

Successful Approaches to Reduce Sodium in School Meals

VOLUME II: DETAILED STUDY FINDINGS



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INTRODUCTION

The U.S. Department of Agriculture (USDA) Food and Nutrition Service (FNS) has been working with school nutrition professionals to overcome operational challenges in providing meals that meet established sodium standards and encourage student participation. This volume provides additional detailed findings on the Objective 1 and 2 phases of the *Successful Approaches to Reduce Sodium in School Meals* study, which was conducted to identify the challenges that both the food industry and schools must overcome, and the successful, innovative methods they have utilized to achieve compliance with the sodium targets originally established in the Healthy, Hunger-Free Kids Act (HHFKA) of 2010 (Pub. L. 111–296). As described in the *Successful Approaches to Reduce Sodium in School Meals: Final Report*, the study was designed to investigate two objectives:

- **Objective 1.** Examine the market availability of foods that meet the current and future sodium standards (i.e., sodium targets) for school meals programs
- **Objective 2.** Identify best practices in schools that are successfully meeting sodium targets that could inform technical assistance to School Food Authorities (SFAs) developing lower sodium menus

This volume presents additional detailed findings drawn from the respective summary reports developed for each phase of the study. The volume is organized into the following chapters:

- Chapter 1. Detailed Study Findings from Food Industry Representatives
- Chapter 2: Detailed Study Findings from Selected SFAs
- Chapter 3: Supplementary Tables

CHAPTER 1. DETAILED STUDY FINDINGS FROM FOOD INDUSTRY REPRESENTATIVES

Overview

As described in the *Successful Approaches to Reduce Sodium in School Meals: Final Report*, the Objective 1 study phase was designed to examine the market availability of foods that meet the current and future sodium standards (i.e., sodium targets) for school meals programs. This summary report presents findings from the first objective of the overall study: to examine the market availability of foods that meet the current and future sodium levels (i.e., sodium targets) for school meals programs. The 2M Study Team conducted focus groups and key informant interviews with representatives from food manufacturers and food service management companies (FSMCs) that provided food products to schools and had already modified (or would have to modify in the future) the sodium content of their products to meet mandates for lower sodium school foods for this study, collecting data from a total of 16 representatives from either food manufacturers or FSMCs. In early 2016, respondents participated in individual interviews or in a focus group to explore the availability of lower sodium foods, barriers and facilitators to supplying these foods to schools, communication and outreach specific to changes in sodium levels being conducted by the food industry, and ways FNS can provide support to enhance implementation of the new provisions. The methods used to select and recruit these respondents and analyze these data are described in detail in the *Successful Approaches to Reduce Sodium in School Meals: Final Report*.

This study of manufacturers and FSMCs sought to answer the extent to which lower sodium foods are available to schools and the facilitators and barriers to achieving the related sodium targets. Other questions of interest for this phase of the study were specific to the communication and outreach used to enact the new guidelines, as well as support FNS could provide throughout the implementation process. Qualitative data collection methods were used to examine each of the topic areas, and corresponding research questions are presented in Table 1.

Table 1. Topic Areas and Research Questions for the Objective 1 Phase

Topic Area	Research Question
Availability of Lower Sodium Foods	1. Is the food industry positioned to sell foods lower in sodium to schools/school districts?
	2. What research and development efforts have been put in place to develop lower sodium foods to meet school meals standards for sodium?
	3. What are the current barriers the food industry faces, and what barriers does the food industry foresee in providing (and continuing to provide) schools with lower sodium foods (short-term, long-term)?
	4. What are the most common foods being reformulated/developed by the food industry? And why?
	5. Are new food products in development to meet the future sodium standards for school meals (e.g., Sodium Targets 2 and 3)?
	6. Does the food industry think that people's tastes are changing and the wider market is shifting towards lower sodium foods? What about for the school's food market (elementary, middle, and high schools)?
	7. Are there higher costs associated with producing lower sodium foods?
	8. Does the food industry develop specific lower sodium foods for the National School Lunch Program vs. the general public?
	9. Are food service management companies (FSMCs) trying to incorporate more fresh, frozen, and/or local items? ¹
Communication/Outreach Efforts from Food Industry	10. What outreach/communication efforts has the food industry put forth about product availability of lower sodium foods?
Technical Assistance Needed from FNS	11. What technical assistance would the food industry like from USDA FNS with regard to providing lower sodium foods for school meal programs that meet the new sodium standards?

As noted in Table 1, there were three primary topic areas addressed through the qualitative data collection methods. The following sections present findings for each of these topic areas. Quotes are provided as examples of the identified themes, with the type of respondent (FSMC or food manufacturer represented) indicated at the end of each quote.

Topic 1: Market Availability of Lower Sodium Foods for Schools

This section addresses the findings for the overall availability of lower sodium foods, specifically in meeting the new target guidelines, and facilitators and barriers the respondents shared in implementing the guidelines.

OVERALL AVAILABILITY OF LOWER SODIUM FOODS

Respondents of the study were generally very familiar with the sodium target regulations; they clearly understood that the sodium targets are based on an entire menu, rather than per product. In order for both food manufacturers and FSMCs to assist schools in meeting the sodium targets, they examine each food product in order to lower the sodium content.

Food manufacturers indicated that they have reduced sodium in some processed food items by making minor product formulation changes, such as reducing the amount of added salt, switching to reduced-sodium cheese products, and adding non-sodium seasoning or flavoring to replace some sodium. One large FSMC stated that processed foods are most commonly targeted for reformulation.

The types of foods we target for reformulation with vendors are those that are highly processed, high-sodium, and high in other less desirable nutrients, including sugar and saturated fat. — Large FSMC

Overall, food manufacturers indicated that when sodium was naturally occurring (such as in dairy products) or used for functional purposes (such as in baking), then sodium reduction is more challenging.

The products that we offer most often throughout the menu and that have the great[est] potential to impact sodium levels include cheese, biscuits, bread, deli meats, and breaded chicken. However, instead of asking manufacturers to make low-sodium alternatives of these products, we prefer that they gradually lower the sodium in all products. — Large FSMC

Respondents indicated that they were still working on reformulating condiments, dressings, deli meats, and breakfast sandwiches to be lower in sodium. These types of products were more challenging to reformulate because sodium is used to enhance flavors or increase preservation. The following sections present findings specific to first how the respondents met Sodium Target 1, followed by the general consensus around their ability to meet both Sodium Targets 2 and 3.

MEETING TARGET 1

All FSMCs felt that they have been successful in meeting the first sodium target. Food manufacturers noted that only an approximate 10 percent decrease in sodium per product was needed to help schools create menus that meet Sodium Target 1. Manufacturers indicated that the reason they have been able to reduce sodium in many of their products is because they had sufficient time to prepare to meet the first target, and many had begun working toward reducing sodium content before regulations were administered. Respondents noted that in order to meet Target 1, an approximate 10 percent decrease in

sodium per product was needed. All participants agreed this was not difficult to achieve. One participant indicated the following:

A lot of the changes [to products in order to reduce sodium] were relatively small. And you might be able to get those done in 12 months. — Food manufacturer

FSMCs echoed this sentiment, crediting sufficient preparation time as a key reason they were able to meet the Sodium Target 1 level. Food manufacturers indicated that most of their school food products have been reformulated to help schools meet the Sodium Target 1 levels and noted that their companies have also reduced total fat and eliminated *trans* fats from their products over the past several years to help schools meet Federal regulations. In order to reach Sodium Target 1, food manufacturers indicated that they decreased sodium primarily in entrée foods where little natural sodium occurs (but where more sodium tends to be added), including beef, chicken, turkey, pork, or other meat products. One food manufacturer indicated that almost all of their products were examined to determine which ones would help schools to meet the Sodium Target 1 levels.

All FSMCs mentioned at least a few foods that have been difficult to reformulate for less sodium, including deli meats. Some mentioned processed meats as an especially challenging food category to reformulate to meet stricter levels because of the way these foods are produced and the role of sodium in preservation.

The biggest hurdle is deli meats. Students like them, and it's hard to meet [the lower sodium levels] with the deli-build sandwich, so we might have to get rid of it. — Regional FSMC

Breakfast sandwiches and deli meats are a big challenge, and these are very popular items. We're going to have to push these manufacturers farther, especially the breakfast sandwiches . . . we'll have to limit the number of times they are offered. — Large FSMC

Food manufacturers indicated that there are several factors to consider when altering or developing new lower sodium products: cost, taste, and food preservation and functionality. Generally, lower sodium foods are higher in cost because they have to be tested with students for flavor, and require research and development for product reformulation and alterations in production.

MEETING TARGETS 2 AND 3

While respondents generally indicated that Target 1 was a requirement most had met, their ability to meet lower sodium levels for Target 2, and especially for Target 3, is far more challenging. They were particularly vocal about the fact that they were not consulted in the process of creating the new sodium targets, and that if they had been, they could have provided information about the feasibility of the reductions and how difficult the reductions would be to achieve. For example, one food manufacturer said:

[USDA-FNS] should have, they should have come to [the] industry if they're expecting us to make it work, they should have come to us before the issues and said 'Ok, here's the rule we're going to make. Is that practical and will it work in the real world?' We could have told them.

Other food manufacturers indicated that they really wanted to be heard by USDA FNS in terms of how difficult these sodium reductions will be, particularly for some products such as bakery and dairy.

Several food manufacturers expressed uncertainty about whether the sodium targets will continue to be implemented as planned. Food manufacturers indicated that not only were they unclear about when the additional sodium targets would be implemented, but even whether they would be implemented at all. The food manufacturers are very hesitant to make changes to their products without knowing whether the sodium targets will actually be implemented, as changes to products take time and money. Indeed, one large FSMC indicated that they had heard from food manufacturers that they “do not want to invest in the time and money without knowing [what the future sodium targets will be].”

Overall, Target 2 seemed to be achievable by some of the respondents (only one food manufacturer reported that they were evaluating their foods to determine which could be modified to help schools meet Target 2), but Target 3 was considered infeasible to nearly all respondents. There was a high level of frustration voiced among respondents over the changes that would need to be made, particularly in achieving Target 3, not only in the content, but also in the preparation and storage of foods.

We don't even want to think about [the later sodium targets]. Just dealing with Target 1 and getting manufacturers on board has been a challenge. — Regional FSMC

It's reduce it, or replace it. Up until now, we have reduced [sodium]. We've done a fabulous job of reducing it greatly. And if we are forced to go to that next level [Targets 2 and 3], we will go back to the drawing board to reduce it a little bit more because there aren't that many alternatives for the replacement part of it. — Food manufacturer

Both food manufacturers and FSMCs indicated that in order to meet Sodium Target 3 reductions, a shift toward scratch cooking will be needed to minimize the amount of additives in the products. Several food manufacturers agreed that convenience food products (i.e., preassembled, pre-prepared) presented a greater challenge for sodium reduction compared to individual food products that require cooking or assembly. These respondents further explained that many schools choose to use these convenience foods because they can be reheated and served relatively quickly, since little cooking or assembling is required on site by the schools, thus saving on labor costs.³⁹

Target 3 is going to force scratch cooking only . . . scratch cooking is not an answer for all school districts. — Large FSMC

Another challenge voiced in meeting Targets 2 and then 3 is in finding suitable replacements for sodium in its function of adding flavor or preserving foods. Respondents indicated that the lower sodium levels make the food unpalatable to some people, particularly children, and decreases the shelf-life of the foods. For example, one food manufacturer indicated that:

The levels [of sodium] are such that it compromises what you're making. People aren't going to want to eat it . . . [the foods are] not going to taste good. [The foods are] not going to be something that somebody wants to eat. — Food manufacturer

The following sections provide findings from respondents in terms of the factors that facilitate changes in sodium levels, and the barriers or challenges that can impact change.

FACILITATORS TO REDUCING SODIUM LEVELS

Respondents were asked to describe the successes they had with regard to reducing sodium levels, and facilitators to these changes that are organized around three themes: planning in advance of the change, incorporating taste testing for reformulated products, and approaching the changes through the entire system, recognizing that to lower sodium in foods would require adjustments across the entire food supply chain.

Planning

Both food manufacturers and FSMCs had started sodium reduction in their products prior to the implementation of the sodium targets. For example, a food manufacturer stated that their company had anticipated that reduced sodium would be a component of the CN regulations after looking at the *Dietary Guidelines for Americans*.^{3, 4} They shared that they also began looking for ways to reduce the sodium content while maintaining the quality of their food products.

We started (8 years ago) to look at all recipes and products for sodium content. We initiated a company-wide program to reduce sodium and look for alternate products. — Large FSMC

Respondents generally agreed that knowing what the requirements are well in advance of when they are required to be met is critical to being able to achieve the USDA goals.

Taste Testing

Food manufacturers and FSMCs both indicated that a facilitator to successfully making changes in foods that are offered to schools is in conducting taste testing with students prior to new food rollout.

We've done extensive testing with every product before we hit market with it because, you know, it's too expensive to try to push something out that you have doubts about. — Food manufacturer

The general perspective among food manufacturers was that taste testing with students should occur during product reformulation before a new product is rolled out. Food manufacturers indicated that the taste testing must be accounted for when assessing the amount of time it will take for the reformulated food products to reach the schools. The idea of taste testing prior to product rollout was shared by FSMCs. FSMCs also believed that taste testing is a key facilitator to increase the likelihood that lower sodium food products will gain wider acceptance. FSMCs indicated that taste testing with students prior to sale of lower sodium products to schools also increases the likelihood of student acceptance (i.e., because the FSMC would release food products where the response had been favorable).

We want to be successful, and our success with students is because of taste testing. We do rigorous taste testing in partnership with food manufacturers. — Large FSMC

When new products and/or recipes are under development, as part of the development process, we test for customer [student] acceptance. We will identify a diverse group of schools and work with the managers in these locations to set up the tasting, as well as how we would like to receive the feedback. — Large FSMC

System Level Approach

Respondents noted that a facilitator to making this level of change in sodium consumption will require a change in the system overall. Both food manufacturers and FSMC representatives noted that sodium reductions ought to be addressed at multiple levels throughout the supply chain to best ensure that all three target levels are met on time. In particular, one food manufacturer shared that not only does it take a significant amount of time for product development, but additional time may elapse before newly developed food products actually reach the schools.

[One must keep] in mind that already your supply chain is pretty full of products that are needed for menu cycles, so . . . it adds cost and time and supply chain inefficiency as you're moving from one target to another target. — Food manufacturer

It's not just making the product and all the components we talked about: time, R&D, testing. It's the entire supply chain . . . the inventory, transitioning, multiple SKUs. That supply chain is an enormous cost that isn't talked about. And it has to be quantified. It really, really does. — Food manufacturer

Although both food manufacturers and FSMCs indicated that they were able to help schools meet the first sodium target relatively easily, they believe Sodium Targets 2 and 3 to be much more difficult to achieve due to how the food supply chain is constructed. The more FNS can focus on changes at each step in the process of serving food to children, the better able the schools will be to meet the lower sodium targets. Ways FNS could facilitate this process at each level of the supply chain might include providing research findings about ingredients that can be used to replace sodium for baking and other functions, providing packages with recipes, ensuring kitchens are adequately equipped, and training kitchen staff on food preparation and assembly.

BARRIERS TO MEETING SODIUM TARGETS

Respondents noted several barriers to meeting the lower sodium targets, including a low level of demand for these products outside of the school system, the costs and time involved in reformulating existing products, limited capacity among schools to achieve the new targets, and challenges with replacing sodium in some foods given its functionality.

Low Demand for Lower Sodium Foods Outside of Schools

Both the food manufacturers and FSMCs work to assist schools in meeting other nutrition standards (e.g., whole grain). However, greater decreases to the sodium levels, require food for schools to be manufactured differently from the rest of the market, making it more challenging it for companies to help schools meet those requirements. Not only do food manufacturers supply foods to consumers in

the K–12 market, they also supply foods through a variety of other distribution channels, including any type of consumer market such as colleges and universities, restaurants, hotels/motels, healthcare institutions, convenience stores, supermarkets, sports venues, cruise ships, military facilities, and others.¹

Schools are the only market that require foods to meet this specific sodium standard, although there is some demand for such products from hospitals as well. In particular, foods that would help meet Targets 2 and 3 were identified as being difficult to obtain buy-in from a company's marketing and research and development teams to fund and support the lower sodium reformulations. Some respondents indicated that the food products for K–12 are entirely different than those products for other markets—to the extent that their company created an entirely separate product and price list only for K–12, as that was the only customer to whom they provided lower sodium products. Others agreed that, given the extreme nutritional constraints of the products, it is difficult to find distribution channels other than schools, and perhaps hospitals, to purchase them.

The perception from both food manufacturers and FSMCs is that the K–12 market sector, because of the great differences in the food formulations for children versus the general population, is no longer viewed as a guiding force in the market.

Our supply chain expert used to say ‘where K–12 goes, the rest of the world goes.’ Not so much anymore, as K–12 is such a small piece of the entire supply chain . . .

Manufacturers are not looking at school demands as applicable to other segments or channels of the foodservice industry . . . manufacturers are not motivated [to do] further sodium reductions [because] they cannot afford it. — Large FSMC

It used to be, [you would sell] things in K–12, and people would look at it for kids' menus, or sometimes there were applications for consumer brands or club stores. Now, it's like the only place you can sell these things is K–12, and sometimes for [hospital] patient bases. — Food manufacturer

These experiences may impact their subsequent ability to produce additional lower sodium food products, particularly since the wider market is likely not interested in the degree of sodium reduction that is required to meet the sodium targets.

¹ Manufacturers' Agents Association for the Foodservice Industry. (2016). *MAFSI 2016 commercial foodservice market forecast*. Retrieved from <http://www.mafsi.org/assets/MarketForecast/2016%20mafsi%20report%20final.pdf>

Frankly, in most of the consumer products, the ability to bring down sodium by 10 percent isn't that hard. But [Targets 2 and 3] are far, far different levels than what we're talking about in foodservice. So, is anybody in the consumer world looking at the types of wellness that we're talking about? No. — Food manufacturer

Schools are not a good customer for commercial distributors unless [distributors] specialize in schools. So, you're going to continue to have less and less competition. — Food manufacturer

Costs

Given the lower demand for sodium-reduced foods, a major barrier in changing these foods is the associated costs of reformulating these foods. The consensus across the FSMCs is that there are indeed higher costs and certain challenges associated with purchasing lower sodium foods. To begin, food manufacturers indicated that being the first to reformulate their food products was extremely costly and placed their company at a disadvantage by affecting price competitiveness and incurring both the cost of investment and costs associated with supply chain management. One food manufacturer explained:

All of the other companies that took 'the wait and see [approach]' benefited. — Food manufacturer

The food manufacturers noted that their competitors who were not part of the first cohort to reformulate products to help schools meet the Sodium Target 1 levels avoided development costs, including research and development, product testing, and creating new labels. The time involved in this process also impacts the overall cost involved, as noted by a number of respondents, since it is ideal to make the required changes incrementally.

Some [food manufacturers] are making the changes [to food products], if there are multiple changes to make. You can't make them all at the same time. It's really difficult to identify which ones that would work or wouldn't. So you really need a much longer process if there are multiple things to change [in food products.] — Food manufacturer

Generally, food manufacturers indicated that lower sodium foods, due to testing, reformulation, and production, simply cost more. In addition to the costs for manufacturers, respondents representing FSMCs gave a detailed account of the delicate balance between meeting regulation levels and controlling cost and quality. Most notably, one regional FSMC shared that their company absorbs the increase in food costs, raising the concern that they may need to cut their labor costs, thereby decreasing the quality of their services in order to make up the difference.

We have a set contract with a school district, so there is a budget to meet, so that district doesn't care if you have to buy a new product that is more expensive—as an FSMC, we have to absorb that cost. They don't want to hear that we may have to cut labor due to increased cost of food, which may decrease service quality. — Regional FSMC

Others noted that the costs were often passed along to the schools, which did not always plan for the added costs. Respondents, in particular the food manufacturers, indicated that USDA did not account

for all of the costs associated with the sodium targets. They believe that if they had been consulted earlier in the process, they could have communicated the various factors (e.g., cost and low demand for lower sodium foods outside of schools) that should have been taken into consideration from the beginning.

Limited School Capacity

A concern raised by some of the respondents is the limited capacity of schools to implement the changes required, particularly for the Sodium Target 3 requirements. It was the strong belief of most respondents that Target 3 requirements cannot be met through their products, thereby requiring baking and other preparation from scratch. Several food manufacturers and FSMCs shared the belief that many schools will be unprepared to do the amount of scratch cooking required of them to meet Target 3 because they have neither the necessary kitchen equipment nor staff skill set. Kitchen staff are typically not required to make foods from scratch with the current requirements and do not have the recipes, equipment, and training to increase scratch cooking. Investments in infrastructure to address these deficits will need to be made in order to achieve the Sodium Target 3 requirements.

[School kitchen] staff doesn't have the skill set to do [scratch cooking] and the schools don't have the [kitchen] equipment. — Large FSMC

Labor and food costs are the biggest challenge. [Outdated equipment in schools] is a challenge with scratch-prepared foods. The outcome is pretty, but there are hurdles [to get] there. — Regional FSMC

LIMITATIONS ON FOOD PRODUCTION

It has been difficult to decrease sodium in processed food products, including bakery items, because there is a functional purpose for sodium in certain foods (e.g., salt to strengthen gluten, baking soda to help baked goods rise).^{14, 41} One food manufacturer explained:

If it was a flavor you were enhancing, you could find things to enhance it in other ways, but if it was a functional ingredient, it made it difficult because it wouldn't perform the same . . . [The sodium] levels [for Targets 2 and 3] are such that it compromises what you're making. — Food manufacturer

Several FSMC respondents expressed similar concerns. In particular, they indicated that Target 3 may be so low in sodium that it will affect the ability to make certain products (e.g., breads). FSMCs in particular would be affected in that some food items requested by schools cannot be made. Thus, FSMCs may have a limited portfolio of food products meeting Sodium Target 3 to offer schools. As a result, schools may have difficulty providing school meals compliant with Sodium Target 3. Specifically, FSMCs indicated that because sodium is a necessary functional component needed for certain recipes to work, large reductions will affect the ability to produce certain food items.

