

# Successful Approaches to Reduce Sodium in School Meals

VOLUME I: FINAL REPORT



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## EXECUTIVE SUMMARY

This report presents a summary of the findings from the Successful Approaches to Reduce Sodium in School Meals study. In 2016, the U.S. Department of Agriculture's (USDA) Food and Nutrition Service (FNS) contracted 2M Research and Abt Associates (collectively, the Study Team) to conduct the Successful Approaches to Reduce Sodium in School Meals study to identify (1) the challenges that both the food industry and schools must overcome to meet current and future sodium standards and (2) the successful, innovative methods schools and school districts use in partnership with the food industry to achieve compliance with the sodium standards. 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 final report summarizes the outcomes and lessons learned from the study. It synthesizes the major findings for similar research questions asked in both the Objective 1 and Objective 2 phases of the study to enhance the understanding of (1) the market availability of lower sodium foods that will help schools meet the current and future sodium standards for school meals programs, (2) the strategies most often used by schools that have met the sodium standards, and (3) the technical assistance requested of USDA for implementation of the sodium standards.

### Study Background

The National School Lunch Program (NSLP) and the School Breakfast Program (SBP) are federally assisted meal programs operating in almost 100,000 public and nonprofit private schools and residential child care institutions nationally. These programs provide nutritious meals to millions of school children in grades kindergarten through 12 (K–12) through the work of SFAs and school nutrition professionals who work with the food industry, including food distributors, manufacturers, and food service management companies (FSMCs), to obtain and prepare the foods served daily. In recent years, there has been increasing concern about the role of the school meal environment in children's diets, including health impacts associated with high levels of sodium consumption among children ages 5–18. Research suggests that U.S. children consume sodium at levels that are higher than the recommended amounts (U.S. Department of Agriculture [USDA] & U.S. Department of Health and Human Services [HHS], 2015; USDA Agricultural Research Service, Food Surveys Research Group, 2017; National Academy of Medicine [NAM], formerly known as the Institute of Medicine, 2010; Nutrition Standards in the National School Lunch and School Breakfast Programs Final Rule, 2012). To address growing concerns over consumption patterns among children ages 5–18 years, Congress passed the Healthy, Hunger-Free Kids Act of 2010 (HHFKA) (Pub. L. 111–296), which required USDA to update the school meal standards to align with the 2010 *Dietary Guidelines for Americans* (USDA & HHS, 2015). One of the provisions of the updated nutrition standards required that schools gradually reduce the average sodium content of weekly meals over a 10-year period. The timeline for compliance with sodium reductions was set to begin with Sodium



Target 1 levels in school year (SY) 2014–2015, with Sodium Target 2 levels in SY 2017–2018, and the final Sodium Target 3 levels in SY 2022–2023. The three sodium targets established in 2012 (and in effect at the beginning of this study) are shown in **Table 1** in Chapter 1 of this report.

This study focuses on the resources and approaches necessary to achieve sodium targets. On May 1, 2017, immediately preceding the initiation of data collection, USDA Secretary Sonny Perdue issued a Proclamation announcing several menu-planning flexibilities, including flexibilities for program operators in meeting the sodium standards. On May 5, 2017, Congress enacted the Consolidated Appropriations Act, 2017 (P.L. 115-31; the Appropriations Act). Section 747 of the Appropriations Act provides flexibilities that continue Target 1 for sodium for SY 2017–2018 (USDA FNS, 2017c). After consultation with FNS, the Study Team did not alter its methodology to reflect these changes; data on progress achieving the Target 2 standard were still collected.

## Overview of Study Design and Methods

This study relies on qualitative data from a limited, purposeful sample of respondents with direct experience responding to the sodium target levels for school meals. It was developed to address two objectives: Objective 1 aimed to understand the availability of foods that met the current and future sodium target levels for school meals programs from the perspective of food manufacturers and FSMCs. Objective 2 sought to identify best practices among SFAs developing lower sodium menus in school districts that were successfully meeting sodium targets that could inform other SFAs trying to meet the targets.

To understand the market availability of lower sodium products, the Study Team collected data for Objective 1 in early 2016, through one focus group with six sales and/or marketing managers representing the school foodservice divisions of national or international food manufacturing and supply companies and through six key informant interviews with representatives of food service management companies (FSMCs) that work with K–12 schools. We recruited participants through a deliberate sample drawn from attendees at K–12 industry conferences and through lists of top FSMCs. We selected participants based on their involvement across key product categories present in the K–12 school foods market, including bakery products, convenience frozen foods, cereals and breakfast grains, meats, prepackaged snack-food items, and canned fruit and vegetable products.

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 Target 2 sodium standards. The sample of SFAs was obtained through a multiphase process. A random stratified sample of SFAs ( $n = 616$ ) was invited to participate in the study's Prescreening Web Survey. The goal was to identify SFAs that were meeting Target 1 and close to or meeting Target 2; 404 SFAs responded. The web survey data were analyzed to identify 69 candidate SFAs to participate in a Brief Site Visit Selection interview to identify additional information on approaches used for meeting the sodium standards, the use of possible innovative practices, and potential participants for the in-depth interviews. Selection criteria used to identify candidate SFAs included consideration of the distribution across size and urbanicity and the use of creative and innovative sodium-reduction strategies. Overall, 45 SFAs participated in these interviews. From these 45 SFAs, the Study Team identified the 36 SFAs to

participate in in-depth interviews. The 36 SFAs were selected based on (1) their use of strategies deemed to be more innovative, (2) their use of multiple strategies to achieve sodium targets, (3) SFA size, and (4) SFA geographic region.

A total of 118 in-depth interviews were conducted 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).<sup>1</sup> In addition to these 118 interviews, the Study Team conducted in-person site visits at a subsample of 10 SFAs.

For both phases of this study, all qualitative interviews were transcribed and imported into NVivo 11 qualitative data analysis software for coding and analysis. The Study Team coded the data to hierarchically order data according to prescribed codes or themes. Coding structures arranged ideas logically to map the research questions and concepts of interest to ensure that the qualitative data addressed the research questions. Chapter 1 provides additional description of the sampling, data collection and analysis methods used for both the Objective 1 and Objective 2 phases of the study.

## Limitations of the Research Study

The research findings described in this report are derived from a small qualitative study that did not aim to have a representative sample of the food industry or SFAs. Because the goal of the study was to learn from those who have experienced success in their efforts to meet the sodium targets, the responses reflect a particular subset of the population. Even as efforts were made to include a diverse subset of respondents by either industry segment (food manufacturers) or SFA size, region, and urbanicity, the report findings are not nationally representative and are thus unlikely to reflect the full range of experiences of all SFAs and stakeholders engaged in meeting Target 1 and/or Target 2. The study findings are not intended to be generalizable to the entire population of SFAs. The findings capture lessons learned and best practices from those with direct experience implementing approaches to successfully meet the sodium standards.

The study findings only represent the experiences and perspectives of the respondents interviewed. No additional claims can be made concerning the degree to which USDA program policy or regulations were implemented correctly by respondents. Verification of the degree to which respondents (specifically SFA directors and food suppliers) correctly complied with program regulations and policy guidance is beyond the scope of this study.

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<sup>1</sup> “School employee” was defined as a principal, assistant principal, nurse, administrator, staff member on a local school wellness committee, or teacher who was knowledgeable about, or had been instrumental in, promoting or working with students on the acceptance of and changes to nutrition in their school, including reducing sodium in school meals. “Food supplier” was defined as an individual or part of an organization that delivered meals, food, or ingredients to an SFA or schools for use in school meals, with a key role in supplying lower sodium food or food ingredients. Food supplier respondents included brokers, distributors, manufacturers, FSMC representatives, and other individuals in key positions that interacted with SFAs.

## Key Findings

### MARKET AVAILABILITY OF LOWER SODIUM ITEMS

Food manufacturers, FSMCs, and SFA respondents all indicated that lower sodium products that meet sodium Target 1 are available in the food distribution chain. Food manufacturers and FSMCs described having a sufficient timeline as key to preparing to meet the sodium standard; industry efforts were made in advance of the regulations to reduce the sodium content in many school foods. Additional facilitators included incorporating taste testing in reformulation of products and identifying necessary changes throughout the food supply chain to accommodate these items.

SFAs reported using USDA food procurement programs, cooperative purchasing agreements (food buying co-ops), and group purchasing entities to obtain access to lower sodium foods. Smaller and rural SFAs were more likely to report challenges in terms of access to lower sodium items and to describe their participation in a food buying co-op or group purchasing entity as a means of overcoming some of the limitations encountered in accessing lower sodium items. Initially, some SFAs also encountered issues in ordering and menu planning because of changing availabilities of products, inconsistencies in product quality, and long ordering timelines.

Food industry respondents identified the extreme specialization required to produce and market lower sodium products as a barrier for their industry and to their ability to continue to offer compliant food products to schools. Based on their perceptions, creating a more specialized product for school foods to meet sodium Target 2 or Target 3 may decrease the number of food suppliers offering compliant products because of the financial and business effects of participating in a highly segmented market.

### Market Availability of Lower Sodium Items

**Key Finding: Lower sodium items are available, but some challenges exist in accessing them.**

- ✓ A large variety of products that meet the Target 1 sodium standard are available due to an extended preplanning period in anticipation of sodium reduction.
- ✓ Most SFAs have access to a range of lower sodium items through procurement processes, including use of the USDA Food Program and USDA Department of Defense (DoD) Fresh Fruit and Vegetable Program.
- ✓ Smaller SFAs report using co-ops or group purchasing entities to increase their purchasing power and access to lower sodium items.
- ✓ Challenges to accessing lower sodium items include extreme specialization of these items for the school food market only, infrastructure limitations of SFAs, and timing of the purchase process.

## STRATEGIES FOR REDUCING SODIUM IN SCHOOL MEALS

Among SFAs that have met or are close to meeting the Target 2 standards, SFAs used five broad strategies most frequently: (1) effective menu planning; (2) food procurement; (3) the involvement of stakeholders including students, staff, parents, and other community members in sodium changes to gain acceptance; (4) changing food preparation methods; and (5) food supplier interactions.

Among effective menu planning strategies, the most common practices were using more fresh or frozen fruits and vegetables, using lower sodium products, and modifying recipes. Some SFAs also maintained or increased their level of scratch cooking to reduce sodium; however, increasing scratch cooking required more labor, time, and resources, including necessary kitchen equipment. SFA participation in USDA food procurement programs, food buying co-ops, and group purchasing entities increased access to fresh fruit and vegetables and other lower sodium items and many reported using herbs, spices, and other flavor enhancers as the main approach to changing food preparation methods. Of the five broad sodium reduction strategies discussed, food supplier interactions<sup>2</sup> were the least common strategy used by SFAs to meet lower sodium standards.

The findings suggest that SFAs that have met or are close to meeting Target 2 sodium standards employ multiple strategies to reduce sodium in school meals, most often the combination of maximizing participation in USDA food procurement programs with effective menu planning and changes in food preparation practices. The combination of these three strategies was used by nearly half of the 36 SFAs in the study. Key facilitators for implementation of this combination of strategies (effective menu planning, food procurement strategies, and changing food preparation practices) included:

- (1) access to a wide range of fresh and frozen lower sodium items;
- (2) additional staff training on food storage, preparation, and production;
- (3) additional labor resources for production and preparation;
- (4) staff resources and expertise in recipe modification or development; and
- (5) the ability to tailor menu offerings for culturally diverse populations to increase student acceptance.

### The Most Used Strategies for Reducing Sodium in School Meals

**Key Finding:** *SFAs that have achieved or are close to achieving Target 2 sodium standards employed a combination of strategies to reduce sodium in school meals.*

- ✓ SFAs used effective menu planning, federal food procurement programs, and changes in food preparation to successfully reduce sodium.
- ✓ SFAs fostered student acceptance through opportunities for feedback, specifically through taste testing.
- ✓ Some SFAs also used or increased their level of scratch cooking to reduce sodium, but this may not be a strategy most SFAs can adopt.

<sup>2</sup> In this study, food supplier interactions include SFAs working with vendors to gain information about the sodium content in food products, attending trade shows, and working with vendors on product reformulation.

## STUDENT ACCEPTANCE OF LOWER SODIUM ITEMS

A key consideration in examining approaches used by SFAs to reduce sodium in school meals is the degree to which products and approaches achieved student acceptance. The study findings indicate that most SFAs experienced challenges in gaining acceptance of lower sodium items. 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 particularly challenging. Reasons for lack of acceptance of lower sodium items included unpopular or bland flavor profiles, and negative responses to the color, shape, consistency, texture, and/or quality of food items.

SFAs developed a combination of successful approaches to support and encourage student acceptance of lower sodium items, including taste testing, which was the most commonly used approach. SFAs used a variety of approaches to implement taste testing, including developing student taste testing panels and selecting a set of test schools where taste testing activities occurred. Some SFAs also included parents, staff, and community members in taste tests to determine items with the highest levels of acceptance. Most SFAs also used a set of supportive approaches along with taste testing to enhance student acceptance of lower sodium items, including:

- (1) promoting healthy food choices through educational activities and communication materials;
- (2) providing more menu options and customizing existing items to reflect student’s cultural preferences and/or a popular flavor profile;
- (3) offering students the ability to customize their meals with special lower sodium toppings (e.g., sauces, seasonings, or cut vegetables); and
- (4) implementing menu changes gradually to improve uptake of sodium reduction.

