EVALUATING CLIENT AND STAFF ACCEPTABILITY OF THE TRANSITION TO A CLIENT CHOICE FOOD DISTRIBUTION SYSTEM AT A LOCAL FOOD AND RESOURCE CENTER

A Thesis
By
MICHAEL A. DECARO

Submitted to the Graduate School
at Appalachian State University
in partial fulfillment of the requirements for the degree of
MASTER OF SCIENCE

May 2019
Department of Nutrition and Healthcare Management

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APPROVED BY:

_____
Dr. Melissa D. Gutschall
Chairperson, Thesis Committee

_____
Dr. Kyle L. Thompson
Member, Thesis Committee

_____
Dr. Alisha R. Farris
Member, Thesis Committee

_____
Dr. Margaret Barth
Chairperson, Department of Nutrition & Health Care Management

_____
Michael McKenzie, Ph.D.
Dean, Cratis D. Williams School of Graduate Studies

Abstract

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Michael A. DeCaro
BS Appalachian State University

Chairperson: Dr. Melissa D. Gutschall

Nearly one in five (18.3 percent) households in Watauga County, N.C. experience food insecurity. In 2016, 68 percent of adults in Watauga County did not meet the recommended fruit and vegetable intake, increasing risks for chronic disease. Recognizing and meeting the nutritional needs of a food pantry's clientele may have a positive influence on diet, self-efficacy, disease management and prevention. The purpose of this study was to explore the feasibility of designing and implementing a client-choice food distribution model at a local food bank. A mixed-methods approach was used to determine need and feasibility of such a program. Data were gathered from staff and clients, as well as regional food banks that use this system to aid in the design and implementation. Most (85.4%) clients expressed desire for a client-choice food distribution system to replace a pre-made food box program. The client-choice system was designed to nudge clients to make the healthiest food choices and was implemented over a three month period. The implementation phase included a paper order system for build-to-order boxes to be used as a transitional step toward a client choice experience. Strengths of the program included partnerships with local businesses and institutions. Challenges of the program were related to financial constraints and labor.

Barriers related to financial constraints, food supply, volunteer staff, security, safety, cultural awareness and training of staff were addressed for full implementation and evaluation. Future research should examine the effectiveness of the fully implemented client-choice design to improve client self-efficacy for food selection, and adaptable models for other pantries.

Acknowledgements

A sincere appreciation also goes to the staff at the Hunger and Health Coalition in Boone, North Carolina for their professionalism and collaboration throughout this study. Gratitude is extended to community partners; Publix, Clerk 1 Excess Equipment Warehouse Retail Business Services, and Boone Decorating Center for the selfless donation of resources and time to support this project. Further appreciation goes to my professor and mentor, Dr. Melissa Gutschall, and my entire thesis committee for their tireless guidance and support. I would like to conclude my acknowledgements by dedicating this study in remembrance of the late Crystal Winebarger. Crystal served as Director of Operations at the Hunger and Health Coalition. Her years of loyal service to her community will be remembered and continue to inspire all who loved her.

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Foreword

Chapter 2 of this thesis will be submitted to the *Journal of Hunger and Environmental Nutrition*, a peer-reviewed journal published by Taylor & Francis Group; it has been formatted according to the style guide for that journal.

Chapter 1: Introduction

Food insecurity is defined by the United States Department of Agriculture (USDA) as the lack of access, at times, to enough food for an active, healthy life for all household members and limited or uncertain availability of nutritionally adequate food [1]. According to a document published in 2017 by Feeding America, the USDA estimated that 41 million people, including 18 percent of all children, in the United States were food insecure in 2016. Cross-sectional analysis revealed that 12.5 percent of Americans, and 16.7 percent of children, lived in households without consistent access to adequate food. While these statistics are staggering, the data are correlated with a downward trend in food insecurity from a high of 50 million in 2009 [2].

Watauga County, North Carolina is located in the northwest mountain region of North Carolina. The population of this rural county was estimated to be 53,922 in 2016. [3, 4] Nearly one in five (18.3 percent) households in Watauga County experience food insecurity, for an estimated total of 10,000 people. Unfortunately, 30 percent of food insecure people in this region do not qualify for food assistance programs. The physical and psychological symptoms of chronic malnutrition directly impacts the prevention and management of chronic illnesses including hypertension, diabetes and obesity.

The Hunger and Health Coalition (HHC) is a local organization focused on food recovery and providing life-saving medications through their free pharmacy. [5] HHC services are offered five days a week to qualifying individuals in the local community. In 2017, 11,385 food boxes and 43,916 meals were prepared and distributed through their facility. Fresh produce (125,258 pounds) was procured from local businesses and farmers markets

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Food insecurity is associated with a range of negative health outcomes, including poor physical, psychological, and social growth in infants and children, mental health issues among adolescents and adults, and nutrient deficiencies. [6] The diets of food insecure individuals and families are characterized by commercially processed, high calorie-dense and low nutrient-dense foods.[6] These foods increase risk for chronic health conditions: obesity, diabetes, heart disease, hypertension, and high cholesterol.[6]

Families and individuals facing food security issues are likely to have low confidence in their ability to become self-sufficient.[7] Further, the traditional pre-selected pantry model often distributes foods to clients and families that they may not need, want, or use.[7] Certain items may become overstocked as food is distributed through boxes or prioritized by availability rather than nutritional value. The result of foods and necessity items being thrown away by clients negatively impacts the environment and operational costs of food pantries.

Food pantries often deplete valuable resources to purchase items that clients may not want or need. This may impact the self-efficacy of clients, as they feel further undignified by minimal flexibility and control over their lives. A client choice food pantry model provides an opportunity to preserve resources, educate clients, and nudge individuals toward healthy choices that are appropriate to their cultural and nutritional needs.[7,13]

Food insecurity is a significant public health issue in the United States. It affects the physical and psychological well-being of at-risk individuals and communities at large. [6, 8] Previous research has identified the association between food insecurity and self-reported

disease. In a study that analyzed 5094 adults, aged 18-65 years, researchers concluded that health policy discussions should focus attention to the ability to afford and obtain high-quality foods for adults with or at risk for chronic disease. [9] Unfortunately, it is not only adults who are at risk. After controlling for confounding risk factors, other studies have found that food insecure children are at least twice as likely to report being in fair or poor health. Food insecure older adults were more likely to report limitations in activities of daily living when compared to their food secure counterparts. [10] Unemployment, low levels of income and education, high housing and heating costs, lack of access to transportation, poor mental health and low social capital are just some factors associated with living in a state of food insecurity. [6]

