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Feeding Families

Evaluation Report

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Submitted to Westside Family Healthcare

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Table of Contents

Executive Summary 4

Background 5

Methods 6

Findings 7

- Program Participation 7
  - Table 1: Feeding Families Participant Characteristics 8
  - Table 2: Participant Drop Out 8
- Progress towards Outcomes 9
  - Progress toward Outcome 1 9
  - Table 3: Food Insecurity, Tabulated by Individual Question 9
  - Table 4: Food Insecurity, Individual Questions Combined 10
  - Progress toward Outcome 2 10
  - Table 5: Healthy Meal Preparation 11
  - Figure 1: Participant Dietary Quality, Baseline and 6-months 12
  - Table 5: Participant Baseline and 6-month Dietary Quality 12
  - Figure 2: Dinners Eaten at Home 13
  - Table 6: Frequency of Dinners Eaten at Home in the Past Week 13
  - Progress toward Outcome 3 13
  - Figure 3: Participant Progress Toward Health Goal 14
  - Progress toward Outcome 4 14
  - Table 7: Food Label Understanding 15
  - Figure 4: Nutrition Quality Knowledge 16
- Additional Food, Nutrition, and Well-being Outcomes 16

Summary and the Next Steps 17

Appendix A: IRB Approval Letter for Exemption 20

Appendix B: Survey Administered via Qualtrics 21

Appendix C: Feeding Families Nutrition Lesson Curriculum and Evaluation Metrics 25

Appendix D: Self-Management Questions 29

Executive Summary

With funding from Highmark BluePrints for the Community (Highmark), Westside Family Healthcare (WFH) launched the "Feeding Families" pilot program designed to address food insecurity, expand access to fresh foods, provide routine nutrition counseling, and teach participants how to better manage their chronic diseases. In 2021, 51 WFH families were recruited to receive fresh foods weekly for 24 weeks (6 months) from home-delivery service Hungry Harvest, and meet virtually with a nutritionist and social service coordinator for customized education, cooking tools, and recipes. Forty-two participants were retained over the course of the program.

In the Feeding Families program, participants demonstrated significant and positive shifts in food security as well as in dietary quality and knowledge; they also reported weight loss. These data points show that the program was successful in meeting grant deliverables.

- At baseline, 85.7% participants were food insecure (36 of 42 participants); however these rates were significantly reduced by the end of the 24 week intervention period, allowing 10 (27%) of the initial 36 families who were food insecure to become food secure. Among those that remained food insecure, 95% shifted from severe to moderate food insecurity, shifting from "always" worrying their food would run out to the more moderate level of "sometimes."
- After 24 weeks of intervention, 16.7% of participants reported that their dietary quality was excellent and an additional 23.8% reported that their diets were very good; these are notable shifts from baseline, when no participants (0%) reported their diets qualified as excellent. Further, only 7.1% reported that their dietary quality was very good at baseline.
- After 24 weeks of intervention, 66.7% of participants indicated that they had lost weight since they started receiving their food boxes; only 11.9% said they had not, while 14.3% were unsure. While this was not a planned outcome, this is a notable behavior change because of goal setting.
- After 24 weeks of intervention, almost 93% of participants reported that they understood how to read a food label, a 26.2% increase from baseline.

Using the same Highmark funding, participants were offered an extension to continue receiving food for an additional 24 weeks. Of interest will be the sustained effectiveness of these efforts and the addition of measuring change in biometric parameters, as well as whether participants' use of the food boxes continues at high levels with fewer meeting with the social services team. We may begin to explore if social support mechanisms such as walking groups or social media may be of interest to participants; if so, additional funding sources will also be explored.

Background

Westside Family Healthcare (WFH) is a community-minded, non-partisan Federally Qualified Health Center located in Wilmington, DE. Dedicated to a person-centered approach, WFH serves individuals and families with various programs and services including primary care, dental care, women's health services, pediatric healthcare, behavioral health, and in support areas such as nutrition and social services.

In January, 2021, with funding from Highmark Blue Cross Blue Shield Delaware's BluePrints for the Community: Social Determinants of Health Grant (Highmark), WFH launched the "Feeding Families" pilot program designed to address food insecurity. The Feeding Families program serves those persons with diabetes, a hemoglobin A1c level greater than eight, and/or hypertension, and/or obesity, and those who identify as food insecure according to the Hunger Vital Signs[1] screening tool. The program provides routine nutrition counseling, and educates WFH patients in self-management of chronic diseases. The Feeding Families program addresses the social economic inequities that lead to chronic food insecurity and poor health outcomes among WFH's patient population. While these social inequities existed long before the COVID-19 pandemic, it exacerbated the need and drastically deepened the hunger crisis in Delaware.

Funding sought to provide families with 24 weekly, fresh foods deliveries from Hungry Harvest. Each week, patients receive enough food to prepare healthy meals for their whole family. Participants are asked to attend both monthly nutrition counseling and weekly social service check-ins; they also receive additional incentives such as cooking appliances and kitchen utensils. For this pilot program, WFH initiated a partnership with the University of Delaware's Center for Research in Education and Social Policy (UD-CRESP) to measure how increased access to healthy foods, nutrition counseling, and other support facilitates behavior change. The first six months of the grant period were focused on program planning and structural organization, while the second six months (24 weeks) included program implementation. Additional funds and approvals were obtained to continue the program beyond its initial year, and the program is expected to continue for an additional 24 weeks with participants who wish to remain receiving services[2].

The 24-week program included several distinct efforts: the delivery of weekly healthy food boxes, monthly nutrition counseling, and weekly social services support, as well as incentives such as cooking appliances, kitchen utensils, and a journal that could serve as supportive accessories for the food deliveries. The food deliveries from Hungry Harvest included a variety of fruits, greens, vegetables, and eggs, and occasional add-ons of olive oil and bread. Monthly nutrition counseling sessions were conducted by WFH nutritionists and included goal tracking, strategies for behavior change, and education on chronic disease management. WFH's social services team had a check-in each week with participants to assess progress, address program challenges, and connect to other resources as needed.

[1] https://childrenshealthwatch.org/public-policy/hunger-vital-sign/

[2] As of March 9, 2022, 41 participants have indicated that they would like to remain in the program.

WFH designed the Feeding Families program in January to March 2021, and enrolled 51 families program from March to June 2021. Of the 51 initially enrolled, the program was notably able to retain 42 for the full duration of the program. The grant proposal included resources to patients to help with Zoom and internet access to connect with the nutritionist in monthly group sessions. Because of the COVID-19 pandemic, internet and Zoom became free or lower cost during the program implementation and was no longer a program cost. Additionally, there was less interest in group sessions with the nutritionist by Zoom, as initially planned, and more interest in meeting one-on-one with the nutritionist by phone.