The next targets will be extremely difficult to produce quality . . . dough products. I don't think USDA can provide solutions for bakery formulas with the restrictions on sodium that will produce quality products. The American Institute of Baking doesn't have answers, so I doubt USDA has the knowledge. — Food manufacturer

Respondents also expressed concern that the shelf life for food products will be shorter because salt is used as a preservative. Food manufacturer respondents described their previous experience eliminating *trans* fats, which resulted in shortened shelf life, to exemplify that food manufacturers have recently implemented changes that reduced the shelf life of products, and that additional reductions in sodium will reduce shelf life even more.

And again your short shelf life . . . there's certain items that took [out] the trans fat that went from a year to 6 months, and when you look at it like as a supply chain, the 6 months' shelf life is a nanosecond. — Food manufacturer

If anything, it's back in the function of what sodium does in food especially when we're having a consumer mandate out there to reduce preservatives. Then you have this second conundrum of short shelf life and spoilage. That's a real problem. — Food manufacturer

Topic 2. Communication and Outreach Efforts from Food Industry

Two themes were noted concerning the communication and outreach efforts of the food industry, including that FSMCs serve as the conduit of information between the food manufacturers and schools, and that several different methods are used for communicating about and training on lower sodium.

FSMCS AS THE LIAISON BETWEEN MANUFACTURERS AND THE SCHOOLS

As depicted in Figure 1, the FSMCs are in contact with both the food manufacturers and SFAs/school districts and serve as the key conduit for information between the organizations. For the sodium targets to be implemented, it is often the FSMC that communicates with manufacturers about the necessary changes for foods sold to schools. Large FSMCs, with a larger market base, reported having a more collaborative relationship with food manufacturers, whereas Regional FSMCs described encountering challenges to establishing similar collaborations with food manufacturers. Two Regional FSMCs stated that it has been difficult to influence food manufacturers to make the necessary lower sodium changes and, specifically, to get food manufacturers to provide their company with a variety of available food products.

With regard to communicating lower sodium product information and availability to SFAs (including school districts, schools, and students), food manufacturers and FSMCs view their company's roles differently. Whereas two food manufacturers largely leave messaging about sodium content of meals to the school foodservice directors, FSMCs provide information on the meals and food products directly to SFAs and students. To illustrate, one food manufacturer stated their company is the expert on individual products, whereas the foodservice directors know the overall sodium content of school meals and know their student audiences best:

[The school foodservice directors] are looking at [the sodium] as a total over the week, or over the menu . . . they're looking at the milligrams [of sodium] that you provide, and then they've got to fit it into their meal patterns. But yeah, we're not going to put it on something because they're not going to serve that one item. They're going to serve that [in] combination with other items. So we really can't make those kind of statements. We can't say, you know, 'your meal was low-sodium' because we don't know. We only know what we're—our product contributes. It's up to them to determine that [overall amount].
— Food manufacturer

METHODS OF COMMUNICATION AND TRAINING

Communications from food manufacturers on their changes to foods are primarily provided directly to FSMCs and indirectly to the SFA/school districts and students. Since food manufacturers typically do not correspond directly with schools or students, they rely on providing product information through their website. One food manufacturer indicated that their company updates their website as new products become available and that the Global Traded Item Number (GTIN) is readily available upon request.

In contrast, FSMCs engage in more direct communication with SFAs and students about general nutrition, and use positive framing to encourage lower sodium consumption. Both large and regional FSMCs reported using various methods to communicate with SFAs, school districts, schools, and students, including print materials, trainings, presentations and cooking demonstrations, and web-based materials. Information shared typically focuses on detailing the new regulations and how their company adjusts menus, products, and recipes to help schools meet the sodium levels. Another Regional FSMC stated that they strive to provide “turnkey” materials for school foodservice directors. One Large FSMC stated that their company produces a quarterly series of printed materials that provide information on general nutrition and distributes the materials to parents and community members.

Perhaps the most novel approach to using the web for communication is that of one Large FSMC that reported using their web and mobile application to provide students with information to help them make informed food choices for their health and nutritional preferences. They shared:

[We] tell the story of our food through . . . our web and mobile app. [Our web and mobile app] is a powerful tool that puts the menu, nutrition, and allergen information into the palm of students' hands. This enables us to deliver nutrition and food education that drives healthful decision making. In addition, each menu item is brought to life through real food photography taken by [our] chefs in schools, as well as videos and recipe descriptions. — Large FSMC

One of FSMCs' most frequently cited way of communicating with SFAs and schools was through training sessions; four FSMCs reported using this method. One Regional FSMC reported that their company provides trainings to foodservice directors and menu planners. Another Regional FSMC hosts an in-person training with school districts. Both Regional FSMCs offer the training in an online format through programs such as WebEx and SchooX.² The trainings include guidance on how to reduce sodium, and range from a 30-minute SchooX online training to a 3-day in-person training. One Large FSMC provides a

² More information about this product available at: <https://www.schoox.com>

training to foodservice directors using the “train-the-trainer” approach. Another Large FSMC stated that, in addition to online and in-person trainings for schools, their company offers technical training on culinary arts designed for foodservice operators and workers.

Presentations and live demonstrations are also used by FSMCs to convey general nutrition information, as well as changes in the nutrition levels of school meals to SFAs and schools. A total of four FSMCs, two Large and two Regional, reported using presentations or cooking demonstrations. One Regional FSMC stated that they primarily give presentations on the sodium levels at school board meetings and wellness team meetings. The second Regional FSMC cited that their company educates school administration on sodium levels, costs that will be incurred to meet the sodium levels, and the equipment that will facilitate preparation of foods that meet Sodium Target 1 levels. One Large FSMC reported that their company provides regular cooking exhibits for students through food demonstration tables in school cafes and classroom visits. The second Large FSMC offers a whole host of live demonstrations, including culinary demonstrations, presentations at health fairs, adult nutrition classes, and student nutrition courses.

In addition to the one large FSMC above who uses their web and mobile application to provide students with nutrition and food education, two FSMCs described using web-based materials to communicate with SFAs and schools. A commonly mentioned method was the use of videos. One Regional FSMC stated that their company’s website features 2- to 4-minute vignettes on a variety of topics and demonstrations of food preparation techniques, one of which demonstrated how to enhance flavor in foods like vegetables without adding sodium. One Large FSMC reported using a similar technique; their company produces videos with a chef providing cooking demonstrations.

Training for FSMC staff to help support SFAs to meet the meal requirements also included food and beverage sources, how to identify the sodium content of foods and package labeling, recipe development with an emphasis on avoiding added sodium using other flavor enhancers, smart menu planning, and meal cost management. One Large FSMC also reported supplementing their trainings with USDA webinars.

Topic 3: Technical Assistance Received from USDA FNS

Several themes emerged surrounding the types of support the food manufacturers and FSMCs noted would be beneficial to receive from FNS in order to implement the sodium targets more effectively. Food manufacturers consistently noted how frustrated they were with not being included in the process of establishing the sodium targets, and requested to be “at the table” when decisions are being made with regard to food they will ultimately be supplying. Types of education, support, or technical expertise that FNS could provide are divided across the following two themes: (1) providing more informational materials on the rationale behind the sodium reductions, as well as practical strategies for effectively communicating the reductions; and (2) provision of consistent training across the food distribution supply chain.

PROVIDE PRODUCTS AND INFORMATIONAL MATERIALS

Respondents made suggestions for information from FNS in the areas of (1) documentation of the research that supports the targeted sodium reductions for children; and (2) materials or tools that can

be used to effectively communicate the changes to other stakeholders across the food supply chain, such as school personnel, including SFAs, as well as students, parents, and the larger community.

Several respondents representing either food manufacturers or FSMCs expressed that they would like to be provided with information indicating that the amount of sodium reduction required to meet Sodium Targets 2 and 3 has been substantiated by research. For example, one food manufacturer stated that “there’s no scientific evidence” to support the sodium reductions. A second food manufacturer indicated that they would like USDA to “make sure they have the science” before implementing the additional sodium targets. Further, one Regional FSMC believed that:

Research shows restricting sodium in diets doesn’t affect health. [The] current recommendations are good. Further restrictions don’t reflect current research. [Sodium Targets 2 and 3 do not] reflect any research on children. — Regional FSMC

Food manufacturers also indicated that not only would they like to see scientific research in support of Sodium Targets 2 and 3, but that they would also like information on the safety of salt substitutes. In particular, one food manufacturer shared that they would like to see the development of a “cost-effective, safe salt substitute,” though respondents also expressed concern that this approach may be in conflict with providing “clean labels” (i.e., foods that do not contain artificial ingredients). A second food manufacturer noted that:

When each of us get to those very low-sodium levels, you now start to push people past that [process of] just taking salt out of various things or adding in herbs and spices. Now you start going towards things like testing chloride and moving away from clean labels to actually adding more ingredients [with] longer names. — Food manufacturer

Regarding the messaging around the sodium reduction targets, two FSMCs (one Regional and one Large) indicated that they would like for FNS to provide them with materials they can use to help communicate and describe the sodium targets with lay people, including (1) parents and community; (2) students; and (3) school personnel, including school district officials and boards. These FSMCs had specific feedback about what form and topics should be covered for each of the three groups of lay people identified. These are described below:

- **Parents and Community:** One Large FSMC indicated that communication should take the form of a newsletter that is publicly available, as “many parents do not understand or believe that their children may have a shorter lifespan than [their parents] due to [their child’s] diet.” The following topics were suggested:
 - The health benefits of limiting sodium intake at all ages, with key statistics
 - How school meals and family meals fit together for healthy eating
 - The functions that sodium provides in various foods; when it can be eliminated, and when it is naturally occurring
 - Debunking myths (e.g., explaining that sea salt actually does contain sodium)
- **Students:** One Large FSMC suggested that there should be an integrated health curriculum for students to help schools “see the bigger picture [with regard to health and nutrition], and how nutrition and healthy eating can be taught continuously in each grade from a coordinated age-specific master curriculum.”

- **School Personnel:** For school personnel, such as board members, superintendents, principals, teachers, and school district officials, one Large FSMC suggested that USDA provide FSMCs with single-page summary papers (with references) that can be used to educate this audience about the need for nutrition targets and the long-term benefits to schools and communities from “a sound, scientific perspective.” One Regional FSMC suggested that sample letters be provided by USDA that describe, in layman’s terms, the regulations to school district officials and boards to help “avoid pushback” on the sodium targets from school personnel.

Finally, two Large FSMCs indicated that they would like assistance from USDA regarding recipe modification. One Regional FSMC suggested a revision of the USDA recipes to eliminate unnecessary sodium and incorporate flavorful ingredients, based on student trend data. One Large FSMC similarly suggested that USDA assist FSMCs to identify the most popular food items on school menus, examine their sodium content, and help determine what can realistically be done to reduce sodium content so that these items are in compliance with the sodium regulations. Similarly, one Large FSMC indicated that they would like information from FNS USDA about the top food products that have reduced sodium, their degree of acceptance by students,³ and how the reduced sodium affects the functionality of the foods.

DEVELOP TRAINING MATERIALS

Although some food manufacturers and FSMCs utilize trainings from USDA such as the new FNS PartnerWeb and USDA webinars, many noted that their employees generally do not use these trainings and requested additional resources from FNS. In particular, one food manufacturer indicated that they would like USDA to provide a “side-by-side, up-to-date comparison of [the sodium] levels” because there are too many different documents to track. Although one large FSMC acknowledged that there are many materials available from USDA, they indicated that they would like a more streamlined approach for finding and downloading the USDA materials, as this process is often difficult and time-consuming.

In addition to being able to better utilize the currently available trainings from USDA, some food manufacturers believe that there is a need for consistency in the communication of the sodium targets across the different levels of the distribution supply chain—including those responsible for CN labeling (an FNS program that evaluates a product's formulation to determine its contribution toward meal patterns requirements and allows manufacturers to provide this contribution on their labels), State agencies, and those working with the technical aspects of the regulations—so that all receive the same messaging and information. (See Figure 1 for a depiction of the different levels of the food distribution supply chain.) One food manufacturer suggested that USDA provide the training on the sodium targets to the States and companies within the food industry at the same time so that the food manufacturers will have a clear understanding of what is being communicated to the other groups in the supply chain. In particular, this food manufacturer said:

³ To be collected among the SFAs participating in Objective 2 of the current study

I want to see what USDA is providing for training to States. I want to see that, and they should be communicating that same thing to industry at the exact same time, so we know what our directors are facing . . . I want the opportunity to listen in and have a written [document] of what they say so when my customers have a problem I can say ‘Hold on. Hold on. I can help you with that.’ That’s what I want. I want to know [what is being communicated to the States.] — Food manufacturer

Allowing food manufacturers to view the training for States may also alleviate one food manufacturer’s perception that State agencies have the “flexibility to reinterpret [the sodium] regulations.”

Similarly, one Regional FSMC suggested that USDA provide FSMCs with access to the sodium levels guidance provided for State agencies. This will allow them to better assist in the creation and offering of lower sodium products. This strategy would also allow all groups in the distribution supply chain to understand the entire picture in terms of how they should be working together and communicating with one another. Overall, food manufacturers and FSMCs want to understand what is being communicated to all members of the supply chain, and food manufacturers, in particular, want consistent and clear messaging. Finally, food manufacturers indicated that they would like a more streamlined feedback process than is currently offered by the USDA, to enable them to convey concerns or needs more efficiently.

Lastly, one Large FSMC indicated that school food staff should also be the recipients of training to help them prepare healthier foods, and that this area “is most lacking is information and training designed to enhance the skills of the foodservice staff who are preparing and serving the foods to students.” This Large FSMC further suggested that short lessons be developed for foodservice staff on “hands-on” topics, such as how to read recipes, how to substitute ingredients, or how much of a specific herb to add as replacement for salt, which would be particularly helpful to increase the foodservice staff’s capability of preparing lower sodium meals. Finally, they suggested that:

. . . [having] State agency personnel in schools working with managers (i.e., train-the-trainer) and staff would be a huge support in helping us reach as many folks as possible to get this message entrenched in schools. — Large FSMC

Conclusions

A total of 16 respondents representing either food manufacturing companies or FSMCs participated in a focus group or individual interviews to answer questions specific to three topic areas:

1. Availability of lower sodium foods for schools
2. Communication and/or outreach efforts from the food industry
3. Technical assistance needed from FNS

Although the sample size for this study is small, important themes emerged across respondents for each of these topic areas that deserve attention. Limitations of this study include the small sample size and the extent to which those selected for participation are similar to other food manufacturer and FSMC staff in the country. There was also a limited number of respondents from each type of participant, such that the Study Team is unable to draw comparisons between Large and Regional FSMCs or about food

manufacturers overall. Limited data were collected from focus group respondents; there are no characteristics specified about the participants (e.g., type of management position, years in industry). Conclusions around each of these topic areas are presented in the following section.

AVAILABILITY OF LOWER SODIUM FOODS

Food manufacturers were able to produce food products that helped schools meet Sodium Target 1 with relative ease since they identified strategies for reducing sodium prior to implementation of the policy change. Food manufacturers, in particular, expressed frustration with how the sodium targets were set, because they felt that the food industry was not considered nor consulted with respect to a feasible time frame in which to meet the targets, as well as how the targets would impact their business. Despite their frustration, both Large and Regional FSMCs reported that they were able to help their SFAs meet Sodium Target 1 without much difficulty, likely because foods lower in sodium were already in production by the food manufacturers. Most respondents shared that as the specified sodium levels decrease with the subsequent Targets, it will become increasingly challenging for them to meet the requirements. Few respondents shared that they will be able to meet Sodium Target 2 for some of their foods by the established deadline; none felt they would be able to offer enough foods that would provide for meals that meet Sodium Target 3.

Respondents shared three facilitators that have helped to ensure timely changes to meet each sodium target, including (1) the time they spent planning for meeting the first target, (2) the use of taste testing as a strategy to produce foods acceptable to students, and (3) the ability to approach the change at a system level. Most food manufacturer respondents shared that their companies had spent time changing foods over the past few years to meet reductions in *trans* fats, for example, while at the same time planning for reductions in sodium. Foods where sodium does not serve a functional purpose (e.g., for flavor) or is not naturally occurring (e.g., dairy products) are the easiest for the food manufacturers to change sodium levels, whereas baked goods (e.g., breads) or food items where sodium is used to help with preservation (e.g., deli meats) are more difficult to alter, since it changes the overall food formulation. When new foods were added to their product line or current foods were reformulated, all respondents reported the importance of taste testing with students prior to mass production. System level changes will be particularly important when the sodium targets move to the third level, as this will require drastic changes in the preparation and assembling of foods.

Food manufacturers and FSMCs both shared that changing the sodium content of foods can take a great deal of time and has high costs that must be absorbed by key players in the food distribution chain. Cost was the barrier most commonly reported by respondents. Not only is it expensive to produce new foods lower in sodium, but it adds costs if a company is the first to develop and test a product that is then replicated by others. Therefore, it does not pay to be a leader in manufacturing new products that help to meet lower sodium levels.

There were several other barriers reported by three or more respondents in terms of achieving the lower sodium levels, including the low demand for these foods outside of the school system, limited school capacity, and limitations to food production when less sodium is used. Food manufacturer respondents shared that the school systems are only one segment of the consumer market since they serve restaurants and medical facilities, among others. Since the school market represents a fairly low proportion of the companies' overall markets, respondents indicated that it is sometimes difficult to

enlist leadership support to change products, particularly when people outside the school market are not likely to adopt the new products. Without those sales outside of the school market, a company has to assess whether the cost to produce a new item is worth the benefit of the income from the school systems. Respondents indicated that as the required sodium levels decrease, it will be harder for them to justify to their leadership the return on investment for making the changes.

In addition, both FSMCs and food manufacturers indicated that Sodium Target 2, and particularly Target 3, will require scratch cooking and other methods for cooking such as replacing salt with herbs and spices. Respondents indicated that many schools are ill-equipped to engage in the amount of scratch cooking that will likely be needed. In particular, they noted that schools do not have the necessary kitchen equipment, nor the budget to purchase necessary kitchen equipment, nor do many kitchen staff have the skillset for scratch cooking.

Food manufacturers indicated that making changes to the sodium content of many of their products will take a great deal of time and money due to the research and development process, as well as taste testing. Further, the food suppliers also noted that the food distribution chain is already full with current food products that were used by schools to meet the previous nutrition levels. When new targets are implemented, the current products either need to be sold to industries other than K–12 or sold at a discount to K–12. Food manufacturers indicated that this may be difficult, as the lower sodium foods that are sold to K–12 are not in demand in other service channels, except for perhaps some hospitals. One food manufacturer noted that it may take up to 18 months for depletion to occur. Additional costs result from the distributors' current products no longer meeting the most recent sodium specifications. More time is added when additional pretesting of items must occur. One respondent stated that it might take up to 5 years to complete the full process of product development. Therefore, it may take some time before the lower sodium products actually enter the school retail market (commercial and noncommercial).

COMMUNICATION AND OUTREACH EFFORTS FROM THE FOOD INDUSTRY

FSMCs and food manufacturers perceive their interaction with SFAs as differing roles. Food manufacturers tend to leave the messaging of lower sodium to the SFAs because they are the ones responsible for creating complete meals that meet the sodium standards, whereas FSMCs provide the nutritional information of meals and food products directly to SFAs and students. Whereas FSMCs have more direct interaction and directly support SFAs to meet nutrition levels, food manufacturers largely view their role as indirect, where they create and produce the food products that help meet the nutrition levels. However, in some instances, food manufacturers will directly interact with SFAs, such as if SFAs specifically ask food manufacturers for information regarding the content of their food products.

More specifically, whereas food manufacturers typically communicate information about their food products with SFAs or students more indirectly through their website, FSMCs use a variety of communication methods. These communication methods include print materials, presentations and cooking demonstrations, and web-based materials. Particularly novel was the use of a web and mobile application for students that communicates a whole host of information about the foods served, including nutrition and allergen information. Further, trainings were one of the most frequently cited ways that FSMCs reported communicating about how to create menus that meet the lower sodium standards and interacting with SFAs.

TECHNICAL ASSISTANCE RECEIVED FROM USDA FNS

Food manufacturers, and particularly FSMCs, indicated that they would like more materials to help communicate the sodium changes to their customers in the format of informational material and training materials.

Respondents indicated that they would like to have information that the sodium levels required by Sodium Targets 2 and 3 are substantiated by research. Food manufacturers, in particular, stated that they would like more research and information on the safety of salt substitutes and their effects on health.

With regard to FNS providing support to FSMCs in communicating sodium reduction, several respondents indicated that they would like materials to help communicate and describe the new sodium targets with (1) parents and the community, (2) students, (3) and school personnel. Other respondents noted that they would like assistance from FNS in the form of web trainings that could be viewed at any time and accessed by more people more quickly than in-person trainings. FSMCs also suggested that FNS could support them through revising the USDA recipes and through identifying reduced sodium products that are popular with students.

Both food manufacturers and FSMCs suggested that FNS could provide them with additional training on the sodium targets, including a side-by-side comparison of the sodium levels and a more streamlined approach for finding and downloading current USDA training and resources. Food manufacturers also indicated that they would like to have the training that is provided to States shared with them so that they have a better understanding of what is being communicated across the entire food distribution chain. Food manufacturers suggested there be a more streamlined process for providing USDA FNS with concerns or needs they have in a more efficient manner.

