

More with Less:
**Evaluating the Impact of Altered Purchasing Strategies and Community Outreach on
the Nutritional Content of Food Provisions Distributed by the Community Food
Pantry of Sleepy Hollow & Tarrytown.**

Abstract

The Community Food Pantry of Sleepy Hollow and Tarrytown provides food provisions to community members facing food insecurity in southern Westchester, NY. A desire to increase the nutritional value of the provisions provided to the patrons of the food pantry was expressed by pantry board members and by patrons via a previously conducted needs assessment. Additionally, increasing demands for food relief related to the COVID-19 pandemic has highlighted the need for the food pantry to adopt economically sustainable practices. An intervention study was conducted in two-phases to assess whether the nutritional value of the provisions offered to the pantry provisions could be improved while maintaining or minimizing associated costs. Phase-1 was characterized by proposing 4-tiers of changes to purchasing strategies the food pantry could implement to improve the nutritional value of the provisions purchased monthly while maintaining or minimizing associated costs. Phase-2 of the intervention was characterized by publishing an informational pamphlet to the food pantry's website to improve the nutritional value of the foods donated to the pantry by community members and organizations. All 4-tiers of interventions presented in phase-1 succeeded in supporting the proposed hypothesis by demonstrating the ability to increase overall nutritional value of the purchase orders while maintaining or minimizing associated costs. Phase-2 of the intervention revealed mixed results by showing improvement in nutritional value for some nutrient categories while displaying unfavorable results in other categories. Overall, the results of this intervention study reveal that changes made to purchasing strategies for emergency food relief organizations can result in improved nutritional value of the provisions while maintaining or minimizing costs. Additional research is warranted to study the impact that improvement in the nutritional values of provisions offered to food pantry provisions has on the health and nutritional risk of individuals that utilize these services.

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Introduction

Food insecurity impacts over 35 million Americans, including 11 million children.¹ This number is predicted to have increased to a rate exceeding 42 million Americans due to the impacts of the novel Coronavirus Pandemic.¹ The rates of food insecurity are disproportionately higher within underserved and minority communities, with 16% of Latino individuals living in food insecure households versus 9% of non-Hispanic whites.¹ The effects of food insecurity include a variety of detrimental health outcomes including mental health disorders, chronic diseases like diabetes, hypertension, and hyperlipidemia, and a plethora of adverse issues.² In children, these issues expand to include cognitive and behavioral deficits, as well as decreased academic performance have been observed in addition to increased risk for developing chronic diseases.²

Many individuals who face food insecurity do not qualify for or feel comfortable receiving government-based food assistance due to factors like undocumented immigration status and

government distrust. Community based hunger relief organizations, like food banks and pantries, have continued to fill a gap in community and individual needs. More than 36% of people facing food insecurity use charitable organizations to obtain food provisions.³ However, the food provisions which are provided by these hunger relief organizations (HRO) do not always provide the highest nutritional value.⁵ Due to a reliance highly processed food items that are shelf stable, as well as organizational needs to adhere to continuously decreasing budget parameters, the food provisions tend to be high in sodium, added sugars, and saturated fats, while being low in fiber and micronutrient content.⁵ The lack of highly nutritious foods provided to already vulnerable populations can further exacerbate the risks for developing chronic diseases and illnesses, which already plague these at-risk communities at alarming rates.^{4,5}

The challenge of providing highly nutritious foods while accommodating increased economic demands is an issue that plagues many hunger-relief organizations. The Community Food Pantry of Sleepy Hollow and Tarrytown is a charity food relief organization within southern Westchester County, NY, that is facing these exact issues. At the height of the Coronavirus pandemic between 2020 and 2022, the number of individuals and households being served by the food pantry more than doubled, all while the pantry's food budget decreased due to lack of monetary donations and funding. As a result, the number of food distribution events was cut in half while other food and community related services were cut completely. Food distributions have been hosted less frequently, and the utilization of donated food items, which are typically less nutritious, have increased.

The board members of the food pantry revealed a desire to increase the nutritional value of the food products offered to the community by altering purchasing practices by the food pantry and obtained by community donations. This was reflected in a survey of food pantry patrons which displayed a desire for them to receive more staple food items like rice and beans, which offer great nutritional value in a cost-effective package.

The purpose of this study is to evaluate the feasibility and effectiveness of the intervention in increasing the nutritional value of provisions offered to the patrons of the Community Food Pantry of Sleepy Hollow and Tarrytown, while maintaining or minimizing the associated costs.

Methods

Study Design

An interventional study was conducted at the Community Food Pantry of Sleepy Hollow and Tarrytown (CFPSHT) to evaluate the feasibility and effectiveness that changes made to purchasing strategies would have on overall nutritional value and associated costs of provisions. This study also assessed the impact that informational materials distributed to community donors would have on the nutritional profile of food items received by CFPSHT from community donors. The interventional study was conducted in two-phases over a period of 4 months from February through May 2022. Overall, the study evaluated whether the implemented interventions resulted in cost-effective improvements in the nutritional value of food provisions offered to patrons of the Community Food Pantry of Sleep Hollow and Tarrytown.

Procedures & Data Collection

Phase 1 of the intervention evaluated the feasibility and impact that changes in purchasing strategies had on increasing the nutritional value of the overall purchase, while maintaining or minimizing the associated monthly costs.

A previous purchase order of food provisions placed by the CFPSHT during May 2021 was obtained from the food pantry's board. The purchase order was reviewed to analyze the cost and nutritional breakdown of the order. The entire purchase order, as well as the individual items present, were assessed for cost in dollars, calories, carbohydrates, protein, fat, saturated fat, added sugars, sodium, potassium, calcium, and iron content. Nutrition information was obtained from the food label of each product, and missing information was obtained from ESHA Nutritional Analysis software. Additionally, the cost breakdowns were obtained from the purchase order. These values were recorded in a spreadsheet (table-1).