Multiple studies have acknowledged the association between food security and self-efficacy; that is one's judgment of his or her abilities to perform an action. [6, 11] Research indicates that higher levels of self-efficacy may reduce levels of food insecurity. [11] In addition, acculturation, the process of social, psychological, and cultural change that stems from blending cultures, has been found to be a potential factor promoting food insecurity among immigrant populations. Kamimura and his team of researchers concluded that self-efficacy should be an integral part of nutritional education programs to reduce levels of food insecurity. [11] These findings were supported in a Dutch food bank study. Researchers identified variations in food insecurity rates unique to each socio demographic subgroup. [12]

A study conducted in the north end of Hartford examined a food pantry intervention that included client choice and motivational interviewing, and its effect on self-efficacy and food security in clients served. [6] Participants (n=227) were randomized into an intervention or control group. The intervention group was invited to visit the client choice food pantry by

scheduled appointment, whereas the control group continued to receive food boxes from traditional pantries. Quarterly follow-ups were conducted over 18 months. Self-efficacy was significantly inversely associated with very low food security ($p < .05$). Individuals who were part of the intervention group were independently associated with decreased very low food security. Researchers concluded that the traditional food pantry model fails to recognize the influence of self-efficacy on a person's food security.

A pantry model developed to encompass client choice, motivational interviewing, and targeted referral services could lead to increased self-efficacy among clients. It appears that providing access to food alone is not a proper solution to addressing food insecurity and alleviating the associated distress and expense. [6] Integrating educational tools and supportive services into the daily operations of food pantries may be one crucial step toward addressing common denominators of food insecurity while simultaneously empowering individuals.

In the fall of 2014, researchers manipulated the display of a targeted product in a New York State food pantry. [13] They evaluated the binary choice of a targeted good when placed in the front or the back of a category line (placement order) and when the product was presented in its original box or unboxed (packaging). Researchers knew that food pantries and food banks were interested in cost-effective methods to encourage the selection of targeted foods without restricting choice. Therefore, the purpose of the study was to evaluate the effectiveness of "nudging" clients toward targeted foods. When controlling for confounders, low cost and unobtrusive nudges were found to be effective tools for encouraging individuals to select targeted foods. Nudging individuals toward healthy foods would not only advocate for client health, but could also be an effective way to motivate individuals and promote self-efficacy.

A systematic review was published in the Journal of the Academy of Nutrition and Dietetics in April of 2017. [14] The purpose was to summarize published evidence about the dietary quality of food pantry users. Database searches of PubMed, PsycINFO, PsycARTICLES, and Psychology Behavioral Sciences Collection, and hand searches of references were conducted to identify cross-sectional, cohort, and intervention studies that reported baseline data, and were conducted in high-income countries. Studies between 1980 and 2015 were included. Sixteen articles were found to be eligible for review. The diet qualities among food pantries were poor, reflected by an inadequate mean group intake of energy, fruits and vegetables, dairy, and calcium. In studies where the mean intake was adequate, large percentages of the populations did not meet recommendations for vitamins A, C, D, and B, or minerals such as iron, magnesium, and zinc. While none of these studies were nationally representative, evidence suggested that most food pantry users were unable to meet nutrient recommendations.

Attitudes and behaviors of individuals who donate foods to pantries, and the perceived needs of the clientele using the pantries, are both important to consider. Researchers investigated these influential factors by conducting focus groups at pantries, churches, and community centers. [15] Data regarding attitudes and beliefs were collected from 31 clients and 64 donors of mixed ethnicities. The study found that food donations did not match client needs for people with different ethnic backgrounds, age groups or food safety concerns. Researchers expressed that the study demonstrated the need for nutrition educators to work with directors of food pantries and food banks regarding the education of staff and community on appropriate food donations.

The studies previously mentioned set the foundation for future research. This study built on the established community-academic partnership between Appalachian State University's Nutrition and Dietetics Department and the HHC Food Pantry. The intent of this study was to explore the feasibility and design of implementing a client choice food pantry. Study goals included improved access and marketing for shelf-stable foods in a newly renovated food pantry, and feasibility to develop a sustainable and reproducible client choice model for a food pantry. This study provided data on perceptions of food pantry staff and clients to inform the design and implementation of such a model. A client choice model for food distribution at food pantries may improve self-efficacy, nutrition-related knowledge, and provide personalized access to nutritious foods.

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Chapter 2: Article

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Author Contact Information:

Michael A. DeCaro, BS
Corresponding Author, Reprint Contact
MS Candidate
Appalachian State University, Department of Nutrition & Health Care Management
111 Link Drive
Iron Station, NC 28080
(704) 608-9351
decaroma@appstate.edu

Melissa D. Gutschall, PhD, RD, LDN
Associate Professor and Director, Graduate Program in Nutrition
Appalachian State University, Department of Nutrition & Health Care Management
Leon Levine Hall of Health Sciences
1179 State Farm Road, ASU Box 32168
Boone, NC 28607
Phone: (828) 262-2698
Fax: (828) 262-8626
gutschallmd@appstate.edu

Kyle L. Thompson, DCN, RDN, LDN, CNSC
Assistant Professor and Coordinator, Graduate Programs in Public Health Nutrition
Appalachian State University, Department of Nutrition & Health Care Management
Leon Levine Hall of Health Sciences
1179 State Farm Road, ASU Box 32168
Boone, NC 28607
Phone: (828) 262-2631
Fax: (828) 262-8626
thompsonkl@appstate.edu

Alisha Farris, PhD, RD
Assistant Professor
Appalachian State University, Department of Nutrition & Health Care Management
Leon Levine Hall of Health Sciences
1179 State Farm Road, ASU Box 32168
Boone, NC 28608
Phone: (828) 262-2698
Fax: (828) 262-8626
farrisar@appstate.edu

Abstract:

Nearly one in five (18.3 percent) households in Watauga County, N.C. experience food insecurity. In 2016, 68 percent of adults in Watauga County did not meet the recommended fruit and vegetable intake, increasing risks for chronic disease. Recognizing and meeting the nutritional needs of a food pantry's clientele may have a positive influence on diet, self-efficacy, disease management and prevention. The purpose of this study was to explore the feasibility of designing and implementing a client-choice food distribution model at a local food bank. A mixed-methods approach was used to determine need and feasibility of such a program. Data were gathered from staff and clients, as well as regional food banks that use this system to aid in the design and implementation. Most (85.4%) clients expressed desire for a client-choice food distribution system to replace a pre-made food box program. The client-choice system was designed to nudge clients to make the healthiest food choices and was implemented over a three month period. The implementation phase included a paper order system for build-to-order boxes to be used as a transitional step toward a client choice experience. Strengths of the program included partnerships with local businesses and institutions. Challenges of the program were related to financial constraints and labor. Barriers related to financial constraints, food supply, volunteer staff, security, safety, cultural awareness and training of staff were addressed for full implementation and evaluation. Future research should examine the effectiveness of the fully implemented client-choice design to improve client self-efficacy for food selection, and adaptable models for other pantries.