### Gaining Student Acceptance of Lower Sodium Items

**Key Finding: Achieving student acceptance of lower sodium items was challenging. SFAs used a combination of strategies to gain student acceptance, including:**

- ✓ Implementing taste testing to inform menu changes and identify preferred food items
- ✓ Providing more menu options reflective of students’ preferences (i.e., cultural, regional) and customizing existing items
- ✓ Communicating and promoting healthy food choices
- ✓ Implementing menu changes gradually to improve uptake of lower sodium items

## TECHNICAL ASSISTANCE NEEDED TO IMPLEMENT THE SODIUM STANDARDS

SFAs described a variety of technical assistance they received to meet the sodium standards for school meals. The most prevalent form of assistance reported was the sharing of information and marketing materials, either electronically through websites and email or in print form. Several sources provided this type of technical assistance, including USDA, State agencies, and food manufacturers and suppliers. FSMCs and food manufacturers reported that they used USDA training and materials as key technical assistance resources in a variety of ways, including to educate their own staff.

### Technical Assistance Needed to Implement the Sodium Standards

**Key finding: Communications about the sodium standards and lower sodium recipes were the most requested areas for technical assistance from SFAs, food manufacturers, and FSMCs.**

Future USDA technical assistance needs include:

- ✓ Dissemination of research on the health impacts of sodium and sodium substitutes
- ✓ Enhanced planning and communication with all stakeholders for implementing future targets
- ✓ Communication materials for diverse audiences, including schools, cooks, and FSMCs
- ✓ Targeted resources for food preparation, infrastructure, and trainings

Food manufacturers, FSMCs, and SFAs found the technical assistance provided by USDA to be very useful, but they had additional recommendations for future technical assistance including:

- (1) providing additional research findings supporting the health effects of sodium and sodium substitutes on children's diets;
- (2) enhancing the planning process for implementing sodium standards to engage stakeholders across the food supply chain;
- (3) developing additional communication resources for diverse audiences; and
- (4) offering support for targeted trainings, infrastructure investments, and additional labor resources for future implementation.

Food manufacturers, FSMCs, and SFA-based stakeholders suggested that USDA support the implementation of the sodium standards by providing more frequent and strategic communication and guidance focused on clarifying the rationale and research behind the sodium changes, as well as materials to help communicate and describe the sodium targets to (1) parents and the community, (2) students, and (3) school personnel. SFAs described the value of and continued need for lower sodium recipes and related resources—such as guidance on alternative seasonings—to support implementation of the sodium standards. Some respondents also discussed the need for training, either in person or online, to better understand sodium guidelines and menu planning. Among SFAs that received training from USDA, State agencies, and food suppliers, respondents noted that the training topics on food preparation methods, lower sodium products, and challenges experienced in the school districts were helpful and should be continued. To further support implementation of lower sodium targets, USDA might also consider developing new and tailored information for each stakeholder audience across the food supply chain and enhancing circulation and translation of existing tools, resources, and training. SFAs in particular also discussed the need for additional USDA support in obtaining necessary infrastructure equipment and resources to hire and train sufficiently skilled labor to support implementation of the sodium standards.

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## CHAPTER 1. INTRODUCTION

Sodium is an essential nutrient the body uses to maintain blood volume, regulate water balance in cells, and aid in nerve function. Although sodium is essential for optimal human functioning, research suggests that average sodium intake far exceeds recommendations needed to maintain good health (U.S. Department of Agriculture [USDA] & U.S. Department of Health and Human Services [HHS], 2015; USDA Agricultural Research Service, Food Surveys Research Group, 2017). High sodium intake is associated with several chronic conditions—notably, high blood pressure, which is a major contributor to cardiovascular diseases such as strokes and heart attacks; gastric cancer; and decreased bone mineral density (Cappuccio, 2013). Overconsumption is also a potential risk factor for obesity (Cappuccio, 2013; Zhu et al., 2014). While the recommended intake for sodium is between 1,500 and 2,300 milligrams (mg) per day for children (Centers for Disease Control and Prevention, 2017), U.S. children ages 8–12 years are estimated to consume 3,260 milligrams (mg) of sodium per day, on average (Jackson, Coleman King, Zhao & Cogswell, 2016). To address growing concerns over dietary consumption patterns among children ages 5–18 years, Congress passed the Healthy, Hunger-Free Kids Act of 2010 (HHFKA) (Pub. L. 111–296), which required the U.S. Department of Agriculture (USDA) to update the school meal standards to align with the 2010 *Dietary Guidelines for Americans* (USDA & HHS, 2015). One of the provisions of the updated nutrition standards required that schools gradually reduce the average sodium content of weekly meals over a 10-year period. The USDA Food and Nutrition Service (FNS) has been working with school nutrition professionals to overcome operational challenges in providing meals that meet the established sodium standards and encourage student participation and meal consumption.

In 2016, USDA FNS contracted 2M Research and Abt Associates (collectively, the Study Team) to conduct the Successful Approaches to Reduce Sodium in School Meals study to examine 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

The Study Team employed different data collection methods to examine each objective and reported the challenges that the food industry and schools must overcome, as well as the successful innovative strategies used to achieve federally mandated sodium standards. This report synthesizes the major study findings across the two objectives, highlighting the outcomes and lessons learned. The report is organized around the following themes:

- The market availability of lower sodium foods that will help schools meet the sodium standards for school meals programs
- Strategies most often used by those schools that have met the sodium standards
- Strategies used to support student acceptance of changes in school meals
- Recommendations for effective technical assistance



This report summarizes findings from the *Successful Approaches to Reduce Sodium in School Meals* study. To contextualize these findings, we provide a brief overview of the school meals programs and the food distribution chain used to obtain food items, including lower sodium products, as well as a discussion of the sodium standards for school meals.

## Study Background

### SCHOOL MEALS PROGRAMS

The National School Lunch Program (NSLP) and School Breakfast Program (SBP) are federally assisted meal programs operating in approximately 100,000 public and nonprofit private schools and residential child care institutions. Any child enrolled in a participating school can purchase a meal through NSLP or SBP. Children from families with incomes at or below 130 percent of the federal poverty guidelines (FPG) are eligible for free meals; children from families with incomes between 130 percent and 185 percent of FPG are eligible for reduced price meals (USDA Food and Nutrition Service [FNS], 2017b). School districts that participate in NSLP and SBP receive cash reimbursements and commodities (USDA Food Program [USDA Foods]) from USDA for each meal they serve. For both programs, the meals served by schools must meet federal nutrition requirements. In 2016, NSLP provided low- or no-cost lunches to more than 30.4 million children daily, while SBP provided meals to 14.57 million children (USDA Economic Research Service [ERS], 2017; USDA FNS, 2017b).

### SOURCES OF FOODS CONSUMED IN USDA SCHOOL MEALS PROGRAMS

As described above, school meals programs are required to procure and prepare meals that meet federally specified meal pattern requirements and nutrition standards. The food distribution chain that serves as the source of raw and processed foods for school meals is an important component of this process: understanding the complexity of the production of foods to schools across the United States is essential to understanding the availability of foods overall, and of lower sodium foods in particular.

Most commercially prepared food products go through a distribution channel. Although it can vary depending on the retail market, the conventional distribution path for a packaged food product is from manufacturer to broker to distributor to retailer. Food for school meals can be procured by varied means. While some school food authorities (SFAs)<sup>3</sup> buy direct from producers or growers, others might rely on third parties, like distributors or food service management companies (FSMCs).<sup>4</sup> Other SFAs might participate in cooperatives or group buying organizations, which allow multiple entities (in this case, schools or SFAs) to procure items together, or order items from a food hub, which aggregates the goods of several producers (USDA FNS, 2015).

The food industry eases purchasing and procurement by processing raw foods such as fruits, grains, meats, vegetables, and dairy products into finished goods. Prior to creating products, manufacturers,

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<sup>3</sup> “SFA” refers to the end-user that purchases, prepares, and serves the food products to the final consumer—the students. An SFA can refer to individual schools, a school district, or several school districts. SFAs receive federal meal reimbursements for meal programs and are responsible for ensuring that the meals served meet the federal nutrition standards; they also ensure that program eligibility criteria are met and that accurate records of meals served and purchased are kept for the purposes of reimbursement.

<sup>4</sup> FSMCs are companies that perform food service activities (e.g., menu planning, food preparation, serving) on behalf of SFAs; these activities can also include distributing, marketing, and selling certain foods to schools or school food authorities.



processors, and even distributors may engage in research and development to determine how to reformulate their existing products. When creating new food products after research and development, manufacturers may conduct product testing—such as taste tests with students or school personnel to assess the palatability and acceptance of new food items—to further refine the product.

## NUTRITIONAL GUIDELINES FOR SODIUM IN SCHOOL MEALS

In 2010, Congress passed HRFKA (P.L. 111–296), which required USDA to update the school meal patterns and nutrition standards in federal regulations—7 C.F.R. §210 and §220—for NSLP and SBP, respectively. One of the provisions of the updated nutrition standards required that schools gradually reduce the average sodium content of weekly meals over a 10-year period. These standards align with the 2010 *Dietary Guidelines for Americans* and recommendations by the National Academy of Medicine (NAM, formerly known as the Institute of Medicine, 2010), shown in **Table 1**. The three sodium targets established in 2012 and in effect at the beginning of this study are shown in **Table 1** (Nutrition Standards in the National School Lunch and School Breakfast Programs Final Rule, 2012). Sodium Target 1 went into effect on July 1, 2014, and Sodium Target 2 was planned to go into effect on July 1, 2017.

**Table 1. Federal Sodium Reduction Targets**

Grades	Baseline: Average Sodium Levels as Offered in School Year (SY) 2004–2005 (mg)	Sodium Target 1: July 1, 2014 SY 2014–2015 (mg)	Sodium Target 2: (Delayed as of May 2017) SY 2017–2018 (mg)	Sodium Target 3: (Delayed as of May 2017) SY 2022–2023 (mg)
<b>School Breakfast Program</b>				
K–5	573 (Elementary)	≤540	≤485	≤430
6–8	629 (Middle)	≤600	≤535	≤470
9–12	686 (High)	≤640	≤570	≤500
<b>National School Lunch Program</b>				
K–5	1,377 (Elementary)	≤1,230	≤935	≤640
6–8	1,520 (Middle)	≤1,360	≤1,035	≤710
9–12	1,588 (High)	≤1,420	≤1,080	≤740

**Source:** USDA. (2012). *Nutrition levels in the National School Lunch and School Breakfast Programs; Final rule*. Retrieved from: <http://www.gpo.gov/fdsys/pkg/FR-2012-01-26/pdf/2012-1010.pdf>

Data collection for this study took place January to February 2016 (Objective 1) and March to June 2017 (Objective 2). In May 2017, as data for Objective 2 were being collected, USDA Secretary Sonny Perdue issued a Proclamation<sup>5</sup> announcing several menu-planning flexibilities, including flexibilities for program operators in meeting the sodium standards, and Congress enacted the Consolidated Appropriations Act, 2017 (P.L. 115-31; the Appropriations Act). Section 747 of the Appropriations Act retained Target 1 as the regulatory limit through SY 2017–2018 to allow USDA to continue working with SFA directors, school nutrition professionals, the food industry, and other stakeholders to address challenges related to

<sup>5</sup> <https://www.usda.gov/sites/default/files/documents/secretary-perdue-child-nutrition-proclamation.pdf>

sodium reduction. After consultation with FNS, the Study Team did not alter its methodology to reflect these changes; data on progress achieving the Target 2 standard were still collected.<sup>6</sup>

## Study Design and Methods

As described previously, this report summarizes findings related to the two objectives outlined for this study. This discussion provides an overview of the design and methods used to examine each objective.

### OBJECTIVE 1 METHODS

The purpose of the Objective 1 phase of the study was to investigate the availability of foods that meet the current and future sodium target levels for school meals programs from the perspective of food manufacturers and FSMCs.

The key research questions addressed by the Objective 1 phase of the study are shown in **Table 2**.

**Table 2. Research Questions for the Objective 1 Phase**

Research Question	
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 outreach/communication efforts has the food industry put forth about product availability of lower sodium foods?
5	What are the most common foods being reformulated/developed by the food industry and why?
6	Are new food products in development to meet the future sodium standards for school meals (e.g., Sodium Targets 2 and 3)?
7	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 food market (elementary, middle, and high schools)?
8	Are there higher costs associated with producing lower sodium foods?
9	Does the food industry develop specific lower sodium foods for the National School Lunch Program vs. the general public?
10	What technical assistance would the food industry like from USDA FNS with regard to providing lower sodium foods for school meals programs that meet the new sodium standards?
11	Are food service management companies (FSMCs) trying to incorporate more fresh, frozen, and/or local items? <sup>1</sup>

<sup>1</sup> **Note:** Question 11 was addressed in key informant interviews only.

