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KIDS' SAFE & HEALTHFUL FOODS PROJECT

Robert Wood Johnson Foundation

THE PEW CHARITABLE TRUSTS

Serving Healthy School Meals

Despite challenges, schools meet USDA meal requirements

The Kids' Safe and Healthful Foods Project is a collaboration between The Pew Charitable Trusts and the Robert Wood Johnson Foundation that provides nonpartisan analysis and evidence-based recommendations on policies that impact the safety and healthfulness of school foods. For more information, see HealthySchoolFoodsNow.org.

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The analysis included in this report is that of The Pew Charitable Trusts and the Robert Wood Johnson Foundation and does not necessarily reflect the views of outside reviewers. This report is intended for educational and informative purposes. References to specific policy makers, individuals, schools, policies, or companies have been included solely to advance these purposes and do not constitute an endorsement, sponsorship, or recommendation.

Contents

1 Overview

3 Background

5 Meeting new lunch requirements

13 Summary of main findings

14 Conclusion

15 Appendix A: Tables

23 Appendix B: Characteristics of school food authorities

27 Appendix C: Study design and methodology

38 Appendix D: Strengths and limitations of the study

40 Appendix E: The KITS questionnaire

58 Endnotes

Overview

Over the past four decades, the obesity rate among children and adolescents ages 6 to 19 has more than tripled.[1] This has increased the risk of young people developing health problems such as cardiovascular disease, depression, high blood pressure, Type 2 diabetes, breathing problems, sleep disorders, and high cholesterol.[2] More than 31 million U.S. children participate in the National School Lunch Program each school day,[3] and many students consume up to half of their daily calories at school.[4] As a result, schools have the potential to help reverse the national childhood obesity epidemic.

In January 2011, the U.S. Department of Agriculture, or USDA, proposed updated nutrition standards for school meals to align them with the 2010 Dietary Guidelines for Americans[5] and current information on children's nutrient requirements.[6] USDA's standards call for schools to offer more fruits, vegetables, and whole grains, and to serve only fat-free and low-fat milk. In addition, the standards place limits on calorie and sodium levels, and eliminate foods with trans fatty acids, or trans fats. Schools were required to implement the new standards for lunches in school year, or SY, 2012-13 and for breakfasts in SY 2013-14.

The Kitchen Infrastructure and Training for Schools Report Series

This is the first of a series of reports summarizing how schools are putting in place the USDA standards and what challenges they face before they can reach full implementation. The latter reports will contain findings on the state of kitchen equipment and infrastructure in schools and the training of kitchen staff needed to implement USDA's requirements.

As school food authorities,* or SFAs, work to implement the new meal standards, they may face challenges, including limitations in existing kitchen equipment and infrastructure, and in the training and skills of food service staff. In January 2012, the Kids' Safe and Healthful Foods Project—a joint initiative of The Pew Charitable Trusts and the Robert Wood Johnson Foundation—began conducting the first national study to assess the needs of SFAs. The Kitchen Infrastructure and Training for Schools study examined challenges SFAs encountered in implementing the new meal requirements under the National School Lunch Program, and collected data on their reported needs for new equipment, infrastructure changes, and staff training.

The findings presented in this report are based on a self-administered, online survey of school food service directors or their designees (primarily food service managers) from a nationally representative sample of the administrators of public school food authorities.

Key findings

This report presents findings about the challenges districts face in implementing the updated meal standards, when they expect to be able to meet the standards, and how they are finding solutions to meet the standards. Below are our key findings.

* A school food authority is the local administrative unit that operates the national school breakfast and lunch programs for one or more school districts.

Finding 1: Ninety-four percent of school food authorities expected to be able to meet the new lunch requirements by the end of SY 2012-13, which was the year that the new requirements first went into effect. Sixty-three percent anticipated meeting the new standards by the start of SY 2012-13.

Finding 2: Although the vast majority of school food authorities intended to meet the updated standards by the end of the school year, most—91 percent—also indicated that they faced one or more challenges to reaching full implementation. These included, for example, the lack of adequate equipment or training and issues with food costs and availability.

Finding 3: Most school food authorities with inadequate equipment reported "making do" with some type of less efficient process, or workaround, which in turn was widely considered to be inadequate, expensive, inefficient, and/or unsustainable.

A sizable majority of school food authorities reported facing challenges while implementing the updated school meal standards. This report will outline the topmost considerations of SFAs as they work to provide healthier foods to the students they serve.

Background

Established in 1946, the National School Lunch Program operates in nearly all public schools and 94 percent of public and private schools combined.[7] The main goal of the school lunch and breakfast programs is to promote the health and well-being of children by ensuring that they have access to nutritious meals that support normal growth and development. Schools that participate in the school lunch program must make meals available to all students and provide lunches to children from low-income families for free or at a reduced price.

About Our Survey

The findings presented in this report are based on the Kitchen Infrastructure and Training for Schools survey conducted by Mathematica Policy Research of school food directors or their designees (those deemed to be most knowledgeable on the district's equipment, infrastructure, and training needs) from a nationally representative sample of public school food authorities. The questionnaire was developed with assistance from a consultant who works with school food authorities to implement the new meal requirements. In addition, a panel of child nutrition and food service experts from across the country helped identify and frame the key issues to be measured. The questionnaire covered four main topics, each focusing on the needs of school food authorities relative to implementing the new requirements for school lunches:*

- Readiness for and barriers to meeting the new requirements.
- Adequacy of and need to replace or add food service equipment.
- Kitchen infrastructure needs.
- Staff training needs.

Additional questions collected information on demographic and operational characteristics of the SFAs and credentials and experience of survey respondents.

SFAs were sampled from a USDA database of those participating in the school lunch program. A total of 3,372 representatives completed the online survey, for a response rate of 54.3 percent.

Data were collected between August and December 2012, and responses reflect circumstances in SY 2012-13 as schools worked to implement the new lunch requirements. The panel of experts developed the survey with a focus on what districts need, not what they want, in order to meet the updated meal standards. As a result, the questionnaire asked about those needs tied to changes in the meal pattern based on function (i.e., storage and receiving, meal preparation, holding and transportation, and meal service). (See Appendix E.)

Key findings were examined for differences among subgroups defined by size (total student enrollment), community type (urban, suburban, and rural), region of the country (as defined by the Food and Nutrition Service), and poverty category (based on the percentage of enrolled students approved for free or reduced-price meals). More information on the methodology can be found in Appendix C.

* The study focused only on the new requirements for the National School Lunch Program, both to limit the burden on respondents and because new meal requirements for the school breakfast program had not gone into effect at the time of the survey.

The school meal programs are federally funded and subject to policies and regulations set by USDA. At the local level, the programs are administered by state child nutrition agencies and local school food authorities,* which are responsible for ensuring that meals meet minimum nutrition standards. Technical assistance and guidance materials developed by the agency's Food and Nutrition Service are available to all SFAs, which also receive training and technical assistance from, and are monitored by, state child nutrition agencies.

According to USDA's School Nutrition Dietary Assessment study conducted during the 2009-10 school year, only 14 percent of public schools offered lunches that met all of the nutrition standards in place at that time.[8] The study found that the average school lunch was high in sodium, calories from solid fats, and added sugars, and low in whole grains. During that period, however, many states, districts, and schools had voluntarily gone beyond federal meal nutrition requirements: More than 6,500 schools received HealthierUS School Challenge awards, and more than 15,000 schools participated in the Alliance for a Healthier Generation's Healthy Schools Program.† Both initiatives focus on building a healthier school environment, in part by making nutritious and appealing school meals available to all children.

In December 2010, the Healthy Hunger-Free Kids Act reauthorized the school breakfast and lunch programs with a focus on improving children's access to healthy foods in schools and promoting healthy eating and physical activity. USDA gained the authority to update nutrition standards for all foods sold on campuses during the school day and made available, for the first time in more than 30 years, additional funding for the lunch program.‡ An additional 6 cents per lunch is now available to school food authorities that comply with updated meal requirements. In addition, USDA was tasked with creating professional standards for school food service directors, expanding training opportunities for school food service staff, and strengthening wellness policies.

In January 2011, USDA proposed updated nutrition standards for school meals that would require schools to offer more fruits, vegetables, and whole grains, and limit milk to fat-free and low-fat varieties. For the first time, the nutrient standards include maximum calorie and sodium levels and seek to eliminate trans fats.

The final rule establishing the new meal requirements§ went into effect July 1, 2012.[9] These requirements marked the first major changes to the nutrition standards for school meals in more than 15 years. Schools were required to implement the new requirements for lunches beginning in SY 2012-13 and to begin implementing the new requirements for the school breakfast program in SY 2013-14.

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* A school food authority typically operates the program for one school district. Less commonly, a single school food authority operates the program for a small group of districts, or multiple school food authorities oversee the program for a very large district.

† For more information about HealthierUS School Challenge and Alliance for a Healthier Generation awards, see http://teamnutrition.usda.gov/healthierUS/index.html and https://schools.healthiergeneration.org/_asset/7vp2ut/Framework_HSP_Single-Pages.pdf.

‡ Reimbursement rates for the school lunch and breakfast programs are adjusted annually to reflect changes in the Consumer Price Index (Food Away From Home series for All Urban Consumers). (Source: Federal Register. 2012. *National School Lunch, Special Milk, and School Breakfast Programs, National Average Payments/Maximum Reimbursement Rates*. U.S. Department of Agriculture, 77 (142) (July 24, 2012). http://www.fns.usda.gov/cnd/governance/notices/naps/NAPs12-13.pdf.)

§ The final rule, "Nutrition Standards in the National School Lunch and School Breakfast Programs," included new meal patterns and updated nutrient standards for lunches and breakfasts. (Source: Federal Register, 2012a, *7 CFR Parts 210 and 220, Nutrition Standards in the National School Lunch and School Breakfast Programs: Final Rule*, U.S. Department of Agriculture 77 [17], Jan. 26, 2012.)

Meeting new lunch requirements

As schools work to implement the updated USDA standards for school meals, the menu changes will require changes to other food service operations, including purchasing, receiving, and storing food, and preparing and serving meals. Each function has its own labor needs and requires equipment, as well as physical space and other infrastructure upgrades such as updated electrical, plumbing, and ventilation systems, needed to operate that equipment. The additional 6 cents per lunch under the Healthy Hunger-Free Kids Act is intended to help cover additional food costs associated with offering meals with more fruits, vegetables, and whole grains. However, the immediate challenges faced by some school food authorities involve more than just the increased cost of food.

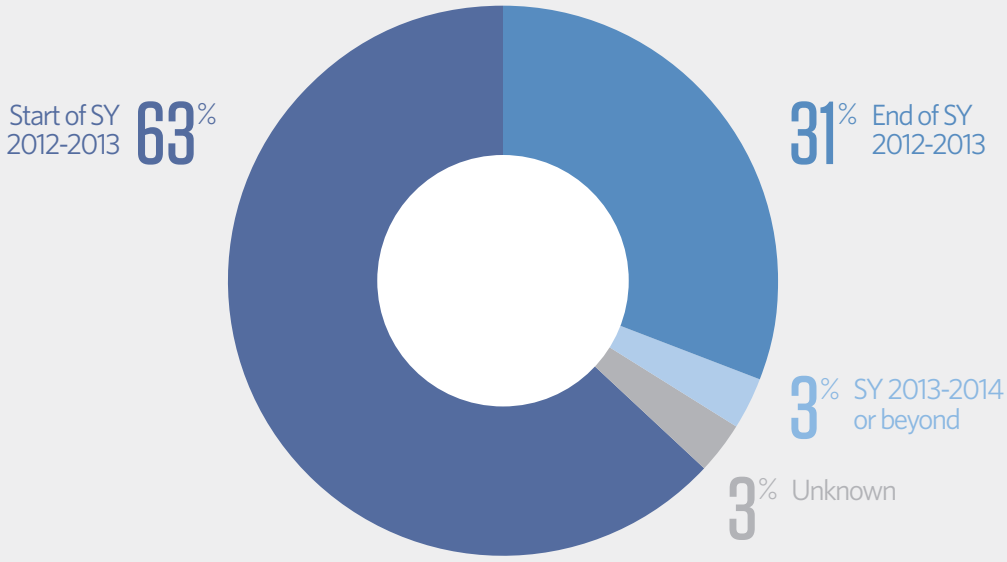
School readiness

Nearly all school food authorities (94 percent) expected to be able to meet the new lunch requirements by the end of SY 2012-13—the year that the new requirements first went into effect. (See Figure 1.) Nearly two-thirds (63 percent) expected to meet the requirements at the start of the year and another third (31 percent) expected to meet the standards by the end of the school year. Only 3 percent said they wouldn't be able to achieve this goal until SY 2013-14 or beyond. Another 3 percent did not know when they would be able to meet the new requirements.

Figure 1

Meeting the New Lunch Requirements

When school food authorities expect to be able to meet the new lunch requirements (percentage of SFAs)



Note:

The data are weighted to be representative of all school food authorities offering the National School Lunch Program.

Source: Kitchen Infrastructure and Training for Schools, 2012.

