A retrospective evaluation of the Locally Grown Produce Initiative of New York State's Hunger Prevention and Nutrition Assistance Program

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A RETROSPECTIVE EVALUATION OF THE LOCALLY GROWN PRODUCE INITIATIVE OF NEW YORK STATE’S HUNGER PREVENTION AND NUTRITION ASSISTANCE PROGRAM

By

Marie Allsopp

A Dissertation
Submitted to the University at Albany, State University of New York in Partial Fulfillment of the Requirements for the Degree of Doctor of Public Health

School of Public Health
Department of Health Policy, Management, and Behavior
2015
A RETROSPECTIVE EVALUATION OF THE LOCALLY GROWN PRODUCE INITIATIVE OF NEW YORK STATE’S HUNGER PREVENTION AND NUTRITION ASSISTANCE PROGRAM

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Marie Allsopp

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Dedication

This dissertation is dedicated to my mother, Dr. Jeannette Allsopp. Mum, I will be forever grateful to you for everything you have done. You are a testament to the fact that there is power in having a praying mother!
Abstract

The Hunger Prevention and Nutrition Assistance Program (HPNAP) is administered by the Bureau of Nutrition Risk Reduction in the New York State Department of Health (NYSDOH). This program provides state funds to food banks, the United Way of New York City and other organizations within the emergency food network. Those organizations use HPNAP dollars to fund food and other resources for food pantries, soup kitchens and emergency shelters. In 2012, HPNAP received a one-time $2 million funding allocation for a Locally Grown Produce Initiative. This one-time stimulus to increase the proportion of state-grown fresh produce in emergency food relief services was specifically divided among eight regional food banks to make purchases between July 1, 2012 and June 30, 2013. This retrospective, non-equivalent control group study evaluated the short-term sustainability of the Locally Grown Produce Initiative. Dollar expenditures on New York State grown (NYSG) produce obtained from the NYSDOH’s Milk, Produce and Grain expenditure report were used as measures for this study. Non-parametric analyses were conducted on dollar expenditures on NYSG produce one year before and one year after the initiative. The control group consisted of non-food bank contractors that did not receive funding during the initiative. The findings demonstrate that the initiative was successful at increasing overall spending by contractors on NYSG produce one year after implementation. As expected, contractor type (food bank or non-food bank) significantly impacted spending on NYSG produce and the initiative was found to have had the most significant impact on food banks located upstate. Increasing access to locally grown fresh fruit and vegetables for patrons of emergency food programs is a feasible way to potentially improve health and reduce
risk of chronic disease in vulnerable populations. Further study is warranted to examine whether increased accessibility to NYSG produce leads to increased consumption. Hopefully the results of this study will encourage other states to adopt similar initiatives.
Chapter 1: Literature Review

Background – Poverty & Food Insecurity

Although June 2009 was declared as the end of the Great Recession according to official measures (The National Bureau of Economic Research Business Cycle Dating Committee, 2011), the effects of the weakened economy are still being felt across the United States (Bean, 2011). The U.S. poverty rate continued its upward trend in 2010, during which there were 46.2 million people living in poverty, rising to 15.1 percent from 14.3 percent in 2009 and 13.2 percent in 2008 (Nichols, 2011). The United States Census Bureau has a variety of money income thresholds that differ, based on family size and composition, to classify persons living in poverty (U.S Census Bureau, 2014). Any person or family whose total income is below 100 percent of the threshold is considered to be living in poverty (U.S Census Bureau, 2014). The official poverty definition includes the use of gross money income while excluding capital gains or noncash benefits, for example Medicaid or public housing (U.S Census Bureau, 2014). One component of poverty that has been on an overall upward trend between 1998 and 2013 is food insecurity (Coleman-Jensen, Gregory & Singh, 2014). Food insecurity is defined by Grosvenor & Smolin (2010) below as:

“A situation in which people lack adequate physical, social, or economic access to sufficient, safe, nutritious food that meets their dietary needs and food preferences for an active and healthy life.” (P. 761)

There are two types of food insecurity. Low food security consists of reports of reduced quality, variety, or desirability of diet with little or no indication of reduced food intake (USDA Economic Research Service, September 3, 2014). Very low food security
consists of reports of multiple indications of disrupted eating patterns and reduced food intake (USDA Economic Research Service, September 3, 2014). The United States Department of Agriculture (USDA) collects information yearly from Americans on adequacy of and access to food, money spent on food, and sources of food assistance. The information is collected from the Current Population Survey (CPS) in an annual food security survey (that is nationally representative), conducted by the U.S. Census Bureau (Coleman-Jensen, Gregory & Singh, 2014). This 18-question survey tool (Appendix A) measures traits associated with the level of food insecurity in households over the past 12 months. According to the scoring system, households are considered food secure if respondents confirm under three scale items, food insecure if three to seven items are confirmed, and severely food insecure if eight or more items are confirmed (Lee, Gundersen, Cook, Laraia & Johnson, 2012). African-Americans, Hispanics, single persons, divorced or separated persons, those who rent, and younger people and those with low levels of education have a higher likelihood of being food insecure than their peers (Coleman-Jensen, Nord, Andrews, & Carlson, 2011).

Food insecurity is inversely related to income (Gunderson, 2013), where, in 2013, incomes were close to or under the federal poverty level (FPL), rates of food insecurity were considerably higher at 38.4 percent compared to the U.S. average of 14.3 percent (Coleman-Jensen, Gregory, Singh, 2014).

considerably higher than the national average for households with incomes below 100 percent of the FPL. Many persons of low socioeconomic status often find themselves stuck in a vicious cycle of poverty (Figure 1), and therefore usually find it difficult to maintain healthy eating habits as a result of numerous factors (Gittelsohn et al., 2008).

The evolution of the U.S. economy, from manufacturing to service-based, has led to the closure of several factories and as a result manufacturing facilities have relocated to foreign countries where labor costs are lower. Former employees habitually do not have the experience or education to transition into different types of jobs. Consequently, they must work longer hours at lower-paying jobs because they are not able to obtain well-paying lines of work. Low wages limit access to child care and transportation, which in turn reduces access to superior jobs. One disadvantage is that any additional education or training needed to obtain better-paying jobs is not possible because of long work hours. Another disadvantage of inadequate income is that it prevents relocation to areas where there are opportunities for higher paying jobs.

![Figure 1. A cycle of poverty that leads to food insecurity. Adapted from Nutrition: Science & Applications, 2nd Ed., p. 778, by M.B. Grosvenor & L.A. Smolin, 2010. Copyright 2010 by John Wiley & Sons Ltd. Adapted with permission.](image-url)
Living in urban areas is associated with difficulty in obtaining healthy foods to eat (USDA Food and Nutrition Service, 2014) because many inner-city, low-income families do not have a vehicle (Grosvenor & Smolin, 2010). Consequently, they are forced to buy groceries at small, expensive corner stores or pay taxi fares in order to access less expensive foods at larger stores further away. Living in rural areas (Ploeg et al., 2009) is also a factor resulting in difficulty in obtaining healthy foods, for example, migrant workers often lack access to food because labor camps are in far-off locations and transportation is often inaccessible (Grosvenor & Smolin, 2010). Those in both rural and urban areas, who are without permanent homes, are vulnerable to food insecurity (Grosvenor & Smolin, 2010).

Another factor leading to food insecurity is that the high cost of housing has lowered food budgets and has also produced a mounting problem of homelessness nationwide (Grosvenor & Smolin, 2010). Based on recent estimates, 610,042 persons were homeless in America on a given night in January 2013 (Solari et al., 2014). The homeless are at high risk not only for food insecurity but also for malnutrition, because of limited finances, cooking facilities and safe places to store food (Grosvenor & Smolin, 2010).

Furthermore, lack of education, a part of the cycle of poverty, also contributes to food insecurity. In the short run, inadequate knowledge about food selection and food safety can play a role in the development of malnutrition (Grosvenor & Smolin, 2010). In the long run, lack of education hinders people from attaining well-paying jobs, which would enable them to get out of poverty (Grosvenor & Smolin, 2010).
Health Impacts of Food Insecurity

Food insecurity is at an all-time high in the United States because rates have not gone back down to the pre-recession levels of 2007 (Gunderson, 2013). In 2010, 17.2 million U.S. households were determined to be food insecure, with 5.4 percent of them categorized as having “very low food security” (Coleman-Jensen, Nord, Andrews, & Carlson, 2011). In fact, food insecurity is the leading nutrition-related public health problem connected with reduced food consumption or hunger because households lack sufficient means to obtain food (Lee, Gundersen, Cook, Laraia & Johnson, 2012). There is a two-fold reason for concern with regard to this issue. First of all, it is because of the sheer magnitude and multi-factorial nature of the problem across the country (Gundersen, 2013). Second of all, it is because food insecurity has many negative health consequences, contributing to higher risk of chronic disease (Gundersen, 2013), anxiety and psychological stress (Laraia, Siega-Riz, Gundersen & Dole, 2006; Perez-Escamilla & Pinheiro de Toledo Vianna, 2012).

Adults

With regard to chronic disease, food insecurity may increase the risk of developing type 2 diabetes (Seligman, Bindman, Vittinghoff, Kanaya, & Kushel, 2007). Seligman et al. (2007) conducted a cross-sectional study analyzing data from the National Health and Nutrition Examination Survey, 1999-2000 and 2001-2002, to investigate the relationship between food insecurity and diabetes in adults (N=5222) 20 years and older (Seligman, Bindman, Vittinghoff, Kanaya, & Kushel, 2007). They found that independent of sociodemographic factors, physical activity level and obesity status, food insecurity in adults was linked to a greater likelihood of developing type 2 diabetes. The
authors concluded that the consumption of high amounts of empty calorie foods, which contain limited nutritional value, may be a causal factor in the association between food insecurity and type 2 diabetes (Seligman, Bindman, Vittinghoff, Kanaya, & Kushel, 2007) because those types of foods are both cheap and convenient (Drewnowski & Darmon, 2005). A later cross-sectional study by Canadian researchers analyzed data from a nationally representative Canadian Community Health Survey (N=6237), conducted in 2005. Based on its findings, there were higher rates of household food insecurity among Canadians with diabetes, 9.3 percent, when compared to those who did not have diabetes, 6.8 percent (Gucciardi, Vogt, DeMelo, & Stewart, 2009). This study provided confirmation for the results of the former study by Seligman et al. (2007), clinical proof of disease (as a fasting plasma glucose ≥126 mg/dL), and indicated that adults who reside in a food-insecure home are possibly more prone to underreporting a diagnosis of diabetes (Gucciardi, Vogt, DeMelo, & Stewart, 2009). A further cross-sectional study in 2010 by Seligman et al. (N=5094), using the National Health and Nutrition Examination Survey (NHANES) 1999-2004 data, also found that food insecurity was strongly associated with diabetes in low-income (< 200% of the FPL) adults (Seligman, Laraia, & Kushel, 2010). There was clinical manifestation of diabetes, given the fact that 7.4 percent of adults resided in food-secure homes compared to 10.2 percent of adults who resided in food-insecure homes. The risk of clinical diabetes was approximately 50 percent greater among adults residing in food-insecure households versus adults residing in food-secure households. This study also found a correlation between food insecurity and poor blood sugar control among adults with a diabetes
diagnosis, likely due to a reduced ability to manage their care (Seligman, Laraia, & Kushel, 2010).

As far as hypertension is concerned, Seligman et al. (2010) found that there is also a correlation between food insecurity and hypertension. Based on NHANES (1999-2004) data 22.4 percent of low-income (< 200% of the FPL) adults who lived in food-insecure households, had clinical confirmation of hypertension (systolic blood pressure >140 mm Hg or diastolic blood pressure > 90 mm Hg) in comparison with only 18.6 percent of adults who lived in food-secure households (Seligman, Laraia, & Kushel, 2010). According to results from the same study, adults experiencing food insecurity in their homes had a 21 percent greater likelihood of having clinical hypertension when compared to adults experiencing food security in their homes (Seligman, Laraia, & Kushel, 2010). The same study found that food insecurity is less strongly correlated with hypertension than with diabetes (Seligman, Laraia, & Kushel, 2010).

Looking further to psychological health, researchers found in a cross-sectional study (N=2870) that the percentage of mothers with either a major depressive disorder or generalized anxiety disorder increased with the onset of food insecurity (30%) compared to those (16.9%) with food security (Whitaker, Philips & Orzol, 2006). A past study of food insecure households (N=98) found that adults living in food insecure households suffered psychologically and experienced intense feelings of isolation, helplessness and decreased self-efficacy with regard to overcoming obstacles (Hamelin, Habicht, & Beaudry, 1999).

When it comes to obesity, a large (N=8169) cross-sectional study examining the association between food insecurity and obesity, which is defined as a body mass index
(BMI) ≥ 30 kg/m², were assessed with data from the 1998 and 1999 California Women’s Health Survey (Adams, Grummer-Strawn, & Chavez, 2003). Obesity was more prevalent in women (31%) from food insecure households than in women (16.2%) from food secure households. Additionally, it was shown that food insecurity is associated with increased likelihood of obesity and the risk is greatest in Asians, African-Americans and Hispanics (Adams, Grummer-Strawn, & Chavez, 2003). In a small study of food pantry clients in Hartford, Connecticut, (N=212) food insecurity was not associated with obesity in that sample (Robaina & Martin, 2013). However, it is worth noting that 72 percent of the population was either overweight (BMI ≥ 25 kg/m²) or obese (BMI ≥ 30 kg/m²), having a mean BMI of 29.5 kg/m², which is not considered to be within the healthy weight range (Robaina & Martin, 2013).

**Seniors**

After retirement a large number of elderly persons are forced to survive on a fixed income, which makes it difficult for them to afford the costs of health care, particularly medications and a nutritious diet. Because food is often the most flexible expense in their budget, they restrict the types and amounts of foods they consume in order to pay their bills (Grosvenor & Smolin, 2010). In a study by researchers at Cornell University, examining the nutritional and health consequences related to food insecurity (N=6596), it was shown that food-insecure older persons had lower nutrient consumption than those who were food secure (Lee & Frongillo, 2001). More specifically, the results revealed that elderly persons experiencing food insecurity consumed significantly less energy, protein, carbohydrate, saturated fat, niacin, riboflavin, vitamin B-6, vitamin B-12, magnesium, iron and zinc (Lee & Frongillo, 2001). Furthermore, food-insecure elderly
persons were more than twice as likely to report fair or poor health status and were at greater nutritional risk. Data for this study was obtained from NHANES, 1988-1994 and the Nutrition Survey of the Elderly in New York State, 1994 (Lee & Frongillo, 2001). Ziliak et al. (2008) also found that there were lower levels of nutrient intake in food insecure seniors and that they also experienced impairments in activities associated with daily living (Ziliak, Gundersen & Haist, 2008). The elderly are already at risk for malnutrition due to some of the physiological changes associated with aging that negatively affect nutritional status (Grosvenor & Smolin, 2010), and food insecurity appears to further exacerbate that risk.

**Infants, Children and Adolescents**

In a study that used population based case-control data (N=1884) it was found that food insecurity in mothers is correlated with increased risk of certain birth defects, including spina bifida (Carmichael, Yang, Herring, Abrams & Shaw, 2007), a condition in which a baby is born with a partially closed spinal column (Spina Bifida Association, 2014). Findings of a cross-sectional study in which the caregivers of children ≤ 36 months of age (N=626) were interviewed, revealed that there is an association between food insecurity in children and iron deficiency anemia (Skalicky et al., 2006). A multisite retrospective cohort study with cross-sectional questionnaires was conducted at urban medical centers in Washington DC and five states, whereby caregivers of children ≤ 36 months of age (N=11,539) were interviewed at hospital clinics and emergency departments (Cook et al., 2004). An analysis of the interviews yielded results which indicated that food-insecure children had odds of “fair or poor” health nearly twice as high as food-secure children (Cook et al., 2004). Such children were also likely to be
hospitalized from birth onwards, at rates nearly three times higher than food-secure children (Cook et al., 2004). A later study in a larger sample of caregivers (N=17,158) was positively correlated with reports of “fair” or “poor” health and hospitalizations in young children (Cook et al., 2006). A study by Kirkpatrick et al. (2010) confirmed the findings by Cook et al. (2004) with respect to caregivers reporting “poorer” health for food insecure children and youth (Kirkpatrick, McIntyre, & Potestio, 2010). The Early Childhood Longitudinal Study observed close to 20,000 kindergarten children during the fall of 1998 enrolled in over 1,200 schools across the United States. Researchers concluded that food insecurity at home negatively affected classroom behavior. The study specifically revealed that food insecurity hindered children’s development of interpersonal relations, self-control, and approaches to learning (Howard, 2011).

Analyzed NHANES data from 15-year old and 16-year old adolescents (N=754) revealed a strong association between food insecurity and depressive disorder and suicidal symptoms in American adolescents (Alaimo, Olson, & Frongillo, 2002). It specifically found that adolescents suffering from food-insecurity were significantly more likely to have had dysthymia (mild, chronic depression), thoughts of dying, desire to die and to have attempted suicide (Alaimo, Olson, & Frongillo, 2002). An analysis of 24-hour dietary recall and household food security data from the 2004 Canadian Community Health Survey, revealed that adolescents living in food-insecure households had a substantially high prevalence of inadequate nutrient intake, namely, protein, vitamin A and magnesium (Kirkpatrick & Tarasuk, 2008).
Nutrition Assistance at the Federal Level - The Supplemental Nutrition Assistance Program (SNAP)

Of the food insecure households that have been identified in this country, 62 percent participate in one or more of the three largest federal food and nutrition assistance programs (SNAP), the Special Supplemental Nutrition Program for Women, Infants and Children (WIC), and the National School Breakfast and Lunch Programs in the country (Coleman-Jensen, Gregory, Singh, 2014). However, the focus of this section will be on SNAP, because it is the largest of those three programs, catering to the needs of persons across the lifespan.

SNAP has a primary goal of lowering rates of food insecurity (Gundersen, 2013) and is the main source of nutrition assistance for the American public (USDA Food and Nutrition Service, January, 26, 2010).

SNAP, which was previously called the Food Stamp Program, provides benefits to millions of Americans living in poverty (USDA Food and Nutrition Service, January, 26, 2010). The Food and Nutrition Service works in conjunction with State agencies, nutrition educators, neighborhood and faith-based organizations to guarantee that those eligible for nutrition assistance can apply for the program and have full access to its benefits (USDA Food and Nutrition Service, January, 26, 2010).

Recipients of the program can use their Electronic Benefit Transfer (EBT) card from SNAP to buy foods such as: breads and cereals; fruits and vegetables; meats, fish and poultry; and dairy products. Seeds and plants which can be grown to produce food to eat are also permissible under this program (USDA Food and Nutrition Service, January, 26, 2010). In some areas, restaurants can be authorized to accept SNAP benefits from
qualified homeless, elderly, or disabled people in exchange for affordable meals (USDA Food and Nutrition Service, January, 26, 2010). Recipients cannot use SNAP benefits to buy beer, wine, liquor, cigarettes or tobacco (USDA Food and Nutrition Service, January, 26, 2010). The purchase of non-food items with SNAP is not allowed (USDA Food and Nutrition Service, January, 26, 2010).

