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Hunger Solutions Market Bucks Program Improvement In The Rural Setting: A Research Project

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HUNGER SOLUTIONS MARKET BUCKS PROGRAM IMPROVEMENT IN THE RURAL SETTING: A RESEARCH PROJECT

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ABSTRACT

Food insecurity – a lack of food required for a healthy and productive life – affects approximately 150 million households in the United States alone (Coleman-Jensen, Rabbit, Gregory, & Singh, 2018). The implications of this are numerous – as individuals who are "food insecure" have a statistically increased risk of numerous health conditions and disorders. In an effort to combat the burden of food insecurity, organizations such as the Supplemental Assistance and Nutrition Program (SNAP) have been created to provide increased access to food items. Furthermore, numerous state organizations have developed additional programs which incentivize SNAP users to purchase nutrient rich foods like fruits and vegetables.

One such program, Market Bucks, provides a dollar-for-dollar match on SNAP dollars used at select Minnesota based farmers markets. While the program has continued to grow in urban areas, its use has declined at most markets outside the seven-county metropolitan area. The purpose of this project was twofold: (1) to identify demographic, physical, and/or psychosocial factors contributing to the decreased usage in rural areas and (2) to evaluate potential solutions to help overcome these barriers.

A survey was distributed to SNAP/Market Bucks users at participating farmers markets which assessed the frequency of farmers market and Market Bucks uses, the perceived benefits of the Market Bucks program, and the perceived barriers to Market Bucks usage. Demographic information was also collected.

A total of 17 responses were received – all of which were from rural markets. Due to both the anticipated and unanticipated limitations of the survey process, the small survey response rate left the research team unable to draw any statistically significant conclusions, or to make

meaningful comparisons between urban and rural farmers markets. In an attempt to answer the research questions, the surveys were analyzed regardless.

The limited survey data was used to make inferences about demographic, spatial-temporal, and psychosocial factors that may be contributing to decreased Market Bucks usage in rural areas. Based on the inferences made by the research team and the findings described in the literature, suggestions for improving the Market Bucks program and for further research are offered.

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Introduction

Hunger continues to be a problem, even in the United States (US) which is considered one of the wealthiest nations in the world. As of 2017, almost 12 percent of American households still struggled with hunger and the ability to put enough food on the table for adequate nutrition at least once throughout the year (Coleman-Jensen, Rabbit, Gregory, & Singh, 2018). Similarly, in 2017, almost 10 percent of Minnesotans experienced the same struggles and challenges (Coleman-Jensen et al., 2018). In order to try and overcome these obstacles, over three million food shelf visits were made in 2017 throughout all of Minnesota (Hunger Solutions, n.d.b). In addition, over 450,000 Minnesotans, roughly eight percent of the total state population, participated in the Supplemental Nutrition Assistance Program (SNAP) throughout 2017 (Center of Budget and Policy Priorities, 2018). Yet despite the efforts of food shelves and government programs such as SNAP, there still remains a significant number of Americans and Minnesotans who are unable to meet their basic nutritional needs on a daily, weekly, monthly, or even yearly basis.

In an effort to try and close the hunger and nutrition gap, a number of assistance programs have been developed throughout the US to improve the access to healthy foods. One such type of incentive program is the collaboration between local farmers markets (FMs) and SNAP. Specifically in Minnesota, the Market Bucks program administered by Hunger Solutions provides the opportunity for SNAP participants to double their benefits (up to $10) at participating FMs throughout the state (Hunger Solutions Minnesota, n.d.c). The focus of this research project was to assess possible factors contributing to the decline in the use of Market

Bucks in rural areas. In doing so, the research team hoped to identify future areas for improvement.

Background to the Problem

Food insecurity can be broadly defined as a state in which one or more members of a household lack the food necessary to operate in a healthy, productive manner (Coleman-Jensen et al., 2018). In the US alone, approximately 150 million households experience periodic food insecurity at least once in any given year (Coleman-Jensen et al., 2018). Several demographic, socioeconomic, and consumer competencies have been implicated as risk factors - the most positive predictors being non-Caucasian race, annual incomes below the poverty line, and single parent headship (Chang, Kim, & Chatterjee, 2017; Coleman-Jensen et al., 2018).

The implications of food insecurity are important to consider, as the condition has been associated with increased risk of physical, mental, and cognitive disorders. Those with persistent or intermittent food insecurity are deemed as having higher risk of cardiovascular disease, type 2 diabetes, anemia, mood/behavioral disorders, and impaired cognitive function (Alaimo, Olson, & Frongillo, 2001; Crews et al., 2014; Mclaughlin et al., 2012; Moradi, Arghavani, Issah, Mohammadi, & Mirzaei, 2018; Saiz et al., 2016; Seligman, Laraia, & Kushel, 2009).

One important factor in addressing the issue of food insecurity is identifying at risk individuals; however, only a very low percentage of medical providers report screening on a regular basis (Barnidge, Labarge, Krupsky, & Arthur, 2016). The most commonly cited barriers to screening include lack of knowledge regarding current screening practices and poor familiarity with available resources (Barnidge et al., 2016). As a result, many food insecure families are unable to utilize the many available programs.

The most widely available and utilized program for combating food insecurity is SNAP, which is overseen by the federal government and administered on the state level (United States Department of Agriculture Food and Nutrition Service [USDA FNS], 2018a). SNAP is generally available to the majority of American citizens who fall within specific low-income and fixed-income levels based on the federal poverty line and a number of other factors such as available resources, assets, and deductions (USDA FNS, 2018c). Once an individual or household has applied and been approved for SNAP benefits, they receive monthly deposits via an Electronic Benefits Transfer (EBT) card (USDA FNS, 2018c). SNAP benefits and EBT cards can be used to purchase the majority of food items intended to be prepared and/or eaten at home, including foods from FMs (USDA FNS, 2017b).

Even though SNAP participation has continued to grow throughout the program's fifty-plus year history, there are still a significant number of eligible individuals and households not participating (Cunnyngham, 2018; Lauffer, 2017). Specifically, as of 2016, about 15% of all those eligible for SNAP and over 50% of eligible elderly individuals were not receiving benefits (Cunnyngham, 2018). Furthermore, analysis of the available data has found a number of common characteristics of those receiving SNAP benefits including: state and location of residence, income below the federal poverty line, and households with children, elderly, and/or disabilities (Cunnyngham, 2018; Stacy, Tiehen, & Marquardt, 2018).

In general, SNAP participation has been associated with individuals and households affected by poverty, food insecurity, and reduced dietary quality (Andreyeva, Trip, & Schwartz, 2015; Lauffer, 2017; Leung et al., 2012; Mancino, Guthrie, Ver Ploeg, & Lin, 2018). However, while there is still room for improvements, SNAP participation has also been associated with alleviation and reduced depth of poverty, reduced food insecurity, as well as improved dietary

quality (Andreyeva et al., 2015; Lauffer, 2017; Malbi, Ohls, Dragoset, Castner, & Santos, 2013; Wheaton & Tran, 2018). In an attempt to continue to improve SNAP effectiveness, a number of solutions have been proposed including changing the nutritional and financial criteria upon which SNAP has been historically based, as well as providing incentives for healthier food purchases (Bartlett et al., 2017; Mulik & Haynes-Maslow, 2017; Waxman, Gundersen, & Thompson, 2018). Pilot programs utilizing a variety of incentives (i.e. subsidies, bonuses, rebates, cash value coupons and vouchers) have seen benefits towards reducing poverty and food insecurity, while improving the dietary quality and health of SNAP recipients (Choi, Seligman, & Basu, 2017; Mozaffarian et al., 2018; Prell & Smallwood, 2017). One specific example of an incentive program that has shown promise is the combination of SNAP benefits with local FMs.

An example of a sustainable food system that has gained popularity in recent years is a farmers market (FM), which is a fixed location where farmers sell their agricultural products directly to the general public (USDA FNS, 2016b). FMs have been associated with increased access to healthy food, increased fruit and vegetable (F/V) consumption, reduced food costs, and increased food security among low-income populations (Freedman et al., 2016; Larsen & Gilliland, 2009). While there is evidence to support benefits of implementation and use of FMs, a variety of perceived barriers and misconceptions about socioeconomic, personal, and spatial-temporal factors have hindered usage among low-income populations (Freedman et al., 2016).

In an effort to improve the diets and levels of food security among these populations - along with attracting more customers - more FMs have begun accepting SNAP and implementing incentive programs that give SNAP participants ways to save money on F/V. Research has shown SNAP incentive programs increase F/V purchases and consumption, SNAP use and overall sales at FMs (Cohen et al., 2018). Despite the proven and potential successes of

these programs, their impacts have been limited because most SNAP participants do not shop at FMs, for a variety of reasons. Studies have indicated low-income individuals may lack awareness of FMs and incentive programs, knowledge about F/V preparation, and access to transportation, all of which lead to decreased incentive program usage (Freedman et al., 2018; Wetherill, Williams, & Gray, 2017). Identifying and addressing these challenges may help bolster use of FMs and incentive programs, and allow them to benefit more SNAP participants (Cohen et al., 2018).

Hunger Solutions Minnesota is a state-assisted, non-profit organization developed to minimize/eliminate hunger and food insecurity in the state of Minnesota (Hunger Solutions, n.d.a). The organization manages several distinct programs, including the Minnesota Food HelpLine, Food Shelf Capacity, and the Market Bucks program (Hunger Solutions, n.d.a). The Market Bucks program was developed to help SNAP customers increase their purchasing power at FMs. Since the Market Bucks pilot, the program has partnered with about 90 local FMs to provide a dollar-for-dollar match of SNAP benefits spent on SNAP-eligible foods, up to $10 per visit (Hunger Solutions, n.d.d). In 2017, SNAP participants spent a total of $198,143 EBT dollars at FMs. Participants were also able to spend an additional $179,563 on FM purchases because of Market Bucks matching (Hunger Solutions, n.d.d).

Problem Statement

Urban usage of Market Bucks has continued to grow annually; however, a needs assessment conducted by the research team found program utilization has declined in regions outside the seven-county metropolitan area (R. Holmes, personal communication, October 26, 2018). While the reasons behind this decline in usage are still largely unknown, numerous physical and psychosocial factors (e.g. ease of access, advertisement, transportation, customer

experience, and stigma surrounding SNAP use) were suggested as possible culprits (R. Holmes, personal communication, October 26, 2018).

Over the course of the 2018 FM season, Hunger Solutions saw a decline in the use of the Market Bucks program among rural FMs. The reasons for this decline in use were not readily apparent and needed to be identified in order to overcome the barriers and promote Market Bucks participation.

Purpose

The purpose of this research project was to identify possible means to increase the availability of nutrient-dense foods to low-income, food insecure individuals in rural Minnesota. More specifically, the researchers of this project aimed to connect rural FMs with SNAP participants to foster increased awareness of the Market Bucks program. The intended outcome of increased Market Bucks utilization was to improve access to healthy food options and improve general health and well-being.

Through this study, the research group sought to answer the following questions: What demographic, physical, or psychosocial factors are contributing to the decline in use of Market Bucks in rural areas? What potential solutions exist to improve the use of Market Bucks in rural areas?

Significance of the Problem

Food insecurity has been proven to have detrimental effects on the health of affected individuals (Crews et al., 2014; Saiz et al., 2016; Seligman et al., 2009). Assistance programs such as SNAP and incentive programs like Market Bucks are strategies aimed at improving the food security status of low-income individuals. Hunger Solutions identified a decrease in usage of the Market Bucks program among rural FMs during the 2018 season, but they were not aware

of the reasons for this decline. This problem was significant because although Hunger Solutions had the financial resources available to help reduce food insecurity, a disconnect existed between the Market Bucks program and its intended participants. Identifying the potential reasons for reduced participation at these rural markets and determining possible solutions, would allow Hunger Solutions to make changes that would promote Market Bucks utilization. Ideally, these changes would subsequently increase the food security status and health of rural, low-income Minnesotans.

Limitations

A number of potential limitations and delimitations existed for this research project. The most significant limitations and delimitations identified were related to spatial-temporal factors, individual market differences, and user response bias. Spatial-temporal factors were a challenge as the FMs of greatest interest (i.e. rural) were located a significant distance from the metropolitan area of Minneapolis-St. Paul, where the researchers resided. The research team was not physically on-site to distribute the survey and, thus, needed to rely on FM volunteers to ensure the survey was correctly distributed and collected. Response and participation of individual FMs also posed a challenge - as most FMs, especially in the rural area, were individually operated. Therefore, survey distribution largely depended on each market's willingness and ability to distribute the survey. Furthermore, many of the rural markets had relatively low Market Bucks participation rate. Gathering enough data for a sufficient sample size proved challenging.

A final important limitation of the study was that the survey was not distributed to the exact population of interest. Due to the protective nature of SNAP user information, researchers were not able to distribute the survey to the exact population of interest: SNAP users that do not

shop at FMs. Instead, the study targeted the next closest population: SNAP users who shop at FMs and may have an idea why others do not. Although the two groups share many similar characteristics, SNAP users that shop at FMs may think somewhat differently than those who do not.

Definition of Terms

Electronic Benefits Transfer (EBT): "Electronic Benefits Transfer (EBT) is an electronic system that allows a recipient to authorize transfer of their government benefits from a Federal account to a retailer account to pay for products received" (USDA FNS, 2018d, para. 1).

Farmers Market: "Two or more farmer-producers that sell their own agricultural products directly to the general public at a fixed location, which includes fruits and vegetables, meat, fish, poultry, dairy products, and grains" (USDA FNS, 2016b, para. 1).

Food Insecurity: Lack of "access by all people at all times to enough food for an active, healthy life" (Coleman-Jensen et al., 2018, p. 2).

Market Bucks: "Market Bucks help SNAP customers stretch their dollars at the farmers market making healthy food more affordable. Market Bucks match SNAP-EBT spending dollar-for-dollar (up to $10) at participating farmers markets across Minnesota" (Hunger Solutions Minnesota, n.d.c, para. 1-2)

Rural: Geographic area outside of the seven county (Anoka, Carver, Dakota, Hennepin, Ramsey, Scott, Washington) metropolitan area of Minneapolis-St. Paul, Minnesota (Metro Council, n.d.).