<sup>6</sup> After this report was produced, the USDA published a Final Rule, *Child Nutrition Programs: Flexibilities for Milk, Whole Grains, and Sodium Requirements* (83 FR 63775), that retains Sodium Target 1 through the end of school year (SY) 2023-2024, continues to Target 2 in SY 2024-2025, and eliminates Target 3, which would have gone into effect in SY 2022-2023. <https://www.federalregister.gov/documents/2018/12/12/2018-26762/child-nutrition-programs-flexibilities-for-milk-whole-grains-and-sodium-requirements>

The Study Team conducted focus groups and interviews with representatives from food manufacturers and FSMCs that provided food products to schools and that 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. The aim of these discussions was to gather information about the market availability of foods that meet the current and future sodium standards for school meals programs. Qualitative data were collected in early 2016 from a total of 13 companies through 1 focus group and 8 key informant interviews representing either food manufacturers or FSMCs. The methods used to select and recruit these respondents are described in more detail below.

Eight food industry representatives participated in the focus group. These participants were recruited from attendees of the 2016 School Nutrition Association's (SNA) School Nutrition Industry Conference. The participants all worked in management positions within the sales and/or marketing departments of companies that provided foods to K–12 schools. Participants were also selected based on their focus on one or more of the following product categories: (1) commodity meat/meat alternative process and cheese products; (2) bakery products; (3) condiments, canned tomatoes, and a variety of convenience frozen food items; (4) cereals, breakfast grains, and yogurt; (5) frozen pizza and other convenience frozen food entrées; (6) prepackaged snack food items; and (7) canned and frozen vegetables.

The focus group was held during the SNA's School Nutrition Industry Conference in San Diego, CA, on January 18, 2016. The focus group discussion lasted approximately 90 minutes. Focus group participants were encouraged to follow up via email if they had additional comments that were not expressed during the focus group session. However, the Study Team did not receive any further comments. Experienced moderators conducted the focus group discussion, which was audio-recorded and transcribed.

Using the "2014 Top 50 Contract Management Companies" list published in *Food Management*, several food manufacturers and FSMCs were identified for participation in key informant interviews. Only companies that were national leaders in the industry or demonstrated strong regional market shares were selected to participate. Then, individuals who were in management positions within the selected companies were contacted for interviews.

Six companies (both national/international and regional) agreed to have at least one representative from their FSMC participate in the key informant telephone interviews in February 2016. A total of eight respondents participated in these interviews; all respondents worked in management positions among various functional areas at FSMCs in the K–12 unit.

The key informant interviews were conducted using a telephone interview guide developed by the Study Team and FNS. Key stakeholder interviews were designed to discuss successes and barriers in meeting Target 1 and collect information about product availability, communication methods, and technical training and assistance to meet the USDA regulations for future targets. Each interview lasted approximately 75 minutes. Participants were recruited by telephone and interview notes were taken by hand and analyzed.

### *Analysis Methods*

The Study Team transcribed the audio recording of the focus group discussion verbatim, and compiled detailed notes from the key informant interviews. Qualitative analysis of the transcripts, detailed notes from the key informant interviews, and all responses to the follow-up data collection were coded in

NVivo<sup>7</sup> (version 11), using three broad topic areas guided by the study’s research questions: (1) availability of lower sodium foods, (2) communication/outreach efforts from the food industry, and (3) technical assistance needed. Two coders reviewed all of the data and cross-checked their findings. Initial inter-coder reliability was high ( $\kappa = 92.5$  percent). Any differences in coding between the two coders was reconciled through discussion, such that the coders arrived at 100 percent agreement. Once we coded the data, the Study Team conducted analysis to determine themes based on the most commonly described and salient responses shared by focus group and key stakeholder participants.

## OBJECTIVE 2 METHODS

The Objective 2 phase of the study sought to identify best practices among SFAs that were successfully meeting sodium targets to inform and guide other SFAs trying to meet these targets. The specific research questions addressed in the Objective 2 phase of the study are detailed in **Table 3**.

**Table 3. 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 the 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? <sup>1</sup>
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?

<sup>1</sup> **Note:** In the Objective 2 study, research question 10 was asked only of SFA directors and school employees.

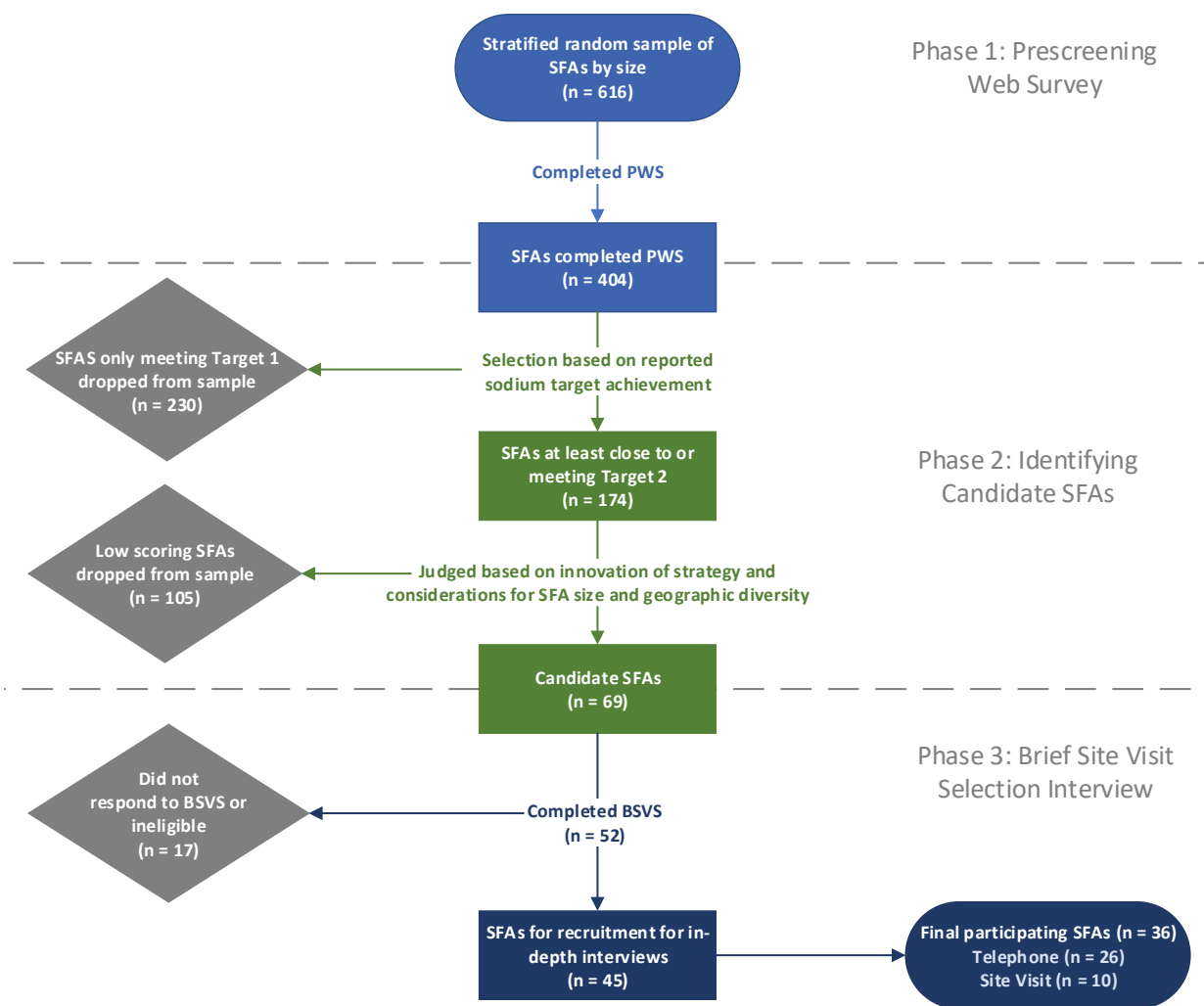
<sup>7</sup> QSR International Pty Ltd

The Study Team conducted interviews with a sample of 36 SFAs identified based on a combination of their characteristics (e.g., size, urbanicity), their regions, and their success in having all schools in their district meet Target 1 standards and at least one of their school types being close to or meeting Target 2 standards. Data collection for Objective 2 aimed to gather information about strategies used to meet sodium standards and identify best, innovative, or promising practices; challenges encountered; and key facilitators. Qualitative data were collected in 2017 from the selected SFAs through in-person and telephone interviews with SFA directors, school employees, community stakeholders, and food suppliers. Responses were analyzed and then synthesized with findings from the Objective 1 phase of the study to address the key research questions. The following sections describe the sampling strategy, detailed data collection methods, and analytical approaches used for the SFA interviews.

### *Sampling*

The 36 SFAs that participated in this qualitative study were selected through a multiphase process of collecting data, analyzing the results, and selecting SFAs to advance to the next phase. The multiphase approach identified SFAs thought to be the most innovative and advanced in meeting the Target 2 (or higher) sodium standards so that their “best practices” could be studied and shared with other SFAs to increase the rates of compliance with the sodium standards. The phases included a (1) Prescreening Web Survey (PWS), (2) Identification of Candidate SFAs, and (3) Brief Site Visit Selection (BSVS) interview and selection of SFAs for primary qualitative data collection. Once the 36 SFAs were identified, an in-depth set of interviews were conducted with key stakeholders from corresponding schools to better understand and document the lessons learned from their experiences. **Figure 1** outlines the various phases the Study Team implemented to identify the final 36 SFAs for participation in in-depth interviews; each phase is described in greater detail in this section.

**Figure 1. SFA Selection Process**



A random stratified sample of 616 SFAs out of the universe of approximately 15,000 public SFAs was selected from the FNS Form 742 Verification Summary Report data from SY 2015–2016. The sample size was based on the estimated minimum number of cases needed to recruit a sample of 36 participants for the Objective 2 study in-depth interviews, which focused on understanding the innovative practices used by SFAs meeting sodium standards. The 616 SFAs were selected from different size strata to ensure enough respondents were (1) meeting Target 1 and close to meeting or meeting Target 2 and (2) representative of SFAs of different sizes in terms of the number of students.<sup>8</sup> These 616 SFAs were invited to participate in the study’s PWS. The goal was to identify SFAs that were meeting Target 1 and

<sup>8</sup> The study plan called for one-third of the SFAs participating in the study to be small (<1,000 students); one-third, medium (1,000–4,999 students); one-sixth, large (5,000–24,999 students); and one-sixth to be very large (25,000+ students). Size categories for the study were defined as described.

were close to or meeting Target 2;<sup>9</sup> 404 SFAs responded. The PWS data were reviewed, and 174 SFAs were found to be meeting or exceeding Target 2 in at least one of their school types. Additional analysis was conducted to identify SFAs that were meeting or exceeding Target 2 based on the degree of innovation in implementing strategies to reduce sodium. PWS responses were coded on innovation to determine a score of 1 to 4, with 1 being lowest score and 4 being the highest score. Examples of responses coded as “4 – very innovative/creative” included the utilization of outside chefs and holding student recipe contests. Examples of responses coded as “3 – somewhat innovative/creative” included the use of a lower sodium spice station and displaying foods in an appealing manner. Examples of responses coded as “2 – a little innovative/creative” included providing packets of condiments instead of unrestricted access to condiments. SFAs that had one or more practices judged as “4 – very innovative/creative” were selected to remain in the pool of SFAs considered for the BSVS interview. At the end of this process, 69 candidate SFAs were at least close to meeting the Target 2 goals for participation in in-depth interviews on their practices and experiences. These 69 SFAs were invited to participate in a BSVS Interview in which additional information on approaches for meeting the standards and the use of possible innovative practices were identified; 45 SFAs were selected for recruitment for in-depth interviews (**Figure 1**). The Study Team identified these SFAs for study participation based on use of innovative practices, while ensuring variation in geographic location, urbanicity, and school district size. Ultimately, 36 SFAs participated in the in-depth interviews. All SFAs selected for in-depth interviews were at least close to or meeting Target 2 in some of their schools, as reported in the PWS. **Table 4** provides overall sample characteristics of the participating SFAs.

The Study Team developed the qualitative methodology for the SFA interviews with the goal of obtaining detailed information from multiple respondents within each SFA to understand how and when (1) the SFAs met the Target 1 or Target 2 standards and (2) the strategies were implemented. To that end, the directors or other appointed points-of-contact at each of the 36 SFAs were asked to identify individuals within each of the three additional respondent categories (school employees, community-based stakeholders, and food suppliers) for up to four respondent categories to be contacted by the Study Team to participate in in-depth interviews.<sup>10</sup>

Ten of the 36 SFAs were also selected for an in-person site visit. For site visit recommendations, the Study Team equally considered the level of success an SFA had achieved in meeting sodium standards and the SFA’s innovation of commonly used strategies to reduce sodium content in meals. The Study Team identified SFAs with observable activities or evidence of sodium reduction efforts. Examples of these activities include signage or nutritional information in or around cafeterias, prominent placement of lower sodium options at points of purchase, and taste testing events for students. Willingness of an

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<sup>9</sup> The goal of the study was to identify the best practices employed by schools meeting Target 1 and to provide relevant guidance for helping schools meet future targets. At the time of the study’s initiation, the deadline for meeting sodium standard Target 2 was fast approaching. Therefore, the study design proposed focused on selecting SFAs that had successfully met the Target 1 sodium requirements and were either meeting or close to meeting or exceeding Target 2 in most or all of their schools—while maintaining high school meal participation rates—to be most responsive to the need to identify best practices.