CHAPTER 2. DETAILED FINDINGS ON APPROACHES USED BY SELECTED SFAS TO REDUCE SODIUM IN SCHOOL MEALS

Overview

As described in the *Successful Approaches to Reduce Sodium in School Meals: Final Report*, the Objective 2 study phase sought to assist USDA in identifying successful sodium reduction strategies employed by schools that have met Target 1 sodium standards and that have met (or are close to meeting) the Target 2 limit. This Appendix provides additional, detailed findings for that phase of the study, which sought to identify best practices among SFAs developing lower sodium menus in school districts that are successfully meeting the sodium targets, with the goal of informing the efforts of other SFAs working toward meeting the sodium standards. Based on the experiences of the 36 SFAs selected for the study, this Appendix provides insight into the strategies, challenges, lessons learned, and factors associated with success in meeting the sodium standards. This Appendix describes emerging, promising practices that schools are using to successfully meet sodium targets, as well as the resources needed to overcome common barriers.

To examine emerging best practices among SFAs that were successfully meeting the Target 2 sodium standards at the time of the data collection (SY 2016–2017), data for Objective 2 were collected in mid-2017 from a sample of 36 SFAs in which all schools were meeting Target 1 and were close to or meeting sodium Target 2 standards. The Study Team conducted a total of 118 in-depth interviews with respondents in the 36 SFAs, including (1) the SFA director, (2) a school employee, (3) a food supplier, and/or (4) a community-based stakeholder (such as a parent, community member, school board member, or nonemployee member of a school wellness committee). In addition to these 118 interviews, the Study Team conducted in-person site visits at a subsample of 10 SFAs. The methods used to select and recruit these respondents and analyze these data are described in detail in the *Successful Approaches to Reduce Sodium in School Meals: Final Report*.

Qualitative data collection methods were used to examine each of the research questions presented in Table 2.

Table 2. Research Questions for the Objective 2 Phase

Research Questions	
1	What are the strategies, tools, and best practices that could be used to provide technical assistance to SFAs and schools trying to meet the sodium standards for school meals?
2	What technical assistance could USDA FNS provide SFAs and schools to help them meet the sodium requirements? Is there assistance available now that has been helpful in meeting the sodium requirements?
3	Are SFAs meeting sodium standards through recipe modification, or by purchasing lower sodium foods, or both? Are specific components of meals driving up the average daily sodium amount for school lunches?
4	What products and recipes have gained the greatest student acceptance? What specific strategies, tools, and resources have been used to gain such student acceptance?
5	What products and recipes have not gained student acceptance?
6	How does the use of USDA Food Program and/or the USDA Department of Defense Fresh Fruit and Vegetable Program relate to meeting the sodium standards (i.e., do the programs help SFAs meet sodium standards)?
7	Do schools have difficulty finding and purchasing lower sodium foods? What types of products are the most difficult to procure? What do schools wish they had? What exactly are the challenges?
8	Are schools working with the food industry/distributors/producers to develop/reformulate menus or products? Are there other ways that the food industry has supported SFAs (e.g., going into schools to help with taste testing, providing menus or recipes)?
9	Are schools incorporating more scratch cooking, or planning to do so in the future?
10	Did any SFAs meet the Target 1 sodium standards before implementation was required in SY 2014–2015? ¹
11	Do you think SFAs will be able to continue lowering sodium levels in school lunches in the future, such as to meet Sodium Targets 2 and 3?
12	Does the type of school (i.e., elementary, middle, high school) play a role in meeting the sodium standards for school meal?
13	Does geographic region or urbanicity play a role in meeting sodium standards? What are the specific barriers faced by geographic region, large vs. small districts, or urban vs. rural locales?
14	Does the method of procurement system affect ability to purchase lower sodium foods?
¹ Note: In the Objective 2 study, research question 10 was asked only of SFA directors and school employees.	

The following discussion presents the detailed findings for the Objective 2 phase of the study.

Topic 1. Specific Strategies Used by SFAs to Reduce Sodium

This discussion presents a summary of the five core strategies used by the selected SFAs to reduce sodium in school meals:

1. Food Procurement
2. Food Supplier Interactions
3. Effective Menu Planning
4. Changing Food Preparation Methods
5. Involving Stakeholders (Students, Staff, Parents, and Community Members) in Sodium Changes to Gain Acceptance

Each of the five core strategies encompasses multiple practices used to meet the sodium targets. Table 3 below illustrates the groupings of the practices under the respective core strategy.

Table 3. Five Core Strategies and Respective Practices Implemented by SFAs

Core Strategy/Practice
Food Procurement
USDA DoD Fresh
USDA Foods
Food buying co-op or group purchasing entity
Food Supplier Interactions
Working with food suppliers on product reformulation and procurement
Attending trade shows and conferences
Using Effective Menu Planning
Using more fresh and/or frozen fruits and vegetables
Using lower sodium products
Modifying recipes already in use or developing new recipes
Implementing a self-serve condiment station or providing individual condiment packets
Changing Food Preparation Methods
Cooking with more herbs and spices
Maintaining or increasing the use of scratch cooking
Involving Stakeholders (Students, Staff, Parents, and/or Community Members) in Sodium Changes to Gain Acceptance
Obtaining feedback from students, staff, parents, and/or community members on new menu items
Conducting taste tests with students
Bringing in local chefs to teach about cooking

Qualitative and quantitative data collected for each of the strategies and practices provide greater detail of the approaches and methods used by the 36 SFAs to meet sodium targets. First, the quantitative data depict the frequency of SFAs' implementation of each of the strategies and identify the most effective strategies used to reduce sodium in school meals. Next, the qualitative data describe each core strategy and detail the implementation of the practices. Each core strategy discussed involves a series of unique interactions between SFA directors, school food service staff, kitchen staff, food suppliers, school staff, students, and even informed community members. This discussion assesses the challenges and successes schools and school districts have experienced while working to meet the sodium standards, with attention paid to the key factors and resources supporting implementation, as well as the emerging barriers SFAs have experienced.

OVERVIEW OF SFA UTILIZATION AND EFFECTIVENESS OF CORE STRATEGIES AND PRACTICES

During the selection process for the 36 sampled sites, SFAs were asked to identify all implemented practices under the five core strategies. These data provide context for the qualitative findings regarding the implementation of the core strategies and the respective practices. Table 4 below presents the number of SFAs employing each of the core strategies and their reported sodium target, respectively.

Table 4. Number of SFAs Implementing Core Strategy, by Sodium Target

Core Strategy	Sodium Target Level ⁴			Total (N = 36) ^a
	Meeting Target 1 (n = 0)	Close to or Meeting Target 2 (n = 31)	Close to or Meeting Target 3 (n = 5)	
Food Procurement	---	30	5	35
Food Supplier Interactions	---	27	5	32
Using Effective Menu Planning	---	31	5	36
Changing Food Preparation Methods	---	29	3	32
Involving Stakeholders (Students, Staff, Parents, and/or Community Members) in Sodium Changes to Gain Acceptance	---	31	4	35

Note: Totals represent the number of SFAs who reported using strategies and may not equal 100 percent of the SFA sample due to variability in frequency of implementation.

Using effective menu planning was the most commonly reported core strategy implemented by SFAs to come close to or meeting sodium Target 2. Food procurement, food supplier interactions, and effective menu planning may have greater impact SFA's abilities to reach sodium Target 2. Changing food preparation methods was the least commonly reported strategy implemented by the 36 SFAs.

Additionally, the 36 sampled SFAs were asked to rank five of the reported, implemented practices based on their effectiveness. Table 5 presents the core strategies included in the top five rankings across the SFAs and the reported sodium target. The core strategy rankings reveal that using effective menu planning may be more instrumental in achieving further sodium reduction than the other commonly utilized strategies of food procurement and food supplier interactions. Consistent with the overall usage of core strategies, food procurement strategies and food supplier interactions were commonly reported as effective strategies to reduce sodium in school meals.

⁴ Note: The School Type Sodium Target level is a composite variable that describes each SFA's overall Sodium Target level, by school type, across all schools within each school type for each SFA.

Table 5. Number of SFAs Noting Core Strategy in Top Five, by Reported Target

Core Strategy	Sodium Target Level			Total (N = 36) ^a
	Meeting Target 1 (n = 0)	Close to or Meeting Target 2 (n = 31)	Close to or Meeting Target 3 (n = 5)	
Food Procurement	---	20	3	23
Food Supplier Interactions	---	8	2	10
Using Effective Menu Planning	---	28	5	33
Changing Food Preparation Methods	---	15	1	16
Involving Stakeholders (Students, Staff, Parents, and/or Community Members) in Sodium Changes to Gain Acceptance	---	11	1	12

The following discussion presents the qualitative findings for each of the core strategies and practices presented above. Each core strategy discussed involves a series of unique interactions between SFA directors, school food service staff, kitchen staff, food suppliers, school staff, students, and even informed community members. It provides additional insights into the challenges and successes schools and school districts have experienced while working to meet the sodium standards, with attention paid to the key factors and resources supporting implementation.

1. FOOD PROCUREMENT STRATEGIES

Overview of the Core Strategy

One strategy that SFAs used to meet the Target 2 sodium standards was procurement mechanisms. Procurement options vary across States and SFAs; schools can competitively solicit proposals and bids, participate in group purchasing entities and cooperative agreements, and use their entitlement funds to obtain foods via USDA DoD Fresh and USDA Foods.

Food procurement involves the use of key federal programs developed to support cost-effective purchases and distribution of fresh fruit and vegetables, canned items, and meats, as well as the development and use of food buying co-ops or group purchasing arrangements by SFAs aimed at increasing collective purchasing power. The food procurement practices discussed include the following:

- Obtaining foods from USDA DoD Fresh and USDA Foods⁵
- Utilizing group purchasing entities (co-ops or third-party services)⁶

⁵ Not all of the 36 SFAs in the study had access to USDA DOD Fresh.

⁶ Most food for school meals is not purchased in any of these ways; most is competitively procured. About 20 percent of school food is obtained via USDA DoD Fresh and USDA Foods in total. The study included both food service management companies and local vendors as practices to reduce sodium. However, neither of these practices were well-used by the 36 SFAs in the report, nor ranked in their top five, thus there is not a specific discussion of these options in the report.

This discussion provides an overview of how SFAs implemented the practices that were most used, highlighting critical resources, barriers, and corresponding facilitators used to reach Target 2 sodium targets.

Obtaining Foods from USDA DoD Fresh and USDA Foods

The majority of SFAs in the study reported participation in the USDA DoD Fresh and USDA Foods programs. SFAs utilized these programs to assist in reducing sodium in school meals, primarily by maximizing their ability to purchase lower sodium items such as beef, pork, fish, poultry, egg products, fruits, vegetables, grains, nuts, seeds, dairy products, and oils (USDA FNS, 2017). SFAs can utilize their entitlement dollars to buy American-grown fresh fruits and vegetables through USDA DoD Fresh, and food products, in addition to produce, from USDA Foods (USDA FNS, 2016). USDA Foods has a dual mission of supporting domestic agriculture and providing healthy foods to schools. Offerings include a variety of fresh, frozen, canned, and dried fruits and vegetables; lean meats; peanut butter; whole wheat grain products; and cheeses. In order to access food items, each State is allocated a certain amount of money, or “entitlement value,” to order USDA Foods, based on the number of lunches served in the previous school year. In FY 2014, \$1.4 billion in USDA Foods went to schools; in any given year, about 10–15 percent of the value of food served through NSLP comes from USDA Foods. USDA DoD Fresh allows schools to use their USDA Foods entitlement funds to order fresh, and often local, produce (USDA FNS, 2015). Participating vendors provide SFAs with an online catalog of produce available to them, which varies by location. SFAs can identify which purchases meet their needs and food items typically arrive on a weekly or biweekly basis. USDA procures items for SFAs through planned purchases; therefore, food items procured through USDA DoD Fresh and USDA Foods can be lower in cost than similar products on the commercial market.

The study asked the 36 SFAs about the degree to which they utilized these procurement approaches specifically as strategies for reducing sodium in school meals. While SFAs may have utilized USDA DoD Fresh or USDA Foods prior to this study to assist in their procurement strategies, the majority of SFAs in the study viewed both USDA DoD Fresh and USDA Foods as a part of their procurement-based approaches for reducing sodium in school meals. Most SFAs used USDA Foods as a strategy to assist in reducing sodium in school meals, primarily by maximizing their ability to purchase lower sodium foods available through the program such as beef, pork, fish, poultry, egg products, fruits, vegetables, grains, nuts, seeds, dairy products, and oils (USDA FNS, 2017). The majority of SFAs with access to the programs also reported a similar finding for USDA DoD Fresh.

Implementing USDA Foods and USDA DoD Fresh as an Approach for Reducing Sodium in School Meals

SFAs reported utilizing both procurement programs to order fresh, frozen, and canned lower sodium produce for immediate use as components in meals that were lower in sodium. Raw lower sodium products, primarily raw meats and cheeses, were also obtained through USDA Foods, processed by SFAs, and then included as lower sodium meal components. Most SFAs said they arranged the produce obtained through these procurement programs into “appealing displays” on salad bars or “grab-and-go” stations that allowed students to choose which produce they wanted. Some SFAs reported preparing the produce received through these programs in new ways, such as roasting, steaming, or incorporating with other, well-liked items, or even adding a lower sodium dipping sauce, such as ranch dressing, to encourage intake.

SFAs reported making necessary staffing and infrastructure changes to be able to take full advantage of USDA Foods and in particular, USDA DoD Fresh. These changes included lengthening food preparation time; securing additional space for preparation and storage (e.g., adequate refrigeration); providing specialized training to cafeteria staff on proper handling and preparation of raw foods; and balancing staffing levels.

Barriers and Successes in Implementation

The most common challenges experienced by SFAs implementing USDA Foods or USDA DoD Fresh were related to cost and management of entitlement funds. Many of the SFAs participating in the programs described difficulty in budgeting entitlement funds over an entire school year, or with budgeting when prices fluctuate. Additional barriers to implementation included the limited availability of popular items due to seasonality. Several SFAs using the program described instances where they had received USDA Foods/USDA DoD Fresh deliveries of inconsistent and unpredictable quality, and as a result, needed to purchase items at the last minute from commercial sources at more expensive prices.⁷ Some SFAs described additional challenges, including incomplete orders and unanticipated changes in products and food suppliers due to discontinuation or modifications of foods. A notable challenge described by some SFAs using USDA Foods was a frustration with the ordering deadlines, which were often well in advance of delivery, often up to 1 year. As a result, these SFAs experienced challenges in planning new menus that incorporated additional lower sodium items/recipes, as they had little to no advance time to test or experiment with newer recipes before having to place an order. These SFAs described being left with significant quantities of food items that required alternative approaches for utilization as a result. These SFAs would have preferred some flexibility in the ordering deadlines to help them limit the quantities of items ordered for recipes that eventually proved unsuccessful.

Most SFAs reported several benefits to USDA Foods/USDA DoD Fresh participation, including reduced produce cost, access to a wide variety of produce, access to a wide variety of other lower sodium food items, increased student engagement, and reduced reliance on canned or frozen fruit or vegetables. Many SFAs specifically indicated that USDA DoD Fresh was a critical procurement vehicle that reduced fruit and vegetable costs. Participation in the program provided access to wide variety of produce that could be integrated in school meals as substitutes for higher sodium items. Nearly half of the SFAs using this practice considered use of the USDA DoD Fresh program to be a successful means to reduce sodium because it eliminated or reduced their dependence on canned and frozen fruits and vegetables, which have added sodium. Many of the SFAs using USDA DoD Fresh indicated that the quality of the produce received via the program helped entice students to consume items that were new to them because of the visual appeal and freshness of the produce. Similar benefits were described regarding participation in USDA Foods. The majority of SFAs reported that obtaining lower sodium items through USDA Foods was an easy way to source versatile items they could use for multiple purposes, supporting flexibility in menu planning in a cost-effective manner.

⁷ The report does not use the terminology “micro-purchasing” as it was not specifically used by respondents, but this is what was alluded to by those SFAs describing this occurrence.

The variety [. . .] that DoD has available is very advantageous in opening their [students'] mind to a tray that has more color. . . if you've cut down on the sodium in their main entrée and added new colors and shapes and variety on their trays and fruits and vegetables, they're becoming more educated consumers. — SFA Director 2059

Many of the SFAs using either or both programs indicated that the overall quality of the food items, and specifically the quality of the produce received via USDA DoD Fresh, helped entice students to consume items that are new to them because of their visual appeal and freshness.

Summary of the Practice

The USDA DoD Fresh and USDA Foods programs are valuable resources for the majority of the SFAs in the study, who dedicated entitlement dollars to these programs to purchase fresh or frozen produce and lower sodium products to offset the use of higher sodium menu items in school meals. The majority of the SFAs indicated that the programs were key to reducing produce and product costs, and that they utilized the program(s) to support efforts to reduce sodium in school meals. The most noted challenges for SFAs were managing the budget and costs associated with using the programs, a lack of necessary storage space, and the limited availability of certain types of popular food items.

Food Buying Co-op or Group Purchasing Entity

Based on responses from SFAs to the study questions, there were two main types of collective purchasing arrangements that SFAs reported using: (1) food buying co-ops, an arrangement of two or more schools/SFAs that combined their purchasing requirements and collectively issued a bid package for goods or services; and (2) group purchasing entities, where a third-party organization brought together multiple schools and helped manage the issuance of bid packages/requests for proposals (RFPs).⁸ Participation in food buying co-ops and group purchasing entities was sometimes free, but sometimes required a membership fee.

Utilizing Food Buying Co-Ops or Group Purchasing Entities as an Approach for Reducing Sodium in School Meals

Most SFAs using this practice stated that it allowed them to leverage collective buying power to find and gain access to a wide variety of lower sodium products, and to obtain high-quality lower sodium products, fruits, and vegetables in bulk and at lower prices. SFAs used these arrangements to improve purchasing power by buying produce in bulk with other schools and school districts and to procure items under the direction of selection committees. SFAs developed committees to direct the selection process of food products to be included on co-op bids and made available to participating SFAs. These committees selected compliant, lower sodium products to appeal to the SFA buyers, streamlining the refinement process employed by SFAs by narrowing the pool of food products which might otherwise be aimed at a broader audience of commercial buyers in comparison to other procurement mechanisms. Some SFAs also described the strategy of creating a collaborative network to share information on procurement in general and to source lower sodium items specifically. Additional advantages included ease in the overall process of procurement, particularly in terms of cost and coordination of shipping foods and flexibility in ordering.

⁸ The RFP developed by SFAs allows SFAs to include subjective criteria (approved by the State agency) in addition to price, such as delivery frequency and timing, ability to provide high-quality products, or ability to modify products offered based on changes in policy or in student taste preference.

And, when I go and buy with [the purchasing alliance], I can buy in bulk, and get cheaper prices on foods. But, I also have more leverage to talk with food suppliers. If it's just me talking to a food supplier, then he's not going to put a lot of concern in my little town that doesn't use a lot[of] lower sodium foods, . . . But when I use a purchasing group . . . those numbers become a whole lot bigger, and I have more leverage to go talk to my suppliers. — SFA Director 1182

Barriers and Successes in Implementation

Very few challenges were discussed by SFAs using this practice. A few SFAs faced barriers in obtaining State agency approval of the RFB or RFP; lack of agreement among participating SFA directors in the co-op on which products to procure; and lack of availability of products, such as popular items being out of stock and high turnover of lower sodium products.

Belonging to a food buying co-op or group purchasing entity provided SFAs with advantages beyond the benefits offered through competitive procurement. Several SFAs stated that their food buying co-op or group purchasing entity hosted a food show for the SFAs, and these SFAs attended the food show to learn more about new, trending products and to taste test the products themselves. Half of the SFAs using this practice reported that their food buying co-op or group purchasing entity provided frequent communication regarding which products were popular in their district, what products were soon to be released, and menu and recipe ideas, among other information. Among these collaborations, SFA committees and/or co-op directors collected feedback from SFAs on student acceptance of items included in the co-op bid to refine offerings and expand the number of available and well-accepted food products at the co-op's reduced price.

Summary of the Practice

The collaborative nature of co-op partnerships among SFAs facilitated selective procurement of a wide variety of available and highly acceptable foods due to SFA participation, leading to increased purchasing power, particularly for small SFAs, and decreased logistical issues in ordering and accessing lower sodium items.

2. FOOD SUPPLIER INTERACTIONS

Overview of the Core Strategy

Food supplier interactions with SFAs are an integral component for meeting the Target 2 sodium standards for school meals. Food supplier interactions facilitated achievement of the lower sodium standards through collaboration among food suppliers, manufacturers, and SFAs on procurement of lower sodium foods, as well as product reformulation. SFA staff and food suppliers described interacting at trade shows and throughout the bidding process to communicate the procurement needs of districts to the suppliers and manufacturers and identify ways to meet demand. The practices described here include the following:

- Collaboration among food suppliers/schools/SFAs on product reformulation and procurement
- Attending trade shows and conferences

This section describes the nature of food supplier interactions, and how they served as a strategy towards meeting the Target 2 sodium standards.

Working with Food Suppliers on Product Reformulation and Procurement

All the SFAs described working with food suppliers on product reformulation and procurement as a practice. Throughout the interviews, respondents cited the collaboration between food suppliers and SFAs regarding product reformulation and procurement as an effective strategy to lower sodium in their districts.

Implementing Working with Food Suppliers on Product Reformulation and Procurement as an Approach for Reducing Sodium in School Meals

Procurement. To meet reduced sodium targets for school meals, SFAs and food suppliers worked together to address procurement needs. Generally, both SFA-based respondents and food suppliers detailed their approach to procurement and how they used an established bidding process to source lower sodium products. First, SFAs detailed the product specifications that would allow them to meet USDA guidelines. Food suppliers then responded to these bids, with nutrition and pricing information for each product; at this point, the SFAs then chose the food supplier(s) with whom they would work for the specified contract period.