Supplemental Nutrition Assistance Program (SNAP): "SNAP offers nutrition assistance to millions of eligible, low-income individuals and families and provides economic benefits to communities. SNAP is the largest program in the domestic hunger safety net" (USDA FNS, 2018a, para. 1).

Conclusion

Food insecurity, including hunger and lack of access to healthy food options, still impacts a significant portion of the population nationally, as well as locally in Minnesota. The negative effects of food insecurity are wide reaching, impacting the socioeconomic status, health, and well-being of those struggling. In addition, despite a number of support programs such as SNAP and Market Bucks attempting to improve food security, there are still many obstacles that must be overcome to connect individuals and households in need with community resources.

This research project focused on better understanding the challenges associated with connecting SNAP participants in Minnesota with local FMs participating in Market Bucks. The main goal of identifying these challenges was to provide Hunger Solutions with data that can be used to improve Market Bucks participation, especially in the rural setting.

The next chapter reviews the literature related to food insecurity, SNAP, and utilization of FM incentive programs. Additionally, the connections, relationship, and impact on health and poverty are discussed as they relate to food insecurity, SNAP, and FM incentive programs. An understanding of these correlations and associations helps to better understand the challenges and needs, as well as possible solutions to the problem.

Chapter 2: Literature Review

Introduction

The issues of hunger and food access have long posed a significant challenge at the local, state, national, and global level. Although severe forms of starvation and malnutrition are rarely seen within the US in modern times, millions of Americans still struggle to obtain the nutrition needed to function optimally in society. As a growing body of evidence suggests strong correlations between insufficient food access and poor food quality, along with a variety of negative physical, emotional, and socioeconomic effects, the broader concept of food insecurity has gained increasing attention.

One vital strategy implemented by the US federal government to increase food security is SNAP. Even though SNAP is the widest reaching program of its kind within the US, other more focused efforts have attempted to improve food insecurity. One such effort is the partnership between SNAP and farmers markets (FMs) to make more nutritious foods such as fruits and vegetables (F/V) more available and affordable. A specific example of a partnership between SNAP and FMs is the Market Bucks program.

This literature review provides an overview of the causes and effects of food insecurity in the US, intended purposes and implementation realties of SNAP, and utilization of targeted FM programs to improve food security, health, and well being of Americans. The purpose of this project was to identify how these issues relate to Market Bucks.

Food Insecurity

Food Insecurity Defined. The United States Department of Agriculture (USDA) defines food security as lack of "access by all people at all times to enough food for an active, healthy life" (Coleman-Jensen et al., 2018, p. 2). In 2017, approximately 88.2 percent of all United

States households reported adequate food security (Coleman-Jensen et al., 2018). The remaining 11.8 percent – an estimated 150 million households – experienced either transient or consistent food insecurity: a state in which they were "unable to acquire adequate food for one or more household members because they had insufficient money and other resources for food." (Coleman-Jensen et al., 2018, p. 6).

In order to objectively identify and categorize food security status, researchers have developed an assortment of different survey instruments. One of the best accepted and validated is the Food Security Survey Module of the USDA's Current Population Survey (CPS-FSS) (Gregory, Rabbitt, & Ribar, 2015). The 18-item battery is typically administered as part of the Current Population Survey (CPS) to households whose total income falls below 185 percent of the poverty line. Households without children are asked up to 10 questions regarding: (1) ability to purchase food, (2) ability to eat regular, balanced meals, and (3) the frequency with which food are rationed or meals skipped (Gregory et al., 2015). Those with children are asked up to an additional eight questions regarding food access (Bickel, Nord, Price, Hamilton, & Cook, 2000). Each affirmative response is coded into a numerical value and all values are summated. Households with affirmative answers to three or more questions are deemed food insecure (Bickel et al., 2000). Food insecure households may be further subdivided into low food security and very low food security categories (Coleman-Jensen et al., 2018). Low food security households continue to consume food/meals on a regular basis, but may have to adopt strategies (i.e. decreasing diet variety or participating in federal or local food assistance programs) to do so. Those deemed as being very low food secure are often forced to reduce the overall food intake of one or more members (Coleman-Jensen et al., 2018).

More abbreviated food security screens have also been discussed in the literature. In 2010, Hager et al. developed a two-item food security screen for use by medical providers. The instrument presented each respondent with two statements: (1) "Within the last 12 months we worried whether our food would run out before we got money to buy more" and (2) "Within the past 12 months, the food we bought just didn't last and we didn't have money to get more" (Hager et al., 2010). An affirmative response to either statement was strongly sensitive (97 percent) and specific (83 percent) for identifying food insecurity when compared to the CPS-FSS (Hager et al., 2010). Given its efficacy and relative ease of use, the American Academy of Pediatrics recently advised the use of this survey as a screening tool during regular health maintenance visits (American Academy of Pediatrics, 2015).

Food Insecurity Risk Factors. The factors contributing to food insecurity status appear to be complex and are often inter-related. A recent cross-sectional analysis conducted by Coleman-Jensen et al. (2018), demonstrated the incidence of low and very low food security were significantly higher among households with children (15.7%), households headed by a single caregiver, households with black or Hispanic headship (21.8 percent and 18%), and households with annual incomes below the national poverty line. Among U.S. households with children who reported food insecurity, the children themselves were subjected approximately half of the time. In the other cases, the children remained food secure while one or more of their caregivers suffered from food insecurity (Coleman-Jensen et al., 2018). Such findings suggest that although children may be shielded from food insecurity, they are certainly not immune to it. Furthermore, the correlation between race, family structure, and socioeconomic status suggest the risk factors for food insecurity may be outside the control of the afflicted individual.

The demographic and socioeconomic associations discovered by Coleman-Jensen et al. (2018), appear to hold true for older US adults as well. In a study of adults greater than age 60, Goldberg and Mawn (2014) identified non-white race, lower education levels, family income below the poverty line, and clinical depression as positive predictive factors of food insecurity. Consumer competency habits have also been implicated as contributors to food insecurity. A study published by Chang, Kim, and Chatterjee (2017) found nutritional literacy (knowledge of dietary guidelines, frequent use of nutrition panels, etc.) and frugal shopping habits (shopping with a list, shopping with coupons, etc.) were inversely correlated with food insecurity. This suggests that specific education may – under certain circumstances – provide some benefit in the prevention and reduction of food insecurity.

Although a variety of patterns may exist, food insecurity is often an episodic, rather than continuous, phenomenon – with approximately three-fourths of food insecure households reporting neither frequent nor continuous food insecure practices (Coleman-Jensen et al., 2018). In analyzing data from the Early Childhood Longitudinal Study – Birth Cohort, Jacknowitz, Morrissey, and Brannegan (2015), determined a strong statistical correlation between entry into food insecurity and maternal loss of job, household decrease in income, maternal depression, and/or change in residence. These findings, in combination with those discovered by Coleman-Jensen et al. (2018), suggest poor home stability may be a key contributor to the development of food insecurity. Therefore, social workers, medical providers, and politicians must be sure to address the needs of the entire family in addition to those that are most immediately affected.

Food Insecurity and Health Effects. The association of food insecurity and disease has been extensively documented in the literature. Amongst non-elderly U.S. adults, poor food security has been linked with increased risk of poor cardiovascular health, hypertension,

hyperlipidemia, type 2 diabetes mellitus, and chronic kidney disease (Saiz et al., 2016; Seligman et al., 2009; Crews et al., 2014). Furthermore, Bishop and Wang (2018) found food insecurity was associated with overall mobility impairment. When monitored over the course of two years, food insecure individuals were also more likely to have significant progression of mobility limitations compared to food secure counterparts (Bishop & Wang, 2018).

The effects of food insecurity also have significant impacts on the physical, mental, and cognitive health of infants, children, and adolescents. Poor food security has been implicated as a possible contributor to the development of asthma and anemia in young children, as well as lower reported overall health (Mangini, Hayward, Dong, & Forman, 2015; Moradi et al., 2018; Ryu & Bartfeld, 2012). Studies published by Melchior et al. (2012), and Mclaughlin et al. (2012), demonstrate a statistically significant correlation between food insecurity and ADHD, mood/behavioral disorders, and substance abuse disorders amongst adolescents. These correlations remained even after controlling for a variety of demographic and social factors (Mangini et al., 2015; Melchior et al., 2012). A national study of U.S. school children found cognitive performance was decreased in children with food insecurity – as evidenced by poorer scoring on standardized tests and increased incidence of repeating a grade (Alaimo et al., 2001).

The Burden of Food Insecurity. The burden of morbidity is especially important to consider amongst food insecure individuals. Since food insecurity is often associated with lower incomes, affected individuals may have poor access to care, ultimately resulting in late detection and more rapid disease progression. Furthermore, having fewer economic resources may restrict one's ability to obtain medications necessary to manage chronic diseases or conditions. As evidenced in a study published by Knight, Probst, Liese, Sercy, and Jones (2015), food insecure diabetics were significantly more likely to cut back on their insulin or oral diabetic medications.

When forced to choose between food and disease-reducing pharmacotherapies, food insecure individuals may see nourishment as a primary need over necessary medication. Unfortunately, without intervention, such practices may create a self-perpetuating cycle of illness, restricted income, and food insecurity (Knight et al., 2015).

In order to help address the needs associated with food insecurity, healthcare providers must first be familiar with the concept of food insecurity, learn to identify affected individuals, and know how to connect the afflicted to available resources. However, a disconnect often exists between these. In a recent survey of 67 pediatric physicians, 80% noted willingness to screen, but only 15% indicated they had ever screened for food security (Barnidge et al., 2016). Many of the providers cited barriers including uncertainty regarding how to handle a positive screen, apprehension of the child's caregiver feeling judged, and lack of knowledge regarding available resources (Barnidge et al., 2016). In order to reduce the overall burden of food insecurity – both on the affected household and society as a whole – further work is needed to bridge this gap. One method, which may assist with this process, is connecting patients with resources such as SNAP.

Supplemental Nutrition Assistance Program (SNAP)

SNAP Introduction and Overview. SNAP is the largest and furthest reaching federally supported program designed to help fight hunger and food insecurity in the US (USDA FNS, 2018a). The Food and Nutrition Service (FNS) division of the USDA oversees SNAP on a national level, however, implementation is primarily delivered via state agencies with the assistance of public and private organizations, as well as individual professionals (USDA FNS, 2018a).

In general, SNAP is available to most Americans who fall within the broad categories of low-income working individuals, families, or seniors, and those with a disability living on a fixed-income (USDA FNS, 2018c). In order to qualify for SNAP, recipients must meet a number of criteria related to income level, resources, assets, and deductions. The majority of SNAP recipients, with the exception of households with elderly or disabled individuals, must meet or fall below both gross monthly income (i.e. 130 percent of the poverty line) and net monthly income (i.e. 100 percent of the poverty line) levels. For example, as of October 2018 the average American family of four would need $1,316 gross monthly income or less, and $1,012 net monthly income or less to qualify for SNAP. However, just because a recipient qualifies for SNAP does not mean they will receive the maximum monthly allotment, as the higher a recipient's net monthly income, the less benefits they receive. For example, the maximum monthly allotment for a family of four is $642 (USDA FNS, 2018c).

Even though SNAP is a federally determined program, because implementation occurs at the state and local level, recipients apply either online or in-person in their current state of residence (USDA FNS, 2018c). In addition to requirements discussed previously, there are also specific work requirements for able-bodied adults, as well as exclusions for non-citizens. Those applying for SNAP must also complete a verification process including either an in-person or phone interview. Applicants are notified of their eligibility status within 30 days of application; however, there are circumstantial exceptions where benefits may be received within one week. An electronic benefit transfer (EBT) card, similar to a debit card, is sent to recipients as their form of payment at EBT authorized vendors. SNAP benefits are always available to those who meet the qualifications, however, recipients are required to recertify at predetermined intervals depending on their benefits (USDA FNS, 2018c).

Purchases with SNAP benefits fall within two general categories: household foods to be cooked and eaten at home, and seeds and plants that can be used to grow food to eat (USDA FNS, 2017b). In general, SNAP benefits are not allowed to be used for: alcohol, tobacco, nonfood household items, vitamins, supplements, medications, and hot foods such as those to-go, or are intended to be eaten in a restaurant or store. Currently, beyond these restrictions, there are very few (if any) restrictions when it comes to the purchase of what some may term "junk food" (i.e. high-sugar, high-calorie beverages and foods) or luxury items (i.e. seafood, steak) (USDA FNS, 2017b).

In addition to the specific food restrictions, SNAP benefits may only be redeemed at SNAP-authorized locations (USDA FNS, 2016b). In order to become a SNAP-authorized vendor and accept EBT payments, vendors must apply with the state similar to SNAP recipients. SNAP-authorized vendors must fall within one of the following categories to be eligible: FM, direct marketing farmer, community supported agriculture (CSA), or SNAP-authorized retailer. SNAP-authorized retailers become eligible and able to accept EBT payments when meeting at minimum one of two criteria. The first criteria according to the USFDA FNS (2016b) is:

> Offer for sale, on a continuous basis, at least three varieties of qualifying foods in each of the following four stable food groups, with perishable foods in at least two of the categories—meat, poultry or fish, bread or cereal, vegetables or fruits, and dairy products. (para. 5)

If the first criteria cannot be met, a second criteria may be used instead, which includes, "more than one-half (50%) of the total dollar amount of all retail sales (food, nonfood, gas and services) sold in the store must be from the sale of eligible staple foods" (USDA FNS, 2016b, para. 5).

SNAP History. While many Americans may be familiar with SNAP, even more may still know the program by its original name, the Food Stamp Program (FSP), or simply as food stamps (USDA FNS, 2018b). The current iteration of SNAP has its roots planted back in the late 1930s with the very first FSP iteration in 1939. As part of the first FSP, individuals and families would purchase food stamps that could be redeemed at the store for any food items, and also be given additional supplemental food stamps to be used for surplus food items determined by the USDA (USDA FNS, 2018b).