<sup>10</sup> “School employee” was defined as a principal, assistant principal, nurse, administrator, staff member on a local school wellness committee, or teacher who was knowledgeable about or had been instrumental in promoting or working with students on the acceptance of and changes to nutrition in their school, including reducing sodium in school meals. “Community-based stakeholder” was defined as an individual who has a strong interest and role in improving the school food environment who is not an employee of any school/school district, but is aware of and engaged in child nutrition, including advocating for lower sodium meals. “Food supplier” was defined as an individual or part of an organization that delivered meals, food, or ingredients to an SFA or school for use in school meals, with a key role in supplying lower sodium food or food ingredients.

SFA to participate in an in-person site visit was another considered factor. An effort was made to select SFAs from each size category for site visits.

**Table 4. Characteristics of Participating SFAs**

SFA Characteristic	SFAs Selected for In-Depth Interviews (n)
<b>SFA Size</b>	
Small	11
Medium	9
Large	8
Very Large	8
<b>Urbanicity</b>	
City	11
Suburb	9
Town	10
Rural	6
<b>Region</b>	
Mid-Atlantic	2
Mountain Plains	7
Midwest	8
Northeast	3
Southeast	6
Southwest	5
West	5
<b>Total</b>	<b>36</b>

#### *Data Collection Methods*

In-depth interviews (conducted with each type of respondent individually) and site visits began May 11, 2017; the last interview was completed on June 29, 2017. The site visit interviews were conducted in person by an experienced two-person site visit team. The remaining in-depth interviews were conducted by experienced qualitative researchers.<sup>11</sup> Separate in-depth interview guides were created for each of the four respondent types, and a site visit protocol was also created (Volume III, Appendices C–F). After fully exhausting all recruitment options, data collection ended with 118 completed interviews, out of 144 possible interviews, including those conducted during the 10 in-person site visits. **Table 5** shows the number of respondents by respondent type.

<sup>11</sup> Prior to data collection, all study members attended a 2-day training on the study's protocols and procedures.



**Table 5. Interview Count by Respondent Type**

Respondent Type	Completed Interviews (n)
SFA Director	36
School Employee	34
Food Supplier	23
Community-Based Stakeholder	25
<b>Total</b>	<b>118</b>

### *Analysis Methods*

As in the Objective 1 phase of the study, all qualitative interviews were transcribed and imported into NVivo 11 qualitative analysis software for coding and analysis. The Study Team coded the data hierarchically based on prescribed codes or themes based on research questions and interview guide topics. The codes were carefully defined in a dictionary (codebook), and coders were trained on the specific meaning and application of each. Coding structures arranged ideas logically to map the research questions and concepts of interest to ensure that the qualitative data addressed the research questions.

To develop the codebook, the Study Team mapped research questions to interview-question guides to identify domains or key areas of interest under the topics included in each interview guide. The transcripts were reviewed by the Study Team to identify potential subcodes through an open-coding, deductive method to organize and group ideas within the domains of the research questions and data collection instruments. These codes were applied across respondent types and reviewed for relevance. The codebook was tested on one SFA director interview and one food supplier interview to refine code applications and definitions, and the Study Team discussed findings to ensure comprehensiveness and understanding of the codebook. Coders then tested the codebook on one transcript and resolved discrepancies and questions. The Study Team completed coding of all transcripts, with a total of 10 percent of the transcripts double-coded to ensure reliability of coding applications between coders and, ultimately, to improve data quality. This inter-rater reliability approach was used to ensure meaning between coders and improve the quality of the data interpretations. During the coding process, the Study Team met weekly to discuss and resolve any issues or questions during coding. One school employee transcript was eliminated during this process due to issues in data quality.

Once the Study Team coded the data, they performed exploratory analyses within NVivo 11 to explore the structured data. Using structured queries and tabulations, data were analyzed to identify processes of implementation, successes, barriers, and influencing factors across strategies. The queried data were synthesized to report the qualitative findings of the interviews in the context of the quantitative data counts and the number of SFAs reporting use of strategies. The quantitative data collected in the Prescreening Web Survey from the 36 participating SFAs were analyzed to describe frequencies of strategies; report sodium targets achieved; and provide characteristics of SFAs, including urbanicity, SFA size, region, and school type.

The approaches implemented by SFAs to meet sodium targets were grouped into categories of core strategies, each comprising specific practices. **Table 6** depicts the organization of the strategies and the

respective practices SFAs implemented to reach the sodium targets in order of the most to least frequently utilized strategies overall.

**Table 6. Strategies and Practices Utilized by SFAs**

<b>Strategy/Practice</b>
<b>Using Effective Menu Planning</b>
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
<b>Food Procurement</b>
USDA Department of Defense (DoD) Fresh Fruit and Vegetable program (USDA DoD Fresh)
USDA Foods
Food buying co-op or group purchasing entity
<b>Involving Stakeholders (Students, Staff, Parents, and/or Community Members) in Sodium Changes to Gain Acceptance</b>
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
<b>Changing Food Preparation Methods</b>
Cooking with more herbs and spices
Maintaining or increasing the use of scratch cooking
<b>Food Supplier Interactions</b>
Working with food suppliers on product reformulation and procurement
Attending trade shows and conferences

## Limitations of the Research Study

The findings described in this report are derived from a small qualitative study that did not aim to capture a representative sample of the food industry or SFAs. Rather, given the intent of learning from those who have experienced success in their efforts to meet the sodium targets, the responses reflect a subset of the population. Results are not intended to be generalizable to the entire population but are useful for capturing lessons learned and best practices from those with first-hand experience.

For the Objective 1 phase of the study, limited individual data were collected from focus group respondents; no characteristics were specified about the participants (e.g., type of management position, years in the industry). Limitations of the Objective 2 phase of the study included the potential for response bias or the desire to provide more socially acceptable answers, and reporting bias or a tendency to selectively reveal or suppress information, even though the study methodology was developed to mitigate these respondent tendencies as much as possible. Additionally, while the sampling approach developed for the study was designed to ensure that multiple viewpoints were captured regarding SFA size, region, and urbanicity, the report findings are not nationally representative and are thus unlikely to reflect the full range of experiences of all SFAs meeting Target 1 and Target 2.

The study findings only represent the experiences and perspectives of the respondents interviewed. No additional claims can be made by the study concerning the degree to which program policy or regulations were implemented correctly by respondents. Verification of the degree to which respondents (specifically SFA directors and food suppliers) correctly complied with program regulations and policy guidance is beyond the scope of this study.

Despite the aforementioned limitations, this study employed a mixed-methods approach that triangulated survey data collected through the pre-screening process and qualitative interview data to ensure that the findings reported are valid for the sample and robust. In addition, the diverse sample included a range of stakeholders (food manufacturers, SFAs, etc.) who were selected across several variables to ensure a broad range of respondents. In addition to the range of participants who were asked to provide insights and experiences related to the challenges and successes in meeting the sodium targets, a strength of the study was the use of a semi-structured interview data collection method, which allowed researchers to ask core questions while still maintaining the researcher's ability to explore specific topics in greater detail based on respondent knowledge and background. Another strength is the study's examination of the process for achieving the sodium standards along the school meal service continuum, including food procurement and product manufacturing, developing and serving lower sodium options, and gaining student acceptance. As a result, the study highlights the successes and challenges for multiple stakeholders in reaching the sodium targets along the school food service continuum.

## CHAPTER 2. KEY RESEARCH FINDINGS

This chapter discusses the key findings of the study—specifically, as they pertain to (1) the market availability of school foods that meet the new sodium standards, (2) emerging promising practices that SFAs and schools have found successful to promote lower sodium foods, and (3) the technical assistance recommended for SFAs and the food industry to meet the sodium standards. This chapter integrates the experiences of food manufacturers, FSMCs, and SFAs to provide an understanding of the barriers and successes experienced across the food distribution chain and by school food professionals in implementing the sodium standards. Due to the diversity of food suppliers included in the study, “food supplier” refers to those generally involved in the supply chain; more specific roles (e.g., manufacturer, FSMC, distributor) may be specified as applicable. For the findings presented, it should be noted that food manufacturers and FSMCs were asked to reflect exclusively on their experiences meeting Target 1; however, all 36 SFAs in the study had met Target 1 and were close to meeting, or had met, Target 2.

### Availability of Lower Sodium Items to Meet the Sodium Standards

The following discussion addresses the market availability of lower sodium items based on information from manufacturers, distributors, FSMCs, and SFAs. Specifically, the study findings revealed processes and issues related to the school food supply chain, providing insight into the development and procurement of lower sodium products.

#### MARKET AVAILABILITY OF LOWER SODIUM ITEMS FROM MANUFACTURERS AND FSMCS

Qualitative data from SFAs, food suppliers, and distributors indicated adequate market availability of lower sodium items to help SFAs meet Target 1. Results indicated that food manufacturers and FSMCs were able to help schools meet Target 1, because they had sufficient time to prepare for this objective, and many had even begun working toward reducing sodium content in school meals before regulations were established. Food manufacturers noted that only an approximate 10 percent decrease in sodium per product was needed to help schools create menus that met Target 1, which minimized the amount of research and development for reformulated products. FSMCs felt that they had been successful in meeting sodium Target 1 standards, as demonstrated by high levels of menu compliance.

#### Factors Affecting Market Availability of Lower Sodium Products

- ✓ Adequate lead time for research and development of products and successful rollout
- ✓ Uncertain policy guidance regarding future sodium reduction targets
- ✓ Reformulation and palatability challenges, especially for multicomponent, processed food products

Food manufacturers and FSMCs seemed prepared to address demand related to meeting Target 1, but the qualitative data highlighted several factors that will affect the market availability of lower sodium products to meet future targets. Although some challenges stemmed from limited seasonal availability of certain produce (a major contributor to lower sodium menus) and difficulties related to decreasing sodium in processed food products (e.g., baked goods), many were related to uncertain guidance regarding future sodium reduction targets and the intricacies of the school food supply chain.

Both food manufacturers and FSMCs expressed some doubt that the future sodium targets would be implemented. This uncertainty may discourage food manufacturers and FSMCs from investing capital to bring lower sodium food options to the K–12 market. The food manufacturers in particular conveyed a strong desire for USDA to solicit their opinions when creating the timeline and sodium level recommendations in the future. Although the sodium targets were based upon NAM recommendations to align with the 2010 *Dietary Guidelines for Americans*, both food manufacturers and FSMCs shared that they would like conclusive scientific evidence for the degree of sodium reduction required for the future sodium targets, as well as information about whether salt substitutes are safe, before using them to develop products that may or may not be necessary for, or acceptable to, schools.

In terms of food production, several food manufacturers agreed that processed, multicomponent food products presented a greater challenge for sodium reduction compared with individual food products that require cooking or assembly. Manufacturers noted the challenge of reducing sodium, particularly in processed products, while maintaining palatability. However, many schools chose to use these processed food products due to the fact that they required less onsite cooking and/or assembling. To address these challenges, future considerations for technical assistance efforts should include support for product reformulation and taste testing, as well as additional support for infrastructure and training to facilitate the use of more scratch cooking.

## KEY FACILITATORS FOR THE AVAILABILITY OF LOWER SODIUM ITEMS

The respondents identified several key facilitators to increasing the availability of lower sodium items, including the following:

### SFAs

- Using group purchasing entities to concentrate demand and increase cost-effectiveness and buying power to obtain lower sodium items
- Engaging large FSMCs to influence market offerings
- Engaging in effective communication between SFAs and food suppliers
- Using procurement strategies to access cost-effective, lower sodium items obtained through federal programs

### Manufacturers

- Including manufacturers and distributors in policy discussions when establishing sodium targets and policies that rely on an understanding of the nuances involved in supply chain interactions
- Providing manufacturers and FSMCs with adequate lead time to develop lower sodium products and bring them to market

### Facilitators for the Availability of Lower Sodium Items

- ✓ Improving buying power and/or access to lower sodium items via group purchasing and participating in federal food programs
- ✓ Engaging large FSMCs to influence market offerings
- ✓ Including a range of stakeholders when establishing sodium targets

The respondents emphasized the importance of leveraging market power through group purchasing and FSMC relationships to facilitate production of compliant products. The majority of SFAs indicated that collective purchasing arrangements facilitated access to lower sodium foods at competitive prices. Relatedly, manufacturers explained that larger FSMCs were well-equipped to meet both Target 1 and future targets, based on their ability to leverage the demand for lower sodium products from their large client bases to influence food manufacturer production decisions.

Respondents also underscored the importance of engaging stakeholders across the supply chain to develop policies and schedules that facilitate the development of lower sodium products by providing food manufacturers with adequate time to develop and test products and make them available within the bidding timelines for SFAs.