Although SNAP has a principal goal of reducing food insecurity, it is perturbing that food insecurity rates among recipients are about twice those of eligible non-recipients (Coleman-Jensen, Nord, Andrews & Carlson, 2011). Higher rates persist even after controlling for other factors (Gundersen, Jolliffe & Tiehen, 2009). Some of the existing barriers to improving the diets and health of SNAP recipients include the high cost of nutrient-rich foods, inadequate monthly SNAP benefit amounts, limited access to purchase healthy foods, and environmental factors associated with poverty (Leung et al., 2013). It should be noted that there are no nutrition requirements for purchases made with SNAP EBT cards.

**The Relationship between SNAP and the Hunger-Obesity Paradox**

Obesity and hunger exist together throughout the United States. The astonishing and counterintuitive fact is that hunger and obesity are now known to coexist within the same person and within the same household. This phenomenon is called the hunger-obesity paradox (Scheier, 2005). Obesity may result from an adaptive physiological response to episodic food insecurity, which can lead to binge eating habits when food is plentiful (Townsend, Peerson, Love, Achterberg & Murphy, 2001). Cyclical food restriction has been associated with an increase in body fat, decrease in lean muscle mass, and a quicker weight gain with response to refeeding (Dietz, 1995). One such feast-
famine cycle has been linked with food stamps. The “food stamp cycle” refers to a 3-week period of overeating when food stamps and money are available, followed by a 1-week period of involuntary food restriction when resources have been depleted. This in turn is followed by overeating when the monthly food stamp allotment has been restored, and so on (Townsend, Peerson, Love, Achterberg & Murphy, 2001; Wilde & Ranney, 2000; Taren, Clark, Chernesky & Quirk, 1990). One possible solution to this problem (which has not yet been implemented) is to update food stamp benefits for SNAP recipients more than once a month. This change was actually recommended by some food stamp recipients in focus group discussions conducted as part of a food stamp cash-out experiment in San Diego (Ohls, Fraker, Martini & Ponza, 1992).

**Nutritional Quality of Items from Emergency Food Networks**

Increased rates of food insecurity have been coupled with increased reliance on emergency food programs. The Hunger in America 2014 study revealed that each year, 46.5 million unduplicated individuals received food assistance from the Feeding America network, a nationwide system of 200 member food banks that serve the entire country (Feeding America, 2015). In New York State, food pantries are a major source of emergency meals providing approximately 170 million meals, 90 percent of the total meals delivered each year (Shackman, Yu, Edmunds, Clarke & Sekhobo, 2015). This dependence on agencies of the emergency food network is problematic however.

Findings from past focus groups, feedback from clients and agency representatives, along with strategic planning projects undertaken in emergency food programs in 2008 and 2009 suggested that many food pantries were not providing food packages to their clients that were consistent with the recommendations from the 2005
Dietary Guidelines for Americans (Rochester, Nanney & Story, 2011). For instance, foods that are low in fat, saturated and *trans* fats, and sodium and ample amounts of fruits, vegetables, and whole grains are included in food packages less often than unhealthy foods (Rochester, Nanney & Story, 2011). Even though there are no studies evaluating the nutritional content of items at food pantries in relation to the newly released 2015 Dietary Guidelines, it is very likely that this trend of failing to comply with the guidelines has continued. There is a lack of oversight of, or guidance for emergency food distribution programs to ensure that healthy foods are available for distribution, or that the agencies have organizational policies or practices that prioritize the sourcing and distribution of healthy foods (Rochester, Nanney & Story, 2011).

Although food distributed through The Emergency Food Assistance Program (TEFAP) is distributed in accordance with the Dietary Guidelines for Americans, no such policy exists to guide food accessed from community or corporate donors and healthy foods policies are only beginning to be implemented by food banks (Rochester, Nanney & Story, 2011). TEFAP is a federal program that helps supplement the diets of low-income Americans, including elderly people, by providing them with free emergency food and nutrition assistance (USDA, August 20, 2014). It is through TEFAP that the USDA buys USDA foods, and makes them available to State Distributing Agencies (USDA Economic Research Service, 2014).

Campbell et al. (2011) examined food and beverage preferences of emergency food program clients of a Food Bank in Upstate New York. They found preference for healthy items over unhealthy items (Campbell, Hudson, Webb & Crawford, 2011). Survey findings indicated that food pantry guests at both rural and urban sites preferred to

“This new information supports the effort being made by the Food Bank to limit foods of minimal nutritional value while focusing on increasing distribution of donated and purchased fruits and vegetables.” (P. 179)

It is worth noting that a majority of guests stated that they would rather receive fresh fruits (72%) and fresh vegetables (51%) than canned or frozen items (Campbell, Hudson, Webb & Crawford, 2011). Based on food pantry bag analysis data, most guests reporting a preference for fresh fruit and vegetables chose those items when available (Campbell, Hudson, Webb & Crawford, 2011). However, only four of the 15 surveyed food pantries offered fresh fruit and only seven offered fresh vegetables (Campbell, Hudson, Webb & Crawford, 2011).

The poor nutritional quality of foods at emergency food relief organizations is not only a problem in terms of health, but also in terms of environmental sustainability. In the newly released 2015 Dietary Guidelines for Americans, the impact of food choices on the environment is an area of focus for the first time (Dietary Guidelines Advisory Committee, 2015). According to the panel of experts who make up the Advisory Committee sustainable diets are defined as follows (Dietary Guidelines Advisory Committee, 2015):

“Sustainable diets are a pattern of eating that promotes health and well-being and provides food security for the present population while sustaining human and natural resources for future generations.” (P.1)
During the development of the 2015 Dietary Guidelines for Americans, the Committee found that changes in climate, alterations in diets of populations, growing consumer-driven needs for certain foods and rising energy prices among other things will make natural resources become a precious commodity (2015 Dietary Guidelines Advisory Committee, 2015). Therefore, it is their belief that meeting the current and future needs of Americans will warrant changes in the eating habits of individuals and populations (2015 Dietary Guidelines Advisory Committee, 2015). Some of these changes include higher levels of consumption of plant-based foods, such as fruits and vegetables, because they are associated with decreased use of natural resources and greenhouse gas emissions (2015 Dietary Guidelines Advisory Committee, 2015).

However, the panel of experts is quick to acknowledge that sustainable diets are out of the reach of vulnerable, low-income populations (2015 Dietary Guidelines Advisory Committee, 2015). On the national level, a number of strategies have been proposed to increase access to healthier foods (Treuhaft & Karpyn, 2010). Some of the initiatives have included: enticing or developing grocery stores and supermarkets (Treuhaft & Karpyn, 2010); establishing other retail outlets such as farmers’ markets, public markets, cooperatives, farm stands, community-supported agriculture programs, and mobile vendors; permitting the use of EBT cards at those locations (Treuhaft & Karpyn, 2010); increasing the stock of fruits, vegetables, and other nutritious items at small grocery stores or neighborhood corner stores (Treuhaft & Karpyn, 2010); growing food locally through community gardens (Treuhaft & Karpyn, 2010); and bettering the transportation system to ensure that grocery stores and farmers’ markets are more accessible (Treuhaft & Karpyn, 2010).
Food Deserts and their link to Food Insecurity

According to the USDA, “food deserts” are defined as urban neighborhoods and rural towns without ready access to fresh, healthy, and affordable food (USDA, July 23, 2013a). Instead of supermarkets and grocery stores, these communities may have no food access or are served only by fast food restaurants and convenience stores offering few healthy, affordable food options (USDA, July 23, 2013a). The Healthy Food Financing Initiative (HFFI) Working Group considers a food desert as a low-income census tract where a substantial number or share of residents has low access to a supermarket or large grocery store (USDA, July 23, 2013b).

The USDA’s 2009 “food desert” study attempted to calculate the extent of the problem nationally. It did so by examining access to supermarkets and determined that 23.5 million people could not access a supermarket within one mile of their homes (Ploeg et al., 2009). A nationwide analysis found that there are 418 rural “food desert” counties where all residents live more than 10 miles from a supermarket or supercenter, that is 20 percent of rural counties (Ploeg et al., 2009).

Food deserts are most likely not the principal source of food insecurity, but they help to create the conditions which cause vulnerable households to spend more money to procure food through normal means. Living in rural areas increases the likelihood of a person residing in a food desert (Rice, 2010). While rural America generally is where food is produced, the rural poor often have no farmland or assets with which to grow their own food (Rice, 2010). Therefore, the risk of being food insecure that they already face, is compounded by their being in a food desert (Rice, 2010). With many of the population decreases in several American small towns, there has been a transition from a
large number of widely dispersed small-scale local grocers to a concentration of
supermarkets in more densely populated geographic areas (Rice, 2010). Evidence of this
is that a 52.6 percent decline in the number of grocery stores between 1976 and 2000 was
found to have taken place in Iowa (Morton, Bitto, Oakland & Sand, 2005).

In urban areas, lower profits have resulted in supermarkets moving out of cities
and into suburbs (Grosvenor & Smolin, 2010). Residents in many urban areas such as
Seattle, Central and South Los Angeles, and East Austin, Texas, have limited means of
transportation access to supermarkets (Treuhaft & Karpyn, 2010). The problem of food
deserts is compounded in urban low income areas by the increased presence of fast food
restaurants and convenience stores with a limited availability of healthy foods but a
plethora of high calorie, nutrient-poor foods and beverages (Pearce, Blakely, Witten, &
Bartie, 2007).

**Disparities in Access to Supermarkets**

According to a national study, zip codes in low-income neighborhoods have 25
percent less chain supermarkets and 1.3 times as many convenience stores compared to
middle-income zip codes. Zip codes in largely black residential areas have about half the
number of chain supermarkets compared to zip codes in predominantly white
neighborhoods. Latino neighborhoods have only a third as many (Powell, Auld,
Chaloupka, O’Malley & Johnston, 2007). Low-income neighborhoods nationwide have
half as many supermarkets as the richest neighborhoods and four times as many smaller
grocery stores, according to an assessment of 685 urban and rural census tracts in three
states. Results from the same study indicated that there were four times as many
supermarkets in predominantly white neighborhoods as compared to predominantly black
ones (Moore, Roux, Nettleton & Jacobs, 2008). Another multistate study found that eight percent of African-Americans live in a census tract with a supermarket compared to 31 percent of whites (Morland, Wing, & Roux, 2002). In New York City, low income neighborhoods have fewer vendors of healthy foods e.g. supermarkets and produce stands compared to outlets such as convenience stores and fast food restaurants, that primarily sell unhealthy foods (Rundle et al., 2009).

Stores carrying fruits and vegetables are unequally distributed among various types of communities in upstate New York: a minority neighborhood in Albany has the least access (4.6 stores per 10,000 residents), followed by a rural community (7.8), a small town (9.8), and a racially mixed neighborhood (11.4) in Albany (Hosler, Rajulu, Ronsani & Fredrick, 2008). Findings from a recent multistate study revealed that persons with access restricted only to supermarkets or supermarkets and grocery stores had the lowest rates of obesity and overweight, whereas those without access to supermarkets had the highest rates (Morland, Roux, & Wing, 2006).

**Food Deserts in New York State**

In May 2011, the USDA developed the Food Desert Locator (Powell, Slater, Mirtcheva, Bao & Chaloupka, 2007). According to the statewide findings from the Food Desert Locator, it has been determined that (Powell, Slater, Mirtcheva, Bao & Chaloupka, 2007) the USDA has identified food deserts in 32 of 62 counties in New York State. In fact, there are more than 656,000 New Yorkers who meet the criteria for living in a food desert. Among people in New York State who live in a food desert, 86 percent live in urban areas and 14 percent reside in rural areas (Powell, Slater, Mirtcheva, Bao & Chaloupka, 2007).
According to findings from the Food Desert Locator developed by the USDA, it has been determined in the New York’s Capital Region that nine census tracts in Albany County and nine census tracts in Schenectady County are classified as food deserts (Powell, Slater, Mirtcheva, Bao & Chaloupka, 2007). It also found that nearly 11,500 Albany and 8,000 Schenectady County households residing in food deserts have no vehicles to get to a supermarket (Powell, Slater, Mirtcheva, Bao & Chaloupka, 2007). As far as food insecurity is concerned in New York City, of households with children, 69 percent are food insecure and 26 percent are food insecure with very low food security (Moore & Diez Roux, 2006). As far as the incidence in New York State goes, it was estimated that 11.3 percent of households in New York State were food insecure in 2006-2008 (Morland, Wing & Roux, 2002). According to national data in 2012, 49 million Americans lived in food insecure households, 33.1 million adults and 15.9 million children. In 2012, 14.5 percent of households (17.6 million households) were food insecure (Rundle et al., 2009).

The Behavioral Risk Factor Surveillance System (BRFSS) is an annual statewide telephone survey of adults (Centers for Disease Control and Prevention, 2015). Results from 2007 revealed important trends in relation to the consumption of fresh fruits and vegetables in New York State. Those surveyed who were white (non-Hispanic), college graduates, and had an annual household income of ≥ $50,000 were more likely to consume five or more servings of fresh fruits and vegetables per day. In contrast, uneducated minorities with an annual household income of ≤ $25,000 were less likely to consume five or more servings of fresh fruits and vegetables per day (Bodor, Rose, Farley, Swalm & Scott, 2008). More than a third of New York's residents have incomes
at or below 200 percent of the FPL making them eligible for federal food assistance programs such as the Supplemental Nutrition Assistance Program (SNAP). The reality is that these programs do not account for New York State's higher cost of living (Franco, Diez Roux, Glass, Caballero & Brancati, 2008).

As per the results of several scientific studies, living more than one mile away from a supermarket may negatively affect health outcomes (Giang, Karpyn, Laurison, Hillier, & Perry, 2008; The Food Trust, 2004; The Food Trust, 2008a; The Food Trust, 2008b; Morland, Diez Roux, & Wing, 2006; Inagami, Cohen, Finch & Asch, 2006; Powell, Auld, Chaloupka, O’Malley, & Johnston, 2007; Babey, Diamant, Hastert & Harvey, 2008), but more research is needed to better determine how access influences the types of foods consumers buy and consume (Community Health Councils Inc., 2008). The degree of availability of healthy food in communities is related to a host of diet-related diseases that include but are not limited to obesity and overweight, diabetes, and cardiovascular disease. This is evidenced by the fact that studies indicate that proximity to supermarkets corresponds with BMI, rates of obesity, diabetes, or diet-related deaths among adults (Giang, Karpyn, Laurison, Hillier & Perry, 2008; The Food Trust, 2004; The Food Trust, 2008a; The Food Trust, 2008b; Morland, Diez Roux & Wing, 2006; Inagami, Cohen, Finch & Asch, 2006) and among adolescents (Powell, Auld, Chaloupka, O’Malley & Johnston, 2007). The link has also been shown between access to affordable nutritious foods and the intake of those foods (Community Health Councils Inc., 2008; Morland, Wing & Roux, 2002; Zenk et al., 2005; Moore, Roux, Nettleton & Jacobs, 2008; Blanchard & Lyson, 2006; Rose & Richards, 2004; Laraia, Siega-Riz, Kaufman, & Jones, 2004).
Past Initiatives to Tackle the Problem of Food Deserts in New York State

In 2007, the New York State Council on Food Policy was created via executive order by Governor Eliot Spitzer in order to establish and suggest policies that protect and improve agricultural food production throughout New York State and guarantee that all New Yorkers have adequate access to safe, reasonably priced, fresh and healthy foods (New York State Council on Food Policy, 2010). There was concern expressed in particular for persons of low socio-economic status, children, and the elderly (New York State Council on Food Policy, 2010). After the New York State Council on Food Policy conducted a state-wide listening tour in 2008 to gain insight from an array of stakeholders about local and regional food policy issues, steps were taken to address the concerns of the public (New York State Council on Food Policy, 2010). As a result the following changes occurred:

- New York became the first state in the country to permit WIC participants to use checks for fresh fruit and vegetables at farmers’ markets.

- A minimum of 40 EBT terminals were distributed free of charge to farmers’ markets, green carts and other mobile markets catering to underserved communities.

- The New York Healthy Food and Healthy Communities Fund, was established to facilitate the development of healthy food markets in underserved communities across the state of New York by providing $30 million in loans and grants to accomplish its mission.

- The Farmers’ Market Nutrition Program supplied low income families with coupons that were accepted by authorized farmers’ markets (New
York State Council on Food Policy, 2010).

**Barriers to Success of Initiatives Tackling Food Deserts in New York State**

In spite of the fact that the previously mentioned initiatives and strategies look good on paper, there are still considerable disparities in assistance and challenges that need to be addressed (Whalen & Seserman, 2011). Even though $10 million in state monies were set aside in fiscal year 2010 to the Healthy Food and Healthy Communities Fund to support new supermarkets in underserved communities, only six projects are currently underway across the state (Whalen & Seserman, 2011). Therefore, the rate of impact will not be widespread in comparison with the need (Whalen & Seserman, 2011).

In the past few years the number of farmers’ markets have increased, but experience and evidence indicate that many low-income populations are not reaping the benefits (Whalen & Seserman, 2011). Possible reasons associated with low utilization of farmers’ markets by low-income shoppers include location, food prices, lack of transportation, or social factors (Whalen & Seserman, 2011).

It could be hypothesized that the diversity of New York State in terms of its demography and geography could be contributing factors in the unfilled gaps in trying to reach underserved communities. Despite the vast amount of open land in the state, New York's population is very urban (Parker, 2010) with more than 40 percent (8,405,837) of New York State's population (19,695,680) residing in New York City (United States Census Bureau, 2015). New York is referred to by its residents as downstate, New York City and its greater metropolitan area, or upstate, the remainder of New York State, which tends to be more rural. Political differences are usually used to distinguish between upstate (conservative) and downstate (liberal) regions (Campbell, 2015).
However, there are social differences that also exist as well (Campbell, 2015) with upstate New York having a more white population with fewer minorities than downstate New York (U.S. Census Bureau, 2015). The New York State Department of Environmental Conservation (DEC) officially categorizes New York State into nine regions (New York State DEC, 2015). These regions are as follows:

- **Region 1**: (Long Island) Nassau and Suffolk counties
- **Region 2**: (New York City) Brooklyn, Bronx, Manhattan, Queens and Staten Island
- **Region 3**: (Lower Hudson Valley) Dutchess, Orange, Putnam, Rockland, Sullivan, Ulster and Westchester counties
- **Region 4**: (Capital Region/Northern Catskills) Albany, Columbia, Delaware, Greene, Montgomery, Otsego, Rensselaer, Schenectady and Schoharie counties
- **Region 5**: (Eastern Adirondacks/Lake Champlain) Clinton, Essex, Franklin, Fulton, Hamilton, Saratoga, Warren and Washington counties
- **Region 6**: (Western Adirondacks/Eastern Lake Ontario) Herkimer, Jefferson, Lewis, Oneida and St. Lawrence counties
- **Region 7**: (Central New York) Broome, Cayuga, Chenango, Cortland, Madison, Onondaga, Oswego, Tioga and Tompkins counties
- **Region 8**: (Western Finger Lakes) Chemung, Genesee, Livingston, Monroe, Ontario, Orleans, Schuyler, Seneca, Steuben, Wayne and Yates counties
- **Region 9**: (Western New York) Allegany, Chautauqua, Cattaraugus, Erie, Niagara and Wyoming counties
Given the fact that these regions vary widely from each other, programs and initiatives that are successful in one region may not be successful in another region. For example, an initiative (such as healthy bodegas) that was successfully implemented in region 2 may not replicate the same success if it is implemented in region 6, because of the stark demographic and geographic differences between New York City and the Western Adirondacks/Eastern Lake Ontario regions.