The original FSP was discontinued in 1943, however, in 1961, a variety of FSP pilots were initiated once again (USDA FNS, 2018b). After three years of pilot programs the Food Stamp Act of 1964 officially passed FSP into legislation. From the rebirth of FSP in 1964, many changes were made over the next 20 plus years towards expanding the reach throughout the country, as well as establishing national standards for eligibility and benefits. In 1977 FSP underwent a major change with the removal of the purchase requirement of food stamps and transitioned towards an entitlement program instead, which provided easier access to benefits (USDA FNS, 2018b).

Over the next decade more changes where made to the program in an attempt to better define eligibility and benefits. One of the most significant changes to FSP came as part of The Hunger Prevention Act of 1988, when pilot programs for the use of EBT where implemented as a new and alternative form of payment instead of traditional paper food stamps (USDA FNS, 2018b). The EBT pilots were so successful that EBT became the primary and required payment method for FSP as of 2004 (USDA FNS, 2018b).

While a number of changes were made to FSP in during the 1990s, the next major change did not occur until 2008 as part of the 2008 Farm Bill (The Food, Conservation, and Energy Act

of 2008) when FSP was officially renamed SNAP (USDA FNS, 2018b). The change of name from FSP to SNAP was in part an effort to rebrand the program and overcome some of the stigma that had come to be associated with food stamps. In addition, the change to SNAP also marked the beginning of an evolution of the program beyond just hunger and food insecurity towards nutrition, health, and wellbeing of recipients (USDA FNS, 2018b).

SNAP Characteristics and Demographics. In order to better understand the utilization and effectiveness of SNAP, the USDA commissions regular data gathering and reports of findings on a variety of aspects. One area that has been researched and followed over the years is the general characteristics of SNAP households. As of 2016, more than 44 million individuals among more than 21 million households where recipients of SNAP benefits (Lauffer, 2017). However, less than 40 percent of eligible households received the maximum benefit level, with the average monthly benefit for all eligible households being around $250. In addition, the majority of all recipients, over 80 percent, were found to be concentrated around large cities, with the rest of recipients split almost equally between small towns and cities, and rural (Lauffer, 2017).

Data collected and analyzed between 2010 and 2016 showed while participation in SNAP is increasing overall, from around 72 percent to 85 percent, there are still subgroups of eligible individuals and households who are not participating (Cunnyngham, 2018). In general, individuals and households with the lowest income and/or with children had the highest participation rates of close to 100 percent. In comparison, those with higher income and/or who were elderly had the lowest participation rates, at less than 50 percent (Cunnyngham, 2018).

In addition to demographics, research has also showed that the state in which a recipient lives may affect participation rates (Stacy et al., 2018). This affect has been attributed to change

in legislation in 1996 that provided states with more flexibility for how they implement SNAP, leading to a wide range of differences among states. In order to combat these discrepancies, the SNAP Policy Index score was developed to help states understand how they compare to others and continue to improve access by learning from each other (Stacy et al., 2018).

After analyzing the data a number of characteristics have emerged of the typical SNAP recipient. Children, elderly, and those with disabilities accounted for the majority of recipients—almost two-thirds. SNAP recipients generally had minimal household income, with the average household income about 40 to 60 percent below the poverty line (Lauffer, 2017). That said, SNAP has been associated with an antipoverty effect; in 2016, 10 percent of recipients moved beyond the poverty line due to SNAP (Lauffer, 2017). Additional research using the Supplemental Poverty Measure (SPM) determined that in addition to bringing some recipients out of poverty, SNAP also reduces the depth of poverty, especially for affected children (Wheaton & Tran, 2018).

Related to poverty, are food insecurity and the effect that SNAP has on reducing hunger and improving food security for recipients. Much like the antipoverty effects, SNAP also has effects on food insecurity. Research evaluating food insecurity status of all households after six months of SNAP participation found food insecurity was reduced between five and 10 percent (Malbi et al., 2013). Additional systematic review of the available research found SNAP improved micronutrient, macronutrient, and overall caloric intake thus reducing food insecurity (Andreyeva et al., 2015). Research has also determined that households with children utilizing SNAP experienced a reduction in food insecurity, which is of the utmost importance for the health and well being of developing children (Malbi & Worthington, 2014).

Because of the association between poverty, food insecurity, and SNAP participation, it is not surprising that many recipients have to use coping strategies beyond SNAP to provide for themselves and their household. Detailed discussions with a representative panel of SNAP households found while SNAP helped to ease their financial situation and improve food access, for most, SNAP did not completely resolve these challenges (Edin, et al., 2013). In order to bridge the gap between SNAP benefits and daily needs most SNAP recipients utilized a variety of coping strategies such as: budgeting, coupons, sales, bulk shopping, changing food choices, utilizing personal and community resources, restricting and skipping meals (Edin et al., 2013).

SNAP Challenges and Opportunities. In addition to studying the overall characteristics of SNAP recipients, research has also started to focus on comparing those receiving SNAP to those who are either eligible and nonparticipating, or ineligible. The importance of these comparisons is to better understand challenges and opportunities for improvement of SNAP. In comparison to non-SNAP households, SNAP households tend to spend less on food, spend more on food for home, and have higher food expenditures at the beginning of the month (when benefits are received) (Tiehen, Newman, & Kirlin, 2017). In addition, using the Healthy Eating Index-2010 (HEI-2010), SNAP households scored lower than other non-SNAP households (Mancion, Guthrie, Ver Ploeg, & Lin, 2018). Non-SNAP households only achieved a HEI-2010 score of 53 out of 100, which is far below the recommended guidelines, meaning that SNAP households fell even lower (Mancion et al., 2018). Additional research also found diet quality of both non-SNAP and SNAP households to be severely lacking, with SNAP household being affected greater (Andreyeva et al., 2015; Leung, Ding, Catalano, Villamor, Rimm, & Willett, 2012). Furthermore, while SNAP has shown to reduce poverty and food insecurity, the effects on

improving overall diet quality have been inconclusive (Gregory, Ver Ploeg, Andrews, & Coleman-Jensen, 2013).

With the shift in focus from the initial goal of reducing hunger and food insecurity, to the addition of improving nutrition, health, and well being of SNAP recipients, a great amount of interest and research has shifted toward access of healthy and affordable foods such as fruits and vegetables (F/V). Historically, the maximum SNAP benefits have been based on the Thrifty Food Plan (TFP), which was last revised in 2006 (Carlson, Lino, Juan, Hanson, & Basiotis, 2007). The TFP utilized a combination of dietary guidelines, average national food prices, and time for preparation to determine how much it costs the average individual and household to purchase and prepare food that meets minimum daily dietary requirements over the course of a month (Carlson et al., 2007). Ability of the current SNAP benefits based on the TFP to provide adequate nutrition has been challenged by a number of researchers, and suggested SNAP benefits must be increased to provide adequate nutrition based on current recommendations (Mulik & Haynes-Maslow, 2017; Waxman et al., 2018).

Although many have suggested changing the food plan upon which maximum SNAP benefits are based, thus raising overall SNAP benefits, there are many legislative and political obstacles to overcome for this to happen. As an alternative approach to improving access to healthy food options, especially F/V, a number of programs have been piloted focusing on providing incentives to SNAP recipients. One specific example of this was the Healthy Incentives Pilot (HIP) where participants received a 30-cent credit per dollar spent on F/V (Bartlett et al., 2014). In comparison to those who did not receive the incentive, HIP participants purchased and ate more F/V, consumed a wider variety, and perceived greater affordability (Bartlett et al., 2014). Additional research has also found a variety of other approaches such as

subsidies, incentives, bonuses, rebates, and cash value vouchers for healthier foods such as F/V at SNAP-authorized retailers and vendors could provide benefits towards food security, poverty, health, and well-being of SNAP recipients (Choi et al., 2017; Mozaffarian et al., 2018; Prell, & Smallwood, 2017).

Farmers Markets

Farmers Markets Introduction and Overview. Farmers markets (FMs) are an example of sustainable food systems that can have positive impacts within the areas in which they operate. As defined by the USDA FNS (2016b), a FM is, "Two or more farmer-producers that sell their own agricultural products directly to the general public at a fixed location" (para. 1). Items commonly sold at FMs include fruits and vegetables (F/V), various meats including fish and poultry, dairy products, grains, and baked goods. While supermarkets that sell local produce do exist, the majority of produce sold at stores comes from, on average, 1,200 miles away (Wadyka, 2018). According to the USDA, over 85 percent of FM vendors grow and bring their produce from within 50 miles of their FM location, meaning this produce is often fresher and more nutritious (Wadyka, 2018). Currently, over 8,700 FMs are registered with the USDA across the nation (Wadyka, 2018). For these reasons as well as social and economic benefits that FMs may bring to communities, FMs have increased in popularity in recent years.

Low-income individuals, especially those living in food desert communities with limited access to fresh F/V, have consistently low F/V consumption patterns, which can result in adverse health outcomes (Freedman et al., 2016). FMs, which have been associated with increased F/V consumption, have been developing in these food deserts as a strategy to increase the accessibility of nutritious foods for low-income populations (Freedman et al., 2016). A study by Larsen & Gilliland (2009) examined the impact on the price and availability of healthy foods

when new a FM was introduced into a low-income, urban food desert in Canada. The results showed after the FM opened, grocery prices in the neighborhood decreased by nearly 12 percent, and the amount and variety of fresh F/V available to residents increased over a three-year period (Larsen & Gilliland, 2009). FMs are not intended to replace traditional food retailers, however, research suggests their presence and use can help bolster access to healthy food, reduce costs, and increase food security among low-income populations (Larsen & Gilliland, 2009).

Barriers to Farmers Market Usage. While there is evidence to support the benefits of implementing and using FMs, there are a variety of perceived barriers and misconceptions about them that have hindered their usage by low-income populations. A systematic review by Freedman et al. (2016), evaluated the perceptions held by low-income individuals regarding economic, social, personal, and spatial-temporal factors discouraging them from shopping at FMs. While the systematic review found varying results, some prominent perceptions included lack of ethnic diversity, inability to use food assistance benefits, limited food variety, and minimal transportation access to FMs (Freedman et al., 2016). In other studies, SNAP participants expressed feelings that shopping at FMs is not affordable, and inconvenient in regard to location, operating hours, and necessity to self-prepare foods (Ritter, Walkinshaw, Quinn, & Johnson, 2018; Wetherill & Gray, 2015). From the perspective of some FM vendors, the relative lack of participation among low-income individuals suggests disinterest or lack of knowledge about shopping at the markets, and this observation may have a negative influence on attitudes toward this subset of customers (Larimore, 2018). Of course, not all low-income individuals hold the same opinions or perceptions about FMs, however, the perceived barriers listed above likely play a role in reduced usage.

SNAP and Incentive Programs at Farmers Markets. In an effort to improve the diets and levels of food security among low-income individuals - along with the benefit of attracting more customers - a growing number of FMs have undergone the process to be able to accept SNAP as payment for their products. In order to accept SNAP, a FM must successfully complete the application process and become licensed by the FNS (USDA FNS, 2016a). Once licensed to accept SNAP benefits, FMs must get electronic benefit transfer (EBT) equipment, design tokens or another form of currency to be used, train vendors in redemption rules and procedures, and implement a system to keep track of sales and reimburse vendors (USDA FNS, 2016a). Farmers have expressed multiple challenges of becoming able to accept SNAP at their markets, including the complexity of the application process as well as limited information and resources for using the payment system (Kellegrew, Powers, Struempler, Parmer, & Funderburk, 2017). Despite these challenges, USDA data shows SNAP users spent over $22 million in benefits at FMs in 2017 (USDA, 2017).

Incentive programs that give SNAP participants a way to save money on F/V are an additional tactic aimed at helping to address the nutritional shortcomings of low-income populations. Research continues to show SNAP incentive programs increase F/V purchases and consumption, SNAP use at FMs, and overall sales at FMs (Cohen et al., 2018). A variety of SNAP incentive programs have been developed and implemented at FMs across the nation. The Double Up Food Bucks (DUFB) program in Michigan is one of the first and most well-known SNAP incentive programs in the country (Cohen et al., 2018). DUFB was the first statewide incentive program of its kind, and has shown proven success at FMs in all geographic settings ("Double Up," n.d.). The DUFB program provides a dollar-for-dollar match of SNAP benefits spent on produce grown within the state at participating FMs, up to 20 dollars per visit (Cohen et

al., 2018). In the five years after the DUFB program began in 2009, SNAP purchases at Michigan FMs saw an almost 38-fold increase, which highlighted its success and popularity (Cohen et al., 2018). The DUFB program became a model for incentive programs across the nation, which has also been beneficial for SNAP users.

In a study of another dollar-for-dollar incentive program used at FMs in an urban Midwest community, 62.1 percent of SNAP users reported they would be unable to afford to shop at FMs using SNAP benefits without the matching program (Amaro & Roberts, 2017). Notably, 46 percent of the incentive program participants in this study had very low food security (Amaro & Roberts, 2017). One more study of a dollar matching SNAP incentive program suggested receiving FM incentives increased food security status of participants after just four weeks, and 86 percent of participants increased F/V consumption (Savoie-Roskos, Durward, Jeweks, & LeBlanc, 2016). Results like these indicate incentive programs can have positive outcomes for the people most in need; however, these programs are not without their issues.