Key words: *Appalachian, rural, food-pantry, client choice, self-efficacy, nutrition education*

Introductory note: Michael DeCaro attended Appalachian State University where he received a Bachelor of Science in Nutrition and Dietetics in 2017. Currently, he is scheduled to receive his Master of Science in Nutrition and Dietetics from Appalachian State University in May 2019.

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Introduction

Purpose of Research

Problem

USDA estimated that 41 million people, including 18 percent of all children, in the United States were food insecure in 2016.[1] Since 1982, The Hunger and Health Coalition (HHC) has been addressing the needs of vulnerable populations in rural, Watauga County where nearly 18.3 percent of households experience food insecurity. [3,4,5] Due to income gaps, 30 percent of food insecure people in Watauga County do not qualify for food assistance programs. [3,4]

Justification

Food insecurity is associated with a range of negative health outcomes, including poor physical, psychological, and social growth in infants and children, mental health issues among adolescents and adults, and nutrient deficiencies. [6] The diets of food insecure individuals and families are characterized by commercially processed, high calorie-dense and low nutrient-dense foods.[6] These foods increase risk for chronic health conditions: obesity, diabetes, heart disease, hypertension, and high cholesterol.[6]

Families and individuals facing food security issues are likely to have low confidence in their ability to become self-sufficient.[7] Further, the traditional pre-selected pantry model often distributes foods to clients and families that they may not need, want, or use.[7] Certain items may become overstocked as food is distributed through boxes or prioritized by availability rather than nutritional value. The result of foods and necessity items being thrown away by clients negatively impacts the environment and operational costs of food pantries.

Objective

This study explored a community-academic partnership and the feasibility of designing and implementing an initiative aimed to increase knowledge and self-efficacy to improve food selection behaviors. In turn, the initiative evaluated in this study may increase food security among food-pantry clients. Therefore, the goals of this research were to design and implement a sustainable program that would:

1. Improve access and marketing for shelf-stable foods to increase self-efficacy and nudge patients towards making healthy food selections.
2. Develop a sustainable and reproducible client choice model for implementation in other facilities.

Literature Review

Food insecurity is defined by the United States Department of Agriculture (USDA) as the lack of access, at times, to enough food for an active, healthy life for all household members and limited or uncertain availability of nutritionally adequate food [1]. According to a document published in 2017 by Feeding America, the USDA estimated that 41 million people, including 18 percent of all children, in the United States were food insecure in 2016. Cross-sectional analysis revealed that 12.5 percent of Americans, and 16.7 percent of children, lived in households without consistent access to adequate food. While these statistics are staggering, the data are correlated with a downward trend in food insecurity from a high of 50 million in 2009 [2].

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Methods

Population

The target population of this study was the clients served by HHC. Eligibility criteria to access the food pantry's services included residency in Watauga County, NC with an income at or below 200 percent of the Federal Poverty Level. The pantry provided canned or dry foods, frozen meats, dairy, and government supplied foods through the Supplemental Nutrition Assistance Program (SNAP) and The Emergency Food Assistance Program (TEFAP). According to the Hunger in America data, 72 percent of Watauga County residents meet the Federal Poverty Level criteria for food assistance. [16]

Study Design & Procedures

All research was conducted at HHC in rural Northwestern North Carolina. This study featured a mixed-methods design, and succeeded with the collection of qualitative and quantitative data through a three-step approach: observation and feedback, design and implementation, and evaluation.

Phase 1: Observation and Feedback

The first phase of this study was dedicated to observation and feedback on daily operations at HHC. The investigator served as an intern on a weekly basis over the span of 7 months before this study began. The investigator directly observed the organization and their policies surrounding food distribution, and worked closely with the Executive Director to gain a better understanding of their vision for a client choice food pantry.

While working as an intern, the investigator was able to interact with clients in an effort to gain a better understanding of the population's nutrition-related knowledge. The investigator gained hands-on experience in every service offered by HHC, and worked

directly with upper management to design, revise and implement HHC programs prior to this study. The RNCE-West Healthy Food Pantry Assessment Tool was used to assess the quality of services offered by the facility. [17] All decisions regarding food pantry renovations included the feedback from all full-time staff at HHC.

Over the spring and summer, 2018, Appalachian State University students from the department of Nutrition and Foods collected qualitative and quantitative pre-renovation data from clients to evaluate the quality of pantry services offered by the facility, and the ability for those services to meet the needs of clients. The survey included 54 questions on sociodemographics, food frequency information, and quality of food pantry services offered by HHC (Appendix B). The investigator trained each surveyor and monitored all interactions between both parties.

Phase 2: Design and Implementation

The design and implementation phase featured a fully-renovated food pantry. Renovations included drywall patching, fresh coats of paint, new shelving, grocery carts, and signage. Merchandising, marketing, and inventory management strategies were be used to enhance the overall quality and presentation of the foods available in the pantry. The use of marketing techniques, with guidance from staff and volunteers, we provided a unique framework to nudge clients towards the ability to identify and select safe foods based on their individual needs. Advanced nutrition students from Appalachian State University served as "personal shoppers" within the pantry on a regular basis, and custom shelving labels were posted to nudge clients toward healthy options in the absence of a "personal shopper."

A blueprint was developed to illustrate renovations and provide accurate measurements for shelving and traffic flow. All renovations were ADA and fire code

compliant (Appendix A). Plans were approved by all stakeholders in February 2018 and renovations were completed in July 2018. Materials, supplies and labor were donated by community partners. Grocery carts, for children and adults, were donated by Clerk 1 Excess Equipment Warehouse Retail Business Services, an Ahold Delhaize Company, in Salisbury, North Carolina. HHC purchased discounted shelving from Lowes Home Improvement in Boone, North Carolina. Paint supplies were donated by Boone Decorating Center in Boone, North Carolina. Volunteer labor was donated by Publix, Appalachian State University, local churches, and other community partners. The investigator worked closely with HHC management to obtain funding and volunteer labor for the renovations, assessments, and daily operations. Post-renovations, the investigator continued to work with HHC staff, students, and volunteers to train and implement an informative and personalized shopping experience for clients.

Phase 3: Evaluation

During the evaluation phase, client and staff feedback were considered for evaluation of the fully redesigned client choice pantry. Pilot data identified barriers that informed an adapted ordering system. Survey data were collected prior to renovations, and feedback was collected from all stakeholders at each milestone of the transition. The intent of a client choice model was to guide other businesses through the transition to a client choice pantry. The proposed model and changes are presented in Appendix A.