The Importance of Incorporating Sustainability into Programs/Initiatives

Over the past three decades, considerable resources have been spent in the United States and other countries to implement and validate innovative prevention programs and strategies (Johnson, Hays, Center, Daley, 2004). During the same time period, a review of several evaluations of the effects of collaborative partnerships, has revealed minimal impacts on public health (Roussos & Fawcett, 2000). A collaborative partnership is defined as a linkage between persons and organizations from a variety of sectors, including, but not limited to, schools and businesses, functioning collectively to achieve a
shared mission (Himmelman, 1995). Sustainability can be defined as the continued capacity of an innovation or program to cater to the needs of its stakeholders (Johnson, Hays, Center & Daley, 2004) after it has been implemented. It can therefore be deduced that measurement used to evaluate sustainability will differ based on the type of program implemented. Decision-makers who are involved in planning and launching an initiative must come to grips with the eventual challenge of preparing for a time when the implementation phase is completed (Johnson, Hays, Center & Daley, 2004). Research by Feinberg, Bontempo and Greenberg (2008) supports their belief that:

“Coalitions, by promoting community buy-in and fostering the pooling of political, financial, and institutional resources, may enhance sustainability and a long-term public health impact.” (P. 495)

Up until this point, the focus has been on the persistent problem of food insecurity nationwide and statewide that has not improved after the Great Recession. Further compounding the issue is the prevalence of food deserts across the country and across the state of New York. In spite of the implementation of ground-breaking and innovative initiatives by the New York State Council on Food Policy to address those issues, the reach and sustainability of them remains to be seen.

The next chapter will transition into a description of a program that has been combating hunger and food insecurity in the state of New York for over the past three decades. It will conclude with a discussion of an initiative that was launched to improve access to produce among at-risk populations across the lifespan. Target populations utilizing the emergency food network do so either alone, or in combination with federal
food and nutrition assistance programs, and are typically unable to obtain fresh fruits and vegetables on a consistent basis.
Chapter 2: Overview of the Intervention

The Hunger Prevention and Nutrition Assistance Program (HPNAP)

HPNAP is a program in the Bureau of Nutrition Risk Reduction at the New York Department of Health (New York State Department of Health, 2012). It improves the nutritional quality of food available at food pantries, soup kitchens and emergency shelters through contractual relationships by providing funding for nutritious food and for the delivery, storage, service and promotion of these foods. Emergency food programs (food pantries, soup kitchens and emergency shelters) serve individuals and families in need of food assistance and who are at risk for hunger or food insecurity (Division of Nutrition, Bureau of Nutrition Risk Reduction, 2012).

Many communities have a local “food pantry,” sometimes mistakenly called a “food bank.” While food banks and food pantries share the same commitment to fighting hunger they are not the same (Food Bank of the Southern Tier, 2014). A food bank is the “storehouse” for massive quantities of food to other agencies that are in turn distributed to the community. A food bank is a non-profit organization that collects and distributes food to smaller agencies within the emergency food network, and does not give out food directly to hungry or food insecure persons (New York State Department of Health, 2006). However, a food pantry functions to directly serve the community with the food it has received from the food bank and other sources (New York State Department of Health, 2006). The mission of a food pantry is to “directly” serve local residents who suffer from hunger and food insecurity within a particular location (Food Bank of the Southern Tier, 2014). The majority of food pantries in the community are backed by local area churches and/or community coalitions (Food Bank of the Southern Tier, 2014).
Independent community food pantries govern themselves (Food Bank of the Southern Tier, 2014) and provide pantry bags to families to assist with food preparation (Shackman, Chengxuan, Edmunds, Clarke & Sekhobo, 2015). In general, the distributed food is enough to last for three meals a day for three days per person, totaling nine meals per individual (Shackman, Chengxuan, Edmunds, Clarke & Sekhobo, 2015). The amount of times persons can come to pick up food depends on the type of pantry (Shackman, Chengxuan, Edmunds, Clarke & Sekhobo, 2015).

*Soup kitchens* are nonprofit organizations that are recipients of donated food items and provide hot meals served in local agency kitchens for those in need (New York State Department of Health, 2006). *Emergency shelters* are agencies that provide housing to persons when they are unable to live in their previous home, in like fashion to homeless shelters (New York State Department of Health, 2006).

The availability of a wide variety of high-calorie, low-cost foods gives rise to higher rates of obesity and chronic diseases, for example type 2 diabetes and high blood pressure, in populations that suffer from food insecurity. Consequently, HPNAP focuses on improving and enhancing emergency food by supplying nutritious, more costly foods such as low-fat milk, whole grains, lean meats and fresh produce, to people who lack access to these foods. Improving the nutritional quality of emergency food can aid in bettering the nutritional status and health of persons requiring food assistance in New York State (Center for Community Health Web, 2014).

A tenet of HPNAP is that participants should be given a choice in deciding what food they need in lieu of being made to take what the program thinks they need (Brewer, 2012). A *client choice* food pantry allows clients to choose the food that they need,
promoting dignity, decreasing waste and addressing clients’ medical nutrition needs (Brewer, 2012). According to the results of the 2013 HPNAP Food Pantry Operator Survey, 62 percent of food bank member pantries operated as a client choice pantry (Shackman, 2013). The proportion of client choice pantries varied, from a high of over 90 percent in two upstate counties, to a low of 19 percent in a downstate food bank (Shackman G, 2013). In the Albany, Central, Long Island and Western regions, the majority of pantries operated as client choice pantries, but in these regions the proportions varied from 52 percent in Long Island to 72 percent in Central New York (Shackman, 2013). Even though the HPNAP program does not maintain records of food waste, program staff estimate that it is likely very minimal (L. Clarke III, personal communication, November 5, 2014).

HPNAP utilizes the concept of empowerment with program participants to maximize its effectiveness of improving their eating habits and reducing waste. As an illustration of this point, participants at soup kitchens and shelters can choose the types of fresh fruits, vegetables, grains, and proteins they want to have on their plate. In other words, as long as the foods participants choose belong to each of the five groups in MyPlate (Table 1) they are given freedom to make their own choices.
Table 1

**HPNAP Minimum Guidelines for a Healthy Pantry Bag – 3 Meals/3 Days**

<table>
<thead>
<tr>
<th>Food Groups</th>
<th>Make substitutions as needed based on your inventory. One selection is equal to:</th>
<th>Selections per family size</th>
<th>Selections per family size</th>
</tr>
</thead>
</table>
| GRAINS      | 1 pound loaf Bread  
1 pound Pasta/Rice  
1 box Cereal  
3 boxes Mac & Cheese  
1 box Stuffing Mix (6 oz)  
1 box Pancake Mix (16 oz)  
*(average about 6-10 servings per selection)* | 2-3                          | 4-5                          |
| VEGETABLES  | 1 can Vegetables (15 oz)  
1 bag Frozen Vegetables (16 oz)  
2 bags or bunches Fresh Vegetables  
*(average about 3-4 servings per selection)* | 2-3                          | 4-6                          |
| FRUITS      | 1 can Fruit (15 oz)  
1 bag Frozen Fruit (16 oz)  
1 container Juice (46 oz)  
4 pieces medium sized,  
1 pint berries or 1 melon Fresh Fruit  
*(average about 3-4 servings per selection)* | 1-2                          | 3-4                          |
| MEAT/FISH/POULTRY/EGGS/DRY BEANS/NUTS/PROTEIN FOODS | All HPNAP meals must include 1 serving of fruit or vegetables per person.  
1 can Salmon (12-15 oz)  
2 cans Tuna (6 oz)  
1 jar Peanut Butter (18 oz)  
2 cans Beans/Legumes, Beef Stew, Chili, Ravioli, Hash (15 oz each)  
2 cans Hearty Soups (15 oz each)  
1 pound Meat (16 oz), 1 package of Hot Dogs  
½ dozen Eggs (6)  
*(average about 4-6 servings per selection)* | 2-3                          | 4-5                          |
| MILK/YOGURT/CHEESE/DAIRY FOODS | All HPNAP meals must include 1 serving of fruit or vegetable per person.  
1 quart Milk, (32 oz) or 1 packet Dry Milk  
4 oz Cheese  
4 containers Yogurt (about ½ cup each)  
*(average about 4 servings per selection)* | 1-2                          | 3-4                          |

HPNAP works in collaboration with organizations (Figures 3 and 4) that operate emergency food programs, the eight regional food banks and the United Way (Division of Nutrition, Bureau of Nutrition Risk Reduction, 2012). These collaborative relationships with public and private sector organizations enable HPNAP dollars to provide healthy food to persons in need on a widespread scale (Division of Nutrition, Bureau of Nutrition Risk Reduction, 2012) by providing food and other resources to more than 2,600 (Figure 3) emergency food relief organizations (Division of Nutrition, Bureau of Nutrition Risk Reduction, 2012). Eight regional food banks and the United Way serve roughly 1,800-1,900 sites. Each of the food banks has more than 100-200 sites that they support with HPNAP funding. Those agencies that are supported by the food banks and the United Way do not get cash money but rather a delivery of food. The remainder of the contractors, classified as direct service projects and resource/grant distribution projects, receive a smaller amount of money from HPNAP because they support either only themselves or a smaller number of sites (L. Clarke III, personal communication, November 14, 2014).

Figure 3. An overview of the operation of the HPNAP program. Adapted from personal communication with E. Baum, April 29, 2014. Adapted with permission.
There are four groups of HPNAP contractors (Figure 4). The eight regional food banks provide food distribution and nutrition support services to a network of emergency food programs (Division of Nutrition, Bureau of Nutrition Risk Reduction, 2012). Resource grant distributions, with the largest one being the United Way of New York City, either distribute HPNAP funding directly to emergency programs in their network or via a grant application process (Division of Nutrition, Bureau of Nutrition Risk Reduction, 2012). Direct service contracts are large emergency food programs or programs that provide special food assistance services (Division of Nutrition, Bureau of Nutrition Risk Reduction, 2012). Food recovery projects collect perishable, fresh or prepared food (such as unharvested fresh produce) that would normally be discarded and distribute them to emergency food programs (Division of Nutrition, Bureau of Nutrition Risk Reduction, 2012). Each contractor with a food line must allocate at least 60 percent of their HPNAP budget for food (Borden, 2014, September). Currently a minimum of two percent of total HPNAP-purchased food funds has to be used to buy one percent (1%) or less fat fluid milk (Borden, 2014, September). A minimum of 10 percent of total HPNAP-purchased food funds has to be used to buy fresh produce (Borden, 2014, September).
In summary, HPNAP provides comprehensive funding for the following: nutritious food; educating emergency food providers on how to promote and provide nutritious food to their clients; converting food pantries to client choice operations; staff, rent, utilities, food service disposable items, food service equipment, refrigerators, and freezers; sanitation supplies and training to prevent food borne illness; food recovery programs; and transportation of donated foods from across New York State (New York State Department of Health, 2012).

**History and Timeline of Accomplishments**

Before there can be a discussion about the HPNAP Locally Grown Produce Initiative, the path that led up to it must be highlighted (Figure 5), because it is not
merely a simple pre and post-analysis. From the time of HPNAP’s inception in 1984, when New York State took an innovative approach to recognize hunger as a public health issue instead of solely as a social issue, it made several positive changes that culminated in the implementation of the Locally Grown Produce Initiative in 2012. In 1998, the HPNAP Policy and Procedure Manual was distributed to all contractors, mandating the use of the Minimum Nutrition Standards for all HPNAP funded meals and food packages (Brewer, 2012). In 2003, the formation of the HPNAP Food Quality Steering Committee to evaluate the nutritional quality of food purchased with HPNAP funds, resulted in revisions to enhance HPNAP’s Minimum Nutrition Standards regarding purchased fruit juice and canned fruit (Brewer, 2012). In 2007, a mandate required contractors to spend approximately 10 percent of their food budget on the purchase of fresh produce. HPNAP partnered with the Food Bank Association of New York State to promote New York State grown (NYSG) fresh produce in 2009 (Brewer, 2012). Also in 2009, HPNAP established a best practice encouraging contractors to purchase NYSG fresh produce (Goldsmith, 2014). At the same time a reporting mechanism was also set up to track the proportion of fresh NYSG produce funds (Goldsmith, 2014).
**Figure 5.** History and timeline of HPNAP’s accomplishments in the context of its annual budgets. Adapted from the “HPNAP 15 Year Summary” by the Division of Nutrition, Bureau of Nutrition Risk Reduction, 2015, [Internal File]. Copyright 2015 by the New York State Department of Health. Adapted with permission.

**HPNAP’s Locally Grown Produce Initiative - Background and Description**

In January 2012, HPNAP set out to obtain $2 million in additional state funding for a Locally Grown Produce Initiative (Friedman, 2014). The HPNAP Locally Grown Produce Initiative was a one-time stimulus to increase the proportion of state-grown fresh produce in emergency food relief services. The initiative’s purpose was to distribute funds to eight regional food banks throughout the state for the purchase and distribution of NYSG produce to emergency food network programs (Friedman, 2014). The goals of HPNAP’s Locally Grown Produce initiative were to: (1) market the initiative and its value to HPNAP, New York State, the farming community and resulting potential health benefits; (2) ensure that New York State would have a naturally beneficial system which
is a unique model by which one can address a public health problem; (3) show the
economic feasibility of the Locally Grown Produce Initiative which created a system of
pursuing more expensive products, all in an effort to achieve health benefits.

The $2 million was added specifically for food banks because they had
widespread reach (Table 2), serving a total of 131,640,369 meals in 2011-2012 (the year
prior to the initiative), as well as the infrastructure to market the product better than the
other contractors (L. Clarke III, personal communication, November 14, 2014), that only
served a total of 74,262,795 meals in 2011-2012. At the same time, the other contractors
received direction from the program to try and increase their purchases of NYSG produce
and to report them on the Milk, Produce and Grain expenditure reports (L. Clarke III,
personal communication, November 14, 2014). The Milk, Produce and Grain
expenditure report, which was a source of data for this study, is a tracking tool that was
developed to monitor expenditures by HPNAP contractors that have a budget to purchase
food items (New York State Department of Health, 2014). As the name indicates, the
dollars spent on milk, produce, and grains are tracked on a monthly basis during the
contract year, beginning on July 1 and ending on June 30 (New York State Department of
Health, 2014).

Table 2

<table>
<thead>
<tr>
<th>Service Provided at HPNAP Supported Food Bank and Non-Food Bank Contractors in 2011-12</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Food Bank Contractors (n=8)</strong></td>
</tr>
<tr>
<td>Sites, n = 2,048</td>
</tr>
<tr>
<td>Meals, n =131,640,369</td>
</tr>
</tbody>
</table>

*Note*. Adapted from “Service Provided at HPNAP Supported Contracts 2011-2012” by the
Division of Nutrition, Bureau of Nutrition Risk Reduction, 2012, [Internal File]. Copyright
2012 by the New York State Department of Health. Adapted with permission.
HPNAP’s efforts to launch the Locally Grown Produce Initiative did not stand in a vacuum as they meshed well with the Fresh Connect Program established by Governor Cuomo in 2011 (New York State Department of Health – Division of Nutrition, 2013). That program was designed to help New York State farmers by increasing the sale of locally-grown food in communities (Governor of New York, 2011). The Governor’s initiative was advantageous in two ways, first it was another way that others were pushing NYSG produce and second, alignment with the Governor’s Fresh Connect Program helped garner support for HPNAP’s Locally Grown Produce Initiative.

Specifically, the Fresh Connect Program created new farmers' markets and supported existing markets that provided fresh produce to high-need areas (Governor of New York, 2011). Therefore, the Fresh Connect Program supported the New York State farming economy and the mission of HPNAP, which is to increase access to healthy food for at risk populations (New York State Department of Health - Division of Nutrition, 2013). In 2012, the Governor expanded the Fresh Connect Program to support not only farmers' markets, but also other creative solutions that increased access to fresh, locally produced food by low-income or underserved communities (Fresh Connect, n.d.). As a result, an expanded Fresh Connect Program awarded grants that supported work at over 50 project sites to better connect New Yorkers with local farm products (Fresh Connect, n.d.). In 2013, the program grew and supported innovative projects that linked communities of low socio-economic status with New York farm products, including: new initiatives at traditional farmers’ markets; youth markets; and delivery of farm products to low-income housing facilities (Fresh Connect, n.d.).
Implementation of HPNAP’s Locally Grown Produce Initiative

Each food bank was notified in mid-August 2012 with respect to the following: the funding intent and requirements; suggestions for how to spend Locally Grown Produce Initiative funds; reporting and evaluation plans; and a Locally Grown Produce Initiative proposal template to be completed by each contractor (New York State Department of Health – Division of Nutrition, 2013).

There were several stipulations for spending the $2 million (Friedman, 2014). Locally Grown Produce Initiative funds had to be spent between July 1, 2012 and June 30, 2013 on produce grown in New York State (Friedman, 2014). A maximum equivalent to five (5%) percent of those additional funds could be moved from the HPNAP fresh produce line for specific administrative costs that were needed to procure or implement the initiative (Friedman, 2014).

In order to maximize the impact of the additional funding, food banks were encouraged to purchase and distribute New York State produce during the entire growing season from May to November (Friedman, 2014). Those additional fresh produce funds had to be used to ensure that all or a majority of HPNAP supported emergency food programs had access to fresh produce routinely (Friedman, 2014). Food banks were required to spend at least 10 percent of those funds to reach harder to serve communities where applicable (Friedman, 2014).

Prior to spending those funds, the attached “Locally Grown Produce Proposal” form had to be completed and returned to the designated HPNAP contract manager for approval by August 31, 2012. All locally grown produce purchased with those funds had to be reported on the monthly Milk, Produce and Grain expenditure report (Friedman,
of emergency food programs receiving any fresh produce purchased with HPNAP funds included locally and non-locally grown fresh produce, as well as the total pounds of fresh produce, and were required to be included on the monthly Milk, Produce and Grain expenditure report addendum (Friedman, 2014). A year-end final report containing information on the impact of funding to increase access to fresh produce also had to be submitted (Friedman, 2014).

