |
| South | 31.2 | 33.3 | 30.9 |
| West | 31.2 | 33.3 | 30.9 |
| *Food Donor Environment* | | | |
| Agricultural | | | |
| Poor | 39.7 | 29.2 | 41.2 |
| Neither | 10.1 | 4.2 | 10.9 |
| Rich | 50.3 | 66.7 | 47.9 |
| Food Manufacturing | | | |
| Poor | 60.9 | 62.5 | 60.6 |
| Neither | 15.9 | 16.7 | 15.8 |
| Rich | 23.3 | 20.8 | 23.6 |
| Food Retail | | | |
| Poor | 20.1 | 16.7 | 20.6 |
| Neither | 13.2 | 12.5 | 13.3 |
| Rich | 66.7 | 70.8 | 66.1 |
| Food Convenience | | | |
| Poor | 43.4 | 41.7 | 43.6 |
| Neither | 29.6 | 37.5 | 28.5 |
| Rich | 27.0 | 20.8 | 27.9 |
| Rural | 0.095 (0.18) | 0.13 (0.26) | 0.089 (0.17) |
| Non-metro | 0.31 (0.31) | 0.30 (0.33) | 0.31 (0.31) |
| Metro | 0.60 (0.37) | 0.57 (0.41) | 0.60 (0.37) |
| Socioeconomic Position | 0.15 (0.041) | 0.14 (0.035) | 0.15 (0.041) |
| Area Need | 0.13 (0.045) | 0.12 (0.047) | 0.13 (0.045) |
| Racial/Ethnic Diversity | 0.68 (0.20) | 0.69 (0.14) | 0.67 (0.20) |

| | | |
|---|---|---|
| Political Conservativeness | 0.49 (0.14) | 0.49 (0.12) |

* p<0.05, ** p<0.01, *** p<0.001

Tests for differences between respondents and non-respondents were performed using Chi-squared tests and T-tests. Because of missing data, some summary statistics presented here were calculated with a smaller sample size than reported in the table. Percentages may not sum to 100 due to rounding.

# Appendix C1: Additional Tables: Research Questions 1.1 and 1.2

Table C1.1: Logistic Regression Models Predicting Alternative Measure of Nutrition Policy

| Characteristics | Policy<br>OR (95% CI)<br>n=176 |
|---|---|
| *Organizational* | |
| Organization Size | |
| Small | 0.799 (0.116, 5.491) |
| Medium | 0.339 (0.0699, 1.647) |
| Large (ref) | |
| Inventory Stream | 1.018 (0.991, 1.047) |
| Service Area Size | |
| Small (ref) | |
| Large | 0.388 (0.0786, 1.9) |
| Food Donor Environment | |
| Food Convenience | |
| Poor | 0.937 (0.263, 3.339) |
| Neither (ref) | |
| Rich | 6.625 (0.686, 64.03) |
| *Contextual* | |
| U.S. Region | |
| Midwest | 0.512 (0.0852, 3.081 |
| Northeast | 1.376 (0.237, 7.976) |
| South | 1.113 (0.212, 5.850) |
| West (ref) | |
| Metropolitan | 0.981 (0.958, 1.005) |
| Area Need | 0.968 (0.848, 1.105) |
| Political Conservativeness | 0.970 (0.920, 1.023) |

† p<0.10, * p<0.05, ** p<0.01, *** p<0.001

# Appendix C2: Additional Tables: Research Questions 1.3 and 1.4

Table C2.1: Linear Regression Model of Nutrition Policy Adoption Predicting Log Transformed Unhealthful Inventory (n=158)

| | Characteristics | Unhealthy Inventory B (SE) |
|---|---|---|
| *Organizational* | | |
| | Nutrition Policy | |
| | None | 0.748 (0.234)** |
| | Informal (ref) | |
| | Formal | 0.0864 (0.160) |
| | Organization Size | |
| | Small | 0.196 (0.212) |
| | Medium | 0.1000 (0.176) |
| | Large (ref) | |
| | Inventory Stream | 0.0125 (0.00370)*** |
| | Service Area Size | |
| | Small (ref) | |
| | Large | 0.166 (0.183) |
| *Food Donor Environment* | | |
| | Agriculture | |
| | Poor | -0.145 (0.148) |
| | Neither | 0.276 (0.230) |
| | Rich (ref) | |
| *Contextual* | | |
| | U.S. Region | |
| | Midwest | 0.339 (0.209) |
| | Northeast | 0.266 (0.225) |
| | South | 0.493 (0.200)* |
| | West (ref) | |
| | Metropolitan | 0.303 (0.236) |
| | Area Need | 0.464 (1.661) |
| | Political Conservativeness | 1.794 (0.614)** |
| Intercept | | -3.399 (0.462)*** |