Although overall most school food authorities expected to meet the new standards by the end of SY 2012-13, readiness varied by type of SFA. (See Table 1.) Those that were most likely to expect to meet the new requirements at the start of SY 2012-13 were those that were medium, large, or very large; urban or suburban; in the mid-Atlantic region; or in districts that fall within the high poverty category. SFAs that were very small or located in rural districts, the Mountain Plains regions, or districts within the low poverty category were least likely to report that they would be ready at the start of SY 2012-13.

Characteristics of School Food Authorities

- In 53 percent of SFAs, at least 40 percent of students are approved for free or reduced-price meals.
- Half of SFAs have fewer than 1,000 enrolled students and are characterized in this report as "very small."
- Just over half of SFAs (55 percent) have one to three schools.
- About one-third (34 percent) of SFAs have four to 11 schools.
- 11 percent of SFAs have 12 or more schools.
- While large and very large districts (those with more than 10,000 students) make up just 7 percent of SFAs, they serve 55 percent of all public school students.
- More than 6 in 10 SFAs (62 percent) are in rural areas.
- Less than one-quarter (22 percent) are in suburban communities.
- 16 percent described their schools as mainly urban.

Nearly all respondents (99 percent) reported that they had begun making changes to meet the new lunch requirements by the time of the survey. (See Table 2.) Close to one-third (31 percent) began making changes before USDA proposed the regulations for new meal requirements, while 23 percent began making changes after the proposal was published in January 2011. The remaining respondents (45 percent) reported that they did not begin to make changes until after the final regulations were passed, in January 2012.

Making it work: Changing production approaches

To successfully implement the new lunch requirements, many schools planned to change their approach to meal production. Respondents were asked about four potential changes:

- Moving to a central kitchen/commissary or production kitchen(s).
- Implementing standard recipes and/or work methods.
- Moving to more cooking from scratch.
- Moving to buying ready-to-eat foods from commercial vendors.

Overall, 90 percent of SFAs had made or expected to make at least one change in production approach in an effort to meet the new meal requirements. (See Appendix Table A.3.) The vast majority of school food authorities (80 percent) reported that they had implemented or would implement standard recipes and/or work

Table 1

Can the New Lunch Requirements Be Met?

Readiness to meet the new lunch requirements by SFA characteristics and school year

Characteristic	Percentage of SFAs ready by...			
	Start of the 2012-13 school year	End of the 2012-13 school year	2013-14 school year or beyond	Unknown
All SFAs	63.0	30.7	3.1	2.6
Size (number of students)				
Very small (fewer than 1,000)	59.8*	31.8	3.7	3.7*
Small (1,000 to 2,499)	60.4	34.2	3.3	1.9
Medium (2,500 to 9,999)	69.8*	27.0*	1.8*	1.2*
Large (10,000 to 24,999)	72.1*	24.5*	2.5	0.5*
Very large (25,000 or more)	80.2*	19.3*	0.0*	0.5*
Community type				
Urban	70.5*	23.8*	3.0	2.0
Suburban	69.3*	28.2	0.8*	0.9*
Rural	59.2*	33.1*	3.9*	3.3*
Food Nutrition Service region				
Northeast	63.3	34.5	0.8*	0.8*
Mid-Atlantic	74.0*	18.8*	2.6	2.3
Southeast	61.0	32.2	4.1	2.6
Midwest	65.6	27.7	4.8	1.5
Southwest	66.6	31.9	0.7*	0.4*
Mountain Plains	52.9*	35.7*	5.5*	5.7*
Western	62.2	31.7	1.1*	4.0
Poverty level†				
Low (fewer than 40%)	59.9*	34.0*	3.8	1.9
Intermediate (40% to 60%)	62.3	31.1	3.1	2.4
High (more than 60%)	67.6*	26.3*	2.1	3.5
Number of SFAs (unweighted)	3,372			
Number of SFAs (weighted)	13,813			

Notes:

The data are weighted to be representative of all school food authorities offering the National School Lunch Program.

* Difference between the subgroup and all other SFAs is significantly different from zero at the $\alpha = .05$ level.

† Categories based on the percentage of enrolled students approved for free or reduced-price meals.

Source: Kitchen Infrastructure and Training for Schools, 2012.

Table 2

Preparing for the New Lunch Requirements

When school food authorities began making changes to prepare for the new lunch requirements

Changes made ...	Percentage of SFAs
Prior to proposed regulations (before January 2011)	30.7
When regulations were first proposed (between January 2011 and January 2012)	23.4
After final regulations were published (after January 2012)	44.7
Has not yet started to make changes	0.7
Missing	0.4
Number of SFAs (unweighted)	**3,372**
Number of SFAs (weighted)	**13,813**

Note:

The data are weighted to be representative of all school food authorities offering the National School Lunch Program.

Source: Kitchen Infrastructure and Training for Schools, 2012.

methods.* (See Figure 2.) Just over half (55 percent) had moved to or expected to move to more scratch cooking,† which could mean schools would need more equipment and space to prepare meals on-site and store fresh ingredients. Twenty-eight percent of SFAs had moved or expected to move to buying more ready-to-eat foods from vendors. Finally, very few (3 percent) expected to move to a central kitchen/commissary or production kitchen in order to meet the new meal requirements.

Among school food authorities that reported expecting to make "other" changes to their production approach, examples included using school gardens, salad bars, and locally grown produce to offer more fruits and vegetables; starting a central bakery to meet whole-grain requirements; and moving to preportioned or packaged entrees.

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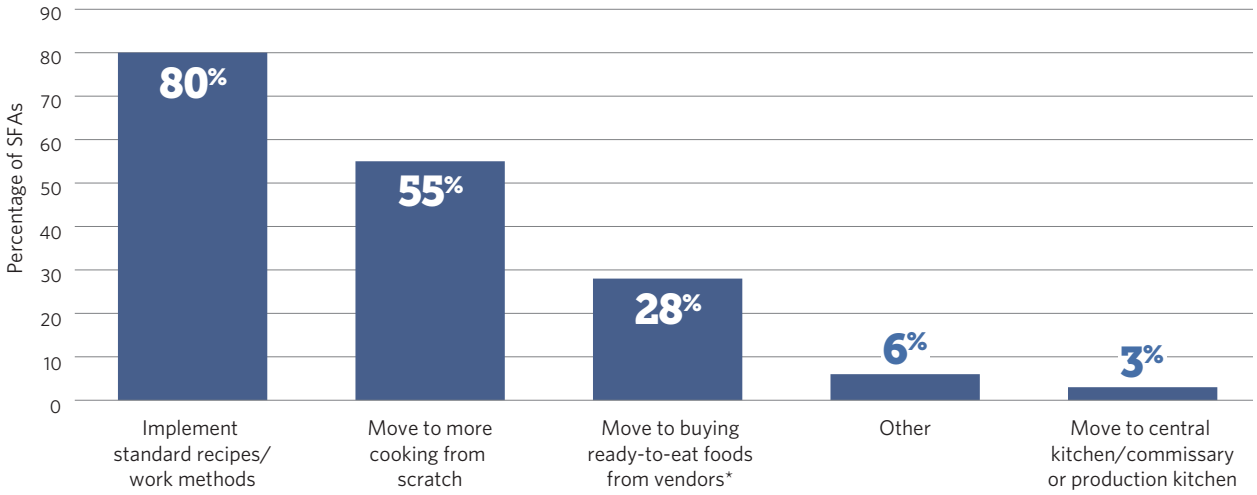
* The use of standard recipes helps control food costs, ensures consistent nutrient content per serving, and increases customer satisfaction. (Source: USDA, Food and Nutrition Service, with the National Food Service Management Institute (NFSMI). 2002. *Measuring Success With Standardized Recipes. University of Mississippi, NFSMI.* http://www.nfsmi.org/documentlibraryfiles/PDF/20090506091901.pdf. Accessed May 21, 2013.)

† Cooking from scratch permits schools to utilize more USDA Foods (formerly known as "commodity foods"), thus, lowering food costs and allows more flexibility to adjust recipes and ingredients to meet nutrient specifications and students' preferences. (Source: Kengor, K., D. Rivas, B. Trudeau, R. Lewis, L. Craven, B. Cross. 2011. "Webinar—Back to Basics: How to Incorporate Scratch Cooking Techniques into Your School Kitchen." University of Mississippi, NFSMI. http://www.nfsmi.org/documentlibraryfiles/PDF/20111130082449.pdf. Accessed May 21, 2013.)

Figure 2

Anticipating the New Lunch Requirements

School food authorities that made or expected to make changes in their production approach to meet the new meal requirements



Notes:

The data are weighted to be representative of all school food authorities offering the National School Lunch Program.

Multiple responses were allowed.

* This questionnaire item had a nonresponse rate of 6 percent.

Source: Kitchen Infrastructure and Training for Schools, 2012.

Small Districts, Big Challenges

Very small districts with fewer than 1,000 students were significantly less ready to meet the updated lunch standards by the beginning of the SY 2012-13 than were larger districts. These smaller districts make up half of SFAs nationally, yet the smaller budgets and lower staffing levels that are typical may make implementing changes more challenging. Smaller districts may be able to address the issue of scale by joining forces with other districts to increase their capacities and purchasing power.

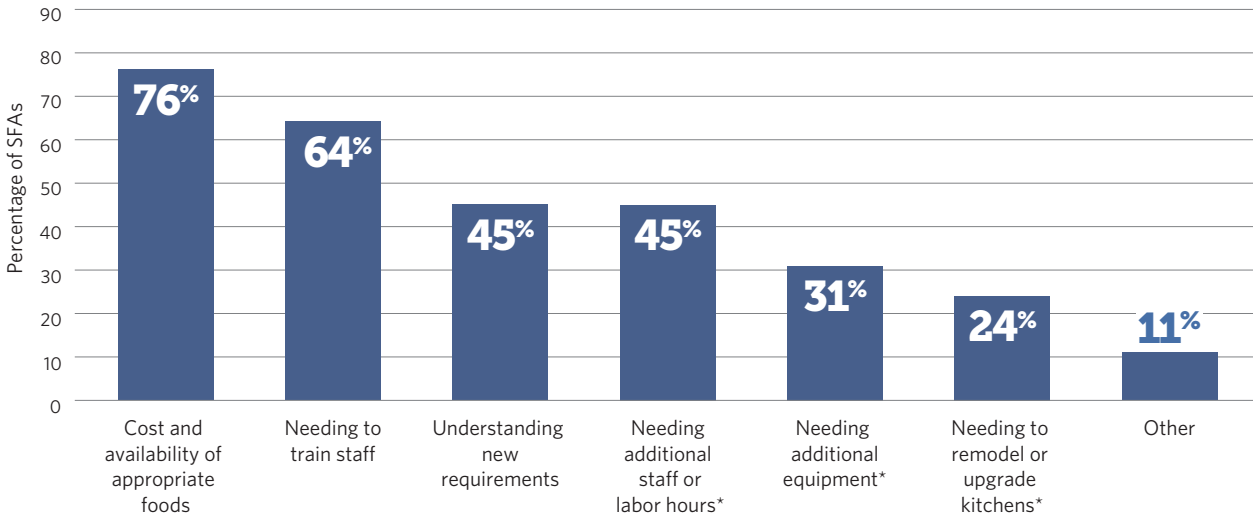
Challenges to implementation

Although most SFAs (94 percent) believed they would be able to meet the new requirements for school lunches during the initial school year (2012-13), many faced significant challenges to meeting these requirements. Ninety-one percent faced one or more barriers to reaching full implementation by the start of the 2012-13 school year. (See Appendix Table A.4.) The two most frequently reported challenges were purchasing appropriate foods—that is, the cost and availability of foods that comply with the new requirements—and the need to train staff. (See Figure 3.) Seventy-six percent and 64 percent of SFAs, respectively, reported this. Additionally, almost half identified additional staff or labor hours and an incomplete understanding of the new meal requirements as barriers (45 percent for each).

Figure 3

Perceived Barriers to Meeting the New Lunch Requirements

Challenges to fully implementing the new lunch requirements by the start of SY 2012-13



Notes:

The data are weighted to be representative of all school food authorities offering the National School Lunch Program.

Multiple responses were allowed.

* Questionnaire items had nonresponse rates between 5 and 9 percent.

Source: Kitchen Infrastructure and Training for Schools, 2012.

Other challenges to fully implementing the new lunch requirement include:

- Additional equipment needed (31 percent).
- Kitchens in need of remodeling or upgrading (24 percent).
- "Other barriers," including gaining student and parent buy-in, not having enough time to implement the requirements, and finding a way to use USDA Foods, formerly known as "commodity foods" (11 percent).

Challenges to fully implementing the new lunch requirements at the start of SY 2012-13 depended on the characteristics of the school food authorities.

Medium and large SFAs (2,500 to 9,999 and 10,000 to 24,999 students, respectively) were significantly more likely than all others to see purchasing appropriate foods (80 and 83 percent, respectively) and the need to train staff (75 and 79 percent, respectively) as challenges to implementing the new lunch requirements. (See Appendix Table A.5.)