The following research questions were addressed in this study,

1. Does a client-choice system improve access and marketing for shelf-stable foods to increase self-efficacy and nudge patients towards making healthy food selections?
2. Is a client-choice system sustainable and reproducible as a model for implementation in other facilities?
3. Is a client choice distribution system acceptable to clients and staff?
4. What are the benefits of a client choice distribution system?
5. What are the barriers to a client-choice distribution system?

Data Analysis

Data were initially collected by direct observation and documentation during time spent volunteering in the fall, 2017 and spring, 2018 semesters. Prior to implementation, data were collected through client surveys that had been adapted from previous validated instruments (Appendix B). All data were compiled and analyzed using Microsoft Excel. Qualitative data were coded for analysis of themes, and both qualitative and quantitative data were evaluated to promote continued development and process evaluations of the client choice system.

Results

Client Survey and Healthy Food Pantry Assessment

The RNECE-West Healthy Food Pantry Assessment Tool was administered alongside the client pre-renovation survey to assess the facilities location, services and policies. The assessment tool further analyzed the safety, quality, variety and storage of food. The Healthy

Pantry Assessment Score – Grand Total was calculated to be 63 out of 100 possible points. Point deductions were related to lack of food variety and presence of HHC policies.

The statistical findings of the Healthy Food Pantry Assessment Tool were in alignment with data collected from clients in the pre-survey; lack of food variety, and on occasion, the questionable quality of foods. Fresh fruits and vegetables were omitted from this study because they are dispensed from the fresh market; a different area from where this study was conducted. It is important to mention these findings extraneously because client perception is based on the entirety of their visit to the facility, and to clarify that the Healthy Food Pantry Assessment Tool assesses the facility as a whole entity. Furthermore, the concerns for expiration dates and quality, and requests for more food variety, were referenced by participants in all services provided by HHC. It is important to note, however, that complaints were conveyed as constructive feedback by a minority of clients, with the large majority expressing satisfaction with the food they received and experiences they encountered at HHC.

The most substantial feedback provided by the client survey was found within the qualitative portion of the survey. Most (79.2 percent) participants supported the offering of trained nutrition experts on site to answer questions and guide them through the food selection process. Most (85.4 percent) participants expressed a desire to self-select foods they receive, and the finding was echoed by being the most common suggestion for improving the food pantry. With most (82.1 percent) respondents stating they gave away or re-donated food in the past, and 46.8 percent stating that the amount of food provided was insufficient, the argument could be made that pantry clients receive inappropriate amounts and types of foods. This may indirectly lead to increased rates of food waste and malnutrition. These findings are

a direct reflection of the innate desire of clients to strengthen their self-efficacy through education and choice. It also supports the assumption that many clients ultimately care about improving their nutrition-related knowledge, quality of life, and the impact food waste has on the community.

Pre-renovation Survey – Section 1: Demographics

Forty-four clients completed the demographic portion of the survey with the assistance of a trained interviewer. Males (n=28) and females (n=16) were both represented in the study. Whites were most represented (n=39), followed by Hispanic/Latino (n=2), African American (n=2) and Other (n=1). One quarter (27.3 percent) of individuals surveyed disclosed their employment status as employed, 52.3 percent identified themselves as unemployed, and 20.5 percent mentioned they were retired. Most (77.8 percent) of clients surveyed self-identified as Civilians, and were followed by Veterans/Retired Military (13.9 percent), Active Military (5.6 percent) and Spouse/Child of a military family (2.8 percent).

When asked about housing status, most (65.9 percent) identified as homeless. After controlling for homelessness, 9.1 percent did not own a refrigerator, 20.5 percent did not own a freezer, 15.9 percent did not own a microwave, and 6.8 percent did not own an oven. Most (40.9 percent) of individuals declared their marital status as married or remarried, with divorced/widowed (27.3 percent) and single (22.7 percent) following closely behind. Only four individuals documented their marital status as separated from their spouse.

In relation to education status, few (9.0 percent) participants did not complete high school. High school graduates and GED recipients accounted for the largest portion of participants (36.4 percent). The remaining clients stated that they had either college experience (25.0 percent), an associate's degree (11.4 percent), bachelor's degree (15.9

percent) or advanced graduate or doctorate degree (2.3 percent). No participants in the study held a master's degree. The combined population of all individuals with some form of higher education accounted for most (54.5 percent) of the sample population.

Household size ranged from 1 to 7 members (μ= 2.75). When asked "how long have you been a client of HHC?" responses varied between 0.5 months to 180 months (μ= 53). When asked "how many times per month do you visit HHC Food Pantry?" responses ranged from 0.33 to 4 visits per month (μ= 1.79). Frequencies of less than one visit per month were accounted for when a participant specified infrequent visits over the span of multiple months. Four participants disclosed that their meals only come from HHC. The average supply of food from HHC accounted for an average of 3.36 meals per week.

Pre-Survey – Section 2: Food Frequency

Participants were asked to rate a list of foods in two areas; prevalence and preference. Prevalence of a food item received was denoted by "common," "rare" or "never," while preference was assessed by "consume" or "avoid." It is important to note that the survey of these foods were strictly related to the pantry box program, and excluded items that clients receive from other services provided by HHC. Food boxes included shelf stable foods, dairy and frozen meats. Vegetables (n=35), beans (n=33) and cold cereals (n=33) were the top three most common foods found in previous food boxes. Fruit (n=15), brown rice (n=13), chips (n=13) and meal kits (n=13) were selected by participants as uncommon foods that were rare to see. Frozen fish (n=25), frozen fruit (n=20), and frozen vegetables (n=17) were foods that clients had never received in their food boxes.

Pre-Survey – Section 3: Qualitative Questionnaire

Forty-eight clients participated in the qualitative questionnaire portion of the survey. When asked "what do you do with food that you receive from the pantry but do not consume?" most (82.1 percent) participants stated that they give away or re-donate those items to friends or pantries. In regards to types of foods that individuals receive in their boxes, most (76.6 percent) participants felt that food variety was acceptable, with the request for more variety being the most popular request (n=4). Diabetes (n=13), cardiovascular disease (n=8) and food allergies/autoimmune disease (n=6) were reported to be the three most common ailments in households.

Most (53.2 percent) participants found the amount of food provided in the food box program to be acceptable, with the remaining 46.8 percent expressing that amounts of food were insufficient or too variable. One participant stated that food boxes were "a generous amount for 2 people, but worry sometimes for bigger families." This was echoed by another participant, "It would be good if they gave portions based on the number of people in the family."