Food suppliers and SFA respondents described a demand-driven procurement process that incentivized collaboration to meet the sodium requirements. Meeting the targets was non-negotiable for the districts, and the food suppliers in turn adapted to retain their market share. Most SFA Directors described food suppliers and distributors as responsive to their requests for products, explaining that, for the most part, food suppliers are “*really good*” and that they “*want to keep people’s business*.” Food suppliers described their willingness to work with SFAs to find products that satisfied nutritional requirements, whether from their own product list or through special orders and other partner distributors. However, a small number of districts stated that some food suppliers required minimum orders on certain special products, thereby making them unavailable due to cost or storage limitations.

Both SFAs and food suppliers described a shift in procurement strategy, moving from higher sodium processed foods to higher quality, lower sodium foods that had a good flavor profile. Respondents also shared the importance of working with different manufacturers to source items that were lower in sodium and high in flavor.

Some food suppliers and most SFA directors and school employees commented that many SFAs rely heavily on support and information from food suppliers, particularly to ensure that all products have the allowable and correct sodium level. Respondents explained that many food suppliers not only sourced the food and managed the pricing, but often provided menus for the district and product research and nutritional analysis to ensure that menus were compliant.

Food Suppliers Working with Other Food Suppliers. In addition to food supplier interactions with SFAs, SFA sites described the role of food supplier interactions with each other in supporting procurement. Several food supplier respondents discussed talking to counterparts in the industry, including other producers, distributors, and chefs, to learn about new opportunities and successful methods to reduce sodium in school meals. Some food suppliers also noted that it was important to remain abreast of developments from food manufacturers. Suppliers described their role in convincing manufacturers that the market demand justifies productions of certain food items. One respondent noted:

If we can show the manufacturer there's a large enough market for something, then we can actually get them to do research and development . . . [A manufacturer] just came out with several items [after] we've showed them that there are many customers looking for a particular item. — Food Supplier 2239

Suppliers also discussed their partnerships working with multiple suppliers and brokers in order to respond to client requests for a greater variety of lower sodium products and to address transportation challenges. One food supplier discussed a shift in the company's operating strategy since the sodium standards went into effect, citing the company's need to “*streamline the way they go to market.*” This shift included working with brokers to pre-sell items to districts, as a way to guarantee demand before adding products to the inventory. Another food supplier noted an additional shift in the school food space: there had been a consolidation of manufacturers who sell to the school market. The respondent went on to explain that having a consolidated number of school food manufacturers created greater incentives for manufacturers to stay ahead of the regulations. Additionally, one other respondent discussed working with sister corporations and partnering organizations to gain technical and marketing support.

Product Reformulation. Several SFA respondents described manufacturer partnerships as a key strategy for effectively accessing lower sodium products for procurement, indicating that “[*the manufacturers*] are the ones that are truly controlling the food development.” As an example, one respondent described the market incentive for manufacturers to work with them on reformulation for the products with the highest demand.

[My food service management company manages] about three or four hundred school districts nationwide.... We do several hundred million dollars' worth of business with them a year. The biggest strategy was pinpointing which items we thought were the most important to get the sodium down on first, because obviously, because of demand nationwide, they were going to pretty much have to do it anyway for all school districts. So, we targeted certain things that we know the kids are going to like.... Probably the biggest single thing was to get the manufacturers to react to what the demand was going to be. Obviously, they saw the writing on the wall, so they complied. — SFA Director 2041

Some SFA-based respondents and a few of the food suppliers commented on the important role of manufacturer partnerships in product innovation and reformulation. While some larger SFAs were able to deal directly with manufacturers, the majority relied on their food suppliers to serve as the go-between.

Additionally, some SFAs and food suppliers discussed how large SFA size or participation in a food buying co-op increased SFA purchasing power, providing access to a wider variety of lower sodium products at better prices. From the food supplier perspective, working with a large SFA or group of SFAs made it easier to source specialty items, and could provide incentives for manufacturers to address reformulation requests. One food supplier explained:

So, when a bunch of [SFAs] come together and say ‘OK, we need 30,000 cases this year’ then the pasta companies are going to sit up and take notice and say ‘OK, we need to have a pasta that has this level of sodium that we can sell to these schools.’ — Food Supplier 2239

SFA directors also highlighted how participation in co-op purchasing agreements increased their leverage when negotiating with food suppliers.

Barriers and Successes in Implementation

SFAs and food suppliers discussed several factors that influenced their ability to implement their product procurement and reformulation strategies. Inability to procure lower sodium products emerged as a major barrier. This difficulty occurred for a variety of reasons; one primary cause was the time constraints of the bidding process. Respondents described how the bidding process itself could impose restrictions and delays in procuring desired products, as districts had to operate on a set bid cycle. One respondent explained:

We have to meet the federal procurement requirement, so I may identify a product in February that I’d like to include for the following fall, but because of the bid cycle, I can’t possibly procure that item for the menu until the following spring because by February all of my bids for the fall have to be complete, which means I need to have already identified [and taste tested] the products I’m going to utilize, and I need that specification written. — SFA Director 4025

Additionally, some SFAs discussed the challenge of procuring lower sodium foods that were palatable to students. While a food supplier or manufacturer might successfully reformulate products to adhere to the sodium standards, SFAs described reformulated foods that did not taste good and were not accepted by students. A few SFAs also discussed how this issue contributed to lowered school meal participation, resulting in cost implications for future procurement contracts.

Another major challenge for some SFAs included lack of lower sodium product availability. The lack of availability was a result of many factors, including lack of profitability for food suppliers and lack of market availability. Some SFAs described food suppliers dropping popular products because they were not profitable enough. For example:

I have seen a lot of products that we used to get from our food suppliers drop out of producing for schools because they don’t sell as much to the schools as they do to the public and it hurts their business . . . I have seen food suppliers that had a good product just go ahead and start opting out, saying ‘I don’t want to . . . I’m not gonna provide it next year.’ — SFA Director 2239

Other respondents indicated that while a food supplier might have advertised certain products at a trade show or in marketing materials, they might not provide them unless the SFA could guarantee a minimum order. This could be difficult for some SFAs due to storage and budget limitations.

In terms of the cost implications of procurement and product reformulation, some SFAs noted concerns. SFAs described limited food budgets that restrict the variety and types of products they could include in a bid. Although food suppliers might offer many products and be able to source more fresh fruits and vegetables, products could still be cost-prohibitive for many SFAs. One respondent stated that her

supplier provided information on popular, palatable lower sodium snacks and entrées, but noted that the prices for these items continued to increase. Some SFAs and food suppliers highlighted the efficacy of frequent communication in facilitating the procurement and reformulation processes. SFAs provided food suppliers with student feedback on menu items, and food suppliers made suggestions for compliant lower sodium products. Some SFA directors stated that they were able to work with their distributors to procure lower sodium products. Additionally, some SFAs noted that food supplier taste tests, both with staff and students, served as a factor to facilitate procurement and product reformulation. The taste tests provided an opportunity for the SFAs and food suppliers to discuss product quality and provide feedback to manufacturers. When reformulated products were not palatable to students, SFAs provided feedback and worked with food suppliers to identify alternative items.

The SFAs highlighted the role of group purchasing agreements as an opportunity for diverse schools and districts to share what products work and make suggestions on items to add to the bid. Respondents discussed how these shared experiences could help successfully facilitate procurement decisions, noting the importance of discussing menu items when trying to introduce new menu concepts, including ethnic foods and less traditional recipes, to learn of other schools' experiences with student populations.

Summary of the Practice

Overall, respondents shared few recommendations focused on procurement and reformulation. The recommendations that were shared advised SFAs and food suppliers to “*stay flexible*” throughout the process, and encouraged SFA directors and employees to remain in, or become more engaged in, the process. When asked about recommendations regarding procurement, respondents highlighted the need for continued engagement on the part of food service directors, arguing that improved procurement options will come with increased demand and vocal engagement. Respondents described the need to move beyond procuring and producing a compliant meal, to striving to make meals the best they can be.

Attending Trade Shows and Conferences

The majority of SFAs indicated that attending trade shows and conferences served as a practice to reduce sodium content in school meals. Specifically, attending trade shows and conferences was an approach used by all the large and very large SFAs, and almost all the SFAs in cities and suburbs.

Utilizing Attendance at Trade Shows and Conferences as an Approach for Reducing Sodium in School Meals

SFA personnel and their food suppliers described regular attendance at food trade shows organized by a variety of groups, including national and State-level school nutrition associations (SNAs), food buying co-ops, major distributors, and the larger food and restaurant industry. Several SFA directors described the SNA conferences as more helpful than the broader food industry trade shows, as all the foods displayed are formulated for school use. As one respondent explained:

In a distributor show, you're going to wade through all manner of other stuff, but if you can get to an SNA show, you're only looking at K-12 product. The brokers and manufacturers are coming in with concepts that are wrapped around product that is K-12 ready . . . We have a great industry network for K-12, and they're actively working on sodium. — SFA Director 3000

The majority of SFA respondents spoke about the important role the trade shows played identifying and testing lower sodium products for integration into their menus. Respondents described the ability to sample products, speak with head suppliers, obtain nutritional information, and take home samples to try. In addition to the benefit of identifying new school food trends and lower sodium products, the trade shows and conferences served as a networking opportunity, allowing SFAs to share ideas and learn about school food trends. Trade shows and conferences provided districts with the opportunity to build relationships with manufacturers and other districts and share information about products.

From the food supplier perspective, a few reported that trade shows served as an opportunity to market their products, offer taste tests, provide special product lists to help customers identify the lower sodium items available, and hold educational sessions for attendees. The shows also offered opportunities to identify new lower sodium products for their clients and to learn about their competitors.

Barriers and Successes in Implementation

Respondents did not discuss many challenges related to attending trade shows and conferences. A few SFAs discussed how cost impacted the frequency of events attended and the number of staff who could attend. One SFA mentioned that the procurement schedule limited how quickly districts could integrate products seen at a trade show or conference into the menu.

One of my top strategies was attending trade shows . . . So a lot of food suppliers introduce new products for the market at the FMA conference in July. And again, the process for districts to sample that with their students . . . means that often they can't be menued until at least the following spring. And for large districts like ours with a very strict procurement schedule, it could be the following fall. — SFA Director 4025

The greatest challenge food suppliers noted in regard to interactions with other suppliers was product availability. One respondent described the initial difficulty in bringing new lower sodium products to market to meet demand.

I think just initially where the difficulties lie is just really a [mis]understanding of what it is that [the districts] are going to purchase, to be able to work with the manufacturers. . . With any new product, there's production line time that needs to be scheduled, and so [it is important that we are] being able to work with the school district on what changes they were going to be making on their menus, to work with manufacturers to ensure that we have the products that they need when they need them and in the quantities that they need it. — Food Supplier 3079

Also, as the sodium targets became more restrictive, manufacturers struggled to develop products that remained palatable and met requirements, despite their willingness to work with food suppliers and invest in research and development.

Summary of the Practice

While there were not many recommendations regarding supplier interactions, a suggestion from SFAs and food suppliers was to target the food suppliers and manufacturers that had the largest overall impact on sodium reduction for reformulation efforts. One respondent explained that the *“canned fruits and vegetables food suppliers can do very little in the lower sodium world,”* but noted that other suppliers with additional higher sodium products could have a larger impact by being proactive with manufacturers.

3. USING EFFECTIVE MENU PLANNING

Overview of the Core Strategy

Effective menu planning is another category of strategies that SFAs used to meet the Target 2 lower sodium standards for school meals. Effective menu planning entails strategies where SFAs and their partners (1) reassessed menu options and food offerings available during cafeteria meal times; (2) incorporated additional lower sodium items into menu offerings; and (3) developed alternative menus and accompanying preparation techniques for the inclusion of lower sodium foods, such as fruits and vegetables. These approaches were implemented by SFAs in this study by

- using more fresh and/or frozen fruits and vegetables in menus and meals,
- using lower sodium products (including reformulated products) to replace menu items,
- modifying recipes already in use or developing new recipes, and
- implementing a self-serve condiment station or providing individual condiment packets to students to further reduce added sodium to meals.

This discussion describes the ways in which SFAs implemented these practices, including the resources identified as most important and the potential cost implications, as well as the barriers to implementation and factors that made the approaches successful for reducing sodium.

Using More Fresh and/or Frozen Fruits and Vegetables

The practice of using more fresh and/or frozen fruits and vegetables in school meals to reduce sodium was utilized by all SFAs, and was the most utilized effective menu planning practice. The utilization of this approach by all SFAs is most likely due to changes in meal pattern requirements for school meals: the addition of more fruits and vegetables and other changes (limiting grain-based desserts, for example) is required. As a result, these changes had the net effect of pushing out higher sodium foods and reducing daily sodium levels overall. This strategy was implemented by maximizing fresh and frozen lower sodium fruits and vegetables procured through food suppliers; cooperative purchasing agreements; and special programs (i.e., USDA Foods and USDA DoD Fresh, as described above); and the incorporation of these items in foods served to students.

Implementing Using More Fresh and/or Frozen Fruits and Vegetables as an Approach for Reducing Sodium in School Meals

SFAs reported incorporating more fresh and/or frozen fruits and vegetables in a variety of ways: rebalancing their menus by pairing fresh or frozen fruits and vegetables with a higher sodium item; using vegetables and vegetable purees in modified recipes to flavor lower sodium entrées; and through salad bars or fruit and vegetable stations where students are encouraged to take as many servings of these food items as possible. Implementation of this approach required SFAs to refresh or develop alternative

cooking techniques to flavor fresh or frozen fruits and vegetables, including roasting and the use of herbs and spices, as well as steaming and blanching vegetables to enhance both the taste and visual appeal for students. Some SFAs also described identifying lower or no-sodium dips and sauces to pair with fresh or frozen fruits and vegetables to increase the acceptance of these items by students.

SFAs discussed the need for adequate freezer and refrigeration space to be able to implement the practice, in addition to having the proper cafeteria line display and service equipment. These resources were described as challenges for both smaller SFAs and those with older cafeteria equipment. Another important resource need was for staff to be properly trained on how to wash and prepare fresh produce, including the need for additional culinary techniques for preparing and presenting fresh or frozen fruits and vegetables in ways that visually appealed to students. Additional resources, such as specialized training or the services of a chef, were identified as key supports to assist these SFAs in using more fresh or frozen fruits and vegetables.

Respondents indicated the need for additional steps to support acceptance and consumption of more fresh or frozen fruits and vegetables by students, including taste testing and offering students smaller portions of those fruits and vegetables that they might be less familiar with. Relatedly, some SFAs also described the need to better tailor their offerings of fresh fruits and vegetables in menu items that appealed to ethnically diverse populations. Tailoring approaches included ordering fruits more common in certain cultures, as well as developing offerings that included vegetable and fruit combinations (such as a Mexican fruit cup or Asian fruit cup) with more cultural appeal to these students.

Barriers and Successes in Implementation

Most respondents described offering a diversity of fresh fruits and vegetables as key to making this practice successful. Managing costs and seasonality/availability of food items were the two most often-mentioned challenges, but storage room and having kitchen staff with the skill set and time to wash and prepare fresh produce was also a challenge for some SFAs. In terms of the costs of this practice, SFAs described their co-operative arrangements and participation in USDA Foods and USDA DoD Fresh as invaluable; however, they still faced some challenges in managing the costs of produce due to seasonality and poor growing seasons. For some SFAs, the availability of fresh items was a barrier that increased the costs of implementation.

The cost is our number one challenge. And I'm not sure I've overcome . . . I don't think I have overcome it, it's been . . . having to be creative in some other areas. Technically, sometimes it's availability, 'cause of where we live, you know, everything's trucked in. For instance, this spring, when California was getting all the rain, we got notice that availability of lettuces, cucumbers, broccoli, strawberries . . . anything that should have been harvested in the January through March area, were extremely short. And so we had to make some adjustments there. — SFA Director 1182

A related barrier was uncertainty regarding which fresh fruits and vegetables might be available from week to week; some SFAs described instances where planned menus had to be abandoned and repurposed for this reason.

Summary of the Practice

A majority of the SFAs implemented and/or increased utilization of fresh fruits and vegetables in menu planning through a variety of lower sodium preparation techniques. Increasing fresh and frozen fruits

and vegetables presented several barriers due to the resources required for preparation, training for staff on preparation and cooking techniques, and necessary kitchen equipment. Presentation and display of these foods emerged as a key consideration in both preparation method selection and serving line arrangement, while diverse and varied fruits and vegetables complemented presentation techniques for increased student acceptance. Relatively high costs of fruits and vegetables were mitigated through participation in additional alternative purchasing techniques (e.g., through farm-to-school programming, local farmers and producers) to increase access to a greater variety of fruits and vegetables. SFAs appealed to students by including culturally relevant fruits and vegetables and collecting and utilizing student feedback, which increased student acceptance.

Using Lower Sodium Products

The majority of SFAs used lower sodium products, including reformulated items, to reduce the sodium in the school meals they served. SFAs commonly noted that they were initially introduced to preferred lower sodium products through food supplier interactions with brokers, manufacturers, and at school food shows. Lower sodium products were procured by SFAs through their existing and/or new procurement processes, as described in the previous Food Procurement discussion.

Using Lower Sodium Products as an Approach for Reducing Sodium in School Meals

SFAs noted that after the implementation of Target 1, many lower sodium products became available through food suppliers, although not all items had high rates of student acceptance. The increase in availability of products caused SFAs to selectively choose which lower sodium products were procured to ensure student acceptance. Once lower sodium products were identified, the products were taste tested by SFA staff, school staff, and/or students to determine acceptability and preference between similar items, if applicable. Utilizing this process of recommendations, testing, and refinement as needed allowed SFAs to determine the most acceptable lower sodium products across food types and brands.

Pretty much anything you want, you can get low sodium. It's a question of the industry catching up. I think. . . This thing was driven so much at schools that, at first, you're right, the first 2 or 3 years there wasn't a lot of options. . . You know, everybody had to buy the same thing. Nowadays, there's more options, there's something of everything, and, in many cases, there's competition between people for that item. If you don't like it from brand X, you can buy brand Y and still have the low sodium content. — Food Supplier 2239

SFAs commonly described the ease of implementation for lower sodium products in meal preparation. Due to the decreased labor associated with heat-and-serve lower sodium products, several SFAs cited decreased labor as a motivating factor for utilizing lower sodium ready-made products. Nutrition labels associated with lower sodium products allowed SFAs to easily calculate the daily and weekly sodium levels for items they intended to prepare before ordering lower sodium products. Prepackaged or readymade lower sodium products were often used in conjunction with scratch cooking to offset labor requirements needed for preparation. This was a common strategy for the beginning and end of the week, when preparation time and/or ability to utilize leftovers was limited. Lower sodium products most frequently mentioned in discussions of challenges in student acceptance were pizza, cheeses, macaroni and cheese, bread products (such as biscuits), processed chicken products (such as patties and nuggets), sauces, and other heat-and-serve dishes. Respondents noted specific barriers in procuring acceptable lower sodium products due to the functionality of sodium for melting of cheese and rising of breads.

Cooking with Reformulated (Lower Sodium) Processed Products. SFAs noted that the use of reformulated products was a critical step in facilitating SFA food preparation as well. Reformulation occurred on the manufacturing and supplier side, which greatly reduced the number of resources involved with implementation; core resources included staff involved with reviewing and selecting reformulated foods, and taste testing among students. A number of challenges were discussed regarding using reformulated products. The greatest challenge centered on maintaining the flavor profiles, textures, and overall palatability of products, according to some SFAs. Certain products, particularly popular food items, were less well-received than others; challenging products included salad dressings, pizzas, macaroni and cheese, and pastas. Respondents noted that while reformulated foods were effective for meeting school food requirements, they did not meet student taste expectations. One respondent stated that children ask, “*Why doesn’t it taste like it does when I have it at home?*” Relatedly, respondents discussed that, in cases when students rejected the reformulated foods, the school experienced lower participation rates and increased food waste, further restricting food service budgets.

Despite the challenges SFAs faced when using reformulated foods, a few SFAs explained that reformulation was especially important for districts that did not have the capacity to introduce scratch cooking into their menu preparation, causing them to rely more heavily on lower sodium processed foods from the manufacturers. Another respondent described the need for strategic reformulation, targeting the highest sodium items like meats, cheeses, and breads, as they had the biggest impact on menu planning. Finally, some respondents indicated that cost of reformulation was a challenge, noting that lower sodium products tended to cost more, and that finding raw materials to create reformulated foods that did not change the price point was difficult.

Barriers and Successes in Implementation

Some SFAs using this practice noted that lower sodium products, when compared to non-reduced sodium products, minimally increased food costs. Increased unit costs did occur in cases where SFAs special ordered lower sodium products not typically carried by food suppliers. In some cases, food suppliers were able to mitigate cost by collecting “presale” orders or allocating the ordering quantity prior to purchase. SFAs who were not able to participate in small group purchasing were burdened with the high initial cost of a special order of lower sodium items and the longer-term burden of food storage for bulk quantities, while others were unable to procure preferred lower sodium products due to limitations of food suppliers.

We just have to really, really shop around and even if we find a product that we think is good, and then we've got to talk the distributor and the courier. . . The problem a lot of times is [we] can't get things direct because I have to take a whole truckload, which I can't have, and so that can become a problem if you find a good product but the distributor is not willing to carry that product for you. Then that kind of eliminates your chance to use it. — SFA Director 3016

While respondents would have preferred to rely on lower sodium reformulated products for menu preparation, particularly when scratch cooking was not an option, the lack of availability, lack of palatability, and higher cost associated with reformulated products were ongoing barriers to the integration of reformulated products.