Food items which offered the least favorable nutritional value and variety were recorded and proposed to be removed from future orders or replaced with more favorable items. Food items that offered a more favorable nutrition profile were then selected to replace the items that were removed. This replacement was done by using the costs appropriated for the removed items for additional portions of the selected items. The changes that were implemented attempted to increase the values of fiber, potassium, calcium, and iron while decreasing saturated fat, added sugar, and sodium content. 5 tiers of interventions were presented CFPSHT board to achieve the goal of increasing the nutritional value of the purchase order while maintaining or minimizing associated costs. Tier 1 removed vegetable oil from the purchase order and replaced the total cost of that item with additional black beans. (table-2) Tier 2 substituted the cost of vegetable oil with additional portions of black beans and enriched rice. (table-3) Tier 3 substituted the dollars spent on vegetable oil, grape jelly, and ground turkey with additional proportions of black beans, enriched rice, and dried oats. (table-4) Tier 4 substituted the dollar amount spent on vegetable oil, grape jelly, and ground turkey with additional proportions of black beans, with \$2250 to be allocated for additional funds to be added to gift cards distributed to the patrons of food pantry savings. (table-5) Each of the 5 tiers were presented as a mock purchase order and guide which different changes could be implemented to achieve varying results. The changes proposed in each tier of phase-1 were driven by data collected during a previously conducted needs assessment at the Community Food Pantry of Sleepy Hollow & Tarrytown and input from the food pantry's board of directors. A nutritional and cost analysis was conducted on the original

purchase order and the 5 tiers of changes to assess the efficacy of each tier of the intervention in supporting the stated hypothesis.

Phase-2 of the intervention was characterized by publishing a donation guide (figure-1), developed by the principal investigator, to the CFPSHT website to be visible by individual donors, partner groups and organizations of the Community Food Pantry. A previously conducted needs assessment at the food pantry revealed that the patrons desired to receive more staple food items like rice, beans, and dried oats. These items contained less added sugar and saturated fat while offering more favorable nutrients like fiber, potassium, calcium, and iron. The pamphlet displayed these staple food items that were being requested, provided a list of items not to donate, and provided a link to make financial contributions to the CFPSHT. This pamphlet was proposed to the food pantry board for approval and to publication on the pantry's website. This pamphlet was also available to be printed out and distributed to community groups in the case of donation drives.

A random sampling of 5 bags of food provisions, which were intended for distribution to patrons, were collected and analyzed for nutritional value. The nutritional content of the bags of provisions were obtained and recorded. (table-7) All nutrients were analyzed, and heightened attention was placed on the specific nutrients of saturated fat, added sugars, sodium, potassium, calcium, and iron. The nutrient content for each bag was recorded in an Excel spreadsheet for future data analysis. The nutritional values for each of these categories were calculated and compared to data collected from the pre-intervention needs assessment (table-6) to determine statistically significant changes.

Data Analysis:

In phase-1, the cost and nutrition information generated from each tier of interventions were compared to the values from the original purchase order from. (tables 1-5) A percent-change model was used to evaluate the impact that each tier of change had on selected categories when compared to the original purchase order. The categories included total cost, calories, carbohydrates, total fats, protein, saturated fat, added sugar, fiber, sodium, potassium, calcium, and iron. Percent change was calculated using Mac Numbers version 12.

In Phase 2, the nutritional information collected during the previously conducted needs assessment was compared to data generated from the post-intervention nutritional assessment of 5 randomly sampled provision bags. Pre- and post-intervention data from phase 2 of the intervention were analyzed to assess whether statistically significant changes were present. A Mann-Whitney U test with a p-value of $p \leq 0.05$ was utilized to determine whether statistically significant differences were present between pre and post intervention values. The Mann-Whitney U test was conducted using IBM SPSS version 27, while the associated graphs were developed using Mac Numbers version 12.

Results

Phase-1

The 5 tiers of interventions made to a previous purchase order in phase 1 of the intervention all succeeded in supporting the hypothesis by displaying an overall improvement of nutritional value while maintaining or minimizing the associated costs. The original purchase order is displayed in table-1, while the implemented changes are analyzed in tables 2-5. Each tier of the intervention provides a feasible strategy the Community Food Pantry can implement to offer more fiber, calcium, potassium, and iron while decreasing the amounts of saturated fats offered in the provisions.

Tier 1: Substituting Vegetable Oils with Black Beans

Purchasing additional portions of black beans to substitute vegetable oil displayed favorable changes in nutritional content while maintaining costs within <1% of the original order. (table-1) Added sugar content remained the same and sodium content increased minimally by 10.8%. Saturated Fat content decreased by 56.3%, fiber content increased 168.9%, Potassium content increased by 149.8%, calcium increased by 88.6%, and iron increased by 78.3%. These results support the hypothesis that favorable changes can be made to the nutrition profile of the purchase order while maintaining or reducing costs.

Tier 2: Substituting Vegetable Oils with Black Beans and Enriched Rice

Purchasing additional quantities of dried black beans and dried rice to replace vegetable oil displayed an overall favorable change in nutritional content while displaying a <1% change in total costs. (table-3) Similar to the first tier of changes there was no difference present in added sugar content, and a slight increase of 4.9% was observed in sodium content, which does not support the hypothesis. Saturated fat content decreased by 56.3%, fiber content increased by 83.4%, potassium increased by 66.4%, calcium content increased by 38.81%, and iron content increased by 35.5% when compared to the original purchase order. These results support the overall hypothesis, despite the changes not resulting in as dramatic changes in nutritional value as tier 1.

Tier 3: Substituting Vegetable Oil, Grape Jelly, and Ground Turkey with Black Beans, Enriched Rice, and Dried Oats

Tier 3 replaced all quantities of frozen ground turkey, grape jelly, and vegetable oil with additional portions of black beans, dried rice, and dried oats (table-4). While displaying a <2% reduction in original cost, the implemented changes resulted in an 88.9% decrease in added sugar content, a 53% decrease in saturated fat content, and a 2.2% decrease in sodium content. Additionally, a 112.1% increase in fiber content, 62.1% increase in potassium content, 55.6% increase in calcium content, and 58.3% increase in iron content were displayed. These results support the hypothesis while displaying a favorable impact on more categories of nutritional values when compared to other tiers of interventions.

Tier 4: Substituting Vegetable Oil, Grape Jelly, and Ground Turkey with Black Beans, Enriched Rice, and Additional Gift Card Funds

Tier 4 presented similar changes to the purchasing as displayed in tier 3, apart from replacing the funds allocated for additional portions of dried oats for an additional \$5 to be allocated to gift cards for the patrons. (table-5) The changes implemented in Tier 4 resulted in a favorable outcome of nutritional values while reducing overall cost of the purchase order. (table-

5) The cost of this intervention is displayed a 2.2% decrease in overall cost compared to the original purchase order. The nutritional analysis displayed an 88.9% decrease in added sugar content, a 61.7% decrease in saturated fat content, and a 1.3% decrease in sodium content. Fiber content increased by 84%, potassium content increased by 62.1%, calcium increased by 37.8%, and iron content increased by 33.6%. These results support the hypothesis in all aspects while allowing \$2,250 dollars to be allocated for gift card funds or savings for the pantry, revealing the most comprehensive and impactful set of changes to the purchase order.