Medium school food authorities were also more likely to report needing additional equipment (37 percent) and needing to remodel or upgrade kitchens (32 percent).

Suburban school food authorities reported the need to train staff more frequently (70 percent) than all other SFAs. This need was reported least frequently by urban SFAs (61 percent). (See Appendix Table A.6.)

SFAs in the Southeast were most likely to report needing staff training (74 percent), to understanding the new meal requirements (55 percent), additional equipment (35 percent), and upgraded or remodeled kitchens (35 percent). (See Appendix Table A.7.)

SFAs in the Northeast were more likely than all others to report purchasing appropriate foods (83 percent) and the need to train staff (70 percent) as barriers to meeting the new requirements.

The only significant variations in the types of challenges reported by SFAs for different poverty categories were the purchasing appropriate foods. Those within the low poverty category were the most likely to report this barrier, while those within the high poverty category were least likely. (See Appendix Table A.8.)

Challenges to implementing the new lunch requirements also varied for school food authorities at different stages of readiness. (See Table 3.) Understandably, those that did not expect to be ready to meet the requirements at the start of SY 2012-13 faced more challenges.

A lack of understanding of the new meal requirements was more often a difficulty for those school food authorities that did not expect to be ready any time in SY 2012-13 (65 percent) compared with 37 percent who did expect to be ready at the start of SY 2012-13 and 59 percent who expected to be ready at the end of SY 2012-13. For every other impediment, the percentages were similar across the different stages of readiness.

Purchasing foods that meet the standards and the need to train staff were perceived as challenges among large proportions of school food authorities in all readiness groups, even those who expected to be ready at the start of SY 2012-13. Regardless of when they expected to be ready, 29 to 36 percent reported needing additional equipment, and 22 to 35 percent needed to remodel or upgrade their kitchens.

Workarounds

Many of the school food authorities with inadequate equipment have found ways to make do with workarounds. Examples of workarounds include:

- Manually chopping and slicing fruits and vegetables because slicers and sectionizers* were unavailable.
- Storing fruits and vegetables in off-site locations and transporting them daily.
- Keeping fruits and vegetables in temporary storage containers such as milk crates and small coolers, or increasing the frequency of food delivery to avoid having to store fruits and vegetables.
- Preparing lunches in shifts due to inadequate preparation and/or meal service space.†

While these techniques are inventive, many of those making do with workarounds found them to be insufficient. For more than one-third of respondents, the accommodations are expensive and/or inefficient (37 and 35 percent, respectively), and 11 percent reported that they were unsustainable. (See Appendix Table A.5.) Of those SFAs that gave "other" reasons why their workarounds were inadequate, the main issue reported was space—food storage space, workspace, space for equipment such as coolers, and space to enlarge serving lines or display food. Multiple respondents also said they lacked the space to expand kitchens to address these issues.

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* Sectionizers are machines used to quickly slice high volumes of fresh fruits and vegetables.

† Questions that asked for examples of workarounds and reasons the workarounds were inadequate for meeting the lunch requirements were added to the survey approximately one-quarter of the way through the field period. Because of the late addition and because some respondents did not answer the questions, only 47 percent (weighted) of the SFAs that reported making do with a workaround provided this information.

Table 3

Perceived Barriers to Implementing the New Lunch Requirements at the Start of SY 2012–13 by SFA Readiness

Barrier	Percentage of SFAs ready by ...				
	Start of the 2012-13 school year	End of the 2012-13 school year	2013-14 school year or beyond	Unknown	Percentage of all SFAs that reported barriers
Purchasing foods to meet new meal requirements (cost and availability)	71.9	81.9	87.7	76.9	75.6
Needing to train staff	57.8	75.2	68.5	80.8	64.1
Needing additional staff or labor hours	41.1	50.0	54.2	53.6	44.6
Understanding new meal requirements*	36.8	59.4	65.0	52.5	45.2
Needing additional equipment*	28.8	35.4	35.9	19.8	30.8
Needing to remodel or upgrade kitchens*	21.6	27.9	34.6	25.8	24.1
Other	9.2	13.2	12.2	13.4	10.6
Number of SFAs (unweighted)	**2,173**	**1,002**	**97**	**82**	**3,372**
Number of SFAs (weighted)	**8,707**	**4,245**	**426**	**353**	**13,813**

Notes:

The data are weighted to be representative of all public school food authorities offering the National School Lunch Program.

Multiple responses were allowed.

Eighteen SFAs were excluded from this table because they did not provide information on readiness.

These data are for descriptive purposes. Differences between categories were not tested for statistical significance.

* Questionnaire items had nonresponse rates between 5 and 10 percent.

Source: Kitchen Infrastructure and Training for Schools, 2012.

Summary of main findings

This report presents findings about how quickly SFAs expected to meet the updated school lunch nutrition standards, including when districts began making changes relative to USDA's proposed and final rules. A second set of findings describes the challenges they face in implementing the requirements and the lengths to which schools are going to find ways to meet the new nutrition standards.

Key findings

- **Finding 1:** Ninety-four percent of school food authorities expected to be able to meet the new lunch requirements by the end of SY 2012-13, the year that the new requirements went into effect. Sixty-three percent anticipated meeting the new standards by the start of SY 2012-13.

  Overall, 90 percent had made or expected to make at least one change in production approach in an effort to meet the new meal requirements, such as using standard recipes and/or work methods, moving to more scratch cooking, and buying more ready-to-eat foods from vendors.

- **Finding 2:** Although the vast majority of school food authorities expected to meet the updated standards by the end of the school year, most—91 percent—also indicated that they faced one or more challenges to reaching full implementation.

  The two most frequently reported challenges were purchasing appropriate foods (76 percent) and the need to train staff (64 percent). Additionally, almost half identified additional staff or labor hours and an incomplete understanding of the new meal requirements as barriers. Approximately one-third needed new equipment and one-quarter needed infrastructure upgrades as barriers to meeting the new requirements.

- **Finding 3:** Most school food authorities with inadequate equipment reported "making do" with some type of workaround, such as manually chopping/slicing fruits and vegetables; storing fruits and vegetables off site and transporting them daily; and keeping fruits and vegetables in temporary storage containers, such as milk crates or small coolers. The leading reasons workarounds were considered inadequate included that they were expensive, inefficient, and/or unsustainable.

Conclusion

With the vast majority of districts expecting to meet USDA's updated lunch standards within the first year of implementation, it is evident that these standards are achievable. This conclusion is reinforced by the fact that by the end of SY 2012-13, more than 70 percent of school districts had applied for certification of their compliance with updated meal standards.[10] However, serving healthier meals does require some adaptations in food service operations that have been a challenge for many districts. Many school food authorities indicate that they could be serving healthy foods more efficiently and effectively if they had the proper equipment and infrastructure, and if their staff members were trained accordingly, making them less reliant on unsustainable workarounds. Thus, it will be important to better understand what is needed in terms of additional equipment and infrastructure upgrades, and how to ensure staff is well-trained and prepared to serve safe, healthy, and appealing meals that students across the country can enjoy. The next reports on the study will address these issues in greater detail.

Appendix A: Tables

Table A.1
Single and Combinations of Production Systems Used by School Food Authorities

Kitchen type	Number of sample SFAs (unweighted)	Number of SFAs (weighted)	Percentage of SFAs (weighted)
Full-service kitchen only	2,078	9,535	69.0
Production kitchens (with or without full-service kitchens; no central facilities)	914	2,773	20.1
Central production kitchens or commissaries* (with or without full-service and/or production kitchens)	340	1,244	9.0
Finishing or satellite kitchens only	39	260	1.9
Number of SFAs	**3,372**	**13,813**	**100**

Notes:

The data are weighted to be representative of all school food authorities offering the National School Lunch Program.

Multiple responses were allowed.

Questionnaire items had nonresponse rates between 4 and 16 percent.

* Include finishing or satellite kitchens by definition.

Source: Kitchen Infrastructure and Training for Schools, 2012.

Table A.2
Readiness to Meet the New Lunch Requirements

Ready by ...	Percentage of SFAs
Start of the 2012-13 school year	63.0
End of the 2012-13 school year	30.7
2013-14 school year or beyond	3.1
Unknown	2.6
Missing	0.6
Number of SFAs (unweighted)	**3,372**
Number of SFAs (weighted)	**13,813**

Note:

The data are weighted to be representative of all school food authorities offering the National School Lunch Program.

Source: Kitchen Infrastructure and Training for Schools, 2012.

Table A.3

Production Approach Changes SFAs Made or Expected to Make to Meet New Lunch Requirements

Production approach change	Percentage of SFAs	Percentage missing
At least one change in production approach reported	90.4	0.5*
Implement standard recipes and/or work methods	79.8	2.2
Move to more cooking from scratch	54.5	3.6
Move to buying ready-to-eat foods from vendors	27.7	6.0
Other†	5.9	58.7
Move to central kitchen/commissary or production kitchen	3.2	4.6
Number of SFAs (unweighted)	**3,372**	
Number of SFAs (weighted)	**13,813**	

Notes:

The data are weighted to be representative of all school food authorities offering the National School Lunch Program.

Multiple responses were allowed.

* Weighted percentage of SFAs that did not answer any of the questions on production approach changes.

† Other changes mentioned included using school gardens, salad bars, and locally grown produce to offer more fruits and vegetables; starting a central bakery to meet whole-grain requirements; and moving to preportioned or packaged entrees. A number of respondents indicated they were already using standard recipes and/or cooking from scratch.

Source: Kitchen Infrastructure and Training for Schools, 2012.

Table A.4

Perceived Barriers to Implementing the New Lunch Requirements at the Start of SY 2012-13

Barrier	Percentage of SFAs	Percentage missing
At least one barrier reported	91.3	0.4*
Purchasing foods to meet new meal requirements (cost and availability)	75.6	3.1
Needing to train staff	64.1	4.4
Understanding new meal requirements	45.2	5.6
Needing additional staff or labor hours	44.6	6.4
Needing additional equipment	30.8	8.7
Needing to remodel or upgrade kitchens	24.1	8.7
Other	10.6	52.0
Number of SFAs (unweighted)	**3,372**	
Number of SFAs (weighted)	**13,813**	

Notes:

The data are weighted to be representative of all school food authorities offering the National School Lunch Program.

Multiple responses were allowed.

* Weighted percentage of SFAs that did not answer any of the questions on barriers.

Source: Kitchen Infrastructure and Training for Schools, 2012.

Table A.5

Perceived Barriers to Implementing the New Lunch Requirements at the Start of SY 2012-13 by SFA Size

Barrier	Percentage of SFAs					All SFAs
	Very small (0-999 students)	Small (1,000-2,499 students)	Medium (2,500-9,999 students)	Large (10,000-24,999 students)	Very large (25,000 students and higher)	
Purchasing foods to meet new meal requirements (cost and availability)	71.8*	78.1	79.6*	82.6*	80.3	75.6
Needing to train staff	55.8*	68.9	74.7*	78.6*	71.2*	64.1
Understanding new meal requirements	43.5	47.6	46.3	48.8	43.0	45.2
Needing additional staff or labor hours	43.3	47.7	45.9	42.5	35.0*	44.6
Needing additional equipment	27.2*	32.2	36.9*	34.6	33.1	30.8
Needing to remodel or upgrade kitchens	19.4*	27.4	31.7*	22.6	27.7	24.1
Other	7.9	10.9	13.8	19.8	19.9	10.6
Missing	0.6	0.1	0.4	0.0	0.5	0.4
Number of SFAs (unweighted)	**1,021**	**681**	**1,142**	**344**	**184**	**3,372**
Number of SFAs (weighted)	**6,855**	**3,107**	**2,893**	**645**	**313**	**13,813**

Notes:

The data are weighted to be representative of all school food authorities offering the National School Lunch Program.

Multiple responses were allowed.

* Difference between the subgroup and all other SFAs is significantly different from zero at the $\alpha = .05$ level.

Source: Kitchen Infrastructure and Training for Schools, 2012.

Table A.6

Perceived Barriers to Implementing the New Lunch Requirements at the Start of SY 2012-13 by Community Type

Barrier	Percentage of SFAs				All SFAs
	Urban	Suburban	Rural	Missing	
Purchasing foods to meet new meal requirements (cost and availability)	66.9*	76.6	77.4*	77.3	75.6
Needing to train staff	60.8	70.2*	62.6	88.3	64.1
Understanding new meal requirements	40.8	47.2	45.6	52.1	45.2
Needing additional staff or labor hours	43.1	43.0	45.7	19.0	44.6
Needing additional equipment	30.6	30.1	31.2	21.9	30.8
Needing to remodel or upgrade kitchens	23.9	23.5	24.5	14.2	24.1
Other	8.9	13.9	10.0	0.0	10.6
Missing	0.1	0.5	0.5	0.0	0.4
Number of SFAs (unweighted)	**638**	**921**	**1,803**	**10**	**3,372**
Number of SFAs (weighted)	**2,181**	**3,075**	**8,507**	**50**	**13,813**

Notes:

The data are weighted to be representative of all school food authorities offering the National School Lunch Program.

