



Examining the Feasibility of Healthy Minimum Stocking Standards for Small Food Stores



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ABSTRACT

Objective In response to recent national efforts to increase the availability of healthy food in small stores, we sought to understand the extent to which small food stores could implement the newly published Healthy Small Store Minimum Stocking Recommendations and reflect on the new US Department of Agriculture Food and Nutrition Service's final rule for stocking of staple foods for Supplemental Nutrition Assistance Program—approved retailers.

Design We collected qualitative and quantitative data from 57 small stores in four states (Arizona, Delaware, Minnesota, and North Carolina) that accepted Supplemental Nutrition Assistance Program but not Special Supplemental Nutrition Assistance Program for Women, Infants, and Children benefits. Data from semistructured, in-depth interviews with managers/owners were transcribed, coded, and analyzed. We collected quantitative store inventory data onsite and later performed descriptive analyses.

Results Store interviews revealed a reluctant willingness to stock healthy food and meet new recommendations. No stores met recommended fruit and vegetable stocking, although 79% carried at least one qualifying fruit and 74% carried at least one qualifying vegetable. Few stores met requirements for other food categories (ie, whole grains and low-fat dairy) with the exception of lean proteins, where stores carrying nuts or nut butter were more likely to meet the protein recommendation. Water and 100% juice were widely available and 68% met basic healthy beverage criteria.

Conclusions In contrast to the inventory observed, most owners believed store stock met basic recommendations. Further, findings indicate that small stores are capable of stocking healthy products; however, technical and infrastructure support, as well as incentives, would facilitate shifts from staple to healthier staple foods. Retailers may need support to understand healthier product criteria and to drive consumer demand for new products.

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EFFORTS TO INCREASE THE CONSUMPTION OF healthier foods and decrease consumption of calorically dense, nutrient-poor foods have resulted in a careful examination of which communities have access to healthy foods, how foods are marketed in stores, and how stores vary by community and store size across the United States.¹⁻³ Results show that community access to affordable, nutritious foods can vary dramatically depending on demographic and socioeconomic context and ZIP code, creating a basis for disparities in health.^{4,5}

At the same time, approaches to increase the amount of healthful purchases made with Supplemental Nutrition Assistance Program (SNAP) dollars have been a key focus of federal policy.⁶ On average, SNAP provides \$126.83/mo in food assistance to more than 43 million Americans living below 130% of the federal poverty level.⁷ Health advocates have expressed concern that product eligibility includes items like sugar-sweetened carbonated beverages, candy, and chips at a

time when beneficiaries are also at highest risk for disease.⁸ Earlier this year as revisions to the program were under consideration, experts called for an overhaul of the program to restrict consumer purchases to healthy staple foods, and in so doing better align the program with the 2015-2020 Dietary Guidelines for Americans. At the retailer level, efforts to require a healthier in-store environment, including requirements to stock a greater variety of healthier foods were proposed, and ultimately an increased requirement for minimum stock of staple foods, although not necessarily healthier staple foods, was included in the final rule.⁹

Efforts to improve the availability of healthier foods in stores is an issue relevant to recent SNAP retailer eligibility requirements. This builds on work completed by numerous healthy small store programs that have been implemented widely across the United States. Such efforts generally identify, incorporate, and test the extent to which new products and healthy food marketing strategies increase sales of

targeted items.^{10–14} The menu of new products typically have fewer calories, sodium, fat, or sugar and higher quantities of fiber than similar or popular products and in some cases policy requiring a specific mix of healthy foods to be available in small food stores has been implemented.^{15,16}

