

Supporting Wellness at Pantries: Development of a Nutrition Stoplight System for Food Banks and Food Pantries

THE FOOD BANKING NETWORK, composed of food banks that warehouse food and food pantries that distribute food, is a critical source of groceries for more than 42 million Americans living in households with food insecurity each year.¹ The majority of food banks are members of Feeding America, the nation's largest antihunger organization. Feeding America brokers relationships with the food industry and other producers who provide surplus food to its 200 local food banks. These regional food banks then distribute food to 60,000 local food pantries and meal programs such as community kitchens.² Food pantries are the community-facing organizations that provide free food to people in need.

Although this network is often called the emergency food system, recent national data show that 63% of households who visit food pantries acquire food through the charitable food system on a regular basis to help with their monthly food budget.³ Several studies have found that people who visit food pantries experience a double burden of food insecurity and chronic diseases⁴⁻⁶; and recent data indicate that more than half of food pantry clients have a household member with hypertension, and one-third have a member with diabetes.³ Despite the

strong link between food insecurity and chronic diseases, the emphasis of many food banks and food pantries is on quantity of pounds distributed, rather than quality of food. A way to rank foods nutritionally for food pantry audiences does not currently exist but is needed. The aim of this article is to describe the development of Supporting Wellness at Pantries (SWAP), a system for ranking foods in food banks and food pantries by specific nutrition criteria, and the pilot-testing of SWAP in six food pantries.

Food pantries have significant potential to promote better nutrition for the communities they serve.^{7,8} To date, a couple of different strategies have been empirically tested in this setting. One strategy is to prescribe food selections for clients based on health profiles. An example is a pilot study conducted by Seligman and colleagues⁹ that provided food pantry clients with type 2 diabetes a special box of "diabetes-friendly" foods, blood sugar monitoring, and self-management support. The findings were promising and suggest that this intervention led to significant improvements in the clients' dietary quality and ability to manage their blood sugar. Other strategies in food pantries have shown that a client choice food pantry offering nutrition education increased diet quality,¹⁰ and a Cooking Matters program improved cooking skills.¹¹

Although the research to date has employed approaches implemented by investigators to influence client diets, a sustainable system depends on the ability of food pantry staff and volunteers to make judgments about the nutritional quality of specific food items so they can identify items that are appropriate to promote and be able to implement on their own. To the authors' knowledge, there are no systems designed specifically for food pantries to educate staff on how to determine

the nutritional quality of foods. The project aim was to create a system that would work in food pantry settings.

There are a number of challenges in creating a nutrition rating system for use in food pantries. First, pantries are typically run primarily by volunteers who have not necessarily had training in nutrition. Therefore, simply encouraging staff to offer nutritious food or food low in salt or sugar is not likely to be concrete enough for reliable implementation. At the same time, the system cannot be too complicated. Scientists have created algorithms that score foods on a scale (eg, from 1 to 100) based on a range of positive and negative nutrients (eg, the NuVal/Overall Nutritional Quality Index system¹² or the Nutrient Profiling model in the United Kingdom¹³). These systems are not feasible to implement in a food pantry because they require access to a computer to calculate the scores. A third challenge is that pantries do not have access to a wide range of food products; they rely on what is available from their regional food bank and local donors. Because of this, pantry staff may believe they have limited capacity to change what is stocked on the shelves. Therefore, the system must set reasonable standards for the types of foods that are available so staff members do not feel like everything they stock is in the "unhealthy" category.

SWAP uses an intuitive stoplight symbol with simple messaging while incorporating the most current nutrition guidelines and recommendations. SWAP was designed to be transparent by clearly indicating why a food falls into the Green, Yellow, or Red category. SWAP was also designed to be simple by categorizing foods based on only three nutrients: saturated fat, sodium, and sugar. These were chosen because they are most associated with chronic disease risk.

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The goal of the SWAP system is to improve the supply of healthier foods and increase demand for those products in food pantry settings. When volunteers are able to clearly identify the healthier options within each category of products they provide, they can bolster supply of the healthier food by intentionally choosing healthier versions from the food bank or soliciting them from local donors. SWAP can also help clients identify and choose healthier items when they shop, increasing their demand for these items.