Multiple responses were allowed.

* Difference between the subgroup and all other SFAs is significantly different from zero at the $\alpha = .05$ level.

Source: Kitchen Infrastructure and Training for Schools, 2012.

Table A.7

Perceived Barriers to Implementing the New Lunch Requirements at the Start of SY 2012-13 by Region

Barrier	Percentage of SFAs							All SFAs
	Northeast	Mid-Atlantic	Southeast	Midwest	South-west	Mountain Plains	Western	
Purchasing foods to meet new meal requirements (cost and availability)	82.6*	72.8	79.4	74.0	74.0	73.9	75.6	75.6
Needing to train staff	70.1*	60.8	73.8*	59.2*	60.3	63.6	68.1	64.1
Understanding new meal requirements	49.4	41.3	54.8*	40.5*	43.0	48.2	44.8	45.2
Needing additional staff or labor hours	38.5	34.4*	46.9	46.3	49.3	45.2	45.5	44.6
Needing additional equipment	28.6	24.9*	34.6*	30.3	35.3	29.8	31.6	30.8
Needing to remodel or upgrade kitchens	22.2	18.2*	34.5*	22.7	25.3	24.3	23.9	24.1
Other	13.4	11.6	11.3	11.2	6.9	10.1	10.7	10.6
Number of SFAs (unweighted)	**413**	**302**	**509**	**517**	**349**	**690**	**592**	**3,372**
Number of SFAs (weighted)	**1,572**	**1,168**	**1,232**	**3,356**	**1,975**	**2,440**	**2,071**	**13,813**

Notes:

The data are weighted to be representative of all school food authorities offering the National School Lunch Program.

Multiple responses were allowed.

* Difference between the subgroup and all other SFAs is significantly different from zero at the $\alpha = .05$ level.

Source: Kitchen Infrastructure and Training for Schools, 2012.

Table A.8

Perceived Barriers to Implementing the New Lunch Requirements at the Start of SY 2012-13 by Poverty Category*

Barrier	Percentage of SFAs			All SFAs
	Low poverty (less than 40%)	Intermediate poverty (40 to 60%)	High poverty (more than 60%)	
Purchasing foods to meet new meal requirements (cost and availability)	80.1†	77.9	67.3†	75.6
Needing to train staff	64.4	66.0	61.7	64.1
Understanding new meal requirements	48.4	42.8	43.9	45.2
Needing additional staff or labor hours	45.0	47.0	41.4	44.6
Needing additional equipment	30.0	31.8	30.8	30.8
Needing to remodel or upgrade kitchens	22.2	25.9	24.6	24.1
Other	13.1	11.2	7.0	10.6
Number of SFAs (unweighted)	**1,211**	**1,140**	**1,021**	**3,372**
Number of SFAs (weighted)	**5,087**	**4,611**	**4,116**	**13,813**

Notes:

The data are weighted to be representative of all school food authorities offering the National School Lunch Program.

Multiple responses were allowed.

* Categories based on the percentage of enrolled students approved for free or reduced-price meals.

† Difference between the subgroup and all other SFAs is significantly different from zero at the $\alpha = .05$ level.

Source: Kitchen Infrastructure and Training for Schools, 2012.

Table A.9

Reasons Workarounds Are Inadequate for Meeting the New Lunch Requirements Among SFAs That Reported "Making Do With a Workaround"

Reason	Percentage of SFAs
Expensive	36.7
Inefficient	35.1
Too labor intensive	26.7
Can't meet increasing needs	23.5
Unsustainable	11.3
Other	9.1
Missing	16.8
Number of SFAs (unweighted)	**1,124**
Number of SFAs (weighted)	**4,706**

Notes:

The data are weighted to be representative of all school food authorities offering the National School Lunch Program.

Due to the late addition of this question to the survey, the table includes only 47 percent of SFAs that reported their equipment as "Inadequate but making do with a workaround" for one or more key changes defined in the new lunch requirements.

Multiple responses were allowed.

Source: Kitchen Infrastructure and Training for Schools, 2012.

Appendix B: Characteristics of school food authorities

To provide context for the study findings, Table B.1 presents data on key characteristics of public SFAs, including size (number of students enrolled), number of schools, community type, region, and poverty category. Using data from the sample frame, SFAs were grouped into five categories based on the number of enrolled students: very small (fewer than 1,000), small (1,000 to 2,499), medium (2,500 to 9,999), large (10,000 to 24,999), and very large (25,000 or more). Half of all public SFAs have fewer than 1,000 enrolled students and can be characterized as very small. Another 44 percent are either small or medium (roughly equal proportions of each). Large and very large SFAs (10,000 or more students) are much less common, accounting for only 7 percent of all SFAs.

The size of an SFA can also be measured by the number of individual schools operating the lunch program. The smallest have one to three schools (55 percent). About one-third (34 percent) have four to 11 schools, and the remaining 11 percent have 12 or more schools.

Respondents were asked to characterize the location* of the majority of schools in their SFAs as urban, suburban, or rural. More than 6 in 10 (62 percent) reported that most of their schools are in rural areas. Less than one-quarter (22 percent) said most of their schools are in suburban communities, and 16 percent described their schools as mainly urban.

USDA's Food Nutrition Service (FNS) administers the National School Lunch Program through seven regional offices. The largest proportion of SFAs is in the Midwest region (24 percent); 14 to 18 percent are in the Southwest, Western, and Mountain Plains regions; and 8 to 9 percent are in the mid-Atlantic and Southeast regions.

To measure socioeconomic status, we used data from the sample frame on the percentage of enrolled students approved for free or reduced-price meals.† Three poverty categories were created: low (fewer than 40 percent of students approved for free or reduced-price meals), intermediate (40 to 60 percent approved for free/reduced-price meals), and high (greater than 60 percent approved for free/reduced-price meals).‡ Thirty-seven percent of all SFAs fall within the low poverty category. Another one-third fall within the intermediate poverty category, and nearly one-third (30 percent) are within the high poverty category.

Production systems used by SFAs

School food authorities may use one type of meal production system or a combination of systems to meet the needs of all their schools. The KITS survey asked about four main types of production systems (or kitchen types), defined in Table B.2.

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* To distinguish the relative urbanicity of an SFA's location based on geographic region, we refer to urban, suburban, and rural areas as "community types."

† In the NSLP and SBP, children from families with household incomes at or below 130 percent of the federal poverty threshold are eligible to receive free meals; those from households with incomes between 131 and 185 percent of the federal poverty threshold level are eligible to receive meals at a reduced price. (From July 1, 2012, to June 30, 2013, 130 percent of the poverty level was $29,965 for a family of four; 185 percent was $42,643.)

‡ Schools that serve 40 percent or more of their lunches free or at a reduced price are considered "severe need" and are eligible for a higher rate of federal reimbursement for breakfasts. (Source: U.S. Department of Agriculture, Food and Nutrition Service. 2012. "National School Lunch Program Fact Sheet." http://www.fns.usda.gov/cnd/Lunch/AboutLunch/NSLPFactSheet.pdf. Accessed May 13, 2013.)

Schools with more than 60 percent of students approved for free or reduced-price meals are reimbursed at a slightly higher rate than other SFAs (2 cents more per lunch served in SY 2012-13). (Source: U.S. Department of Agriculture, Food and Nutrition Service. 2012. "School Breakfast Program Fact Sheet." http://www.fns.usda.gov/cnd/breakfast/AboutBFast/SBPFactSheet.pdf. Accessed May 13, 2013.)

Table B.1

Characteristics of School Food Authorities

Characteristic	Number of sample SFAs (unweighted)	Number of SFAs (weighted)	Percentage of SFAs (weighted)
Size (numtber of students)			
Very small (fewer than 1,000)	1,021	6,855	49.6
Small (1,000 to 2,499)	681	3,107	22.5
Medium (2,500 to 9,999)	1,142	2,893	20.9
Large (10,000 to 24,999)	344	645	4.7
Very large (25,000 or more)	184	313	2.3
Number of schools			
1 to 3	1,074	7,601	55.0
4 to 11	1,486	4,640	33.6
12 to 24	477	887	6.5
25 to 99	294	541	3.9
100 or more	41	144	1.0
Community type			
Urban	638	2,181	15.8
Suburban	921	3,075	22.3
Rural	1,803	8,507	61.6
Missing	10	50	0.4
Food and Nutrition Service region			
Northeast	413	1,572	11.4
Mid-Atlantic	302	1,168	8.5
Southeast	509	1,232	8.9
Midwest	517	3,356	24.3
Southwest	349	1,975	14.3
Mountain Plains	690	2,440	17.7
Western	592	2,071	15.0
Poverty level (percentage of students approved for free or reduced-price meals)			
Low (fewer than 40%)	1,211	5,087	36.8
Intermediate (40% to 60%)	1,140	4,611	33.4
High (more than 60%)	1,021	4,116	29.8
Number of SFAs	**3,372**	**13,813**	**100**

Notes:

Weighted data are representative of all SFAs offering the National School Lunch Program.

Source: School Food Authority Verification Summary Report (Form FNS-742). 2010-2011.

Table B.2

Types of Production Systems Used by SFAs

Kitchen type	Percentage of SFAs	Missing
Full-service kitchens	87.8	3.9
Finishing or satellite kitchens	31.2	15.5
On-site production kitchens	22.7	11.1
Central production kitchens or commissaries	9.0	14.7
Number of SFAs (unweighted)	**3,372**	
Number of SFAs (weighted)	**13,813**	

Notes:

The data are weighted to be representative of all school food authorities offering the National School Lunch Program.

Multiple responses were allowed.

Source: Kitchen Infrastructure and Training for Schools, 2012.

- **Full-service kitchens,** which prepare and serve meals at the schools in which they are located.*
- **On-site production kitchens,** which prepare and serve meals at the schools where they are located but also send food or meals to other schools in the SFA.
- **Central production kitchens or commissaries,** which are typically stand-alone facilities that prepare food and ship it to multiple schools, either in bulk or as pre-portioned meals.
- **Finishing or satellite kitchens,** which receive food or meals from central production facilities, production kitchens, or commercial vendors. The food arrives ready to serve or requiring only minimal preparation.

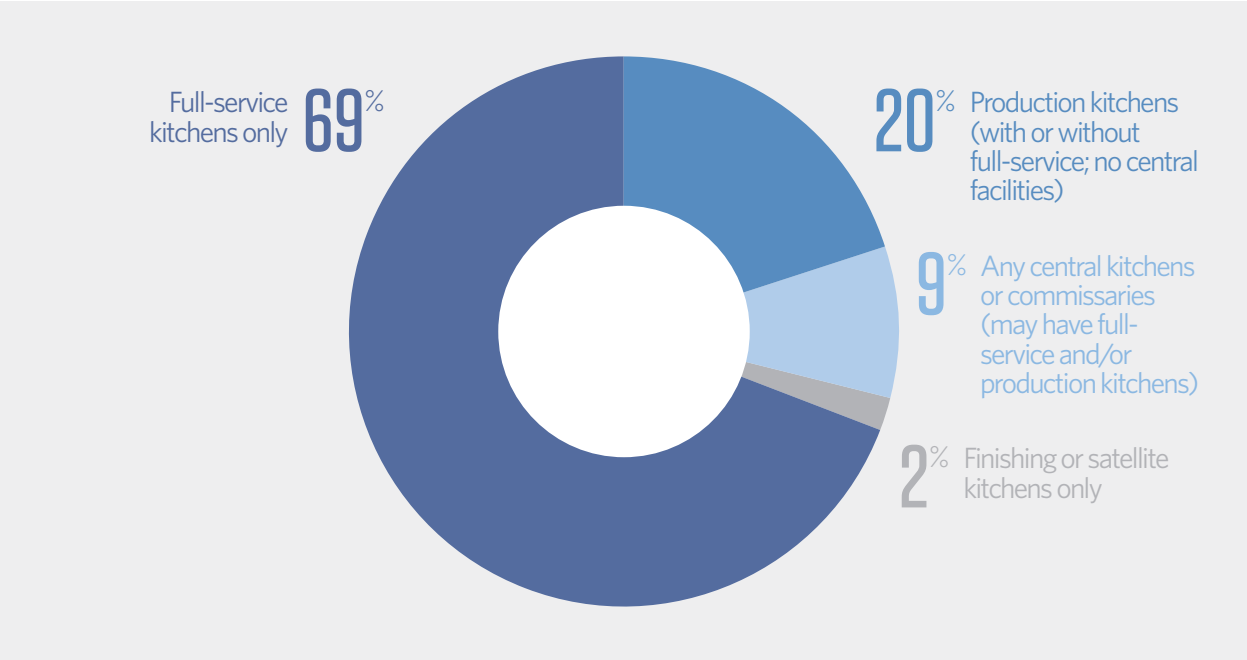
The most common production system, used in 88 percent of all SFAs, is a full-service kitchen that prepares and serves meals on site. (See Table B.2.) Nearly one-quarter (23 percent) use production kitchens that prepare meals on-site and send them to other schools. Centralized production facilities that prepare food off site and ship it to multiple schools are used in 9 percent of SFAs. Those with production kitchens or central facilities, by definition, also have finishing or satellite kitchens to receive and serve food or meals. All SFAs reported having one or more schools with some type of on-site kitchen.