Despite advances, the field lacks any common definition of a healthy small store. As a result, guidelines across programs have led to a patchwork of regulatory standards and certification systems across the country. In response, the Robert Wood Johnson Foundation's Healthy Eating Research program convened an expert panel in 2015 and 2016 to develop evidence-based recommendations for minimum stocking levels and marketing strategies for small retail food stores, resulting in Healthy Small Store Minimum Stocking Recommendations.¹⁷ The panel's goal was to develop stocking levels that would be feasible and would make a meaningful contribution to healthy food access in communities. It identified two minimum stocking levels (basic and preferred) for healthful foods and beverages in small retail food stores. The recommended levels were structured around the 2015 Dietary Guidelines for Americans¹⁸ and built on food categories used by the US Department of Agriculture (USDA) in SNAP minimum stocking rules for staple foods in participating stores. The healthier food categories identified in the recommendations include fruits and vegetables, low- and nonfat dairy, including fortified soy beverages, whole-grain-rich foods, and lean meat/protein, plus an additional category for healthy beverages. Panel guidelines included specific recommendations for quantities, portion sizes, and nutritional content of items stocked as well as marketing guidelines.¹⁷ The present study builds from these recommendations to test the feasibility of the new standards and to provide practical insight from retailers about implementation with a mixed-methods design.

The aims of this study were to understand the barriers and facilitators to implementation of newly proposed Healthy Small Store Minimum Stocking Recommendations among small stores, and compare current levels of store stock with recommendations among a sample of stores in four regions of the United States.

METHODS

Procedures, Study Setting, and Design

We approached 232 small retail food stores for participation. Of those, 74 were ineligible, 99 declined to participate, and 57 agreed to participate across the states of Delaware (n=14), Arizona (n=15), Minnesota (n=13), and North Carolina (n=15). Of the 99 that declined, 48 refused outright and provided no reason, and 32 were visited multiple times but the manager was not there to agree to participation and could not be reached, and 19 indicated they did not have time to participate. Demographic characteristics from the census tracts surrounding surveyed stores reveals stores serve communities where 27% of families live below the poverty line and 34% of residents are black, 34% are white, 7% identify as other, 4% are Asian, 24% are Hispanic, and 25% speak a language other than English. Stores were eligible in cases where they accepted SNAP but not Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) benefits; had three or fewer cash registers; were located in a census tract within a 20-mile radius of a partnering research institution; and in a tract where $\geq 51\%$ of households had incomes below 200% of

RESEARCH SNAPSHOT

Research Question: Are Healthy Small Store Minimum Stocking Recommendations Feasible?

Key Findings: Small stores accepting Supplemental Nutrition Assistance Program benefits carry a variety of staple products, although they fall short of meeting new healthy food guidelines. Seventy-nine percent of these carried at least one fruit and 74% carried at least one vegetable, although no stores met overall healthy stock for the category. Few stores met healthy food requirements for other food categories (ie, whole grain and low-fat dairy) with the exception of lean proteins, water, and 100% juice. Store interviews revealed a tentative willingness to stock healthy food alongside a need for technical assistance to ensure understanding of guidelines.

the federal poverty level. Stores accepting WIC were excluded from our sample because of pre-existing federal minimum stock requirements for healthy staple foods. We identified stores via the SNAP retailer locator website hosted by the USDA (<http://www.fns.usda.gov/snap/retailerlocator>) and identified WIC retailer information from state lists and confirmed onsite. The number of cash registers was observed onsite to determine store eligibility. We obtained census tract household income data from the American Community Survey.¹⁹ Further, stores were excluded in cases where they were currently participating in, or had participated in the past 3 years in any other small store–geared study or healthy stocking initiative or if they were identified as a dollar store or pharmacy. Store characteristics are provided in Table 1.

Store managers or owners of eligible stores (hereafter referred to as managers) were invited to participate initially with a letter and/or direct in-person contact. To participate, managers had to be aged 18 years or older, have owned or managed the store for a minimum of 1 year, and made a majority of the decisions about what products are stocked in the store. Managers were compensated \$25 for their time. The study protocol was reviewed and approved by the institutional review boards of the University of Delaware,

Table 1. Characteristics of participating stores across four states (Arizona, Delaware, Minnesota, and North Carolina) (n=57) in a study examining the feasibility of Healthy Small Store Minimum Stocking Recommendations

Store characteristic	Result
Store type	<i>n (%)</i>
Gas station	19 (33)
Rural	16 (29)
Suburban	8 (14)
Urban	32 (57)
	<i>mean±standard deviation</i>
Aisles	4±2

University of Minnesota, and Arizona State University. Participants gave verbal consent as part of completing the brief discussion guide/survey.