Phase-2

Phase 2 of the intervention revealed mixed results, both supporting and rejecting the proposed hypothesis. The results of the pre-intervention nutritional analysis of the randomly sampled provision bags are displayed in table-6 and the results for the post-intervention analysis are found in table-7. The statistical analysis of the differences between pre- and post-intervention nutrition values are depicted in figure-2-4. Some categories of nutritional values show statistically significant improvement in value while other categories do not, making the results inconclusive.

Saturated Fat:

The Mann-Whitney U test revealed that the post-intervention saturated fat content was significantly lower than the pre-intervention values. (figure-3, table 6-7) These results presented with a statistically significant difference between the pre and post-intervention saturated fat content with a p-value of $P=0.03$.(figure-2) This results supports the stated hypothesis that the use of a donation guide would lead to favorable changes in nutritional value.

Added Sugar:

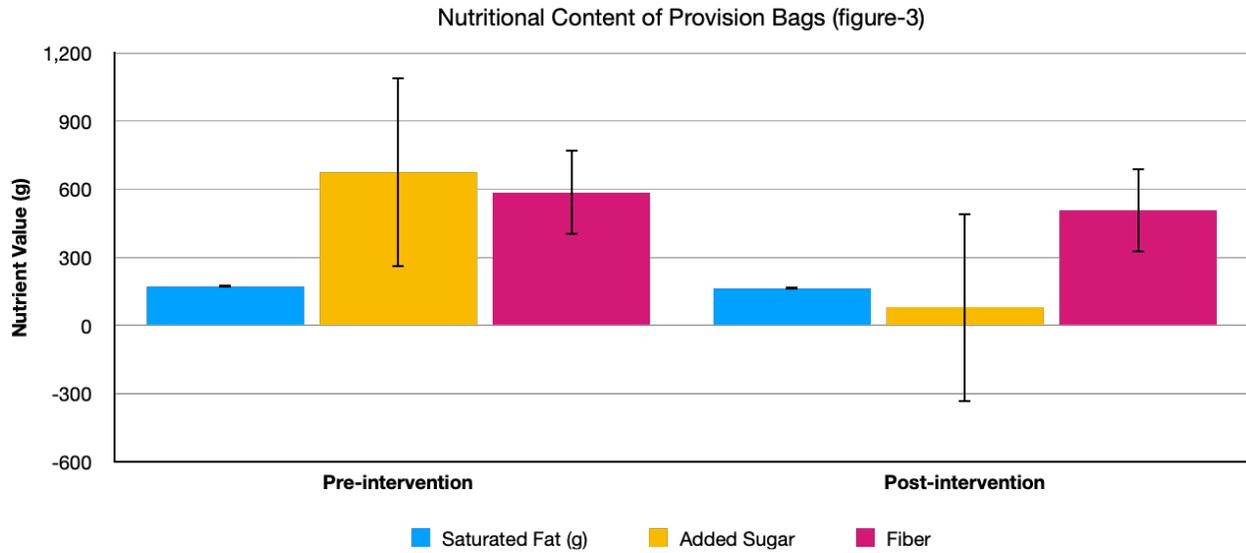
The added sugar content of the post-intervention nutritional analysis revealed a significantly lower value compared to the pre-intervention analysis. (figure-3, table 6-7) This result presented with a statistically significant p-value of $p=0.01$, supporting the stated hypothesis. (figure-2)

Fiber:

There was no statistically significant changes in fiber content between pre-intervention and post-intervention assessments. (figure-3, tables 6-7) A p-value of $p=0.35$ was displayed, indicating that this result does not support the stated hypothesis. (figure-2)

Sodium:

The sodium content of the post-intervention nutritional analysis revealed a significant increase in sodium content compared to the pre-intervention values. (figure-4, table 6-7) This result was statistically significant with a p-value of $p=0.03$, disproving the stated hypothesis by showing statistically significant change that was not an improvement. (figure-2)



Potassium:

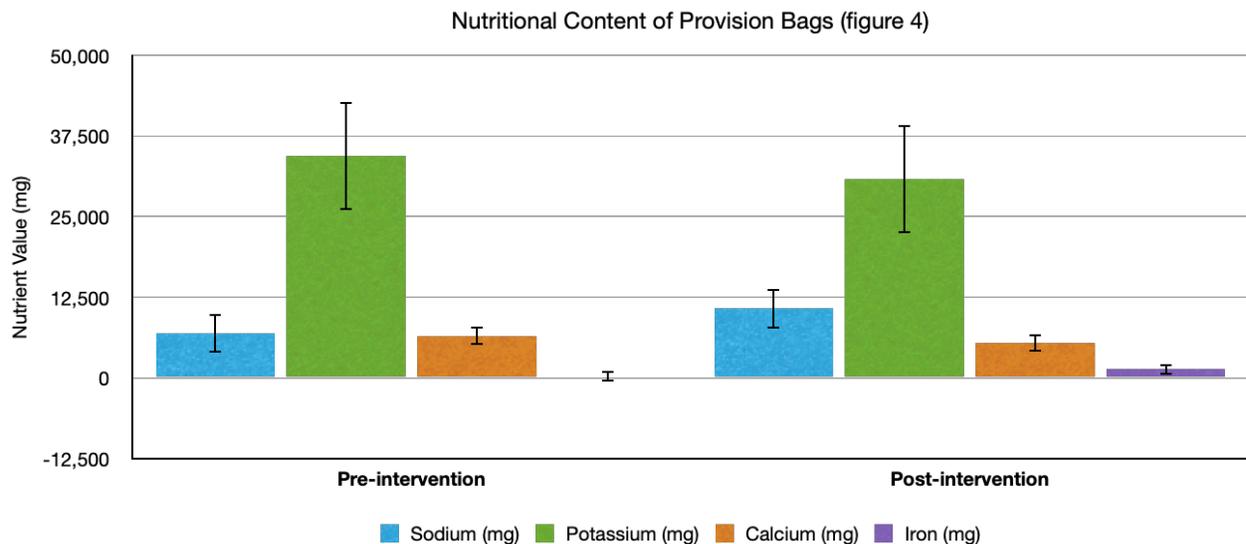
The potassium content of the post-intervention nutritional analysis revealed that there was not a statistically significant change present when compared to the pre-intervention value. (figure-4, table 6-7). This result presented with a p-value of 0.60, disproving the proposed hypothesis. (figure-2)

Calcium:

The calcium content of the food provisions did not display a statistically significant change when compared to pre-intervention values. (figure-4, table 6-7) This result presented with a p-value of $p=0.46$, disproving the proposed hypothesis. (figure-2)

Iron:

The post-intervention iron content of the provisions did not display statistically significant changes when compared to pre-intervention values. (figure-4, table 6-7) The results displayed a p-value of $p=0.08$, disproving the proposed hypothesis. (figure-2)



Discussion

Overall, phase-1 of this interventional study successfully supported the hypothesis by providing feasible changes that could be implemented by the Community Food Pantry of Sleepy Hollow and Tarrytown to improve the nutritional value of food provisions while maintaining or decreasing associated costs. Phase-2 of the study was not successful in supporting the stated hypothesis due to the presence of mixed results. However, the results indicated that additional studies with stricter controls should be conducted to evaluate the overall effect of phase-2 of the intervention.