Summary of the Practice

After establishing acceptable brands and product types, SFAs utilized lower sodium products to decrease labor resources needed for meal preparation, either through integration of lower sodium products in recipes or by implementing readymade products. Identifying student-preferred lower sodium products reduced barriers to some lower sodium products by allowing prioritization of product ordering. SFA procurement of certain lower sodium products noted to have high student acceptance was impeded by ordering and cost barriers, although some SFAs were able to collaborate with other SFAs and food suppliers to seek alternative purchasing techniques to reduce these barriers and increase access to a greater variety of lower sodium products.

Modifying or Developing New Recipes to Reduce Sodium

The majority of SFAs used the effective menu planning practice of modifying or developing new recipes to reduce sodium. SFAs employed this strategy in two ways: either by reducing the sodium in existing recipes or by developing new recipes to replace the menu items in which a simple reduction of sodium would alter the flavor profile of the item to make it unacceptable in taste or consistency.

Modifying or Developing New Recipes to Reduce Sodium as an Approach for Reducing Sodium in School Meals

SFAs most often described replacing sodium with herbs and spices to flavor the meals, resulting in modified recipes, with a focus on developing a palatable flavor profile for the foods to increase student acceptance. Modification of recipes was implemented primarily by SFA directors, chefs, and dietitians available to the SFA. Recipes described as being most readily adaptable included soups, sauces, and vegetable side dishes. Meats and breads were described as more difficult to modify, as sodium is either a key ingredient for providing taste or is required for breads to rise properly. Some SFAs using this approach described developing new recipes where the sodium was removed entirely, primarily to replace existing higher sodium meal favorites served in their schools.

If we have a USDA recipe that has salt in it, we're automatically eliminating that salt. We'll talk about a soup, just 'cause it's easy. So, I've got sodium there already, so I'm gonna eliminate any salt that's on that recipe already and take that off. But, I'm gonna up my spices and my herbs like my thyme, parsley, sage, that type of thing, in that soup, so it's got more flavors in there. — SFA Director 1182

Some SFAs using this practice described searching for lower sodium recipes to replace their existing recipes for similar items, often referring to USDA and State agency resources for standardized recipes. Recipe resources were noted as an important factor in the replacing existing recipes. As a part of recipe development approaches, SFAs described a fair amount of experimenting with spices and vegetables, and pureeing peppers and squash, to give foods additional flavor.

SFAs described a process of refining recipe modification to be responsive to the flavor profiles that students in their schools would most likely prefer. Some SFAs that engaged in either modifying or developing new recipes noted the importance of developing a production sheet specifying the range of alternative spices and herbs that could be added to recipes to replace sodium. This resource encouraged the creativity of kitchen staff and their ownership of the recipes, and by extension, supported the development of a higher quality product.

Some SFAs highlighted access to a professional chef as an important resource for modifying or developing new recipes, as well as providing hands-on training for school kitchen staff on alternative food preparation methods and incorporating additional herbs and spices, more vegetables, or purees.

Barriers and Successes in Implementation

SFAs that utilized new and modified recipes encountered some barriers in developing and preparing recipes for school lunches and breakfasts. A common challenge noted was the amount of time and resources required for the process of recipe development or modification. For the approach to be successful, SFAs must have knowledgeable staff who can invest significant time and technical expertise in developing or modifying a recipe. Some barriers were also reported with kitchen staff implementation of the modified/new recipes, including lack of food preparation skills, and reluctance among longer tenured staff to implement recipes replacing the sodium in meals they had been preparing for a long time. SFAs described the significance of additional staff trainings on food preparation methods and special trainings dedicated to preparing and experimenting with modified or new recipes as an important resource in overcoming these barriers. Student acceptance of modified and new recipes also presented a barrier to the implementation of reduced sodium recipes. SFAs often had to overcome students' initial rejection of the modified item. Even with taste testing and gradual incorporation of modified/new recipes, not all meal items were accepted by students.

Summary of the Practice

Recipe development and revision required significant resources, such as access to standardized recipes, chefs or other trained staff, staff trainings, and other processes to refine recipes. Student acceptance and the number of required resources were the primary barriers to the use of new and modified recipes. Incorporation of flexibility in recipes through the addition of herbs and spices increased staff buy-in and ownership, and in turn, product quality and student acceptance.

Implementing a Self-Serve Condiment Station or Providing Individual Condiment Packets

The majority of SFAs reported using the practice of implementing a self-serve condiment station or providing individual condiment packets to reduce sodium in school meals. The SFAs that utilized this practice developed or modified a self-serve station for distributing lower sodium condiments and controlling the sodium content of foods by limiting the servings of condiments available to students. Typically, this was accomplished by providing individual packets of items like ketchup, mustard, salad dressings, and hot sauces.

SFAs highlighted the importance of monitoring sodium levels in condiments when menu planning, as common condiments (e.g., ketchup, mustard, mayonnaise) could be high in sodium, causing an otherwise well-balanced meal to exceed sodium targets. To reduce the impact that condiments have on child sodium intake, SFAs developed self-serve condiment stations or switched to individual condiment packets. The self-serve stations ranged from herb and spice stations, to fruit and vegetable side stations, to an entire service line dedicated to selecting customized entrée toppings. The self-serve herb and spice stations and "flavor stations" were provided through third-party food suppliers and aimed to enhance flavor by allowing students to dispense lower sodium seasonings for entrées, side dishes, and snacks, including popcorn, which was highlighted as a student favorite. The fruit and vegetable stations and topping stations were designed by school food service directors and cafeteria managers and aimed to increase engagement by offering point-of-sale food options. These condiment self-serve stations

were described as a way to enhance flavor, customize meals, and increase student choice and participation.

The kids always take too much [ketchup] and then it sits on the tray and you're wasting it, but it counts in the nutrient density because they took it. When you go to packets, you are limiting the flow . . . That controls the sodium because you're only taking credit for what they're using, you're not taking credit for what's going down your garbage disposal. — SFA Director 3000

Barriers and Successes in Implementation

Few respondents noted challenges related to implementing condiment packets or self-serve stations in schools. A few SFAs noted that “flavor stations” could be difficult to procure through manufacturers, and they sometimes experienced resistance among school staff due to increased clean-up requirements. There were mixed cost implications involved in employing individual packets for condiment distribution. Some SFAs indicated that switching to condiment packets was a cost-saving strategy, as it reduced waste and labor cost involved with clean-up, while one SFA reported that the condiment packets they obtained were more expensive than purchasing condiments in bulk and providing access to the squeeze bottle or a self-serve station with the ability to obtain more than one serving.

Respondents reported that self-serve stations were well-received among students, increasing student engagement and participation. One site noted that developing “flavor stations” where students can add a variety of seasonings, toppings, or sauces to basic entrée components reduced menu planning and meal preparation burden, while simultaneously increasing choice among students. Most SFAs using this practice reported favorable outcomes, both intended and unintended, related to switching to individual condiment packets, including decreasing student waste, reducing labor required for self-serve monitoring and condiment clean-up, reducing the need to account for levels of sodium, and capturing a more accurate account of per-student nutrient density.

Summary of the Practice

Preportioned condiment packs were a successful substrate practice to reduce the amount of sodium in school meals by limiting the amount of sodium added by condiments and sauces. These items were frequently integrated along with other self-serve foods and toppings in serving lines or standalone stations to customize flavors of entrées and sides to increase student acceptance. Barriers to preportioned condiments included cost and procurement of stations; however, these barriers were offset by reduced waste and increased ability to monitor sodium intake attributable to condiments.

4. CHANGING FOOD PREPARATION METHODS

Changing food preparation methods is another category of strategies that SFAs used to meet the Target 2 sodium standards for school meals. To augment careful and effective planning, SFAs relied on several food preparation methods to lower sodium while maintaining adequate flavor for student acceptance, including the following:

- Cooking with herbs and spices
- Maintaining or increasing scratch cooking

The following discussion describes commonly reported food preparation methods in greater detail, including the resources identified as most important; potential cost implications; and barriers and challenges experienced.

Cooking with More Herbs and Spices

Implementing Cooking with Herbs and Spices as an Approach to Reduce Sodium in School Meals

The majority of SFAs working toward reducing sodium utilized flavor enhancers to replace flavor profiles of side and entrée dishes, including herbs, spices, house-made and premixed spice blends, broths, and citrus juices, such as lemon juice. Employing herbs and spices in lieu of sodium increased palatability and acceptability of menu items; this practice was used by the majority of SFAs. Using flavor enhancing herbs and spices was an integral component to recipe development, scratch cooking, and in-house training of nutritional staff. SFA kitchen staff supplemented scratch cooking and new or modified recipes with herbs and spices to improve the flavor of house-made foods. SFAs also added flavor enhancers to prepared lower sodium products to improve the taste in the absence of sodium. In-house nutritional staff trainings commonly included training on which seasonings complement one another and how to create spice blends for food preparation, which allowed kitchen staff the flexibility to incorporate flavor profiles that might appeal to their school's student population without concern of added sodium.

Barriers and Successes in Implementation

There were few barriers to implementing this approach that were identified by SFAs. The barriers most frequently mentioned by SFAs using this approach focused on the trial and error process of adjusting the amounts of herbs and spices used to optimize the appeal of flavor profiles to support student acceptance. Additionally, while replacing sodium with other lower sodium flavor enhancers required initial labor resources (e.g., time, staff training), the practice represented a relatively low-cost and effective way to enhance flavor. SFAs noted that flavor enhancers, specifically no-sodium and lower sodium spice blends, were well-accepted by SFA staff due to ease of implementation and high levels of student acceptance.

Maintaining or Increasing Scratch Cooking

Half of the SFAs reported they engaged in scratch cooking to reach their target sodium goal. Among SFAs that utilized scratch cooking, participants perceived the strategy as one of the most effective ways to control the sodium in foods, as SFA staff had complete control of all the ingredients assembled for meal preparation. These SFA participants indicated that increasing the number of scratch-cooking items led to greater control over sodium content.

Maintaining or Increasing Scratch Cooking as an Approach to Reduce Sodium in School Meals

Implementing scratch cooking involved a range of activities previously discussed, including incorporating herbs and spices, using more fresh fruits and vegetables, and modifying recipes. As such, implementing scratch cooking incorporated some of the same methods represented in these other practices. For example, to cook menu items from scratch, respondents described integrating fresh fruit and vegetables and herbs and spices into existing recipes.

Key resources needed for scratch cooking were kitchen equipment and refrigeration/freezer space to accommodate the meals being prepared. Most respondents implementing scratch cooking described having a central district-level kitchen, where staff could prepare scratch meals in bulk, ensure nutritional integrity of the recipes, and then send scratch-cooked meals offsite to heat and serve at satellite

locations (schools). In addition to space and equipment needed for scratch cooking, some SFAs reported that additional training resources for kitchen staff for food production and preparation were essential.

Barriers and Successes in Implementation

Respondents reported several challenges to scratch cooking, including time, staff resources, space, and equipment. Several respondents noted that scratch cooking required more time and staff resources to develop recipes, prepare raw foods, and assemble and cook food items. Even when time and staff were available, respondents described the challenges of needing kitchen staff with advanced food preparation skills and the challenges of managing the timeline for preparing scratch items to have them ready for service.

It does take more staff, and I think that that's a big issue everywhere, is, first off, finding staff that'll work in kitchens, in school lunch, 'cause there's not a lot of hours. And then, finding staff that's really willing to put the work in to make those homemade items, instead of just throwing something on a tray and putting it in the oven. — SFA Director 1182

Additional problems with scratch cooking implementation included the ongoing need for space to store commodity items, maintaining or upgrading kitchen equipment needed for efficient mass preparation and production of items, and having enough staff to execute the meals, as these types of jobs were described as having very high turnover. Managing the costs of this practice was also a challenge in some instances. Respondents suggested that while scratch cooking was often less expensive in terms of food purchasing, the increased labor hours to prepare food from scratch might offset the food cost savings. Some respondents indicated that finding scratch recipes that students like was a challenge, as these items were initially perceived as less appealing to some students in comparison to other menu items.

Successful approaches for implementation included the development of a “speed scratch” approach to preparing meals, which consisted of developing recipes that could be prepared with a minimal number of ingredients and required minimal food preparation skills, making implementation achievable for most kitchen staff. A few SFAs described hiring or working with a chef to support implementation of this strategy.

We had enough culinary background to get us to a point, but we really felt like to get over the hump, we needed a chef. We hired one and brought one of our staff and we had some success, and Joey [the chef] worked quite a bit on scratch and ‘speed scratch,’ and on recipes that focus more on the speed scratch. I want ingredients that I can take—three to seven ingredients—work it together and come up with a dish. — SFA Director 3036

Scratch cooking, while a meaningful way to reduce sodium, required resources (e.g., time, skills, equipment, space) that might not be available in every school. To reduce the burden of scratch cooking, speed scratch cooking with few ingredients or centralizing the food preparation could be effective solutions.

Summary of the Practice

Cooking with more herbs and spices, and scratch cooking were two essential ways that SFAs changed meal preparation to meet lower sodium targets. Reaching lower sodium goals with this approach

required investments in staff time, food preparation training, equipment, and storage space. SFAs seeking to incorporate reformulated food products might consider working more closely with manufacturers and suppliers to identify more palatable options.

5. INVOLVING STAKEHOLDERS IN SODIUM CHANGES TO GAIN ACCEPTANCE

Nearly all SFAs reported engaging stakeholders (students, parents, staff, and community members) to gain acceptance of lower sodium meals. To involve stakeholders, SFAs

- obtained feedback from stakeholders,
- conducted taste tests, and
- brought in-house/local chefs into schools to teach about cooking.

Obtaining feedback from students via taste testing was the most often-employed strategy for product selection and recipe refinement according to SFAs.

SFAs indicated that refining recipes and gaining student acceptance of lower sodium foods was the primary focus of their engagement approaches. Resources required for involving stakeholders included partnerships with food suppliers to obtain free samples and conduct taste tests, partnerships with local culinary organizations to bring in local chefs, staff members to coordinate stakeholder engagement events, and staff time and commitment for obtaining and reviewing ongoing feedback. The following section describes the most commonly employed methods of engaging stakeholders to gain acceptance of changes in sodium in school meals, including the resources required, cost implications, barriers, and challenges experienced during implementation.

Engaging Stakeholders in Product Selection, Menu Planning, and Recipe Refinement

Approaches for Implementing the Practice

Obtaining feedback from multiple stakeholders (students, staff, parents, and/or community) was one of the most popular strategies used to reach lower sodium targets. Stakeholder feedback informed decisions made along the lowering sodium implementation continuum: during menu planning and product ordering, student feedback helped SFAs select the best tasting lower sodium products; during menu planning, student feedback helped to identify well-received menu items, as well as those in need of additional refinement. SFAs described soliciting feedback from students, teachers, and parents to help select lower sodium products from food suppliers to be served across district schools, using a variety of methods. Some SFAs conducted open houses, sent parents and students to food shows, and coordinated community taste-testing events at local town hall meetings or through in-school after-hours programming.

Barriers and Successes in Implementation

Most of the SFAs who solicited feedback did so during the menu planning phase to gauge student and parent acceptance and identify which menu items required additional refinement. Some SFAs gathered feedback via online or in-person surveys, where students and parents could provide their reactions to specific menu items, which were then used to refine the entire menu. Two SFAs described the community events they developed to engage both parents and students as a part of menu planning:

Once a year, we all come together and have a food show and representatives, student representatives and some adults too from our various school systems, attend that food show and there they're introduced to new products and they evaluate them . . . which gives us some good feedback about what products to put in our buying guide and to start serving in our schools. — SFA Director 1127

Some SFAs also mentioned obtaining direction and feedback from community members and parents via formal committees, like a local wellness community. The feedback obtained through the wellness committees helped identify foods that might need nutritional refinement.

A lot of [change to scratch cooking] had to do with our Wellness Advisory Committee. The parents that were on the committee wanted us to do away with a lot of the frozen products that came in already made. — SFA Director 1172

Several SFAs described challenges engaging parents and the larger community, noting that when they conducted nutrition or food taste-testing events, parents and community members would not attend in large enough numbers to warrant the labor and resource expense.

Conducting Taste Tests

Approaches for Conducting Taste Tests to Reduce Sodium in School Meals

Conducting taste tests of lower sodium products was a commonly employed feedback strategy across a majority of the SFAs. Information gathered from taste testing could be used for several purposes: to help modify lower sodium recipes/products, gauge acceptance of newly introduced products, engage students in the menu development process, reduce the risk involved with distributing a potentially ill-received food item, and reduce labor costs and food waste. To implement a taste test, SFA staff most often requested free sample products from prospective food suppliers or developed in-house recipes for students and staff to sample.

SFA staff indicated that taste tests ranged in formality and planning resources required, including sending samples to student classrooms, conducting taste tests in food service lines, and creating taste-testing events, like “food shows,” for the students. SFAs differed in terms of the frequency with which they employed the taste-testing strategy, with some utilizing taste tests at set intervals ranging from weekly to annually, while others conducted tastes incrementally as they added menu items.

We'll get something, we'll test it out, when we're doing a similar food item, see if the kids like it, before we go into purchasing it, whole hog. [. . .] We'll serve it alongside other food items for the kids, so that we can make sure that they're still interested in it. We don't start out serving it all at once, we'll gradually introduce a change. — SFA Director 1055

Barriers and Successes in Implementation

In a few cases, when SFA directors lacked certainty on which food items to order, they organized a taste test among students to identify accepted items and determine which final lower sodium items to order. One SFA described selecting a subset of “test site” schools that would regularly employ sample products; examine the labor, resources, and waste involved in production; and provide feedback regarding ease of use and student acceptance. The selected test sites were fully staffed with supportive

principals, managers, assistant managers, and kitchen staff to ensure the product testing process was not too labor-intensive or burdensome.

They are looking at how it works back at the house. So production-wise, is it easy to work with? What does the case look like? Is it coming in like it's supposed to? Is it cooking like it's supposed to? How many fit on the pan? How long can they hold for? 30 minutes are so perfect; [but if] you hold them for 2 hours, you're going to be throwing them away. Where are you going to package them? All those details are very hard to sort out from this office. So they could just tell us the ins and outs of the product down to 'yeah, the students are loving it,' or 'no, they're not loving it,' or 'they took it the first time and now they are not taking it anymore.' — SFA Director 4023

This piloting approach to taste testing was described as a less resource-intensive way to gain insight on menu item preferences, as the approach minimized the labor and additional resource costs associated with executing a taste test and provided sufficient feedback on potential student acceptance and ordering specifications (i.e., quantity needed, brand preferred). A few SFAs noted logistical challenges to setting up a food supplier taste test, including scheduling the taste test, communicating with staff, and ensuring available space in the school.

Bringing in Local Chefs to Teach About Cooking

Approaches for Bringing in Local Chefs to Teach About Cooking to Reduce Sodium in School Meals

Though this practice was the least-frequently mentioned way to involve outside parties in efforts to gain acceptance of new foods or formulations, some of the SFAs that utilized chefs to conduct taste tests or meal preparation classes for staff and the school community (among other activities) noted that the chefs helped put the sodium changes in a more positive light, and bolstered student acceptance of lower sodium food items or recipes.

Nearly all the SFAs that mentioned utilizing an in-house or local chef were large or very large SFAs, indicating that the utilization of chefs and the feasibility of this strategy may primarily be available to larger SFAs with more resources to bring them in. Utilizing a chef to support acceptance of lower sodium foods by teaching or taste testing took various routes for each SFA: for some SFAs, chefs were on staff across the district(s)—one SFA employed their chef as part of a USDA Farm to School grant, and another SFA mentioned that local organizations sent someone to teach cooking skills classes to kitchen staff. Bringing in chefs required the financial resources to make this hire as well as the resources necessary to coordinate with local organizations to fill the chef position.

Barriers and Successes in Implementation

In-house chefs seemed to play two primary roles: first, to develop recipes that meet sodium targets, and second, to act as the “face” of the school/SFA meal program for students by presenting taste tests. An emerging theme noted by respondents was a team-based approach augmented by the addition of a chef. Respondents noted that it was critical for as many factions as possible to come together to support the necessary sodium-related changes, including students, parents, teachers, administrative staff, and kitchen staff and/or chefs. Involving chefs was a part of establishing a larger, more robust “team” to help increase student acceptance of lower sodium foods.

Summary of the Practice

Involving stakeholders in the lower sodium target practices helped to ensure procurement, selection, and refinement of menu items that met student, parent, and community acceptance standards. By employing a wide range of engagement methods, SFAs aimed to gain buy-in across the entire food distribution continuum (product selection, menu planning, recipe refinement) and make informed decisions regarding well-accepted food products. The most popular feedback mechanisms involved student taste tests in the classroom or on the service line, a practice that can be incorporated into school routines and activities and requires relatively few additional resources.

Topic 2. Student Acceptance and Strategies to Improve Acceptance of Reduced Sodium

A key consideration in examining approaches used by SFAs to reduce sodium in school meals to meet Target 2 standards is the degree to which products and approaches achieved student acceptance. While a previous section of this report discussed strategies used by SFAs to engage students and other stakeholders in the process of identifying and selecting lower sodium items, this chapter focuses more specifically on the foods and recipes that gained the greatest student acceptance. Additionally, this chapter presents a more detailed discussion of the range of approaches used for gaining student acceptance, and the communication strategies used to support acceptance of lower sodium items.

LOWER SODIUM PRODUCTS FACING RESISTANCE IN STUDENT ACCEPTANCE

Most SFAs encountered challenges with student acceptance of a wide variety of products, foods, and recipes. SFAs described a range of lower sodium items that were not well-received by students. The most commonly disliked items included meats (especially taco meat), chicken, country fried steak, and sandwich meats; breads (especially biscuits and tortillas); cheese products (especially macaroni and cheese); sauces and condiments (especially ranch dressing), gravy, and spaghetti sauces; and combinations foods (especially pizza and dishes with noodles). Reasons for lack of acceptance of these foods included unpopular or bland flavor profiles; negative responses to the color, shape, consistency, texture, and/or quality of food items; and displeasure with changes to portion sizes that were perceived to be smaller to limit sodium.