During program development, WFH established four outcomes for the Feeding Families program:

1. At least 50% of patients feel food-secure during the program period
2. At least 60% of patients increase consumption of-fruits and vegetables and decrease frequency of fast-food consumption per week by end of program period
3. At least 55% of patients achieve self-management goal by end of program period
4. At least 75% of patients show an increase in knowledge and understanding of how nutrition influences their chronic disease

In addition to capturing progress toward these outcomes, the evaluation approach seeks to understand program implementation and process measures as well.

Methods

In order to measure program impacts and processes, as well as progress towards meeting established outcomes, several survey measures and data capture tools were created and used. All program materials and surveys were available to participants in both English and Spanish to increase the program's accessibility, and are available in this report's Appendices. UD-CRESP and WFH collaborated on the creation of survey tools and an evaluation matrix between January – March 2021, following all Institutional Review Board (IRB) and WFH privacy standards. Each participant received a unique identification number used to track participation across the survey tools; only approved WFH staff had access to the participant name associated with that number. These survey measures and tools include:

1. Participant Knowledge, Dietary Behaviors, and Food Security Survey: This survey, administered via Qualtrics at baseline (i.e., program start) and at 24 weeks (6 months), addressed participants' knowledge about nutrition and their own health, dietary behaviors and food security. WFH social services coordinators administered the survey verbally at these two time points during the current reporting period (a 12-month time point will be added in mid-2022), specifically in order to assess change in the participant's health and food insecurity status along with changes in knowledge and behavior. Several other questions, addressing participants' perceptions of weight loss, health change, and other potential program benefits, were added to the survey at the six-month point. The Qualtrics survey was shared securely between UD-CRESP and WFH using anonymous links generated by UD-CRESP. WFH collected the primary data through

direct responses from participants while UD-CRESP completed data analyses using the de-identified survey responses.

2. Nutrition Lesson Knowledge Assessment[3]: WFH facilitated monthly nutrition lessons with participants that reviewed basic nutrition principles and how nutrition affects chronic disease. Participants were asked a set of questions centered on fat, sodium/salt, and sugar intake and how consumption is related to diabetes, hypertension, and obesity. In many cases, these questions were asked before and after each lesson to assess any change in knowledge; in other cases, a question was asked only before the lesson.

3. Self-Management Tool: WFH facilitated weekly check ins by phone with a social service coordinator and followed a self-management tool, where participants provide feedback on their progress toward goals and the weekly food box. The questions addressed participants' health goals, perceptions of and meals made with the food box, and any feedback that they had about the program. The data was entered into a SmartSheet and was completed approximately weekly.

UD-CRESP used the Qualtrics and SmartSheet data sets to evaluate the efficacy of the program and assess changes in participants' knowledge of nutrition and health.

An IRB protocol for review by University of Delaware was submitted in the Spring of 2021 and was determined exempt on May 4th, 2021. WFH's Quality Improvement Committee also reviewed and approved the internal "Investigational or Research Activity Application" and approved the evaluation.

Findings

> *This week I made salmon in the oven with sautéed the squash with onion and garlic. Also Brussels sprouts. – Participant Food Box Meal Description*

Program Participation

The Feeding Families program enrolled 51 participants between March and June 2021, exceeding its initial goal of 50 participants. Table 1 presents the participant population's diverse demographic makeup. Most participants were female (88.1%), Spanish speaking (57.1%), Latinx

[3] Throughout the pilot of the Feeding Families program and its subsequent evaluation, there were several versions of surveys and measures utilized. Specifically, and after 24 weeks, UD-CRESP and WFH decided to limit the nutrition lessons to once per month and eliminate asking the nutrition/disease questions before and after the lessons. UD-CRESP and WFH also adjusted the weekly self-management questions and the timing of their administration was changed from weekly to monthly. These questions continue to be administered via Smart Sheet, and will include the nutrition questions.

(66.7%), and White-identifying (57.1%), although about one-third of participants identify as African-American. Additional characteristics not shown in Table 1 include that 20% of participants lived alone, while about 40% lived in households of four or more. Nearly all (97%) reported receiving their food box delivery each week.

Table 1: Feeding Families Participant Characteristics

Demographic and Other Characteristics (n=42)	
Average Age	48.3 years
Gender	
Female	88.1%
Male	11.9%
Preferred Language	
English	42.9%
Spanish	57.1%
Ethnicity	
Latinx	66.7%
Not Latinx or Latino	23.8%
No Response	9.5%
Race	
African American	33.3%
White	57.1%
American Indian	2.4%
More than one race	2.4%
Refuse to report	4.8%

Of the enrolled 51 participants, 42 remained enrolled through the 24 weeks of the intervention with an astonishing retention rate of 80.8%. The participants who dropped out of the program were un-enrolled for a number of reasons as shown in Table 2. Of note, the program retained and actually increased its proportion of Latinx participants. Initially, 64.7% (n=33) of enrolled participants were Latinx and after 24 weeks, 66.7% (n=28) identified as Latinx.

Table 2: Participant Drop Out

Reason for Un-Enrollment (n=9)	
Reason	
Transferred to another primary care provider	11.1%
Did not want to participate/make changes to health behavior	11.1%
Moved outside of delivery zone	33.3%
No longer needed assistance with food	22.2%
Other/refused to state reason	22.2%

Progress towards Outcomes

The remainder of the Findings portion of this report is organized into two sections. The first section responds specifically to the stated outcomes originally established for the Feeding Families program. The second section describes a range of food, nutrition, and well-being outcomes of interest to program developers and stakeholders.

Progress toward Outcome 1

At least 50% of patients feel food-secure during the program period.

Significant progress has been made towards achievement of this goal at this point in the Feeding Families program. Food security for the program's participants is an important outcome measure given Feeding Families' efforts to address an important Social Determinant of Health (i.e., food insecurity) by providing adequate, nutritious food. To assess food security, participants answered the two-question Hunger Vital Signs survey, which was included in the baseline and six-month Participant Knowledge, Dietary Behaviors, and Food Security Surveys. To be considered food-insecure, respondents must answer "always true" or "sometimes true" to at least one of these two questions:

1. Within the past six months, I worried whether our food would run out before we got money to buy more.

2. Within the past six months, the food I bought just didn't last and we didn't have money to get more.

A summary of participant responses at baseline and at six-month follow up is provided in Table 3, below.