Data Collection

We collected two types of data in this study: quantitative inventory data to record observed product availability and qualitative data from a store manager semistructured interview to understand perceived feasibility of implementing the Healthy Small Store Minimum Stocking Recommendations. Both assessments took place the same day and interviews were followed by inventories, with the exception of four stores where staff needed to return the following day due to time constraints.

Quantitative Inventory of Product Availability. The store inventory consisted of a checklist for tallying varieties and amounts of five product categories (see the [Figure](#)). In alignment with the Healthy Small Store Minimum Stocking Recommendations, only healthful varieties of products were counted (eg, low-sodium vegetables and no heavy syrup in fruit) in canned, frozen, or fresh varieties in each category. Minimum quantities were assessed in person by trained research staff via unit count and, where relevant, total volume and/or product weight. Ultimately, quantities, and varieties were tallied and then compared with basic or preferred stocking guidelines.

Qualitative In-Depth Interview of Store Managers. We conducted qualitative interviews in the retail setting with managers. Interviews began by sharing a visual aid that described the guidelines in detail, and outlined the basic and preferred stocking levels as depicted in the [Figure](#). After obtaining initial reactions to the guidelines, store managers were asked about the feasibility and interest in complying with the proposed guidelines for each category of products. Questions included: “Are you interested in increasing the amount or type of [category] you offer?” “How would you describe customer demand for [category]?” and, “What do you think would happen if you expanded the amount of [category]?” The manager was also asked one quantitative multiple-choice question: “Right now, how close do you think your store is to meeting these guidelines? A) Far from meeting the guidelines, B) Close to meeting the guidelines, C) Meeting the guidelines, or d) Exceeding the guidelines.” Fifty-four interviews were digitally recorded, and the remaining three interviews were documented with notes taken during and immediately following the interview, due to equipment malfunction, and/or because the manager did not agree to be recorded.

Statistical Analysis

Inventory Data. Descriptive statistics were used to characterize store product availability in comparison to recommendations. For each criterion, mean±standard deviation, median, and percentage meeting the standard was calculated using SPSS version 24.²⁰

Interview Data. Interviews lasted between 20 and 45 minutes. Fifty-one interviews were conducted in English, two in Spanish, and four in other languages (Korean and Hindi). Interviews were transcribed verbatim by a certified external

vendor and translated into English as needed. Each interview transcript was independently coded by two researchers using Dedoose version 7.0.23,²¹ a web application for managing, analyzing, and presenting qualitative and mixed-method research data. We used a standard, two-cycle coding procedure to analyze the data. In the first cycle, we coded transcripts line by line using a coding structure based on concepts addressed in the interview guide and themes that emerged from the interviews. In the second cycle, similar codes were grouped into major themes. The research team met three times over the course of analysis to review inconsistencies, resolve discrepancies in codes, and refine major themes from the data.

RESULTS

Quantitative Results

Meeting the Healthy Proposed Guidelines: Recommended Stocking Levels by Food Category. No stores met recommended fruit and vegetable stocking at either the basic or preferred levels (see [Table 2](#)). However, 79% of stores did carry some qualifying fruit, and 74% maintained some qualifying vegetables. Only 12% of stores evaluated had neither a fruit nor vegetable that met healthful criteria (eg, low sodium or no syrup). On average, stores with any fruit or vegetable stock carried eight varieties of fruits and vegetables combined (median=5 varieties). Among these, four stores (7.0%) stocked 30 lb or more (the basic level criterion), whereas just one store (1.8%) had more than 45 lb (the preferred level criterion). The average store had 15 lb fruit (median=8 lb), and 9 lb vegetables (median=9 lb) available.