Food provisions typically distributed by food pantries are intended to provide staple food items which act as a foundation which households can add upon to develop nutritionally complete meals. Food provisions provided by emergency food relief organizations typically do not offer the greatest nutritional value due to their reliance on heavily processed, shelf-stable items that are high in sodium, low in fiber and micronutrient content.⁵ Offering highly nutritious foods in emergency food relief organizations is vital to supporting the health of these at-risk communities which benefit from these emergency relief services. Research reveals that individuals facing food insecurity have greater risks of developing chronic diseases and conditions like type 2 diabetes and cardiovascular disease.⁶ By increasing the overall nutritional value of foods offered at emergency food relief organizations, specifically by reducing the content of added sugar, saturated fat, sodium, while increasing fiber and potassium content have the potential to positively impact risk for developing these nutrition related chronic conditions and diseases. Additional studies are needed to understand the impact that changing the nutritional content of provisions offered by emergency food relief organizations has on health outcomes of the patrons that receive them.

Rationale of Interventions

The changes proposed in phase-1 of the intervention were driven by data collected via surveys completed by food pantry patrons in a previously conducted needs assessment. Additionally, interviews held with various members of the food pantry's board supported the proposed changes. Survey results indicated a desire for patrons to receive additional staple food items like dried rice, dried beans, and dried oats, as well as receiving gift cards to the local market more regularly. The aforementioned staple food items offer good nutritional value, act as the foundation for nutritious meals, and are culturally relevant to the predominately latinx population that utilizes the pantry services. Therefore phase-1 and phase-2 of the intervention focused on increasing the amount of these highly nutritious staple food items, regardless of if they are obtained via food pantry purchasing or community donations. The provision of additional funds on gift cards also aligns with patron desires and would improve their satisfaction. The ability to increase the overall nutrition profile of foods purchase while having additional funds to spend on gift cards for patrons has been proven feasible in this intervention study. (table-5)

The items which were removed from the purchase orders in phase-1 were determined to be non-essential or provided less than ideal nutritional and meal values to the provisions for their cost. For example, \$1,631.28 was spent to purchase vegetable oil for the month of May 2021. A half-gallon of vegetable oil can be purchased for around 6 dollars at a local grocery store and it may last a household approximately 3 months. Instead of the food pantry purchasing this item, the pantry could purchase additional portions beans, which would add more substance and contribute to the creation of more nutritionally complete meals. Strawberry Jelly is another prime example, as this item was the main contributor to the added sugar content in the overall purchase order and the bags of provisions sampled in phase-2. (table-1) The removal of this item allows

for funds to be allocated for the purchase of more nutritionally balanced items like dried rice and oats, while potentially making funds available for additions to gift-cards, which the patron could use to purchase an item more appropriate to their needs. The removal of frozen turkey from the purchase orders was prompted by patrons expressing a lack of desire for this item, as well as the current and continuously increasing costs of meats.

Limitations & Strengths

One key limitation of this study is that the changes proposed in phase-1 of the intervention are highly specific to the CFPSHT because the recommendations are based on their past purchasing practices. The food costs were based on the prices of the inventory available from Driscoll Foods during that specific time of May 2021. However, the strategies implemented to identify and propose changes to purchased provisions can be applied in a variety of settings and contexts outside of the Community Food Pantry of Sleepy Hollow and Tarrytown. These methods and strategies can be implemented in most emergency food relief organizations that purchase food items from commercial food distributors or food banks. Implementing these strategies are more challenging when food stock is generated primarily via donations. By reviewing past purchasing practices, identifying goods which offer limited nutritional value, and presenting highly nutritious alternatives to those identified foods, improvements in overall nutritional value can be attained at similar or reduced prices.

Phase-2 of the intervention was riddled with limitations which contributed to the inconsistencies found within the results. The differences in mean values, whether statistically significant or insignificant, do not correlate directly with the intervention. The publication of the information guide was not completed promptly enough to have a direct effect on the outcomes. Additionally, a food drive had been conducted prior to the April distribution date, resulting in the items from that event being the predominately donated items found in the provisions. Another limitation that must be considered is the inconsistency related to how the bags of food provisions are packed. All bags are not packed with a standardized methodology. There are key items that each bag will contain, including but not limited to 2 pounds of rice, 2 pounds of dried beans, 5 cans of tuna, and 3 cans of tomato sauce. After including those items in the bag the individuals packing the bags will add additional items, most of which have acquired by donations. Additionally, since all post-intervention bags randomly sampled did not contain the same amount of food items which had been purchased by the food pantry, assessing the impact that donated food items had on the overall nutritional values and mean calculations could not be interpreted as a direct correlation. Therefore, this post-intervention neither proves or disproves the stated hypothesis due to the lack of direct correlations and the significant variance between packing methods. Conducting another intervention studies with stricter data gathering and analysis controls may be able to show a more direct correlation between the intervention and the outcomes. One of these controls that should be included is ensuring that only the nutritional values of the donated items in the bags are the assessed during the pre and post-intervention assessments. This would help ensure that changes in nutritional values are related only to donated items and not to items obtained via food pantry purchasing. Additionally, distributing the pamphlets directly to individuals and community organizations may maximize the reach of the intervention, especially since the reach of the pamphlet was not quantified in this study.

Future Application

The Community Food Pantry of Sleepy Hollow is looking forward to resuming the past practice of hosting 2 distribution days versus the single day of distribution held since the beginning of the COVID pandemic. The changes proposed in this intervention (tables 2-5) would allow for each distribution bag on distribution days to hold similar nutritional value while not exacerbating the costs associated with acquiring additional staple food items. In this case, the proposed changes would support the feasibility of hosting additional distribution days with a similar budget while providing the greatly desired and nutritionally favorable staple food items. Additional changes that were not introduced in this study can be implemented to achieve greater improvements in nutritional value and cost effectiveness. These include, but are not limited to, substituting cold cereal options, purchasing different additional varieties of beans, purchasing dried milk instead of boxed milk, and substituting enriched pasta for whole wheat versions.