Table 3: Food Insecurity, Tabulated by Individual Question

	Question 1: Baseline, % (n=42)	Question 1: 6-Month, % (n=42)	Question 2: Baseline, % (n=42)	Question 2: 6-Month, % (n=42)
Always True	21.4	2.4	26.2	0.0
Sometimes True	61.9	51.4	47.6	50.0
Never True	14.3	45.2	21.4	47.6
Don't Know	2.4	0.0	4.8	2.4

At baseline, 35 of 42 (83.3%) participants answered "always true" or "sometimes true" to the first food security screening question while 31 of 42 (73.8%) responded "always true" or "sometimes true" to the second food security screening question, indicating that most were food insecure at the start of the Feeding Families program; combined, 85.7% participants were food insecure (36 of 42 participants) before the program began.

Rates were significantly reduced by the end of the 24-week intervention period. **Ten (27%) of the initial 36 families who were food insecure at the start of the program were no longer food insecure at the 24-week mark.**

Among those that remained food insecure, 95% shifted from severe to moderate food insecurity, shifting from "always" worrying their food would run out to the more moderate level of "sometimes." At 24 weeks, many fewer (although still a concerning number) worried about their food access as indicated by the decrease to 54.8% of participants having food insecurity based on the first question; 50.0% were food insecure based only on the second question. Further, the level of food insecurity shifted from severe/moderate food insecurity, to becoming more mild. To elaborate on this point, we see that 26.2% of participants responded that they *always* did not have money to get more food when it did not last. At follow up, none (0%) felt this was always true, and when responded to affirmatively, responses shifted to sometimes true. The change reflects a significant shift from moderate to severe food insecurity, to a more mild form of food insecurity.

A slightly different way of looking at the same data is to examine the proportion of participants who answered affirmatively to either of the food security questions at baseline and again at the six-month follow-up (Table 4). In this analysis and at baseline, 85.7% of participants were food insecure. At the six-month follow up, this rate had declined to 61.9% (Table 4). These results closely match those when the responses to the individual food security questions are analyzed, as presented above.

Table 4: Food Insecurity, Individual Questions Combined

	Food Insecure at Baseline, % (n=42)	Food Insecure at 6-months, % (n=42)
Yes	85.7	61.9
No	11.9	38.1
Don't Know	2.4	0.0

Progress toward Outcome 2

At least 60% of patients increase consumption of-fruits and vegetables (FVs) and decrease frequency of fast-food consumption per week by end of program period.

The first part of this objective was met. Increased FV consumption was determined via food box participation as collected via the Self-Management Tool. As previously noted, 97% of participants reported receiving their food box. Increases in FV consumption were also documented using examples of the kinds of foods participants were able to prepare with their food boxes, also as collected by the Self-Management Tool. Over 491 distinct responses were provided, and were consistent with other program goals related to food preparation, including meals with reduced sodium, sugar and fat, and with increased fruit and vegetable offerings. Some examples include:

Apples with ginger and cinnamon, Baked sweet potatoes with smart balance, Baked squash

Kale with olive oil and seasoning, Spaghetti with green peppers, Potato salad with eggs

Lentils with spinach, Diced eggplant with tomato, onion, and pepper, Salad with pepper, Over easy eggs

Omelet with red peppers and spinach, Baked egg in muffin tin, Will make stir fry with squash and chicken

Raw cauliflower with yoghurt dressing, Baked sweet potato with butter, Diced apples with vanilla, nutmeg, and cinnamon

Spinach in green smoothie, Peaches as snacks, Boiled sweet potatoes as snack, Boiled, scrambled, and fried eggs

Soup with spinach and egg, Salad with spinach, Omelet with beans and bread, Hominy soup (pozole) with radish

A further metric established in the Participant Knowledge, Dietary Behaviors, and Food Security Survey relates to participants' self-evaluation regarding the preparation of healthy meals, which would include FVs, for their families. As shown in Table 5, while approximately 76% of participants agreed or strongly agreed they were able to prepare healthy meals at baseline, perceptions shifted for 10 participants, such that at the six-month mark, almost all participants (95.8%, n=40) believed they could prepare such meals.

Table 5: Healthy Meal Preparation

	Baseline, % (n=42)	6-Month, % (n=42)
Strongly agree	23.8	31.0
Agree	51.4	64.8
Disagree	11.9	4.8
Strongly disagree	2.4	0.0
Don't know	7.1	0.0
Refuse to answer	2.4	0.0

The second part of this objective, relating to consumption of unhealthy foods, was also met. Participants were asked a series of questions (via the Participant Knowledge, Dietary Behaviors, and Food Security Survey) regarding how they perceived their overall diet quality, as well as how often they ate food both at and away from home (this latter category includes fast foods).

At baseline, participants did not report that their overall diet was excellent (0%) or very good (7.1%), however proportions shifted at six months, whereby 16.7% reported an excellent

dietary quality and an additional 23.8% reported their diets were very good as shown in Figure 1. A complete table of responses is provided in Table 5.

Figure 1: Participant Dietary Quality, Baseline and 6-months

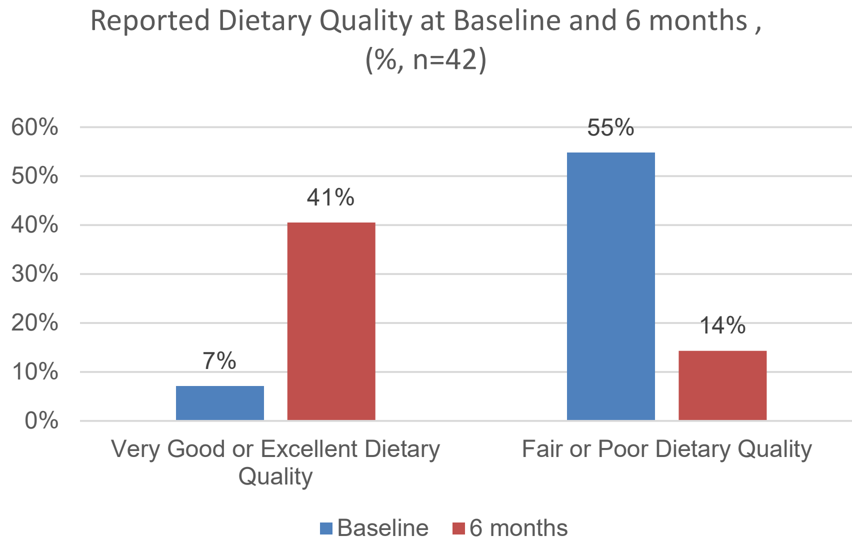


Table 5: Participant Baseline and 6-month Dietary Quality

	Baseline, % (n=42)	6-Month, % (n=42)
Excellent	0.0	16.7
Very Good	7.1	23.8
Good	31.0	42.9
Fair	42.9	11.9
Poor	11.9	2.4
Don't know	7.1	2.4

Further, most participants, even at baseline, prepared meals at home. Specifically, participants reported on the number of meals eaten that were prepared away from home, during the previous week. Because most were already eating at home, the results did not change between baseline and six-months: at each time point, 97.6% (n=41) reported eating seven or fewer meals away from home while 2.4% (n=1) ate between 8-15 meals away from home.