Stores were similarly distant from meeting low-fat dairy recommendations, particularly given limited availability of low-fat milk and/or soymilk. The stock of meat/protein was much more robust, largely a result of the inclusion of nuts and nut butters, which were readily available in many varieties and container sizes. Whole-grain-rich products were also found in stores, although very few carried the variety necessary to meet recommendations (two stores met minimum guideline standards). Within the category of beverages, water was readily available in most stores, and 91% met the preferred (ie, higher level) recommendations. Family sized (≥59 oz) fruit juice was less available than smaller containers of 100% juice. In total, 68% of stores met the basic beverage criteria and 40% met the stricter preferred standard.

Managers' Perceptions of Current Inventory Alignment with Recommended Levels. The vast majority of managers believed their product mix was close to meeting the recommended guidelines (61%), met the guidelines (19%), or exceeded the guidelines (5%). Only eight managers (14%) believed they were far from meeting the guidelines.

Qualitative Results

Managers were receptive to considering the proposed minimum stocking levels. Most were optimistic about their ability to meet the basic level requirements but expressed less capacity and interest in meeting the preferred level of stocking requirements:

I think with the preferred it might be a little bit too much. But I don't think these guidelines are that big of a deal.—(DE store 02)

CARD A: HEALTHY SMALL STORE PROPOSED STANDARDS

Proposed healthy store standards include two levels, Basic and Preferred.

Products	Basic	Preferred
Fruits and Vegetables 	<ul style="list-style-type: none"> • 4 varieties of FRUIT: <ul style="list-style-type: none"> - up to 2 may be canned or frozen AND • 6 varieties of VEGETABLES: <ul style="list-style-type: none"> - up to 2 may be canned or frozen - 1 vegetable must be dark green or red/orange • Total = 30lbs of fruits and vegetables • No more than minimum eligible stock from 1 variety 	<ul style="list-style-type: none"> • 6 varieties of FRUIT: <ul style="list-style-type: none"> - up to 3 may be canned or frozen AND • 8 varieties of VEGETABLES: <ul style="list-style-type: none"> - up to 4 may be canned or frozen - 2 vegetables must be dark green or red/orange • Total = 45lbs of fruits and vegetables • No more than minimum eligible stock from 1 variety
Dairy and Fortified Soy Beverages 	<ul style="list-style-type: none"> • At least 5 gallons of Skim, Low fat (1%) milk or plain/original soy milk in at least 1 variety. • At least 32 oz of plain or low fat yogurt (less than 23 grams of sugar/6oz serving). • At least 2 pounds of low-fat part skim or fat free cheese. 	<ul style="list-style-type: none"> • At least 10 gallons of Skim, Low fat (1%) milk or plain/original soy milk in at least 2 varieties. • At least 64 oz of plain or low fat yogurt (less than 23 grams of sugar/6oz serving) in at least 2 varieties. • At least 4 pounds of low-fat part skin or fat free cheese in any combination of at least 2 varieties
Meat & Protein 	<ul style="list-style-type: none"> • 4 varieties of: <ul style="list-style-type: none"> - Poultry - Fish - Eggs - Dried or canned beans - Dried split peas, lentils - Soybean products like tofu - Nuts & nut butter AND • If any red meat is sold; at least 1 variety is lean or extra lean RED meat. 	<ul style="list-style-type: none"> • 8 varieties of: <ul style="list-style-type: none"> - Poultry - Fish - Eggs - Dried or canned beans - Dried split peas, lentils - Soybean products like tofu - Nuts & nut butter AND • If any red meat is sold; at least 1 variety is lean or extra lean RED meat.
Beverages 	<ul style="list-style-type: none"> • 384 total ounces of water in any container size. • 100% fruit and vegetable juice available if ANY juice or juice flavored beverages are stocked. - At least 6 family sized containers (≥ 59oz containers OR - 24, 8oz bottles in at least 1 variety • If fountain beverages are available: - At least 1 option must be plain water AND - At least 1 option must have no more than 40 calories per 8 oz serving AND - At least 1 container size of 12 oz is available 	<ul style="list-style-type: none"> • 384 total ounces of water in any container size. • 100% fruit and vegetable juice available if ANY juice or juice flavored beverages are stocked. - At least 12 family sized containers (≥ 59oz containers OR - 48, 8oz bottles in at least 1 variety • If fountain beverages are available: - At least 1 option must be plain water AND - At least 2 options must have no more than 40 calories per 8 oz serving AND - At least 1 container size of 12oz or less is available.
Whole Grain Rich staple products 	<ul style="list-style-type: none"> • At least 5 pounds of whole-grain rich staple products (not including breakfast cereal) in any combination of at least 2 varieties. • At least 4 containers with 11 or more ounces of whole grain rich breakfast cereal in any combination of at least 3 varieties. 	<ul style="list-style-type: none"> • At least 10 pounds of whole-grain rich staple products (not including breakfast cereal) in any combination of at least 2 varieties. • At least 12 containers with 11 or more ounces of whole grain rich breakfast cereal in any combination of at least 3 varieties.