Participants were asked to provide feedback on the quality and safety of food they receive in their pantry box. While most (79.2 percent) participants felt that the quality and safety of foods were acceptable, there were 14 remarks concerning the quality and expiration dates of foods. Two of these remarks were removed from data analysis due to mentions of moldy produce, which was related to an area of the facility not included in this study.

Participants were also asked to provide meal preferences. Chicken (n=11), spaghetti (n=8), and vegetables were the most popular items. When asked "would you rather pick up a premade box of food, or self-select the food items you desire?" most (70.8 percent)

participants expressed preference for self-selection. Some participants were vocal against self-selection, “Absolutely not! You’re asking for problems. You’ll lose volunteers; the program works, leave it alone.” In contrast, other participants explained that self-selection would allow them to better manage diseases, food allergies, and select items that would pair well with foods they already have at home.

Most (79.2 percent) individuals were in favor of having nutritionists on site to answer dietary questions and assist with selecting healthy options. In contrast, one participant stated that “People don’t pay attention to healthy options. They come here excited for food, not what kind.”

Participants were finally invited to provide suggestions on how the pantry box program could be improved. The four most popular suggestions were 1) the ability to self-select foods (n=8); 2) larger amounts of foods that scaled based on family size (n=4); 3) more fruit options; and 4) clarification on expiration dates listed on packaging. One participant, a mother of four, stated “often times frozen meats are out of date or have freezer burn.” She followed up by explaining that she does not visit HHC often because the amount of food she receives is not worth the cost of gas. Another participant conveyed that they frequently make the 26 mile drive to visit, stating “it is the best pantry I’ve seen.”

Renovations

The blueprint for renovations was designed by the lead researcher and it went through three separate revisions. The intent was to repurpose a portion of HHC’s dry pantry and receiving area into a client choice experience, while preserving square footage necessary to continue receiving and processing operations. ADA and fire code compliance, traffic-flow, inventory and employee work environment were all taken into serious consideration.

The original plan was much smaller in size, but caused major logistic issues related to traffic flow and the inability to monitor theft. The final plan promoted a more spacious client choice pantry and work environment for employees, and reduced traffic-flow and theft issues, all of which is important for any food service operation (see Appendix A).

Due to the budget limitations of a nonprofit organization, labor and materials accounted for the greatest challenge throughout phase two. Established community partnerships proved to be vital for procuring labor and supplies. Volunteers were supplied by Appalachian State University, Publix and other community partners. Supplies were donated from Clerk 1 Excess Equipment Warehouse Retail Business Services, and paint supplies were donated by Boone Decorating Center in Boone, North Carolina.

Renovations were delayed 2.5 months due to the challenges in finding affordable shelving. Thirty-two feet of shelving were purchased from Lowe's Home Improvement at wholesale cost ($480) to prevent further delay of renovations. The shelves were made of particle board and metal frames. Each shelf was engineered to hold a maximum of 800 pounds of evenly-distributed weight. At an average canned food weight of 0.9 lbs., the researcher and staff agreed that the durability, shelving height, and square footage would be appropriate for the facility's needs. It is important to note that HHC serves the public 40 hours a week and has a sizeable pantry. The hours and square footage of other pantries would need to adjust their budget accordingly.

Publix of Boone, North Carolina, generously provided a large team of volunteers for the day of renovations. HHC closed their facility to reduce traffic and risk of injury. The duration of renovations lasted 8 hours. Renovations would have taken multiple days without a sizeable volunteer group. The task began with the removal of equipment from the building,

sweeping the floors and walls, removal of cabinets and patching of drywall. Painting operations began on stone walls while drywall putty dried. This decision, along with the need for only one coat of paint, saved the facility from closing a second day to complete the project. Volunteers were placed on teams for painting, cleaning equipment, and constructing shelves. Refrigeration and freezing units were moved into position to complete the L-shaped client choice pantry.

Near the end of renovation day, and two days following, volunteers assisted with the organization of food storage, and stocking of shelves. Foods were organized by USDA MyPlate standards; vegetables, fruits, protein, dairy and carbohydrates. One shelf was designated to hold hypoallergenic foods, and foods that would be appropriate for various chronic diseases. Two shelves were reserved for SNAP and TFAP, which offer foods per regulation by state and federal government.

Client Choice Design and Logistics

Fruits and vegetables were positioned so that clients encountered those items before sugary, processed foods. The healthiest options within each food group (i.e., low or reduced sodium, no sugar added, etc.) were positioned at eye level of adults. This decision was made based on the fact that adults account for the largest age-group for picking up food. The hope was that clients would fill up their carts with mostly healthy options before reaching the unhealthy alternatives.

Shelving labels were designed to differentiate food types, and doubled as educational nudges toward healthy options (see Appendix D). Again, the hope being that clients would be encouraged to make healthy decisions on their own, without fear of embarrassment or harassment for selecting unhealthy options. A vibrant, fun and friendly aesthetic and

language was chosen for the layout of these signs to promote a friendly, professional and inviting experience that clients would notice. These signs were written in English and Spanish as these are the two most common languages used by clients.

The signs were also created to aid clients in the selection of healthy options when "personal shoppers" (Appalachian State University nutrition students) were unavailable (see Appendix E). Signage nudged clients towards foods that would prevent or help manage various forms of chronic disease. While it is impossible to fully manage a disease with a simple flashcard, the intent is for clients to feel empowered to make healthy decisions on their own free-will, in other words, to nudge clients toward a step in the right direction.

A point value system was established to meet the needs of larger households (see Appendix C). The previous food distribution system did not take into account the number of individuals in a particular household. It also ignored food preferences, allergies, disease prevalence and age appropriateness and tolerance. The client choice pantry implemented a scaling system combined with freedom of choice and educational nudging. With all of this in mind, supply and demand were carefully considered when deciding how many points each client would be allotted. On average, smaller households received less food items than in previous visits, whereas larger households received more. All values were tailored to ensure every client and their family would receive enough food to supplement their meals over a two week period; as this is the regulation set by HHC for how often a client can receive food from the pantry. A cap was also placed on each food item to prevent one client spending all of their points on the same item (i.e., one individual selects six bags of potato chips). From a nutrition perspective, it was important to HHC staff and the investigator that clients included

a variety of foods in their diet, and that the system was fair to everyone. This system stabilized inventory and ensured that foods were consumed before they expired.