Providing highly nutritious food provisions while minimizing the overall costs of purchasing and operations is an ideal model for emergency food relief organizations around the nation. Budget constraints are often a major limiting factor which prevents the distribution of provisions with high nutritional value. As the costs of food items continue to rise in lieu of issues with the global supply chain issues and corporate greed, altering food purchasing practices can help food pantries serve highly nutritious staple items in cost effective manners. Additionally, developing and distributing informational pamphlets that encourage community donors to donate staple food items that offer more nutritional value can support the mission of increasing nutritional value in cost-effective manners. Ensuring that these pamphlets are distributed in a timely manner via multiple distribution methods is a way to maximize the impact they may have on the outcome.

Although the tiered models of change and the donation guide implemented during this intervention are specific to the Community Food Pantry, the general methodology and rationale used in this study can be applied in various emergency food relief settings. By identifying items which provide the least nutritional value while contributing substantial costs, food pantries can substitute these identified items with staple food items that offer greater nutritional value. Providing community donors with a list of items that are specific to the needs of the food pantry patrons has the potential to increase the nutritional value of the provisions delivered, although further research is needed to support this.

Conclusion

This interventional study presented a variety of methods which could be adopted by emergency relief organizations to improve the nutritional value of the provisions offered to patrons in economically feasible ways. The results of this study indicated that phase-1 of the intervention, characterized by targeted changes made to purchasing strategies, was successful in achieving the objective. Phase-2 of the intervention, characterized by the development and distribution of a donation guide, presented several limitations which resulted in mixed outcomes indicating that further research must be conducted. The methods utilized during this study can be applied in a wide variety of emergency food relief organizations, that display outcomes which are beneficial for organizational economic sustainability and the nutrient intake of the patrons which they serve. By increasing the nutritional value of the food provisions distributed to patrons of emergency food relief organizations, there is potential to promote beneficial health outcomes the reduction of nutrition related chronic diseases. Further research should be conducted to

evaluate the impacts that increased nutritional value of provisions provided by these organizations have on the health outcomes of the patrons utilizing these services.

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Appendix

Table-1

Nutritional & Cost Analysis of May '21 Purchase Order (Table-1)

Food Item:	Black Beans	Pinto Beans	Corn Flakes Cereal	Toasted O's Cereal	Grape Jelly	2% milk	Dried Oats	Vegetable Oil	Spaghetti	Peanut Butter	Rice	Tomato Sauce	Tuna Chunks (light water)	Ground Turkey	Total
# of orders	30	20	12	15	42	44	15	42	60	42	42	22	55	36	—
Units per order	24 (1lb)	24 (1lb)	12 (18oz)	12 (18oz)	12 (20oz)	12 (32oz)	12 (32oz)	12 (24oz)	20 (1lb)	12 (16.3oz)	12 (2lb)	12 (15oz)	48 (5oz)	12 (1lb)	—
Total Units	720lbs	480lbs	144 (18oz/box)	180 (14oz)	504 (20oz)	528 (32oz)	180 (32oz)	504 (24oz)	1200 lbs	504 (16.3oz)	504 (2lbs)	264 (15oz)	2640 (cans)	432lbs	—
Unit Price(\$)	\$22.97	\$25.69	\$26.98	\$31.77	\$36.58	\$23.25	\$24.32	\$38.84	\$14.48	\$37.73	\$28.09	\$22.65	\$51.46	\$25.68	—
Total Cost (\$)	\$689.10	\$513.80	\$323.76	\$476.55	\$1,536.36	\$1,023.00	\$364.80	\$1,631.28	\$868.80	\$1,584.66	\$1,179.78	\$498.30	\$2,830.30	\$924.48	\$14,444.97
Calories* (kcal)	604,800	576,000	262,368	270,000	705,600	253,440	351,000	2,903,040	1,890,000	1,340,640	1,612,800	27,720	264,000	292,032	11,353,440
Protein* (g)	77,760	46,080	5,515.2	7,200	0	16,896	11,700	0	64,800	49,392	30,240	1,848	58,080	34,214.4	403,725.6
Carbohydrates* (g)	198,720	126,720	62,928	50,400	183,456	25,344	63,180	0	405,000	42,336	362,880	7,392	<2,640	0	1,528,356
Added Sugars* (g)	0	0	0	1,800	127,008	0	0	0	0	14,112	0	0	0	0	142,920
Total Fat* (g)	0	0	259.2	4,500	0	10,560	7,020	338,688	1,800	112,896	0	0	2,640	16,200	494,563.2
Saturated Fat* (g)	0	0	0	900	0	6,336	1,170	46,368	600	21,168	0	0	1,320	4,406.4	82,268.4
Trans Fat* (g)	0	0	0	0	0	0	0	0	0	0	0	0	0	531.4	531.4
Mono-Unsaturated Fat*	0	0	0	1,800	0	0	2,340	84,672	0	0	0	0	0	6,091.2	94,903.2
Poly-Unsaturated Fat*	0	0	0	1,800	0	0	2,340	193,536	0	0	0	0	0	3,931.2	201,607.2
Fiber* (g)	129,600	28,800	2,361.6	7,200	0	0	9,360	0	24,000	14,112	10,080	1,848	0	0	227,361.6
Sodium* (mg)	172,800	28,800	535,392	360,000	70,560	242,880	0	0	329,400	1,058,400	0g	166,320	950,400	182,736	4,097,688
Potassium* (mg)	5,961,600	5,880	123,408	252,000	0	686,400	0	0	0	663,264	403,200	376,992	496,320	456,624	9,425,688
Calcium* (mg)	786,240	230,400	5,616	234,000	0	633,600	60,840	0	0	0	40,320	14,840	68,640	25,488	2,099,984
Iron* (mg)	34,560	10,368	21,254.4	20,520	0	0	4,212	0	0	2,822.4	3,628.8	1,848	2,851.2	2,449.44	104,514.24

Table-2

Tier-1 Changes: Substitute Vegetable Oil w/ Black Beans (Table-2)