Figure. Detailed overview of basic and preferred proposed standards for corner store owner comment and reflection (Card A: Healthy Small Store Proposed Standards).

Table 2. Proportion of small food stores in the sample meeting proposed healthy minimum stocking standard^a by category, based on an onsite store inventory (n=57), in a study examining the feasibility of Healthy Small Store Minimum Stocking Recommendations

Minimum stocking standards for food and beverage item category ^b (basic level/preferred level)	Varieties of qualifying products observed in store		Stores Meeting Basic Healthy Stocking Standards	Stores Meeting Preferred Stocking Standards
	Mean±standard deviation	Median	←—————%—————→	
Fruits and vegetables			0	0
Varieties of fruit (4 varieties/6 varieties)	3.5±3.7	3	42	11
Varieties of vegetable (6 varieties/8 varieties)	4.5±6.0	2	19	17
Dark green or red/orange (1 variety/2 varieties)	0.6±0.8	0	21	18
Total weight (30 lb/45 lb)	22.7±24.1	23.1	24	12
Dairy (including soy beverages)			0	0
Low-fat milk (5 gal/10 gal)	2.2±4.6	0	17	9
Low-sugar yogurt (32 oz/64 oz)	97±346.0	0	11	9
Low-fat cheese (≥2 lb/≥4 lb)	82±22.5	88	3	3
Meat and protein			42	25
Varieties (4 varieties/8 varieties)	6.2±2.2	7	86	49
Lean red meat if red meat sold (1 variety/1 variety) ^c	0.74±1.2	1	9	9
Beverages			68	40
Water (384 oz/384 oz)	2,533.8±2,878.2	1,538.3	91	91
100% fruit/vegetable juice (6/12 family size (≥59 oz) or 24/48 containers of 8-oz bottles)	12.0±20.6	3.0	71	43
If fountain beverages sold ^d				
Water (available/available)			65	65
≤40 kcal/8-oz serving (1/2 options)			82	82
Container size (≤12 oz available/available)			23	23
Whole-grain—rich			2	2
Whole grains other than cereal (5 lb/10 lb)	43.8±157.2	1.7	41	35
Varieties of whole grains other than cereal (2 varieties/2 varieties)	0.77±0.8	1	23	23
Stock ≥11 oz cereals (4 containers/12 containers)	2.75±4.1	0	26	10
Varieties breakfast cereal (3 varieties/3 varieties)	0.91±1.2	0	13	13

^aBased on healthy minimum stocking standards for small food stores developed by the Robert Wood Johnson Foundation's Healthy Eating Research program during 2015–2016.

^bMinimum stocking standards were established at two levels: basic and preferred.