As part of the development of SWAP, the research team recruited six food pantries in Connecticut to help design and pilot-test the new system. The pantries were all designed as client choice where clients are able to select the foods they desire. The team conducted focus groups with staff and volunteers from each of the six food pantries to gather feedback on their perceived barriers and challenges with promoting healthy food, and their perceptions of a nutrition ranking system such as a stoplight (results forthcoming). Feedback from the focus groups informed the messaging and also the practical timing of when to train volunteers and help redesign the pantries.

EXISTING NUTRITION RANKING SYSTEMS

SWAP was developed after reviewing a range of other nutrition ranking systems. The first was Feeding America's Detailed Foods to Encourage (F2E), which was developed by an expert panel and released during July 2015.¹⁴ This system sets nutrition criteria for the healthiest varieties of foods within four categories: fruits and vegetables, grains, protein, and dairy. A limitation of this system is that it is binary; that is, foods are either healthy or not. It was important for food pantry staff to have at least two levels of foods to encourage because it was unlikely that the majority of the products in the pantry would meet the healthiest level. Therefore, SWAP was developed as a three-tiered system. Another disadvantage to F2E is that it excludes several food categories that are common in food banks, including meals.

The idea of a stoplight has been used in a variety of settings, such as the Go, Slow, Whoa categories provided by the

National Heart, Lung, and Blood Institute.¹⁵ A stoplight was chosen for SWAP because it is an intuitive symbol that does not need text or numbers to understand. This is important for a system that will be used by people who speak different languages and may have limited literacy and numeracy skills.

Choose Healthy Options Program (CHOP) is based upon the Nutrient Rich Foods system and was created by the Greater Pittsburgh Community Food Bank.¹⁶ This ranking system has been implemented in multiple food banks nationally, and has had implementation support from Mazon, a national antihunger organization.¹⁷ The NRF system identifies nine nutrients to encourage and three nutrients to limit, and uses an algorithm to score 100 g of a food. The results are categorized in the CHOP system into three levels of scores: 1 (choose frequently), 2 (choose occasionally), and 3 (choose rarely). A limitation of the CHOP system for the food pantry setting is that it is necessary to enter nine nutrients into an Excel spreadsheet (Microsoft Corp) to score each food. Although food banks may have the personnel and computer resources to do this successfully, food pantries often do not. SWAP's aim was to devise a system that could be implemented without a computer. Other disadvantages of CHOP are that the system is proprietary to the food bank so it is not possible to determine why a food is ranked a 1, 2, or 3, and the CHOP system places an emphasis on fortified food.

DEVELOPING THE SWAP SYSTEM

The first step in developing SWAP was identifying food categories that would be intuitive to food pantry staff and capture the majority of foods found in a pantry setting. The food categories were also determined based on the authors' years of familiarity and experience in the food pantry setting. Whereas F2E contains 25 food categories, the authors consolidated foods into 11 categories to be more user-friendly for food pantry volunteers. Nutrition guidelines were developed for each of the different food categories (eg, grains, vegetables, and fruit) so foods within the same category are compared with one another. SWAP provides detailed guidelines for 11 food groups with specific ranges of

saturated fat, sodium, and sugar for the Green (choose often), Yellow (choose sometimes), or Red (choose rarely) classifications. The SWAP food groups are fruits, vegetables, grains, dairy, cheese, combination foods (eg, soups or macaroni and cheese), animal protein, plant-based protein, snacks/desserts, condiments, and beverages. It is important to note that the overall ranking is based on the worst ranking. For example, if a food falls into the Green category for saturated fat and sodium, but Yellow category for sugar, the food is ranked Yellow (see Table 1 for food groups and nutrient levels).