Food Item:	Black Beans	Pinto Beans	Corn Flakes Cereal	Toasted O's Cereal	Grape Jelly	2% milk	Dried Oats	Vegetable Oil	Spaghetti	Peanut Butter	Rice	Tomato Sauce	Tuna Chunks (light water)	Ground Turkey	Total	% of Original Purchase Order
# of orders	101	20	12	15	42	44	15	0	60	42	42	22	55	36	—	—
Units per order	24 (1lb)	24 (1lb)	12 (18oz)	12 (18oz)	12 (20oz)	12 (32oz)	12 (32oz)	12 (24oz)	20 (1lb)	12 (16.3oz)	12 (2lb)	12 (15oz)	48 (5oz)	12 (1lb)	—	—
Total Units	2424	480lbs	144 (18oz/box)	180 (14oz)	504 (20oz)	528 (32oz)	180 (32oz)	0	1200 lbs	504 (16.3oz)	504 (2lbs)	264 (15oz)	2640 (cans)	432lbs	—	—
Unit Price(\$)	\$22.97	\$25.69	\$26.98	\$31.77	\$36.58	\$23.25	\$24.32	\$38.84	\$14.48	\$37.73	\$28.09	\$22.65	\$51.46	\$25.68	—	—
Total Cost (\$)	\$2,319.97	\$513.80	\$323.76	\$476.55	\$1,536.36	\$1,023.00	\$364.80	\$0.00	\$868.80	\$1,584.66	\$1,179.78	\$498.30	\$2,830.30	\$924.48	\$14,444.56	< 1%
Calories* (kcal)	2,036,260	576,000	262,368	270,000	705,600	253,440	351,000	0	1,890,000	1,340,640	1,612,800	27,720	264,000	292,032	9,881,860	-13.70%
Protein* (g)	261,792	46,080	5,515.2	7,200	0g	16,896	11,700	0	64,800	49,392	30,240	1,848	58,080	34,214.4	587,757.6	193.50%
Carbohydrates* (g)	669,024	126,720	62,928	50,400	183,456	25,344	63,180	0	405,000	42,336	362,880	7,392	<2,640	0	1,998,660	130.77%
Added Sugars* (g)	0	0	0	1,800	127,008	0g	0g	0	0	14,112	0	0	0	0	142,920	100.00%
Total Fat* (g)	0	0	259.2	4,500	0	10,560	7,020	0	1,800	112,896	0	0	2,640	16,200	155,875.2	31.52%
Saturated Fat* (g)	0	0	0	900	0	6,336	1,170	0	600	21,168	0	0	1,320	4,406.4	35,900.4	43.64%
Trans Fat* (g)	0	0	0	0	0	0	0g	0	0	0	0	0	0	531.4	531.4	100.00%
Mono-Unsaturated Fat*	0	0	0	1,800	0	0	2,340	0	0	0	0	0	0	6,091.2	10,231.2	10.78%
Poly-Unsaturated Fat*	0	0	0	1,800	0	0	2,340	0	0	0	0	0	0	3,931.2	8,071.2	4.00%
Fiber* (g)	436,320	28,800	2,361.6	7,200	0	0	9,360	0	24,000	14,112	10,080	1,848	0	0	534,081.6	234.90%
Sodium* (mg)	581,760	28,800	535,392	360,000	70,560	242,880	0g	0	329,400	1,058,400	0	166,320	950,400	182,736	4,506,648	109.98%
Potassium* (mg)	20,070,720	5,880	123,408	252,000	0	686,400	0g	0	0	663,264	403,200	376,992	496,320	456,624	23,534,808	249.69%
Calcium* (mg)	2,647,008	230,400	5,616	234,000	0	633,600	60,840	0	0	0	40,320	14,840	68,640	25,488	3,960,752	188.61%
Iron* (mg)	116,352	10,368	21,254.4	20,520	0	0	4,212	0	0	2,822.4	3,628.8	1,848	2,851.2	2,449.44	186,306.24	178.26%

Table-3

Tier 2 Changes: Substitute Vegetable Oil w/ Rice & Beans (Table-3)

Food Item:	Black Beans	Pinto Beans	Corn Flakes Cereal	Toasted O's Cereal	Grape Jelly	2% milk	Dried Oats	Vegetable Oil	Spaghetti	Peanut Butter	Rice	Tomato Sauce	Tuna Chunks (light water)	Ground Turkey	Total	% of Original Purchase Order
# of orders	60	20	12	15	42	44	15	0	60	42	72	22	55	36	—	—
Units per order	24 (1lb)	24 (1lb)	12 (18oz)	12 (18oz)	12 (20oz)	12 (32oz)	12 (32oz)	12 (24oz)	20 (1lb)	12 (16.3oz)	12 (2lb)	12 (15oz)	48 (5oz)	12 (1lb)	—	—
Total Units	1440	480lbs	144 (18oz/box)	180 (14oz)	504 (20oz)	528 (32oz)	180 (32oz)	0	1200 lbs	504 (16.3oz)	864 (2lbs)	264 (15oz)	2640 (cans)	432lbs	—	—
Unit Price(\$)	\$22.97	\$25.69	\$26.98	\$31.77	\$36.58	\$23.25	\$24.32	\$38.84	\$14.48	\$37.73	\$28.09	\$22.65	\$51.46	\$25.68	—	—
Total Cost (\$)	\$1,378.20	\$513.80	\$323.76	\$476.55	\$1,536.36	\$1,023.00	\$364.80	\$0.00	\$868.80	\$1,584.66	\$2,022.48	\$498.30	\$2,830.30	\$924.48	\$14,345.49	99.31%
Calories* (kcal)	1,209,600	576,000	262,368	270,000	705,600	253,440	351,000	0	1,890,000	1,340,640	2,764,800	27,720	264,000	292,032	10,207,200	89.90%
Protein* (g)	155,520	46,080	5,515.2	7,200	0	16,896	11,700	0	64,800	49,392	51,840	1,848	58,080	34,214.4	503,085.6	124.61%
Carbohydrates* (g)	397,440	126,720	62,928	50,400	183,456	25,344	63,180	0	405,000	42,336	622,080	7,392	<2,640	0	1,986,276	129.96%
Added Sugars* (g)	0	0	0	1,800	127,008	0	0	0	0	14,112	0	0	0	0	142,920	100.00%
Total Fat* (g)	0	0	259.2	4,500	0	10,560	7,020	0	1,800	112,896	0	0	2,640	16,200	155,875.2	31.52%
Saturated Fat* (g)	0	0	0	900	0	6,336	1,170	0	600	21,168	0	0	1,320	4,406.4	35,900.4	43.64%
Trans Fat* (g)	0	0	0	0	0	0	0	0	0	0	0	0	0	531.4	531.4	100.00%
Mono-Unsaturated Fat*	0	0	0	1,800	0	0	2,340	0	0	0	0	0	0	6,091.2	10,231.2	10.78%
Poly-Unsaturated Fat*	0	0	0	1,800	0	0	2,340	0	0	0	0	0	0	3,931.2	8,071.2	4.00%
Fiber* (g)	259,200	28,800	2,361.6	7,200	0	0	9,360	0	24,000	14,112	17,280	1,848	0	0	364,161.6	160.17%
Sodium* (mg)	345,600	28,800	535,392	360,000	70,560	242,880	0	0	329,400	1,058,400	0	166,320	950,400	182,736	4,270,488	104.22%
Potassium* (mg)	11,923,200	5,880	123,408	252,000	0	686,400	0	0	0	663,264	691,200	376,992	496,320	456,624	15,675,288	166.30%
Calcium* (mg)	1,572,480	230,400	5,616	234,000	0	633,600	60,840	0	0	0	69,120	14,840	68,640	25,488	2,915,024	138.81%
Iron* (mg)	69,120	10,368	21,254.4	20,520	0	0	4,212	0	0	2,822.4	6,221	1,848	2,851.2	2,449.44	141,666.44	135.55%