Finally, participants did report a slight increase in the frequency of eating dinner at home with their families (Figure 2). At baseline, nearly all participants frequently prepared dinners at home, perhaps a result of the COVID-19 pandemic, and as such, not much variation in this outcome was expected. By the end of the six-month evaluation period, however, small positive shifts were reported, whereby the number of individuals who reported eating all dinners at home with family increased 7.2% (n=3). Table 6 presents the complete set of responses.

Figure 2: Dinners Eaten at Home

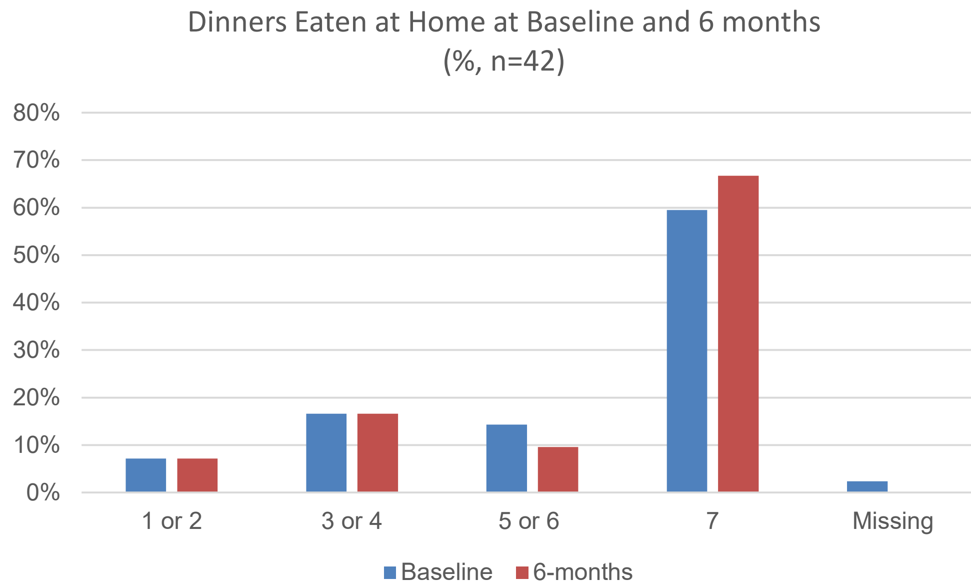


Table 6: Frequency of Dinners Eaten at Home in the Past Week

Number of Dinners	Baseline, % (n=42)	6-Month, % (n=42)
1	4.8	0
2	2.4	7.1
3	7.1	9.5
4	9.5	7.1
5	14.3	4.8
6	0	4.8
7	59.5	66.7
Missing	2.4	0

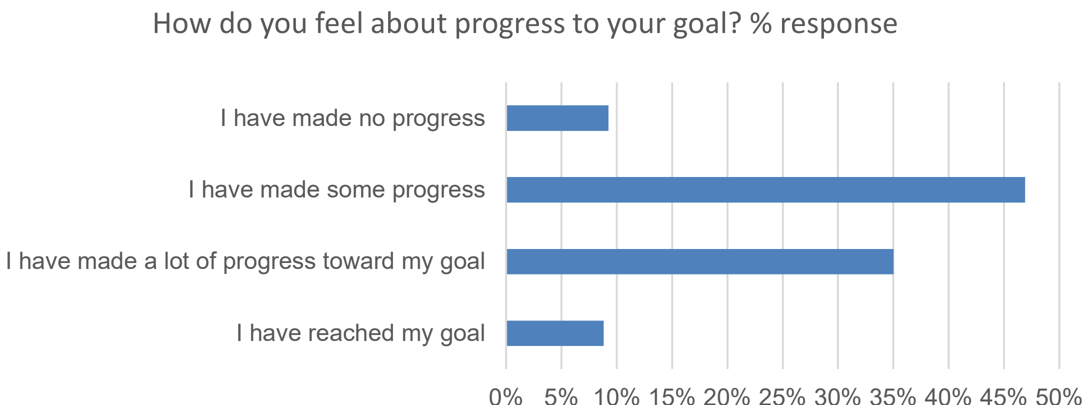
Progress toward Outcome 3

At least 55% of patients achieve self-management goal by the end of program period.

Participants are making progress towards meeting this goal, but it has not yet been fully achieved. Goal setting is a main component of the Feeding Families program to help participants with chronic disease management. Throughout the 24 weeks of the program, participants completed weekly check-ins with WFH's Social Services staff to help with goal establishment and management, via the Self-Management Tool. Ninety percent of participants

each week reported working towards a goal that most often included losing weight, increasing exercise, eating fewer salty foods/managing blood pressure, checking blood glucose levels or working toward better control of glucose, and eating fewer carbohydrates and fried foods. When asked about progress towards their goal, most made some progress (about 45%), although nearly the same number felt they had made a lot of progress or had reached their goal (see Figure 3). In total, approximately 45% of participants made a lot of progress toward, or had reached, their self-management goal.

Figure 3: Participant Progress Toward Health Goal



Participants were also asked to describe barriers toward making progress on their goal. Most described either a type of family stressor (e.g., death in family, worry about children), or physical ailments such as illness, back pain, or medication issues, as limitations toward progress. Challenges with “sticking with” dietary changes, lacking adequate time for activity given caregiving duties, and weather’s influence on physical activity progress were also reported.

In terms of goal tracking, participants were also asked about their use of the program journal. On average, 25% of participants used the journal regularly. Another 10% used it on and off, and many (60%) neglected to take advantage of the opportunity.

Progress toward Outcome 4

At least 75% of patients show an increase in knowledge and understanding of how nutrition influences their chronic disease.

The first part of this objective was met. Participants’ understanding of food labels, as collected by the Participant Knowledge, Dietary Behaviors, and Food Security Survey, improved notably. Specifically, 92.9% (n=39), , indicated that yes, they understand how to read a food label when compared to 26.2% (n=11) at baseline. Data are shown in Table 7.