In addition, both SFAs and food suppliers highlighted the efficacy of frequent communication to facilitate 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. SFA respondents stated that they were able to work with their distributors to procure lower sodium products.

## FOOD PROCUREMENT APPROACHES SFAS USE MOST TO OBTAIN LOWER SODIUM ITEMS

Food manufacturers and FSMCs described the availability of lower sodium items in the marketplace, but this availability may not necessarily translate to SFAs having the ability to readily access these foods. The SFAs participating in the study were asked to describe the availability of lower sodium items and their processes for obtaining them as well as any barriers they experienced. Overall, 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 affected their ability to incorporate these items into school offerings. Several procurement strategies, including use of USDA Foods and USDA DoD Fresh, and participation in food buying co-ops or group purchasing entities facilitated increased market access to a wider variety of produce and other lower sodium foods.<sup>12</sup> It should be noted that although SFAs may have used USDA Foods or USDA DoD Fresh prior to this study to assist in their procurement strategies and it is thus not a new strategy, the majority of SFAs in the study viewed both USDA Foods and USDA DoD Fresh as a part of their procurement-based approaches for reducing sodium in school meals.

### Food Procurement Approaches Used by SFAs

- ✓ Sourcing lower sodium meats and frozen and canned vegetables through USDA Foods
- ✓ Sourcing fresh produce through USDA DoD Fresh
- ✓ Utilizing food buying co-op or group purchasing entity to increase market access to lower sodium products

### USDA Foods

Among the SFAs interviewed, nearly all used USDA Foods as a strategy to help reduce sodium in school meals, primarily by maximizing their ability to purchase lower sodium beef, pork, fish, poultry, and cheeses, as well as frozen and canned vegetables and beans available through USDA Foods (USDA FNS, 2017a). SFAs used USDA Foods to identify and procure lower sodium items in a cost-effective manner. SFAs described ordering a variety of fresh, frozen, and canned lower sodium products to be prepared in house and other lower sodium products, including cheeses and meats. However, SFAs that chose to receive USDA Foods products reported increased needs for resources such as the infrastructure necessary to store and prepare these foods (e.g., adequate refrigeration), as well as trained cafeteria staff capable of properly handling and preparing raw foods.

<sup>12</sup> USDA Foods and USDA DoD Fresh contribute to an estimated 15–20 percent of food that schools serve to students daily (USDA FNS, 2015).

Some SFAs encountered ordering and menu-planning issues resulting from inconsistencies in product availability and quality and long ordering timelines. Some SFAs described frustration with the ordering deadlines for USDA Foods, which were often well in advance of delivery, often up to one year. As a result, 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 would have preferred some flexibility in the ordering deadlines to help them limit the quantities of items ordered for recipes that eventually proved unsuccessful. Some SFAs indicated that many products (e.g., canned items, meat products, cheeses) offered by commercial food suppliers and some products (e.g., canned items) available through USDA Foods had sodium levels that did not easily fit into sodium restrictions.<sup>13</sup> A few SFAs described encountering challenges with using the program due to receiving items that were of poor quality, experiencing incomplete orders, and facing unanticipated changes in products and food suppliers due to discontinuation or modifications of foods.

### *USDA DoD Fresh*

Most SFAs reported using USDA DoD Fresh as a strategy to assist in reducing sodium in school meals, primarily by maximizing the quantity of fresh fruits and vegetables in their purchase orders to replace higher sodium foods. A majority of SFAs using this approach indicated that the program was key to reducing their fruit and vegetable costs and that it provided wide access to lower sodium items. However, there were some barriers in implementing the approach. The most noted challenge for SFAs was managing the budget and costs associated with using the program. Respondents experienced challenges in getting their food orders correct and within budget because of fluctuating produce costs, as well as the effects of seasonality and poor growing seasons on the availability of items. Additional barriers included increased labor costs incurred for staff preparation time (e.g., cleaning, cutting, cooking); additional physical storage needs for the produce, such as more refrigerated storage; and the limited availability of certain types of popular food items because of USDA DoD Fresh's requirement to source only American-grown produce.

### *Food Buying Co-Op or Group Purchasing Entity*

The two main types of collective purchasing arrangements reported by SFAs were (1) food buying co-ops—an arrangement of two or more schools or SFAs that combined their purchasing requirements and collectively issued a bid package for goods or services, and (2) group purchasing entities—third-party organizations that brought together multiple schools and helped manage the issuance of bid packages and requests for proposals (RFPs).<sup>14</sup> Among participating SFAs, most reported using these approaches primarily 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. Of the SFAs using these approaches, most stated that it allowed them to take advantage of collective buying power; increase economies of scale to find and gain access to a variety of lower sodium products; and obtain high-quality lower sodium products, fruits, and vegetables in bulk and at lower prices. For SFAs using collective purchasing agreements, few challenges arose. A few SFAs faced the following barriers: obtaining State agency

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<sup>13</sup>This statement reflects the perceptions of some SFA respondents. It should be noted that all canned items offered through USDA Foods are low-sodium.

<sup>14</sup> The RFP 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.



approval of the request for bid (RFB) or RFP; lack of agreement among participating SFA directors in the food buying co-op on which products to procure; and lack of availability of products, as when popular lower sodium products were out of stock. Participation in food buying co-ops was a cost-effective method of procurement because of increased purchasing power, particularly for small SFAs that had limited stand-alone purchasing power; participation also decreased barriers to logistics, such as SFA ordering and product delivery.

SFAs also highlighted the role of collective purchasing arrangements as an opportunity for diverse schools and districts to share which 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, or to learn of other schools' experiences with student populations.

### ADDITIONAL FACTORS AFFECTING SFA ACCESS TO LOWER SODIUM ITEMS

Another key consideration for the study was the degree to which SFA factors such as the type of school, geographic region or urbanicity, and size of the school district affected access to lower sodium items. To understand the impacts of fixed variables such as SFA size, urbanicity, and region, the study used a mixed-methods analysis approach to combine the quantitative data obtained in the Prescreening Web Survey with the descriptive findings gathered from the in-depth interviews with the 36 SFAs.<sup>15</sup> Based on these data, some of the fixed characteristics examined in the study of SFAs (i.e., type, size, urbanicity, and region) seemed to partially influence SFAs' strategies and their ability to reach sodium targets in a variety of ways:

#### Impacts of Fixed Characteristics on SFA Access to Lower Sodium Items

- ✓ High schools may experience more difficulty reaching Target 2
- ✓ Increased proximity to lower sodium food items for more urban areas
- ✓ Regional preferences may impact student acceptance of lower sodium items

- **School type** may impact SFAs' efforts to meet Target 2. High schools showed the greatest variability in achieving sodium targets, with some SFAs reporting difficulties in getting all the high schools in their SFA to meet the standard. Elementary schools, middle schools, and other schools had similar likelihoods of being close to or meeting Target 2 or Target 3.<sup>16</sup> Elementary schools reported fewer barriers to meeting lower sodium targets, while middle and high schools reported challenges with student acceptance of lower sodium foods. As a result, achieving reduction of sodium in school meals may be more difficult to implement among high schools.
- The findings also suggest that **proximity to urban areas** increased access to, and availability of, fruits and vegetables, in large part because of increased buying power due to a closer proximity to distributors. In contrast, SFAs in rural communities and towns reported barriers with the procurement and distribution of pre-prepared or fresh lower sodium foods.

<sup>15</sup> The Study Team performed cross tabulations of the fixed characteristics of interest, collected in the Prescreening Web Survey, and whether SFAs were meeting Target 2. These percentages were analyzed. These data and the in-depth interview data were triangulated to develop the findings. Because the sample size for the qualitative study was so small, no significance testing could be performed.

<sup>16</sup> "Other schools" were defined as any school that did not meet the definition of elementary (kindergarten through 6<sup>th</sup> grade), middle (6<sup>th</sup> through 9<sup>th</sup> grade), or high school (9<sup>th</sup> through 12<sup>th</sup> grade).



- **District size** seemed to have a mixed impact, with smaller districts reporting greater flexibility and ownership over menu planning and food preparation and larger districts reporting access to more staff, equipment, and space.
- It was difficult to discern any meaningful variability in **regional location** on the ability to meet the Target 2 sodium standards. However, respondents consistently reported that region correlated to student exposure to fresh fruits and vegetables and to students' established palate and food preferences, and that these factors influenced student acceptance of lower sodium foods.

In addition, there were considerable differences among the food manufacturers, large FSMCs, and regional FSMCs with regard to being able to support schools in meeting sodium targets.

- Only one food manufacturer indicated that their company was evaluating their current products to determine which could be modified to help SFAs meet sodium Target 2.
- Regional FSMC respondents provided similar feedback. One regional FSMC shared that they were still currently working toward sodium Target 1, and that it had been difficult to get food manufacturers on board with the changes.

During key informant interviews, large FSMCs indicated they were positioned and equipped to meet sodium targets in different ways than smaller FSMCs. For instance, large FSMCs were sometimes able to influence food manufacturers to create products that were in demand, whereas the regional FSMCs could not always exert the same level of influence on manufacturers. As a result, larger FSMCs reported being more prepared to assist schools in meeting the future targets and/or better able to respond to their customers' requests and needs.

## ONGOING CHALLENGES AND BARRIERS TO THE AVAILABILITY OF LOWER SODIUM ITEMS

FSMCs, food manufacturers, and SFAs reported a variety of challenges regarding the availability of lower sodium products for current and future targets. The main barriers reported focused on the effort and cost of developing lower sodium items, especially when sodium serves as a functional ingredient; the limited demand for lower sodium items outside of the K–12 market; and challenges in acquiring and purchasing, lower sodium foods.

### *Reformulation for Development of Lower Sodium Products*

Food manufacturers noted the difficulty of decreasing sodium in processed food products, including bakery items, when sodium serves a functional purpose (e.g., salt to strengthen gluten, baking soda to help baked goods rise). In particular, FSMCs worried that Target 3 may be so low in sodium that it will affect the ability to produce these products. Respondents also expressed concern that the shelf life for food products will be shorter without enough salt to act as a preservative. This factor, coupled with pressure to reduce *trans* fats and preservatives, challenged food manufacturers and left them with a second challenge of food shelf life and spoilage. In addition, several

### Ongoing Challenges to the Availability of Lower Sodium Products

Among food manufacturers and FSMCs:

- ✓ Limited ability to modify and reformulate products due to functionality of sodium in items
- ✓ Increased food supplier costs for product research, development, and reformulation

Among SFAs:

- ✓ Decreased palatability and student acceptance
- ✓ Limited availability of acceptable lower sodium products

food manufacturers agreed that multicomponent food products, that is, menu items comprised of two or more meal components—typically entrées—presented a greater challenge for sodium reduction and that many schools choose to use the multicomponent food products because they can be heated and served relatively quickly.

SFAs also reported challenges with product reformulation. Specifically, 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 reduce sodium content, these SFAs described foods reformulated in order to meet Target 2 standards that did not taste good and were not accepted by students. SFAs noted that the palatability of reformulated products contributed to lower school meal participation, resulting in cost implications for future procurement contracts. This in turn influences development of lower sodium items in the future. Some SFAs addressed this challenge by continuing to search for more palatable products and using taste testing as a way to further gain acceptance of lower sodium foods.

### *Market Demand and Cost Impacts for Developing and Offering Lower Sodium Products*

Food manufacturers and SFAs noted that the cost of testing, reformulation, and production of lower sodium foods presented a principal challenge to offering lower sodium products. These costs included fixed and variable costs: fixed costs by food manufacturers included product testing, development, and reformulation, as well as infrastructure investments by SFAs to support schools' refrigerated storage and scratch cooking equipment. Ongoing variable costs by SFAs included additional labor costs associated with increased preparation time for using fresh produce and scratch cooking.<sup>17</sup>

In some instances, food manufacturers felt that cost was linked to demand. One food manufacturer believed that there had been a decrease in student participation in the school meals programs because of lower sodium products and, as a result, believed that the overall cost of meals served to students had increased. FSMCs also indicated that the lower sodium foods cost more to provide to schools. Notably, a regional FSMC shared that their company absorbs the increase in food costs and is therefore worried that they may have to cut their labor costs, which could negatively impact the quality of the services they provide to the schools they serve. Most FSMC and food manufacturer respondents felt that USDA did not fully account for the added costs associated with the sodium targets. They believed that if they had been consulted earlier in the process, they could have communicated factors that should have been taken into consideration when creating sodium targets.

Food manufacturers and FSMCs noted that many of the lower sodium food products schools requested to help meet the sodium targets in school meals were not in demand by any other industry or the wider

### **Challenges Relating to Market Demand and Cost Impacts**

Among food manufacturers and FSMCs:

- ✓ Costs for product testing, development, and reformulation
- ✓ Limited demand for lower sodium items outside the K–12 market
- ✓ Saturation of supply chain costs for introducing new products

Among SFAs:

- ✓ Costs for infrastructure to support refrigerated storage, scratch cooking equipment
- ✓ Costs associated with increased preparation and production time when using lower sodium items

<sup>17</sup> Most SFAs in this study that were using scratch cooking had already been preparing meals this way prior to the sodium standards.

consumer market. Food manufacturers also indicated that being the first to reformulate their food products may have placed their company at a disadvantage by decreasing price competitiveness, incurring both the cost of investment and costs associated with supply chain management, to develop an entirely new product food line specifically for K–12 schools. The manufacturers noted that their competitors who were not part of the first cohort to reformulate products to help schools meet the sodium standards avoided costs related to multiple components of the supply chain, including research and development, product testing, and creating new labels. These other manufacturers had not spent the time or the money to reformulate their products, yet they were still awarded the K–12 business by SFAs and schools, placing them in a more profitable position. Also, as the sodium targets became more restrictive, manufacturers that were willing to work with food suppliers and invest in research and development struggled to develop products that remained palatable while still meeting sodium requirements.