^cThe numbers in the row represent data for 33 stores in the sample that carried red meat.

^dThe numbers in the rows represent data for 39 stores in the sample that offered fountain drinks.

These are ok. I'm already doing this.—(NC store 05)

Of 57 store managers interviewed, 39 indicated they had some interest in expanding their selection in one or more food/beverage categories, particularly beverages.

Challenges to Meeting Healthy Stocking Levels. Despite managers' overall receptivity to the stocking levels, several potential challenges were identified. Managers reported concerns about issues, including space, customer demand, and/or product procurement. For example, managers cited

challenges related to lack of space in their small store to display and/or store new types of products (or greater quantities of products they already stocked):

If we had the space, I could see an actual fresh vegetable, fresh meat section.—(NC store 09)

If I don't have a place to put it, I'm not gonna order it.—(MN store 23)

Some retailers were also concerned that there may be insufficient customer demand to support increases in their

inventory of healthful foods and/or beverages, which could result in spoilage and profit loss.

Nobody, even diabetics, they don't buy it.—(DE store 10)

I used to carry the 1% milks, fruits and vegetables and they didn't even move. These were all spoiling out.—(AZ store 15)

Finally, other retailers noted that procurement challenges include having inadequate mechanisms to obtain recommended products at reasonable costs and with adequate quality.

Store Support Needed to Meet Guidelines. Managers indicated that increased customer demand for healthy products, as well as increased delivery and stocking support, would facilitate the sale of healthier foods. Because managers were concerned with loss, financial assistance to cover the initial investment required to increase product availability would further support their ability to carry additional healthy, and especially perishable, products.

Yeah. We can [meet these guidelines but] we need a lot of customers. We need to have some more advertisements... More customers, more things. That's how it is for businesses.—(AZ store 03)

Money. I need more money to meet the recommendations.—(DE store 10)

Managers also discussed needing ways to obtain better prices from wholesalers, who often only provide competitive prices to larger stores because of the larger quantities of products purchased.

If they could get cheaper prices, more companies that deliver and do that stuff, more companies that offer selling that stuff. Because, usually, companies, they don't even deliver, only to big market, not small market.—(NC store 08)

Owners indicated that it would be easier to stock and promote healthful foods if there were a subsidy on those foods, decreasing prices for the store and customers:

It would be easier if there was some sort of subsidy on the healthier foods/produce.—(MN store 31)

Managers further proposed that nutrition education is needed to promote healthier foods:

... Customer they must be educated. Buy juices, cereals, milk, some kind of beans. Something healthy. Something healthy. That's why I sell a lot of mostly—if you give them fruit fresh they don't like. They go up there they buy pork and beans.—(NC store 06)

Others emphasized the need for a regular produce supplier, similar to what is available for sugary beverages (such as sugar-sweetened carbonated beverages), salty snack foods, and candy. Furthermore, drawing on their experience with other product suppliers, managers emphasized the need to allow stores to return products when they begin to expire. They also emphasized the benefits of improved infrastructure and marketing, such as the provision of baskets, special

shelves, additional space, or tags to display healthier options, and ideally a supplier who would maintain stock. Some managers indicated frustration with the contracted requirements with vendors that dictate product placement for the vendors' products and constrain their power to reposition products in their stores.

You know what? I think what would make it easier—what would make it easier for us if the big brands wouldn't make us sign those big contracts, where they can—they want to hold two, three, four or five wheels for themselves. Same thing with chocolate. They want a certain amount of space for themselves. So that leaves us with our hands tied on how many products we can bring.—(AZ store 11)

In response, they propose significant changes to the slotting fee terms to free up prime placement for healthier foods. One also suggested adopting a similar approach to what is undertaken by the snack food companies, but instead proposed competing requirements for healthful foods that would also ask owners to sign a contract and receive an incentive. At least one manager also mentioned tax breaks from the government.

Finally, it is important to note that not all owners believed they would need additional support. Six managers reiterated that they were already close to meeting the guidelines and would not need additional support.