Table 7: Food Label Understanding

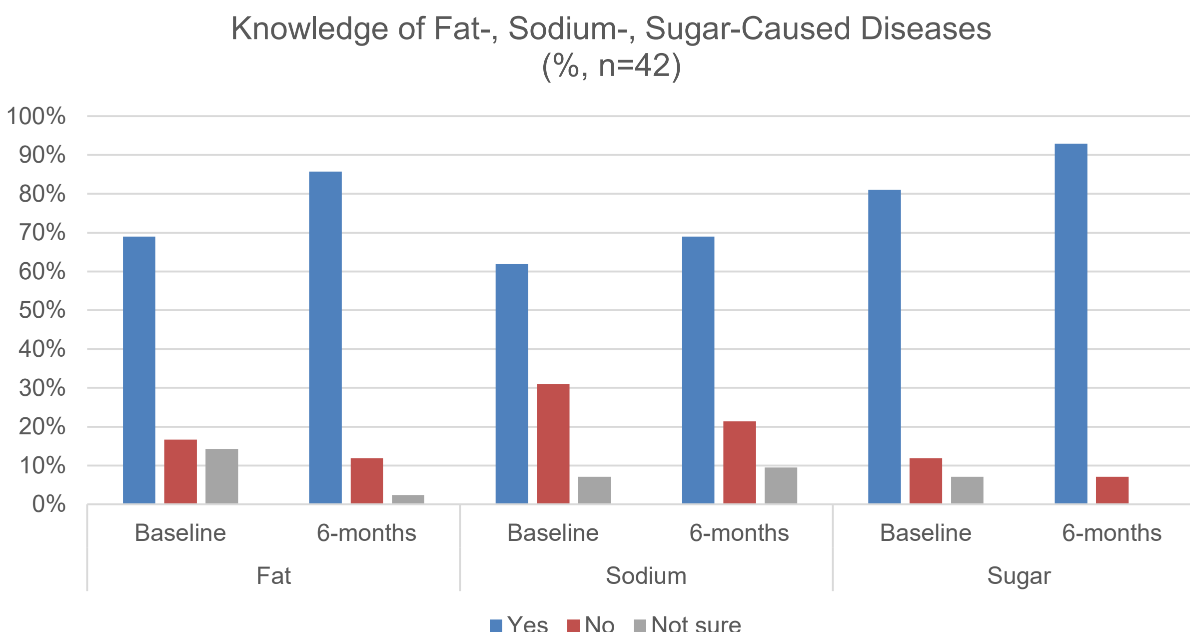
	Baseline, % (n=42)	6-Month, % (n=42)
Yes	66.7	92.9
No	33.3	4.8
Don't know	0.0	2.4

Significant progress has been made in reaching the second part of this objective, which relates to participants' understanding of key nutrition parameters (i.e., fat, sodium/salt, sugar) and the relationship of these parameters to chronic disease.

The Methods section outlines Feeding Families' approach to collecting participant knowledge regarding a variety of nutrition parameters: fat, sodium/salt, and sugar consumption. With respect to nutrition quality, the same data were collected in two ways – the Nutrition Lesson Knowledge Assessment and the Participant Knowledge, Dietary Behaviors, and Food Security Survey. The program was designed to hold monthly group education sessions; however, they were not well attended. The WFH Nutrition team shifted to meet with each participant individually in once-a-month counseling sessions that covered the same nutrition topics as would have been covered in the group session, while also providing better scheduling flexibility. In the counseling sessions, many participants provided responses to questions about fat, sodium/salt, and sugar consumption, and how that intake is related to a variety of health conditions both before and after the nutrition counseling session. These same questions were also asked of participants at the baseline and at six-month time points in the Participant Knowledge, Dietary Behaviors, and Food Security Survey; their responses are presented and analyzed below.

For all three parameters, the percentage of participants who understand the relationship between nutrition and chronic disease is between 80%-90% for fat and sugar, and close to 70% for sodium/salt, as shown in Figure 4. Further, it is notable that more than twice the number of participants improved their knowledge of fat-related illnesses when compared to sodium/salt and sugar conditions. Specifically, the proportion of those reporting knowledge of fat-related illness increased 16.7% (n=7); sodium/salt-caused illness knowledge increased 7.1% (n=3); and, the increase in sugar-related illness knowledge was 11.9% (n=3).

Figure 4: Nutrition Quality Knowledge



In each subject area, and when a participants responded affirmatively when asked if they were aware of any major health problems or diseases related to the amount of fat, sodium/salt, or sugar consumed, they were also provided the opportunity to identify the specific health issue or illness. For the fat- and sodium/salt-related illnesses, many participants mentioned high cholesterol, high blood pressure, and other cardiac diseases; for sodium/salt-related illnesses, some participants also included diabetes. Participants indicated diabetes as the principal health issue related to sugar consumption.

Additional Food, Nutrition, and Well-being Outcomes

As noted in the Methods section, six questions were added to the version of the Participant Knowledge, Dietary Behaviors, and Food Security Survey that participants completed at the six-month time point of the Feeding Families program. Accordingly, the data described as follows are not representative of a quantitative change between the baseline and six-month points; rather, they indicate participants' perceptions of the indicated change over the six-month period, or other feedback, depending on the question asked.

First, 66.7% (n=28) of participants indicated that they had lost weight since they started receiving their food boxes as part of the program over the past six months; only 11.9% (n=5) said they had not while 14.3% (n=6) were unsure.

Participants were then asked if they had noticed improvements in their health as a result of food box receipt; 76.2% (n=32) observed changes that included "feeling better, stronger, and have lost weight," "before I would have some pain in my bones," "eating healthier," and

"having more energy and walking more." Participants also self-reported improvements in health metrics such as blood pressure, cholesterol, and blood sugar.

After six-months, participants were further asked if they had observed changes to their mental health due to receipt of the food boxes over the same previous six-month period. Those who noted changes (40.5%, n=17) indicated feeling better, and being more motivated both overall and to eat healthier. One participant noted that "I don't have to worry anymore about having food to eat or not."

The fourth additional question asked participants if, after six months, there were any other benefits that they had experienced due to the food boxes. These responses (90.5%, n=38) were similar to the physical and mental health benefits; e.g., "eating healthier" and "feeling healthier." Participants also expressed appreciation for the nutritionists and social services coordinators who assisted them, since they had learned a great deal and appreciated the increased accountability.

The final two questions addressed the overall nature of the program by asking, "how would you make the program better" and, "overall, how likely would you be to recommend this program to a friend or family member." To improve the program, some respondents suggested adding meat or dairy, and more fiber, along with a wider variety of vegetables and cooking classes. And notably, almost all participants (92.9%, n=39) were either extremely likely or likely to recommend the Feeding Families program to a friend or family member.

Summary and the Next Steps

The Feeding Families program is well on its way to achieving the four outcomes established at inception, and the six month extension should make further progress on those goals that have not yet been met. In some cases, the specified outcome has already been met. Overall, this is a highly effective program that has resulted in participants gaining dietary knowledge, improving food security, and losing weight, among other positive benefits. Most participants are highly satisfied with the Feeding Families program – e.g., almost all said they would recommend the program to a friend or family member.