In addition to the requirements for expenditures of the $2 million, the HPNAP program provided the food banks with suggested best practices for spending (Huyett, 2014). Food banks were permitted to purchase New York State produce directly from local farmers. The food banks were encouraged to visit www.prideofny.com to access the directory of local farmers (Friedman, 2014). Food banks were also allowed to purchase New York State produce from food vendors or food cooperatives if they could prove that the produce was grown in New York State (Friedman, 2014). Food Banks could work with the Farmers’ Market Federation of New York State to purchase “Health Bucks” (i.e. $2 vouchers), to distribute to food bank agency clientele for use at participating farmers’ markets to purchase locally grown produce (Friedman, 2014).

Similarly, the development of a farmers’ market voucher system in collaboration with local farmers’ markets was also encouraged (Friedman, 2014). If that type of project was selected, the use of Health Bucks or farmers’ market vouchers as an incentive for clients attending Just Say Yes to Fruits and Vegetables classes needed to be considered (Friedman, 2014). The Just Say Yes to Fruits and Vegetables classes supplied attendees utilizing the food pantry network (A. Koren-Roth, personal communication, November 5, 2014) with practical nutrition information, recipes and cooking
demonstrations incorporating fruits and vegetables (Just Say Yes, n.d.). In addition, those in attendance were taught the importance of food safety and how to stretch their budgets for food (Just Say Yes, n.d.). Therefore, using Health Bucks as an incentive could provide tangible ways of encouraging participants to apply what they learned in class. Food banks could order produce from farmers and have them delivered directly to interested emergency food programs (Friedman, 2014).

Food banks had the ability to develop mini-grants similar to Operation Support Grants (grants that fund the overall operating expenses of an organization), allowing emergency food programs to apply for funds to purchase locally grown produce (Friedman, 2014). Emergency food programs were required to prove that funding was spent solely on NYSG produce. While this initiative required that food banks buy and distribute NYSG produce during the entire growing season (May-November), HPNAP strongly recommended the use of other HPNAP produce funds to buy and distribute non-NYSG fresh produce during the off season (Friedman, 2014). Spending those additional funds on non-NYSG fresh produce allowed food banks to comply with the stipulations of purchasing fresh produce from their food budgets (Friedman, 2014).

The number of emergency food programs that received fresh produce and the number of pounds of fresh produce distributed were added as components to HPNAP’s monthly Milk, Produce and Grain expenditure report (New York State Department of Health – Division of Nutrition, 2013).

Funds from the Locally Grown Produce Initiative were added to the budget of each food bank for produce referred to as the produce line (Table 3). Funding was allocated based on monies available for food bank services and poverty data in the
regions served (Friedman, 2014). Food banks were required to prove that the entire amount added was used for NYSG produce. None of those monies could be used for administrative costs or food handling fees (Friedman, 2014). However, each food bank was permitted to move a maximum equivalent of five percent (5%) of the additional fresh produce monies from funds that were in their HPNAP produce line for specific administrative costs needed to procure or implement the Locally Grown Produce Initiative. Those costs included staffing, printing, mailing, and material and supply charges (Friedman, 2014).

Table 3

| Funding Allocation Methodology of HPNAP’s Locally Grown Produce Initiative |
|---------------------------------|-----------------|-----------------|-----------------|-----------------|
| Food Bank Region                | Available Funding per Region | % of Total | 2012-13 Contract Value | Initiative Funding |
| Upstate                         | $2,034,083          | 12.1%          | $1,960,367       | $242,000           |
| Downstate                       | $3,319,599          | 19.8%          | $3,210,538       | $398,000           |
| Upstate                         | $2,461,989          | 14.7%          | $2,373,483       | $294,000           |
| Upstate                         | $1,794,988          | 10.7%          | $1,780,296       | $214,000           |
| Downstate                       | $1,726,828          | 10.3%          | $1,468,276       | $206,000           |
| Upstate                         | $3,350,952          | 20.0%          | $3,363,816       | $400,000           |
| Upstate                         | $983,700            | 5.9%           | $1,118,792       | $118,000           |
| Downstate                       | $1,070,582          | 6.4%           | $1,032,501       | $128,000           |
| Totals                          | $16,742,721         | 100%           | $16,308,069      | $2,000,000         |

Note. Adapted from the “Locally Grown Produce Funding Packet” by S.R. Friedman, 2014, [Internal File]. Copyright 2014 by the New York State Department of Health. Adapted with permission.

Results of the Interim Evaluation of HPNAP’s Locally Grown Produce Initiative

During the implementation phase of the HPNAP Locally Grown Produce Initiative an internal six-month evaluation was conducted by the New York State Department of Health. At the end of 2012, the eight food banks collectively exceeded $2 million in spending on locally grown produce, which continued into 2013 (Table 4) and was highlighted (Table 5) by certain best practices (New York State Department of
Health – Division of Nutrition, 2013). During the 2012-13 contract year food banks used some of their food line budget allocated for produce to supplement procurement of locally grown produce with the $2 million stimulus (L. Clarke III, personal communication, November 14, 2014).

Table 4

<table>
<thead>
<tr>
<th>Best Practice Suggestion</th>
<th>Expenditure during 2012-2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>Purchasing NYSG produce directly from local farmers</td>
<td>$462,582</td>
</tr>
<tr>
<td>Purchasing NYSG produce from food vendors</td>
<td>$1,598,513</td>
</tr>
<tr>
<td>Purchasing Health Bucks $2 vouchers to distribute to food bank agency clientele</td>
<td>$58,318</td>
</tr>
<tr>
<td>Farm to emergency food program Initiatives</td>
<td>$41,924</td>
</tr>
<tr>
<td>Mini-grants</td>
<td>$66,830</td>
</tr>
<tr>
<td>Other (e.g. Food bank sponsored farmers’ markets)</td>
<td>$499,805</td>
</tr>
<tr>
<td>Total</td>
<td>$2,727,972</td>
</tr>
</tbody>
</table>

Note. Adapted from the “Locally Grown Produce Funding Packet” by S.R. Friedman, 2014, [Internal File]. Copyright 2014 by the New York State Department of Health. Adapted with permission.
Table 5

Food Bank Expenditures per Best Practice classified by Region

<table>
<thead>
<tr>
<th>Food Bank Region</th>
<th>Purchasing NYSG produce directly</th>
<th>Purchasing NYSG produce from food vendors</th>
<th>Purchasing Health Bucks $2 vouchers to distribute to food bank agency clientele</th>
<th>Farm to emergency food programs initiatives</th>
<th>Mini-Grants</th>
<th>Other*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upstate</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Downstate</td>
<td></td>
<td></td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Upstate</td>
<td>✓</td>
<td></td>
<td>✓</td>
<td></td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Upstate</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Downstate</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Upstate</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Downstate</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note. *For example food bank sponsored farmers’ markets. Adapted from the “Locally Grown Produce Funding Packet” by S.R. Friedman, 2014, [Internal File]. Copyright 2014 by the New York State Department of Health. Adapted with permission.

Collectively (Figure 6) the food banks exceeded the $2 million in Locally Grown Produce Initiative funds (Table 4) by spending an additional $728,000 in HPNAP funds on NYSG produce totaling more than $2.7 million (New York State Department of Health – Division of Nutrition, 2013). In contrast, the non-food bank contractors that received best practice suggestions but no additional funding also spent more on NYSG produce during the implementation year of the HPNAP Locally Grown Produce Initiative. Collectively, non-food banks spent a total of $277,482.00 (Figure 6) in 2012-2013 (New York State Department of Health., 2014). Nearly seven million pounds of NYSG produce were purchased (New York State Department of Health – Division of Nutrition, 2013). A total of 97 farmers received Locally Grown Produce Initiative funds (New York State Department of Health – Division of Nutrition, 2013). Nearly $500,000 in Locally Grown Produce Initiative funds were paid directly to farmers (New York State Department of Health – Division of Nutrition, 2013). There were also 75 farmers’
markets that were directly supported with Locally Grown Produce Initiative funds (New York State Department of Health – Division of Nutrition, 2013).

Figure 6. Total monthly expenditures on NYSG produce during the HPNAP Locally Grown Produce Initiative. Adapted from the “Locally Grown Produce Initiative Monthly Expenditures” by J Hart, 2014, [Internal File]. Copyright 2014 by the New York State Department of Health. Adapted with permission. Adapted from the Milk, Grain, and Produce expenditure report by the Division of Nutrition – Bureau of Nutrition Risk Reduction [Data file]. Copyright 2014 by the New York State Department of Health. Adapted with permission.

The New York State Department of Health’s evaluation provided evidence pointing to the initial success of the Locally Grown Produce Initiative during implementation with respect to increasing expenditures on local produce. The following chapter will discuss the purpose and methodology of a pilot evaluation study, conducted to determine whether the initial successful benefits of the initiative were sustained for at least one year following implementation.
Chapter 3: Methodology

Design and Purpose of the Study

This is a retrospective, non-equivalent control group evaluation study of the HPNAP Locally Grown Produce Initiative. The purpose of the study was to determine whether the HPNAP Locally Grown Produce Initiative had a significant impact on NYSG produce spending by HPNAP contractors one year later. In other words, was the HPNAP Locally Grown Produce Initiative able to sustain itself? For this study sustainability was defined as “continued expenditures by HPNAP contractors on NYSG produce at significantly higher levels during the year following implementation compared to the year preceding implementation.”

Research Questions

1. Did the HPNAP Locally Grown Produce Initiative have an effect, irrespective of contractor type (food bank or non-food bank), on total dollar expenditures and the proportion of total dollar expenditures on NYSG produce?
2. Did contractor type (food bank or non-food bank) have an effect on total dollar expenditures and the proportion of total dollar expenditures on NYSG produce?
3. Did contractor region (upstate or downstate) have an effect on total dollar expenditures and the proportion of total dollar expenditures on NYSG produce?
4. Did the interaction of contractor type (food bank or non-food bank) and contractor region (upstate or downstate) have an effect on total dollar expenditures and the proportion of total dollar expenditures on NYSG produce?
Null Hypotheses

The HPNAP Locally Grown Produce Initiative was expected to have an effect on annual expenditures by HPNAP contractors on NYSG produce. More specifically, it was hypothesized that the following would occur:

1. The HPNAP Locally Grown Produce Initiative will not have an effect, irrespective of contractor type (food bank or non-food bank), on total dollar expenditures and the proportion of total dollar expenditures on NYSG produce.

2. Contractor type (food bank or non-food bank) will not have an effect on total dollar expenditures and the proportion of total dollar expenditures on NYSG produce.

3. Contractor region (upstate or downstate) will not have an effect on total dollar expenditures and the proportion of total dollar expenditures on NYSG produce.

4. The interaction of contractor type (food bank or non-food bank) and contractor region (upstate or downstate) will not have an effect on total dollar expenditures and the proportion of total dollar expenditures on NYSG produce.

Data Source

The Milk, Grain and Produce expenditure report is a tracking system that monitors expenditures on and procurement of milk, grains and produce by the entire network of HPNAP contractors in dollars and pounds respectively (New York State Department of Health, 2014). In addition, the report lists the number of sites each contractor serves, for example, the number of food pantries and soup kitchens that a food bank distributes food to (New York State Department of Health, 2014). The variables for this study were extracted from the Milk, Grain and Produce expenditure report. The expenditures are reported each month by each contractor and are grouped together by
contract year (New York State Department of Health, 2014). A contract year is defined by HPNAP as a 12-month period from July 1 to June 30. Dollar expenditures only were chosen for the analysis because poundage data for contract year 2011-2012 were missing. Two contractors were excluded from the report because of having several months of missing expenditures on NYSG produce.

**Measures**

The independent variables for this study were: the HPNAP Locally Grown Produce Initiative, which was defined as the effect over time; contractor type, which was defined in terms of being a food bank or not; and contractor region which was defined in terms of geographical location within New York State. The HPNAP Locally Grown Produce Initiative variable was divided into two time measures, baseline or time 1 (2011-2012) and follow-up or time 2 (2013-2014). A third variable, the difference between time 1 and time 2, was the one calculated by subtracting the baseline time measure from the follow up time measure. The contractor type-variable, which was classified as food bank or non-food bank, included the eight regional food banks (Table 6) that received a one-time additional $2 million funding allocation during the 2012-2013 contract year (July 1-June 30). In addition to receiving the $2 million, the food bank contractors also received emailed suggested best practices (Table 4) on how to spend the money on NYSG produce. The non-food bank HPNAP contractors included resource grant distribution and direct service contractors along with special projects and food recovery contractors (Table 6). Non-food bank contractors did not receive any additional funding to purchase NYSG produce. Those contractors also received emails with suggested best practices (the same ones the food bank contractors received) on how to spend their
existing budget funds on NYSG produce. The contractor region variable was classified as either downstate or upstate. Downstate was defined as New York City, Long Island and Westchester County, while upstate was defined as the rest of New York State. Contractor region was selected as an independent variable because it was hypothesized that geographical location would impact implementation of the Locally Grown Produce Initiative. This is because logistically an innovation or program that works well in an urban location may not be suitable for or work well in a rural location. More specifically, in the case of the Locally Grown Produce Initiative, it was expected that procurement of NYSG would be more feasible in the upstate region than in the downstate region because of the higher number of farms, even though there are urban pockets upstate and rural pockets downstate.

The dependent variables for this study were as follows: post-implementation expenditures on NYSG produce; post minus pre-implementation expenditures on NYSG produce; proportion of post-implementation expenditures on NYSG produce; and proportion of post minus pre-implementation expenditures on NYSG produce. Therefore, the measures used to analyze the effect of the independent variable on the dependent variable were dollars spent by HPNAP contractors on NYSG produce.
Table 6

**A Description of the Independent Variables**

<table>
<thead>
<tr>
<th>HPNAP Locally Grown Produce Initiative</th>
<th>Non-Food Bank Contractors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time 1 = baseline (July 1, 2011-June 30, 2012)</td>
<td>Types of Agencies</td>
</tr>
<tr>
<td>Time 2 = follow-up (July 1, 2013-June 30, 2014)</td>
<td>- 6 Resource Grant Distribution</td>
</tr>
<tr>
<td>Time 2 – Time 1 = difference</td>
<td>- 23 Direct Service</td>
</tr>
<tr>
<td>Food Bank Contractors</td>
<td>- 4 Special Projects</td>
</tr>
<tr>
<td>Type of Agencies</td>
<td>- 1 Food Recovery</td>
</tr>
<tr>
<td>- 8 Food Banks</td>
<td>Funding</td>
</tr>
<tr>
<td></td>
<td>- No additional funding</td>
</tr>
<tr>
<td></td>
<td>- Food budget of which 10% was allocated for the purchase of fresh produce (with no requirement for NYSG produce)</td>
</tr>
<tr>
<td></td>
<td>Information</td>
</tr>
<tr>
<td></td>
<td>- Best practice suggestions on ways to spend their additional funding and existing food budget funding on NYSG produce</td>
</tr>
<tr>
<td></td>
<td>- Purchasing NYSG produce directly from local farmers</td>
</tr>
<tr>
<td></td>
<td>- Purchasing NYSG produce from food vendors</td>
</tr>
<tr>
<td></td>
<td>- Purchasing Health Bucks ($2 vouchers) to distribute to food bank agency clientele</td>
</tr>
<tr>
<td></td>
<td>- Farm to emergency food program initiatives</td>
</tr>
<tr>
<td></td>
<td>- Mini-grants</td>
</tr>
<tr>
<td></td>
<td>Downstate Contractors</td>
</tr>
<tr>
<td></td>
<td>- New York City</td>
</tr>
<tr>
<td></td>
<td>- Long Island</td>
</tr>
<tr>
<td></td>
<td>- Westchester County</td>
</tr>
<tr>
<td></td>
<td>Upstate Contractors</td>
</tr>
<tr>
<td></td>
<td>- Lower Hudson Valley Region (except Westchester County); Capital Region or Northern Catskills Region; Eastern Adirondacks/Lake Champlain Region; Western Adirondacks/Eastern Lake Ontario Region; Central New York Region; Western Finger Lakes; Western New York Region</td>
</tr>
</tbody>
</table>

**Note.** Adapted from the “Locally Grown Produce Funding Packet” by S.R. Friedman, 2014, [Internal File]. Copyright 2014 by the New York State Department of Health. Adapted with permission.
Data/Statistical Analysis Procedures

The data analysis procedures (Table 7) consisted of univariate analyses, bivariate analyses and a set of specific analyses selected to test the null hypotheses. Univariate analyses (including frequency and descriptive statistics) on all of the dependent variables were conducted to first determine whether there were any outliers and second to assess for assumptions of normality and homogeneity in variance of the two contractor types. Bivariate analyses, a Chi Square test and Fisher’s Exact test, were run to assess multicollinearity between the pair of explanatory variables, contractor type (food bank or non-food bank) and contractor region (upstate or downstate). The original plan was to do a repeated measures Analysis of Variance (ANOVA) to test the null hypotheses. However, as will be shown in the univariate analyses, the assumptions of normality and homogeneity of variance were not met. Because data transformation did not yield normal distributions, non-parametric analyses were used to test hypotheses.