As noted in Table 2, the 2015-2020 Dietary Guidelines for Americans recommendations for saturated fat, sugar, and salt were used to anchor the limits for each nutrient.¹⁸ Then, MyPlate Daily Checklist¹⁹ was used to determine nutrient levels based on serving size recommendations for each food group, and match the serving sizes on the Nutrition Facts label. The calculations in Table 2 were used as benchmarks to determine the nutrient ranges for Green, Yellow, and Red ratings within each food category. Whereas the Dietary Guidelines recommend <10% of daily calories come from added sugar, at the time SWAP was developed, the Nutrition Facts label on most foods did not differentiate between added and naturally occurring sugar. The SWAP guidelines were for total sugar, not just added sugar, but attention was given to foods that would have added sugar. Once the new added sugar regulations are in effect for all nutrition labels, the SWAP system will be revised for nutrition guidelines specific to added sugar. These tasks were completed by the research team, which included a registered dietitian nutritionist.

The guidelines were field-tested with more than 500 actual food labels, including many food items from local food pantries. The objective of the field-testing was to measure face validity; that is, whether the system appears to measure what it is intended to measure. When there was an inconsistency between federal labeling standards and the SWAP cut-off values, adjustments were made. For example, the sodium content for canned vegetables to be ranked Green was originally set at 125 mg, but national standards allow for cans with up to 140 mg sodium to be labeled as "low

Table 1. Comparisons between Supporting Wellness at Pantries (SWAP) and Feeding America's detailed Foods to Encourage (F2E) and Capital Area Food Bank (CAFB) Wellness Foods

Food group	Nutrients to limit	SWAP			F2E Food to encourage	CAFB Wellness Tracker Wellness Food
		Green	Yellow	Red		
Fruits	Saturated fat (g)	≤1	≤1	≥1.5	≤2	
	Sodium (mg)	≤32	≤50	≥51	≤230	
	Sugar (g)	≤12	≤25	≥26	≤12	≤15
Vegetables	Saturated fat (g)	≤1	≤1	≥1.5	≤2	
	Sodium (mg)	≤140	≤230	≥231	≤230	≤140
	Sugar (g)	≤4	≤7	≥8	≤12	
Grains	Saturated fat (g)	≤2	≤2	≥2.5	≤2	Whole grain first ingredient
	Sodium (mg)	≤230	≤400	≥401	≤230	
	Sugar (g)	≤6	≤12	≥13	≤0	
Cereal	Saturated fat (g)	≤2	≤2	≥2.5	≤2	
	Sodium (mg)	≤230	≤400	≥401	≤230	
	Sugar (g)	≤6	≤12	≥13	≤12	≤7
Animal protein	Saturated fat (g)	≤2	≤5	≥5.5	≤2	
	Sodium (mg)	≤200	≤480	≥481	≤480	≤250
	Sugar (g)	≤0	≤1	≥2		
Plant protein	Saturated fat (g)	≤2	≤5	≥5.5	≤2	
	Sodium (mg)	≤200	≤480	≥481	≤480; ≤230 for nut spreads	≤140
	Sugar (g)	≤5	≤9	≥10	Nut spreads <4	Peanut butter is Wellness Food
Dairy	Saturated fat (g)	≤1.5	≤3	≥3.5	≤3	All are Wellness Foods
	Sodium (mg)	≤180	≤200	≥201	≤480	
	Sugar (g)	≤12	≤22	≥23	≤22 Milk ≤30 Yogurt	
Cheese	Saturated fat (g)	≤3	≤6	≥6.5	≤3	All are Wellness Foods
	Sodium (mg)	≤200	≤400	≥401	≤480	
	Sugar (g)	≤1	≤2	≥3		
Meals/combo foods	Saturated fat (g)	≤3	≤6.5	≥7	No criteria	
	Sodium (mg)	≤480 m	≤600	≥601		≤450
	Sugar (g)	≤7	≤10	≥11		
Snacks/dessert	Saturated fat (g)	≤2	≤2	≥2.5	No criteria	No desserts are Wellness Foods
	Sodium (mg)	≤230	≤400	≥401		
	Sugar (g)	≤6	≤12	≥13		≤12 For snacks
Beverages	Saturated fat (g)	≤0	≤0	≥0	No criteria	None are wellness
	Sodium (mg)	≤0	≤160	≥161		
	Sugar (g)	≤0	≤11	≥12		
Condiments	Saturated fat (g)	≤0	≤0.5	≥1	No criteria	
	Sodium (mg)	≤250	≤350	≥351		≤150 mg
	Sugar (g)	≤2	≤7	≥8		

sodium" and this higher amount is now used. An exception was made for 100% fruit juice to be automatically ranked as Yellow. At this time, the role of 100% juice in the diet is somewhat controversial. Although 100% juice does not have any added sugar, it has been

singled out by the Dietary Guidelines and American Academy of Pediatricians as a food to limit due to its caloric density.²⁰⁻²² Ranking 100% juice as Yellow acknowledges the nutrients that are present in juice, yet does not put it in the same category as whole

fruit, which is a superior source of those nutrients.