Some food manufacturers also indicated that, in previous years, commercial retailers may have been influenced by what schools purchased; however, currently, they did not have the sense that commercial retailers were driven by school food purchases. As one FSMC stated, “Our supply chain expert used to say, ‘where K–12 goes, the rest of the world goes on board.’ Not so much anymore, as K–12 is such a small piece of the entire supply chain.”

#### *Limitations SFAs Experience in Accessing Lower Sodium Items*

Many SFAs cited the lack of lower sodium product availability as a major challenge. Some SFAs described food suppliers dropping popular lower sodium products because they were not profitable enough, whereas others discussed how manufacturers imposed requirements for minimum orders that made certain items unobtainable, especially given SFA storage and budget limitations. Challenges with USDA DoD Fresh, USDA Foods, and food buying co-ops included limited item availability due to seasonality, weather events, and limited SFA infrastructure to store and refrigerate goods. In addition, SFAs noted specific challenges with the bidding process. Respondents described how the bidding process itself is not currently designed to include restrictions and delays in procuring desired products, as districts had to operate on a set bid cycle.

## The Most Frequently Used Strategies for Reducing Sodium in School Meals

The SFAs in the study were asked to describe the strategies and related practices they most often used to support implementation of the sodium standards, along with the barriers and successes experienced in using these approaches. At the time of the SFA interview data collection (2017), all SFAs had successfully achieved Target 1 sodium standards and were close to or meeting Target 2 sodium standards.

**Table 7** presents a summary of the strategies and practices most often used by SFAs, including the key facilitators and barriers for implementing these approaches for reducing sodium in school meals. There were five broad types of strategies most used by SFAs. Each strategy has a set of accompanying practices that were used for reducing sodium in school meals. SFAs were asked to indicate whether the practice was one of their top five most used options. The most used strategies in order of usage, from most to least used, were: (1) using effective menu planning; (2) utilizing food procurement strategies that reduced costs and/or increased purchasing power (through their participation in federal food

programs); (3) involving stakeholders (students, staff, parents, and/or community members) in sodium changes to gain acceptance; (4) changing food preparation methods; and (5) food supplier interactions.

**Table 7. Summary of Strategies and Practices Used by the 36 SFA Sites to Achieve or Move Close to Achieving Target 2 Sodium Standards**

Strategy	Key Facilitators for Implementation	Key Barriers for Implementation	Practices Associated with Each Strategy	N = 36 n*
<b>Using Effective Menu Planning</b>	▪ Access/cost effectiveness	▪ Managing costs, seasonality of food items	Using more fresh and/or frozen fruits and vegetables	24
	▪ Availability of appropriate storage	▪ Limited storage/serving infrastructure	Using lower sodium products	16
	▪ Resources for preparation, production, and staff training	▪ Increased labor costs	Modifying recipes or developing new recipes	4
			Implementing a self-serve condiment station/providing individual condiment packets	4
<b>Food Procurement</b>	▪ Cost effectiveness	▪ Seasonality of food items	USDA DoD Fresh	13
	▪ Availability/quality	▪ Limited storage	USDA Foods	11
	▪ Collaborative professional networks on sourcing items	▪ Recurring ordering issues	Food buying co-op or group purchasing entity	10
<b>Involving Stakeholders in Sodium Changes to Gain Acceptance</b>	▪ Support from food suppliers for taste-testing	▪ Resources for taste testing	Obtaining feedback via taste testing from students, staff, parents, and/or community members on new menu items	19
	▪ Student engagement in tasting panels	▪ Participation of community stakeholders		
<b>Changing Food Preparation Methods</b>	▪ Specialized production sheets	▪ Increased labor costs	Cooking with more herbs and spices	10
	▪ Tailoring to in-demand flavor profiles	▪ Lack of staff with advanced skills	Maintaining or increasing the use of scratch cooking	8
<b>Food Supplier Interactions</b>	▪ Access to professional networks	▪ Timing constraints of bidding process	Attending trade shows and conferences	6
	▪ Leveraging power of large SFAs to access wider variety of items	▪ Limited availability of items	Working with food suppliers on product reformulation	4

\* **Note:** Number of interviewed SFAs indicating the practice was a top 5 choice.

In terms of **effective menu planning** strategies, the most favored practices for meeting the sodium targets were using more fresh or frozen fruits and vegetables, using lower sodium products, implementing a self-serve condiment station or providing individual condiment packets (such as ketchup, mayonnaise, and hot sauces), and modifying recipes. The key facilitators for implementation of these approaches included additional staff training on food storage, preparation, and production; increased tailoring of offerings to meet the flavor profiles favored by culturally diverse populations (to increase student acceptance); and utilizing access to lower sodium items via participation in USDA DoD Fresh, USDA Foods, and food buying co-ops.

Regarding **food procurement** strategies, the study 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 affected their ability to incorporate these items into school offerings. SFAs described these procurement strategies as being cost effective overall, with the added value of the collaborative networks established as a part of food buying co-ops and group purchasing entities. According to SFAs, challenges to implementation primarily focused on the availability of lower sodium items, either due to seasonality or limited product offerings due to restrictions of buying only American-grown items.

**Involving stakeholders** was a core strategy used to refine recipes and gain student acceptance of lower sodium foods. The most commonly used practice for obtaining feedback involved taste testing, which helped SFAs obtain real-time feedback on palatability and acceptability of new menu items. Involving stakeholders required a range of internal and external resources, including partnerships with vendors to obtain free samples and conduct taste tests; staff training on food presentation, preparation techniques, and menu development for new items being offered; staff members to coordinate stakeholder engagement events; and staff time and commitment for obtaining and reviewing ongoing student feedback.

**Changing food preparation methods** was also an essential way to reduce sodium in school meals; generally, using herbs, spices, and other flavor enhancers was a less resource-intensive approach and offered a simple and seamless way to reduce sodium while maintaining flavor. Some SFAs also used or increased their level of scratch cooking to control sodium content in meals while maintaining flavor and student acceptance. However, increasing scratch cooking required more labor and time resources and therefore may not be an option for many SFAs due to the lack of sufficient kitchen storage and preparation equipment, or the increased labor resources required for this approach.

**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 and food supplier respondents 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. However, barriers to the approach included the inability of some SFAs to source lower sodium items due to minimum ordering restrictions that impacted budgets, as well as storage constraints.

## KEY RESOURCES NEEDED TO IMPLEMENT STRATEGIES

In describing approaches to implementing strategies and practices to meet sodium standards, respondents identified a number of factors that facilitated implementation and acceptance of lower sodium foods. The key resources for implementing these strategies included:

- (1) allocating more time to food preparation;
- (2) securing additional space for preparation and storage (e.g., adequate refrigeration);
- (3) providing additional staff training on food storage, preparation, and production;
- (4) obtaining additional labor resources for production and preparation tasks;
- (5) having staff resources and expertise in recipe modification or development; and
- (6) accessing lower sodium items via participation in USDA DoD Fresh, USDA Foods, and food buying co-ops.

### *Improving Student Acceptance of Lower Sodium Items*

Both food suppliers and SFA respondents noted student acceptance as a determining factor in the successful reduction of sodium in school meals: high levels of student acceptance facilitated their participation in school meals programs. SFAs implemented many practices, including obtaining feedback from stakeholders, conducting taste tests, and providing cooking lessons to engage stakeholders such as students, staff, parents, and community members to increase student acceptance of lower sodium foods. Although less common, SFAs implemented other techniques such as providing more food choices, gradually implementing menu changes, offering educational activities, and engaging in communication and promotion of overall nutrition to inform menu planning and to build student buy-in.

Most SFAs reported that highlighting the absence or reduction of sodium in school meals was not a successful way to gain acceptance or encourage participation. Instead, SFAs encouraged uptake of lower sodium foods by promoting generally healthy food choices, fresh fruits and vegetables, and new food items through educational activities and communication materials. Students participated in cooking classes and gardening activities and were provided printed materials (e.g., signage and newsletters) to increase student acceptance of new or modified foods.

SFAs shared that students highly valued customization and that it encouraged student acceptance of lower sodium foods by allowing them to feel they had options. SFAs provided students with choices by allowing them to pick the toppings from a serving bar or select their entrée or multiple smaller servings.

### Key Resources Facilitating Common and Effective Strategies

- ✓ Increased staff training on food storage, preparation, and production
- ✓ Additional resources for food storage and staff labor
- ✓ Increased staff resources and expertise in recipe modification or development
- ✓ Strategic use of USDA DoD Fresh, USDA Foods, and food buying co-ops to obtain lower sodium items

### Key Approaches for Gaining Student Acceptance of Lower Sodium Foods

- ✓ Implementing taste testing to inform menu changes and identify preferred food items
- ✓ Communicating and promoting healthy food choices
- ✓ Providing more menu options reflective of students' preferences (i.e., cultural, regional) and customizing existing items
- ✓ Implementing menu changes gradually to improve uptake of lower sodium items



Overall, SFAs noted one of the most crucial methods to gain student acceptance of lower sodium foods was to implement changes gradually over time; gradual implementation allowed students adequate time to adjust and decreased reported rates of rejection. SFAs measured student acceptance over time and in single occurrences by monitoring food waste, informally discussing preferences with students, and formally and regularly polling students on satisfaction.

Taste testing was the approach most often used by SFAs to gain acceptance of lower sodium items. To measure acceptance of new, modified, or novel food items, SFAs conducted taste testing to obtain stakeholder feedback at the SFA level at a given point in time. SFAs most commonly conducted taste tests with students; however, many SFAs included parents, staff, and community members in taste tests to determine items with the highest levels of acceptance. SFAs used the results of taste tests to define student preferences and inform menu planning. Additionally, food suppliers emphasized the importance of taste tests as a critical step in gaining student acceptance and increasing the vitality of school meals programs. In many SFAs, food suppliers facilitated taste testing by providing samples, technical support, or other resources. More specifically, food manufacturers used taste tests in schools and at school food conferences to refine products before the rollout of new or reformulated products, while food distributors used taste tests in schools to ensure student acceptance and palatability of stocked food products.

### IMPLEMENTATION CHALLENGES FOR SFAS

SFAs faced several barriers when implementing strategies to reduce sodium in school meals, including limited infrastructure and resources, limited access to lower sodium products, and low student acceptance.

Changing food preparation methods and using effective menu planning were the most labor-intensive strategies, requiring skilled staff, increased storage and serving capacities, and increased preparation time for successful implementation. Respondents identified scratch cooking as the most promising and effective strategy to reduce sodium, noting that, because preservatives are not necessary for

scratch cooking, kitchen staff are better able to control ingredients and regulate sodium content. However, some SFAs described challenges implementing scratch cooking due to lack of cafeteria equipment and skilled staff. Several small and regional FSMCs shared this sentiment, noting outdated school kitchen equipment was not able to handle scratch cooking. FSMC respondents indicated that school kitchen equipment would need to be upgraded to accommodate scratch-prepared foods, and there would be an increased need for school staff able to commit the time and labor hours to prepare those foods. Due to the significant investments needed, this approach will likely only be implemented by SFAs already engaged in some level of scratch cooking.

SFAs and food suppliers also noted the limited availability of acceptable lower sodium products. SFAs reported difficulty in identifying lower sodium items with high student acceptance, while food suppliers reported difficulty in supplying acceptable lower sodium products.

#### Challenges to Sodium Reduction Strategies

- ✓ Increased labor and equipment costs to support more intensive food preparation methods
- ✓ Decreased access to lower sodium products associated with SFA urbanicity and size
- ✓ Lack of student acceptance as a result of cultural and regional taste preferences

SFAs described student acceptance of lower sodium items as challenging, especially for items where sodium was either a main ingredient or a core component of the expected flavor of the item. SFA respondents felt that students' lack of acceptance was the result of comparisons made to foods commonly consumed in their homes and items served in restaurants or available in stores.

As described previously, fixed characteristics—particularly SFA urbanicity, size, and school type— influenced the perceived effectiveness of strategies implemented to reduce sodium in school meals and to gain student acceptance of lower sodium products. School type seemed to be somewhat related to students' willingness to try new food items and their overall acceptance of lower sodium products. High school students were perceived as less receptive to lower sodium alternatives due to established taste preferences and easy access to off-campus food, while elementary schools reported fewer barriers to student acceptance when implementing sodium standards. 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 large urban SFAs procured higher quantities of food at lower costs, with access to a larger number of suppliers.