In order to test the effect of the HPNAP Locally Grown Produce Initiative, irrespective of contractor type (food bank or non-food bank), the Wilcoxon Signed-Rank (related measures) test was run with 2011-2012 NYSG expenditures and 2013-2014 NYSG expenditures. In order to test the null hypothesis that contractor type (food bank or non-food bank) had the same impact, the Mann Whitney-U test was conducted on post minus pre differences in NYSG produce expenditures. In order to test the null hypothesis that region had the same impact, the Mann Whitney-U test was conducted on post minus pre-differences in NYSG produce expenditures. To test the null hypothesis of no interaction of contractor type (food bank or non-food bank) and region (upstate or downstate), the Kruskal-Wallace test was run on the four combinations of interactions
(i.e., a non-parametric one-way ANOVA) on post minus pre-differences; the four groups were downstate food banks, upstate food banks, downstate non-food banks, and upstate non-food banks. This was followed with a set of six Mann-Whitney U tests to determine which interaction cells were significantly different.
Table 7

**Data Analysis Procedures**

<table>
<thead>
<tr>
<th>Univariate Analyses</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Independent Variables</strong></td>
</tr>
<tr>
<td>HPNAP Locally Grown Produce Initiative</td>
</tr>
<tr>
<td>• Time 1 = baseline, Time 2 = follow-up, Time 2 – Time 1 = difference</td>
</tr>
<tr>
<td>Contractor Type</td>
</tr>
<tr>
<td>• Food Bank</td>
</tr>
<tr>
<td>• Non-Food Bank</td>
</tr>
<tr>
<td>Contractor Region</td>
</tr>
<tr>
<td>• Downstate</td>
</tr>
<tr>
<td>• Upstate</td>
</tr>
</tbody>
</table>

**Bivariate (Chi Square and Fisher’s Exact Tests) Analyses**

<table>
<thead>
<tr>
<th>Independent Variables</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contractor Type – Food bank or Non-Food bank</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Non-parametric Tests</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wilcoxon Signed-Rank test</td>
</tr>
<tr>
<td>• Time 1 and Time 2</td>
</tr>
<tr>
<td>Mann Whitney-U test</td>
</tr>
<tr>
<td>• Food Bank and Non-Food bank</td>
</tr>
<tr>
<td>• Time 2 – Time 1</td>
</tr>
<tr>
<td>Mann Whitney-U test</td>
</tr>
<tr>
<td>• Downstate and Upstate</td>
</tr>
<tr>
<td>• Time 2 – Time 1</td>
</tr>
<tr>
<td>Kruskal Wallace test</td>
</tr>
<tr>
<td>• Downstate Food Banks, Upstate Food Banks, Downstate Non-Food Banks, Upstate Non-Food Banks</td>
</tr>
<tr>
<td>Mann Whitney-U tests</td>
</tr>
<tr>
<td>• Six interaction cells</td>
</tr>
</tbody>
</table>
Because baseline funding levels for food banks were much higher than non-food banks due to having larger budgets to begin with, the decision was made to also test each of the hypotheses on the proportion of dollar expenditures on NYSG produce. The $\alpha$ was set to 0.05 to determine significance in this study. The statistical analysis software used was IBM SPSS Statistics.
Chapter 4: Results

Descriptive characteristics at baseline, intervention and follow up time periods for HPNAP food bank and non-food bank contractors are presented in Table 8. As portrayed in the table, statewide increases in NYSG produce expenditures occurred with both food banks and non-food banks one year following implementation of the HPNAP Locally Grown Produce Initiative.

Table 8

| Baseline, Intervention and Follow-up Characteristics of the HPNAP Contractors |
|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| Food Bank       | Non-Food Bank   | Food Bank       | Non-Food Bank   |
| Upstate          |                 |                 |                 |                 |                 |
| Sites, n         | 1,322           | 1,333           | 1,258           | 23              | 25              | 27              |
| Meals, n         | 52,850,365      | 51,972,431      | 57,187,700      | 1,572,593       | 2,028,157       | 1,768,709       |
| RFAs             | 9,100,636       | 8,877,427       | 9,774,920       | 230,457         | 263,991         | 500,764         |
| Children %       | 27%             | 28%             | 28%             | 25%             | 25%             | 25%             |
| Adults %         | 64%             | 63%             | 63%             | 68%             | 67%             | 74%             |
| Elderly          | 9%              | 9%              | 9%              | 8%              | 8%              | 13%             |
| Total $ NYSG     | $178,256        | $1,350,454      | $548,361        | $40,061         | $51,655         | $54,348         |
| Downstate        |                 |                 |                 |                 |                 |                 |
| Sites, n         | 726             | 702             | 680             | 458             | 465             | 458             |
| Meals, n         | 78,790,004      | 73,551,164      | 68,870,343      | 7,269,020       | 7,601,862       | 7,880,8077      |
| RFAs             | 10,196,243      | 9,549,497       | 9,221,283       | 11,681,283      | 12,250,922      | 12,316,518      |
| Children %       | 34%             | 34%             | 34%             | 25%             | 25%             | 25%             |
| Adults %         | 52%             | 52%             | 52%             | 57%             | 58%             | 56%             |
| Elderly          | 14%             | 14%             | 14%             | 18%             | 18%             | 18%             |
| Total $ NYSG     | $304,917        | $1,358,248      | $580,112        | $180,267        | $225,827        | $353,533        |
| Statewide        |                 |                 |                 |                 |                 |                 |
| Sites, n         | 2,048           | 2,035           | 1,938           | 481             | 490             | 484             |
| Meals, n         | 131,640,369     | 125,523,595     | 126,058,043     | 74,262,795      | 78,046,839      | 80,510,350      |
| RFAs             | 19,296,879      | 18,426,924      | 18,996,203      | 11,911,740      | 12,514,913      | 12,556,361      |
| Children %       | 31%             | 31%             | 31%             | 25%             | 25%             | 25%             |
| Adults %         | 58%             | 57%             | 58%             | 57%             | 58%             | 57%             |
| Elderly          | 11%             | 12%             | 11%             | 18%             | 17%             | 18%             |
| Total $ NYSG     | $483,173        | $2,708,702      | $1,128,473      | $220,328        | $277,482        | $407,881        |

Notes. NYSG stands for New York State grown and RFA stands for requests for assistance. Adapted from “Service Provided at HPNAP Supported Contracts 2011-2012” by the Division of Nutrition, Bureau of Nutrition Risk Reduction, 2012, [Internal File]. Copyright 2012 by the New York State Department of Health. Adapted with permission. Adapted from “Service Provided at HPNAP Supported Contracts 2013-2014” by the Division of Nutrition, Bureau of Nutrition Risk Reduction, 2014, [Internal File]. Copyright 2014 by the New York State Department of Health. Adapted with permission.
The distributions of contractor by type and region are presented in Table 9. As can be seen most contractor types were non-food banks (81%). With respect to region, the majority of contractors (66.7%) were from downstate.

Table 9

<table>
<thead>
<tr>
<th>Categorical Variable</th>
<th>Number</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contractor Type</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Food Bank</td>
<td>8</td>
<td>19%</td>
</tr>
<tr>
<td>Non-Food Bank</td>
<td>34</td>
<td>81%</td>
</tr>
<tr>
<td>Contractor Region</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Downstate</td>
<td>28</td>
<td>66.7%</td>
</tr>
<tr>
<td>Upstate</td>
<td>14</td>
<td>33.3%</td>
</tr>
</tbody>
</table>
Univariate Analyses: Expenditures in Dollars

The baseline distributions of the NYSG produce expenditures in 2012 of the whole sample of food banks and non-food banks were examined with relevant statistics presented in Table 10 and histograms presented in Figures 7, 8, and 9 respectively.

Table 10

*Statistics for NYSG Produce Total Dollar Expenditures in 2012 by all Contractors, Food Banks and Non-Food Banks.*

<table>
<thead>
<tr>
<th>Statistical Measure</th>
<th>All</th>
<th>Contractors N=42</th>
<th>Food Banks N=8</th>
<th>Non-Food Banks N=34</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>19,682.81</td>
<td>75,793.75</td>
<td>6,480.24</td>
<td></td>
</tr>
<tr>
<td>Std. Error of Mean</td>
<td>7,958.30</td>
<td>35,582.12</td>
<td>2,506.16</td>
<td></td>
</tr>
<tr>
<td>Median</td>
<td>56.00</td>
<td>35,933.00</td>
<td>.00</td>
<td></td>
</tr>
<tr>
<td>Mode</td>
<td>.00</td>
<td>.00*</td>
<td>.00</td>
<td></td>
</tr>
<tr>
<td>Std. Deviation</td>
<td>51,575.65</td>
<td>100,641.43</td>
<td>14,613.30</td>
<td></td>
</tr>
<tr>
<td>Variance</td>
<td>2,660,047,737.00</td>
<td>1.013E+10</td>
<td>213,548,410.70</td>
<td></td>
</tr>
<tr>
<td>Skewness</td>
<td>4.53</td>
<td>2.05</td>
<td>3.37</td>
<td></td>
</tr>
<tr>
<td>Std. Error of Skewness</td>
<td>.37</td>
<td>.75</td>
<td>.40</td>
<td></td>
</tr>
<tr>
<td>Kurtosis</td>
<td>23.59</td>
<td>4.55</td>
<td>12.96</td>
<td></td>
</tr>
<tr>
<td>Std. Error of Kurtosis</td>
<td>.72</td>
<td>1.48</td>
<td>.79</td>
<td></td>
</tr>
<tr>
<td>Range</td>
<td>304,917.00</td>
<td>304,917.00</td>
<td>72,647.00</td>
<td></td>
</tr>
<tr>
<td>Minimum</td>
<td>.00</td>
<td>.00</td>
<td>.00</td>
<td></td>
</tr>
<tr>
<td>Maximum</td>
<td>304,917.00</td>
<td>304,917.00</td>
<td>72,647.00</td>
<td></td>
</tr>
</tbody>
</table>

*Notes. *Multiple modes exist. The smallest value is shown.

One can see immediately that the distributions are far from normally distributed with high levels of skewness and kurtosis. In addition, one can see that the variance of the food bank group is exponentially greater than the non-food bank group. Thus, the large variances have resulted in high standard deviation values. As shown in Figures 7, 8, and 9 there were a large number (n=21) of contractors with $0.00 expenditures on NYSG produce in 2012. Consequently, ANOVA was not an appropriate statistical procedure and instead non-parametric tests were done.
Figure 7. Histogram of NYSG produce total dollar expenditures in 2012 by all contractors.

Mean = 19622.81
Std. Dev. = 51575.651
N = 42
Figure 8. Histogram of NYSG produce total dollar expenditures in 2012 by food banks.
Figure 9. Histogram of NYSG Produce total dollar expenditures in 2012 by non-food banks.
The post-interventions distributions of NYSG produce expenditures in 2014 for the whole sample of food banks and non-food banks were examined with pertinent statistics presented in Table 11 and histograms presented in *Figures* 10, 11, and 12 respectively.

Table 11

<table>
<thead>
<tr>
<th>Statistical Measure</th>
<th>All Contractors N=42</th>
<th>Food Banks N=8</th>
<th>Non-Food Banks N=34</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>36579.86</td>
<td>141059.13</td>
<td>11996.50</td>
</tr>
<tr>
<td>Std. Error of Mean</td>
<td>11275.73</td>
<td>38890.91</td>
<td>4847.37</td>
</tr>
<tr>
<td>Median</td>
<td>5716.00</td>
<td>123839.50</td>
<td>3182.50</td>
</tr>
<tr>
<td>Mode</td>
<td>.00</td>
<td>14182.00*</td>
<td>.00</td>
</tr>
<tr>
<td>Std. Deviation</td>
<td>73075.10</td>
<td>110000.11</td>
<td>28264.80</td>
</tr>
<tr>
<td>Variance</td>
<td>5,339,970,466.22</td>
<td>1.210E+10</td>
<td>798,898,942.32</td>
</tr>
<tr>
<td>Skewness</td>
<td>3.01</td>
<td>1.34</td>
<td>4.59</td>
</tr>
<tr>
<td>Std. Error of Skewness</td>
<td>.37</td>
<td>.75</td>
<td>.40</td>
</tr>
<tr>
<td>Kurtosis</td>
<td>10.48</td>
<td>2.52</td>
<td>23.50</td>
</tr>
<tr>
<td>Std. Error of Kurtosis</td>
<td>.72</td>
<td>1.48</td>
<td>.79</td>
</tr>
<tr>
<td>Range</td>
<td>371,527.00</td>
<td>357,345.00</td>
<td>159,083.00</td>
</tr>
<tr>
<td>Minimum</td>
<td>.00</td>
<td>14,182.00</td>
<td>.00</td>
</tr>
<tr>
<td>Maximum</td>
<td>371,527.00</td>
<td>371,527.00</td>
<td>159,083.00</td>
</tr>
</tbody>
</table>

*Notes.* *Multiple modes exist. The smallest value is shown.*

One can observe right away that the post-intervention distributions are not normally distributed with high levels of skewness and kurtosis. In addition, one can observe that the variance of the food bank group is exponentially greater than the non-food bank group. As shown in *Figures* 10, 11, and 12 there were a large number (n=10) of contractors with $0.00 expenditures on NYSG produce in 2014.
Figure 10. Histogram of NYSG produce total dollar expenditures in 2014 by all contractors.
Figure 11. Histogram of NYSG produce total dollar expenditures in 2014 by food banks.
Figure 12. Histogram of NYSG produce total dollar expenditures in 2014 by non-food banks.
Univariate Analyses: Proportion of Expenditures in Dollars

The baseline distributions of the proportion of NYSG produce expenditures in 2012 for the whole sample of food banks and non-food banks were examined with relevant statistics presented in Table 12 and histograms presented in Figures 13, 14, and 15 respectively.

Table 12

<table>
<thead>
<tr>
<th>Statistical Measure</th>
<th>All Contractors N=42</th>
<th>Food Banks N=8</th>
<th>Non-Food Banks N=34</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>.256</td>
<td>.333</td>
<td>.238</td>
</tr>
<tr>
<td>Std. Error of Mean</td>
<td>.058</td>
<td>.106</td>
<td>.067</td>
</tr>
<tr>
<td>Median</td>
<td>.025</td>
<td>.250</td>
<td>.000</td>
</tr>
<tr>
<td>Mode</td>
<td>.000</td>
<td>.000*</td>
<td>.000</td>
</tr>
<tr>
<td>Std. Deviation</td>
<td>.372</td>
<td>.299</td>
<td>.389</td>
</tr>
<tr>
<td>Variance</td>
<td>.139</td>
<td>.089</td>
<td>.151</td>
</tr>
<tr>
<td>Skewness</td>
<td>1.239</td>
<td>.976</td>
<td>1.356</td>
</tr>
<tr>
<td>Std. Error of Skewness</td>
<td>.365</td>
<td>.752</td>
<td>.403</td>
</tr>
<tr>
<td>Kurtosis</td>
<td>-.062</td>
<td>.473</td>
<td>.093</td>
</tr>
<tr>
<td>Std. Error of Kurtosis</td>
<td>.717</td>
<td>1.481</td>
<td>.788</td>
</tr>
<tr>
<td>Range</td>
<td>1.00</td>
<td>.900</td>
<td>1.000</td>
</tr>
<tr>
<td>Minimum</td>
<td>.000</td>
<td>.000</td>
<td>.000</td>
</tr>
<tr>
<td>Maximum</td>
<td>1.000</td>
<td>.900</td>
<td>1.000</td>
</tr>
</tbody>
</table>

Notes. *Multiple modes exist. The smallest value is shown.

One can immediately see that the post-intervention distributions are not normally distributed with levels of skewness not equal to zero. As portrayed in Figures 13, 14, and 15 there were a large number (n=21) of contractors with the proportion of expenditures on NYSG produce equal to .000 in 2012. As a result, ANOVA was not an appropriate statistical procedure and instead non-parametric tests were conducted.
Figure 13. Histogram of the proportion of NYSG produce total dollar expenditures in 2012 by all contractors.
Figure 14. Histogram of the proportion of NYSG produce total dollar expenditures in 2012 by food banks.
Figure 15. Histogram of the proportion of NYSG produce total dollar expenditures in 2012 by non-food banks.
The post-interventions distributions of the proportion of NYSG produce expenditures in 2014 for the whole sample of food banks and non-food banks were examined with pertinent statistics presented in Table 13 and histograms presented in Figures 16, 17, and 18 respectively.

Table 13

<table>
<thead>
<tr>
<th>Statistical Measure</th>
<th>All</th>
<th>Contractors N=42</th>
<th>Food Banks N=8</th>
<th>Non-Food Banks N=34</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>.345</td>
<td>.633</td>
<td>.278</td>
<td></td>
</tr>
<tr>
<td>Std. Error of Mean</td>
<td>.057</td>
<td>.130</td>
<td>.058</td>
<td></td>
</tr>
<tr>
<td>Median</td>
<td>.235</td>
<td>.800</td>
<td>.115</td>
<td></td>
</tr>
<tr>
<td>Mode</td>
<td>.000</td>
<td>.800</td>
<td>.000</td>
<td></td>
</tr>
<tr>
<td>Std. Deviation</td>
<td>.367</td>
<td>.368</td>
<td>.338</td>
<td></td>
</tr>
<tr>
<td>Variance</td>
<td>.135</td>
<td>.136</td>
<td>.114</td>
<td></td>
</tr>
<tr>
<td>Skewness</td>
<td>.756</td>
<td>-.634</td>
<td>1.165</td>
<td></td>
</tr>
<tr>
<td>Std. Error of Skewness</td>
<td>.365</td>
<td>.752</td>
<td>.403</td>
<td></td>
</tr>
<tr>
<td>Kurtosis</td>
<td>-.928</td>
<td>-1.684</td>
<td>.202</td>
<td></td>
</tr>
<tr>
<td>Std. Error of Kurtosis</td>
<td>.717</td>
<td>1.481</td>
<td>.788</td>
<td></td>
</tr>
<tr>
<td>Range</td>
<td>1.00</td>
<td>.920</td>
<td>1.000</td>
<td></td>
</tr>
<tr>
<td>Minimum</td>
<td>.000</td>
<td>.080</td>
<td>.000</td>
<td></td>
</tr>
<tr>
<td>Maximum</td>
<td>1.00</td>
<td>1.000</td>
<td>1.000</td>
<td></td>
</tr>
</tbody>
</table>

One can observe right away that the post-intervention distributions are not normally distributed with levels of skewness not equal to zero. As shown in Figures 16, 17, and 18 there are a large number (n=10) of contractors with the proportion of expenditures on NYSG produce equal to .000 in 2014.
Figure 16. Histogram of the proportion of NYSG produce total dollar expenditures in 2014 by all contractors.
Figure 17. Histogram of the proportion of NYSG produce total dollar expenditures in 2014 by food banks.
Figure 18. Histogram of the proportion of NYSG produce total dollar expenditures in 2014 by non-food banks.
**Bivariate Analyses**

In order to assess for possible multicollinearity the hypothesis that contractor type and contractor region were independent was tested. The distribution across cells is presented in Table 14.

Table 14

*Contractor Type by Contractor Region Contingency Table*

<table>
<thead>
<tr>
<th>Contactor Type</th>
<th>Contractor Region</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Downstate</td>
</tr>
<tr>
<td>Food Bank</td>
<td>Count</td>
</tr>
<tr>
<td></td>
<td>Expected Count</td>
</tr>
<tr>
<td>Non-Food Bank</td>
<td>Count</td>
</tr>
<tr>
<td></td>
<td>Expected Count</td>
</tr>
<tr>
<td>Total</td>
<td>Count</td>
</tr>
<tr>
<td></td>
<td>Expected Count</td>
</tr>
</tbody>
</table>

Because assumptions of the Chi Square test for a 2 X 2 table were violated with some of the expected counts, the significance value for the Fisher’s Exact test was used to rule out multicollinearity. The results are presented in Table 15.
Table 15

*Chi-Square Tests*

<table>
<thead>
<tr>
<th>Test</th>
<th>Value</th>
<th>df</th>
<th>Asymp. Sig. (2-sided)</th>
<th>Exact Sig. (2-sided)</th>
<th>Exact Sig. (1-sided)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pearson Chi-Square</td>
<td>3.783</td>
<td>1</td>
<td>.052</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Correction</td>
<td>2.335</td>
<td>1</td>
<td>.126</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Likelihood Ratio</td>
<td>3.583</td>
<td>1</td>
<td>.058</td>
<td>.092</td>
<td>.066</td>
</tr>
<tr>
<td>Fisher's Exact Test</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Linear-by-Linear Association</td>
<td>3.693</td>
<td>1</td>
<td>.055</td>
<td></td>
<td></td>
</tr>
<tr>
<td>N of Valid Cases</td>
<td>42</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Notes.*

a. 1 cell (25.0%) has expected count less than 5. The minimum expected count is 2.67.
b. Computed only for a 2x2 table

As can be seen, the result of the Fisher’s Exact test approached but did not achieve significance, with a 1-sided p-value of 0.066. Thus, the null hypothesis that contractor type and contractor region were not related was accepted.
Test of Hypotheses: Expenditures in Dollars

In order to test the impact of the HPNAP Locally Grown Produce Initiative irrespective of contractor type and region, the Wilcoxon Signed Rank test was done comparing dollar expenditures on NYSG produce in 2012 with dollar expenditures on NYSG produce in 2014. Results are presented in Table 16.