Figure B.1 illustrates the combinations of production systems reported by SFAs. Sixty-nine percent use full-service kitchens exclusively and 19 percent use them in combination with at least one other production system. Some SFAs with production kitchens also use full-service kitchens but rarely have central production facilities. The

* These facilities include kitchens that prepare food items from scratch and those that mainly heat and serve food items they have purchased fully or partly prepared.

Figure B.1

Combinations of Production Systems Used by School Food Authorities



Note:

The data are weighted to be representative of all school food authorities offering the National School Lunch Program.

Source: Kitchen Infrastructure and Training for Schools, 2012.

few SFAs that reported using finishing or satellite kitchens but not central facilities or production kitchens may receive meals from outside vendors, caterers, or other SFAs. (See Table B.1.)

The type of meal-production system used by an SFA or individual school has implications for its equipment, infrastructure, and staffing requirements.[11] Differences between on-site school kitchens and central production facilities are the most notable. Therefore, respondents from SFAs with central kitchens or commissaries were asked to answer several survey questions separately for their central facilities, and these findings are discussed separately in the text.

Appendix C: Study design and methodology

This appendix describes the design and methodological processes involved in conducting the Kitchen Infrastructure and Training for Schools (KITS) study. Information is provided on questionnaire development and testing, sampling, data collection, response rates, weighting, and data analysis.

Questionnaire development and pilot testing

The questionnaire was developed collaboratively by the study teams at Mathematica Policy Research and The Pew Charitable Trusts, with assistance from a consultant, Mary Jo Tuckwell, and input from an expert panel. (See Appendix E.)

Expert panel input

Eight individuals with expertise in child nutrition and school food service served on the expert panel. The panel helped identify the key issues to be measured and determine critical survey questions, and provided feedback on the draft questionnaire. The panel members, each of whom received an honorarium for their participation, included:

Kate Adamick, chef and co-founder of Cook for America®

Pamela Lambert, director of student nutrition services for Escondido (CA) Union High School District

Dr. Robert Lewis, director of nutrition services for El Monte (CA) City School District

Steven W. Marshall, president of the Marshall Associates, Inc., a company specializing in food service design

Jean Ronnei, director of nutrition and custodial services for Saint Paul (MN) Public Schools

Dr. Keith Rushing, research scientist for the National Food Service Management Institute at the University of Southern Mississippi

Margie Seidel, vice president of nutrition and sustainability at Chartwells School Dining Services

Donna West, child nutrition manager, Brownwood (Scottsboro, AL) Elementary School

In early April 2012, the expert panel met via webinar with Mathematica project staff and representatives from Pew and the Robert Wood Johnson Foundation. The panel discussed the proposed framework for the study, the main topics to be covered, and potential groupings of questions. At this point, project staff and Tuckwell drafted the questionnaire. After the draft was completed, panel members reviewed the questionnaire and participated in another webinar in early May 2012 to provide more feedback. The resulting survey covered four main areas, each focused on SFAs' perceptions of their needs relative to meeting the new meal requirements for school lunches: (1) readiness and perceived barriers to full implementation, (2) adequacy of existing kitchen equipment and need for new equipment, (3) needed changes or upgrades in kitchen infrastructure, and (4) staff training needs.

Pilot testing

The draft questionnaire underwent two rounds of pilot testing. For the first round, respondents completed a paper copy of the draft questionnaire. Respondents generally provided positive feedback on the questionnaire design and topics covered. However, because the administration times were longer than anticipated, the survey was revised and shortened. The second draft of the questionnaire was then pilot-tested, and this version averaged 20 minutes to complete. Pew approved the final version of the survey in early June 2012.

The KITS survey was designed to be self-administered and completed online. Programming for the web-based

questionnaire began in June and internal testing was completed in early August 2012. The questionnaire was finalized and released online by mid-August 2012.

Overview of study design

The KITS study was designed to provide national and state estimates, allowing it to develop and disseminate individual state profiles in addition to the national report. To produce reliable estimates from the survey data at both levels, it was necessary to draw a sufficiently large initial sample of SFAs and meet target completion rates within each state. Because not all SFAs that were selected to participate were eligible for the study or completed a survey, sampling weights were applied so that the study findings would be representative of SFAs across the nation and within states.

To accomplish the goals of the KITS sample design, maximize response rates, and increase the likelihood of meeting sample size requirements for reliable estimates, a stratified random sampling approach was employed, target completion rates for each state were set, the initial sample was augmented with a second sample release, and the data collection period was extended by two weeks. These strategies are summarized below and discussed in the sample design, response rates, and weighting sections that follow.

The sampling frame was all public SFAs in the 50 states and District of Columbia participating in the National School Lunch Program in school year 2010–2011. To select the sample, the SFAs within each state were divided into one to four strata based on size (number of schools). Mathematica statisticians then determined the target number of completed questionnaires required in each state to obtain the desired precision level for survey estimates.* To avoid releasing a larger initial sample than might be needed, the number of SFAs selected across the size strata for each state was based on a completion rate of 75 percent. After tracking the response rates in each state over several months of data collection, an additional sample of SFAs was selected based on the number of completed surveys needed in states where the targets had not yet been met.

The final KITS national sample was defined as the 3,372 eligible SFAs that completed questionnaires as of Nov. 20, 2012. Although this sample size was more than adequate for national estimates, the field period was kept open longer because a few states had not met their sample size requirements. By Dec. 7, 2012, all states had reached the targeted number of completes needed for the state and CA regional analyses. The final weighted response rate for the national sample was 54.3 percent. (SeeTable C.1.)† More details on the national sample and the state sample sizes and response rates are provided in Tables C.2 through C.4.

Mathematica's statisticians computed sampling weights to make the samples of respondents more representative of the target populations: all public SFAs and SFAs in each state. Applying weights to the data helps to reduce the potential for bias that sometimes occurs when subgroups of SFAs (such as those of different sizes) are over- or undersampled relative to their actual population proportion, or when sample members do not respond to the survey. An analysis determined whether characteristics associated with non-response were also related to survey responses, and the weights were adjusted accordingly. The final weights used for analysis accounted for unequal selection probabilities, the two rounds of sample release, and potential nonresponse bias.

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* It was not necessary to establish a separate target completion rate for the national sample because the sum of the state-level targets was larger than that needed to provide precise national estimates. In some of the smaller states, it was necessary to include all SFAs in the sample.

† Unweighted response rates measure the proportion of the sample that resulted in useable information for analysis and are useful in gauging the results of the interviewing effort. Weighted response rates, on the other hand, are used to estimate a survey's sample coverage (the proportion of the population covered by the responding sample).

Table C.1

Sample Sizes and Response Rates for KITS National Report

	Number of sample SFAs released	Number of sample SFAs eligible	Number of sample SFAs completed	Response rates (%)	
				Unweighted	Weighted
KITS national sample	5,999	3,825	3,372	57.1	54.3

Source: Kitchen Infrastructure and Training for Schools, 2012

Sample design

KITS was designed to be representative of public SFAs at the national and state levels. The target population for the KITS study included public SFAs in all 50 states and the District of Columbia. The sampling frame was a file of all public SFAs participating in the National School Lunch Program derived from the school year 2010–2011 School Food Authority Verification Summary Report (Form FNS-742). There were 14,837 public SFAs included in the sample frame.

Stratification

This study employed a stratified random sampling approach. SFAs with equal probability within strata (or levels), defined based on geography and size, were selected. The first level of stratification was the state. Within a state, we defined up to four strata, including: (1) first-level certainty (*1-cert*), (2) second-level certainty (*2-cert*),* and either (3) large and small,† or (4) non-certainty (*noncert*). The noncert stratum combined SFAs that would have fallen into the large and small stratum, except that the number of SFAs allocated to the large and small stratum would have been fewer than nine. Overall, 161 sampling strata were formed nationwide.

Sample allocation and selection

To allocate the sample across the states, the study team first determined the target number of completed questionnaires—that is, the number needed in each state to obtain a 10 percent margin of error at the 95 percent confidence level for estimates presented in the reports.‡ The state-specific targets were based on a reasonable assumption of the design effects. The total sample size to be selected for a state was calculated by dividing the target number of completes by a conservative completion rate (50 percent). This state-level sample size was allocated to strata in that state/region such that: (1) all SFAs in the 1-cert and 2-cert strata were included, and (2) the remaining sample was allocated to the other strata (large and small, noncertainty) in proportion to its share

* The first-level certainty stratum included SFAs with an MOS large enough that, if we were using probability proportional to size (PPS) sampling, would be certain to be sampled given a sample size and release based on the most optimistic assumptions about response rates. The second-level certainty stratum included those that would be selected with certainty using PPS sampling if all reserve sample was released.

† The large and small stratum was defined based on the MOS. The definition varied from state to state.

‡ Alternatively, this can be stated as a two-sided 95 percent confidence interval of plus or minus 10 percentage points.

Table C.2

Sample Sizes and Response Rates for National Report

(a) Released for contact	(b) Eligibility status determined	(c) Eligible	(d) Completed survey	Eligibility determination rate (%) (EDR = b/a)	Completion rate (%) (CR = d/c)	Response rate (%) (EDR*CR)
Unweighted national response rate						
5,999	3,825	3,763	3,372	63.8	89.6	57.1
Weighted national response rate						
14,816	8,953	8,778	7,885	60.4	89.8	54.3

Source: Kitchen Infrastructure and Training for Schools, 2012.

of the total measure of size (MOS)* for the state. Seven of the smaller states had only one stratum (1-cert); thus, all public SFAs in those states were included in the sample.

To ensure that the sampling process was as efficient as possible, the total sample size for each state was adjusted using a less conservative completion rate. Thus, the initial sample sizes were calculated by dividing the target number of completes by a completion rate of 75 percent. Then, the state-level sample size was distributed across each stratum within that state such that SFAs in the 1-cert stratum were all released, and the remaining sample size was allocated in proportion to the initial sample sizes of other strata. Using this approach, the total size of the initial sample release (release 1) across all states was set at 4,635 SFAs. SFAs were randomly sampled from the total sample to be part of this first release for obtaining contact information and data collection. Those SFAs were flagged as "main" sample, while the SFAs not sampled for the first release were flagged as the "alternate" sample.

About halfway through the data collection period, after tracking response rates in each state, additional sample was released in states at risk of not meeting (or coming close to) their targets. Alternates were selected randomly within each stratum to meet the target number of completes in each state.† A total of 1,364 additional SFAs from the alternate sample were included in the second sample release (release 2). The total sample size across all states and the two sample releases was 5,999 SFAs.

* In most instances, we used the number of schools provided in the FNS-742 file as the MOS. However, we found that some of the data were not reasonable. For example, for some SFAs, the number of students per school was 1. Therefore, we either obtained a MOS from the National Center for Education Statistics (NCES) 2009-2010 Common Core of Data (CCD), or imputed the MOS, for 51 SFAs where the number of students per school was considered too small (less than 11) and for 63 SFAs where the ratio of students per school was considered too large (greater than 1,600).

† This was done by (1) assigning a random number to each alternate, uniformly between 0 and 1; (2) sorting the SFAs in each stratum by those random numbers, from smallest to largest; and (3) releasing SFAs in order starting from the one with the smallest number until we obtained the desired size of the release (number of SFAs) in that stratum.