The most profound obstacle during the entire study was the increased labor required to operate a client choice pantry. While receiving and processing services do not require additional labor, guiding clients through a client choice experience does. Based on the square footage and volume of traffic at HHC, it was predicted that a minimum of two personnel would be required for operations to run smoothly. This evaluation was based on discussions with three other client choice food pantry directors, and by analyzing the layout of the fully implemented client choice pantry. Food pantries commonly have trouble scheduling volunteer labor, and HHC has the added challenge of operating 40 hours a week. Any pantry that attempts to replicate the HHC client choice model may experience a similar challenge in securing volunteer labor. Labor is not only required to assist clients with guided tours and food selections, but to also reduce risks of theft and accidental injuries.

In an effort to provide staff with a flexible timetable to locate and schedule volunteers, an adjustment was made to hybridize the previous box program with client choice. This goal was achieved by placing a table at the entrance way to the pantry to prevent clients from walking into the space. The majority of foods were visible from the client's point of view. Clients were able to request foods based on what they saw, and by filling out an order sheet that listed all foods HHC has to offer (see Appendix C). The order sheet also featured an area for special requests and to denote whether or not someone in their household had a chronic illness (i.e., diabetes, cardiovascular disease, celiac, etc.). Clients were provided these sheets at the time of check in, and were instructed to provide the completed form to the pantry staff. Staff would build the box based on the specifications of each client,

and would offer substitution options when requests were unable to be met. Clients were also provided the option to receive a pre-made box. This was an accommodation made to those who preferred the old system or simply did not have enough time for the entire client choice experience. This system succeeded at offering an efficient client choice experience for individuals and their families, and circumventing labor shortages experienced by HHC.

Stakeholders expected that it would take time for staff and clients to acclimate to a newly renovated client choice pantry. Not only did staff have to be trained on the changes in operations, but it also disrupted expectations of clients. Based purely on observation, a small number of clients and staff experienced distress with adapting to the new system. Their complaints to the investigator were not that to say the change was bad, but that it was something new that they were having difficulty adjusting to. Overall, feedback on the client choice experience was overwhelmingly positive from clients and staff.

Discussion

Food insecurity is associated with a range of negative health outcomes, including poor physical, psychological, and social growth in infants and children, mental health issues among adolescents and adults, and nutrient deficiencies. [6] A client choice food pantry model provides the opportunity to preserve resources, educate clients, and guide individuals through making healthy choices that are appropriate to their cultural and nutritional needs. While studies have underscored the relationship between food pantries and food security, self-efficacy, and effective "nudging," no study has developed an inter-professional, reproducible model for converting a pantry to client choice.

Studies have shown that freedom of choice may improve self-efficacy amongst food insecure individuals. Nudging is a technique to provide subliminal messaging, while providing the client or customer with a choice free of social stigmas. Subliminal messaging has proven to be effective in "nudging" a client or customer towards selecting desired items. This is the same strategy that businesses use to sell goods and services around the world. Have you ever wondered why the sugary kids' cereals are found on the bottom shelf? It is because the positioning is perfect for children to see. What about those candy bars and drinks located at the cashier station? The quick and ease of a grab and go snack is perfect for a shopper leaving hungry or craving something sweet. The investigator in this study repurposed this strategy to promote healthy choices at HHC's food pantry. This preliminary study was conducted to collect data from clients and staff at a local food pantry to determine the need and feasibility of a client choice model.

Strengths of this study could be attributed to the established relationship between Appalachian State University and HHC. This relationship supported the investigator's ability to interact with clients and construct plans for renovations. An established network of community partners also proved to be invaluable in procuring the labor and materials required to complete this study and meet deadlines.

Training multiple surveyors allowed researchers to collect data from a larger sample size, which was needed to properly evaluate the interest and feasibility of integrating a client choice system into HHC's food pantry operations. Interviewers read each question and documented responses for clients to limit bias and variability, and ensured that each client comprehended the question in proper context. The mixed-methods approach of this study

allowed for a qualitative and quantitative analysis of client opinion and perspective, which is invaluable to any community-centered research study.

Delays in renovations prevented the timely collection of post-renovation survey data regarding nutrition knowledge and self-efficacy. This data will be collected in the fall of 2019. Another weakness of this study could be attributed to the inability to communicate with HHC's large Hispanic population. Unfortunately the research team did not have bilingual interviewers who could interview clients who were not fluent in English.

Conclusions

The goal of using client and staff feedback to inform the design and implementation of a client choice food distribution system was achieved in this study. The data collected from the pre-renovation survey and Healthy Food Pantry Assessment Tool validated the questions that researchers initially set out to test. Barriers related to financial constraints, food supply, volunteer staff, security, safety, cultural awareness and training of staff must be addressed for full implementation and evaluation. Future research should be conducted to validate the sustainability and reproducibility of the client choice model established in this study, as well as the benefits of such a system on client outcomes related to nutrition knowledge, and self-efficacy for making better food choices.

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Project Timeline

May, 2017-December, 2017 – observations, undergraduate internship, building rapport with staff.