## Technical Assistance Required to Implement the Sodium Standards

Study participants reported relying on a variety of technical assistance in support of implementing the sodium standards and reducing sodium in school meals.

Food manufacturers and FSMCs reported leveraging several USDA resources to support the implementation of lower sodium targets, including FNS PartnerWeb, nutrition standards fact sheets, a USDA FNS session before the SNA Annual National Conference, and online webinars. While a few reported that they did not use any USDA resources for training purposes, most FSMCs and food manufacturers reported that they used USDA training and materials in a variety of ways, including to educate their sales teams and their own staff.

### Technical Assistance Used by SFAs and FSMCs

- ✓ Electronic and print materials provided by USDA, State agencies, and food suppliers
- ✓ In-person and virtual trainings available through conferences and webinars
- ✓ Food supplier menu recommendations, recipes, tip sheets, and marketing materials

SFAs described many types of technical assistance they received to meet the lower sodium standards for school meals. The most prevalent form was information and marketing materials provided by several sources, including the USDA, State agencies, and food manufacturers and suppliers. SFAs reported accessing and sharing these materials either electronically via websites and email or in print form.

Most SFA respondents discussed receiving technical assistance through training opportunities and conferences, and some reported receiving technical assistance via webinars, noting that trainings offered through the USDA, State agencies, food suppliers, and other organizations helped keep them abreast of changing regulations and taught them new techniques to achieve the lower sodium targets. In addition, food suppliers were a major source of technical assistance for nearly half of the SFAs in terms of helping them to find lower sodium products and to develop menus, recipes, tip sheets, and marketing materials.



Most SFA respondents also noted that they received training for managers, kitchen managers, and food service directors, including onsite assistance from the USDA and State agencies. For most SFAs, access to lower sodium recipes from various sources was helpful, while fewer SFAs noted assistance with menu development and nutritional analysis as valuable. SFA respondents appreciated the ability to access USDA and State agency support over the phone and discussed the benefit of onsite support and face-to-face interactions with staff from the USDA regional offices and State agencies.

Overall, the findings indicate that the technical assistance used by SFAs, food manufacturers, and FSMCs was an important supportive resource in meeting sodium standards. The most used technical resources available from the USDA included newsletters, flyers, and tip sheets providing guidance on how to reduce sodium; electronic trainings; and resources for lower sodium recipes. Most SFAs noted that they relied on these resources from the USDA, as well as the resources for lower sodium recipes and recipe modification made available through their State agency websites, to lower sodium in school meals. Although these resources were viewed as valuable, SFAs, food manufacturers, and FSMCs also expressed the desire for continued technical assistance in these areas.

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## CHAPTER 3. RECOMMENDATIONS FOR ACHIEVING FUTURE SODIUM TARGETS

This chapter discusses emerging recommendations for achieving future sodium targets based on information from food manufacturers, FSMCs, and SFAs. It addresses the willingness of SFAs and the food industry to pursue future sodium targets and discusses the recommendations of these stakeholders to support future efforts. Specifically, the study identified several recommendations—including conducting additional research to support understanding of the impact of sodium reduction, enhancing the planning process for adoption of future sodium goals with the food industry and SFAs, developing communications and guidance on future targets, and identifying technical assistance and support for resources needed for implementing top strategies for sodium reduction—that would be useful to reach both current and future sodium targets.

### Plans for Reaching Future Sodium Standards

SFAs, food manufacturers, and FSMCs were varied in their commitment and willingness to pursue future lower sodium standards without federal regulations in place. A few SFAs reported that they planned to meet future sodium targets and described children’s health as the motivation to continue to decrease sodium levels in school meals. Other respondents noted that they planned to continue to restrict sodium in anticipation of future federal sodium standards out of desire to proactively smooth eventual transitions for schools, students, and staff. Among the few SFAs reporting they would not continue efforts to reach Target 2 or Target 3 standards until future USDA regulatory requirements were in place, the most common reasons were a reluctance to further disrupt school meal participation rates by serving foods with even lower sodium, and the perception that foods with even lower sodium content would have a high probability of rejection by students and parents.

Some food suppliers reported that they would continue to work toward Target 2 and Target 3 even as regulatory enforcement is delayed. These food suppliers cited business objectives as their primary motivation for continuing to lower sodium, noting that lower sodium is an ongoing trend and incorporating lower sodium items in schools offers an opportunity to become industry leaders. However, food suppliers who reported they would not be working toward future sodium targets noted that their reliance on manufacturers to create or reformulate compliant food products acted as a major barrier to implementing sodium changes. Without certainty regarding the sodium targets, there was little incentive on the part of the food industry to invest in developing items with even lower sodium content. Additionally, food suppliers noted that they wanted to be strategic in offering products with adequate levels of demand from SFAs.

Both food manufacturers and FSMCs shared that changing the sodium content of foods can take a great deal of time and is associated with high costs that they must absorb. From the perspective of these respondents, cost was the most commonly reported barrier to pursuing future sodium targets. Based on the experiences and perceptions of food manufacturers and FSMCs, 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 may then be replicated by other food suppliers. These stakeholders reported several other barriers to

pursuing future sodium targets, including the low demand for these foods outside of the school system and limitations to food production when less sodium is used. Food manufacturers indicated that because the K–12 market represents a low proportion of the companies’ overall markets, it is sometimes difficult to justify developing lower sodium items for schools, as they are not likely to be in high demand by most of food manufacturers’ remaining customers.

## Approaches and Resources Needed to Reach Future Sodium Standards

While describing the potential challenges of pursuing more restrictive future sodium targets, SFAs, food manufacturers, and FSMCs also discussed the approaches and resources that would be most helpful for implementing such sodium targets. The following discussion describes these resources and recommendations.

### ADDITIONAL RESEARCH TO SUPPORT UNDERSTANDING OF THE IMPACT OF SODIUM REDUCTION

While the sodium targets were based on NAM recommendations and the 2010 *Dietary Guidelines for Americans*, both food manufacturers and FSMCs stated a desire for more research evidence substantiating the health benefits of the reduced amount of sodium required to meet sodium Target 2 and Target 3. Food manufacturers expressed interest in information about available lower sodium food products; their degree of student acceptance; and how reduced sodium affects the functionality (e.g., physical properties such as appearance and texture) of ingredients in recipes. They also indicated that they would appreciate guidance as to whether salt substitutes are safe. Food manufacturers conveyed concern with both the safety of salt substitutes and other flavor-enhancing products to replace sodium, as these ingredients may conflict with “clean” product labels (i.e., foods that do not contain artificial ingredients), a requirement by most of their school clients.

#### Recommendations for Additional Research

- ✓ Provide peer-reviewed articles substantiating the efficacy of lower sodium targets
- ✓ Provide information regarding available food products and their respective student acceptance and functionality in recipes
- ✓ Offer research regarding the safety of salt substitutes and flavor-enhancing additives

### ENHANCING THE PLANNING PROCESS FOR ADOPTION OF FUTURE SODIUM GOALS

As noted in Chapter 2, most respondents, primarily food manufacturers, conveyed a strong desire for regular, direct dialogue with USDA regarding recommendations for reduced sodium level targets and corresponding implementation timelines in the future. Food manufacturers also indicated that they would like a more streamlined feedback process to enable them to efficiently convey concerns or needs to USDA FNS and receive guidance. Respondents wanted policymakers to listen to leaders across various levels of the school food industry and supply chain to better understand what is necessary to achieve and implement sodium policies. FSMCs and food manufacturers indicated that future planning processes should be grounded in science and an understanding of what is feasible and achievable for manufacturers and suppliers within a given timeline.

Relatedly, food manufacturers recommended implementing a stable, established policy to encourage food manufacturers and distributors to invest time and money into changing products. To ease the burden of meeting updated sodium standards, respondents emphasized the importance of providing transparent communication and messaging to all stakeholders in the school food supply chain, clearly stating whether the future sodium targets will be implemented and, if so, when implementation may occur. Respondents suggested stabilizing implementation timelines and increasing lead time for food supplier manufacturing and procurement to improve processes moving forward. Both food manufacturers and FSMCs expressed doubt during the focus group and interviews that the future sodium targets will be implemented, stressing the challenge of revising products to support sodium reduction when long-term federal regulations are uncertain.

### Recommendations for Enhancing the Planning Process

- ✓ Increase communication between USDA and manufacturers
- ✓ Solicit stakeholder input to understand what is feasible and achievable
- ✓ Establish longer term sodium policies
- ✓ Provide consistent messaging and standard training for all stakeholders in the supply chain

Additionally, food manufacturers identified a lack of consistent messaging being delivered across the supply chain. In particular, food manufacturers noted that there is a need for standardized training across the different levels of the food service supply chain, including those responsible for CN labeling;<sup>18</sup> State agencies; and those working with the technical aspects of the regulations, including manufacturers, suppliers/distributors, school food service directors, and dietitians. By including a diverse audience, the trainings will ensure that all parties receive consistent messaging and information. Food manufacturers recounted instances where sales were lost when an auditor was improperly trained on sodium regulations and requirements.

### DEVELOPING COMMUNICATIONS TO PROVIDE GUIDANCE ON FUTURE TARGETS

Food manufacturers, FSMCs, and SFAs indicated a need for increased communication to support implementation of future sodium targets. These stakeholders suggested that USDA could support the implementation of the sodium standards by providing more frequent and strategic communication focused on clarifying the rationale and research behind the sodium changes, and materials to help communicate and describe the new sodium targets to (1) parents and the community, (2) students, and (3) school personnel.

### Recommendations for Developing Communications on Future Sodium Targets

- ✓ Provide additional communication materials regarding sodium reduction
- ✓ Tailor available USDA materials to FSMCs and local school cooks
- ✓ Increase communication between USDA and various stakeholders regarding regulations and nutrition resources/recipes

Regional FSMCs noted that USDA materials are geared toward local districts, but additional materials tailored to FSMCs and local school cooks should be developed. Food manufacturers and FSMCs indicated that it would be useful for USDA to provide support for communicating sodium reduction to their customers (e.g., food distributors, SFAs, and

<sup>18</sup> CN labeling refers to a USDA program that evaluates the formulation of commercially prepared main-dish products to determine the dish's contribution toward meal pattern requirements and allows manufacturers to provide this contribution on their labels.

brokers). Food manufacturers suggested several areas where USDA could help them meet the sodium targets, including creating a “side-by-side, up-to-date comparison” of the standards; writing sample letters and newsletters that describe the sodium standards in layman’s terms for school district officials and boards; and providing FSMCs with access to the guidance offered to State agencies. Other technical assistance needs that food manufacturers and FSMCs identified were tools and templates tailored for stakeholders across the food distribution chain to communicate sodium reduction to various audiences. Specifically, FSMC respondents requested a litany of additional materials, including culinary training resources, funding for equipment upgrades, research on the impact of changing sodium levels, publications regarding sodium with infographics, and lower sodium recipes that have been taste tested by students.

## ADDITIONAL TECHNICAL ASSISTANCE AND SUPPORT NEEDED TO IMPLEMENT STRATEGIES

To reach lower sodium targets and implement the top strategies, SFAs and FSMCs noted the need for additional technical assistance and resources. This section describes key technical assistance and resources respondents reported would be useful for planning and implementing new strategies.

### *Resources Needed for Implementing Top Strategies*

SFA respondents indicated that combining procurement, effective menu planning, and changes in food preparation was the most effective approach to reduce sodium in schools. To meet sodium targets and collectively implement these three strategies, SFAs and FSMCs specifically noted the need for additional USDA-provided technical assistance in the areas of conducting and disseminating research on sodium, enhancing the planning process for implementing sodium standards, developing additional communication resources for diverse audiences, and offering support for targeted trainings, infrastructure investments and additional support resources for implementation. Several SFA respondents also requested additional in-person networking opportunities to discuss strategies for reducing sodium with similar schools.

### *Offering Additional Planning and Operational Support to Offset Implementation Costs*

In addition to barriers related to outdated kitchen equipment and lack of skilled staff, several SFAs noted that the time required to plan and implement new strategies increased labor costs. Specifically, SFAs employed kitchen staff, chefs, and dietitians for additional time to support menu planning/recipe development, identification of new lower sodium products, and development of new food preparation techniques. Given the challenges and increased labor involved in implementing lower sodium food targets, SFAs and FSMCs not currently implementing the top practices may require additional personnel or specific menu planning guidance to lessen the resource burden during strategy initiation and implementation.

### *Providing Targeted Food Preparation Resources*

SFAs described the value and continued need for access to lower sodium recipes and related resources, such as guidance on alternative seasonings, to support implementation of the sodium standards. SFAs in the study described the significant resources required for implementing new recipes or modifying

### Recommendations for Additional Technical Support

- ✓ Provide operational and planning support for SFAs lacking kitchen equipment and sufficiently skilled labor
- ✓ Develop targeted training in fresh fruit and vegetable preparation
- ✓ Provide recipes and identify lower sodium products accepted by students
- ✓ Offer trainings on menu planning and lower sodium products

existing ones. SFAs reported using lower sodium USDA recipes available online but noted increased access to lower sodium recipes from various USDA sources was an ongoing need, especially recipes with proven student acceptance. SFAs also stated that assistance with menu development and nutritional analysis was valuable and described the need for additional support in these areas. SFAs appreciated the ability to access support from the USDA and State agencies over the phone and discussed the benefit of onsite support and face-to-face interactions with staff from the USDA regional offices and State agencies. Food manufacturers and FSMCs described the need for revised USDA recipes to eliminate unnecessary sodium and to incorporate flavorful ingredients.