Table C.3

Unweighted Sample Sizes and Response Rates by State

State	(a) Released for contact	(b) Eligibility status determined	(c) Eligible	(d) Completed survey	Eligibility determination rate (%) (EDR = b/a)	Completion rate (%) (CR = d/c)	Response rate (%) (EDR*CR)
AK	61	47	43	40	77.0	93.0	71.7
AL	105	59	58	52	56.2	89.7	50.4
AR	131	75	75	66	57.3	88.0	50.4
AZ	157	96	95	83	61.1	87.4	53.4
CA	391	276	265	238	70.6	89.8	63.4
CO	106	75	74	71	70.8	95.9	67.9
CT	107	73	73	67	68.2	91.8	62.6
DC	49	34	30	26	69.4	86.7	60.1
DE	30	24	24	20	80.0	83.3	66.7
FL	93	70	69	69	75.3	100.0	75.3
GA	112	73	73	68	65.2	93.2	60.7
HI	26	25	22	19	96.2	86.4	83.0
IA	142	94	94	90	66.2	95.7	63.4
ID	98	76	75	64	77.6	85.3	66.2
IL	192	118	116	100	61.5	86.2	53.0
IN	124	84	81	75	67.7	92.6	62.7
KS	115	83	83	75	72.2	90.4	65.2
KY	121	81	81	71	66.9	87.7	58.7
LA	88	56	56	52	63.6	92.9	59.1
MA	162	105	105	91	64.8	86.7	56.2
MD	26	21	20	18	80.8	90.0	72.7
ME	122	78	73	66	63.9	90.4	57.8
MI	177	98	97	86	55.4	88.7	49.1
MN	153	102	101	89	66.7	88.1	58.7
MO	145	92	92	88	63.4	95.7	60.7
MS	105	72	71	71	68.6	100.0	68.6
MT	117	90	90	80	76.9	88.9	68.4
NC	108	76	75	67	70.4	89.3	62.9
ND	133	84	83	60	63.2	72.3	45.7
NE	101	86	86	82	85.1	95.3	81.2
NH	87	49	49	41	56.3	83.7	47.1
NJ	180	102	100	75	56.7	75.0	42.5
NM	100	65	64	60	65.0	93.8	60.9
NV	28	23	23	19	82.1	82.6	67.9
NY	171	89	89	81	52.0	91.0	47.4
OH	173	103	102	95	59.5	93.1	55.5
OK	167	98	97	83	58.7	85.6	50.2
OR	138	79	79	63	57.2	79.7	45.7
PA	169	95	95	82	56.2	86.3	48.5
RI	44	30	29	22	68.2	75.9	51.7
SC	86	55	51	51	64.0	100.0	64.0
SD	117	83	82	71	70.9	86.6	61.4
TN	83	67	67	67	80.7	100.0	80.7
TX	157	103	103	92	65.6	89.3	58.6
UT	75	57	55	49	76.0	89.1	67.7
VA	97	68	68	61	70.1	89.7	62.9
VT	134	72	68	65	53.7	95.6	51.4
WA	152	95	95	80	62.5	84.2	52.6
WI	141	92	92	88	65.2	95.7	62.4
WV	56	42	41	39	75.0	95.1	71.3
WY	47	33	33	31	70.2	93.9	66.0

Source: Kitchen Infrastructure and Training for Schools, 2012.

Table C.4

Weighted Sample Sizes and Response Rates by State

State	(a) Released for contact	(b) Eligibility status determined	(c) Weighted eligible	(d) Weighted completed survey	Weighted eligibility determination rate (%) (EDR = b/a)	Weighted completion rate (%) (CR = d/c)	Weighted response rate (%) (EDR*CR)
AK	61	47	43	40	77.0	93.0	71.7
AL	132	72	70	63	54.7	90.5	49.5
AR	252	134	134	118	53.0	88.0	46.7
AZ	369	216	209	181	58.5	86.2	50.4
CA	1,005	682	652	603	67.9	92.5	62.8
CO	181	119	118	115	65.7	97.5	64.0
CT	163	109	109	103	66.5	94.5	62.9
DC	49	34	30	26	69.4	86.7	60.1
DE	30	24	24	20	80.0	83.3	66.7
FL	141	100	96	96	70.9	100.0	70.9
GA	218	122	122	107	55.9	87.8	49.1
HI	26	25	22	19	96.2	86.4	83.0
IA	368	239	239	225	64.9	94.2	61.1
ID	126	98	96	82	77.8	85.4	66.4
IL	851	554	534	453	65.0	84.8	55.2
IN	334	220	197	180	65.9	91.6	60.4
KS	286	205	205	185	71.9	90.3	64.9
KY	174	113	113	97	65.1	85.4	55.6
LA	88	56	56	52	63.6	92.9	59.1
MA	367	245	245	213	66.6	86.9	57.9
MD	26	21	20	18	80.8	90.0	72.7
ME	172	105	96	85	60.9	88.6	54.0
MI	720	349	338	318	48.4	94.1	45.6
MN	475	309	302	265	65.1	87.8	57.1
MO	590	329	329	313	55.7	95.3	53.1
MS	154	103	100	100	66.9	100.0	66.9
MT	222	169	169	149	75.9	88.4	67.2
NC	158	103	101	91	65.2	90.7	59.2
ND	176	111	109	78	62.7	71.5	44.8
NE	247	206	206	194	83.3	94.6	78.8
NH	87	49	49	41	56.3	83.7	47.1
NJ	562	282	265	195	50.2	73.6	36.9
NM	120	77	75	70	64.2	92.3	59.3
NV	28	23	23	19	82.1	82.6	67.9
NY	700	319	319	298	45.6	93.5	42.6
OH	928	522	511	490	56.2	95.9	53.9
OK	541	295	292	244	54.5	83.6	45.6
OR	190	112	112	92	58.8	82.2	48.4
PA	624	353	353	294	56.6	83.3	47.1
RI	44	30	29	22	68.2	75.9	51.7
SC	86	55	51	51	64.0	100.0	64.0
SD	178	120	119	103	67.4	86.5	58.3
TN	143	121	121	121	84.8	100.0	84.8
TX	1,177	771	771	681	65.5	88.3	57.9
UT	79	60	58	52	76.3	89.0	67.9
VA	138	89	89	80	64.6	89.2	57.6
VT	203	109	103	99	53.8	96.2	51.7
WA	285	193	193	172	67.7	89.2	60.3
WI	437	280	280	263	64.0	93.9	60.1
WV	56	42	41	39	75.0	95.1	71.3
WY	47	33	33	31	70.2	93.9	66.0

Source: Kitchen Infrastructure and Training for Schools, 2012.

Data collection

Several advance activities were conducted to notify FNS's regional offices about the study, engage state child nutrition, or CN, directors, and gain access to SFA directors. In May 2012, project staff emailed regional office liaisons to introduce the study and request their support for gathering SFA directors' contact information from state CN directors. One week later, emails were sent to the state CN directors to introduce the study, request contact information for the sampled SFAs in their state, and ask that they inform these SFAs about the study and encourage them to participate.

Reminder emails were sent to nonresponding CN directors at the end of May 2012, and SFA contact information was received from all 50 states and the District of Columbia by August. Project staff reviewed and edited contact information as needed, and noted SFA closures, merges, and other anomalies to prepare a complete sample contact list to use for the initial mailing to SFAs. Twenty-one SFAs that had closed or merged were replaced with SFAs from the alternate sample.

Data for the KITS study were collected between August and December 2012 (total of 17 weeks). The initial survey materials were mailed to SFA directors (or another staff member who had primary responsibility for making decisions about the types of equipment and training needed to implement the new meal requirements). The mailing included a letter inviting the SFA director to participate in the study, a colorful flyer with the Web address and instructions for accessing the online questionnaire, a study fact sheet, and an endorsement letter from the School Nutrition Association.

Both email and telephone reminders were used to encourage participation and maximize response rates. Up to eight email reminders, each containing a link to the online survey, were sent weekly to nonrespondents after the initial mailing. Potential respondents had been identified by CN directors using state databases that did not always have the most up-to-date contact information, therefore, telephone follow up was needed. Several rounds of follow-up calls were made to nonresponding SFAs by trained telephone interviewers, both to identify the most appropriate respondent and to obtain or verify email addresses. Because the questionnaire was designed for self-administration, telephone interviewers first encouraged respondents to complete it online rather than over the telephone. However, if a respondent requested or if it appeared that telephone administration was necessary to ensure completion, telephone interviewers used this mode. A total of 133 questionnaires (4 percent of responses) were completed over the telephone.

To keep to the schedule for the KITS national report, and because the sample size was more than adequate to produce national estimates, the final national sample was defined as the 3,372 eligible* SFAs that completed questionnaires as of Nov. 20, 2012. We extended the field period by about two weeks because a few states had not met their sample size targets. As state targets were met, email reminders were stopped and telephone interviewers ceased calls to SFAs in those states. By Dec. 7, 2012, all states had reached the targeted number of completes needed for state analysis. Questionnaires completed by an additional 87 SFAs between Nov. 21 and Dec. 7, 2012, were included in their respective state samples.†

* A sampled SFA was eligible for the study if it (1) had a food service operation, (2) participated in the NSLP in SY 2012-2013, (3) had at least one public school, and (4) was *not a stand-alone Pre-Kindergarten or Head Start program; a jail, prison, or juvenile detention center; or merged with another SFA.*

† The additional two weeks of data collection yielded completed surveys from 1 to 13 SFAs across 35 states; these cases would have had little effect on the national estimates if they were included in the national sample.

Response rates

Two sets of response rates (unweighted and weighted) were computed for the KITS study:

- Response rates for the national sample of 3,372 SFAs (data presented in this report)
- Response rates for each of the 50 states and the District of Columbia

To compute the response rates, we defined four terms.

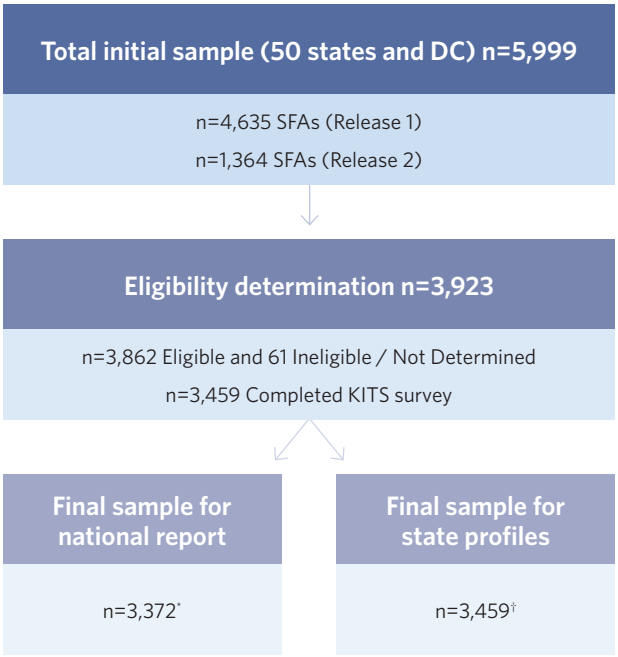
1. Total number of sample SFAs released
2. Number for which eligibility was determined
3. Number found to be eligible to complete the survey
4. Number of eligible SFAs that completed the survey

By the end of the data-collection period (Dec. 7, 2012), we had released 5,999 SFAs. Among them, 3,923 had their eligibility status determined. Of the 3,923 SFAs for which we determined eligibility status, 3,862 were eligible for the study, and 3,459 completed the survey. For the national sample (as of Nov. 20, 2012), 3,372 of the 3,862 eligible SFAs completed the survey.

Figure C.1 summarizes sample selection, eligibility determination, and final samples available for the national and state reports.

Figure C.1

KITS Sample Sizes for National Report and State Profiles (Unweighted)



Notes:

* Completed KITS survey by Nov. 20, 2012

† Completed KITS survey by Dec. 7, 2012.

Source: Kitchen Infrastructure and Training for Schools, 2012.

The unweighted response rate (for the nation or any state) was defined as the product of the eligibility determination rate (b/a) and the completion rate (d/c):

$$\text{Unweighted Response Rate} = \text{Eligibility Determination Rate} \times \text{Completion Rate} = \frac{b}{a} \times \frac{d}{c} .$$

The final unweighted response rate for the national sample was 57.1 percent. (See Table C.2.) The unweighted response rates for each state were computed similarly and ranged from 42.5 to 83.0 percent. (See Table C.3.)

The weighted response rates were calculated by using the numbers of SFAs defined in (a), (b), (c), and (d) above and unadjusted sampling weights (the inverse of the probability of selection, as discussed in the next section).

$$\text{Weighted Response Rate} = \frac{\text{Weighted } b}{\text{Weighted } a} \times \frac{\text{Weighted } d}{\text{Weighted } c} .$$

The final weighted response rate for the national sample was 54.3 percent. The weighted response rates for the states ranged from 36.9 to 83.0 percent and are reported in Table C.4.

Data cleaning and coding

Data were cleaned to check for out-of-range values, valid identification numbers, duplicate entries, and inconsistent responses within questionnaire. For example, in answering the equipment questions some respondents said they needed a certain type of equipment but then typed "0" as the number of pieces needed. In this case, the cleaning rule resulted in recoding the "yes" response to a "no," assuming that the zero was correct and the respondent did not need that particular piece of equipment. Trained staff coded open-ended responses. Project staff reviewed coded responses for accuracy.

Data analysis

Sampling weights were used to adjust all estimates for unequal selection probabilities and nonresponse associated with known characteristics of the SFAs. Thus, the data presented in this report can be generalized to all public SFAs. Likewise, the KITS data for individual states (reported separately) can be generalized to all public SFAs in those states and regions, respectively.

Descriptive analyses of all data collected in the KITS survey were conducted. The focus was on the proportions of SFAs that reported their perceived readiness for and barriers to meeting the new lunch requirements, need to replace or add new equipment or upgrade kitchen infrastructures, and need to train staff. Analyses of the estimated costs of reported equipment needs included tabulations of total costs; the median, range, and distribution of costs per SFA; and the distribution and mean costs per school. Data on distributions of SFA characteristics from the sample frame were also tabulated.

Subgroup analysis

Key findings were examined for statistically significant differences among subgroups of SFAs defined as follows:

- **SFA size.** SFAs were grouped into five categories based on data from the FNS-742 file on the number of enrolled students: very small (fewer than 1,000), small (1,000 to 2,499), medium (2,500 to 9,999), large (10,000 to 24,999), and very large (25,000 or more).
- **Community type.** Survey respondents were asked to characterize the location of "the majority of schools" in their SFAs as urban, suburban, or rural.