+p<0.10, * p<0.05, ** p<0.01, *** p<0.001

| Table C2.2: Linear Regression Model of Nutrition Tracking System Adoption Predicting Unhealthful Inventory (n=158) | | |
|---|---|---|
| | Characteristics | Unhealthy Inventory B (SE) |
| *Organizational* | | |
| | Nutrition Tracking System | |
| | No (ref) | |
| | Yes | -0.196 (0.154) |
| | Organization Size | |
| | Small | 0.133 (0.227) |
| | Medium | 0.129 (0.185) |
| | Large (ref) | |
| | Inventory Stream | 0.0113 (0.00377)** |
| | Service Area Size | |
| | Small (ref) | |
| | Large | 0.229 (0.183) |
| *Food Donor Environment* | | |
| | Agriculture | |
| | Poor | -0.0625 (0.151) |
| | Neither | 0.268 (0.236) |
| | Rich (ref) | |
| *Contextual* | | |
| | U.S. Region | |
| | Midwest | 0.339 (0.212) |
| | Northeast | 0.272 (0.228) |
| | South | 0.451 (0.204)* |
| | West (ref) | |
| | Metropolitan | 0.00405 (0.00239)+ |
| | Area Need | 0.00269 (0.0169) |
| | Political Conservativeness | 0.0186 (0.00623)** |
| Intercept | | -2.118 (0.248)*** |
| +p<0.10, * p<0.05, ** p<0.01, *** p<0.001 | | |

Table C2.3: Linear Regression Model of Nutrition Policy Adoption Predicting Healthful Inventory (n=172)

| | Characteristics | Unhealthy Inventory B (SE) |
|---|---|---|
| *Organizational* | | |
| | Nutrition Policy | |
| | None | -0.011 (0.040) |
| | Informal (ref) | |
| | Formal | -0.020 (0.026) |
| | Organization Size | |
| | Small | -0.035 (0.035) |
| | Medium | -0.0034 (0.029) |
| | Large (ref) | |
| | Inventory Stream | 0.00027 (0.00061) |
| | Service Area Size | |
| | Small (ref) | |
| | Large | 0.011 (0.031) |
| *Food Donor Environment* | | |
| | Agriculture | |
| | Poor | 0.0041 (0.024) |
| | Neither | -0.089 (0.039)* |
| | Rich (ref) | |
| *Contextual* | | |
| | U.S. Region | |
| | Midwest | -0.070 (0.0349)* |
| | Northeast | -0.090 (0.036)* |
| | South | -0.083 (0.033)* |
| | West (ref) | |
| | Metropolitan | 0.00051 (0.00039) |
| | Area Need | -0.0013 (0.0027) |
| | Political Conservativeness | -0.0026 (0.0010)* |
| Intercept | | 0.39 (0.037)*** |

+p<0.10, * p<0.05, ** p<0.01, *** p<0.001

| Table C2.4: Linear Regression Model of Nutrition Tracking System Adoption Predicting Healthful Inventory (n=174) | | |
|---|---|---|
| | Characteristics | Unhealthy Inventory B (SE) |
| *Organizational* | | |
| | Nutrition Tracking System | |
| | No (ref) | |
| | Yes | 0.019 (0.025) |
| | Organization Size | |
| | Small | -0.029 (0.037) |
| | Medium | 0.0051 (0.030) |
| | Large (ref) | |
| | Inventory Stream | 0.00014 (0.00060) |
| | Service Area Size | |
| | Small (ref) | |
| | Large | -0.0031 (0.030) |
| *Food Donor Environment* | | |
| | Agriculture | |
| | Poor | -0.0044 (0.024) |
| | Neither | -0.086 (0.039)* |
| | Rich (ref) | |
| *Contextual* | | |
| | U.S. Region | |
| | Midwest | -0.061 (0.035)+ |
| | Northeast | -0.091 (0.035)* |
| | South | -0.086 (0.033)** |
| | West (ref) | |
| | Metropolitan | 0.00040 (0.00039) |
| | Area Need | -0.0012 (0.0027) |
| | Political Conservativeness | -0.0024 (0.0010)* |
| Intercept | | 0.38 (0.040)*** |
| +p<0.10, * p<0.05, ** p<0.01, *** p<0.001 | | |