Table-4

Tier 3 Changes: Remove Jelly, Vegetable Oil, Ground turkey - Replace w/ beans + rice + Dried Oats (Table-4)

Food Item:	Black Beans	Pinto Beans	Corn Flakes Cereal	Toasted O's Cereal	Grape Jelly	2% milk	Dried Oats	Vegetable Oil	Spaghetti	Peanut Butter	Rice	Tomato Sauce	Tuna Chunks (light water)	Ground Turkey	Total	% of Original Purchase Order
# of orders	60	20	12	15	0	44	107	0	60	42	77	22	55	0	—	—
Units per order	24 (1lb)	24 (1lb)	12 (18oz)	12 (18oz)	12 (20oz)	12 (32oz)	12 (32oz)	12 (24oz)	20 (1lb)	12 (16.3oz)	12 (2lb)	12 (15oz)	48 (5oz)	12 (1lb)	—	—
Total Units	1440	480lbs	144 (18oz/box)	180 (14oz)	0	528 (32oz)	1,284 (32oz)	0	1200 lbs	504 (16.3oz)	924 (2lbs)	264 (15oz)	2640 (cans)	0	—	—
Unit Price(\$)	\$22.97	\$25.69	\$26.98	\$31.77	\$36.58	\$23.25	\$24.32	\$38.84	\$14.48	\$37.73	\$28.09	\$22.65	\$51.46	\$25.68	—	—
Total Cost (\$)	\$1,378.20	\$513.80	\$323.76	\$476.55	\$0.00	\$1,023.00	\$2,602.24	\$0.00	\$868.80	\$1,584.66	\$2,162.93	\$498.30	\$2,830.30	\$0.00	\$14,262.54	98.74%
Calories* (kcal)	1,209,600	576,000	262,368	270,000	0	253,440	2,503,800	0	1,890,000	1,340,640	2,956,800	27,720	264,000	0	11,554,368	101.77%
Protein* (g)	155,520	46,080	5,515.2	7,200	0	16,896	83,460	0	64,800	49,392	55,440	1,848	58,080	0	544,231.2	134.80%
Carbohydrates* (g)	397,440	126,720	62,928	50,400	0	25,344	450,684	0	405,000	42,336	665,280	7,392	<2,640	0	2,233,524	146.14%
Added Sugars* (g)	0	0	0	1,800	0	0	0	0	0	14,112	0	0	0	0	15,912	11.13%
Total Fat* (g)	0	0	259.2	4,500	0	10,560	50,076	0	1,800	112,896	0	0	2,640	0	182,731.2	36.95%
Saturated Fat* (g)	0	0	0	900	0	6,336	8,346	0	600	21,168	0	0	1,320	0	38,670	47.00%
Trans Fat* (g)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00%
Mono-Unsaturated Fat*	0	0	0	1,800	0	0	16,692	0	0	0	0	0	0	0	16,492	19.49%
Poly-Unsaturated Fat*	0	0	0	1,800	0	0	16,692	0	0	0	0	0	0	0	18,492	9.17%
Fiber* (g)	259,200	28,800	2,361.6	7,200	0	0	66,768	0	24,000	14,112	18,480	1,848	0	0	422,769.6	185.95%
Sodium* (mg)	345,600	28,800	535,392	360,000	0	242,880	0	0	329,400	1,058,400	0	166,320	950,400	0	4,017,192	98.04%
Potassium* (mg)	11,923,200	5,880	123,408	252,000	0	686,400	0	0	0	663,264	739,200	376,992	496,320	0	15,266,664	161.97%
Calcium* (mg)	1,572,480	230,400	5,616	234,000	0	633,600	433,992	0	0	0	73,920	14,840	68,640	0	3,267,488	155.60%
Iron* (mg)	69,120	10,368	21,254.4	20,520	0	0	30,046	0	0	2,822.4	6,653	1,848	2,851.2	0	165,483	158.34%

Table-5

Tier 4 Changes: Remove Jelly, Vegetable Oil, Ground turkey - Replace w/ beans + rice + \$2250 extra funds (Table-5)