Program retention (over 80% remaining fully engaged in the program after 24 weeks) is a notable accomplishment given that participants received a range of services with relatively frequent contact (2-3 times a week on average). Further, it is worthy of recognizing that nearly all the Latinx participants were retained. Serving the Latinx community in particular across the state has been recognized as a priority and the organizational structure, and multi-lingual nature of WFH staff seem to have had a considerable impact on serving its patients in this program in a way that they wanted to remain involved. Future efforts across the state, especially those seeking to serve and retain Latinx adults in food and nutrition programming efforts, may benefit from the WFH approach.

The reduction in food insecurity seen as part of the Feeding Families program is an important and notable achievement and consistent with prior studies on similar programs. A recent report[4] provides a review of recent studies examining the effectiveness of nutrition and health-care oriented partnerships broadly, and includes a review of studies specifically focused on food insecurity and referral to produce programs. The review identified 14 studies which included a food insecurity screening and referral to food distribution, however, of these only four reported on changes in food security; all four found improvements as a result of the produce program[5,6,7,8]. Because most programs only enrolled those who initially screened as food insecure, all studies began with a baseline of food insecurity of 100% or near 100%. In one study of 1722 patients[5], food insecurity decreased 94% over the course of the intervention. Another study of the Fresh Rx Program[6] found that, by the end of the nine-month intervention 98% of participants were food secure. A study examining the impact on pediatric food insecurity[8] found a 72% improvement in food security associated with participation in a food voucher program.

Our findings showed a considerable improvement in food security, although rates were very high at baseline. Initially, 85.7% participants were food insecure, however after 24 weeks of intervention, 27% if those food insecure no longer reported struggling with food insecurity. And among those that did continue to have some level of food insecurity, their level of food insecurity shifted from severe/moderate to more mild for those participants. That said, those experiencing any food insecurity is still relatively high (61%) indicating that ongoing, and perhaps more sizable resources are needed. The program eliminated food insecurity for 10 families.

Program participants have been invited to continue for an additional 24 weeks (six months) of the Feeding Families program. In this extension, WFH and UD-CRESP plan to collect biometric data, such as A1c levels as well as patient weight, to quantitatively assess change in participants' chronic diseases and other important health metrics. Participants will decrease social service check ins to once a month. Participants will further receive an additional cooking appliance and a Bluetooth scale.

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[4] Cavaliere, B. N., Martin, K. S., Smith, M., & Hake, M. (2021). Key Drivers to Improve Food Security and Health Outcomes: An Evidence Review of Food bank - health care partnerships and Related Interventions. Available at: https://hungerandhealth.feedingamerica.org/resource/food-bank-health-care-partnerships-evidence-review/

[5] Aiyer, J. N., Raber, M., Bello, R. S., Brewster, A., Caballero, E., Chennisi, C., Durand, C., Galindez, M., Oestman, K., Saifuddin, M., Tektiridis, J., Young, R., & Sharma, S. V. (2019). A pilot food prescription program promotes produce intake and decreases food insecurity. *Translational Behavioral Medicine*, *9*(5), 922–930. https://doi.org/10.1093/tbm/ibz112

[6] Lauck, L., & Gates, G. (2017). Effectiveness of the Fresh Rx Program in Food Bank Clients with Chronic Disease. *Journal of Nutrition Education and Behavior, 49(7*), S36-S37. https://doi.org/10.1016/j.jneb.2017.05.319

[7] Berkowitz, S. A., O'Neill, J., Sayer, E., Shahid, N. N., Petrie, M., Schouboe, S., Saraceno, M., & Bellin, R. (2019). Health Center-Based Community-Supported Agriculture: An RCT. *American Journal of Preventive Medicine*, *57*(6 Suppl 1), S55–S64. https://doi.org/10.1016/j.amepre.2019.07.015

[8] Ridberg, R. A., Bell, J. F., Merritt, K. E., Harris, D. M., Young, H. M., & Tancredi, D. J. (2019). A Pediatric Fruit and Vegetable Prescription Program Increases Food Security in Low-Income Households. *Journal of Nutrition Education and Behavior*, *51*(2), 224–230.e1. https://doi.org/10.1016/j.jneb.2018.08.003

Of interest will be the sustained effectiveness of the efforts as well as whether participants' use of the food boxes continues at high levels. We will also examine questions such as, "do participants experience the same results with fewer check ins" and "does food security continue to increase."

The final report, planned for July of 2022, will include evaluation 12 months of participant data, and address data collection and program improvement processes for future iterations of the Feeding Families program. We will also consider whether the changes in frequency of check ins sustains behavior change. We may begin to explore if social support mechanisms such as walking groups or social media that participants use for support may be of interest to participants; if so, additional funding sources will also be explored.

The dedication and commitment of all partners is clearly evident in just this first phase of the Feeding Families program. WFH and UD-CRESP will continue to work together on the remaining time of the Feeding Families program, and ideally, on future food security programs, furthering research to reach the mutual goal of increasing access to healthy food in Delaware.

Appendix A: IRB Approval Letter for Exemption

Institutional Review Board
210H Hullihen Hall
Newark, DE 19716
Phone: 302-831-2137
Fax: 302-831-2828

DATE:	May 4, 2021
TO:	Allison Karpyn, PhD
FROM:	University of Delaware IRB
STUDY TITLE:	[1749395-1] Feeding Families - Westside Family Health
SUBMISSION TYPE:	New Project
ACTION:	DETERMINATION OF EXEMPT STATUS
EFFECTIVE DATE:	May 4, 2021
REVIEW CATEGORY:	Exemption category # *(2)*

Thank you for your New Project submission to the University of Delaware Institutional Review Board (UD IRB). According to the pertinent regulations, the UD IRB has determined this project is EXEMPT from most federal policy requirements for the protection of human subjects. The privacy of subjects and the confidentiality of participants must be safeguarded as prescribed in the reviewed protocol form.

This exempt determination is valid for the research study as described by the documents in this submission. Proposed revisions to previously approved procedures and documents that may affect this exempt determination must be reviewed and approved by this office prior to initiation. The UD amendment form must be used to request the review of changes that may substantially change the study design or data collected.

Unanticipated problems and serious adverse events involving risk to participants must be reported to this office in a timely fashion according with the UD requirements for reportable events.

A copy of this correspondence will be kept on file by our office. If you have any questions, please contact the UD IRB Office at (302) 831-2137 or via email at hsrb-research@udel.edu. Please include the study title and reference number in all correspondence with this office.