Incentive Program Challenges and Opportunities. Possibly the largest issue that persists is most SNAP participants do not shop at FMs, for a variety of reasons. A study of SNAP participants that lived within one mile of various FMs showed 52 percent had either not shopped at a FM within the last year or had never shopped at a FM before (Freedman et al., 2018). Notably, 57 percent of participants in this study did not know they lived near a FM, and only 43 percent had their own form of transportation to use for shopping. Compared to participants that had shopped at a FM, SNAP participants that had never shopped at a FM were significantly less likely to be aware of the FM near their home and the SNAP incentive program, to perceive the F/V at FMs as good quality, and to be confident they could self-prepare F/V

(Freedman et al., 2018). SNAP participants also perceived F/V prices at FMs to be the same or higher than at stores. Shockingly, only 10 percent of SNAP participants that had shopped at FMs three or more times in the last year were aware of the SNAP incentive program, even though the program had been operational at the FMs for over four years (Freedman et al., 2018). Freedman et al. (2018) highlighted possible reasons for minimal usage of FMs and SNAP incentive programs among low-income populations. With the USDA committing $100 million in funding toward expanding and assessing these programs, it will be important for researchers, policymakers, and program leaders to determine ways to make them more effective and further extend their positive impact (Cohen et al., 2018).

As problems that limit FM and SNAP incentive program usage by low-income populations have been identified, possible solutions to counteract these issues have been offered. One clear solution for increasing usage would be to increase awareness of SNAP incentive programs. In a study where 63.8 percent of participants were unaware of the incentive program until they got to the FM, participants indicated the program needed better advertisement (Amaro & Roberts, 2017). Advertising SNAP acceptance at FMs and incentive programs is one way to increase awareness. The USDA FNS (2017a) suggests adding signage throughout the markets, posting flyers at places such as food banks, public aid offices, schools, places of worship, and public transportation centers, and distributing information via other groups in the community. In addition, one study found advertisers may want to consider that low-income populations might respond better to visual representation of receiving a larger amount of produce with an incentive versus a quantitative representation of the money they are saving (McGuirt et al., 2014).

Another strategy to increase awareness and usage is by direct outreach at places such as health centers. In a study by Cohen et al. (2017), patients in the waiting room of a health center

in a low-income community were given an explanation of a FM SNAP incentive program, written program information including a map with locations and hours, and a $10 FM voucher. After this intervention, there was an almost four-fold increase in use of the incentive program, as well as a clinically significant increase in F/V consumption (Cohen et al., 2017).

Advertising is one strategy likely to increase incentive program participation, however, strategies that address barriers other than lack of awareness are important as well. Research has shown that people who possessed knowledge about preparing F/V were three times more likely to participate in FM incentive programs than those without, and promoting F/V self-efficacy caused increased produce consumption over time (Wetherill et al., 2017; Freedman et al., 2018). To address the perceived inability to self-prepare F/V, FMs could hold cooking demonstrations with food from the market, or distribute recipes and instructions to current and potential market customers (USDA FNS, 2017a).

Another commonly identified barrier to FM use, lack of transportation or not living near a FM, could potentially be addressed by implementing FMs closer to public transportation routes or in areas where low-income populations live and work, or offering free public transportation directly to the market (Freedman et al., 2018; USDA FNS, 2017a). Finally, while attracting SNAP participants to use FMs and incentive programs for the first time is important, getting people to use them consistently is equally important. In a study of nearly 12,000 SNAP users that participated in the Michigan DUFB program from 2012-2013, participants averaged just 1.8 SNAP/DUFB transactions, and 69 percent only had one transaction (Cohen et al., 2018). No concrete strategies have been identified thus far to retain repeat FM and incentive program users within the SNAP population, but they likely differ from tactics needed to gain first-time customers (Freedman et al., 2017). The successes, barriers, and potential solutions other studies

have found regarding SNAP incentive programs will be important to consider as this project evaluates the incentive program that is the subject of the current study.

Market Bucks. Originally started by the Blue Cross Blue Shield of Minnesota Center for Prevention, Market Bucks is a SNAP incentive program currently used at Minnesota FMs. In 2015, Minnesota became the first state in the country to fund a FM incentive program (Westfall, 2017). The Minnesota legislature passed the Healthy Eating, Here at Home act which allocated funding through the Minnesota Humanities Center to be used to fund Market Bucks (Westfall, 2017; Healthy Eating Here at Home Act of 2015). Market Bucks, now administered by Hunger Solutions Minnesota, matches SNAP spending dollar-for-dollar at participating FMs, up to $10 (Hunger Solutions Minnesota, n.d.c). Participants use SNAP benefits to buy tokens from the EBT booth at FMs and get up to 10 Market Bucks to match, both of which can be used to purchase SNAP-eligible foods from vendors (Hunger Solutions Minnesota, n.d.c). As of July 2018, 96 different FMs across Minnesota were participating in the Market Bucks program (Piatt, 2018). With Market Bucks being a fairly new incentive program, the goal of this study was to assess the program's successes and shortcomings thus far, as well as determining potential strategies to make improvements.

Conclusion

A number of general conclusions can be suggested after reviewing the literature related to food insecurity, SNAP participation, and utilization of FMs to improve food security, health, and well being in the US. First, food insecurity is still a challenge faced by a significant number of Americans, especially those of lower socioeconomic status, as well as children and elderly (Coleman-Jensen et al., 2018). Additionally, food insecurity has wide reaching negative effects on the health and well being of those effected. Second, while SNAP provides food benefits to

the majority of those impacted by food insecurity, the benefits that recipients receive may be inadequate. Specifically, SNAP benefits may fall short in providing adequate access and affordability to healthy food choices such as F/V (Mulik & Haynes-Maslow, 2017; Waxman et al, 2018). Finally, incentive programs such as the combination of SNAP and FMs have shown to be a viable option towards decreasing food insecurity while increasing access and affordability to healthy food choices such as F/V (Amaro & Roberts, 2017; Savoie-Roskos et al., 2016).

The next chapter outlines and discusses the research project with Hunger Solutions Minnesota and the Market Bucks Program. The methodology includes the rationale for the project, plan and implementation, potential barriers, and tools utilized. The overall goal of this project was to assess possible barriers to current Market Bucks utilization – with the eventual goal of increasing FM and Market Bucks utilization among SNAP recipients in Minnesota.

Chapter 3: Methodology

Introduction

Over the course of the 2018 farmers market (FM) season, Hunger Solutions saw a decline in the use of the Market Bucks program among rural farmers markets (FMs) when compared to participating urban FMs. Through this study, the research group sought to answer the following questions:

1. What demographic, physical, or psychosocial factors are contributing to the decline in use of Market Bucks in rural areas?
2. What potential solutions exist to improve the use of Market Bucks in rural areas?

The purpose of this chapter was to detail and explain the research methodology used to conduct this research project. This chapter covers the study design, population, experimental procedures and protocols, limitations and delimitations, and data collection – including the study tool and statistical analysis.

Study Design

This research study was a quantitative, cross-sectional descriptive study using a written survey (Appendix A) administered by independently-operated FMs participating in the Market Bucks program throughout the state of Minnesota. As this study was cross-sectional by design, this study was neither prospective nor retrospective; rather, it was a "snapshot" in time. This methodology and study design were chosen because the research group was evaluating perceptions and values of the target population, rather than attempting to measure change.

Population

This research study was performed at independently-operated, Minnesota FMs participating in the Market Bucks program. Characteristics of the sample included adult SNAP

participants shopping at Market Bucks participating FMs in Minnesota. This population was selected because they were the population of interest identified by Hunger Solutions as being utilizers of the Market Bucks program. The inclusion criteria to participate in the research survey included: eligible active SNAP recipient/participant, over the age of 18 years old, and the ability to read and understand English. Exclusion criteria to participate in the research survey included: non-SNAP recipient/participant and/or persons under the age of 18 years old, and/or unable to read and understand English. Permission to survey this population was granted by Hunger Solutions (Appendix B).

Experimental Procedures

The written paper surveys (Appendix A), along with all other documents found in Appendices C, D, and E, were physically mailed to all Market Bucks participating FMs in the state of Minnesota during the summer market season (May-August 2019). Surveys were then made available at a designated Market Bucks distribution booth. After a SNAP user redeemed their market dollars, a market volunteer (usually the market manager) asked if the consumer would be willing to participate in the survey. Market manager/volunteer were provided with detailed instructions regarding obtaining informed consent and administering the survey (Appendix C). An information flyer (Appendix D) was also posted to advertise the survey. Upon agreeing to participate in the survey, an informed consent form (Appendix E) was provided to the interested participant. Consent was attained by having the participant check a box stating that they understood the terms of the survey. Having the participant check the box rather than writing their signature ensured a greater degree of anonymity. After consent was obtained, the participant completed a written survey – which did not contain any identifying information. The survey tool is further described in the heading below. Once the survey was

completed, it was collected by the FM manager for safekeeping. All completed surveys were mailed to a Hunger Solutions representative either intermittently throughout or by the end of the summer FM season. Hunger Solutions then transferred possession of the surveys to the research team - at which time survey results were electronically transcribed and data analysis was performed.

After recording the data, the paper surveys were kept locked in the PA program office. The electronic data, while being analyzed, was kept on a password-protected computer owned by the researchers. After completion of the study, the data was transferred to an external storage device which will be locked in the PA program office for a minimum of five years, per securing requirements for Bethel University Physician Assistant Program.

The independent variable for this study was initially intended to be the location of the FM (urban vs. rural); however, no responses were obtained from urban markets. The dependent variables were factors affecting the ease and/or difficulty of the use of Market Bucks. Questions in the survey were closed-ended with the opportunity to select one or more of the choices made available. After all data was collected, statistical analysis was performed using percentage values, which were calculated using Qualtrics and Excel software.

IRB approval from Bethel University was sought and obtained on April 15, 2019.

Limitations and Delimitations

A number of potential limitations and delimitations existed for this research project. The most significant limitations and delimitations identified were related to spatial-temporal factors, individual market differences, and user response bias. Spatial-temporal factors were a challenge as the FMs of greatest interest (i.e. rural) were located a significant distance from the metropolitan area of Minneapolis-St. Paul, where the researchers resided. The research team was

unable to be physically on-site to distribute the survey and, thus, needed to rely on FM volunteers to ensure the survey was correctly distributed and collected. Response and participation of individual FMs also posed a challenge - as most FMs, especially in the rural area, were individually operated. Therefore, survey distribution largely depended on each market's willingness and ability to distribute the survey. Furthermore, many of the rural markets have historically had relatively low Market Bucks participation rate. Gathering enough data for a sufficient sample size proved challenging.

A final important limitation of the study is that the survey was not distributed to the exact population of interest. Due to the protective nature of SNAP user information, the researchers were not able to distribute the survey to the exact population of interest: SNAP users that do not shop at FMs. Instead, the study targeted the next closest population: SNAP users who shop at FMs, and may have an idea why others do not. Although the two groups share many similar characteristics, SNAP users that shop at FMs may think somewhat differently than those who do not.

Study Tool and Statistical Analysis

A 13-question written survey (Appendix A) was developed by the research team to assess Market Bucks utilization among participating rural and urban Minnesota FMs. The survey was only available in English and utilized both multiple choice and/or write-in answers to all questions. The last three questions sought to gain demographic information (gender, age, and ethnicity). The remaining questions pertained directly to the research questions and sought to identify the frequency of FM usage, the frequency of Market Bucks usage, the average distance traveled by Market Bucks users, the pros and cons of FM usage, the pros and cons of Market

Bucks usage, and the barriers and stigmas associated with SNAP and Market Bucks usage at FMs.

Informed consent (Appendix E) was gained via written documentation associated with the written survey. Informed consent was obtained by the participant checking a box confirming their consent; however, no signature or personal identifying information was collected. The survey participant was informed that their participation was completely voluntary. The participant could stop at any time, and their participation or lack of participation in the survey would not affect their SNAP or Market Bucks benefits in any way.

As the data tool was developed by the research team, there was no established validity and reliability available. Instead, an expert panel was utilized to ensure the tool was readable and answered the above research questions. The expert panel included employees of Hunger Solutions, SNAP users known by the research team, the research chair and reader, and several other adults known by the readers with a less than high school graduate education level. Feedback from the expert panel will be considered and incorporated into revisions of the written survey.

Once all surveys had been collected, statistical analysis of the data was completed using Qualtrics and Excel software to calculate percentage values. Wilcoxon-Mann Whitney and Chi-squared tests were unable to be performed – as no data was available from urban markets. Percentage values were used to analyze demographic data and the frequency of responses to all other survey questions.

Conclusion

A written survey was used to assess the utilization for the Market Bucks program in participating Minnesota FMs by SNAP recipients/participants. Through these surveys the

researchers aimed to analyze the data to determine the demographic, physical, and/or psychosocial factors which may have been contributing to the decline in use of Market Bucks in rural areas.

Chapter four reviews the results of the survey data, gathered and analyzed as described throughout the methodology contained in this chapter. Chapter five discusses the results of the data analysis contained in chapter four, including: summary of the findings, limitations of the study, suggestions for further research, and solution recommendations.

Chapter 4: Results

Introduction

As stated previously in Chapter 1, Hunger Solutions had noted a decline in the use of the Market Bucks program among rural FMs (outside the seven-county metropolitan area) during the 2018 FM season (R. Holmes, personal communication, October 26, 2018). The reasons for this decline were not readily apparent, so the research team developed a survey (Appendix A) with the goals of identifying barriers to FM/Market Bucks use, and offering potential solutions and/or improvements that could promote Market Bucks use at rural FMs. The survey questions aimed to assess the factors potentially contributing to the decline in use, as suggested by Hunger Solutions and the literature review in Chapter 2.

Chapter 4 explores the techniques used in data analysis, response rates, and demographics of survey respondents. The chapter also explores temporal factors pertaining to FM and Market Bucks use, the frequency with which respondents utilized FMs and Market Bucks, perceptions regarding the benefits and drawbacks of FMs, and overall perceptions of the Market Bucks program.

Techniques of Data Analysis

As discussed in Chapter 3, paper copies of the survey tool were sent to a total of ninety, non-participant FM managers. FM managers did not participate in the survey directly, but instead distributed the survey to willing Market Bucks participants shopping at their FM. Paper surveys completed during the 2019 FM season were then sent to Hunger Solutions Minnesota and later transferred to the researchers for data analysis. Data collection was completed on August 15th, 2019.

A total of seventeen (n=17) total surveys were collected. Survey results were carefully transcribed into Qualtrics online survey software - which was used to assist in performing a descriptive statistical analysis. Data was also transcribed into an Excel spreadsheet which was used to confirm the statistical values calculated by Qualtrics.