Implications and Interest in Expansion

As a whole, managers were not highly enthusiastic about expanding the availability of healthy products in the guidelines but were willing to do so.

When managers were asked to predict what would happen in case they did expand their inventory, responses ranged from having never considered expanding, to predicting that sales and/or customers would increase, to predicting that the new products would not sell and would spoil. Those who had not considered adding product in these categories were open to trying.

It would be interesting to see what would happen. I don't know. People do tend to shop us a little like a grocery store, but then not completely like a grocery store. So I'm not really sure what the results would be.—(MN store 20)

It might get the business better. It might, I don't know, but it's worth a try.—(NC store 15)

A number of managers reported that expanding their inventory, particularly beverages, would result in increased sales. They believed that purchases of other items might increase as well with increased inventory. This was rarely the case with dairy, as a majority of managers responded that spoilage would increase if they stocked lower-fat milks.

Well, we had [dairy]. It didn't sell. But what I said; we had and no one bought it. We [also] sold soymilk and it didn't sell.—(AZ store 08)

Others believed that overall business would increase and that this would have a ripple effect and extend to other small stores when they observed the positive influence of expanding the inventory.

My business would grow bigger and I would increase more money to helping out other convenient stores into doing the same thing as I am doing. Because if I'm doing one thing that makes my business better, it's gonna make other peoples' business better.—(NC Store 07)

A few store managers reported that they had tried stocking some of the foods in the guidelines with mixed results. One manager continued to stock more vegetables because it resulted in an increase in customers. Others could not sell the amounts required to keep costs down.

Before we had to buy, let's say, a box of bananas. Because if you buy few bananas, well, the price goes up and you have to raise it for the customer. You can't have high prices. But we would lose half a box of bananas, half a box of bananas. So it was upsetting. Are we going to sell bananas? Yes or no? So now we sell half the box of bananas.—(AZ Store 8)

Others responded that expanding their inventory would not affect purchases, nor would it increase business.

Importance of SNAP Benefits Overall

Nearly every manager interviewed reported that SNAP payment accounts for a significant source of store income. A potential change in SNAP authorization status for most would likely result in store closings and significant loss of revenue.

Huge, huge impact. I don't know how—man, that's a scary thought to have. This thing is our lifeline. SNAP is huge.—(MN store 23)

One exception was stores that relied heavily on beer and tobacco sales.

DISCUSSION

Our data show misalignment between managers' estimations of healthy product availability and the actual products on the shelf. For example, more than 60% of store owners believed their store product availability met guidelines, although quantitative data revealed that no stores met minimum criteria. Although it is not entirely clear why this disconnect occurred, part of the reason for the mismatch may be due to the nuances inherent in the healthier guideline details, although it may also be the case that with fewer items stocked generally, stores were sold out at the time of our assessment. Despite interviewer materials and probing for clarification, many owners only glanced at guidelines, perhaps a result of their apparent complexity and detailed specifications. Such specifications in the guidelines were included to ensure that products stocked meet nutrition standards for healthy products. However, the trade-off between specificity of product detail and guideline comprehension remains a concern.

One approach gaining momentum as a mechanism to improve access to affordable and nutritious food is to require stores to maintain a minimum stock of staple items. Since its inception, stores authorized to accept WIC benefits must meet minimum stocking standards aligned with the program.²² In an effort to further federal guidelines, states, including Minnesota and California, have independently implemented new healthy stocking requirements for both the WIC and non-WIC

certified vendors.^{15,16} Research on changes to the WIC food package in 2009 found that after an initial transition period, small stores were generally able to comply with the new requirements.²³ There was also no evidence that large numbers of stores dropped out of the program due to an inability to meet requirements.²⁴ Findings from our study indicate that at present although relatively few stores meet all healthy stocking basic criteria, many stores do already offer healthier product offerings in the beverage and protein category and most are willing to shift to adopt an even greater stock of healthier food if required to do so.