INSTITUTIONAL REVIEW BOARD

www.udel.edu

- 1 - Generated on IRBNet

Appendix B: Survey Administered via Qualtrics

(also made available in Spanish)

CONSENT TO PARTICIPATE IN A RESEARCH STUDY, Title of Study: Feeding Families Program
Principal Investigator(s): Allison Karpyn
Important aspects of the study you should know about:
Purpose: The purpose of the study is to evaluate the effectiveness of the Westside Family Healthcare Feeding Families Program.
Procedures: If you choose to participate, you will be asked to answer the questions provided in this survey to the best of your ability.
Duration: The survey will take about 10 minutes, and you will be asked to complete it two times; once at the start of the program and again at the end of the program.
Risks: There are no foreseen risks or discomforts that will result from this survey.
Benefits: There are no direct benefits from participation in this survey.
Costs and Compensation: If you decide to participate there will be no additional cost to you. You will not be directly compensated for completing this survey.
Participation: Taking part or not in this research study is your decision. You can decide to participate and then change your mind at any point.
Contact Information: If you have any questions about the purpose, procedures, or any other issues related to this research study you may contact Westside Family Healthcare Director of Clinical Operations, Debbie Bryant at 302-836-2864 ext: 1313 or deborah.bryant@westsidehealth.org. If you have any questions about the content of this survey please contact the Principal Investigator, Allison Karpyn at 610-909-3154 or karpyn@udel.edu.

I have read and understood the information in this form and I agree to participate in the study. I am 18 years of age or older. I have been given the opportunity to ask any questions I had and those questions have been answered to my satisfaction. I understand that I will be given a copy of this form for my records:
( ) Yes I consent to participate.
( ) No I decline to participate. Thank you very much for your time.

1. In general, how healthy is your overall diet? Would you say:
    a. Excellent
    b. Very good
    c. Good
    d. Fair
    e. Poor
    f. Refuse to answer
    g. Don't know

2. In general, how many times each week do you eat dinner at home with family?
    a. 1
    b. 2
    c. 3
    d. 4

e. 5
f. 6
g. 7
h. Refuse to answer
i. Don't know

3. During the past seven days, how many meals did you get that were prepared away from home in places such as restaurants, fast food places, or from vending machines?
   a. 0 - 7
   b. 8 - 15
   c. 16 - 21
   d. Refuse to answer
   e. Don't know

4. Within the past six months, I worried whether our food would run out before we got money to buy more.
   a. Always true
   b. Sometimes true
   c. Never true
   d. Refuse to answer
   e. Don't know

5. Within the past six months, the food I bought just didn't last and we didn't have money to get more.
   a. Always true
   b. Sometimes true
   c. Never true
   d. Refuse to answer
   e. Don't know

6. Do you understand how to read a food label?
   a. Yes
   b. No
   c. Refuse to answer
   d. Don't know

7. This question has been removed, please go to the next question.

8. I have the knowledge and skills to prepare healthy meals for my family
   a. Strongly disagree
   b. Disagree
   c. Agree
   d. Strongly agree

e. Refuse to answer
f. Don't know

9. Are you aware of any major health problems or diseases that are related to the amount of fat people eat?
    a. Yes
        i. If yes, what diseases or health problems do you think are related to fat?
    b. No
    c. Not sure

10. Are you aware of any major health problems or diseases that are related to how much salt or sodium people eat?
    (a) Yes
        i. If yes, what diseases or health problems do you think are related to salt?
    (b) No
    (c) Not sure

11. Are you aware of any major health problems or diseases that are related to how much sugar people eat?
    a. Yes
        i. If yes, what diseases or health problems do you think are related to sugar?
    b. No
    c. Not sure
    (a)

[The remaining questions were added at the program's 6-month point]

12. Since you began this program and started getting your food box, have you lost weight?
    a. Yes
    b. No
    c. Unsure

13. Since you began this program and started getting your food box, have you seen an improvement in your health?
    a. Yes (if so please describe below)
    b. No

    If Yes, please describe how you have seen an improvement in your health:
    ____

14. Since you began this program and started getting your food box, have you seen a change in your mental health?
    a. Yes
    b. No
    c. Unsure

    If Yes, Please describe how you have seen a change in your mental health:
    ____

15. Are there any other benefits of the program or food box that you have experienced?
____

16. How would you make the program better?
____

17. Overall, how likely would you be to recommend this program to a friend or family member?
    a. Extremely Likely
    b. Likely
    c. Unlikely
    d. Extremely Unlikely
    e. Unsure or Don't know

Appendix C: Feeding Families Nutrition Lesson Curriculum and Evaluation Metrics

<u>**FEEDING FAMILIES LESSON PLANS**</u>

Metric 3: At least 75% of patients show an increase in knowledge and understanding of how nutrition influences their chronic disease

There will be 3 lessons via zoom on:

1. Sodium and hypertension;
2. Carbohydrates and Diabetes;
3. Fats and obesity.

Each topic will contain three parts:

1. Definition/Information on the nutrient and why it is important for the related chronic disease
2. How to read a label for that nutrient
3. “Recipes” or how to use the fruits and veggies delivered in the food box

We will encourage patients to prepare meals at home as much as possible because they are healthier and cost less money.

<u>**Nutrition topic 1: Sodium and hypertension**</u>

Objective: 1. At the end of the program, patients will know that eating salt increases their blood pressure

Objective 2: At the end of the program, patients will know how to read a nutrition label for sodium content

<u>Introduction:</u> Sodium is a mineral, like iron. We get most of our sodium from salt in our food. Eating too much sodium increases our blood pressure. High blood pressure, also called hypertension, is a health problem since it increases the risk for stroke and kidney disease.

Dietary sources of sodium- the salt shaker- during cooking or at the table. Most of our salt comes from food that we buy ready to eat. Like fast food or takeout meals, canned foods including vegetables and soups; frozen dinners, snack foods like chips; lunchmeat, cheese, pizza, sauces and pickles. Breads, rolls, bagels, flour tortillas, and wraps often have a lot of salt too.

Lower sodium options- “no added salt” in canned foods, low salt chips and pretzels; cooking with less salt- many seasonings like Old Bay, Maggi, Adobo seasoning, BBQ sauce, ketchup are very high in sodium. Try Mrs. Dash; all the herbs like onion, garlic, cilantro, thyme are salt free.

Fruits and veggies are naturally low in sodium so it is a good idea to eat more of them. Many of them also contain other nutrients that help with high blood pressure.

<u>How to read a label for sodium</u>: -2300mg or less daily (the amount in 1 teaspoon)

<u>Recipe discussion:</u> Foods delivered this week?

How did you use them? Additional ways to use them.