Response

A total of ten written surveys were sent to each of ninety FMs throughout the state of Minnesota (total n=900). Of those, a total of seventeen responses were collected - making for a response rate of 1.89%. All collected surveys were from rural markets, with a total of four markets contributing to the survey.

Demographics

Analysis of the survey data showed that 14 out of 17 respondents were female (82.35%) and three out of 17 were male (17.65%). Given the interval nature of the data, a precise average age could not be calculated. However, 5 of 17 respondents were between 26 and 35 years of age (29.41%), 4 of 17 respondents were between 36 and 49 years of age (23.53%), and 7 of 17 respondents were between 50-65 years of age (41.18%). There were no respondents younger than age 25.

A total of 15 of 17 respondents were Caucasian (88.24%). Other reported races/ethnicities included Asian/Pacific Islander (n=1; 5.88%) and Other/Multi-Racial (n=1; 5.88%). None of the respondents reported Black/African American, Hispanic/Latino, or Native American/Alaska Native race/ethnicity.

Variable	Count	Percent
Location		
Urban	0	0.00%
Rural	17	100.00%
Gender		
Male	3	17.65%
Female	14	82.35%
Other	0	0.00%
Prefer not to say	0	0.00%
Age		
18-25	0	0.00%
26-35	5	29.41%
36-49	4	23.53%
50-65	7	41.18%
>65	1	5.88%
Prefer not to say	0	0.00%
Ethnicity		
Asian/Pacific Islander	1	5.88%
Black/African American	0	0.00%
Caucasian	15	88.24%
Hispanic/Latino	0	0.00%
Native American/Alaska Native	0	0.00%
Other/Multi-Racial	1	5.88%
Prefer not to say	0	0.00%

Table 1. Demographic information. Table outlining the demographic information of survey respondents, drawn from the responses to survey questions 1, 11, 12, and 13.

Data Analysis

Spatial-Temporal Factors Pertaining to FM/Market Bucks Use. Participants were asked to select "How far did you travel (miles) to get to the farmers market today?" Options included "0-2 miles," "3-5 miles," "6-10 miles," "11-15 miles," "16-20 miles," and ">20 miles." Eight of seventeen respondents (47.06%) selected "0-2 miles". Five of seventeen respondents (29.41%) selected "3-5 miles." Three of seventeen (17.65%) and one of seventeen (5.88%) selected "6-10 miles" and "11-15 miles," respectively. No participants traveled more than 15 miles to attend the FM. The median selection was "3-5 miles."

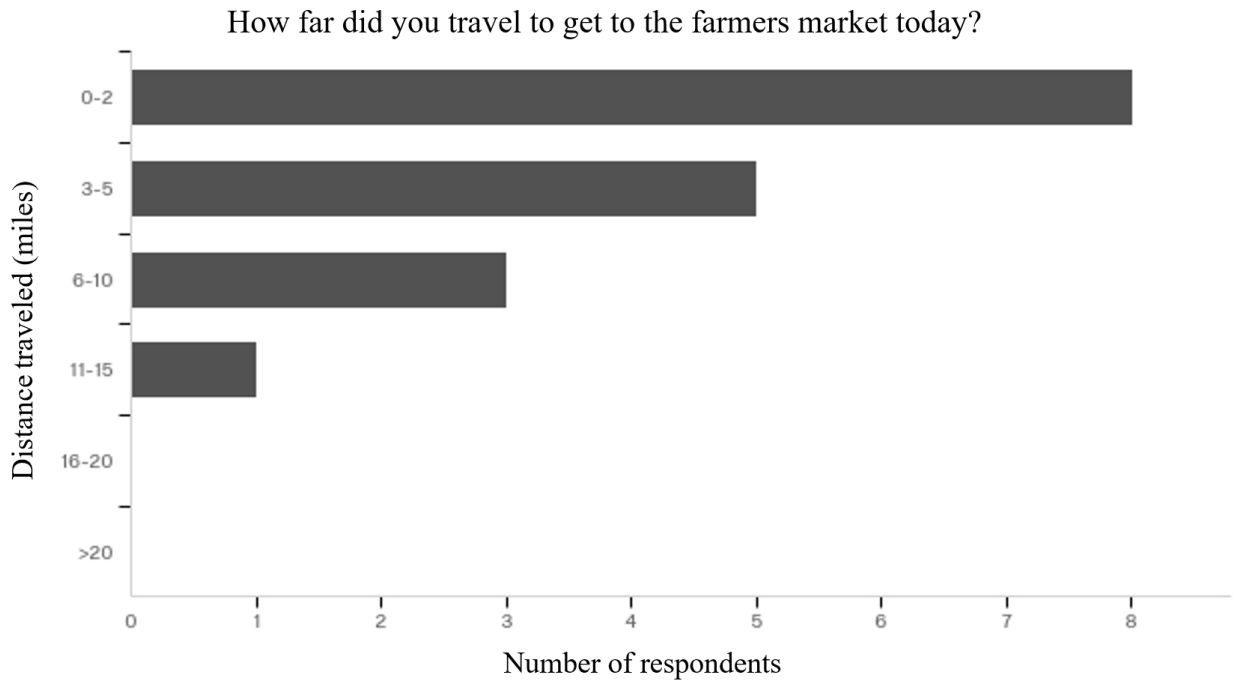

Figure 1. Survey question 2. Graph depicting the distance the survey respondents traveled to get to the farmers market where they took the survey.

Participants were asked to select "What is the furthest you would travel (miles) to get to a farmers market that uses Market Bucks?" Options included "0-2 miles," "3-5 miles," "6-10 miles," "11-15 miles," "16-20 miles," and ">20 miles." One of seventeen participants selected "0-2 miles" (5.88%). Six of seventeen participants selected "3-5 miles" (35.29%). Three of seventeen participants selected "6-10 miles" (17.65%). Six of seventeen participants selected "11-15 miles" (35.29%). No participants indicated they would travel greater than 20 miles to get to a Market Bucks participating FM. The median selection was "6-10 miles."

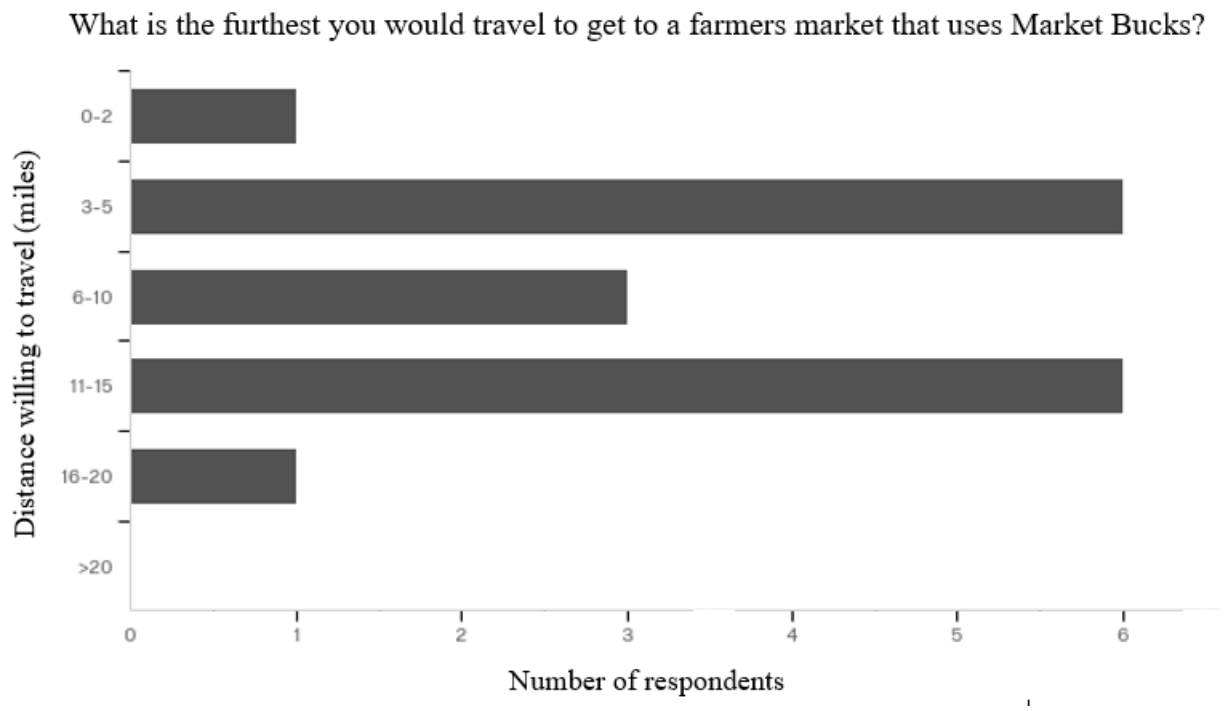

Figure 2. Survey question 4. Graph depicting the furthest distance survey respondents would be willing to travel to get to a farmers market that uses Market Bucks.

Frequency of FM/Market Bucks Use. Participants were asked to select "How many times have you shopped at a farmers market in the last year?" Options included "0," "1," "2,", "3-4," "5-6," and ">6." All seventeen respondents indicated they had attended a FM at least twice within the last year. Two of seventeen selected they had attended a FM "2" times within the last year (11.76%). Three of seventeen reported attending a FM "3-4" times within the last year (17.65%). Twelve of seventeen respondents (70.59%) indicated they had attended FMs ">6" times within the last year. The median selected response was ">6."

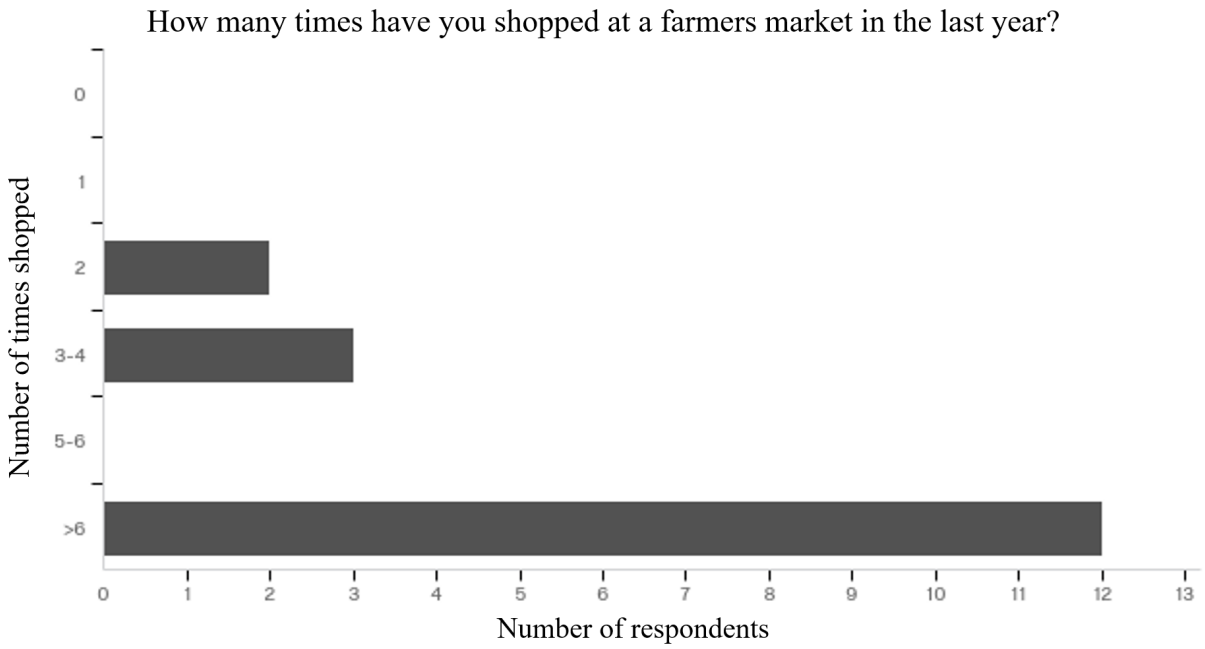

Figure 3. Survey question 3. Graph depicting the number of times survey respondents had shopped at a farmers market in the last year.

Participants were asked to select "How many times have you used Market Bucks within the last year?" Sixteen of seventeen respondents selected an answer to the question. Options included "1," "2,", "3-4," "5-6," and ">6." One respondent indicated they had used Market Bucks "1" time within the last year (6.25%). One respondent indicated they had used Market Bucks "2" times within the last year (6.25%). Four of sixteen respondents indicated they had used Market Bucks "3-4" times within the last year (25%). Ten of sixteen respondents indicated they had used Market Bucks ">6" times within the last year (62.5%). The median selected response was ">6."

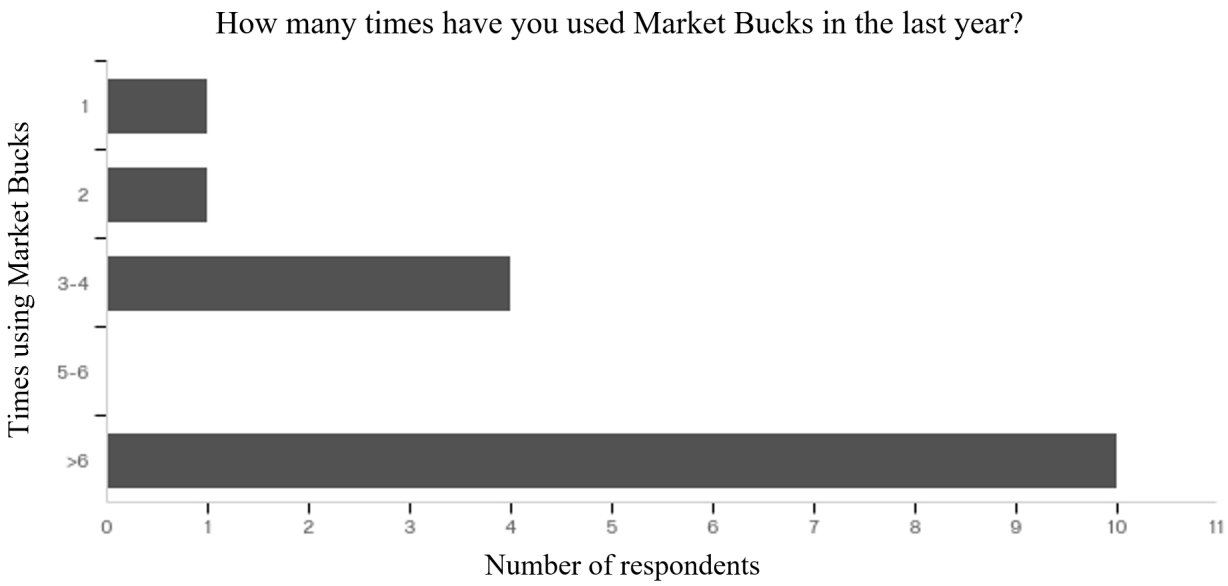

Figure 4. Survey question 5. Graph depicting the number of times survey respondents had used Market Bucks in the last year.