Table 16

Wilcoxon Signed-Rank Test on NYSG Produce Total Dollar Expenditures by all Contractors for 2012 and 2014.

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Mean Rank</th>
<th>Sum of Ranks</th>
<th>Z</th>
<th>Asymp. Sig (2-tailed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Negative Ranks</td>
<td>6a</td>
<td>9.17</td>
<td>55.00</td>
<td>-4.029d</td>
<td>0.000</td>
</tr>
<tr>
<td>Positive Ranks</td>
<td>27b</td>
<td>18.74</td>
<td>506.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ties</td>
<td>9c</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>42</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Notes.

a. Total $ NYSG 2014 < Total $ NYSG 2012
b. Total $ NYSG 2014 > Total $ NYSG 2012
c. Total $ NYSG 2014 = Total $ NYSG 2012
d. Based on negative ranks

As one can observe the null hypothesis of no effect was rejected with an observed z-score of 4.029 (p < .0005). Thus, expenditures on NYSG produce were significantly greater in the year following the initiative compared to baseline.
Next contractor types were compared with respect to the difference in spending on NYSG produce between 2012 and 2014 using the Mann Whitney U test. Results are presented in Table 17.

Table 17

*Mann-Whitney U Test comparing Post minus Pre-Differences in Dollar Expenditures on NYSG Produce by Contractor Type*

<table>
<thead>
<tr>
<th>Contractor Type</th>
<th>N</th>
<th>Mean Rank</th>
<th>Sum of Ranks</th>
<th>Mann-Whitney U</th>
<th>Z</th>
<th>Asymp. Sig. (2-tailed)</th>
<th>Exact Sig. [2*(1-tailed Sig.)]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Food Bank</td>
<td>8</td>
<td>37.25</td>
<td>298.00</td>
<td>10.000</td>
<td>-4.056</td>
<td>.000</td>
<td>.000^a</td>
</tr>
<tr>
<td>Non-Food Bank</td>
<td>34</td>
<td>17.79</td>
<td>605.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>42</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Notes.*

a. Not corrected for ties.

As can be seen, the null hypothesis of no difference between food bank and non-food bank contractors was rejected with an observed z-score of -4.056. Thus, food banks had a significantly greater change in spending on NYSG produce compared to non-food banks.
Next contractor regions were compared with respect to the difference in spending on NYSG produce between 2012 and 2014 using the Mann Whitney U test. Results are presented in Table 18.

Table 18

*Mann-Whitney U Test comparing Post minus Pre-Differences in Dollar Expenditures on NYSG Produce by Contractor Region*

<table>
<thead>
<tr>
<th>Contractor Region</th>
<th>N</th>
<th>Mean Rank</th>
<th>Sum of Ranks</th>
<th>Mann-Whitney U</th>
<th>Asymp. Sig (2-tailed)</th>
<th>Exact Sig. [2* (1-tailed Sig.)]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Downstate</td>
<td>28</td>
<td>21.14</td>
<td>592.00</td>
<td>186.00</td>
<td>-.268</td>
<td>.789</td>
</tr>
<tr>
<td>Upstate</td>
<td>14</td>
<td>22.21</td>
<td>311.00</td>
<td></td>
<td></td>
<td>.802 a</td>
</tr>
<tr>
<td>Total</td>
<td>42</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Notes.*

a. Not corrected for ties.

As one can observe, the null hypothesis of no difference between downstate and upstate regions was accepted with an observed z-score of -.268. Therefore, region did not have a significant effect on dollars spent by contractors on NYSG produce.
Next interactions of contractor type and contractor region were tested using the Kruskal Wallis Test on four groups: downstate food banks; upstate food banks; downstate non-food banks; and upstate non-food banks. Results are presented in Table 19.

Table 19

*Kruskal Wallis Test of the interaction of Contractor Type and Contractor Region*

<table>
<thead>
<tr>
<th>Contractor Type and Contractor Region</th>
<th>N</th>
<th>Mean Rank</th>
<th>Chi-Square</th>
<th>df</th>
<th>Asymp. Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Downstate Food Bank</td>
<td>3</td>
<td>36.67</td>
<td>17.859 a,b</td>
<td>3</td>
<td>.000 a,b</td>
</tr>
<tr>
<td>Upstate Food Bank</td>
<td>5</td>
<td>37.60</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Downstate Non-Food Bank</td>
<td>25</td>
<td>19.28</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Upstate Non-Food Bank</td>
<td>9</td>
<td>13.67</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>42</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Notes.*

a. Kruskal Wallis Test
b. Grouping Variable: Contractor Type and Contractor Region

Based on the results of the Kruskal Wallis test, the null hypothesis of no interaction was rejected ($\chi^2 (3) = 17.859, p < .005$). Consequently, there was a significant interaction between contractor type and region with respect to changes in dollars spent on NYSG produce between 2012 and 2014. In order to determine which groups were significantly different from one another a series of six Mann Whitney U tests were conducted on each pair of groups.
The first test compared downstate food banks to upstate food banks with respect to difference in spending on NYSG produce between 2012 and 2014. The results of the Mann-Whitney U test are depicted in Table 20.

Table 20

*Mann-Whitney U Test comparing Downstate Food Banks and Upstate Food Banks with respect to Post minus Pre-Differences in Dollar Expenditures on NYSG produce*

<table>
<thead>
<tr>
<th>Contractor Type and Region</th>
<th>N</th>
<th>Mean Rank</th>
<th>Sum of Ranks</th>
<th>Mann-Whitney U</th>
<th>Asymp. Sig.</th>
<th>Exact Sig. [2*(1-tailed Sig.)]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Downstate Food Banks</td>
<td>3</td>
<td>3.67</td>
<td>11.00</td>
<td>5.000*</td>
<td>-.745*</td>
<td>.456*</td>
</tr>
<tr>
<td>Upstate Food Bank</td>
<td>5</td>
<td>5.00</td>
<td>25.00</td>
<td></td>
<td>.571*</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>8</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Notes.*

a. Grouping Variable: Contractor Type and Contractor Region
b. Not corrected for ties

As can be seen, the null hypothesis of no difference between downstate food banks and upstate food banks was accepted with an observed z-score of -.745. Therefore, there was no significant difference in change in spending on NYSG produce between downstate food banks and upstate food banks.
The second test compared downstate food banks to downstate non-food banks with respect to the difference in spending on NYSG produce between 2012 and 2014. The results of the Mann-Whitney U test are depicted in Table 21.

Table 21

*Mann-Whitney U Test comparing Downstate Food Banks and Downstate Non-Food Banks with respect to Post minus Pre-Differences in Dollar Expenditures on NYSG produce.*

<table>
<thead>
<tr>
<th>Contractor Type and Contractor Region</th>
<th>N</th>
<th>Mean Rank</th>
<th>Sum of Ranks</th>
<th>Mann-Whitney U</th>
<th>Z</th>
<th>Asymp. Sig. (2-tailed)</th>
<th>Exact Sig. [2*(1-tailed Sig.)]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Downstate Food Bank</td>
<td>3</td>
<td>26.00</td>
<td>78.00</td>
<td>3.000</td>
<td>-2.606</td>
<td>.009a</td>
<td>.004b</td>
</tr>
<tr>
<td>Downstate Non-Food Bank</td>
<td>25</td>
<td>13.12</td>
<td>328.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>28</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Notes.*

a. Grouping Variable: Contractor Type and Contractor Region
b. Not corrected for ties

As one can observe, the null hypothesis of no difference between downstate food banks and downstate non-food banks was rejected with an observed z-score of -2.606. Therefore, downstate food banks had a significantly greater change in spending on NYSG produce than downstate non-food banks.
The third test compared downstate food banks to upstate non-food banks with respect to the difference in spending on NYSG produce between 2012 and 2014. The results of the Mann-Whitney U test are depicted in Table 22.

Table 22

*Mann-Whitney U Test comparing Downstate Food Banks and Upstate Non-Food Banks with respect to Post minus Pre-Differences in Dollar Expenditures on NYSG produce*

<table>
<thead>
<tr>
<th>Contractor Type and Contractor Region</th>
<th>N</th>
<th>Mean Rank</th>
<th>Sum of Ranks</th>
<th>Mann-Whitney U</th>
<th>Asymp. Sig. (2-tailed)</th>
<th>Exact Sig. [2*(1-tailed Sig.)]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Downstate Food Bank</td>
<td>3</td>
<td>11.00</td>
<td>33.00</td>
<td>0.000&lt;sup&gt;a&lt;/sup&gt;</td>
<td>-2.496&lt;sup&gt;a&lt;/sup&gt;</td>
<td>.013&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>Upstate Non-Food Bank</td>
<td>9</td>
<td>5.00</td>
<td>45.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>12</td>
<td></td>
<td></td>
<td>0.000&lt;sup&gt;a&lt;/sup&gt;</td>
<td>-2.496&lt;sup&gt;a&lt;/sup&gt;</td>
<td>.013&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
</tbody>
</table>

Notes.
- a. Grouping Variable: Contractor Type and Contractor Region
- b. Not corrected for ties

As can be observed, the null hypothesis of no difference between food banks downstate and non-food banks upstate was rejected with an observed z-score of -2.496. Therefore, downstate food banks had a significantly greater change in spending on NYSG produce than upstate non-food banks.
The fourth test compared upstate food banks to downstate non-food banks with respect to difference in spending on NYSG produce between 2012 and 2014. The results of the Mann-Whitney U test are depicted in Table 23.

Table 23

*Mann-Whitney U Test comparing Upstate Food Banks and Downstate Non-Food Banks with respect to Post minus Pre-Differences in Dollar Expenditures on NYSG produce*

<table>
<thead>
<tr>
<th>Contractor Type and Contractor Region</th>
<th>N</th>
<th>Mean Rank</th>
<th>Sum of Ranks</th>
<th>Mann-Whitney U</th>
<th>Asymp. Sig.</th>
<th>Exact Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upstate Food Bank</td>
<td>5</td>
<td>26.80</td>
<td>134.00</td>
<td>6.000&lt;sup&gt;a&lt;/sup&gt;</td>
<td>-3.187</td>
<td>.001</td>
</tr>
<tr>
<td>Downstate Non-Food Bank</td>
<td>25</td>
<td>13.24</td>
<td>331.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>30</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Notes.*
- a. Grouping Variable: Contractor Type and Contractor Region
- b. Not corrected for ties

As can be seen, the null hypothesis of no difference between food banks upstate and non-food banks downstate was rejected with an observed z-score of -3.187. Therefore, upstate food banks had a significantly greater change in spending on NYSG produce than downstate non-food banks.
The fifth test compared upstate food banks to upstate non-food banks with respect to difference in spending on NYSG produce between 2012 and 2014. The results of the Mann-Whitney U test are depicted in Table 24.

Table 24

*Mann-Whitney U Test comparing Upstate Food Banks and Upstate Non-Food Banks with respect to Post minus Pre-Differences in Dollar Expenditures on NYSG produce*

<table>
<thead>
<tr>
<th>Contractor Type and Contractor Region</th>
<th>N</th>
<th>Mean Rank</th>
<th>Sum of Ranks</th>
<th>Mann-Whitney U</th>
<th>Asymp. Sig. (Z)</th>
<th>Exact Sig. [2*(1-tailed Sig.)]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upstate Food Bank</td>
<td>5</td>
<td>11.80</td>
<td>59.00</td>
<td>1.000$^a$</td>
<td>-2.867</td>
<td>.004</td>
</tr>
<tr>
<td>Upstate Non-Food Bank</td>
<td>9</td>
<td>5.11</td>
<td>46.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>14</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Notes.*

a. Grouping Variable: Contractor Type and Contractor Region
b. Not corrected for ties

As can be observed, the null hypothesis of no difference between upstate food banks and upstate non-food banks was rejected with an observed $z$-score of -2.867.

Therefore, upstate food banks had a significantly greater change in spending on NYSG produce than upstate non-food banks.
The sixth test compared upstate food banks to downstate non-food banks with respect to difference in spending on NYSG produce between 2012 and 2014. The results of the Mann-Whitney U test are depicted in Table 25.

Table 25

*Mann-Whitney U Test comparing Upstate Food Banks and Downstate Non-Food Banks with respect to Post minus Pre-Differences in Dollar Expenditures on NYSG produce*

<table>
<thead>
<tr>
<th>Contractor Type and Contractor Region</th>
<th>N</th>
<th>Mean Rank</th>
<th>Sum of Ranks</th>
<th>Mann-Whitney U</th>
<th>Asymp. Sig.</th>
<th>Exact Sig. [2*(1-tailed Sig.)]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upstate Food Bank</td>
<td>25</td>
<td>18.92</td>
<td>473.00</td>
<td>77.000^a</td>
<td>-1.399^a</td>
<td>.162^a</td>
</tr>
<tr>
<td>Downstate Non-Food Bank</td>
<td>9</td>
<td>13.56</td>
<td>122.00</td>
<td></td>
<td></td>
<td>.175^b</td>
</tr>
<tr>
<td>Total</td>
<td>34</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Notes.*

a. Grouping Variable: Contractor Type and Contractor Region
b. Not corrected for ties

As one can see, the null hypothesis of no difference between upstate food banks and upstate non-food banks was accepted with an observed z-score of -1.399. Therefore, there was no significant difference in change in spending between upstate food banks and downstate non-food banks.
Tests of Hypotheses: Proportion of Expenditures

In order to test the impact of the HPNAP Locally Grown Produce Initiative, irrespective of contractor type and region, the Wilcoxon Signed-Rank test was done comparing proportion of dollar expenditures on NYSG produce in 2012 with the proportion of dollar expenditures on NYSG produce in 2014. Results of these tests are presented in Table 26.

Table 26

*Wilcoxon Signed-Rank Test on the Proportion of NYSG Produce Total Dollar Expenditures by all Contractors for 2012 and 2014.*

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Mean Rank</th>
<th>Sum of Ranks</th>
<th>Z</th>
<th>Asymp. Sig (2-tailed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Negative Ranks</td>
<td>6(^a)</td>
<td>18.08</td>
<td>108.50</td>
<td>-2.551(^d)</td>
<td>.011</td>
</tr>
<tr>
<td>Positive Ranks</td>
<td>24(^b)</td>
<td>14.85</td>
<td>356.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ties</td>
<td>12(^c)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>42</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Notes.

\(^a\) Proportion of Total $ NYSG 2014 < Proportion of Total $ NYSG 2012
\(^b\) Proportion of Total $ NYSG 2014 > Proportion of Total $ NYSG 2012
\(^c\) Proportion of Total $ NYSG 2014 = Proportion of Total $ NYSG 2012
\(^d\) Based on negative ranks

As can be seen from the table, the null hypothesis of no effect was rejected with an observed z-score of -2.551. Thus, the proportion of expenditures on NYSG produce was significantly greater in the year following the initiative compared to baseline.
Next contractor types were compared with respect to the proportion of the difference in spending on NYSG produce between 2012 and 2014 using the Mann-Whitney U test. Results are presented in Table 27.

Table 27

Mann-Whitney U Test comparing Post minus Pre-Differences in the Proportion of Dollar Expenditures on NYSG Produce by Contractor Type

<table>
<thead>
<tr>
<th>Contractor Type</th>
<th>N</th>
<th>Mean Rank</th>
<th>Sum of Ranks</th>
<th>Mann-Whitney U</th>
<th>Asymp. Sig. (2-tailed)</th>
<th>Exact Sig. [2*(1-tailed Sig.)]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Food Bank</td>
<td>8</td>
<td>32.13</td>
<td>257.00</td>
<td>51.00&lt;sup&gt;a&lt;/sup&gt;</td>
<td>-2.755&lt;sup&gt;a&lt;/sup&gt;</td>
<td>.006&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>Non-Food Bank</td>
<td>34</td>
<td>19.00</td>
<td>646.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>42</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Notes.

a. Grouping Variable: Contractor Type and Contractor Region
b. Not corrected for ties

As one can observe, the null hypothesis of no difference between food bank and non-food bank contractors was rejected with an observed z-score of -2.755. Thus, food banks had a significantly greater proportion of change in expenditures on NYSG produce compared to non-food banks.
Then contractor regions were compared with respect to the difference in the proportion of spending on NYSG produce between 2012 and 2014 using the Mann-Whitney U test. Results are presented in Table 28.

Table 28

Mann-Whitney U Test comparing Post minus Pre-Differences in Dollar Expenditures on NYSG Produce by Contractor Region

<table>
<thead>
<tr>
<th>Contractor Region</th>
<th>N</th>
<th>Mean Rank</th>
<th>Sum of Ranks</th>
<th>Mann-Whitney U</th>
<th>Asymp. Sig (2-tailed)</th>
<th>Exact Sig. [2* (1-tailed Sig.)]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Downstate</td>
<td>28</td>
<td>21.64</td>
<td>606.00</td>
<td>192.00</td>
<td>- .108 a</td>
<td>.914 a</td>
</tr>
<tr>
<td>Upstate</td>
<td>14</td>
<td>21.21</td>
<td>297.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>42</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Notes.
(a) Grouping Variable: Contractor Type and Contractor Region
(b) Not corrected for ties

As can be seen, the null hypothesis of no difference between downstate and upstate regions was accepted with an observed z-score of -.108. Therefore, region did not have a significant effect on the proportion of dollars spent by contractors on NYSG produce.
Next interactions of contractor type and contractor region were tested using the Kruskal Wallis test on four groups: downstate food banks; upstate food banks; downstate non-food banks; and upstate non-food banks. Results are presented in Table 29.

Table 29

<table>
<thead>
<tr>
<th>Contractor Type and Contractor Region</th>
<th>N</th>
<th>Mean Rank</th>
<th>Chi-Square</th>
<th>df</th>
<th>Asymp. Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Downstate Food Bank</td>
<td>3</td>
<td>27.17</td>
<td>10.913^a,b</td>
<td>3</td>
<td>.012</td>
</tr>
<tr>
<td>Upstate Food Bank</td>
<td>5</td>
<td>35.10</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Downstate Non-Food Bank</td>
<td>25</td>
<td>20.98</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Upstate Non-Food Bank</td>
<td>9</td>
<td>13.50</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>42</td>
<td>42</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Notes.