- **FNS region.** FNS administers the National School Lunch Program through seven regions across the United States: Northeast, Mid-Atlantic, Southeast, Midwest, Southwest, Mountain Plains, and Western region. SFAs were grouped accordingly.
- **Poverty category.** SFAs were categorized into three groups based on data from the FNS-742 on the percentage of enrolled students approved for free or reduced-price meals:* low (less than 40 percent approved for free/reduced-price meals), intermediate (40 to 60 percent approved for free/reduced-price meals), and high (greater than 60 percent approved for free/reduced-price meals).

We used *t* tests to determine whether there were statistically significant differences in estimates within subgroups of SFAs. Each group of SFAs was compared with all other SFAs combined. For example, SFAs within the high poverty category were compared with low and intermediate poverty SFAs combined.† Differences were considered statistically significant at the $\alpha = .05$ level.

All statistical procedures were conducted using Stata Statistical Software (Release 12, StataCorp LP, College Station, TX, 2011). In estimating the standard errors of the estimates for subgroups, we accounted for the complex sample design (stratification), the use of sampling weights, and the finite population correction factor, or FPC. We applied the FPC to account for the fact that a large proportion of the target population was sampled (to allow for representative estimates in individual states). Standard errors were computed by taking a weighted sum of the variances from each sampling stratum.

Estimating equipment costs

To estimate the costs associated with SFAs' reported equipment needs, survey data on the types and amounts of equipment needed was linked to estimated unit costs. Respondents were presented with lists of equipment (49 items for school kitchens and 27 items for central production kitchens) but the survey did not disclose estimated unit costs. The unit cost estimates were compiled using AutoQuotes, a proprietary database commonly used in the food service industry for pricing equipment and supplies.‡ Estimated unit costs were based on national averages. Estimates were derived by reducing manufacturers' list prices by the standard dealer discount to generate a dealer net cost, then adding estimated costs for the following routine additional expenses: over-the-road freight, delivery, unpacking and installation, sales tax, and overhead and profit for a food service equipment dealer. After the original estimates were generated, unit costs were independently reviewed by external industry consultants.

Two types of missing data on SFAs' reported equipment needs were encountered: some respondents reported that they needed a specific type of equipment but did not report the number of pieces needed, and some respondents did not answer one or more questions about whether a specific piece of equipment was needed. In computing estimates of total equipment costs at the national, state, and SFA levels, modeling was used to impute the value of an equipment need for SFAs that reported needing equipment but did not quantify this need for one or more types of equipment. The modeling was done within state, by specific piece of equipment, using SFA size

* In the NSLP and School Breakfast Program, children from families with household incomes at or below 130 percent of the federal poverty threshold are eligible to receive free meals; those from households with incomes between 131 and 185 percent of the federal poverty level are eligible to receive meals at a reduced price.

† Similarly, for the individual state reports, the state was compared with all other states combined.

‡ Information about AutoQuotes is available at: http://www.aqnet.com/community.html. The database is used by food service consulting firms, equipment dealers, manufacturing firms, and equipment manufacturers' representatives throughout the United States and the world. AutoQuotes is updated in real time so it included the latest models and pricing of food service equipment as of November 1, 2012.

(number of schools and number of enrolled students) as the predictors. For the national sample, equipment costs were imputed in this way for one or more pieces of equipment needed by 990 SFAs (29 percent). Approximately two-thirds of these SFAs (64 percent) had equipment costs imputed for no more than three pieces of equipment.

In developing national- and state-level estimates of total equipment costs, an estimation procedure was used to adjust for SFAs that did not respond to one or more questions about whether a specific piece of equipment was needed, including 21 that did not answer any questions on equipment needs. In these cases, we estimated total costs for each piece of equipment based on the weighted mean costs among SFAs that responded to the question (including zero dollars for SFAs that reported that they did not need the specific piece of equipment) and then multiplied this mean by the estimated number of public SFAs in the national or state population.

For all other estimates of equipment costs, such as estimated total costs per SFA and mean costs per school, missing responses on whether a specific piece of equipment is needed were treated as a "no" (zero dollars). Thus, estimated equipment costs per SFA and per school should be considered slight underestimates of true costs. The 21 SFAs that did not answer any questions on equipment needs, three that reported needing only "other" equipment for which no unit cost was available, and one determined to be an outlier were excluded from these estimates.

For all estimates of equipment costs presented in this report, zeros were included for 317 SFAs (12 percent) that answered at least one question about specific equipment needs but did not provide a "yes" response to any questions on specific pieces of equipment needed.

Appendix D: Strengths and limitations of the study

In drawing conclusions from the study, both its strengths and limitations should be considered. The major strengths of this study lie in its large representative sample of SFAs, the techniques the study team employed to create a robust survey, and the timeliness of the findings. The study was designed to be representative of public SFAs at both the national and state levels. The state-level samples allowed the study to develop and disseminate individual state profiles. Efforts were made during data collection to ensure that the targeted number of SFA directors (or their designees) responded from all 50 states and the District of Columbia. Although the overall response rate for the national sample was 54 percent (57 percent unweighted), the sample was weighted to make it characteristic of the full population and to account for potential non-response bias associated with known characteristics of the SFAs. The weighted estimates presented in this report can thus be generalized to all public SFAs.* The sample was larger than needed to provide precise national estimates.

The survey was developed with the assistance of a consultant who provided important substantive expertise. She is a former SFA director, was a member of the Institute of Medicine committee that developed recommendations for the new meal patterns and nutrient standards, and consults with SFAs across the country on creating action plans to enhance the nutritional quality of school meals as well as meet operational goals. In addition, the study team assembled an eight-person panel with expertise in child nutrition and school food service to help define the essential equipment, infrastructure, and types of staff training that SFAs might need to meet the new meal requirements and to frame the questions appropriately. Two versions of the questionnaire were pilot-tested with SFA directors to help ensure that the questions were clear and that the survey would not be overly burdensome to complete.

The relevance and timeliness of the findings are also strengths of the study. It provides policymakers, school food service operators, and other stakeholders with concrete feedback on SFAs' experiences implementing the new meal requirements at the time initial changes were being made. Information about SFAs' needs for equipment, infrastructure, and training is directly relevant to current and future endeavors to identify additional funding for the SFAs and schools that most need it. Moreover, the study makes a unique contribution to our understanding of SFAs' needs as they implement the new requirements so that USDA, Congress, and others can address them.

One limitation of the study is that findings related to equipment needs are based on respondents' perceptions and projected average costs, rather than a standardized needs assessment. The questionnaire asked respondents to review a list of equipment and to indicate the items needed as well as their "best estimates" of the number of pieces needed across all kitchens in their SFA. Some SFAs may have over- or underestimated their actual needs. In addition, because the equipment list did not include detailed specifications (such as size or capacity), and because costs vary due to factors such as state taxes, delivery costs, and discounts, professional judgment was used to determine representative costs. Although it is difficult to predict the direction of any resulting bias in the cost estimates, the estimates could be high if, despite instructions to the contrary, SFAs identified some equipment that "would be nice to have" but was not essential to meeting the new meal requirements.

A second limitation relates to the timing of the data collection period. The survey was fielded shortly after the start of SY 2012–2013, when the new requirements for school lunches first went into effect. This was an extremely busy time for SFA directors and, to avoid the added burden of completing a survey, some directors might have delegated the survey to less-knowledgeable staff. This could explain, in part, the relatively large proportion of respondents who did not identify themselves as SFA directors (about 30 percent) and some of the

* Assumes that the weights corrected for potential bias and the survey data provided unbiased estimates.

"don't know" responses to questions about equipment and training budgets and missing data on infrastructure needs. On the other hand, the subject matter of the survey might have been perceived as particularly salient to SFA directors once they had begun to implement the new requirements; the timing of the study could have led to a higher response rate than might have been realized if the survey had been fielded earlier.

Nearly all SFAs had started making changes to meet the new meal requirements by the time they completed the survey. However, there was a great deal of variability on when SFAs started to make these changes. More than half of all SFAs (54 percent) began making changes prior to January 2012 when the final rule was published. Respondents from these SFAs may have been in a better position to assess their equipment, infrastructure, and training needs than those that made changes after the final rule was published or at the start of SY 2012–2013. If the study is replicated at a later time, results may differ from those reported here because SFAs will be further along in implementing changes to meet the requirements.

Appendix E: KITS questionnaire

Mathematica Policy Research

Kitchen Characteristics

1. Please indicate the number of schools (by level and total) served by your school nutrition program. Please use the same definitions for level of school as registered with the State Child Nutrition agency for the National School Lunch Program. Do not include any stand-alone Pre-Kindergarten or Head Start programs. Count each school in one category only.

	Number of
a. Elementary schools	
a. Middle or junior high schools	
a. High schools	
TOTAL NUMBER OF SCHOOLS SERVED BY YOUR SCHOOL NUTRITION PROGRAM	

2. Thinking about all the schools in your School Food Authority (SFA) or district, would you say the **majority** of your schools are ...

   Select one only

   1 ❍ Located in urban areas,
   2 ❍ Located in suburban areas, or
   3 ❍ Located in rural areas?

3. Which of the following best describes your food service management approach?

   Select one only

   1 ❍ A self-operated program, or
   2 ❍ A program contracted (all or part) to a food service management company

4. Please indicate the types of food production systems in use in your SFA/district and the number of each. (Your best estimate at the number is fine.) *Select one per row*

Type of production systems used in your SFA/district	Present in SFA/district		Number of each within SFA/district
	Yes	No	
a. Central production facility or commissary Meals are prepared in central facility (not a school) and shipped to schools, either pre-portioned or in bulk	1 ❍	0 ❍	
b. On-site production kitchen Meals are prepared at a school and sent to other schools in the district as well as served at own school	1 ❍	0 ❍	
c. Finishing or satellite kitchens Meals are prepared in a different location and sent to the school kitchen where meals are served. Meals may or may not need to be heated or portioned	1 ❍	0 ❍	
d. Full-service kitchens Meals are prepared and served in the school kitchen. Do not include production kitchen(s) already counted in 4b	1 ❍	0 ❍	

5. IF ANY FINISHING/SATELLITE KITCHENS: How many of your finishing or satellite kitchens are served by central production facilities/commissaries and how many by on-site production kitchens at other schools?

	Number
a. Number of finishing/satellite kitchens served by central production facilities/commissaries	
b. Number of finishing/satellite kitchens served by on-site production kitchens at other schools	

Menu Planning

6. Who planned your menus for the 2012-13 school year? *Select all that apply*

1 ❍ You
2 ❍ Someone else on your staff, such as a dietitian, kitchen manager, lead cook, or an area supervisor
3 ❍ Someone at the food service management company
4 ❍ An outside consultant
5 ❍ A food vendor
6 ❍ Other (PLEASE SPECIFY) _____

7. Have any of your schools participated in or been recognized by any of the following health and nutrition award programs? *Select one per row*

	Yes	No
a. Alliance for a Healthier Generation	1 ❍	0 ❍
b. Team Nutrition	1 ❍	0 ❍
c. Healthier US School Challenge (HUSSC) award winner	1 ❍	0 ❍
d. State-based nutrition or health promotion award program	1 ❍	0 ❍
e. School Nutrition Association's (SNA) District of Excellence	1 ❍	0 ❍
f. Other (PLEASE SPECIFY) _____	1 ❍	0 ❍

Planning for New Meal Requirements

As you are aware, new meal pattern and nutrient requirements go into effect starting in the 201213 school year. SFAs/districts certified as meeting the new meal requirements for lunches are eligible to receive an additional 6-cent meal reimbursement. Some people started planning for the changes a while ago, while others may just now be starting to think about what needs to be done to meet and implement the new requirements.

8. Which of the following best describes how close you feel your SFA/district is to being able to meet the new meal pattern and nutrient requirements **as specified for lunch** in the 2012-13 school year? *Select one only*

   1 ❍ We will be able to meet all or nearly all of the lunch requirements by the start of the 2012-13 school year

   2 ❍ We expect to be able to meet the lunch requirements by the end of the 2012-13 school year

   3 ❍ It will likely take us until the 2013-14 school year or beyond to meet the lunch requirements

   4 ❍ I am not sure when we'll be able to meet the lunch requirements

9. Which of the following best describes when you began making changes in preparation for implementing the new meal requirements for lunch? *Select one only*

   1 ❍ Started making changes prior to proposed regulations (before January 2011)

   2 ❍ Started making changes when regulations were first proposed (between January 2011 and January 2012)

   3 ❍ Started making changes after final regulations were published (after January 2012)

   4 ❍ Have not yet made changes

10. Which of the following do you consider to be barriers to being able to fully implement the new meal requirements for lunch by the start of the 2012-13 school year? *Select one per row*

Barrier to fully implementing by start of 2012-13 school year	Yes	No
a. Understanding new meal requirements	1 ❍	0 ❍
b. Purchasing foods to meet the new meal requirements (cost and availability)	1 ❍	0 ❍
c. Needing additional staff or labor hours	1 ❍	0 ❍
d. Training of staff	1 ❍	0 ❍
e. Needing additional equipment	1 ❍	0 ❍
f. Training of staff	1 ❍	0 ❍
g. Other (PLEASE SPECIFY) _____	1 ❍	0 ❍

11. DISPLAY BARRIERS SELECTED IN Q.10.

And how would you rank each of the barriers? Please enter a "1" next to what you consider the biggest barrier to your SFA/district being able to fully implement the new meal requirements for lunch. Enter a "2" next to what you consider to be second greatest barrier, and continue until all barriers are assigned a ranking.