Pros and Cons of Farmers Market Use. Question 6 asked participants "Why do you enjoy shopping at farmers markets?" Participants were able to select any/all options that applied and had the additional option to write in responses. The most frequently selected responses included "the food/items available" (n=15, 31.25%) and "the community" (n=11, 22.92%). Nine of seventeen respondents indicated they enjoy "the prices/value" and "the convenience" (18.75%). Two respondents wrote in a variation of the "quality of the food" (n=2, 4.17%), and two respondents wrote in a variation of "supporting local business" (n=2, 4.17%).

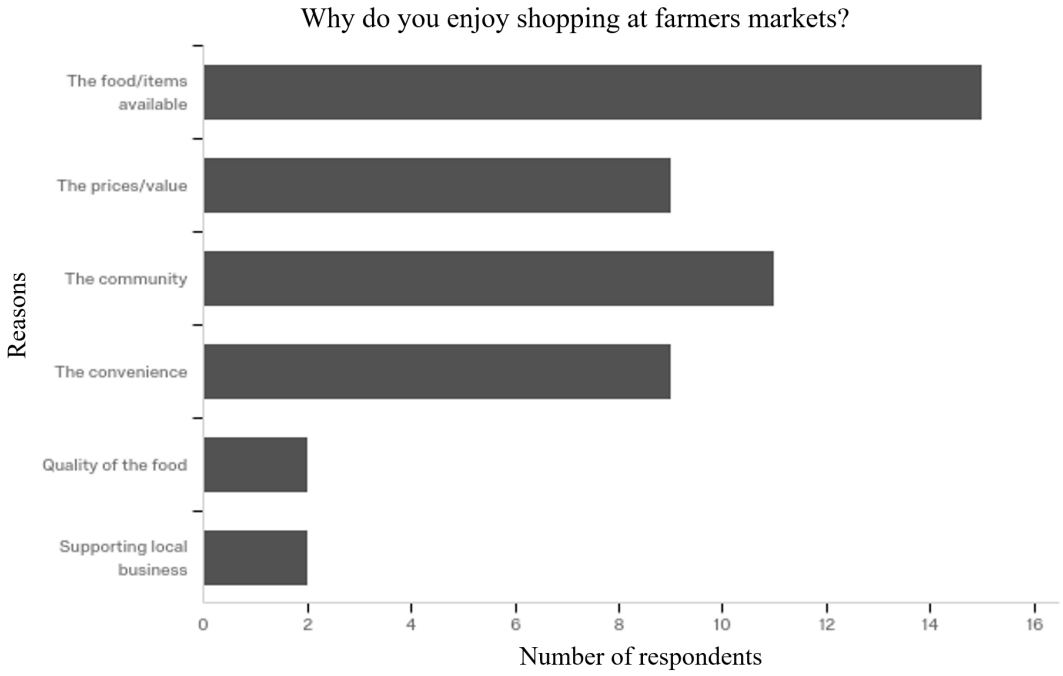

Figure 5. Survey question 6. Graph depicting the reasons survey respondents enjoy shopping at farmers markets. This question prompted respondents to select all answers that apply, and had an option to write in answers. Quality of the food and supporting local business were both answers written in by respondents.

Question 7 asked participants "What do you not enjoy about shopping at farmers markets?" Participants were able to select any/all options that applied and had the additional option to write in responses. The most frequently selected responses included "more expensive than a grocery store or supermarket" (n=5, 22.73%), "not as many options as a grocery store or supermarket" (n=3, 13.64%). Other recorded responses included "less convenient than a grocery store or supermarket" (n=2, 9.09%), "don't know how to prepare the fruits and/or vegetables" (n=1, 4.55%), and "live too far away" (n=1, 4.55%). One respondent wrote in "too many people" (n=1, 4.55%). Nine of seventeen respondents indicated none of the pre-written options applied to their feelings regarding farmers markets (n=9, 40.91%).

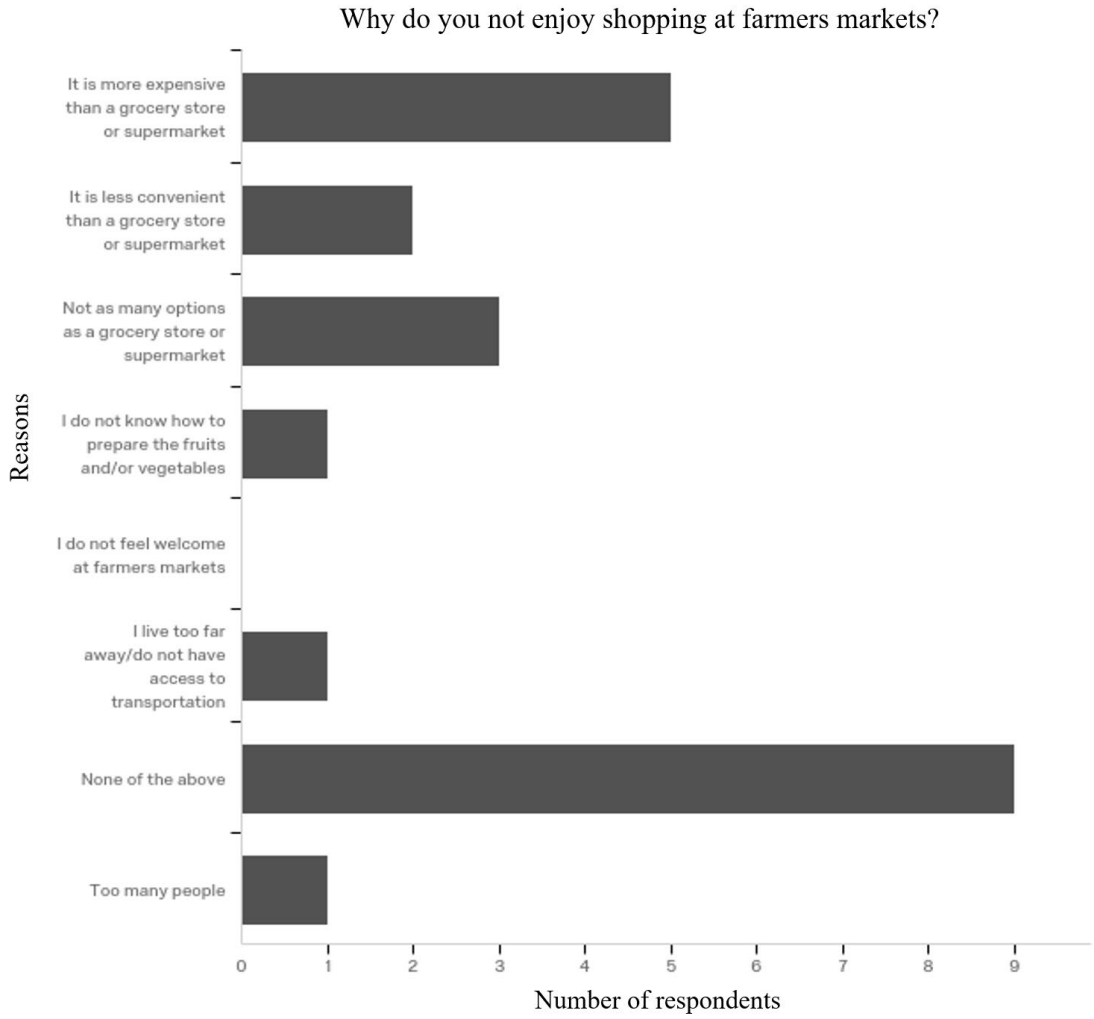

Figure 6. Survey question 7. Graph depicting the reasons why survey respondents do not enjoy shopping at farmers markets. This question prompted respondents to select all answers that apply, and had an option to write in answers. "Too many people" was an answer written in by a respondent.

Market Bucks and Its Perceptions. For question 8, participants were asked "How/where did you first learn about the Market Bucks program?" Participants were given the option to select from a list of provided options or could write in their own response. Six of seventeen respondents reported first hearing of Market Bucks through the Minnesota Department of Human Services/SNAP (35.29%). Four of seventeen indicated their first exposure was via "someone at a farmers market" (23.53%). Other responses included "from a place in [the] community" (n=2, 11.76%), "from a friend or relative" (n=1, 5.88%), from a "flyer, poster, sign"

(n=1, 5.88%). Two of seventeen respondents wrote in that they could not remember their initial exposure (n=2, 11.76%). One respondent wrote in that they first learned about Market Bucks from a food shelf (n=1, 5.88%). No respondents reported hearing about Market Bucks through Hunger Solutions Minnesota or an internet source.

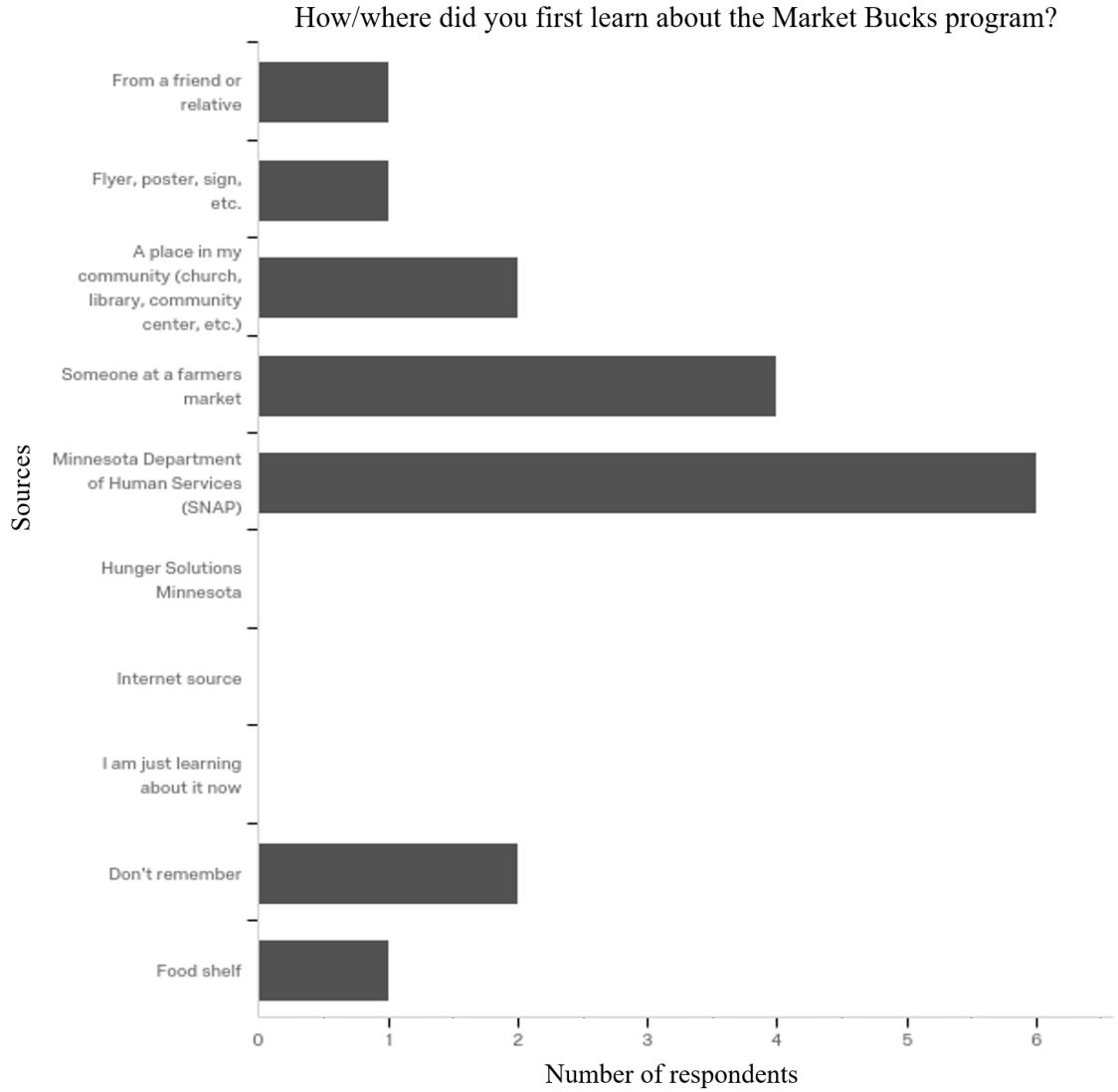

Figure 7. Survey question 8. Graph depicting the information sources from where survey respondents first learned about the Market Bucks program. This question had an option to write in answers. Don't remember and food shelf were both answers written in by respondents.

Question 9 asked "If you have not used Market Bucks before, what is/are the reason(s)?" Participants were able to select any/all options that applied and had the additional option to write

in responses. All seventeen respondents either left this question blank or selected "none of the above," indicating that they had all used Market Bucks before.