Based on the results of the Kruskal Wallis test, the null hypothesis of no interaction was rejected ($\chi^2 (3) = 10.913, p < .05$). Consequently, there appears to be an interaction between contractor type and region with respect to changes in the proportion of dollars spent on NYSG produce between 2012 and 2014. In order to determine which groups were significantly different from one another a series of six Mann-Whitney U tests were conducted on each pair of groups.
The first test compared downstate food banks to upstate food banks with respect to difference in the proportion of spending on NYSG produce between 2012 and 2014. The results of the Mann-Whitney U test are depicted in Table 30.

Table 30

**Mann-Whitney U Test comparing Downstate Food Banks and Upstate Food Banks with respect to Post minus Pre-Differences in the Proportion of Dollar Expenditures on NYSG produce**

<table>
<thead>
<tr>
<th>Contractor Type and Region</th>
<th>N</th>
<th>Mean Rank</th>
<th>Sum of Ranks</th>
<th>Mann-Whitney U</th>
<th>Asymp. Sig. (2-tailed)</th>
<th>Exact Sig. [2*(1-tailed Sig.)]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Downstate Food Banks</td>
<td>3</td>
<td>3.67</td>
<td>11.00</td>
<td>5.000&lt;sup&gt;a&lt;/sup&gt;</td>
<td>-.745</td>
<td>.456</td>
</tr>
<tr>
<td>Upstate Food Bank</td>
<td>5</td>
<td>5.00</td>
<td>25.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>8</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Notes:

a. Grouping Variable: Contractor Type and Contractor Region

b. Not corrected for ties

As one can see, the null hypothesis of no difference between downstate food banks and upstate food banks was accepted with an observed z-score of -.745. Therefore, there was no significant difference in change in the proportion of spending on NYSG produce between downstate food banks and upstate food banks.
The second test compared downstate food banks to downstate non-food banks with respect to difference in the proportion of spending on NYSG produce between 2012 and 2014. The results of the Mann-Whitney U test are depicted in Table 31.

Table 31

*Mann-Whitney U Test comparing Downstate Food Banks and Downstate Non-Food Banks with respect to Post minus Pre-Differences in the Proportion of Dollar expenditures on NYSG produce.*

<table>
<thead>
<tr>
<th>Contractor Type and Contractor Region</th>
<th>N</th>
<th>Mean Rank</th>
<th>Sum of Ranks</th>
<th>Mann Whitney U</th>
<th>Asymp. Sig. (2-tailed)</th>
<th>Exact Sig. [2*(1-tailed Sig.)]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Downstate Food Bank</td>
<td>3</td>
<td>18.33</td>
<td>55.00</td>
<td>26.000</td>
<td>-.881</td>
<td>.378</td>
</tr>
<tr>
<td>Downstate Non-Food Bank</td>
<td>25</td>
<td>14.04</td>
<td>351.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>28</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Notes.

a. Grouping Variable: Contractor Type and Contractor Region
b. Not corrected for ties

As can be observed, the null hypothesis of no difference between downstate food banks and downstate non-food banks was accepted with an observed z-score of -.881.

Therefore, there was no significant difference in change in the proportion of spending on NYSG produce between downstate food banks and downstate non-food banks.
The third test compared downstate food banks to upstate non-food banks with respect to difference in the proportion of spending on NYSG produce between 2012 and 2014. The results of the Mann Whitney U test are depicted in Table 32.

Table 32

*Mann-Whitney U Test comparing Downstate Food Banks and Upstate Non-Food Banks with respect to Post minus Pre-Differences in the Proportion of Dollar Expenditures on NYSG produce*

<table>
<thead>
<tr>
<th>Contractor Type and Contractor Region</th>
<th>N</th>
<th>Mean Rank</th>
<th>Sum of Ranks</th>
<th>Mann-Whitney U</th>
<th>Asymp. Sig. (2-tailed)</th>
<th>Exact Sig. [2*(1-tailed Sig.)]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Downstate Food Bank</td>
<td>3</td>
<td>9.17</td>
<td>27.50</td>
<td>5.500&lt;sup&gt;a&lt;/sup&gt;</td>
<td>-1.482&lt;sup&gt;a&lt;/sup&gt;</td>
<td>.138&lt;sup&gt;a&lt;/sup&gt;, .145&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td>Upstate Non-Food Bank</td>
<td>9</td>
<td>5.61</td>
<td>50.50</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>12</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Notes.*

a. Grouping Variable: Contractor Type and Contractor Region
b. Not corrected for ties

As one can see, the null hypothesis of no difference between food banks downstate and non-food banks upstate was accepted with an observed z-score of -1.482. Therefore, there was no difference in change in the proportion of spending on NYSG produce between downstate food banks and upstate non-food banks.
The fourth test compared upstate food banks to downstate non-food banks with respect to difference in the proportion of spending on NYSG produce between 2012 and 2014. The results of the Mann-Whitney U test are depicted in Table 33.

Table 33

Mann-Whitney U Test comparing Upstate Food Banks and Downstate Non-Food Banks with respect to Post minus Pre-Differences in the Proportion of Dollar Expenditures on NYSG produce

<table>
<thead>
<tr>
<th>Contractor Type and Contractor Region</th>
<th>N</th>
<th>Mean Rank</th>
<th>Sum of Ranks</th>
<th>Mann-Whitney U</th>
<th>Asymp. Sig. (2-tailed)</th>
<th>Exact Sig. [2*(1-tailed Sig.)]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upstate Food Bank</td>
<td>5</td>
<td>24.10</td>
<td>120.50</td>
<td>19.500</td>
<td>-2.439 a</td>
<td>.015 a</td>
</tr>
<tr>
<td>Downstate Non-Food Bank</td>
<td>25</td>
<td>13.78</td>
<td>344.50</td>
<td></td>
<td>b</td>
<td>.013 b</td>
</tr>
<tr>
<td>Total</td>
<td>30</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Notes.
a. Grouping Variable: Contractor Type and Contractor Region
b. Not corrected for ties

As can be seen, the null hypothesis of no difference between food banks upstate and non-food banks downstate was rejected with an observed z-score of -2.439.

Therefore, upstate food banks had a significantly greater change in the proportion of dollars spent on NYSG produce than downstate non-food banks.
The fifth test compared upstate food banks to upstate non-food banks with respect to difference in the proportion of spending on NYSG produce between 2012 and 2014.

The results of the Mann-Whitney U test are depicted in Table 34.

Table 34

**Mann-Whitney U Test comparing Upstate Food Banks and Upstate Non-Food Banks with respect to Post minus Pre-Differences in the Proportion of Dollar Expenditures on NYSG produce**

<table>
<thead>
<tr>
<th>Contractor Type and Contractor Region</th>
<th>N</th>
<th>Mean Rank</th>
<th>Sum of Ranks</th>
<th>Mann-Whitney U</th>
<th>Asymp. Sig. (2-tailed)</th>
<th>Exact Sig. [2*(1-tailed Sig.)]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upstate Food Bank</td>
<td>5</td>
<td>12.00</td>
<td>60.00</td>
<td>.000&lt;sup&gt;a&lt;/sup&gt;</td>
<td>-3.000&lt;sup&gt;a&lt;/sup&gt;</td>
<td>.003&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>Upstate Non-Food Bank</td>
<td>9</td>
<td>5.00</td>
<td>45.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>14</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Notes:

a. Grouping Variable: Contractor Type and Contractor Region
b. Not corrected for ties

As one can observe, the null hypothesis of no difference between upstate food banks and upstate non-food banks was rejected with an observed z-score of -3.000.

Therefore, upstate food banks had a significantly greater change in the proportion of dollars spent on NYSG produce than upstate non-food banks.
The sixth test compared upstate food banks to downstate non-food banks with respect to difference in the proportion of spending on NYSG produce between 2012 and 2014. The results of the Mann-Whitney U test are depicted in Table 35.

Table 35

*Mann-Whitney U Test comparing Upstate Food Banks and Downstate Non-Food Banks with respect to Post minus Pre-Differences in the Proportion of Dollar Expenditures on NYSG produce*

<table>
<thead>
<tr>
<th>Contractor Type and Contractor Region</th>
<th>N</th>
<th>Mean Rank</th>
<th>Sum of Ranks</th>
<th>Mann-Whitney U</th>
<th>Asymp. Sig. (2-tailed)</th>
<th>Exact Sig. [2*(1-tailed Sig.)]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upstate Food Bank</td>
<td>25</td>
<td>19.16</td>
<td>479.00</td>
<td>71.000&lt;sup&gt;a&lt;/sup&gt;</td>
<td>-1.648&lt;sup&gt;a&lt;/sup&gt;</td>
<td>.099&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>Downstate Non-Food Bank</td>
<td>9</td>
<td>12.89</td>
<td>116.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>34</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Notes.*

a. Grouping Variable: Contractor Type and Contractor Region
b. Not corrected for ties

As can be seen, the null hypothesis of no difference between upstate food banks and downstate non-food banks was accepted with an observed z-score of -1.648. Therefore, there was no significant change in the proportion of spending on NYSG produce between upstate food banks and downstate non-food banks.
Chapter 5: Discussion and Conclusion

Main Findings of the Study

This evaluation of the HPNAP Locally Grown Produce Initiative examined expenditures on NYSG produce before and after implementation of the one-time stimulus to increase the proportion of state-grown fresh produce in emergency food relief services. The findings demonstrate that the HPNAP Locally Grown Produce Initiative was associated with increased overall spending (including the proportion of spending) by contractors on NYSG produce. This finding suggests that the initiative was able to achieve short-term sustainability because expenditures on NYSG produce were significantly higher during the year following implementation compared to the year preceding implementation.

The study also found that contractor type (food bank or non-food bank) significantly impacted spending on NYSG produce. Food banks that received funding during the initiative had a significantly greater change in spending on NYSG produce than non-food banks that did not receive funding during the initiative. With respect to the proportion of spending, which controlled for the fact that food banks had much larger food budget lines than non-food banks to begin with, the result was also significant. However, region of state did not have a significant effect on spending or the proportion of spending.

The interaction of contractor type and contractor region had a significant effect on spending and the proportion of spending by contractors on NYSG produce. With respect to expenditures, downstate food banks had a significantly greater change in spending from time 1 to time 2 on NYSG produce than downstate non-food banks. Downstate
food banks had significantly a greater change in spending from time 1 to time 2 on NYSG produce than upstate non-food banks. Furthermore, upstate food banks had a significantly greater change in spending from time 1 to time 2 on NYSG produce than downstate food banks. Lastly, upstate food banks had a significantly greater change in spending from time 1 to time 2 on NYSG produce than upstate non-food banks. Tests run on the proportion of expenditures only yielded two significant results. Upstate food banks had a significantly greater change in the proportion of spending from time 1 to time 2 on NYSG produce than downstate non-food banks. Upstate food banks had a significantly greater change in the proportion of spending from time 1 to time 2 on NYSG produce than upstate non-food banks. Although there were differences among interaction cells in terms of spending and the proportion of spending, the Kruskal Wallis H-test confirmed in both instances that the initiative had the most significant impact on food banks located upstate.

In addition to funding, the reason why upstate food banks experienced more benefit from the initiative could possibly be explained by key informant interviews (Table B1) that speak to greater accessibility of NYSG produce. For example, in contrast to downstate contractors, upstate contractors did not report a lack of availability of NYSG produce and did not report any difficulty in obtaining the quantities of NYSG produce needed (Table B1).

**Comparisons with Other Studies**

Increasing local food in the food system has become a vital aim of many communities around the nation and hundreds of programs and initiatives that intend to stimulate local food use have been put into place (Timmons & Wang, 2010). While
HPNAP’s Locally Grown Produce Initiative is not unique, apart from New Jersey (State-of-New Jersey Department of Agriculture, 2008), New York appears to be one of the few states to fund such an initiative. Subsequently, a literature review did not yield any comparable studies that have been conducted statewide with the exception of one study conducted in South Carolina. However, that study was limited to one food bank in a particular region of that state (Robinson, Robinson, Carpio & Hughes, 2007).

Researchers evaluated the Growing Local Foods program after the first year of its launch. The program was created to assist local farmers by increasing the distribution of local farm products by the Lowcountry Food Bank to emergency food assistance agencies in coastal South Carolina (Robinson, Robinson, Carpio & Hughes, 2007). The analysis revealed that one year after implementation of the Growing Local Foods program, fresh produce was obtained from farmers and combined with other items in order to enhance the nutritional quality of products provided to Lowcountry Food Bank agencies. Local farm incomes apparently increased after the first year of the program, but researchers were unable to quantify the exact level of the increases (Robinson, Robinson, Carpio & Hughes, 2007).

**Strengths and Weaknesses of the Study**

This study is a seminal contribution to the public health and nutrition literature because it is the first systematic evaluation of a unique state-sponsored public health nutrition initiative to promote consumption of locally-grown fresh produce in multiple regional food banks. This study also has strong internal validity because statistical analyses were both comprehensive and robust.
Although one set of data analyses focused on dollar expenditures, a separate set of analyses focused on proportion of dollar expenditures to control for differences in baseline budgets between food banks and non-food banks. Further, given the nature of the data, chief strengths of non-parametric tests used in the analyses are that they do not depend on assumptions of normality and homogeneity of variance and are not affected by outliers (Howell, 2013).

The main limitations associated with this type of evaluation study stem from the use of secondary data sources. Secondary data are not necessarily designed to answer specific research questions (Bailey & Handu, 2013). Often, understanding of secondary data can be compromised because of the way in which it was documented (Bailey & Handu, 2013). Heavy reliance on secondary data was further compounded by a lack of published data on HPNAP. Consequently, the one published research article on HPNAP by Shackman et al., 2015 was the only peer-reviewed reference about the program.

This was a quasi-experimental design study with a small sample size (N=42). The fact that the study was only conducted in one state restricted its comparability to other states. The main disadvantage associated with the non-parametric analyses is the fact that they have less statistical power than their corresponding parametric tests (Howell, 2013). The lack of availability of pounds of produce procured hindered the scope of the analysis by limiting it to dollar expenditures only. Furthermore, the retrospective design limited the ability to account for secular trends (e.g. the Fresh Connect Program) in real time that may have influenced changes in expenditures observed during contract years analyzed. Finally, because the analyses were non-parametric, results could not be reported in dollar amounts.
Possible Mechanisms

The success and short-term sustainability of the HPNAP Locally Grown Produce Initiative may possibly be associated with previously existing relationships and partnerships that facilitated implementation. Reports of such relationships came from NYSDOH internal documents and key informant interviews. Those documented relationships aligned with a level of collaborative capacity referred to in the integrated model by Foster-Fishman et al. (2001) as relational capacity (Foster-Fishman, Berkowitz, Lounsbury, Jacobson & Allen, 2001). Successful collaboration is ultimately about developing the social relationships needed to achieve desired goals (Foster-Fishman, Berkowitz, Lounsbury, Jacobson & Allen, 2001).

Because collaboration often requires both broader relational networks and new ways of interacting with current contacts, most coalitions are faced with the task of needing to build both positive internal and external relationships (Foster-Fishman, Berkowitz, Lounsbury, Jacobson & Allen, 2001). Foster-Fishman et al. (2001) state that the elements of relational capacity include the following: develops a positive working climate; develops a shared vision; promotes power sharing; values diversity; and develops positive external relationships (Foster-Fishman, Berkowitz, Lounsbury, Jacobson, Allen, 2001). Based on those elements a framework (Appendix D) was developed to help explain the success observed with the initiative.

In the case of the HPNAP Locally Grown Initiative, the internal relationships occurred between the HPNAP program and its contractors, specifically between the HPNAP contract managers and their contractors. Furthermore, those internal relationships existed between the contractors, especially between direct service
contractors (e.g. food pantries) and food bank contractors. External relationships involved the interactions between the HPNAP contractors (e.g. food banks) and the stakeholders, i.e., the New York State farmers. All of those relationships were integral to the positive achievements of the HPNAP Locally Grown Produce Initiative.

The following example illustrates this concept. Many of the HPNAP non-food bank contractors are members of their local regional food bank. During the Locally Grown Produce Initiative some of those contractors used their existing food line budgets to purchase NYSG produce from food bank contractors, who had procured it with the additional funding from the initiative.

According to a food bank contractor located upstate, “It's important to establish good relationships with farmers and distributors” (Borden, 2014, April). A non-food bank contractor based upstate, who reported procurement success as a result of the Locally Grown Produce Initiative, reported having relationships with approximately 50 farmers in 12 different counties (Borden, 2014, April). In fact, that same contractor reported willingness to assist other neighboring HPNAP contractors with purchasing NYSG produce (Borden, 2014, April).

The testimonial below from a direct service contractor was an example of how positive external relationships led to successful outcomes with the HPNAP Locally Grown Produce Initiative (Friedman, 2013):

“The produce initiative has been a godsend. My clients now choose the fresh over the canned. It has been especially helpful over the winter months when produce costs are high and my clients’ budgets are very tight. I received $1,250 to obtain local produce directly from the farmers and I used every penny of it!”
now have relationships with these farmers for a long lasting linkage. I ended up getting even more produce through donations from these farmers. We are connecting with the local farmers and the farmers are now more aware about what the pantries do. If it wasn’t for this grant I don’t think we would have approached the farmers.” – *Food Pantry Director, upstate*

The next testimonial below (Friedman, 2013) illustrated the perspective of a stakeholder, i.e., a farmer. It is another example of the positive relationships between food banks and stakeholders that paved the way for the mutually beneficial results of the initiative.

“We are so pleased to have partnered with the Food Bank ... and extended our reach. The CSA [Community Supported Agriculture] model is mutually supportive - Our farmers gain a committed market base and receive funds in the beginning of the season when they are needed most. Our members have access to the most nutritious vegetables available and a real relationship to the people and land who feed them. CSA partnerships between food banks and growers have a direct and beneficial effect on local economies and regional food security.”

-- *Farmer, upstate*

Even though emphasis was placed on relationship capacity, it is only one of four elements of collaborative capacity referred to in the framework. The other three elements are member capacity, organizational capacity and programmatic capacity (Foster-Fishman, Berkowitz, Lounsbury, Jacobson & Allen, 2001). Results of the initiative also appear to have aligned with components of member capacity as evidenced by HPNAP’s positive attitude about other stakeholders (farmers) and ability to work collaboratively with others (food banks). Components of organizational capacity noted were effective
leadership, as was the case with HPNAP, and continuous improvement orientation exemplified by an interim evaluation by the NYSDOH. Finally, the Locally Grown Produce Initiative was successful because there were clear, focused programmatic objectives with respect to guidelines for spending on NYSG produce.