To implement SWAP in a pantry, visual materials were developed in both English and Spanish that include shelf tags, user-friendly nutrition ranking charts, and stoplight posters.

Table 2. Calculations to determine Green standard for Supporting Wellness at Pantries guidelines

Nutrient to limit	2015 Dietary Guidelines for Americans Recommendation	Based on 2,000-kcal diet	Convert calories by grams or milligrams	Divide by 3 meals and 1 snack per day
Saturated fat	<10% of kcal	200 kcal	9 kcal/g fat=22 g/d	5 g per meal or snack
Sodium	<2,300 mg/d	Not applicable	Not applicable	<575 mg/meal or snack
Sugar	<10% of kcal from added sugar	200 kcal	4 kcal/g sugar=50 g added sugar/day	12.5 g/meal or snack

These visuals are designed to be used by both clients and volunteers. The research team provided hands-on training for volunteers and staff in the six pantries about the SWAP system and how to rank foods using SWAP, and worked closely with the food pantries to implement the system. The team worked with staff and volunteers to help design the pantry with nudges so that Green category items were on prominent shelves at eye level, and Red category items were less prominent. Adjustments were made on an ongoing basis to ensure the system was working as needed at each pantry.

A large SWAP nutrition ranking guide was placed on the wall near where items are sorted and shelved so volunteers can quickly reference nutrition cut points and categorize food by color on the appropriate shelf. To determine the color rank, volunteers simply identify the food group, read the Nutrition Facts label for saturated fat, sodium, and sugar and refer to the SWAP guide to see in which color category the amounts fall (see [Table 1](#)). The shelf tags help direct clients to healthier food options within each category. In addition to the color, there is a corresponding message. For example, a green spotlight symbol with the corresponding message, “Low in salt” can be placed near low-sodium canned vegetables.

COMPARISONS BETWEEN SWAP AND OTHER RELEVANT SYSTEMS

[Table 1](#) presents data comparing SWAP guidelines with F2E. F2E does not have criteria for some of the food groups included in SWAP (eg, soups and meals and beverages), and combines fruits and vegetables into one food group. Several nutrition criteria that are designated as F2E are ranked Yellow in

SWAP. For example, levels for sodium in canned vegetables, sugar in cereal, sodium in protein items, and saturated fat in dairy all match the Yellow category criteria for these items using SWAP, whereas SWAP uses stricter limits to be designated as Green (see [Table 1](#)).

During the same time frame when SWAP was being developed, the Capital Area Food Bank (CAFB) in Washington, DC, developed a Wellness Tracker System in 2014.²³ This initiative was part of the food bank’s strategic plan, and the food bank developed a tracking system to determine “Wellness Foods” based on salt, sugar, and fiber content. The food bank identifies Wellness Foods in their online database, and provides incentives for member agencies to increase the amount of Wellness Foods they order. The main differences between SWAP and the Wellness Tracker is that the Tracker is used to make decisions on procurement of food by the food bank. Thus, the Tracker is an either/or (Wellness or not Wellness) system for deciding which foods to procure. Also, the Tracker only ranks one attribute (sodium, sugar, or fiber) per food group, whereas SWAP uses three nutrients for each food group, but does not include fiber.

As noted in [Table 1](#), the Wellness Tracker does not include saturated fat, which is among the nutrients included in SWAP. Further, SWAP has stricter sugar limits for several items (eg, canned fruit, cereal, and snacks), whereas the CAFB system has stricter sodium limits for several items (eg, plant-based protein, combination foods, and condiments).

To make comparisons between SWAP and the CHOP system, it is necessary to enter the nine nutrients used by CHOP into a CHOP database that has an algorithm to rank foods. The CHOP system does not provide a

table of their nutrient levels that can be compared with SWAP.