Achieving acceptance of lower sodium items, especially those where sodium was either a main ingredient or a core component of the expected flavor of the item, was described as challenging. Despite working with food suppliers and food manufacturers, many SFAs described ongoing challenges in identifying lower sodium items such as pizzas, breakfast meats, macaroni and cheese, and chicken products that were acceptable to students. However, some SFAs found successful replacements for these products. Some SFAs indicated that after numerous conversations with their food suppliers and ongoing taste tests to identify a well-liked flavor profile, their lower sodium pizza, macaroni and cheese, and chicken products had been widely accepted.

Reasons for students' lack of acceptance and resistance towards lower sodium items were complex and wide-ranging. However, the majority of SFAs felt that students' lack of acceptance was the result of comparisons made to foods commonly consumed in their culture, to items served in restaurants and available in stores, and to foods provided in their homes. Students' lack of acceptance was also

reportedly influenced by environmental factors like the behaviors and attitudes people around them, specifically their peers, their parents, and the school staff.

GAINING ACCEPTANCE OF LOWER SODIUM FOODS

In addition to taste testing, as described in the previous chapter, most SFAs used some other supporting approaches to promoting acceptance. Several SFAs felt that education was important for student acceptance of the lower sodium standards and foods provided during school meals. These SFAs reported educating students through a variety of required classes such as health class, nutrition class, physical education, and even math class. One SFA reported creating a new cooking class for the sole purpose of demonstrating scratch cooking and educating students on the benefits of lower sodium foods. SFAs also used different communication strategies, including marketing materials, signage, and announcements to promote acceptance.

They grow things that a lot of kids have never heard [of] or tasted. A lot of kids don't know what basil is. A lot of kids don't know what sage is. So, it's a challenge to get them to try it because it does have a different flavor and it does, you know, changes the flavor of the food a little bit. They've never tasted it or seen it. And so, we show them what it looks like before it's dried, and how we implement it into seasoning and their food. — SFA Director 2062

Several SFAs stated that one of the most important factors in garnering acceptance of lower sodium foods was allowing students to feel as though they had options. SFAs provided students with choices, whether it was allowing them to pick the toppings of their sandwiches and taco bowls or choosing from more than one lower sodium entrée. These SFAs believed that customization was highly valued by students.

They can put on whatever they want to put on and it's not something that's already made, like it's been in the past, that's just wrapped up for them to take and go eat. They get to choose. They like to choose. — SFA Director 1172

Some SFAs stated that consistency in the messaging about the school meal changes helped with the acceptance of the lower sodium standards. SFAs incrementally implemented strategies with consistency and flexibility to adjust to the changes needed to maintain student acceptance and meal participation. SFAs also stated that providing lower sodium foods consistently helped students become familiar with new foods. An important factor was taking a “team approach” and making it a “school-wide effort.” An emerging theme among the majority of SFAs was the need to adopt a gradual approach to implementing changes in meals. As an example, SFAs reported that they adapted recipes and changed lower sodium food purchases, when needed, to increase acceptance of ongoing adjustments to sodium.

COMMUNICATION STRATEGIES USED TO GAIN ACCEPTANCE OF LOWER SODIUM FOODS

Communication strategies SFAs utilized to support sodium reduction were varied across respondents, but most sites reported utilizing at least some combination of formal and informal communication tactics to support sodium reduction and acceptance of sodium-compliant foods in schools. An emerging finding was the lack of direct sodium-specific messaging for the promotion of lower-sodium foods—

instead, the majority of SFAs utilized messaging that promoted overall good nutrition: fresh fruit and salad bars, and promotion of novel fruits and vegetables (e.g., eggplant, kiwi fruit). Sodium reduction was not frequently described or highlighted. For the limited occasions when sodium was specifically mentioned in communication materials (including posters, flyers, and stickers), it was as a part of an overall healthy eating strategy and not individually highlighted by the majority of SFAs. Most SFAs believed that highlighting food items as being lower in sodium was not an effective strategy for promoting acceptance, primarily due to both the complexity involved in understanding the need to reduce sodium and the risk that featuring the meals as lower sodium would be linked with negative connotations about the taste and quality of the foods among students. As a result, indirect communication strategies were the most commonly mentioned ways of communicating improved nutrition and/or sodium reduction information. These strategies included signage in cafeterias, bulletin boards near kitchens/cafeterias, and kitchen staff talking with students about making more healthy food choices overall. Cafeteria and bulletin board signs included promotion of local beef, local vegetables, hormone-free milk, filtered milk, fruit and salad bars, vegetarian and gluten-free options, fresh fruits and vegetables, and milk products, as well as signage regarding lower sodium foods.

The posters are very, very effective. Because the kids see those. They read them. And that's been the biggest help. That's been about the biggest, helpful thing that we have.
— SFA Director 2062

Many respondents noted that the key to promoting acceptance of any new food, including lower sodium items, was communication. Kitchen staff in many schools were encouraged to talk directly with students as they went through food lines to explain new items, how much food to take for a meal to be reimbursable, or why food had changed (such as to meet the sodium requirements). This was also a way to engage students and solicit informal, direct feedback as to the acceptability of foods.

I don't want [the cafeteria staff] to just hand [out] food. Talk to the kids . . . Communication with the kids, communication with the head cook, communication with me. So goes from the kids, to the line, to the head cook, to me. There's gotta be a lot of communication or it's not working. — SFA Director 2178

SFAs also utilized some formal communication strategies to inform parents about the changes in school meals. Many schools periodically sent newsletters out to parents and staff, and updates or articles regarding school nutrition were often included as the primary means of informing parents of changes. School-wide or sometimes cafeteria-specific newsletters were sent out with varying frequency—some were monthly or biweekly, and others went out whenever school food menus were published. Once again, the approaches used by SFAs did not feature direct sodium-specific messaging for the promotion of lower sodium foods. Wellness committees and/or PTA meetings were other ways SFAs formally communicated changes of nutritional requirements to parents and/or staff. Some wellness committees included parent and community member representatives; others were internal to the school or district. For those without direct parental involvement, changes were communicated instead to teachers and staff on the committee, who then took on the role of helping to disseminate information to students and parents. Finally, though this strategy was uncommon, some SFAs were able to bring in outside community members to discuss health and wellness, nutrition, and what the changing foods meant for students' wellbeing. One participant noted that their SFA was able to leverage a local university to have a nurse come to schools and discuss nutrition with students across their district.

MEASURING AND TRACKING STUDENT ACCEPTANCE OF LOWER SODIUM FOODS

SFAs reported measuring acceptance of lower sodium foods after introduction of modified menus to evaluate the uptake and student acceptance. SFAs reported four ways of measuring student acceptance: (1) by observation; (2) through participation rates and/or meal counts; (3) via conversations; and (4) through formal and informal surveys. Measures of student acceptance were not mutually exclusive and were frequently used in combination to determine student satisfaction, and for menu refinement and strategic menu planning.

Some SFAs reported monitoring of student acceptance through participation rate changes and meal or food item counts. Participation rate changes were reported by most SFAs, indicating higher or lower student acceptance of meals across an extended period. SFAs noted difficulty in attributing rate changes directly to reduction in sodium due to confounding factors, such as the whole grain standard from HHFKA, which may have augmented changes in participation. Several SFAs specifically monitored daily participation or meal counts and associated menu items; this was more useful to monitor acceptance of specific menu items than monitoring overall monthly participation.

Observational measurements of student acceptance were reported by most SFAs. Participation rates were monitored qualitatively by observing the number of students bringing lunches from home, the number of students going off-campus for lunch, student selection, and the amount of food waste. The most common method of observation, monitoring food waste, was reported by most SFAs. These measures indicated student acceptance of lunch over time and acceptance of specific menu items on certain days of the week. Like participation rates and meal counts, these qualitative measures indicated high or low student acceptance of menus over time or of menu items on a given day.

A lot of times, when we try something new or something that the kids really aren't used to having all the time, we'll even go through and we'll look inside the garbage cans to see what they've thrown away. Sometimes, we see a lot of stuff, which tells us that's not a good thing. They don't really care for that. Then sometimes when we see the garbage can's almost empty, it's like, 'they must have really liked that.' — School Employee 1172

Many SFAs noted ongoing communications with students, typically in the lunch line, as a method of measuring student acceptance. Serving line staff and checkout staff were the primary individuals responsible for initiating and reporting conversational indicators of student acceptance, although additional faculty and staff reported indications of student acceptance as well.

Lastly, formal and informal surveys were utilized to determine student acceptance of lower sodium products by some SFAs. Most surveys took place at the end of the school year, while others were collected on an ongoing basis (e.g., in a comment box). Formal surveys measured student satisfaction with the lunch or breakfast program. Informal surveys were more in-depth discussions of menu items to assess student acceptance of lower sodium items.

SUMMARY OF FINDINGS

Student acceptance of lower sodium meals significantly impacted SFAs' choice and implementation of strategies to meet Target 2 sodium standards. Changes in food product characteristics and taste profiles impacted the students' uptake of lower sodium foods; external factors, specifically foods eaten outside

of school and attitudes and behaviors of peers and parents, influenced students' expectations of school foods and therefore overall student acceptance of lower sodium school meals.

New and existing lower sodium foods were promoted through cafeteria and school signage, nutritional communication materials, and verbal promotions targeting students and parents. Communication strategies used to increase student acceptance primarily utilized messaging encouraging student acceptance of generally healthy food choices, new food items, and fresh fruits and vegetables. Very few SFAs communicated the intentional decrease in sodium directly to students.

SFAs employed multiple modes of measurement to gather student feedback qualitatively and quantitatively to assess student acceptance of menus. Feedback was collected both over time and in single instances to track student acceptance of weekly and monthly menus, as well as given menu items. These approaches to promoting acceptance and gathering feedback were employed to increase student acceptance of new and existing food items by engaging stakeholders to increase buy-in, familiarity, and awareness of menu changes.

Topic 3. Factors Influencing the Implementation of Strategies

Another key consideration for the study is the degree to which SFA factors such as the type of school, geographic region or urbanicity, and size of the school district play a role in efforts to meet sodium standards. This discussion considers the impact of these characteristics as (1) potential barriers to reaching sodium targets, requiring SFAs to adjust their approach; or (2) facilitators that provide unique advantages in the implementation of the strategies discussed previously. This chapter explores each of these SFA characteristics in greater detail, using both qualitative and quantitative information to better understand the barriers SFAs faced and the strategies employed to overcome them.

Overall, perhaps in part due to the small sample size, fixed variables such as SFA size, urbanicity, and region demonstrated minimal to moderate impacts on SFAs' ability to reach sodium targets. School type and region were the primary factors that seemed to impact SFAs' ability to implement lower sodium items. This was likely due to low student acceptance; student acceptance across school type varied by age and overall willingness to accept change, while student norms and parameters of acceptable food types varied somewhat by region. SFA size and urbanicity related more to SFAs' ability to procure foods and to plan menus. Small, rural SFAs reported fewer resources for purchasing and procuring foods, while large, urban SFAs procured higher quantities of food at lower costs, with access to a larger number of suppliers.

IMPACT OF SCHOOL TYPE ON IMPLEMENTATION OF STRATEGIES TO REDUCE SODIUM

School type—elementary, middle, high school, and other schools—may influence the extent to which SFAs are able to reach sodium targets for breakfast or lunch. Table 6 presents a descriptive overview of the 36 SFAs in the study by school type and by their reported sodium target status.

Table 6. SFA School Type, by Level of Reported Lower Sodium Target

School Type	Sodium Target Level ⁹			Total
	Target 1 (n = 2)	Close to or Meeting Target 2 (n = 85)	Close to or Meeting Target 3 (n = 16)	
Elementary	---	29	5	34
Middle	---	23	5	28
High	2	23	4	29
Other	---	10	2	12

Note: School types are listed by the highest category of sodium target achieved; e.g., elementary and middle schools in all SFAs at least met Target 1, and thus none are listed in that column.

High schools showed the greatest variability in achieving sodium targets and were the only school type to report only meeting Target 1. Elementary schools, middle schools, and other schools had similar likelihoods of being close to or meeting Target 2 or Target 3. These quantitative data are similar to the qualitative data, indicating that achieving further reductions of sodium in school meals may be more difficult to implement among high school students.

Qualitative interview data provided some clarity through supportive evidence regarding the impact of school type on acceptance of lower sodium meals. Respondents largely used the term “school type” as a proxy for student age group and discussed several age-related factors associated with student acceptance: development of taste preference, willingness to try new foods, and ability to access off-campus food. Respondents noted the differences between elementary and older students in terms of their preferences and acceptance of lower sodium meals. In general, most respondents felt that elementary-aged students were more receptive to reductions in sodium. Respondents reported younger students had not yet defined their palates and taste preferences and may have become more accustomed to lower sodium items compared to older students, and therefore, were more open to menu changes.

I think that probably the elementary students are probably more apt to be accepting of the lower sodium products. As the kids get older, they become less likely to be accepting.
— Food Supplier 2127

Most respondents reported that older students in middle and high school are “pickier” than elementary-students and are more accustomed to higher sodium products than younger students, decreasing student acceptance of lower sodium items. However, a few SFAs reported that elementary students often lacked the maturity to try new things, noting that older students, while “pickier” in some respects, tended to try spicier foods more often than younger students and were more likely to use the salad bar. These SFAs tried to utilize herbs and spices in the absence of sodium to increase acceptance in older students. In addition to differences in food preferences and willingness to try new items, some SFAs indicated that high school students were more likely to go off-campus to get meals from fast food

⁹ Note: The Sodium Target level is a composite variable that describes each SFA’s overall Sodium Target level, by school type, across all schools within each school type for each SFA.

franchises, thus enabling them to avoid school lunches altogether, particularly in cases where lower sodium foods had low student acceptance.

IMPACT OF SCHOOL SIZE ON IMPLEMENTATION OF STRATEGIES TO REDUCE SODIUM

SFA size¹⁰ (i.e., small, medium, large, or very large) may influence the extent to which SFAs are able to reach sodium targets. Table 7 presents an overview of the 36 SFAs in the study by school size and by reported sodium target. Regardless of school size, SFAs reported similar likelihoods of being close to or meeting Target 2 or Target 3. Qualitative data provide a more nuanced understanding of how SFA size may impact SFAs' abilities to implement specific practices.

Table 7. SFA Size, by Level of Reported Lower Sodium Target

SFA Characteristics	Sodium Target Level ¹¹			Total
	Target 1 (n = 0)	Close to or Meeting Target 2 (n = 31)	Close to or Meeting Target 3 (n = 5)	
Size				
Small	---	9	2	11
Medium	---	8	1	9
Large	---	7	1	8
Very large	---	7	1	8

Respondents discussed the effects of their districts' size on their ability to provide lower sodium foods to their students; there were facilitators and barriers associated with both large and small size. SFAs in larger districts explained that their size gave them more leverage when working with food suppliers and ordering in bulk; allowed them to hire dietitians to help with ingredient and menu planning; and allowed them to operate in a more organized manner than smaller districts.

I think we're very fortunate. We have a district of 7,300 students, so we're large enough to where we have some good buying power, plus we belong to a co-op that we purchase with. We partner with them. So I believe we get excellent pricing and not only pricing, but also support in general from our food suppliers above and beyond price. — SFA Director 3018

While larger school district size seemed beneficial for leveraging food suppliers and accessing lower sodium items, respondents also discussed challenges, including not being able to use gardens or farms due to the size of their student population, and needing more time to plan and prepare meals. Conversely, smaller districts reported that their size permitted more flexible menu planning and allowed them to forge better connections with their students, staff, and community. However, respondents from

¹⁰ SFA size was determined by the number of students; small = 1–999 students, medium = 1,000–4,999, large = 5,000–24,999, and very large = 25,000+.

¹¹ Note: The Sodium Target level is a composite variable that describes each SFA's overall Sodium Target level, by school type, across all schools within each school type for each SFA.

small districts discussed the challenges of smaller budgets and fewer resources and the inability to buy foods in bulk.

To better understand how SFA size impacted the implementation of specific practices, the study team examined the strategies each size SFA reported among their top five most used for reducing sodium in school meals. Table 8 presents an overview of the lower sodium core strategies in the study, by SFA size.

Table 8. Number of SFAs Noting Core Strategy in Top Five, by SFA Size

Core Strategy/Practice	Small (n = 11)	Medium (n = 9)	Large (n = 8)	Very Large (n = 8)
Food Procurement	7	8	5	3
USDA DoD Fresh	3	6	2	2
USDA Foods	4	5	1	1
Food buying co-op or group purchasing entity	3	4	2	1
Food Supplier Interactions	1	2	3	4
Working with food suppliers on product reformulation and procurement	1	---	1	2
Attending trade shows and conferences	---	2	6	3
Using Effective Menu Planning	11	8	7	7
Using more fresh and/or frozen fruits and vegetables	8	6	5	5
Using lower sodium products	4	4	3	5
Modifying recipes already in use or developing new recipes	2	1	---	5
Implementing a self-serve condiment station or providing individual condiment packets	1	2	2	---
Changing Food Preparation Methods	6	4	2	5
Cooking with more herbs and spices	3	3	1	4
Maintaining or increasing the use of scratch cooking	5	---	1	2
Involving Stakeholders (Students, Staff, Parents, and/or Community Members) in Sodium Changes to Gain Acceptance	3	2	3	4
Conducting taste tests with students	1	---	2	1
Obtaining feedback from students, staff, parents, and/or community members on new menu items	2	3	---	3
Bringing in local chefs to teach about cooking	---	---	---	---

Across all SFAs, using effective menu planning was the most commonly employed core strategy to lower sodium in school meals. While using effective menu planning was the top reported core strategy regardless of SFA size, size seemed associated with which other top core strategies were selected. Small and large SFAs noted food procurement among their top core strategies, while medium-sized SFAs were more likely to report changing food preparation methods among their top core strategies. In qualitative interviews, participants from small SFAs often noted the effect that food procurement could have on

lowering sodium, though they reported having less control over the inventory and pricing due to small order size and resulting lack of purchasing power. By using foods from USDA DoD Fresh and USDA Foods, many small SFAs were able to overcome their food procurement challenges. Very large SFAs reported relying more on changing food preparation methods and interactions with food suppliers. The finding that very large SFAs relied on interactions with food suppliers is supported among the qualitative data collected, which contain discussions indicating that larger SFAs had more leverage with food suppliers.

IMPACT OF URBANICITY ON IMPLEMENTATION OF STRATEGIES TO REDUCE SODIUM

SFAs' urbanicity¹² (i.e., classification as city, suburb, town, or rural) may have an impact on their capacity to reach lower sodium targets. Table 9 presents an overview of the 36 SFAs in the study by urbanicity, by sodium target. SFAs located in cities, suburbs, and towns were the most likely to be close to or meeting Target 2, while SFAs located in rural locations were the least likely to be close or meeting Target 2. This finding may suggest SFA location within or close to an urban center may be beneficial in reaching sodium targets, while being located outside an urban area may act as a barrier to implementation.

Table 9. SFA Urbanicity, by Level of Reported Lower Sodium Target

SFA Characteristics	Sodium Target Level ¹³	Close to or Meeting Target 2 (n = 31)	Close to or Meeting Target 3 (n = 5)	Total
	Target 1 (n = 0)			
Urbanicity				
City	---	9	2	11
Suburb	---	8	1	9
Town	---	9	1	10
Rural	---	5	1	6

Most SFAs described the ways in which urbanicity impacted their ability to use lower sodium products and strategies in their SFAs. Some SFAs spoke about the effects a rural location had on the implementation of strategies to meet targets. A few respondents discussed how their rural location impacted the SFA's ability to meet with food suppliers, and other SFAs discussed the increased cost of shipping to rural areas.

Three respondents discussed how limited exposure to new and different foods by students in a rural SFA could adversely impact menu planning via reduced student acceptance, while two respondents discussed the benefits of being closer to farm products and fresh produce.

¹² SFA urbanicity was defined as follows: "city" is inside an urbanized area and inside a principal city; "suburb" is outside of a principal city and inside an urbanized area; "town" is inside an urban cluster, but not in an urbanized area; and "rural" is census-defined rural territory. See: Gevert, D. (2017). *Education Demographic and Geographic Estimates (EDGE) Program: Locale boundaries, 2015* (NCES 2016032). U.S. Department of Education. Washington, DC: National Center for Education Statistics. Retrieved from <http://nces.ed.gov/pubsearch>

¹³ Note: The Sodium Target level is a composite variable that describes each SFA's overall Sodium Target level, by school type, across all schools within each school type for each SFA.

Some SFAs discussed the benefits and challenges of working in urban districts. Challenges included varied access to fresh produce; busy purchasing schedules; and the presence of food deserts. Benefits included student populations that were more open to change; nearby drop-off points; and the availability of high-end chefs.

Given the potential influence urbanicity may have on implementation, the study team examined the type of core strategies employed, by SFA urbanicity. Table 10 presents an overview of the lower sodium core strategies in the study, by school urbanicity.