December 2017 – March 2018: Planning

February – April, 2018 – Pre-survey data collection

May – June, 2018- renovations and implementation of client choice model

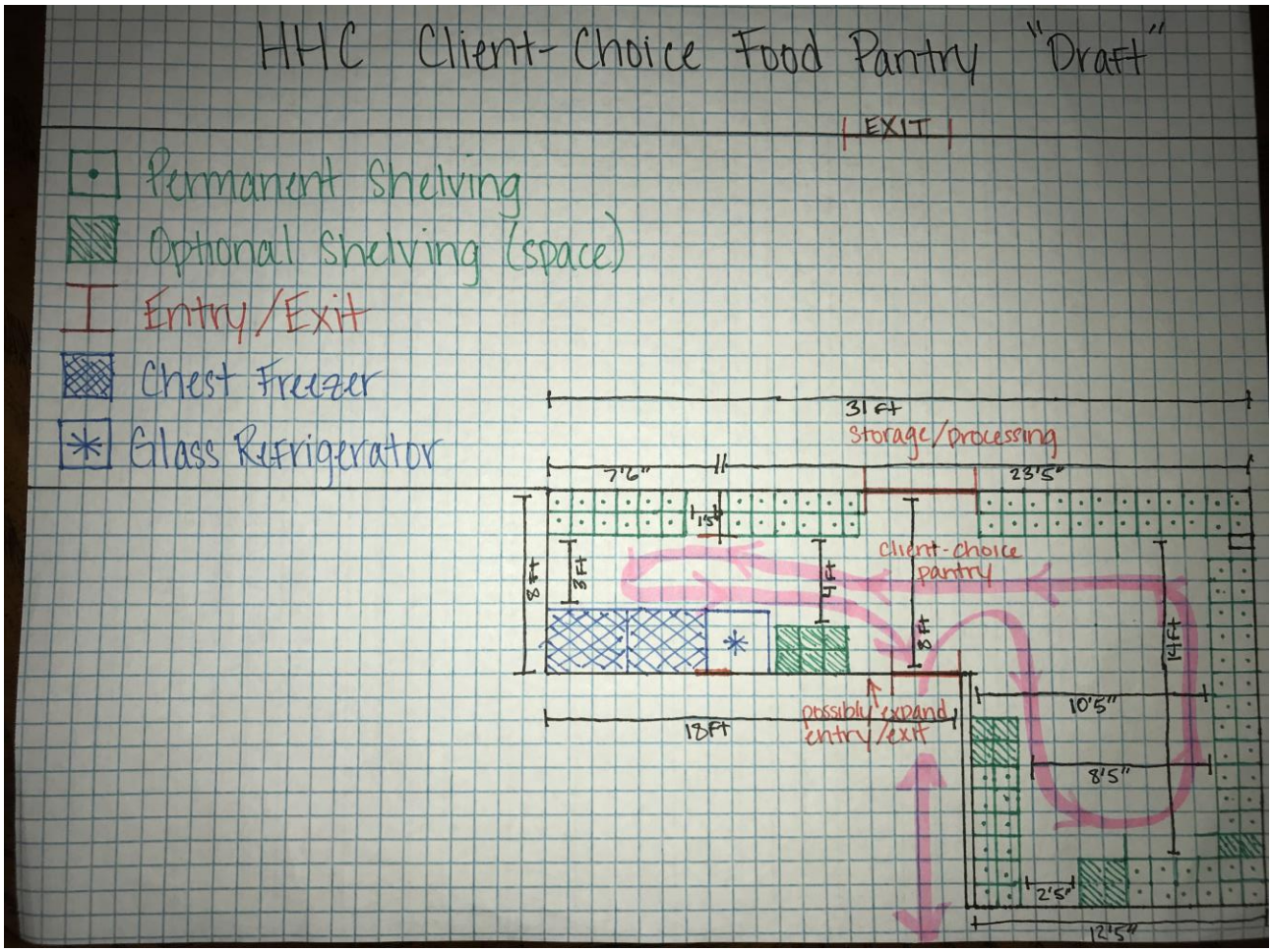
June-August, 2018 – post-survey data collection

August- October, 2018 – Data Analysis

November, 2018-March, 2019 – Conclusions and final development of thesis document

April, 2019 – Thesis Defense and pursuit of manuscript publication

Appendix A



Suggested Changes to the Pantry:

1. Remove cabinets and counters from rear wall.
    a. Minor drywall repair and painting may be required.
2. Relocate freezers to the other side of pantry.
    a. Minor electrical work may be required.
3. Relocate large refrigerator, and replace with a smaller transparent version.
4. Install shelving around entire perimeter, with one line of shelving used to create an artificial wall in the center of the current pantry.

5. Reorganize exterior pantry area for storage and stocking by staff.
6. Display education and nutrient-information through handouts, labels, and displays.
7. Integrate smaller shopping carts to reduce collisions between clients and support traffic flow.
8. Design and implement training programs for staff and volunteers.

Appendix B

Confidentiality and Participation

The purpose of this survey is to collect data for the development and expansion of nutrition services for the Hunger and Health Coalition in Watauga County, North Carolina. Your participation in completing this survey is voluntary and you may decide to stop at any time for any reason with no penalty or you may choose not to answer any of the survey questions. All responses will be anonymous. You will be asked to complete questions regarding perceptions of foods donated, nutrition knowledge and self-efficacy, and food security; these questions should not take more than 20 minutes. There may be no personal benefit from your participation but the information from this research may help others in the future by implementing a successful nutrition initiative at the Hunger and Health Coalition, thus improving care for the rural population.

If you have any questions or concerns about the nature of this research or the survey please contact Melissa Gutschall PhD, RD, 828-262-2698, gutschallmd@appstate.edu, or irb@appstate.edu.

Appalachian State University's Institutional Review Board has determined this study to be exempt from IRB oversight.

By continuing to the survey, I acknowledge that I am at least 18 years old, have read the above information, and provide my consent to participate under the terms above.

Client Identification Number (CIN) _____ **Date _____**

Client Survey
Section 1: Demographics

1. Age _____

2. Sex/Gender
☐ Male ☐ Female

3. Ethnicity:
☐ White
☐ Hispanic/Latino
☐ African American
☐ Asian
☐ American Indian/Alaska Native
☐ Native Hawaiian/Pacific Islander
☐ Other

4. Employment Status
☐ Employed
☐ Unemployed
☐ Retired

5. Military
☐ Civilian (No Service Record)
☐ Active
☐ Veteran/Retired
☐ Military Spouse/Child

6. Are you homeless?
☐ Yes ☐ No

7. Do you have a Refrigerator?
☐ Yes ☐ No

8. Do you have a Freezer?
☐ Yes ☐ No

9. Do you have a Microwave?
☐ Yes ☐ No

10. Do you have an Oven?
☐ Yes ☐ No

11. Marital Status
☐ Single
☐ Married/Remarried
☐ Separated
☐ Divorced/Widowed

12. Education
☐ Did Not Complete High School
☐ High School/GED
☐ Some College
☐ Associates Degree
☐ Bachelor's Degree
☐ Master's Degree
☐ Advanced Graduate Work or Ph.D

13. Household Size _____

14. How long have you been a client of the Hunger and Health Coalition? _____

15. How many times *per month* do you visit the Hunger and Health Coalition <u>Food Pantry</u>?
_____

16. How many of your meals *per week* are supplied by the Hunger and Health Coalition Food Pantry?
_____

Section 2: Food Frequency

Please select the foods that you receive in a pantry box, and whether or not your family consumes them.