# Appendix D1: Additional Interview Guides

**Partner Agency Interview Guide**

1. How does the promotion of healthy eating promotion fit within the mission/values/priorities of your organization?
2. How does your organization promote healthy eating?
    a. *Any policies?*
    b. *Anything specifically tied to improving inventory?*
3. How would you describe to the nutritional quality of your inventory currently?
4. How do you work with food banks to improve inventory quality?
    a. *Specific organizational strategies?*
    b. *How do you know you if inventory is improving?*
5. What sort of impact[s] (if any) have you seen as a result of efforts to improve inventory?
6. What challenges have you faced (and may still be facing) as inventory quality shifts?
    a. *How do you handle unwanted, unhealthy food & beverage donations?*
7. How have these efforts affected your relationship with your food bank(s)?
    a. *Clients*
    b. *Food & beverage donors*
    c. *Financial funders (know that some food & beverage donors do both)*
    d. *Board Members?*
    e. *Other stakeholders (e.g., church leaders, politicians)*
8. How have you coordinated your efforts to improve inventory with your food bank(s)?
    a. *Direct food & beverage donors?*
9. How do you manage competing priorities?
    a. *How does nutrition rank among the other initiatives?*
10. What additional changes you would like your organization to make around the composition of food bank inventory?
    - *What would help your organization achieve these changes?*
11. Anything else you would like to share?

**Donor Interview Guide**

1. How does your store/organization think about the promotion healthy eating in the charitable food system?
    - Have you implemented any new practices/programs in efforts to promote healthy eating among charitable food clients?
    - Anything specifically tied to improving donations?
2. How do your store/company make decisions around food and beverage donations to food banks?
    - *How does health impact this decision?*
3. How would you describe the nutritional quality of the food and beverages your store/company donate to food banks currently?
4. How do your food bank donations strategies balance within other competing priorities for the store/company?
    - *How does nutrition at food banks fit among the other factors?*
5. How have you coordinated with food banks as they work to improve their inventory?
    - *How have these efforts affected your relationship with your food bank(s)?*
        i. *Shareholders?*
        ii. *Customers?*
6. If applicable: what sort of impact[s] (if any) have you seen as a result of efforts to make healthier donations to food banks?
7. What challenges have you faced (and may still be facing) as food banks shift inventory quality?
    - *How do you handle unwanted, unhealthy food & beverage donations?*
8. What would help your store/company donate healthier food to food banks?
9. Does your store/company have future plans to expand, sustain, or implement additional efforts to promote healthy eating within the charitable food system?
    - *How so? Or why not?*
    - *What would help your organization achieve these plans?*

10. Are there any additional changes you would like to make to your food and beverage donations to food banks?
11. Anything else you would like to share?

# Appendix D2: Qualitative Study Code Book

| Id | Parent Id | Depth | Title | Description |
|---|---|---|---|---|
| 1 | | 0 | Attitude | Mindset around healthy food change |
| 2 | | 0 | Challenges for Changing Inventory | Barriers to inventory change |
| 3 | 2 | 1 | Accessibility | Nutritious produce is less available |
| 4 | 2 | 1 | Client | Related to the end user |
| 5 | 4 | 2 | Capacity | Client's ability to take certain types of foods |
| 6 | 4 | 2 | Preferences | Clients want certain types of food |
| 7 | 2 | 1 | Consistency | Donor streams unpredictable |
| 8 | 2 | 1 | Diet change | Unclear if changing inventory improves diet |
| 9 | 2 | 1 | Financial | Barriers associated with costs |
| 10 | 2 | 1 | Food and beverage donors | Barriers related to donors |
| 11 | 2 | 1 | Food bank capacity | Limitations of food banks to process different foods |
| 12 | 2 | 1 | Lack of control | Do not have the power to regulate |
| 13 | 2 | 1 | Leadership | Barriers related to leadership |
| 14 | 2 | 1 | Location | How the surrounding environment makes changing inventory more difficult |
| 15 | 2 | 1 | Measurement | Focus on weight vs. Nutritional quality |
| 16 | 2 | 1 | Nutrition knowledge | Going beyond the green and red foods |
| 17 | 2 | 1 | Pantry | Pantries hesitant on healthy eating promotion efforts |
| 18 | 17 | 2 | Infrastructure | The physical building of the pantry limits the distribution of healthy inventory |
| 19 | 17 | 2 | Preference | Desire for certain types of inventory |
| 20 | 2 | 1 | Perceived barriers | Barriers that do not actually exist |
| 21 | 20 | 2 | Donor loss | Changing inventory results in losing food and beverage donors |
| 22 | 20 | 2 | Personal choice | If charitable food network should decide what types of food to provide |
| 23 | 2 | 1 | Quality | The caliber of the donations |
| 24 | 2 | 1 | Real barriers | Challenges that actually exist for food banks |
| 25 | 2 | 1 | Staffing | Who takes on the extra work of promoting nutrition |
| 26 | 2 | 1 | Structure | The design of the charitable food system makes changing inventory difficult |
| 27 | 2 | 1 | Timing | Amount of time needed |
| 28 | 2 | 1 | Volunteers | Volunteers reluctant to healthy eating promotion efforts |
| 29 | | 0 | Change impetus | Where the decision to change comes from |
| 30 | 29 | 1 | Bottom up | Driven by clients/pantries |
| 31 | 29 | 1 | Data driven | Using data to motivate change |
| 32 | 29 | 1 | Inevitable | "we all knew it was coming" |