Table 10. Number of SFAs Noting Strategy in Top Five 5, by Urbanicity

Core Strategy/Practice	City (n = 11)	Suburb (n = 9)	Town (n = 10)	Rural (n = 6)
Food Procurement	8	4	7	4
USDA DoD Fresh	4	1	5	3
USDA Foods	3	3	3	2
Food buying co-op or group purchasing entity	3	2	3	2
Food Supplier Interactions	5	2	1	2
Working with food suppliers on product reformulation and procurement	2	---	1	1
Attending trade shows and conferences	3	2	---	1
Using Effective Menu Planning	9	9	10	5
Using more fresh and/or frozen fruits and vegetables	7	6	9	2
Using lower sodium products	5	4	5	2
Modifying recipes already in use or developing new recipes	3	2	2	1
Implementing a self-serve condiment station or providing individual condiment packet	---	2	3	---
Changing Food Preparation Methods	6	5	4	2
Cooking with more herbs and spices	3	4	3	1
Maintaining or increasing the use of scratch cooking	3	2	2	1
Involving Stakeholders (Students, Staff, Parents, and/or Community Members) in Sodium Changes to Gain Acceptance	2	6	3	1
Conducting taste tests with students	2	1	1	---
Obtaining feedback from students, staff, parents, and/or community members on new menu items	---	5	2	1
Bringing in local chefs to teach about cooking	---	---	---	---

Regardless of urbanicity, most SFAs reported core strategies with similar frequency. Effective menu planning was mostly commonly reported, followed by food procurement and changing food preparation methods. However, SFAs demonstrated some variation in strategies reported by proximity to urban centers. Urban SFAs (those located in cities) were more likely to report working with food suppliers as a strategy to reduce sodium; as indicated in the qualitative data, city-based SFAs might have had increased communications with food suppliers due to their proximity, and fewer barriers when compared to towns, suburbs, and rural areas. Rural SFAs were much less likely to change food preparation methods when compared to other urbanities; this suggests that rural SFAs might have greater barriers to labor-intensive strategies such as cooking with more herbs and spices, scratch cooking, and preparing and roasting vegetables. Suburban SFAs were more likely to report engaging stakeholders by involving students, staff, parents, and/or community members.

IMPACT OF GEOGRAPHIC REGION ON IMPLEMENTATION OF STRATEGIES TO REDUCE SODIUM

For the purposes of this report, and to better triangulate qualitative findings, the study team grouped SFAs into four distinct regions: North, South, Midwest, and West. Figure 1 below provides a map of the regions.

Figure 1. FNS Regions of the United States, by Analysis Region

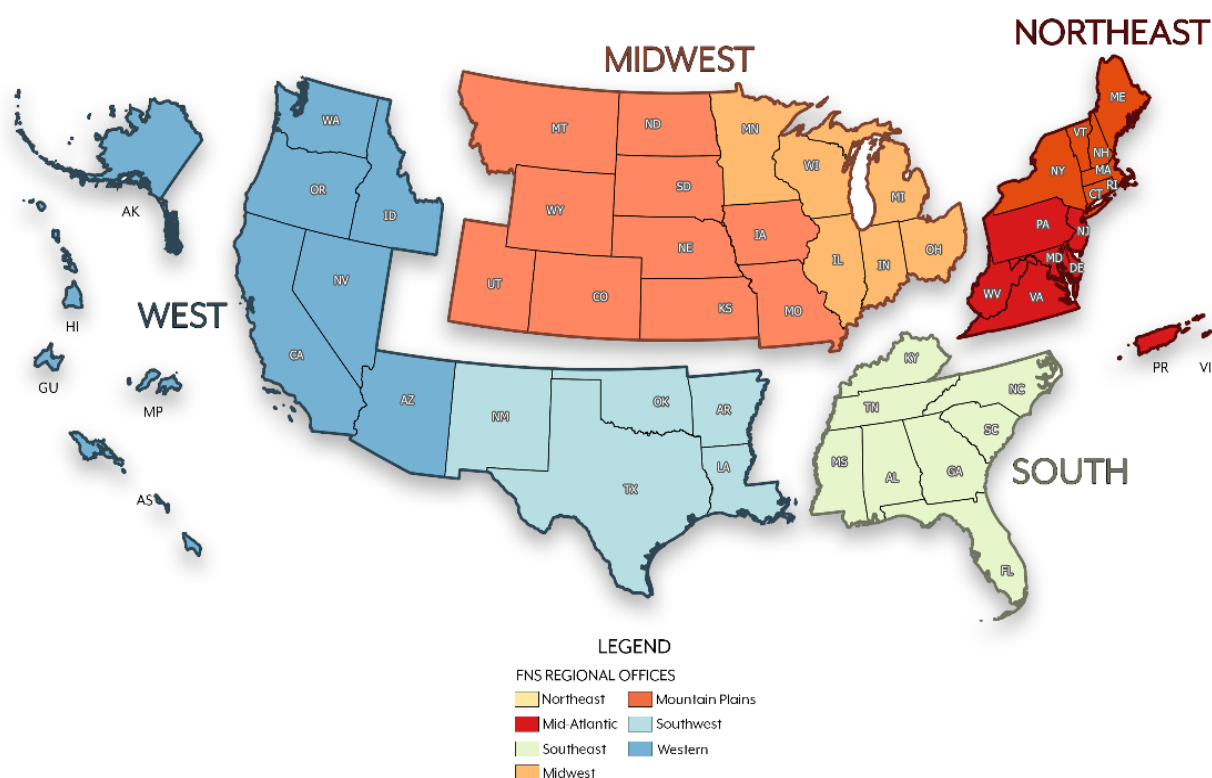


Table 11 presents an overview of the 36 SFA sites by geographic region, by sodium target. The majority of SFAs were close to or meeting Target 2. There were SFAs in the West and Midwest that reported being close to or meeting Target 3.

Table 11. SFA Region, by Level of Reported Lower Sodium Target

SFA Characteristics	Sodium Target Level ¹⁴			Total
	Target 1 (n = 0)	Close to or Meeting Target 2 (n = 31)	Close to or Meeting Target 3 (n = 5)	
Region				
Midwest^a	---	13	2	15
Northeast^b	---	5	0	5
South^c	---	6	0	6
West^d	---	7	3	10

Note: SFAs were organized into broad regions based on groupings of FNS Regional Offices as follows: a = the Mountain Plains and Midwest regions; b = the Northeast and Mid-Atlantic regions; c = Southeast region; and d= the Western and Southwestern regions. See Figure 1 above.

Most SFAs reported their perception that region impacted implementation of core strategies. Respondents noted the impact of region on student preferences or acceptance, with a few SFAs reporting an impact on food procurement strategies. Most SFAs did not attribute food procurement barriers to region or location. However, this was not consistent across SFA sizes; some small SFAs reported difficulty in food deliveries due to their geographic location. Several small SFAs noted that the driving distance to meet with co-op purchasing groups was not worth the buying power of the co-op.

Several SFAs reported that regional food culture could influence student acceptance of lower sodium meals, particularly due to exposure to healthy food outside of the school environment, which helped to establish students' palate and food preferences. Respondents from the West noted that health-conscious students, such as those living in California, are more likely to accept lower sodium foods due to their consistent exposure to fresh fruits and vegetables. Respondents from the South noted that students are more exposed to food high in fat content and sodium outside of schools.

Different regions have different flavor profiles and what they're accustomed to, how they pair and partner. Some of these alternate ways of preparing foods really are foreign [to students]. It's a matter of introducing and allowing something that's unfamiliar to become familiar. I do think that different regions of the country have different challenges. It's really, I think, driven a lot by what they're exposed to in the homes, in their community and then how we can affect that in the meals that we serve at school.
— Food Supplier 3000

Several SFAs in the Midwest and Northeast reported “meat and potatoes” as an integral component of their community or regional preferences. According to these SFAs, a preference for hearty foods caused low levels of student acceptance of “lighter” items, such as fresh fruits and vegetables; students preferred entrées that were more filling, typically with higher sodium levels, and starchy sides such as

¹⁴ Note: The Sodium Target level is a composite variable that describes each SFA's overall Sodium Target level, by school type, across all schools within each school type for each SFA.

corn, potatoes, and carrots. This negatively affected student acceptance of alternative fruits, vegetables, and ethnic or spiced flavor profiles, and limited SFAs' acceptable menu planning options.

It's meat and potatoes here. And so, I would love to introduce more ethnic foods, different varieties of things with different tastes and spices. And I've kind of held off on that, because it is so meat and potatoes. We did 1 week where we had things. . . we called it "Around the World in Four Days." . . . we went down into Louisiana, and we did red beans and dirty rice, and things that are really popular down there, the kids here were just like, 'That is disgusting.' — SFA Director 1182

In the South, foods with high acceptance included fried chicken and catfish, biscuits, and gravy; SFAs reported barriers to acceptance of lower sodium alternatives because of the preferences for authentic flavors consistent with regional preferences, including high sodium levels.

Yeah, we have lots of fried chicken here . . . and they're not serving fried chicken in schools. At the end of the day, fried chicken tastes good, so when you go eat fried chicken, it's going to be higher in sodium, it's going to be higher in fat. Then you go into a school where they're serving that grilled chicken. I think there's definitely a disconnect . . . you cannot expect a child to [go] into school lunch, love school lunch, and then come home and not have that same kind of food, but still like school lunch. — Community Stakeholder 4023

Despite the barriers respondents noted related to region, SFAs in the South did not seem to experience significant delays in reaching their lower sodium targets, as compared to other regions. It is possible that simply understanding and accounting for the students' previously established palates and food preferences allowed SFAs to implement tailored lower sodium strategies.

Given the potential influence region may have on implementation, the study team examined the type of core strategies employed by region. Table 12 presents an overview of the lower sodium strategies in the study, by SFA region.

Table 12. Number of SFAs Noting Strategy in Top Five, by Region

Core Strategy/Practice	SFA Region			
	Midwest (n = 15)	Northeast (n = 5)	South (n = 6)	West (n = 10)
Food Procurement	13	3	3	4
USDA DoD Fresh	9	1	1	2
USDA Foods	8	1	1	1
Food buying co-op or group purchasing entity	5	1	2	2
Food Supplier Interactions	3	2	2	3
Working with food suppliers on procurement and reformulation	1	---	1	2
Attending trade shows and conferences	2	2	1	1
Using Effective Menu Planning	14	5	6	8
Using more fresh and/or frozen fruits and vegetables	11	3	4	6
Using lower sodium products	5	3	3	5
Modifying recipes already in use or developing new recipes	3	1	2	2
Implementing a self-serve condiment station or providing individual condiment packets	1	2	---	2
Changing Food Preparation Methods	6	2	3	6
Cooking with more herbs and spices	4	1	2	4
Maintaining or increasing the use of scratch cooking	3	1	1	3
Involving Stakeholders (Students, Staff, Parents, and/or Community Members) in Sodium Changes to Gain Acceptance	6	2	3	1
Conducting taste tests with students	2	1	---	1
Obtaining feedback from students, staff, parents, and/or community members on new menu items	4	1	3	---
Bringing in local chefs to teach about cooking	---	---	---	---

There was little variability among SFAs in interactions with food suppliers and in effective menu planning. The West and South were more likely to alter food preparation methods than the Midwest and Northeast; SFAs located in the West reported the least use of stakeholder engagement, such as involving students, staff, parents, and/or community members, compared to other regions; the qualitative data support this finding, as student populations in the West might have had greater exposure to fresh fruits and vegetables and lower sodium products outside of school, and therefore might require fewer stakeholder strategies to gain student acceptance.

SUMMARY OF FINDINGS

Based on descriptive and qualitative data, all of the fixed variables included in this study (type, size, urbanicity, region) seemed to influence SFAs' strategies and their ability to reach the sodium targets. Elementary schools reported fewer barriers to meeting lower sodium targets, while middle and high schools faced barriers related to student acceptance of lower sodium foods and lack of participation in school lunch. School size seemed to have a mixed impact, with smaller schools reporting greater flexibility and ownership over menu planning and food preparation methods due to the relatively small student body, and larger schools reporting access to more staff, equipment, and space.

Both descriptive and anecdotal evidence suggest that proximity to urban areas increased access to food deliveries; SFAs in rural communities and towns reported barriers to procurement and distribution of lower sodium foods. Finally, it was difficult to discern meaningful variability of regional location in the descriptive data. However, respondents consistently reported that regional location correlated to student exposure to fresh fruits and vegetables, and to students' established palate and food preferences, and thus their acceptance of lower sodium foods in school meals.

Conclusions

All the SFAs interviewed had implemented strategies which altered the meals served to students; however, many of these changes were implemented to increase consumption of fruits and vegetables or whole wheat due to other (non-sodium-related) USDA policy changes. Because of these changes, and in combination with the study team's selection process, all 36 SFAs included in the study had met Target 1, and some had met Target 2, in all their schools; none had achieved Target 3 in all of their schools. Thus, the reduction in sodium in school meals described by SFA respondents was frequently an incidental change due in part to USDA policy changes that predate the sodium standards, rather than purely intentional changes due to the usage of the strategies described in this report.

The findings suggest that SFAs that have achieved or are close to achieving Target 2 sodium standards employ a combination of strategies to reduce sodium in school meals, most often the combination of maximizing their participation in federal food procurement programs with effective menu planning and changes in food preparation approaches. No single strategy is used by these SFAs; instead, they use a combination of strategies focusing on procuring lower sodium products, developing or utilizing alternative food preparation methods, and strategic efforts to encourage student acceptance.

SFA directors also discussed their longer-term efforts to identify and access lower sodium products that would be most appealing to their student populations. Over the course of this process, SFAs discussed the importance of flexibility in approaches to modify their strategies based on student acceptance, as well as the impact of their selected strategies on labor costs, staff skills, and infrastructure.

Regarding food procurement strategies, the findings indicate that SFAs widely used federal programs to support increased access to lower sodium items, especially fresh or frozen produce, but not without experiencing some challenges in procurement that impacted the ability to incorporate these items into school offerings. One-third of the SFAs in the study used these food procurement practices—including use of USDA DoD Fresh, USDA Foods, or participating in cooperative buying agreements—as a top five approach for reducing sodium in school meals. SFAs described these procurement strategies as being cost-effective overall, with the added value of the collaborative networks established as a part of cooperative buying agreements. These networks supported information sharing about the availability and best use of lower sodium items. Challenges to implementation primarily focused on the availability of lower sodium items, either due to seasonality or limited product offerings due to restrictions on buying only American-grown items. Another frequently noted challenge was the timing constraints of bidding processes for federal food programs. SFAs who chose to receive food products through either USDA DoD Fresh or USDA Foods reported increased need for resources such as appropriate storage and trained staff to assist in food preparation to effectively utilize these lower sodium food items.

While all 36 of the SFAs described working with food suppliers on product reformulation and procurement as a strategy, it was not reported by SFAs as one of the most effective approaches, as less than one-fourth of the SFAs in the study ranked this practice as a top five most effective strategy for reducing sodium in school meals. Respondents discussed the challenges and nuances associated with product reformulation, noting the leverage available to larger SFAs or cooperatives (co-ops) of SFAs. These larger entities not only had increased SFA purchasing power with access to a wider variety of lower sodium products at better prices, but also made it easier to source specialty items and provide financial incentives for manufacturers to address reformulation requests.

In terms of effective menu planning strategies, the most favored approaches for meeting the sodium targets were using more fresh or frozen fruits and vegetables, using lower sodium products, and recipe modification. The key facilitators for implementation of these approaches included additional staff training on food storage, preparation, and production; increased tailoring of offerings for culturally diverse populations for student acceptance; and access to lower sodium items via participation in USDA DoD Fresh, USDA Foods, and other food buying co-ops. Many SFAs discussed the challenges associated with ensuring their kitchen staff have the right kinds of food preparation skills for implementing the strategies, especially food preparation and production skills that enhanced the taste and quality of lower sodium menu items. These respondents stressed opportunities for kitchen staff to have both creativity and ownership in preparing lower sodium foods. Training, along with supportive food preparation materials such as specialized production sheets describing alternative seasonings that could be used, were identified as promising methods facilitating implementation of these approaches. Having both sufficient and properly trained staff was key to implementation of effective menu planning and changing food preparation strategies, as this minimized the challenges encountered in learning how to plan and prepare alternative meals and menus with lower sodium products.

Access to a professional chef was not available to all the SFAs in this study, but the findings suggest that such access facilitated the implementation of other practices, such as effective menu planning and changes in food preparation. Among those SFAs with the resources to hire or access a chef (typically larger SFAs), SFA respondents described a positive impact from having a chef on the implementation of sodium reduction strategies. Chefs brought specialized training approaches to scratch cooking and the preparation of fresh or frozen fruit and vegetables, which significantly elevated the quality and appeal of the food items offered to students. The ability to hire a chef as a staff member or to access one for specialized trainings also supported recipe modification, as well as the development of quick scratch cooking, which made these strategies more feasible to implement, according to SFA directors.

Changing food preparation methods was an essential way to reduce sodium in school meals, and SFA staff indicated that increasing or maintaining scratch cooking was one of the most common ways to control sodium content in meals while maintaining flavor and student acceptance. However, changing food preparation methods, particularly scratch cooking, requires extensive labor and time resources, which may impede SFAs' abilities to implement this approach. Generally, using herbs, spices, and other flavor enhancers was less resource-intensive and offered a simple and seamless way to reduce sodium while maintaining flavor.

Involving stakeholders was a core strategy used to refine recipes and gain student acceptance of lower sodium foods. The most commonly used practices for obtaining feedback involved taste testing, which helped SFAs obtain real-time feedback on palatability and acceptability of new menu items. By piloting or taste testing new items, SFAs avoided the cost (e.g., labor, time, food expense) involved with a full-scale offering of a poorly received menu item. Involving stakeholders required a range of internal and external resources, including partnerships with vendors to obtain free samples and conduct taste tests; partnerships with local culinary organizations to bring in local chefs to provide staff training on food presentation, preparation techniques, and menu development; staff members to coordinate stakeholder engagement events; and staff time and commitment for obtaining and reviewing ongoing student feedback.

Several immutable factors seemed to influence the SFAs' capacity to reach lower sodium targets. The study team examined school type, size, urbanicity and region through descriptive and quantitative evidence. Findings from the study support the notion that SFA factors influence the implementation of efforts to achieve lower sodium targets. SFA size seemed to have some impact on the capacity to reach sodium targets. Small and large SFAs were more likely to report being close to meeting Target 2, whereas medium and very large SFAs reported meeting Target 2. SFAs in cities and towns were more likely to report being close to or reaching Target 2, while suburban and rural SFAs were less likely to have reached Target 2. School type and region were the primary factors that seemed to impact SFAs' abilities to implement reduced or lower sodium items. This was likely due to low student acceptance; student acceptance across school type varied by age and overall willingness to accept change, while student norms and parameters of acceptable food types varied by region. SFA size and urbanicity related more to SFAs' abilities to procure foods and to plan menus. Small, rural SFAs reported fewer resources for purchasing and procuring foods, while urban, large SFAs procured higher quantities of food at lower costs, with access to a larger number of suppliers.

Across all SFAs, using effective menu planning was the most commonly employed strategy to lower sodium in school meals. While using effective menu planning was the top reported strategy regardless of SFA size, size seemed related to which other top strategies were selected. Small and large SFAs noted food procurement among their top strategies, while medium-sized SFAs were more likely to report changing food preparation methods among their top strategies. Respondents from small SFAs often noted the effect that food procurement could have on lowering sodium, though they reported having less control over the inventory and pricing due to small order size and resulting lack of purchasing power. By using foods from USDA DoD Fresh and USDA Foods, many small SFAs were able to overcome their food procurement challenges. Very large SFAs reported relying more on changing food preparation methods and interactions with food suppliers.

Among the core strategies and practices that were implemented by SFA sites in the study, taste testing was the most commonly used approach for involving stakeholders and encouraging students to accept lower sodium menu offerings. Most SFAs encountered challenges with student acceptance of a wide variety of products, foods, and recipes. SFAs described a range of lower sodium items that were not well-received by students, with the most commonly disliked items including meats (especially taco meat), chicken, country fried steak, and sandwich meats; breads (especially biscuits and tortillas); cheese products (especially macaroni and cheese); sauces and condiments (especially ranch dressing), gravy, and spaghetti sauces; and combination foods (especially pizza and dishes with noodles). In addition to taste testing, an important factor in garnering acceptance of lower sodium foods included allowing students to feel as though they had options, such as picking the toppings of their sandwiches and taco bowls or choosing from more than one lower sodium entrée.

SFAs also used different communication strategies, including marketing materials, signage, and announcements, to promote acceptance. The communication strategies primarily encouraged student acceptance of generally healthy food choices, new food items, and fresh fruits and vegetables; very few SFAs communicated the intentional decrease in sodium directly to students. The majority of SFAs believed that highlighting food items as being lower in sodium was not an effective strategy for promoting acceptance, primarily due to both the complexity involved in understanding the need to reduce sodium and the risk that featuring the meals as lower sodium would be linked with negative connotations among students about the taste and quality of the foods served. Using a consistent,

collaborative approach, but maintaining flexibility to adjust to changes in meals, was a theme that repeatedly emerged among SFAs as they described how to gain eventual student acceptance of many lower sodium items. The findings also indicate that ongoing efforts to promote acceptance of lower sodium items among students would need to be a component of any approach to achieve future lower sodium standards.

CHAPTER 3. SUMMARY TABLES

Overview

This chapter includes detailed quantitative findings on the strategies used by the 36 SFAs that were selected for the Objective 2 phase of the *Successful Strategies to Reduce Sodium in School Meals* study. The tables presented in this chapter are derived from the study's Prescreening Web Survey (PWS), which was used to collect data on the strategies used by the 36 sampled SFAs to meet sodium targets, as well as their current status in meeting the sodium standards to identify them for eventual inclusion in the study.

Data are presented for each of the 36 SFAs under the following domains: food procurement strategies, food supplier interactions, using effective menu planning, changing food preparation methods, and involving students, staff, parents, and/or community members in changes to gain acceptance. Each of these domains included specific sub-strategies used by the 36 SFAs. All sub-strategies implemented by these SFAs were identified and the top five strategies were ranked by each SFA. The tables below represent the count and percentage of SFAs implementing the strategies in total and as one of their top five strategies. These two groupings are further divided to show the number and percentage of SFAs using the strategy by SFA characteristics including SFA size, urbanicity, region, and current sodium status.