Food Item:	Black Beans	Pinto Beans	Corn Flakes Cereal	Toasted O's Cereal	Grape Jelly	2% milk	Dried Oats	Vegetable Oil	Spaghetti	Peanut Butter	Rice	Tomato Sauce	Tuna Chunks (light water)	Ground Turkey	Total	% of Original Purchase Order
# of orders	60	20	12	15	0	44	15	0	60	42	77	22	55	0	—	—
Units per order	24 (1lb)	24 (1lb)	12 (18oz)	12 (18oz)	12 (20oz)	12 (32oz)	12 (32oz)	12 (24oz)	20 (1lb)	12 (16.3oz)	12 (2lb)	12 (15oz)	48 (5oz)	12 (1lb)	—	—
Total Units	1440	480lbs	144 (18oz/box)	180 (14oz)	0	528 (32oz)	180 (32oz)	0	1200 lbs	504 (16.3oz)	924 (2lbs)	264 (15oz)	2640 (cans)	0	—	—
Unit Price(\$)	\$22.97	\$25.69	\$26.98	\$31.77	\$36.58	\$23.25	\$24.32	\$38.84	\$14.48	\$37.73	\$28.09	\$22.65	\$51.46	\$25.68	—	—
Total Cost (\$)	\$1,378.20	\$513.80	\$323.76	\$476.55	\$0.00	\$1,023.00	\$364.80	\$0.00	\$868.80	\$1,584.66	\$2,162.93	\$498.30	\$2,830.30	\$0.00	\$12,025.10	—
Calories* (kcal)	1,209,600	576,000	262,368	270,000	0	253,440	351,000	0	1,890,000	1,340,640	2,956,800	27,720	264,000	0	9,401,568	82.81%
Protein* (g)	155,520	46,080	5,515.2	7,200	0	16,896	11,700	0	64,800	49,392	55,440	1,848	58,080	0	472,471.2	117.03%
Carbohydrates* (g)	397,440	126,720	62,928	50,400	0	25,344	63,180	0	405,000	42,336	665,280	7,392	<2,640	0	1,846,020	120.78%
Added Sugars* (g)	0	0	0	1,800	0	0	0	0	0	14,112	0	0	0	0	15,912	11.13%
Total Fat* (g)	0	0	259.2	4,500	0	10,560	7,020	0	1,800	112,896	0	0	2,640	0	139,675.2	28.24%
Saturated Fat* (g)	0	0	0	900	0	6,336	1,170	0	600	21,168	0	0	1,320	0	31,494	38.28%
Trans Fat* (g)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00%
Mono-Unsaturated Fat*	0	0	0	1,800	0	0	2,340	0	0	0	0	0	0	0	4,140	4.36%
Poly-Unsaturated Fat*	0	0	0	1,800	0	0	2,340	0	0	0	0	0	0	0	4,140	2.05%
Fiber* (g)	259,200	28,800	2,361.6	7,200	0	0	9,360	0	24,000	14,112	18,480	1,848	0	0	365,361.6	160.70%
Sodium* (mg)	345,600	28,800	535,392	360,000	0	242,880	0	0	329,400	1,058,400	0g	166,320	950,400	0	4,017,192	98.04%
Potassium* (mg)	11,923,200	5,880	123,408	252,000	0	686,400	0	0	0	663,264	739,200	376,992	496,320	0	15,266,664	161.97%
Calcium* (mg)	1,572,480	230,400	5,616	234,000	0	633,600	60,840	0	0	0	73,920	14,840	68,640	0	2,894,336	137.83%
Iron* (mg)	69,120	10,368	21,254.4	20,520	0	0	4,212	0	0	2,822.4	6,653	1,848	2,851.2	0	139,649	133.62%

Table-6

Pre-intervention Nutritional Analysis of Pantry Provisions (Table-6)

Bag #	Total Calories (kcal)	Carbohydrates (g)	Protein (g)	Total Fat (g)	Saturated Fat (g)	Added Sugar (g)	Fiber (g)	Sodium (mg)	Potassium (mg)	Calcium (mg)	Iron (mg)
Bag #1	22,745	3,067	657	982	169	394	310	7,211	27,527	5,488	192
Bag #2	23,685	3,130	861	990	173	368	703	5,632	34,579	5,631	261
Bag #3	30,950	5,101	1,093	948	166	550	892	4,820	47,434	7,468	334
Bag #4	22,010	3,021	705	1,000	173	1,334	508	5,800	38,354	6,896	306
Bag #5	23,089	3,395	975	981	180	725	511	10,801	24,196	6,972	285
Totals	122,479	17,714	4,291	4,901	861	3,371	2,924	34,264	172,090	32,455	1,378

Table-7

Post-intervention Nutritional Analysis of Pantry Provisions (table-7)

Bag #	Total Calories (kcal)	Carbohydrates (g)	Protein (g)	Total Fat (g)	Saturated Fat (g)	Added Sugar (g)	Fiber (g)	Sodium (mg)	Potassium (mg)	Calcium (mg)	Iron (mg)
Bag #1	23,755	3,397	755	970	159	52	449	10,933	27,571	3,746	256
Bag #2	23,315	3,283	775	1,000	164	0	433	8,963	27,771	5,906	1,947
Bag #3	21,935	3,007	729	970	159	0	436	8,203	27,311	3,746	509
Bag #4	26,195	4,031	996	1,042	170	66	795	11,478	45,111	7,766	2,042
Bag #5	23,515	3,331	765	1,000	164	276	423	14,043	26,211	5,946	1,769
Totals	118,715	17,049	4,020	4,982	816	394	2,536	53,620	153,975	27,110	6,523

Donation Guide (figure-1)



Donations are Needed

Donations help us provide nutritious foods to community members in need !

Please consider donating the following items
which offer great nutritional value for a low cost !

Rice



Dried Beans



Dried Peas



Dried Lentils



Pasta (all shapes)



Peanut Butter



Canned Tuna/Sardines



Please Do Not Donate

Items Needing Refrigeration or Freezing

Pre-Prepared Meals

Baby Food / Formula

Juices & Sodas

Opened and expired items

Pet Food

Holiday Items

(Christmas, Easter, Passover, etc.)

Consider making a tax-deductible donation via PayPal



Statistical Analysis of Phase-2 Intervention (figure-2)

			Test Statistics ^a						
			Saturated Fat (g)	Added Sugar (g)	Fiber (g)	Sodium (mg)	Potassium (mg)	Calcium (mg)	Iron (mg)
Mann-Whitney U			2.000	.000	8.000	2.000	10.000	9.000	4.000
Wilcoxon W			17.000	15.000	23.000	17.000	25.000	24.000	19.000
Z			-2.214	-2.619	-.940	-2.193	-.522	-.733	-1.776
Asymp. Sig. (2-tailed)			.027	.009	.347	.028	.602	.463	.076
Exact Sig. [2*(1-tailed Sig.)]			.032 ^b	.008 ^b	.421 ^b	.032 ^b	.690 ^b	.548 ^b	.095 ^b
Monte Carlo Sig. (2-tailed)	Sig.		.024 ^c	.008 ^c	.419 ^c	.033 ^c	.693 ^c	.507 ^c	.096 ^c
	95% Confidence Interval	Lower Bound	.021	.006	.410	.029	.684	.498	.090
		Upper Bound	.027	.010	.429	.036	.702	.517	.102
Monte Carlo Sig. (1-tailed)	Sig.		.012 ^c	.003 ^c	.209 ^c	.015 ^c	.351 ^c	.258 ^c	.048 ^c
	95% Confidence Interval	Lower Bound	.010	.002	.201	.013	.341	.249	.044
		Upper Bound	.014	.004	.217	.018	.360	.266	.052

a. Grouping Variable: Group

b. Not corrected for ties.

c. Based on 10000 sampled tables with starting seed 2000000.

Nutritional Content of Provision Bags (figure-3)