At the end of 2016, the USDA issued a final rule to SNAP-authorized vendors that requires a greater variety and quantity of staple food products for stores accepting the benefit. The policy took effect January 17, 2017, with a 120-day requirement for compliance. In it, the minimum required stock for a majority of stores was increased from three product varieties to seven, and stores are required to carry at least three individual items for each variety across the four product categories—vegetables or fruits; dairy products; meat, poultry, or fish; and bread or cereals—totaling a required minimum stock of 84 products. Prior guidelines required only 12 staple products.

However, in the case of the USDA SNAP final rule, such guidelines have not moved to require a minimum product standard with regard to healthier products, perhaps a result of limited data of the potential for stores to meet healthier criteria. For example, canned ravioli, in which tomato is the first ingredient, would be considered a vegetable (tomato). Requirements for products to meet lower sugar, salt, or fat standards are not part of the final rule, although snack and dessert products, considered accessory items, are now explicitly excluded from minimum stock criteria. Beverages are altogether excluded from the criteria. As such, the extent to which stores will stock healthier products as a way to meet the final rule requirements is unclear.

The SNAP final rule guidelines are inherently simpler on paper (four product categories, seven varieties, three products per variety) than the Healthy Small Store Minimum Stocking Recommendations. The risk of store owner overestimation of compliance with the new SNAP rule likely still exists given the magnitude of the disconnect revealed in our study and the potential challenges with interpretation of the staple foods criteria. For example, ravioli, in cases where it is considered a vegetable (tomato) would count as one variety such that other tomato products (eg, canned tomato sauce or fresh tomatoes) would no longer be relevant because tomatoes were already present in the store and accounted for by the ravioli product. Such nuance may result in ongoing misinterpretation and significant challenges with implementation.

Findings from this study suggest that some categories of products (eg, fresh produce) may be more difficult for small stores to meet than others (eg, beverages and protein). Further development of how, where, and under what conditions additional distribution mechanisms are needed, as well as additional exploration into the types of incentives that will advance manufacturers' and broad-line distributors' wholesale distribution of healthy products. Our research team frequently found that products on store shelves did not qualify toward meeting the minimum recommendations due to their nutritional content (eg, canned vegetables above sodium limit) although similar lower sugar, salt, or fat

products could be stocked instead (or in addition to) those that fell outside the healthier guideline. Indeed, most stores carried some version of canned fruit and vegetable products, although few were low in sodium or canned in juice or water. Some store owners expressed the potential to access such products via existing wholesale channels in case they were required to stock those items.

The need to increase customer demand was frequently cited by managers as a necessary complement to increased availability of healthier products in their stores. Registered dietitian nutritionists play a critical role in education and improved opportunities to connect community nutrition needs with educational and marketing efforts would further support the development of healthier food environments at the neighborhood level.

The Healthy Small Store Minimum Stocking Recommendations report also recognized this and included recommendations for marketing strategies to encourage purchases of products that meet the qualifying nutrition standards of the minimum stocking guidelines. Future analyses of manager interviews conducted for this study will explore managers' perceptions of healthy food marketing and promotion strategies in more detail, and will provide greater insights into the sustainability of stocking and promoting healthier foods and beverages in small stores.

Prior research, together with managers' reports in this study, suggest that small stores would be capable of successfully meeting standards for stocking healthy products, such as those basic requirements proposed by Healthy Eating Research. However, additional support, including technical assistance and financing for display or infrastructure improvements in the form of loans or grants and to explain the differences between seemingly similar products, will be needed to support stores during the critical transition period. Retailers are generally supportive of the idea of increasing healthy product availability and future policy efforts should capitalize on local, regional, and national momentum to ensure access to healthy, not just staple, foods.

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AUTHOR CONTRIBUTIONS

All authors contributed to data collection, review of data findings, methods, and review of findings. In addition, all authors contributed to the writing and editing of drafts of the manuscript.