Food Procurement Strategies

Food procurement strategies implemented by SFAs include food buying in co-op or group purchasing, DoD's Fresh Fruit and Vegetable Program, USDA food purchases, farm to school programs, and school or community gardens.

Table 13. Food Buying in Co-Op or Group Purchasing, by SFA Characteristic

SFA Characteristics	Strategy Used by Any SFA (N = 36) n(%)	Strategy in the Top 5 Approaches Used by SFAs (N = 36) to Reduce Sodium n(%)
SFA Size (n)		
Small (11)	5(45.5)	3(27.3)
Medium (9)	5(55.6)	3(33.3)
Large (8)	6(75.0)	3(37.5)
Very Large (8)	4(50.0)	1(12.5)
Urbanicity (n)		
City (11)	8(72.7)	3(27.3)
Suburb (9)	4(44.4)	2(22.2)
Town (10)	5(50.0)	3(30.0)
Rural (6)	3(50.0)	2(33.3)
FNS Region		
MARO (2)	2(100.0)	---
MPRO (7)	2(28.6)	1(50.0)
MWRO (8)	5(62.5)	4(50.0)
NERO (3)	2(66.7)	1(33.3)
SERO (6)	3(50.0)	2(33.3)
SWRO (5)	3(60.0)	---
WRO (5)	3(60.0)	2(40.0)
Current Sodium Target Level		
Target 1(0)	---	---
Close to Meeting Target 2(15)	12(80.0)	6(40.0)
Target 2(16)	6(37.5)	3(18.8)
Close to Meeting Target 3(3)	2(66.7)	1(33.3)
Target 3(2)	---	---

Table 14. USDA DoD Fresh Fruit and Vegetable Program, by SFA Characteristic

SFA Characteristics	Strategy Used by Any SFA (N = 36) n(%)	A Strategy in the Top 5 Approaches Used by SFAs (N = 36) to Reduce Sodium n(%)
SFA Size (n)		
Small (11)	5(45.5)	3(27.3)
Medium (9)	6(66.7)	5(55.6)
Large (8)	5(62.5)	4(50.0)
Very Large (8)	6(75.0)	1(12.5)
Urbanicity (n)		
City (11)	7(63.6)	4(36.4)
Suburb (9)	6(66.7)	1(11.1)
Town (10)	5(50.0)	5(50.0)
Rural (6)	4(66.7)	3(50.0)
FNS Region		
MARO (2)	1(50.0)	1(50.0)
MPRO (7)	7(100.0)	5(71.4)
MWRO (8)	4(50.0)	4(50.0)
NERO (3)	2(66.7)	---
SERO (6)	5(83.3)	1(16.7)
SWRO (5)	2(40.0)	1(20.0)
WRO (5)	1(20.0)	1(20.0)
Current Sodium Target Level		
Target 1(0)	---	---
Close to Meeting Target 2(15)	8(53.3)	5(33.3)
Target 2(16)	11(68.8)	6(37.5)
Close to Meeting Target 3(3)	2(66.7)	1(33.3)
Target 3(2)	1(50.0)	1(50.0)

Table 15. USDA Food Program, by SFA Characteristic

SFA Characteristics	Strategy Used by Any SFA (N = 36) n(%)	Strategy in the Top 5 Approaches Used by SFAs (N = 36) to Reduce Sodium n(%)
SFA Size (n)		
Small (11)	10(90.9)	4(36.4)
Medium (9)	7(77.8)	5(55.6)
Large (8)	6(75.0)	1(12.5)
Very Large (8)	7(87.5)	1(12.5)
Urbanicity (n)		
City (11)	11(100.0)	3(27.3)
Suburb (9)	7(77.8)	3(33.3)
Town (10)	7(70.0)	3(30.0)
Rural (6)	5(83.3)	2(33.3)
FNS Region		
MARO (2)	2(100.0)	---
MPRO (7)	6(85.7)	4(57.1)
MWRO (8)	5(62.5)	4(50.0)
NERO (3)	2(66.7)	1(33.3)
SERO (6)	5(83.3)	1(16.7)
SWRO (5)	5(100.0)	---
WRO (5)	5(100.0)	1(20.0)
Current Sodium Target Level		
Target 1(0)	---	---
Close to Meeting Target 2(15)	13(86.7)	3(20.0)
Target 2(16)	12(75.0)	5(31.3)
Close to Meeting Target 3(3)	3(100.0)	2(66.7)
Target 3(2)	2(100.0)	1(50.0)

Food Supplier Interactions

Strategies included in food supplier interactions implemented by SFAs include working with vendors to gain information about the sodium content in food products and attending trade shows.

Table 16. Working with Food Suppliers on Product Reformulation and Procurement, by SFA Characteristic

SFA Characteristics	Strategy Used by Any SFA (N = 36) n(%)	Strategy in the Top 5 Approaches Used by SFAs (N = 36) to Reduce Sodium n(%)
SFA Size (n)		
Small (11)	9(81.8)	1(9.1)
Medium (9)	5(55.6)	---
Large (8)	5(62.5)	1(12.5)
Very Large (8)	8(100.0)	2(25.0)
Urbanicity (n)		
City (11)	8(72.7)	2(18.2)
Suburb (9)	8(88.9)	---
Town (10)	6(60.0)	1(10.0)
Rural (6)	5(83.3)	1(16.7)
FNS Region		
MARO (2)	1(50.0)	---
MPRO (7)	5(71.4)	1(14.3)
MWRO (8)	6(75.0)	---
NERO (3)	3(100.0)	---
SERO (6)	6(100.0)	1(16.7)
SWRO (5)	3(60.0)	2(40.0)
WRO (5)	3(60.0)	---
Current Sodium Target Level		
Target 1(0)	---	---
Close to Meeting Target 2(15)	11(73.3)	---
Target 2(16)	12(75.0)	2(12.5)
Close to Meeting Target 3(3)	3(100.0)	1(33.3)
Target 3(2)	1(50.0)	1(50.0)

Table 17. Attending Trade Shows and Conferences, by SFA Characteristic

SFA Characteristics	Strategy Used by Any SFA (N = 36) n(%)	Strategy in the Top 5 Approaches Used by SFAs (N = 36) to Reduce Sodium n(%)
SFA Size (n)		
Small (11)	2(18.2)	---
Medium (9)	5(55.6)	2(22.2)
Large (8)	8(100.0)	2(25.0)
Very Large (8)	8(100.0)	2(25.0)
Urbanicity (n)		
City (11)	8(72.7)	3(27.3)
Suburb (9)	8(88.9)	2(22.2)
Town (10)	4(40.0)	---
Rural (6)	3(50.0)	1(16.7)
FNS Region		
MARO (2)	2(100.0)	2(100.0)
MPRO (7)	3(42.9)	1(14.3)
MWRO (8)	4(50.0)	1(12.5)
NERO (3)	2(66.7)	---
SERO (6)	5(83.3)	1(16.7)
SWRO (5)	2(40.0)	---
WRO (5)	5(100.0)	1(20.0)
Current Sodium Target Level		
Target 1(0)	---	---
Close to Meeting Target 2(15)	10(66.7)	3(20.0)
Target 2(16)	10(62.5)	3(18.8)
Close to Meeting Target 3(3)	2(66.7)	---
Target 3(2)	1(50.0)	---

Using Effective Menu Planning

Strategies included in using effective menu planning implemented by SFAs include increasing fresh and frozen vegetables, using lower sodium products, modifying recipes already in use by the school district, implementing a self-serve condiment station or providing individual condiment packets, using herbs and spices, and maintaining or increasing scratch cooking.

Table 18. Using More Fresh and/or Frozen Fruits and Vegetables, by SFA Characteristic

SFA Characteristics	Strategy Used by Any SFA (N = 36) n(%)	Strategy in the Top 5 Approaches Used by SFAs (N = 36) to Reduce Sodium n(%)
SFA Size (n)		
Small (11)	11(100.0)	8(72.7)
Medium (9)	9(100.0)	7(77.8)
Large (8)	8(100.0)	4(50.0)
Very Large (8)	8(100.0)	5(62.5)
Urbanicity (n)		
City (11)	11(100.0)	7(63.6)
Suburb (9)	9(100.0)	6(66.7)
Town (10)	10(100.0)	9(90.0)
Rural (6)	6(100.0)	2(33.3)
FNS Region		
MARO (2)	2(100.0)	1(50.0)
MPRO (7)	7(100.0)	4(57.1)
MWRO (8)	8(100.0)	7(87.5)
NERO (3)	3(100.0)	2(66.7)
SERO (6)	6(100.0)	4(66.7)
SWRO (5)	5(100.0)	4(80.0)
WRO (5)	5(100.0)	2(40.0)
Current Sodium Target Level		
Target 1(0)	---	---
Close to Meeting Target 2(15)	15(100.0)	8(53.3)
Target 2(16)	16(100.0)	12(75.0)
Close to Meeting Target 3(3)	3(100.0)	2(66.7)
Target 3(2)	2(100.0)	2(100.0)

Table 19. Using Lower Sodium Products, by SFA Characteristic

SFA Characteristics	Strategy Used by Any SFA (N = 36) n(%)	Strategy in the Top 5 Approaches Used by SFAs (N = 36) to Reduce Sodium n(%)
SFA Size (n)		
Small (11)	8(72.7)	4(36.4)
Medium (9)	8(88.9)	3(33.3)
Large (8)	7(87.5)	5(62.5)
Very Large (8)	8(100.0)	4(50.0)
Urbanicity (n)		
City (11)	10(90.9)	5(45.5)
Suburb (9)	9(100.0)	4(44.4)
Town (10)	8(80.0)	5(50.0)
Rural (6)	4(66.7)	2(33.3)
FNS Region		
MARO (2)	2(100.0)	1(50.0)
MPRO (7)	6(85.7)	3(42.9)
MWRO (8)	8(100.0)	2(25.0)
NERO (3)	3(100.0)	2(66.7)
SERO (6)	6(100.0)	3(50.0)
SWRO (5)	3(60.0)	2(40.0)
WRO (5)	3(60.0)	3(60.0)
Current Sodium Target Level		
Target 1(0)	---	---
Close to Meeting Target 2(15)	13(86.7)	6(40.0)
Target 2(16)	15(93.8)	8(50.0)
Close to Meeting Target 3(3)	3(100.0)	2(66.7)
Target 3(2)	---	---

Table 20. Modifying Recipes Already in Use or Developing New Recipes, by SFA Characteristic

SFA Characteristics	Strategy Used by Any SFA (N = 36) n(%)	Strategy in the Top 5 Approaches Used by SFAs (N = 36) to Reduce Sodium n(%)
SFA Size (n)		
Small (11)	7(63.6)	2(18.2)
Medium (9)	4(44.4)	1(11.1)
Large (8)	7(87.5)	1(12.5)
Very Large (8)	8(100.0)	4(50.0)
Urbanicity (n)		
City (11)	7(63.6)	3(27.3)
Suburb (9)	7(77.8)	2(22.2)
Town (10)	7(70.0)	2(20.0)
Rural (6)	5(83.3)	1(16.7)
FNS Region		
MARO (2)	2(100.0)	1(50.0)
MPRO (7)	5(71.4)	2(28.6)
MWRO (8)	3(37.5)	1(12.5)
NERO (3)	1(33.3)	---
SERO (6)	6(100.0)	2(33.3)
SWRO (5)	5(100.0)	2(40.0)
WRO (5)	4(80.0)	---
Current Sodium Target Level		
Target 1(0)	---	---
Close to Meeting Target 2(15)	11(73.3)	4(26.7)
Target 2(16)	12(75.0)	3(18.8)
Close to Meeting Target 3(3)	2(66.7)	2(66.7)
Target 3(2)	1(50.0)	---

Table 21. Implementing a Self-Serve Condiment Station or Providing Individual Condiment Packets, by SFA Characteristic

SFA Characteristics	Strategy Used by Any SFA (N = 36) n(%)	Strategy in the Top 5 Approaches Used by SFAs (N = 36) to Reduce Sodium n(%)
SFA Size (n)		
Small (11)	7(63.3)	1(9.1)
Medium (9)	5(55.6)	3(33.3)
Large (8)	6(75.0)	1(12.5)
Very Large (8)	6(75.0)	---
Urbanicity (n)		
City (11)	7(63.6)	---
Suburb (9)	6(66.7)	2(22.2)
Town (10)	6(60.0)	3(30.0)
Rural (6)	5(83.3)	---
FNS Region		
MARO (2)	1(50.0)	1(50.0)
MPRO (7)	4(57.1)	---
MWRO (8)	7(87.5)	1(12.5)
NERO (3)	1(33.3)	1(33.3)
SERO (6)	3(50.0)	---
SWRO (5)	4(80.0)	---
WRO (5)	4(80.0)	2(40.0)
Current Sodium Target Level		
Target 1(0)	---	---
Close to Meeting Target 2(15)	10(66.7)	4(26.7)
Target 2(16)	9(56.3)	---
Close to Meeting Target 3(3)	3(100.0)	---
Target 3(2)	2(100.0)	1(50.0)

Changing Food Preparation Methods

Strategies used included cooking with herbs and spices and maintaining or increasing scratch cooking.

Table 22. Cooking with More Herbs and Spices, by SFA Characteristic

SFA Characteristics	Strategy Used by Any SFA (N = 36) n(%)	Strategy in the Top 5 Approaches Used by SFAs (N = 36) to Reduce Sodium n(%)
SFA Size (n)		
Small (11)	8(72.7)	3(27.3)
Medium (9)	8(77.8)	3(33.3)
Large (8)	8(100.0)	1(12.5)
Very Large (8)	6(75.0)	4(50.0)
Urbanicity (n)		
City (11)	9(81.8)	3(27.3)
Suburb (9)	8(88.9)	4(44.4)
Town (10)	7(70.0)	3(30.0)
Rural (6)	5(83.3)	1(16.7)
FNS Region		
MARO (2)	2(100.0)	---
MPRO (7)	7(100.0)	2(28.6)
MWRO (8)	7(87.5)	2(25.0)
NERO (3)	2(66.7)	1(33.3)
SERO (6)	4(66.7)	2(33.3)
SWRO (5)	4(80.0)	3(60.0)
WRO (5)	3(60.0)	1(20.0)
Current Sodium Target Level		
Target 1(0)	---	---
Close to Meeting Target 2(15)	11(73.3)	3(20.0)
Target 2(16)	15(93.8)	7(43.8)
Close to Meeting Target 3(3)	3(100.0)	1(33.3)
Target 3(2)	---	---

Table 23. Maintaining or Increasing the Use of Scratch Cooking, by SFA Characteristic

SFA Characteristics	Strategy Used by Any SFA (N = 36) n(%)	Strategy in the Top 5 Approaches Used by SFAs (N = 36) to Reduce Sodium n(%)
SFA Size (n)		
Small (11)	6(54.5)	5(45.5)
Medium (9)	3(33.3)	1(11.1)
Large (8)	3(37.5)	---
Very Large (8)	6(75.0)	2(25.0)
Urbanicity (n)		
City (11)	6(54.5)	3(27.3)
Suburb (9)	5(55.6)	2(22.2)
Town (10)	3(30.0)	2(20.0)
Rural (6)	4(66.7)	1(16.7)
FNS Region		
MARO (2)	1(50.0)	---
MPRO (7)	4(57.1)	2(28.6)
MWRO (8)	2(25.0)	1(12.5)
NERO (3)	1(33.3)	1(33.3)
SERO (6)	4(66.7)	1(16.7)
SWRO (5)	2(40.0)	1(20.0)
WRO (5)	4(80.0)	2(40.0)
Current Sodium Target Level		
Target 1(0)	---	---
Close to Meeting Target 2(15)	10(66.7)	4(26.7)
Target 2(16)	6(37.5)	3(18.8)
Close to Meeting Target 3(3)	2(66.7)	1(33.3)
Target 3(2)	---	---

Involving Students, Staff, Parents, and/or Community Members in Changes to Gain Acceptance

Strategies included in obtaining feedback from students, staff, parents, and/or community members on new menu items; conducting taste tests with students, staff, and/or parents; hosting food tasting parties to expose students, etc.; sampling vendor's products by students, staff, and/or parents; and bringing in local chefs to teach about cooking.

Table 24. Obtaining Feedback from Students, Staff, Parents, and/or Community Members on New Menu Items, by SFA Characteristic

SFA Characteristics	Strategy Used by Any SFA (N = 36) n(%)	Strategy in the Top 5 Approaches Used by SFAs (N = 36) to Reduce Sodium n(%)
SFA Size (n)		
Small (11)	10 (90.9)	2 (18.2)
Medium (9)	8 (88.9)	2 (22.2)
Large (8)	6 (75.0)	1 (12.5)
Very Large (8)	8 (100)	3 (37.5)
Urbanicity (n)		
City (11)	10 (90.9)	---
Suburb (9)	9 (100.0)	5 (55.6)
Town (10)	7 (70.0)	2 (20.0)
Rural (6)	6 (100.0)	1 (16.7)
FNS Region		
MARO (2)	2 (100.0)	---
MPRO (7)	7 (100.0)	2 (28.6)
MWRO (8)	6 (75.0)	2 (25.0)
NERO (3)	3 (100.0)	1 (33.3)
SERO (6)	5 (83.3)	3 (50.0)
SWRO (5)	5 (100.0)	---
WRO (5)	4 (80.0)	---
Current Sodium Target Level		
Target 1(0)	---	---
Close to Meeting Target 2(15)	13 (86.7)	3 (20.0)
Target 2(16)	15 (93.8)	4 (25.0)
Close to Meeting Target 3(3)	3 (100.0)	1 (33.3)
Target 3(2)	1 (50.0)	---

Table 25. Conducting Taste Tests with Students, Staff, and/or Parents, by SFA Characteristic

SFA Characteristics	Strategy Used by Any SFA (N = 36) n(%)	Strategy in the Top 5 Approaches Used by SFAs (N = 36) to Reduce Sodium n(%)
SFA Size (n)		
Small (11)	9 (81.8)	1 (9.1)
Medium (9)	4 (44.4)	---
Large (8)	5 (62.5)	2 (25.0)
Very Large (8)	8 (100.0)	1 (12.5)
Urbanicity (n)		
City (11)	9 (81.8)	2 (18.2)
Suburb (9)	7 (77.8)	1 (11.1)
Town (10)	5 (50.0)	1 (10.0)
Rural (6)	5 (83.3)	---
FNS Region		
MARO (2)	1 (50.0)	---
MPRO (7)	5 (71.4)	---
MWRO (8)	5 (62.5)	2 (25.0)
NERO (3)	1 (33.3)	---
SERO (6)	6 (100.0)	---
SWRO (5)	4 (80.0)	1 (20.0)
WRO (5)	4 (80.0)	---
Current Sodium Target Level		
Target 1(0)	---	---
Close to Meeting Target 2(15)	10 (66.7)	1 (6.7)
Target 2(16)	12 (75.0)	3 (18.8)
Close to Meeting Target 3(3)	3 (100.0)	---
Target 3(2)	1 (50.0)	---

Table 26. Obtaining Feedback from Students, Staff, Parents, and/or Community Members on New Menu Items, by SFA Characteristic

SFA Characteristics	Strategy Used by Any SFA (N = 36) n(%)	Strategy in the Top 5 Approaches Used by SFAs (N = 36) to Reduce Sodium n(%)
SFA Size (n)		
Small (11)	10 (90.9)	2 (18.2)
Medium (9)	8 (88.9)	2 (22.2)
Large (8)	6 (75.0)	1 (12.5)
Very Large (8)	8 (100)	3 (37.5)
Urbanicity (n)		
City (11)	10 (90.9)	---
Suburb (9)	9 (100.0)	5 (55.6)
Town (10)	7 (70.0)	2 (20.0)
Rural (6)	6 (100.0)	1 (16.7)
FNS Region		
MARO (2)	2 (100.0)	---
MPRO (7)	7 (100.0)	2 (28.6)
MWRO (8)	6 (75.0)	2 (25.0)
NERO (3)	3 (100.0)	1 (33.3)
SERO (6)	5 (83.3)	3 (50.0)
SWRO (5)	5 (100.0)	---
WRO (5)	4 (80.0)	---
Current Sodium Target Level		
Target 1(0)	---	---
Close to Meeting Target 2(15)	13 (86.7)	3 (20.0)
Target 2(16)	15 (93.8)	4 (25.0)
Close to Meeting Target 3(3)	3 (100.0)	1 (33.3)
Target 3(2)	1 (50.0)	---

Table 27. Bringing in Local Chefs to Teach About Cooking, by SFA Characteristic

SFA Characteristics	Strategy Used by Any SFA (N = 36) n(%)	Strategy in the Top 5 Approaches Used by SFAs (N = 36) to Reduce Sodium n(%)
SFA Size (n)		
Small (11)	---	---
Medium (9)	1 (11.1)	---
Large (8)	3 (37.5)	1 (12.5)
Very Large (8)	1 (12.5)	---
Urbanicity (n)		
City (11)	3 (27.3)	1 (9.1)
Suburb (9)	1 (11.1)	---
Town (10)	1 (10.0)	---
Rural (6)	---	---
FNS Region		
MARO (2)	---	---
MPRO (7)	---	---
MWRO (8)	2 (25.0)	---
NERO (3)	1 (33.3)	---
SERO (6)	---	---
SWRO (5)	1 (20.0)	---
WRO (5)	1 (20.0)	1 (20.0)
Current Sodium Target Level		
Target 1(0)	---	---
Close to Meeting Target 2(15)	3 (20.0)	1 (6.7)
Target 2(16)	2 (12.5)	---
Close to Meeting Target 3(3)	---	---
Target 3(2)	---	---

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