How did eating fruits and veggies help you to be healthy?

How can we reduce sodium when preparing meals?

Remember: Preparing meals at home saves you money. It also allows you to use less salt, which helps to keep blood pressure normal.

Evaluation: Are you aware of any major health problems or diseases that are related to how much salt or sodium people eat?
(a) yes
(b) no
(c) not sure
If yes, what diseases or health problems do you think are related to salt?

Nutrition topic 2: Diabetes and carbohydrates
Objective 1: At the end of the program, patients will know that diabetes is a chronic disease, which is made worse by eating sugar and other carbs.
Objective 2: At the end of the program, patients will know how to read a nutrition label for carb content

Introduction: Carbohydrates, or carbs, are a source of energy. Diabetes is a serious disease that is related to how much sugar, and other carbs, people eat. Most of us love to eat carbs since they include sugar and sweet foods like cookies and cakes.

Some carbs are healthier than others. We need to eat less sugar – including honey and syrup; candy, soda, sweet drinks; cookies, cakes, pies. Less white flour and foods made from it like white bread, white pasta. Less white rice.

It is healthier if we get MORE our carbs from whole grains like whole wheat breads and tortillas, whole-wheat pasta, brown rice, (quinoa). Fruits and some veggies also provide healthier carbs. Milk provides natural sugar, which is a carb.

Different foods provide different amounts of carbs. This includes "natural sugar", which is naturally in the food- like the sugar in fruit; and "added sugar" which we add to the food when we prepare it.

Recommended maximum amounts of added sugar- 6 teaspoons for women, 9 for men- and there are 17 teaspoons of added sugar in 20oz of Pepsi

Ways to reduce added sugar- Eat fruit for dessert instead of cookies or cakes • Swap sugary cereals for unsweetened cereal with fruit • Drink water or low-fat milk with meals instead of sodas

Remember: Preparing meals at home saves you money. It also allows you to use less sugar. Eating less sugar and fewer carbs can help to control diabetes.

How to read a label for carbs and added sugar
Recipe discussion: Foods delivered this week?
How did you use them? Additional ways to use them.
How does eating fruits and veggies help you to be healthy?
How can we reduce added sugar when preparing meals?

Evaluation: Are you aware of any major health problems or diseases that are related to how much sugar people eat?

(a) yes
(b) no
(c) not sure
If yes, what diseases or health problems do you think are
related to sugar?

Nutrition topic 3- Dietary Fat (and overweight/obesity)
Objective 1: At the end or the program, patients will know that overweight and obesity are serious health problems, which can be helped in many ways. One way is to eat less fat.
Objective 2: At the end of the program, patients will know how to read a nutrition label for fat

Introduction: Fat is the most concentrated way to store energy (calories). We make fat from the foods we eat and store it on our bodies. We also get fat from our foods. Eating a lot of fat can cause us to gain weight. Eating less fat can help us lose weight. Overweight and obesity are serious health problems because they increase the risk for many diseases including high blood pressure, diabetes and cancer.

There are many types of fat. Some are solid like the fat on meat, and others liquid, like oils that we use in cooking. The chemists helped us to divide fats into groups based on how they work. You may have heard the names of these groups, like saturated fats, unsaturated fats, monounsaturated fats, omega three fats. They all provide a lot of calories, so can cause a lot of weight gain, but some are healthier for your heart. Generally, oils are healthier for your heart, especially Olive oil and Canola oil. The solid fats, like the fat on meat or butter or the fat in cheese are not so good for your heart. We should eat less of these solid fats.

Eating less of all kinds of fat can help us lose weight. [We may get questions about Keto].

Ways to eat less fat:
Choose lean meats- round, 90% lean ground beef, chicken and turkey breast. Remove visible fat and chicken skin. Eat more fish and seafood (not fried).

Have less fried foods since frying adds oil to foods. Frying also makes the oil less healthy for your heart. Have more baked, air fried, grilled, boiled foods or in soups and stews. Use non-stick cooking spray.

Have lower fat dairy- low fat milk, yogurt, low fat cottage cheese, reduced fat or fat free cheese, lite cream cheese

Have less butter, margarine, gravy, and mayonnaise; use lite versions

To lose weight, we need to eat fewer calories. That can mean less fat and more foods that have few calories. Most Fruits and veggies have little fat and few calories.

The fruits and veggies that we are sending you every week can help you to be healthier and to lose weight if you are overweight.

Whole grains, like the whole wheat bread we are sending you, are healthier than white bread. Other whole grains like brown rice, whole grain pasta, whole-wheat tortillas, oatmeal and quinoa are also better choices. Beans, peas, lentils are low in fat and good choices.

Try to eat foods that are less processed. These foods often have a long list of ingredients on the label.

Something else that is important for losing weight if you are overweight is exercise. Aim for 30 minutes or more 5 days a week. Walking is a great place to start.

Remember: Preparing meals at home saves you money. It also allows you to use less fat, which can help you to avoid overweight and obesity.

How to read a label for fat

Aim for – less saturated fat, no trans fats

Low fat foods- <3 g per serving, < 1g saturated fat;

Lower fat foods are useful because they help you not to gain weight.

Recipe discussion:

How can we cook with less fat? Baked/ air fried, grilled, steamed, in soups and stews

-perhaps replacing fat in recipes by bananas, flaxseed

-skim off fat after cooking- use little or no gravy

What did you get in your fruit/veggie box this month?

How did eating them help you to be healthy?

Evaluation: Are you aware of any major health problems or diseases that are related to the amount of fat people eat?

(a) yes

(b) no

(c) not sure

If yes, what diseases or health problems do you think are related to fat?

Appendix D: Self-Management Questions

Weekly Self-Management Check in, Baseline-6 months	Monthly Self-Management Check in, 6-12 months
Participant ID	Participant ID
Full Name	Full Name
Date of Birth	Date of Birth
Today's Date	Today's Date
Are you working on a health goal?	Are you working on a health goal or anything that made a difference in your health? (yes or no)
What goal are you working on?	If yes, describe your goal:
How do you feel about your progress to your goal?	Have you achieved a health goal since we last spoke? (Yes, Somewhat, No)
What are some barriers you faced this week?	Did you have any difficulties or any successes this week?
Did you use your program journal this week?	Did you use your program journal this week?
How many people live with you in your home?	How many people live with you in your home?
Did you receive your food box delivery last week?	Did you receive your food box delivery last week?
What foods did you like best in your food box?	What foods did you like best in your food box?
What meals did you make with your food box?	What meals did you make with your food box?
	Is there anything else you would like to share with me about the food box and how it is working for you?
	Staff name completing check in
	Type of check in (social service/nutrition)