**Lessons Learned and Public Health Implications**

It is apparent that HPNAP not only had a clear understanding of sustainability, but was able to incorporate systematic methods for maintaining post-implementation benefits of the Locally Grown Produce Initiative. In response to positive findings of the NYSDOH’s interim evaluation, they developed the 2013-14 Performance Measures to increase the percent of HPNAP funds for fresh NYSG produce from 23 percent to 30 percent by June 2014 (Friedman, 2013). HPNAP’s commitment to continuing the initiative is evidenced by the current 2014-15 Performance Measures established by the Bureau of Nutrition Risk Reduction at the NYSDOH. An outcome measure was established to promote growth in the procurement of NYSG produce by its contractors (Borden, 2014, September). Based on the current 2014-15 Performance Measures, the percent of NYSG produce purchased with HPNAP funds should increase up to a minimum of 30 percent for each contractor who has a produce budget line, by June 30, 2015 (Borden, 2014, September).

The 2014 Feeding America Study estimated that 82 percent of households served by the Food Bank of Western New York are food insecure (Feeding America, 2014). Past studies by Kendall et al. (1996), Dixon et al. (2001) and Lee et al. (2001) have demonstrated a correlation between food insecurity and reduced consumption of fruits and vegetables (Kendall, Olson, & Frongillo, 1996). Because the assumption was that
increased access to locally grown produce would lead to increased consumption, it was hypothesized that increasing access to fresh produce for New York residents utilizing HPNAP supported contractors in the emergency food network, may be an effective strategy in helping to increase consumption of fresh fruits and vegetables. This is reasonable given that the majority of HPNAP sponsored agencies support “client choice” (Shackman, 2013) and that Campbell et al. (2011) showed that food bank clients surveyed in upstate New York preferred to receive healthy food items including fruit and vegetables rather than unhealthy food items. Because of the health benefits associated with higher intakes of fruit and vegetables (Appel et al., 1997; Boeing et al., 2012; Slavin et al., 2012), this may potentially be a long-term benefit of the initiative if expenditures on fresh produce continue to be sustained.

The potential of the HPNAP Locally Grown Produce Initiative to increase consumption of fruits and vegetables in those for whom such a diet is not affordable could be helpful to New York’s environment. Plant-based foods such as fruits and vegetables are associated with decreased use of natural resources and greenhouse gas emissions (2015 Dietary Guidelines Advisory Committee, 2015). The New York City Panel on Climate Change has projected hotter temperatures, increased heat waves, increased yearly precipitation and harsher droughts for the New York metropolitan region in the approaching decades (Horton et al., 2015). Therefore, efforts by HPNAP to make sustainable diets available to those in need, through the increased production of locally grown produce, could play a small role in protecting New York City from deleterious effects of climate change in future.
Areas for Future Study

There are opportunities for further research to quantify the potential public health impacts of this study. To evaluate continued sustainability of the Locally Grown Produce Initiative non-parametric analyses should be run on 2014-2015 contract year data and the subsequent three contract years to establish a trend. A qualitative data study using a validated food frequency questionnaire should be conducted on the actual consumption of fresh fruit and vegetables by clients of HPNAP supported contract sites. Data triangulation with quantitative data on types of produce procured by HPNAP contractors and with data from the Behavioral Risk Factor Surveillance System is suggested. A follow-up study to test the Foster-Fishman Framework of Collaborative Capacity should also be considered. In collaboration with the New York State Department of Conservation, future research should be carried out to examine the potential benefit of similar initiatives to the environment. Finally, a cost-benefit analysis study needs to be done to determine how much funding should be given for future initiatives in New York as well as in other states potentially.

Conclusion

The Locally Grown Produce Initiative has become part of a sustainable cycle. Through the initiative, the program was able to overcome barriers of supplying high quality New York State grown produce to the emergency food network in an economical manner while helping local farmers. Clients from emergency food network agencies experienced high levels of customer satisfaction because of the greater perceived value of locally grown fresh produce (L. Clarke III, personal communication, November 5, 2014).
While the statistical analyses and the interim NYSDOH evaluation revealed the accomplishments of the initiative, a recent telephone survey (Appendix C) revealed some of its limitations from the perspective of farmers (Allsopp, 2015). Some of them included limited time frame, delivery issues and lack of coordination between funding and seasonality of produce. Farmers stated that future initiatives should provide them with adequate time for produce projections. They also stated (Appendix C) that there should be an increase in the awareness of seasonality of produce, improved communication and training prior to implementation of future initiatives (Allsopp, 2015).

The results of this retrospective evaluation study revealed that the Locally Grown Produce Initiative had a positive, year-long effect on the procurement of New York State grown produce. These findings have practical value because results of a recent study suggest that efforts to reduce hunger and food insecurity should continue to be a priority in New York State (Shackman, Chengxuan, Edmunds, Clarke, & Sekhobo, 2015). The success of this initiative in a state like New York with a cold climate should be encouraging other states, particularly in the South, with a year-round growing season that similar initiatives could have even greater impact. It is hoped that other states around the nation would contemplate adopting similar initiatives that are ongoing and provide farmers with sufficient time to make accurate produce projections. In addition to states giving careful consideration to the importance of funding and geographical region, future initiatives should incorporate training, excellent communication skills and increased awareness of seasonality of produce. According to Nordin, Boyle & Kemmer (2013):

“It is the position of the Academy of Nutrition and Dietetics that all people should have consistent access to an appropriately nutritious diet of food and water…The
Academy supports policies, systems, programs, and practices that work to achieve nutrition security and self-sufficiency while being environmentally and economically sustainable” (P. 581)

This study has confirmed that the HPNAP Locally Grown Produce Initiative was one such example.
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Appendix A

Questions Used To Assess the Food Security of Households in the Current Population Survey (CPS)

Food Security Survey

1. “We worried whether our food would run out before we got money to buy more.” Was that often, sometimes, or never true for you in the last 12 months?
2. “The food that we bought just didn’t last and we didn’t have money to get more.” Was that often, sometimes, or never true for you in the last 12 months?
3. “We couldn’t afford to eat balanced meals.” Was that often, sometimes, or never true for you in the last 12 months?
4. In the last 12 months, did you or other adults in the household ever cut the size of your meals or skip meals because there wasn’t enough money for food? (Yes/No)
5. (If yes to question 4) How often did this happen—almost every month, some months but not every month, or in only 1 or 2 months?
6. In the last 12 months, did you ever eat less than you felt you should because there wasn’t enough money for food? (Yes/No)
7. In the last 12 months, were you ever hungry, but didn’t eat, because there wasn’t enough money for food? (Yes/No)
8. In the last 12 months, did you lose weight because there wasn’t enough money for food? (Yes/No)
9. In the last 12 months did you or other adults in your household ever not eat for a whole day because there wasn’t enough money for food? (Yes/No)
10. (If yes to question 9) How often did this happen—almost every month, some months but not every month, or in only 1 or 2 months?
(Questions 11-18 were asked only if the household included children age 0-17)
11. “We relied on only a few kinds of low-cost food to feed our children because we were running out of money to buy food.” Was that often, sometimes, or never true for you in the last 12 months?
12. “We couldn’t feed our children a balanced meal, because we couldn’t afford that.” Was that often, sometimes, or never true for you in the last 12 months?
13. “The children were not eating enough because we just couldn’t afford enough food.” Was that often, sometimes, or never true for you in the last 12 months?
14. In the last 12 months, did you ever cut the size of any of the children’s meals because there wasn’t enough money for food? (Yes/No)
15. In the last 12 months, were the children ever hungry but you just couldn’t afford more food? (Yes/No)
16. In the last 12 months, did any of the children ever skip a meal because there wasn’t enough money for food? (Yes/No)
17. (If yes to question 16) How often did this happen—almost every month, some months but not every month, or in only 1 or 2 months?
18. In the last 12 months did any of the children ever not eat for a whole day because there wasn’t enough money for food? (Yes/No)

Table B1

Challenges Experienced by Contractors related to New York State grown (NYSG) produce after the HPNAP Locally Grown Produce Initiative.

<table>
<thead>
<tr>
<th>Type of Challenge</th>
<th>Contractor Region</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Procurement Challenges</strong></td>
<td></td>
</tr>
<tr>
<td>Limited New York State Growing Season</td>
<td>Downstate</td>
</tr>
<tr>
<td>Lack of variety</td>
<td>Downstate</td>
</tr>
<tr>
<td><strong>Cost</strong></td>
<td></td>
</tr>
<tr>
<td>Difficult to obtain quantities needed</td>
<td>Downstate</td>
</tr>
<tr>
<td>Lack of availability of NYSG produce from vendors</td>
<td>Downstate</td>
</tr>
<tr>
<td><strong>Delivery Challenges</strong></td>
<td></td>
</tr>
<tr>
<td>Limited delivery schedules</td>
<td>Downstate</td>
</tr>
<tr>
<td>Lack of transportation capacity</td>
<td>Downstate</td>
</tr>
<tr>
<td>Lack of delivery dock</td>
<td>Upstate</td>
</tr>
<tr>
<td><strong>Storage Challenges</strong></td>
<td></td>
</tr>
<tr>
<td>Equipment (e.g. cost of purchasing, operating and maintaining refrigerated storage space)</td>
<td>Downstate</td>
</tr>
<tr>
<td>Inadequate storage space (e.g. for large bins)</td>
<td>Downstate</td>
</tr>
<tr>
<td><strong>Handling Challenges</strong></td>
<td></td>
</tr>
<tr>
<td>Large shipping bins; Lack of consumer friendly packaging</td>
<td>Upstate</td>
</tr>
<tr>
<td>Storage space (e.g. inadequate space to distribute NYSG produce)</td>
<td>Upstate</td>
</tr>
</tbody>
</table>

*Note.* Adapted from the “HPNAP Contractor Manager Chart 14” by L. Borden, 2014, [Internal File]. Copyright 2014 by the New York State Department of Health. Adapted with permission.
Appendix C

2015 Survey of Farmers who received HPNAP Locally Grown Produce Initiative Funding

Goals

The goal of the pilot survey is to help HPNAP evaluate the benefit of the initiative to farmers so they could be better served by similar initiatives in the future. Another goal is to promote the value of the Locally Grown Produce Initiative so that other states might be encouraged to adopt similar initiatives.

Methods & Data Analysis

A telephone survey (n=14) was conducted with 10 farmers and 4 wholesale produce vendors in Upstate New York. The survey was conducted between May 5 and May 15, 2015. For this pilot survey 12 participants gave consent to do the survey while 2 participants declined to do the survey. The data analysis was conducted in systematic manner using the seven steps listed below (Planning Council for Health and Human Services, Inc., 2011):

1. Developed categories
2. Assigned each response to a category (or categories)
3. Checked the categories
4. Reviewed for major themes
5. Identified patterns and trends
6. Wrote up the analysis
Key Results

Question #1

Based on the combined total number of responses, the modal response to question 1 was cucumbers (19% of responses), which was followed by squash of varying varieties (15% of responses), and then by tomatoes (11% of responses).
Question #2

“Financial benefit” was cited as the most liked aspect (25% of responses) of participation in the HPNAP Locally Grown Produce initiative. This was followed by “beneficial to the community” (15% of responses). “Nothing”, “Beneficial to farmers”, “Worked well logistically”, and “Decreased product losses” were equally mentioned in 10% of responses. “Product promotion” was cited the least frequently in only 5% of responses.

n=12. Of those surveyed 9 were farmers and 3 were wholesale produce vendors.
Question #3

Farmers and/or vendors reported “limited time frame” as the challenge they experienced most often (22% of responses) while working with the HPNAP Locally Grown Produce initiative. This was followed by “delivery issues” (17% of responses) which was tied with “none.” “Packaging issues”, “limited growing season” and “funding not correlated with seasonality of produce” were each reported in 11% of responses. “Decreased profits” and “lack of explicit communication” were both mentioned the least often in only 6% of responses.

n=12. Of those surveyed 9 were farmers and 3 were wholesale produce vendors.
Question #4 (part 1)

When asked whether they would participate in another HPNAP Locally Grown Produce initiative 75% of respondents said yes while the remaining 25% said no.

n=12. Of those surveyed 9 were farmers and 3 were wholesale produce vendors.
**Question #4 (part 2)**

When farmers and vendors were asked “why or why not” with regard to whether they would participate in another HPNAP Locally Grown Produce initiative, the modal response was “beneficial to the community” accounting for 39% of the responses. “Financial benefit” was the second most frequent answer representing 31% of the responses. “Achieved goals”, “easy to work with food bank”, “good partnerships with food banks and farmers” and “cooperative” were all tied for each answer representing 8% of the responses.

**Question #4 – Would you participate in another HPNAP Locally Grown Produce initiative?  Why or why not?**

- Beneficial to the community (39%)
- Financial benefit (31%)
- Achieved goals, easy to work with food bank, good partnerships with food banks and farmers, cooperative (8% each)

* n=12. Of those surveyed 9 were farmers and 3 were wholesale produce vendors.*
Question #5

With regard to suggestions on how to improve a future HPNAP Locally Grown Produce initiative, “no” was the answer that made up nearly half (46%) of the responses. “Allow farmers adequate time for produce projections” was mentioned in approximately 15% of the suggestions. The remainder of the answers “conduct surveys sooner”, “improve communications”, set up farmers markets in the community”, “increase awareness of seasonality of produce” and “training” each accounted for 8% of suggestions made in the responses.

n=12. Of those surveyed 9 were farmers and 3 were wholesale produce vendors.
Question #6

The 9 responses by the farmers surveyed in relation to the size in acres of their farms ranged from 19 acres to 300 acres. With regard to the classifications, one response was categorized as >10-20 acres whereas the other 8 responses were categorized as > 20 acres.
Question #7

The 9 responses by the farmers in relation to the number of years they have been farming ranged from 5 years to 68 years. In terms of the classifications, 1 farmer was classified as working > 2-5 years, 4 farmers were classified as working > 5-10 years, 2 farmers were classified as working 10-20 years and 2 farmers were classified as working > 20 years.
Conclusions

Based on the recollection of the participants, cucumbers, squash and tomatoes were the top 3 items sold by participants to an upstate food bank during the HPNAP Locally Grown Produce Initiative. As might be expected, “financial benefit” was reported by participants as the most liked aspect of participating in the initiative by 10 participants. The remaining 2 participants who reported “nothing” mentioned limited timeframe, limited funding, being forced to falsify books and funding not correlated with seasonality of produce as reasons why. The challenge of the “limited timeframe” of the initiative was cited most often by survey participants. Of the 12 participants surveyed, three quarters of them reported they would participate in a future initiative whereas one quarter of them reported they might or might not participate. When farmers and vendors were asked why or why not with regard to their participation in a future initiative, “beneficial to the community” was the most frequent response. Furthermore, it is worth noting that that response was reported more often than “financial benefit” by participants surveyed. Half of the respondents appeared to have been satisfied with the initiative because they did not provide any suggestions on how to improve a future initiative. Of those surveyed those who did have suggestions, “allow farmers adequate time for produce projections” was the suggestion made most often. With regard to the farmers surveyed, those who reported farming for > 10 - 20 years reported experiencing the most challenges. A similar trend was not observed in relation to size of the farm. However, it is noteworthy that “financial benefit,” the most liked aspect of the initiative, was reported across the board in both small and large farms.

The final conclusions can be drawn that future initiatives to promote locally grown produce in New York State should be ongoing, provide funding when produce is in season and should be implemented in a manner that allows farmers to have adequate time to make produce projections. Consideration should be given to the fact that farmers who have been farming for 10-20 years may be more likely to experience challenges during such initiatives.

Recommendations for future surveys

After conducting the survey the points below are listed as concerns and suggestions:

Concern(s)

- Vendors may not remember the Locally Grown Produce Initiative and may have been reporting about other initiatives.
- It has been difficult to reach the farmers in May which has led to repeated phone calls being made. Furthermore, it is not explicit when the phone calls should stop e.g. after 6 attempts.

Suggestions for future surveys

- Continue to send out letters to the farmers/vendors one week prior to the phone calls because that was helpful.
• Conduct the survey right after implementation so the information is fresh in the participants’ minds.
• Ensure that the survey is carried out during the winter non-growing season months.
• Shorten the informed consent to one paragraph if feasible.
• Possibly seek to obtain IRB approval to conduct the survey via email in order to provide participants with another option for completing the survey.
• Modify the script to “Hello may I speak to ________?” Then state “My name is….I am calling from the New York State Department of Health on behalf of the Hunger Prevention and Nutrition Assistance Program.
• Rename the survey to Vendor survey to include wholesale vendors if they are going to be included otherwise just use farmers.
• If the name of the survey is modified then some of the questions to pertaining to the farmers should be rephrased if applicable.
• If the answers to question #1 can be obtained from the Food Bank that question should be removed from the survey.
• Modify the acreage answer options to larger values for the question “How many acres is your farm?”
• The acreage question could be further rephrased to “On how many acres of your farm do you grow produce?”
• Rearrange the order of the questions as follows:
  o Questions #4 (Would you participate in another HPNAP Locally Grown Produce initiative? Why or why not?) should directly follow questions #2 (What did you like most about participation in the HPNAP Locally Grown Produce initiative?).
  o Question #5 (Do you have any suggestions on how to improve a future HPNAP Locally Grown Produce initiative?) should be placed right after question #3 (What were some challenges you experienced working with the HPNAP Locally Grown Produce initiative?).

Notes. Adapted from the “2015 Survey of Farmers who received HPNAP LGP initiative funding” by M. Allsopp, 2015. [Internal File]. Copyright 2015 by the New York State Department of Health. Adapted with permission. Approval was granted by the New York State Department of Health Institutional Review Board.

Reference

Appendix D

An illustration of how the framework of relational capacity by Foster-Fishman et al. (2001) may have led to the success of the HPNAP Locally Grown Produce Initiative. Adapted with permission.

Positive working climate between HPNAP and its contractors.

Shared vision. In 2009, HPNAP partnered with the Food Bank Association of New York State to promote New York State grown (NYSG) fresh produce. Food Banks and all HPNAP contractors were encouraged to purchase NYSG fresh produce and report the amount of HPNAP dollars spent on that produce.

In 2011, the Fresh Connect program was launched to create new farmers' markets and support existing markets that provided fresh produce to persons in low-income areas. The shared vision with the New York State Governor’s office garnered support for an initiative to promote NYSG produce.

Valuing diversity and power sharing was key to successfully preparing for the implementation of the Locally Grown Produce Initiative. The HPNAP Locally Grown Produce Initiative workgroup set up meetings prior to the launch of the initiative

HPNAP Locally Grown Produce Initiative. In 2012, food Banks collectively received a $2 million stimulus to increase the proportion of state-grown fresh produce in emergency food relief services.

Positive external relationships existed between stakeholders (food banks) and farmers. Positive external relationships existed between food bank and non-food bank contractors (food pantries, soup kitchens and emergency shelters). Non-food bank contractors bought NYSG produce from the food banks with the existing budget funds.

The Locally Grown Produce Initiative was very successful after an internal six-month evaluation. Levels of spending on NYSG produce were sustained in 2013-14 and were higher post-implementation vs. pre-implementation.