| | | | | |
|---|---|---|---|---|
| 33 | 29 | 1 | New generation | New cadre of CEOs/leaders leading change in the system |
| 34 | 29 | 1 | Reaction | Responding to other changes in the system |
| 35 | 29 | 1 | Top down | The reasons for change come from higher level |
| 36 | | 0 | Convenience | Ease |
| 37 | | 0 | Coordination | How to different organizations work together |
| 38 | 37 | 1 | Consumers | How organizations work with clients |
| 39 | 37 | 1 | Food and Beverage Donors | How have organizations worked with food and beverage donors |
| 40 | 37 | 1 | Government | How food banks work with the government |
| 41 | 37 | 1 | Pantries | How food banks work with pantries |
| 42 | 37 | 1 | Public | The general population |
| 43 | | 0 | Decision making | The process of deciding |
| 44 | 43 | 1 | Consequences | Results of decision making |
| 45 | 43 | 1 | Intentions | What motivates decision making |
| 46 | | 0 | Dignity | Respecting the client |
| 47 | | 0 | Embedded in the food system | Describing the charitable food system as part of the broader food system |
| 48 | | 0 | Facilitators | What helps food banks change inventory |
| 49 | 48 | 1 | Access | The availability of fresh produce/healthy food makes it easier to distribute |
| 50 | 48 | 1 | Data | Use of data helps promote nutrition/healthy eating |
| 51 | 48 | 1 | Engaging staff | Connecting with staff in the process |
| 52 | 48 | 1 | External partners | Organizations outside of the food bank provide support |
| 53 | 52 | 2 | Health professionals | People with health expertise help to support nutrition initiatives |
| 54 | 48 | 1 | Flexibility | The ability to adapt to changes |
| 55 | 48 | 1 | Funding | Organizational wealth helps improve inventory |
| 56 | 48 | 1 | Geography | Where an organization is located helps improve inventory |
| 57 | 48 | 1 | Incentives | Motivations that support inventory change |
| 58 | 48 | 1 | Infrastructure | Refrigerators, transportation, etc. that help process nutrient dense foods |
| 59 | 48 | 1 | Leadership | Organizational leadership supporting healthy eating promotion |
| 60 | 48 | 1 | Technology | Tools that make it easier to promote healthy eating |
| 61 | 48 | 1 | Using existing resources | Supporting healthy eating promotion by using things that someone else developed |
| 62 | 48 | 1 | Values | Part of what is important to the food bank |
| 63 | 48 | 1 | Volunteers | Volunteers help to make health/nutrition promotion possible |