For question 10, participants were asked to select "What would make you more likely to use Market Bucks?" Participants were able to select any/all options that applied and had the additional option to write in responses. The most frequently recorded responses included "instructional material for preparing fruits and/or vegetables" (n=4, 21.05%) and "more/better advertising of the program" (n=3, 15.79%). Other responses included "more/better instructions on how the program works" (n=2, 10.53%), and "free/reduced transportation to farmers markets (n=2, 10.53%). One respondent wrote in "market being open longer" (n=1, 5.26%). Seven of seventeen respondents indicated none of the options pertained to their feelings regarding Market Bucks (n=7, 36.84%).

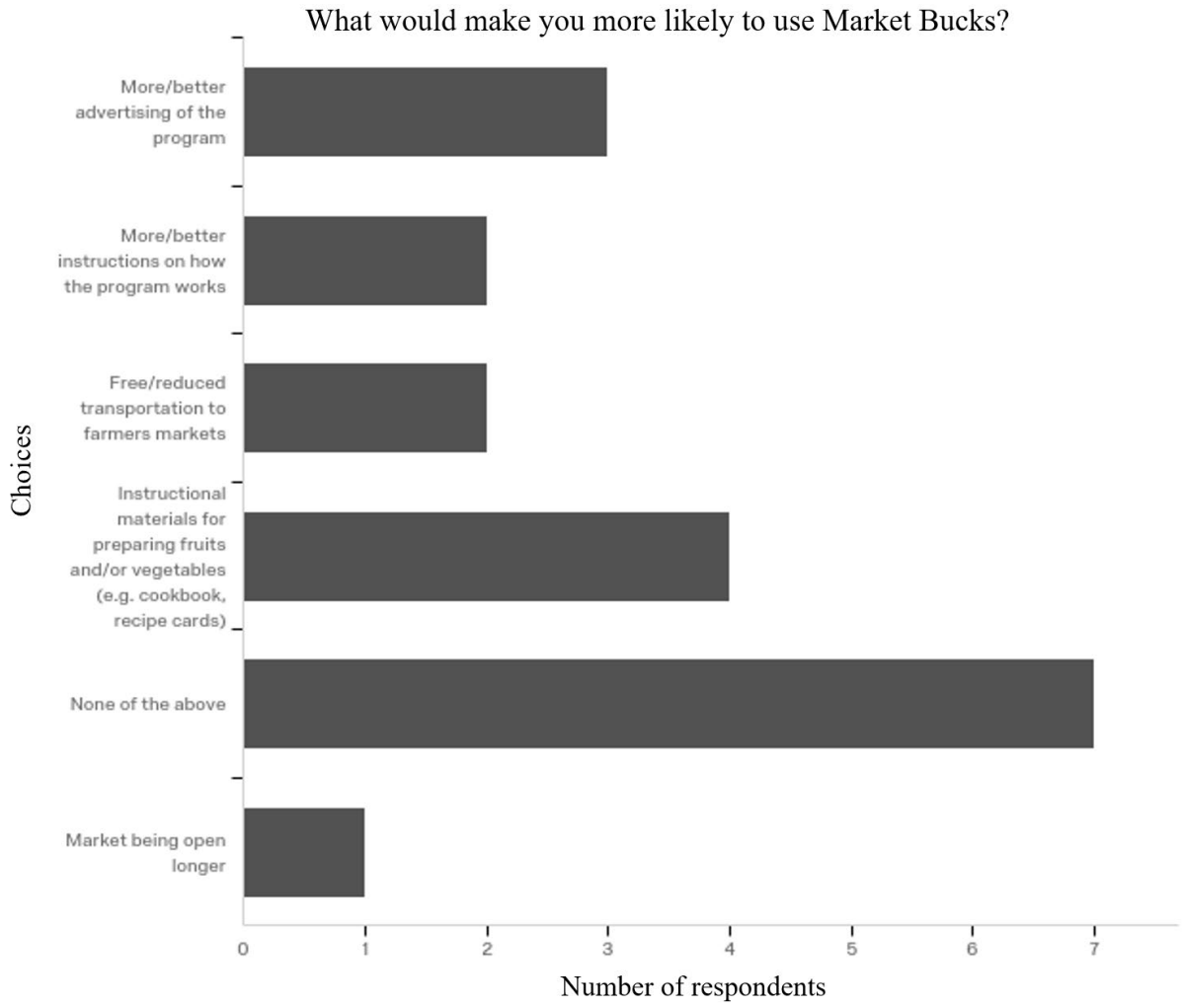

Figure 8. Survey question 10. Graph depicting possible reasons survey respondents would be more likely to use Market Bucks. This question prompted respondents to select all answers that apply, and had an option to write in answers. Market being open longer was written in by a respondent.

Conclusion

In summary, survey data was analyzed to assess for demographic trends, temporal trends, and benefits and drawbacks pertaining to FM and Market Bucks use. A descriptive analysis was performed using Qualtrics survey software and was confirmed using Microsoft Excel. The following chapter, Chapter 5, provides a discussion of the results, limitations/delimitations of this project, and recommendations for future research.

Chapter 5: Discussion

Introduction

This original research attempted to determine the reason(s) for the decline in the Market Bucks program usage among rural FMs in Minnesota. This chapter will discuss the summary of the results as they relate to these research questions, and how these results relate to the literature review outlined in Chapter 2. The limitations of this study as outlined in Chapter 3, as well as new limitations discovered during the research process, will be discussed in this chapter. Finally, conclusions determined from data analysis performed in Chapter 4 will be outlined, along with recommendations for further research related to this topic.

Summary of Results

Research Question Restated. The research group sought to answer two main research questions related to the reduced usage of the Market Bucks program at rural FMs in Minnesota. The primary research question sought to determine the potential demographic, physical, and psychosocial factors that may be impacting Market Bucks usage. The secondary research questions sought to suggest potential solutions to improve Market Bucks usage based on the results/conclusions of the primary research question. Ultimately, the research group sought to determine the reason(s) for the reduced usage of the Market Bucks program at rural FMs and what improvements could be made by Hunger Solutions and individual FMs to counteract/reverse this trend in the future.

Summary of findings given for each research question with related literature review. Due to both the anticipated and unanticipated limitations of the survey process (discussed below), the research team only received 17 surveys back. With a statistically insignificant response rate of 1.89%, it was not possible to draw any statistically significant

conclusions that would be representative of the study's target population. The surveys returned were analyzed regardless, in an attempt to answer the research questions. The researchers were able to make some inferences and implications based on the responses, but again, due to the limited sample size they cannot be taken for anything more than inference and speculation.

Demographics Questions. While the original intention of this study was to compare the use of Market Bucks in rural and urban FMs, all surveys returned to the researchers were completed at rural FMs. As a result, comparisons between urban and rural FMs/customers were unable to be made, and any inferences made based on the responses only apply to rural FMs/customers. Looking at the responses to the demographic questions on the survey, it would appear most SNAP participants shopping at FMs are Caucasian women between the ages of 26 and 65 years. Demographic groups that were either not well represented or completely lacking in the responses included men, people ages 18-25 years and older than 65 years, and all races/ethnicities other than Caucasians. Trying to attract SNAP participants that fall into these underrepresented categories may be one method to increase Market Bucks utilization at rural FMs. Conversely, attempting to attract SNAP participants that fall within the well-represented categories may provide an opportunity to increase Market Bucks usage as well.

While the limited data of this research found the average survey respondent and SNAP user to be a Caucasian female between the age of 26 and 65 years, other research on the risk factors for food insecurity and SNAP eligibility paints a different demographic picture. In comparison, previous research found black and Hispanic households of all ages had higher incidences of food insecurity (Coleman-Jensen et al., 2018; Goldberg & Mawn, 2014). Furthermore, households with a single caregiver and/or children, as well as lower education and/or nutritional literacy levels also had higher incidences of food insecurity (Chang, Kim, &

Chatterjee, 2017; Coleman-Jensen et al., 2018; Goldberg & Mawn, 2014). In addition, research has shown those with higher food insecurity also suffer from increased risk of poorer health including chronic disease and mobility impairments (Bishop & Wang, 2018; Crews et al., 2014; Saiz et al., 2016; Seligman et al., 2009). However, in order to protect the privacy of the respondents and encourage participation the research team of this study did not ask questions related to household status, education/literacy, and health as discussed above. These are questions and areas that could be explored in future research.

Physical/Spatial-Temporal Questions. Prior to completing the surveys, the research team had hypothesized the location of FMs, distance from SNAP participants, and transportation would be important determinants of Market Bucks usage, especially in the rural areas. The results of the surveys showed nearly three quarters of respondents traveled five miles or less to get to the FM where they completed the survey, and almost half traveled two miles or less. Interestingly though, nearly 60% of respondents indicated they would be willing to travel further than five miles to get to a FM that used Market Bucks. Based on the responses to these questions, it seems most SNAP participants live near the FM they shop at, but a majority would be willing to travel further if it meant they could use Market Bucks. Focusing efforts on attracting SNAP participants living within a five-mile radius of the FM would likely yield more Market Bucks customers. In addition, attracting participants that live greater than five miles away may be worthwhile; however, there appears to be diminishing returns as the distance approaches 15 miles and beyond based on the surveys received.

Although the limited data of this study found the majority of respondents travel five miles or less to the FM, the majority of respondents would also be willing to travel more than five miles (but less than 15 miles) to the FM. This finding somewhat contradicts other research –

which suggests location and transportation as common barriers to the use of FMs (Freedman et al., 2018). However, this is to be expected since this research team was only able to survey those who were both aware of and attended the FM, and not those that were unable to due to the location and transportation barriers found in other research. Furthermore, the research team received feedback from two respondents who indicated free/reduced transportation to the FM would increase their usage in the future. Offering free public transportation directly to the FM and placing the FM close to public transportation routes has been suggested by others as a potential solution to this challenge (Freedman et al., 2018; USDA FNS, 2017a).

Psychosocial Questions. A number of survey questions were designed by the research team to determine the variety of psychosocial factors that may positively or negatively influence usage of the Market Bucks program. From the question related to how often the respondent shopped at a FM in the past year, the median response, with more than 70% of respondents selecting it, was greater than six times. A similar result was found when asked how often the respondent used Market Bucks in the past year, with greater than 60% of respondents and the median response being "greater than six times". From these results an inference could be made that once SNAP users shop at a FM and use Market Bucks they are more likely to continue to do so. With this in mind, focusing efforts on attracting SNAP users new to the FM and Market Bucks, and encouraging current users to spread the word about the program could help to attract new customers.

While the limited data of this study found the majority of respondents utilized the FM and Market Bucks greater than six times over the course of a year, other research found the average respondent utilized the FM and similar incentive program less than two times, and

almost 70% had only one transaction (Cohen et al., 2018). Again, the data is likely inherently skewed due to the fact that the survey population was SNAP participants that do shop at FMs.

Another pair of survey questions sought to better understand the pros and cons of FMs to better understand what factors may attract and repel SNAP users. When asked about the pros of FMs, the most frequent answers were related to the food/items available followed by the community, and then the prices/value and convenience. Less than five percent of respondents felt the quality of the food and supporting local businesses were benefits. Interestingly in comparison, when asked about the cons, similar answers to the pros were most frequently chosen. The most common cons of FMs when compared to grocery stores and supermarkets were increased cost, followed by fewer options, and less convenience. Less than five percent of respondents reported not knowing how to prepare food/items, distance from the FM, and too many people as being obstacles of using the FM. Even though the results of these questions appear to be somewhat conflicting, there may be an opportunity to focus efforts on the food/items available, prices/value, and convenience that could both strengthen the opinions of users who see these factors as pros, and educate users who see these factors as cons.

Previous research by Freedman et al. (2018) found some SNAP participants to perceive F/V available at the FM to be higher priced and of lower quality compared to the local grocery store or supermarket, while others perceived the prices and quality to be better. The same perception was prevalent within the limited data of this research as well. Respondents in both the research by Freedman et al. (2018) and by this research team, also indicated a lack of confidence in preparing food/items purchased at the FM as a barrier to use. Freedman et al. (2018) and Wetherill et al. (2017) also found those who had knowledge about food preparation were three times more likely to utilize the FM and incentive programs.

Additionally, three survey questions sought to better understand the marketing and perceptions of the Market Bucks program. With regards to marketing and where participants first learned about Market Bucks, over a third of respondents indicated the Minnesota Department of Human Services/SNAP, and almost a quarter of respondents indicated someone at the FM. Less common responses indicated the community, a friend/relative, flyer/poster/sign, or food shelf. Of interest, no respondent reported hearing about Market Bucks from Hunger Solutions Minnesota or an internet source. Furthermore, all respondents had used Market Bucks prior to completing the survey, and the majority indicated there wasn't anything that would make them more likely to use Market Bucks. That said, the most frequent responses for what would make them more likely to use Market Bucks were instructions for preparing food/items, followed by improved advertising and instructions about the program, and transportation assistance to the FM. With these results in mind, there appears to be opportunity for improved marketing and informational instructions related to both the Market Bucks program, as well as how to prepare the food/items purchased through the program at the FM. There also appears to be a possible disconnect between Hunger Solutions Minnesota and the SNAP users they serve as none of the respondents had heard about Market Bucks from the organization. Furthermore, while there may be a variety of reasons why SNAP users did not hear about Market Bucks via internet sources that are beyond the scope of this research, this is a potentially untapped and/or overlooked avenue for marketing and connection in the future.

Lack of awareness and effective advertising of FMs and incentive programs such as Market Bucks among SNAP participants has been found by other research as a major barrier for usage (Amaro & Roberts, 2017; Freedman et al., 2018). Previous research has suggested increased visual representations of the value of the FM and incentive program could be added to

a variety of locations such as: food banks, public aid offices, places of worship, schools, public transportation centers, community centers, and health centers (Cohen et al., 2017; McGuirt et al., 2014; USDA FNS, 2017a). The limited data analyzed by this research team supports this conclusion as these are all locations where respondents first learned about the Market Bucks program.