Shelf-Stable Foods (Canned, Boxed)		**Frozen Foods**
Soup ☐ Common ☐Rare ☐ Never ☐Consume ☐Avoid	Nuts/Seeds ☐ Common ☐Rare ☐ Never ☐Consume ☐Avoid	Microwavable Meals ☐ Common ☐Rare ☐ Never ☐Consume ☐Avoid
Beans ☐ Common ☐Rare ☐ Never ☐Consume ☐Avoid	Pasta/Macaroni (dry) ☐ Common ☐Rare ☐ Never ☐Consume ☐Avoid	Chicken ☐ Common ☐Rare ☐ Never ☐Consume ☐Avoid
Vegetables ☐ Common ☐Rare ☐ Never ☐Consume ☐Avoid	White Rice ☐ Common ☐Rare ☐ Never ☐Consume ☐Avoid	Beef ☐ Common ☐Rare ☐ Never ☐Consume ☐Avoid
Fruit ☐ Common ☐Rare ☐ Never ☐Consume ☐Avoid	Brown Rice ☐ Common ☐Rare ☐ Never ☐Consume ☐Avoid	Pork ☐ Common ☐Rare ☐ Never ☐Consume ☐Avoid
Fish ☐ Common ☐Rare ☐ Never ☐Consume ☐Avoid	Crackers ☐ Common ☐Rare ☐ Never ☐Consume ☐Avoid	Fish ☐ Common ☐Rare ☐ Never ☐Consume ☐Avoid
Chicken ☐ Common ☐Rare ☐ Never ☐Consume ☐Avoid	Chips ☐ Common ☐Rare ☐ Never ☐Consume ☐Avoid	Vegetables ☐ Common ☐Rare ☐ Never ☐Consume ☐Avoid
Beef/Pork ☐ Common ☐Rare ☐ Never ☐Consume ☐Avoid	Flour/Corn Starch ☐ Common ☐Rare ☐ Never ☐Consume ☐Avoid	Fruit ☐ Common ☐Rare ☐ Never ☐Consume ☐Avoid
Pasta (canned) ☐ Common ☐Rare ☐ Never ☐Consume ☐Avoid	Cookies ☐ Common ☐Rare ☐ Never ☐Consume ☐Avoid	
Nut Butter ☐ Common ☐Rare ☐ Never ☐Consume ☐Avoid	Snack/Breakfast Bars ☐ Common ☐Rare ☐ Never ☐Consume ☐Avoid	
Jam/Jelly ☐ Common ☐Rare ☐ Never ☐Consume ☐Avoid	Meal Kits (Tacos, Ham. Helper) ☐ Common ☐Rare ☐ Never ☐Consume ☐Avoid	
Hot Cereals ☐ Common ☐Rare ☐ Never ☐Consume ☐Avoid	Cold Cereals ☐ Common ☐Rare ☐ Never ☐Consume ☐Avoid	

Other foods (not listed) that you typically receive in a pantry box:

_____
_____

Client Survey
Section 3: Qualitative Questionnaire

The following questions pertain to the food pantry only, and exclude the fresh market and food recovery.

1. What do you do with food that you receive from the pantry but do not consume?

_____
_____
_____
_____

2. Do you, or your family members, have any health conditions that impact the types of foods you are able to eat?

_____
_____
_____
_____

3. What feedback do you have about the *types* of food you receive in the pantry box? Do you find it difficult to find food to manage your health condition or to find foods that fit your culture?

_____
_____
_____
_____

4. What feedback do you have about the *amount* of food you receive in the pantry box?

_____
_____
_____
_____

5. What feedback do you have about the *quality and safety* of food you receive in the pantry box?

_____
_____
_____
_____

6. What are some specific meal preferences (foods and beverages) for your family?

_____
_____
_____
_____

7. Would you rather pick up a premade box of food, or self-select the food items you desire?

_____
_____

_____
_____

8. What is your opinion on having nutritionists on site to answer dietary questions, and assist you with selecting healthy options for yourself and/or your family?

_____
_____
_____
_____

9. Do you have any suggestions on how we can improve our food pantry program?

_____
_____
_____
_____

Staff Identification Number (SIN) _____ **Date _____**

Interview Log

CIN	Date	Name	Age	Gender	Interviewer

Appendix C

Name _____ Points _____

Hunger and Health Coalition

Pantry Checklist

Check *Mystery Box* If you would like a premade box

☐ ***Mystery Box***

Canned Fruits & Vegetables
(1) (2) Fruits
(1) (2) Beans
(1) (2) Corn
(1) (2) Tomatoes
(1) (2) Other Vegetables
(1) (2) Tomato Sauce

Frozen Meats
Chicken or Turkey (circle 1)
Beef or Pork (circle 1)

Dairy/Eggs
If available, these items will be offered to you.

Canned Proteins
(1) (2) Soup
(1) Peanut Butter & Jelly
(1) (2) Fish
(1) (2) Chicken
(1) (2) Pork/Beef

Carbohydrates
(1) (2) Pasta Noodles
(1) (2) Canned Pasta
(1) (2) Macaroni and Cheese
(1) Crackers/Chips
(1) Cookies
(1) (2) Cereal/Oatmeal
(1) Snack Bars
(1) (2) Rice

Special Requests (Food Preferences, **Allergies**, **Health Conditions**, etc.)
☐ Low Sodium ☐ Low Sugar ☐ Whole Wheat ☐Gluten-Free
☐ Vegetarian ☐ Vegan

_____

_____

Hunger and Health Coalition

Food Pantry Allotment Chart

Family Size	Points	SNAP/TFAP
Individual	12	1 of each item
2	14	1 of each item
3	16	1 of each item
4	18	1 of each item
5	20	1 of each item
6	22	1 of each item
7	24	1 of each item
8	26	1 of each item
9	28	1 of each item
10	30	1 of each item

Red Hat Bags and Snack Bags are available upon request.

Appendix D

Food for Thought
Select vegetables with reduced or low sodium.

Comida para el pensamiento
Seleccione vegetales con reducido o Bajo en sodio.

Food for Thought
Consider choosing fish or chicken over beef or pork.

Comida para el pensamiento
Considera elegir pescado o pollo sobre carne de res o cerdo.

Food for Thought
Select fruits in natural juices or water.

Comida para el pensamiento
Seleccione frutas en jugos naturales o agua.

Food for Thought
Select whole grain/wheat options. Limit candy and sweets.

Comida para el pensamiento
Seleccione opciones de trigo integral / trigo. Limite los dulces y dulces.

Appendix E


Diabetic Friendly
The Diabetic Diet
Vegetables, Some Fruit, Chicken, Fish
Try whole grain/wheat options.
La dieta diabética
Verduras, algo de fruta, pollo, pescado
opciones de trigo integral / trigo.
Allergies/Alergias
Read Ingredients!
May be safe for people with celiac or
food allergies.
¡Lea los ingredientes!
Puede ser seguro para personas con
celiaquía oalergias a los alimentos

The Heart Healthy Diet
Fruits, Vegetables, Chicken, Fish
Reduce Salt Intake (try Mrs. Dash)
La dieta saludable para el corazón
Frutas, verduras, pollo, pescado
Reduzca la ingesta de sal

Vita

Michael DeCaro is a native of Stanley, North Carolina. He is the son of Jeff DeCaro and Kim Hooks. He graduated from East Lincoln High School in 2008. Michael continued his education at Gaston College, where he received an Associate of Applied Science in Emergency Medicine. He later earned his Bachelor of Science in Nutrition and Foods from Appalachian State University in May 2017. Michael earned his Master of Science in Nutrition and Dietetics from Appalachian State University in May 2019. He will pursue a career as a Registered Dietitian.