| | | | | |
|---|---|---|---|---|
| 64 | | 0 | Fit | How does nutrition fit into organization operations |
| 65 | | 0 | Future | Anticipating what is to come |
| 66 | 65 | 1 | Beyond low hanging fruit | Easy stuff has been accomplished |
| 67 | 65 | 1 | Breaking down silos | Better integration between different groups or sectors |
| 68 | 65 | 1 | Narrowing networks | Cutting down on the number of pantries served |
| 69 | 65 | 1 | Vision | What would ideal change look like |
| 70 | 69 | 2 | Addressing root causes | Working to impact food insecurity or poverty more broadly |
| 71 | 69 | 2 | Better data | Collecting different metrics on inventory |
| 72 | 69 | 2 | Change incentives | Efforts to restructure donation incentives |
| 73 | 69 | 2 | End charitable food | Stop providing food through the private sector |
| 74 | 69 | 2 | Equity | Creating a system that's more equity focused |
| 75 | 69 | 2 | Innovation | Trying new programs or distribution methods to support healthy eating |
| 76 | 69 | 2 | Institutionalization of nutrition efforts | These efforts become routine |
| 77 | 69 | 2 | Inventory change | Making additional changes to food bank inventory |
| 78 | 77 | 3 | Choice | Charitable food system clients can pick the foods they want |
| 79 | 69 | 2 | Strategic network | A more deliberate effort to address hunger |
| 80 | | 0 | Healthy eating promotion | Ways in which food banks support healthy eating |
| 81 | 80 | 1 | Changing inventory | The process of improving nutritional quality of inventory |
| 82 | 81 | 2 | Educating donors | Talking to food and beverage donors about what they donate |
| 83 | 81 | 2 | Gardening | Building gardens to increase produce access |
| 84 | 81 | 2 | Goal setting | Defining a target for inventory change |
| 85 | 81 | 2 | New donors | Identifying new sources of inventory |
| 86 | 81 | 2 | New funding sources | Identifying new sources of monies |
| 87 | 81 | 2 | Policies | Organizational guidelines that shape food sourcing |
| 88 | 87 | 3 | Bans | Restricting certain food and beverage donations |
| 89 | 81 | 2 | Purchasing food | Buying inventory rather than receiving food and beverage donations |
| 90 | 81 | 2 | Ranking system | Nutrition tracking system |
| 91 | 80 | 1 | Distribution models | Changing the process through which inventory is given out |
| 92 | 80 | 1 | Nutrition education | Providing demos and recipes to encourage healthier food consumption |

| | | | | |
|---|---|---|---|---|
| 93 | 80 | 1 | Pantry design | Programs that promote healthy eating through pantry transformations |
| 94 | 80 | 1 | Supply and demand | Need to change inventory as well as client choices |
| 95 | | 0 | Impact | What results from promoting healthy eating/changing inventory |
| 96 | 95 | 1 | Different channels | Food gets distributed elsewhere |
| 97 | 95 | 1 | Success | How has the organization been successful |
| 98 | 95 | 1 | Unclear | Unsure of result of health promotion efforts |
| 99 | | 0 | Managing priorities | Balancing different initiatives of the organization |
| 100 | 99 | 1 | Too much | Capacity limited to address all issues |
| 101 | | 0 | Metrics | |
| 102 | | 0 | Nutritional quality | Rating of healthfulness |
| 103 | 102 | 1 | Donations | Healthfulness of inventory |
| 104 | 102 | 1 | Inventory | Healthfulness of inventory |
| 105 | | 0 | Progress | Momentum in the field |
| 106 | 105 | 1 | Along the spectrum | Food banks are in different points of the process when it comes to changing inventory |
| 107 | 105 | 1 | End goal | Destination of these efforts |
| 108 | 105 | 1 | Role of the Charitable Food System | Describes the function of the charitable food system |
| 109 | 108 | 2 | Disposal | The charitable food system as a channel for food waste |
| 110 | 108 | 2 | Entry point | Food as a starting point for addressing other needs |
| 111 | 108 | 2 | Feed the Hungry | The role of the charitable food system is to feed the hungry |
| 112 | 108 | 2 | Food environment | The charitable food system as a food environment |
| 113 | 108 | 2 | Old way of doing things | Describing the original role of food banks |
| 114 | 108 | 2 | Promote nutrition/health | The role of charitable system is to provide healthy food |
| 115 | 108 | 2 | Providing choice | The charitable food system offers clients options |
| 116 | 108 | 2 | Strategy | Part of an array of tools for addressing food insecurity |
| 117 | 108 | 2 | Tension | Strain between the different roles of the charitable food system |
| 118 | 105 | 1 | The need to go further | The desire for organizations to make additional progress |
| 119 | | 0 | Relationships | Connections between stakeholders in the charitable food system |
| 120 | 119 | 1 | Bidirectional | The partnership goes both ways |
| 121 | 119 | 1 | Dependence | How organizations in the system rely on one another |

| | | | | |
|---|---|---|---|---|
| 122 | 119 | 1 | Impacts | How efforts to change affects relationships between stakeholders |
| 123 | 119 | 1 | Tension | Strain on relationships |
| 124 | | 0 | Risk mitigation | Reducing liability |
| 125 | | 0 | Role of Food and Beverage Donors | Food and beverage donors as contributors in the promotion of healthy eating |
| 126 | 125 | 1 | Changing operations | Food and beverage donors changing business practices |
| 127 | 125 | 1 | Food safety | Concerns about the safety of a food item |
| 128 | 125 | 1 | Support | The backing of donors |

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