To empirically examine how SWAP guidelines compare with CHOP and the CAFB Wellness Tracker System, all three systems were used to rank a sample of 128 actual food items obtained from local food pantries. A convenience sample of 128 food items was selected, using foods found frequently in the sampled food pantries, making sure to have several items in each food group. Foods were selected until the project reached saturation, creating a good representation of typical foods in food pantries.

Among the food items, 68 (53%) ranked the same using SWAP and CHOP, 36% were one level different, and 11% were two levels different (eg, Green vs Red). The congruency between the two systems is low. Of those that ranked differently ($n=60$), SWAP ranked healthier than CHOP (either Green or Yellow vs a 3 from CHOP) for more than half of items (57%). The differences in the SWAP vs CHOP food classifications can be explained by the nature of the two ranking systems. SWAP focuses just on three nutrients to limit, whereas CHOP bases rankings on nutrient density as well as nutrients to limit. Therefore, the foods ranked healthier by SWAP are foods that are less nutrient dense but have lower salt, sodium, or saturated fat, whereas the foods ranked healthier by CHOP are nutrient dense but have higher levels of at least one of these three nutrients. For example, SWAP ranks all low-sodium and low-sugar canned vegetables Green, whereas CHOP ranks low nutrient dense vegetables such as corn and potatoes Red, regardless of sodium content.

When comparing SWAP to the CAFB Wellness Tracker using the same 128 food items, the two systems were in alignment for 83% of food items. Of

those that ranked differently ($n=16$), SWAP ranked healthier than CAFB for two items that were meals because SWAP has a slightly higher sodium cut-off. CAFB ranked 14 foods as Wellness Foods, which were either Yellow or Red for SWAP. Six fruits and vegetables with high sugar content ranked Yellow for SWAP but were considered Wellness Foods for CAFB. Three cereals that were low in sugar but did not have whole grain as the first ingredient ranked Yellow for SWAP but were considered Wellness Foods for CAFB. Three dairy items were considered wellness foods for CAFB but yellow or red for SWAP due to saturated fat or sugar. Peanut butter is considered a wellness food for CAFB but typically ranks yellow in SWAP due to saturated fat.

The SWAP guidelines were also compared with those set by the American Heart Association (AHA) and American Diabetes Association (ADA), presented in Table 3. The AHA Heart Check program is designed to help

consumers make informed choices about the foods they purchase, and are based on scientific findings of the AHA.²⁴ When compared with the AHA Heart Check program, the SWAP Green Guidelines meet some but not all of the AHA requirements. In general, the AHA saturated fat guidelines are stricter than SWAP and the SWAP saturated fat guidelines for grains, dairy, plant proteins, combination foods, and snacks exceed the AHA requirements. Furthermore, the AHA sodium guidelines are based on individual food items rather than food groups, so some foods within the SWAP Green food groups do not meet AHA guidelines, whereas other foods in the same group do meet the guidelines. The SWAP Green Food Guidelines meet all of the AHA sugar guidelines. The following SWAP food groups can be labeled “heart healthy” according to the AHA recommendations: All Green and Yellow fruits and vegetables, nonfat milk and yogurt, all Green animal protein,

and Green canned and dried beans and legumes.

It is the position of the ADA that there is not a one-size-fits-all eating pattern for individuals with diabetes. The ADA does not provide specific nutrient recommendations for diabetes treatment but published general nutrition therapy recommendations in their 2016 Position Statement and Standards of Care.²⁵ The SWAP Green Guidelines are all consistent with the ADA's recommendations for nutrition therapy for people with diabetes. Therefore, it is appropriate to claim that all SWAP Green foods are “diabetes friendly” and meet the ADA guidelines.

STAKEHOLDER FEEDBACK

The SWAP system has been pilot-tested in six food pantries. After approximately 2 months of the system being in place, brief surveys were administered to staff and volunteers ($N=54$) to measure their perceptions of the system. Overall, the reaction to the new SWAP system was very positive. More than two-thirds of respondents said they like the system (70%) and it has been easy to use (68%). The majority of pantry staff and volunteers said that SWAP is helping staff order healthier food from the food bank (69%), from other sources (72%), and requesting healthier food from donors (60%). This was not considered human subjects research because it was program improvement.