Finally, while they did not come directly from the survey data, the research team was made aware of a few additional insights and anecdotes in a hand-written note returned with the surveys by the manager of a rural FM. She said the survey "started some interesting conversations with customers" (J. Joyce, personal communication, August 14, 2019). She learned that "our common customers using their EBT benefit to shop are happy with the $10 Market Bucks bonus" (J. Joyce, personal communication, August 14, 2019). From this comment, it appears that SNAP participants that use Market Bucks recognized and appreciated they are able to get more with their money. One customer "told an unsettling story about receiving a cold shoulder/stigma from our vendors" (J. Joyce, personal communication, August 14, 2019). While the sense of community was one of the most frequently reported reasons why participants enjoy shopping at FMs and nobody reported not feeling welcome at FMs on the surveys, this comment clearly suggests some SNAP participants have encountered stigmas at FMs. Another customer "shared a dilemma about being homeless and needing foods that are ready to eat" (J. Joyce, personal communication, August 14, 2019). From this comment, it may be inferred that some SNAP participants do not have the means available to prepare the foods sold at FMs, which may be a contributing factor in regard to low Market Bucks utilization. The anecdotes relayed in this note from the FM manager highlight the fact that there is clearly more at play than the small number of surveys received revealed.

Limitations

Several limitations of this research were outlined in Chapter 3 prior to the collection of the surveys and analysis of the data received. Among these limitations were spatial-temporal factors, willingness of individual FM participation, current low Market Bucks participation in rural areas, and accessibility of the specific population of interest. The spatial-temporal factors were related to the remote location of the research team in relation to rural FMs primarily being studied. Due to the distance between the research team and the rural FMs the success of the survey administration relied heavily/ultimately on the individual rural FMs. Related to the spatial-temporal factors was the willingness and ability of the individual rural FMs to participate and administer and return the surveys. In addition, the rural FMs have a historically low Market Bucks participation, thus obtaining a sufficient sample size was suspected to be a challenge from the start. Finally, due to the protective nature of the specific study population of interest – SNAP users who do not shop at FMs – the research group had to rely on obtaining data from the next closest population, SNAP users who do shop at FMs.

While the research team anticipated the potential for a small sample size related to the limitations discussed in Chapter 3 and above, less attention was initially paid to the limitation of how the surveys were distributed to and received from individual FMs. Given the extremely small and statistically insignificant response rate of 1.89%, a new limitation was a much smaller sample size than anticipated. Another new limitation was only receiving surveys from rural FMs, making the comparison between urban and rural FMs impossible. Related to these limitations was the new limitation of reliance on physical mailing of the surveys for distribution and administration by the FMs, as well as return of the surveys to the research team for data analysis. These new limitations appear to have played a more important role than expected, as

the research team was ultimately unable to conduct a meaningful data analysis or draw any statistically significant conclusions.

Further Research

The findings of this original research suggest multiple recommendations for further research on this topic and/or with the Market Bucks program and Hunger Solutions.

First, as previously discussed in the limitations, spatial-temporal factors appear to have been a significant limitation to obtaining a statistically significant sample size. With this in mind, an alternative to the widely distributed approach this research design took, would be to focus on a small number of representative rural and urban FMs to compare. By including a small number of FMs this could give future researchers the opportunity to administer the surveys in person and have greater control over the data collection. Obviously, this would require a significant time and financial (i.e. travel) commitment by future researchers.

Second, due to the difficulty of obtaining data from the exact population of interest (i.e. SNAP users who do not shop at FMs), instead of focusing on SNAP users who do shop at FMs as this research did, the FM managers could be studied. FM managers could be a group of interest as they are the ones in charge of overseeing the Market Bucks program at their individual FM, and could potentially provide insight related to the strengths and challenges of the Market Bucks program. In addition, FM managers could provide examples of what they have tried to increase usage of Market Bucks, including what has worked and not worked well, along with additional ideas they are interested in implementing in the future.

Finally, the research team recommends simplifying the data collection process for further research. The primary recommendation related to data collection simplification is utilizing electronic collection. As discussed in Chapter 3, there were multiple reasons for the research

team choosing to collect data in paper form, however this may have been a leading factor for such a low response rate. Given the recommendations above for focusing on a small number of representative FMs or the individual FM managers for further research, these would provide ample opportunity to utilize electronic data collection and hopefully a more statistically significant sample size.

Following completion of the project, these recommendations – in addition to the data collected during the research project – were shared with Hunger Solutions.

Conclusion

The goal of this original research was two-fold; first, to determine the reason(s) for the decrease in Market Bucks usage among rural FMs in Minnesota, and second, to make recommendations to Hunger Solutions Minnesota for improvement. Unfortunately, due to a statistically insignificant response rate of 1.89%, no statistically significant conclusions could be made that would be representative of the study's target population. However, based on the data collected and analyzed, the research team attempted to draw possible connections and inferences to hopefully help Hunger Solutions Minnesota and guide further research. With this in mind, the research team recommends further investigation and actions towards determining and implementing strategies to retain current users and attract new users, combatting and correcting real and perceived barriers to FM use, building upon the strengths of the Market Bucks program, and improving upon its weaknesses. The Market Bucks program has proven to be consistently successful at urban Minnesota FMs, but continues to be under-utilized at rural markets. Hopefully, with further research and action, the untapped potential of the Market Bucks program can be translated into greater food security for low-income residents across Minnesota.

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APPENDIX A

Written Survey

1. **What *farmers market* are you at today? Please specify:**_____

2. **How far did you travel to get to the *farmers market* today?**
   - ☐ 0-2 miles
   - ☐ 3-5 miles
   - ☐ 6-10 miles
   - ☐ 11-15 miles
   - ☐ 16-20 miles
   - ☐ >20 miles

3. **How many times have you shopped at a *farmers market* in the last year?**
   - ☐ 0
   - ☐ 1
   - ☐ 2
   - ☐ 3-4
   - ☐ 5-6
   - ☐ >6

4. **What is the furthest you would travel to get to a farmers market that uses *Market Bucks*?**
   - ☐ 0-2 miles
   - ☐ 3-5 miles
   - ☐ 6-10 miles
   - ☐ 11-15 miles
   - ☐ 16-20 miles
   - ☐ >20 miles

5. **How many times have you used *Market Bucks* in the last year?**
   - ☐ 1
   - ☐ 2
   - ☐ 3-4
   - ☐ 5-6
   - ☐ >6

6. **Why do you enjoy shopping at *farmers markets*? (Select all that apply)**
   - ☐ The food/items available
   - ☐ The prices/value
   - ☐ The community
   - ☐ The convenience
   - ☐ Other (please specify):
     _____
     _____

7. **Why do you not enjoy shopping at *farmers markets*? (Select all that apply)**
   - ☐ It is more expensive than a grocery store or supermarket
   - ☐ It is less convenient than a grocery store or supermarket
   - ☐ Not as many options as a grocery store or supermarket
   - ☐ I do not know how to prepare the fruits and/or vegetables
   - ☐ I do not feel welcome at farmers markets
   - ☐ I live too far away/do not have access to transportation
   - ☐ None of the above
   - ☐ Other (please specify):
     _____
     _____

8. **How/where did you first learn about the *Market Bucks* program?**
   - ☐ From a friend or relative
   - ☐ Flyer, poster, sign, etc.
   - ☐ A place in my community (church, library, community center, etc.)
   - ☐ Someone at a farmers market
   - ☐ Minnesota Department of Human Services (SNAP)
   - ☐ Hunger Solutions Minnesota
   - ☐ Internet source
   - ☐ I am just learning about it now
   - ☐ Other (please specify):
     _____
     _____

9. **If you have not used *Market Bucks* before, what is/are the reason(s)? (Select all that apply)**
   - ☐ I have never heard of Market Bucks
   - ☐ I have heard of Market Bucks, but I did not know how it works
   - ☐ I do not want people to know I use SNAP
   - ☐ None of the above
   - ☐ Other (please specify):
     _____
     _____

10. **What would make you more likely to use *Market Bucks*? (Select all that apply)**
    - ☐ More/better advertising of the program
    - ☐ More/better instructions on how the program works
    - ☐ Free/reduced transportation to farmers markets
    - ☐ Instructional materials for preparing fruits and/or vegetables (e.g. cookbook, recipe cards)
    - ☐ Other (please specify):
      _____
      _____

11. **Please select your gender**:
    - ☐ Male
    - ☐ Female
    - ☐ Other
    - ☐ I'd prefer not to say

12. **Please select your age**:
    - ☐ 18-25
    - ☐ 26-35
    - ☐ 36-49
    - ☐ 50-65
    - ☐ >65
    - ☐ I'd prefer not to say

13. **Please select your ethnicity/race**:
    - ☐ Asian/Pacific Islander
    - ☐ Black/African American
    - ☐ Caucasian
    - ☐ Hispanic/Latino
    - ☐ Native American/Alaska Native
    - ☐ Other/Multi-Racial
    - ☐ I'd prefer not to say

APPENDIX B

Population Permission E-Mail

Rachel Holmes via hungersolutions.onmicrosoft.com Mon, Feb 4, 9:38 AM (3 days ago)

to me

On behalf of Hunger Solutions, I, Rachel Holmes, give permission to Bethel University Physician Assistant students Kollin Michels, Nicholas Reich, and Jeffrey Sandquist, to conduct their Master's research through Hunger Solutions with permission being granted for Market Bucks participants to be surveyed

Rachel Holmes
Special Projects Coordinator

555 Park Street, Suite 400
St. Paul, MN 55103

Direct: 651-789-9842

APPENDIX C

Instructions for Survey Distribution

Market Bucks Survey Instructions – For Market Managers/Volunteers:

***ATTENTION*: It is important that all participant information remains completely confidential. All market managers/vendors/volunteers who help with the survey process must read and sign the confidentiality agreement on the opposite side of this sheet. Thank you for your compliance.**

1. Upon arriving at the Market Bucks booth to obtain their Market Bucks, each SNAP participant meeting the criteria listed below should be asked if they would be willing to participate in a research survey. **Potential participants should be informed that the survey will have NO impact on their SNAP benefits and/or Market Bucks compensation** – regardless of if the survey is completed or not. The survey should take 5 minutes or less to complete.
   - Inclusion criteria:
     - Age 18 or older
     - SNAP eligible
     - Able to read and understand the English language (or with the assistance of someone able and willing to translate)
2. Upon verbally agreeing to participate in the survey, the Market Bucks user should be given an Informed Consent/Survey sheet. Instruct the participant to read the Informed Consent ("Side A") and check the box at the bottom of the form to provide consent. **NO personal information will be collected (i.e. the participant does NOT need to write their name or provide a signature).**
3. Once written consent (i.e. checking of the box) has been completed, the participant should flip to "Side B" and complete the 13-question survey to the best of their ability. **They may complete any or all of the survey and may stop at any time, for any reason.**
   a. **To maintain the privacy of the participant, allow them to complete the survey at a different, more discrete location (and then return it to you) if they do not feel comfortable filling it out in front of other people.**
4. Once the survey has been completed, the Market Bucks distributor (Market manager, etc.) should collect the survey. Collected surveys may be mailed to Hunger Solutions at the address listed below. Surveys may be mailed intermittently at your discretion (weekly, monthly, etc.). Along with the surveys, **please mail back this sheet**, as we need the signed confidentiality agreement on the opposite side. Pre-addressed pre-stamped envelopes have been enclosed for your convenience. **All surveys must be mailed back to Hunger Solutions by August 15th, 2019.**

   Mailing address:

   Hunger Solutions Minnesota – Attn: Rachel Holmes
   555 Park Street, Suite 400
   St. Paul, MN 55103

Thank you again for your willingness to help with the survey collection process. If you have any questions or concerns, please feel free to contact us.

Kollin Michels (Researcher) – (952) 217-9175
Nicholas Reich (Researcher) – (719) 963-0207
Jeffrey Sandquist (Researcher) – (651) 558-1578

APPENDIX D

Market Bucks Survey Flyer

Do you like Market Bucks? Want to help make it even better? Us too!

If you are a SNAP participant, please consider taking a short survey about the Market Bucks program. Your feedback will help Hunger Solutions make nutritious food more affordable for people across Minnesota.

Ask for more information!

APPENDIX E

Informed Consent

Informed Consent:

Dear Market Bucks user,

We are physician assistant students from Bethel University completing a research project as part of our degree. Our study is looking at the factors which impact the use of Market Bucks in urban versus rural areas.

On the next page, there is a short survey which will be used to collect our data. This will take about 5 minutes or less to complete. Any information obtained from this survey will remain confidential. The survey is anonymous, and no one will be identified or identifiable.

Once you finish the survey, it will be collected by Hunger Solutions and will be given to our research group to analyze. All of the information will be kept private – either in a locked cabinet or on a password-protected computer. The data will be shared with Hunger Solutions and will be used to help improve the Market Bucks program. After completion of the study, the data will be kept on an external storage device locked in the PA program office for at least five years.

Your participation is voluntary. If you decide not to participate, it will not affect your relationship with Bethel University or Hunger Solutions in any way. Completing or not completing the survey does not change the SNAP/Market Bucks benefits you receive. If you decide to participate, you may stop the survey at any time without consequences.

Privacy risk: No identifying information about you will be recorded, but there is a chance other people may see you filling out the survey. If you are not comfortable taking the survey in front of others, you may complete it in a different, more private area, and then return it to the market volunteer.

Sensitive information risk: This survey contains questions/answers about beliefs and/or opinions about farmers markets, Market Bucks, and food assistance that some participants may consider to be personal or sensitive. If you do not want to answer a certain question, you may skip that question, or stop the survey at any time without consequences. Again, participation in the survey is completely voluntary.

Please know your participation is vital to the success of this research, and we appreciate your time and help. If you have any questions/concerns, please contact:

Kollin Michels (Researcher) – (952) 217-9175
Nicholas Reich (Researcher) – (719) 963-0207
Jeffrey Sandquist (Researcher) – (651) 558-1578
Mary Michener (Research Chair) – (651) 635-8001

Thank you in advance for your participation.

Sincerely,

Kollin Michels, Nicholas Reich, and Jeffrey Sandquist

☐ **By checking this box**, you acknowledge that you have read the statement above and agree to participate. You may stop the survey at any time without consequences.