#### *Additional Trainings and Resources*

Some respondents discussed the need for training, either in person or online, to better understand sodium guidelines and menu planning. Among SFAs that received training from the USDA, State agencies, and food suppliers, respondents noted that the training topics on food preparation methods, lower sodium products, and challenges experienced in the school districts were helpful and should be continued. SFAs described the need for both additional resources and trainings in advanced food preparation and production techniques to support the incorporation of lower sodium items into school meals.

Both food manufacturers and FSMCs suggested that FNS could provide them with additional training on the sodium targets, and a more streamlined approach for locating and downloading current USDA training and resources. Food manufacturers indicated that they would like the training that is provided to State agencies to be shared with them so that they have a better understanding of what is being communicated across the entire food distribution chain. With regard to the format of trainings, a large FSMC noted during follow-up data collection that video training has been a well-received method for delivery of information and suggested that any future trainings be visual, short, and interactive.

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## CHAPTER 4. KEY POLICY IMPLICATIONS OF THE STUDY FINDINGS

The purpose of this study was to examine, from both the industry and school perspectives, successes and challenges in implementing the sodium targets for school meals programs. This report identifies some successes and challenges from both the operational (SFAs and FSMCs) and the food manufacturing/distribution perspectives. These perspectives suggest policy-related changes and resource needs to help promote sustained improvements to the quality of school meals, and more directly, to help schools achieve compliance with the sodium targets established as part of the new school meal standards.

The themes that emerged throughout this report may provide insights for planning and developing policies and targeted resources to support the successful implementation of the sodium targets. This chapter begins with a discussion of the need for clear and established policy with regard to the sodium reduction implementation targets and timeline. The sections that follow include considerations for engaging stakeholders, supporting additional research efforts, and providing resources for the successful implementation of the current and future sodium standards.

### Early Notification and Stable Program Policy for Sodium Reduction Efforts

All schools participating in the NSLP were required to begin implementing new nutrition standards beginning in SY 2012–2013 (USDA FNS, 2012). The new nutrition standards, required by law to align with the 2010 *Dietary Guidelines for Americans*, are based on recommendations from NAM (2010). The timeline for compliance with sodium reductions was originally set to begin with Target 1 levels in SY 2014–2015, with Target 2 levels in SY 2017–2018, and the final Target 3 levels in SY 2022–2023.

As mentioned in Chapter 1, at the time of follow-up data collection for the Objective 1 phase of the study, food manufacturers and FSMCs expressed doubts regarding the implementation timeline proceeding as planned, likely due to a SNA report released in January 2016 (School Nutrition Association, 2016); the report stated that an agreement had been reached with SNA and USDA that would delay the Target 2 implementation schedule by 2 years, to SY 2019–2020. The subsequent uncertainty created hesitation among manufacturers to commit research and development resources to product reformulation that might never be needed, thus slowing down the supply chain of such products to the K–12 market. Subsequent FNS policy memoranda issued in January and May of 2017 confirmed that policy on the sodium targets was under review by FNS, and first offered flexibilities for SFAs working toward compliance with Target 2, and then announced a process to amend the regulations for the school meals programs with respect to sodium, among other amendments to the school meal standards (USDA FNS,

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*Recommendation: Provide clear and specific communications regarding timeline, expectations, and intent to modify school meals standards to all stakeholders*

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2017d; 2017e). In November 2017, USDA issued an Interim Final Rule providing flexibilities for milk, whole grains, and sodium requirements, specifically retaining Target 1 as the regulatory standard through SY 2018–2019, with the opportunity for public comment for USDA’s consideration in developing the Final Rule (USDA FNS, 2017c). Although the Interim Final Rule clearly indicated that the purpose of extending the Target 2 implementation date was to provide schools and manufacturers additional time to make the necessary menu and product changes for compliance, some may see this as an evolving policy that will further delay manufacturers’ willingness to commit additional resources to reformulating products until the policy becomes final and they are sure that these products will continue to be in demand. Some SFA respondents were unwilling to pursue future goals without assurances of future target requirements in place. This underscores the need for very clear and unwavering policy from FNS on the commitment to implement the sodium standards going forward.

## Considerations for Engaging Stakeholders

Respondents from the food industry reported that they would like more opportunities for regular, direct communication with USDA. They felt that including manufacturers and distributors in early policy discussions—particularly when establishing sodium targets and policies that rely on understanding the nuances involved in both reformulation and supply chain challenges—was very important. This consideration is in line with the recommendation in the NAM report for engaging the food industry as a means to promote effective implementation of the meal standards. If not already in progress, FNS might consider establishing a formal process to create an open dialogue with industry stakeholders.

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*Recommendation: Establish a formal process to create frequent and open dialogue with industry stakeholders to promote effective implementation*

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The NAM report also asserts that engaging the entire school community and student (peer) advisory councils is essential in helping to promote the school meal changes. SFA respondents reported engaging stakeholders in several ways, including coordinated community events, town hall meetings, and open houses, and soliciting feedback from community wellness committees. Their most commonly used strategy for engaging students was the use of taste testing to encourage students to accept lower sodium menu items and to help refine recipes and guide product selection. FNS may consider providing SFAs with appropriate guidance for operationalizing some of these strategies.

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*Recommendation: Provide SFAs with practical guidance on engaging students to promote acceptability of lower sodium items and recipes*

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## Additional Research to Gain Support for Continued Sodium Reduction

Food manufacturers and FSMCs reported a desire for more evidence-based research that supports the need for the reduced sodium levels, particularly in school-aged children. They also expressed a need for more research on the use of cost-effective, safe salt substitutes. FNS may consider sponsoring additional



research in these areas or providing guidance to the food industry and SFAs on credible research that provides support for the sodium recommendations.

The NAM report noted that there was only limited evidence by which to predict the acceptance of lower sodium products by children, especially when introduced gradually, which was in part the reason for setting a 10-year window for the sodium reduction standards. The NAM recommendations for continued evaluation and research on the nutrient targets and meal requirements focus on student acceptance and participation rates, school food service operations, and the cost of the program. A specific recommendation includes comparisons of the results of the next School Nutrition Dietary Assessment (SNDA) study with the results of SNDA-III, especially as it relates to trends in nutrient intakes. The results of the next SNDA study, School Nutrition and Meal Cost Study, are expected to be available in the spring of 2019. FNS may consider revisiting the specific comparisons laid out in the NAM report and perhaps convene a panel of experts to review the data to help guide policy decisions on any further updates to the sodium reduction timeline.

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*Recommendations: Communicate and disseminate evidence to support the need for and benefits of sodium reduction*

*Sponsor additional research or provide guidance to the food industry and SFAs on credible research that provides support for the sodium recommendations*

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## Additional USDA Resources and Supports for Implementing Current and Future Sodium Standards

Although most SFAs reported that they received technical assistance from the USDA and their State agencies, more sustained and targeted trainings may be needed to help support efforts to meet future sodium targets. Several sources of information and marketing materials, including the USDA, State agencies, and food manufacturers and suppliers, were identified by SFAs as providing them with practical, online information in addition to USDA-sponsored training and webinars. As SFAs continue to rely on increased scratch cooking and recipe modification as strategies to reduce sodium in school meals, FNS might consider increasing funding for Team Nutrition materials development, training grants, and equipment grants that will allow schools and SFAs to maximize the use of fresh ingredients in meal preparation.

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*Recommendation: Increase funding for Team Nutrition materials development, training grants, and equipment grants that will allow schools and SFAs to maximize the use of fresh ingredients in meal preparation*

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Most SFAs rely heavily on the USDA Foods and USDA DoD Fresh programs. USDA Foods already provides SFAs with a wide variety of lower sodium products, including fresh fruits and vegetables and other food products. An individual SFA's experience with USDA Foods and USDA DoD Fresh depends on many decisions that their State

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*Recommendation: Increase range of lower sodium products available through USDA DoD Fresh and USDA Foods*

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makes about how to operate the program and which foods to offer. USDA continues to provide training and technical assistance to State Distributing Agencies to adapt their program to better meet the needs of their SFAs. Efforts to provide a wider range of lower sodium options will likely contribute greatly to the success of implementing the future sodium targets. Some FSMCs have suggested that USDA should offer more muscle meats (e.g., unprocessed meats), so SFAs can season their own meats rather than relying on processed varieties. Likewise, USDA DoD Fresh has provided SFAs with fresh produce, and as SFAs continue to do more scratch cooking to help them meet the sodium targets, the demand for fresh produce will likely continue or increase.

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## CHAPTER 5. CONCLUSIONS

In an effort to address growing concerns over dietary consumption patterns among children ages 5–18 years, Congress passed HHFKA (Pub. L. 111–296), which required USDA to update the school meal standards to reflect the 2010 *Dietary Guidelines for Americans*. One of the provisions of the updated nutrition standards required that schools gradually reduce the average sodium content of weekly meals over a 10-year period. The results presented in this report provide insight for USDA, school nutrition professionals, and the food industry regarding how to overcome the operational challenges of providing meals that meet the sodium standards while also encouraging school meal participation. Findings from this study have revealed policy and implementation facilitators and challenges that impact the entire school food supply chain and have yielded a number of recommendations and next steps to improve the approach to sodium reduction in school meals.

Data from SFAs, food suppliers, and distributors indicated a high rate of success in meeting the Target 1 sodium standards, with many SFAs making significant progress toward or reaching Target 2. Findings revealed that school districts employ a diverse set of practices to meet the sodium targets, the most prevalent of which include:

- (1) using effective menu planning;
- (2) food procurement strategies;
- (3) involving stakeholders (students, staff, parents, and/or community members) in sodium changes to gain acceptance;
- (4) changing food preparation methods; and
- (5) food supplier interactions.

Collectively, these strategies, and their associated facilitators and barriers to implementation, can inform future technical assistance approaches and serve as a roadmap for SFAs working toward meeting the sodium targets.

In addition to identifying best practices in SFAs and schools successfully meeting the sodium targets, this study also set out to examine the market availability of foods that meet current and future sodium standards. Results show that while there is adequate market availability of foods to meet Target 1, many barriers remain to meeting future targets, with SFAs relying heavily on the USDA DoD Fresh program, lower sodium offerings from USDA Foods, and food buying co-ops to access and afford lower sodium items.

The interviews with SFAs, food manufacturers, and FSMCs identified a number of implementation challenges that fall into two broad categories. First, they emphasized the need for clear and stable policy guidance regarding the sodium targets that considers research findings, market realities, bidding processes, and timelines associated with sodium reduction and school food procurement. Food manufacturers noted that there is limited ability to modify and reformulate some products due to functionality of sodium in these items; emphasized the lack of evidence supporting the more restrictive sodium targets; and highlighted the major challenge of increased costs associated with product reformulation for items with a limited market. SFAs face the challenge of providing high-cost foods that are not palatable to students, impacting school lunch participation rates and, ultimately, school food

budgets. Stakeholders throughout the supply chain noted that the current policies do not take into account the cost and time constraints associated with product development, student testing, and procurement timelines. Findings suggest that future adjustments to the sodium targets should include input from all stakeholders to ensure that policies can be feasibly implemented.

Second, the findings identified a need for technical assistance that addresses fixed SFA factors such as type of school, geographic regions, and size that make it more difficult to reach future sodium targets. The interviewed SFAs noted that high schools were less able than elementary or middle schools to achieve sodium targets beyond Target 1, as they reported more challenges related to student acceptance of lower sodium foods, possibly related to more established food preferences among older students. Geographically, SFAs in rural communities and towns reported more challenges than those with urban proximity to be able to procure lower sodium foods that were pre-prepared or fresh. The challenges were mixed with regard to district size. While larger districts generally had more staff, equipment and space at their disposal to help them achieve lower sodium meals, smaller districts reported greater flexibility and ownership over menu planning practices to help address their challenges.

Actionable recommendations for achieving future sodium targets, described in more detail in Chapters 3 and 4, include the following:

- Disseminating peer-reviewed research to support the sodium target levels and the safety of salt substitutes
- Providing information on currently available lower sodium products and their respective student acceptance and functionality in recipes to identify recipes and meal plans that help to achieve compliance and are acceptable to students
- Engaging the food industry and SFAs in the planning process and policy development for adoption of future sodium goals
- Developing consistent communications and guidance on future targets for all stakeholders that clearly define timeline, expectations, and intent to modify nutritional standards
- Identifying, developing, and making available the additional USDA resources, technical assistance, and financial support needed to implement the top strategies for sodium reduction that would be useful to reach both current and future sodium targets

These findings should be considered in future efforts to implement the sodium targets for school meals programs. Additional research, technical assistance, financial support, and policy guidance could help the food industry and school districts promote sustainable improvements to the quality of school meals, and more specifically, could help schools achieve compliance with the sodium targets while simultaneously delivering school meals that are acceptable to students.

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