Based on the survey results, informal conversations were held with staff and volunteers to find creative and practical ways to improve the system. For example, the system originally used laminated flip cards with the nutrition guide for each food group. Staff and volunteers said that it was cumbersome to flip through the cards to rank foods. Large posters were created in response, with a Nutrition Guide for each food group and nutrition values for Green, Yellow, and Red categories to make it easier to rank foods. Also, in two large pantries, a streamlined process for using the system was discussed. One suggestion was to designate a location for food before it is ranked, separating into food groups, then ranking by color. The system was also adjusted using color-coded labels on boxes of food so that volunteers could more easily designate food by

Table 3. Comparisons between Supporting Wellness at Pantries (SWAP) Green category and American Heart Association (AHA) and American Diabetes Association (ADA) recommendations

SWAP food group	AHA Heart Check Requirements ^a	ADA ^a
Fruits	✓	✓
Vegetables	✓	✓
Grains	Meets sugar requirements; meets sodium requirement for most grains but not plain grains (≤ 140 mg vs ≤ 230 mg); AHA stricter for saturated fat requirement (≤ 1 g vs ≤ 2 g)	✓
Dairy	Meets sugar and sodium requirement; AHA stricter for saturated fat requirements (≤ 1 g vs ≤ 1.5 g) and (≤ 3 g for cheese)	✓
Animal protein	✓	✓
Plant-based protein	Meets sodium requirements for canned products but not for dry beans, tofu, or nuts (≤ 140 mg vs ≤ 200 mg); AHA stricter with saturated fat limits (≤ 1 g vs ≤ 2 g)	✓
Combination foods	Meets sodium requirements; AHA stricter for saturated fat requirements (≤ 1 g vs ≤ 3 g)	✓
Condiments	Meets saturated fat requirements; AHA stricter for sodium limits (≤ 140 mg vs ≤ 250)	✓
Beverages	✓	✓
Snacks/desserts	Meets sodium and sugar requirements; AHA stricter for saturated fat limits (≤ 1 g vs ≤ 2 g)	✓

^a✓=SWAP Green category guidelines meet recommendations.

the SWAP rankings before it is placed on shelves to help with organization.

IMPLICATIONS

The SWAP system is designed to be simple, yet sophisticated. When food pantries use the SWAP system, they obtain a clear snapshot of their inventory and can see the percentages of their foods that fall into the Green, Yellow, and Red rankings. There are often barriers for procuring healthy food within the charitable food system, including availability of healthy food from the food bank or food industry, and resources to purchase or transport healthier food items. Pantry staff can use the SWAP information to set goals for procuring foods that are healthier within each food category. Further, they can work with donors to encourage more food items that are yellow or green by requesting foods with less saturated fat, sodium, and added sugar.

Based on lessons learned from this pilot project to test for feasibility of using SWAP in a pantry setting, the research team is creating a training manual and videos to help train the trainer to help with scalability of SWAP in additional food pantries.

Our pilot project yielded several lessons about which types of pantries would be good candidates for using the SWAP system. Most importantly, it is critical that the food pantry director be committed to the mission of providing healthy food, rather than emphasizing quantity of food. A committed director then can help ensure that staff and volunteers understand how the SWAP system fits with the mission. It is helpful when the pantry receives the majority of its food from a local food bank because then they have consistent foods and will be familiar with their rankings. It is also helpful when the pantry has a steady and reliable group of volunteers who can be trained with SWAP and understand their role with ranking foods when they help shelve the food.

Resources and materials are available to help food banks develop nutrition policies and procure healthier food.²⁶ Comparable tools are needed at the food pantry level. The materials developed will help food pantry staff communicate to their clients and donors about SWAP and the importance

of nutritional quality. One of these tools is a Healthy Food Donation list to help encourage more Green and Yellow items during food drives and from retail donors. Educational shelf tags and posters are used to nudge clients to choose healthier items. Future research is needed to test the best way to implement the SWAP system in food pantries, and to measure its influence in terms of inventory shifts and item selection by food pantry clients.

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