Barrier to fully implementing by start of 2012-13 school year	Ranking
a. Understanding new meal requirements	
b. Purchasing foods to meet the new meal requirements (cost and availability)	
c. Needing additional staff or labor hours	
d. Training of staff	
e. Needing additional equipment	
f. Needing to remodel or upgrade kitchens	
g. Other (PLEASE SPECIFY) _____	

12. There are a number of different ways that SFAs/districts might change their production approach to meet the new meal requirements. For each of the following, please indicate if this is a change your SFA/district made or expects to make in order to implement the new meal requirements for lunch.

	Yes	No
a. Move to central facility/commissary or production kitchen(s)	1 ❍	0 ❍
b. Implement standard recipes and/or work methods	1 ❍	0 ❍
c. Move to more cooking from scratch	1 ❍	0 ❍
d. Move to buying ready to eat foods from vendors	1 ❍	0 ❍
e. Other (PLEASE SPECIFY) _____	1 ❍	0 ❍

Training

13. Which of the following types of training do you feel are essential for food service staff, including yourself, in order to successfully operate your school nutrition program, including implementing the new meal requirements? *Select all staff that apply for each row*

Types of training	Training needed for ...			Training not needed in this area
	Director or food service management team	Kitchen or cafeteria managers	Cooks or front-line servers	
a. Developing or modifying menus	1 ❍	2 ❍	3 ❍	4 ❍
b. Modifying and/or standardizing recipes	1 ❍	2 ❍	3 ❍	4 ❍
c. Revising food purchasing specifications	1 ❍	2 ❍	3 ❍	4 ❍
d. Assessing equipment and infrastructure needs	1 ❍	2 ❍	3 ❍	4 ❍
e. Purchasing new equipment	1 ❍	2 ❍	3 ❍	4 ❍
f. Using/operating new equipment	1 ❍	2 ❍	3 ❍	4 ❍
g. Understanding compliance with meal pattern and nutrient requirements	1 ❍	2 ❍	3 ❍	4 ❍
h. Basic cooking skills, including hands-on training and standardized work methods	1 ❍	2 ❍	3 ❍	4 ❍
i. Basic nutrition training	1 ❍	2 ❍	3 ❍	4 ❍
j. Basic food safety/ServSafe training	1 ❍	2 ❍	3 ❍	4 ❍
k. Completing applications/paperwork for additional reimbursement and Coordinated Review Effort (CRE) reviews	1 ❍	2 ❍	3 ❍	4 ❍
l. Completing production records	1 ❍	2 ❍	3 ❍	4 ❍
m. Marketing and promoting the new meal requirements	1 ❍	2 ❍	3 ❍	4 ❍
n. Other (PLEASE SPECIFY) _____	1 ❍	2 ❍	3 ❍	4 ❍

14. Does your SFA/district have a budget for staff development and training?

1 ❍ Yes

0 ❍ No

d ❍ Don't know

GO TO Q.16

15. IF TRAINING BUDGET: Thinking about your budget allocated for staff development and training and the amount of training needed for your staff to be able to implement the new meal requirements, would you say your training budget should be sufficient to meet …

Select one only

1 ❍ All your training needs,

2 ❍ Some of your training needs,

3 ❍ Only a few of your training needs, or

4 ❍ None of your training needs?

16. How much of the new meal requirements training do you expect the state will provide (or has already provided)?

Select one only

1 ❍ All your training needs,

2 ❍ Some of your training needs,

3 ❍ Only a few of your training needs, or

4 ❍ None of your training needs?

Preparing Meals

As you are aware, there are a number of changes in the new meal requirements that may have an impact on your SFA's/district's equipment needs. For each of the following changes in the meal pattern and nutrient requirements for lunch, please indicate the adequacy of your equipment in terms of receiving and storage, production, holding and transporting, and the meal service area.

IF CENTRAL PRODUCTION FACILITY/COMMISSARY, PLEASE ANSWER Q.17 AND Q.18.

17. First thinking only about your **central production facility/commissary**, how would you characterize your SFA's/district's equipment needs as they relate to …

Select one per row

	Adequate: either as is or using a workaround	Inadequate: but making do with a workaround	Inadequate: and no workaround
More fruit and vegetable items on daily menus			
a. Receiving and storage	1 ❍	2 ❍	0 ❍
b. Preparation (including assembly and packaging)	1 ❍	2 ❍	0 ❍
c. Holding and transportation	1 ❍	2 ❍	0 ❍
d. Meal service area	1 ❍	2 ❍	0 ❍
Greater variety and forms of fruits and vegetables			
e. Receiving and storage	1 ❍	2 ❍	0 ❍
f. Preparation (including assembly and packaging)	1 ❍	2 ❍	0 ❍
g. Holding and transportation	1 ❍	2 ❍	0 ❍
h. Meal service area	1 ❍	2 ❍	0 ❍
At least half of grains to be whole grain rich across the week			
i. Receiving and storage	1 ❍	2 ❍	0 ❍
j. Preparation (including assembly and packaging)	1 ❍	2 ❍	0 ❍
k. Holding and transportation	1 ❍	2 ❍	0 ❍
l. Meal service area	1 ❍	2 ❍	0 ❍
Differing portion sizes by grade groups			
m. Receiving and storage	1 ❍	2 ❍	0 ❍
n. Preparation (including assembly and packaging)	1 ❍	2 ❍	0 ❍
o. Holding and transportation	1 ❍	2 ❍	0 ❍
p. Meal service area	1 ❍	2 ❍	0 ❍
New calorie ranges, saturated fat, trans fat, and sodium targets			
q. Receiving and storage	1 ❍	2 ❍	0 ❍
r. Preparation (including assembly and packaging)	1 ❍	2 ❍	0 ❍
s. Holding and transportation	1 ❍	2 ❍	0 ❍
t. Meal service area	1 ❍	2 ❍	0 ❍

18. Thinking now about specific pieces of equipment, please indicate whether or not you would need a new or additional piece of this equipment **at any central production facility/commissary** to meet the new meal requirements for lunch and, if so, how many pieces of the equipment are required. Please think only about what you really need, as opposed to what would be nice to have.

	Piece of equipment needed		Number of this equipment required *(Your best estimate is fine)*
	Yes	No	
Receiving and storage			
a. Central production facility or commissary	1 ❍	0 ❍	
b. Scales, large or floor	1 ❍	0 ❍	
c. Dry storage shelving units	1 ❍	0 ❍	
d. Walk-in refrigerators	1 ❍	0 ❍	
e. Walk-in freezers	1 ❍	0 ❍	
Production			
f. Fruit and vegetable preparation sinks	1 ❍	0 ❍	
g. Stainless steel work tables	1 ❍	0 ❍	
h. Slicers	1 ❍	0 ❍	
i. Automatic can openers	1 ❍	0 ❍	
j. Food processors	1 ❍	0 ❍	
k. Vertical cutters	1 ❍	0 ❍	
l. Mixers	1 ❍	0 ❍	
m. Sets of knives with cutting boards	1 ❍	0 ❍	
n. Roll-in convection oven	1 ❍	0 ❍	
o. Rolling sheet pan and steam table racks	1 ❍	0 ❍	
p. Steam jacketed kettles with pumps/filler	1 ❍	0 ❍	
q. Blast or tumble chillers	1 ❍	0 ❍	
r. Conveyor/Wrapper system with containers configured to menu	1 ❍	0 ❍	
s. De-nester and fillers	1 ❍	0 ❍	
t. Meal baskets and dollies	1 ❍	0 ❍	
Holding and transportation			
u. Walk-in cooler (separate from Receiving/Storage walk-in refrigerators)	1 ❍	0 ❍	
v. Hot holding mobile carts	1 ❍	0 ❍	
w. Non-refrigerated trucks	1 ❍	0 ❍	
x. Refrigerated trucks	1 ❍	0 ❍	
Administrative			
y. Computer	1 ❍	0 ❍	
z. Software programs	1 ❍	0 ❍	
aa. Other (PLEASE SPECIFY) _____	1 ❍	0 ❍	

ASK ALL: [INSERT (other) IF SFA HAS CENTRAL FACILITY]

19. Focusing on all your (other) production systems and kitchen types combined, that is any production kitchens that prepare meals for other schools, finishing or satellite kitchens, and full service kitchens that prepare their own meals, how would you characterize your SFA's/district's equipment needs as they relate to …

Select one per row

	Adequate: either as is or using a workaround	Inadequate: but making do with a workaround	Inadequate: and no workaround
More fruit and vegetable items on daily menus			
a. Receiving and storage	1 ❍	2 ❍	0 ❍
b. Preparation (including assembly and packaging)	1 ❍	2 ❍	0 ❍
c. Holding and transportation	1 ❍	2 ❍	0 ❍
d. Meal service area	1 ❍	2 ❍	0 ❍
Greater variety and forms of fruits and vegetables			
e. Receiving and storage	1 ❍	2 ❍	0 ❍
f. Preparation (including assembly and packaging)	1 ❍	2 ❍	0 ❍
g. Holding and transportation	1 ❍	2 ❍	0 ❍
h. Meal service area	1 ❍	2 ❍	0 ❍
At least half of grains to be whole grain rich across the week			
i. Receiving and storage	1 ❍	2 ❍	0 ❍
j. Preparation (including assembly and packaging)	1 ❍	2 ❍	0 ❍
k. Holding and transportation	1 ❍	2 ❍	0 ❍
l. Meal service area	1 ❍	2 ❍	0 ❍
Differing portion sizes by grade groups			
m. Receiving and storage	1 ❍	2 ❍	0 ❍
n. Preparation (including assembly and packaging)	1 ❍	2 ❍	0 ❍
o. Holding and transportation	1 ❍	2 ❍	0 ❍
p. Meal service area	1 ❍	2 ❍	0 ❍
New calorie ranges, saturated fat, trans fat, and sodium targets			
q. Receiving and storage	1 ❍	2 ❍	0 ❍
r. Preparation (including assembly and packaging)	1 ❍	2 ❍	0 ❍
s. Holding and transportation	1 ❍	2 ❍	0 ❍
t. Meal service area	1 ❍	2 ❍	0 ❍

20. Thinking now about specific pieces of equipment, please indicate whether or not you would need a new or additional piece of this equipment in any **production kitchens, satellite or finishing kitchens, or full service kitchens** to meet the new meal requirements for lunch and, if so, how many pieces of the equipment are required. Please think only about what you really need, as opposed to what would be nice to have.

	Piece of equipment needed		Number of this equipment required *(Your best estimate is fine)*
	Yes	No	
Receiving and storage			
a. Platform and hand trucks	1 ❍	0 ❍	
b. Scales	1 ❍	0 ❍	
c. Dry storage shelving units	1 ❍	0 ❍	
d. Dunnage racks	1 ❍	0 ❍	
e. Basket dollies	1 ❍	0 ❍	
f. Walk-in refrigerators	1 ❍	0 ❍	
g. Walk-in freezers	1 ❍	0 ❍	
Production			
h. Fruit and vegetable preparation sinks	1 ❍	0 ❍	
i. Stainless steel work tables	1 ❍	0 ❍	
j. Utility sinks	1 ❍	0 ❍	
k. Slicers	1 ❍	0 ❍	
l. Can openers	1 ❍	0 ❍	
m. Food processors	1 ❍	0 ❍	
n. Mixers	1 ❍	0 ❍	
o. Sectionizers	1 ❍	0 ❍	
p. Sets of knives with cutting boards	1 ❍	0 ❍	
q. Rolling (mobile) sheet pan or steam table pan racks	1 ❍	0 ❍	
r. Utility carts	1 ❍	0 ❍	
s. Convection ovens (double deck)	1 ❍	0 ❍	
t. Steam-jacketed kettles	1 ❍	0 ❍	
u. Tilting skillet	1 ❍	0 ❍	
v. Combi ovens	1 ❍	0 ❍	
w. Convection (pressureless) steamer	1 ❍	0 ❍	
x. Pressure steamer	1 ❍	0 ❍	

	Piece of equipment needed		Number of this equipment required *(Your best estimate is fine)*
	Yes	No	
y. Re-thermalization and holding ovens	1 ❍	0 ❍	
z. Commercial microwave	1 ❍	0 ❍	
aa. Blast chillers	1 ❍	0 ❍	
bb. Reach-in freezers	1 ❍	0 ❍	
cc. Reach-in refrigerators	1 ❍	0 ❍	
dd. Hot holding cabinets	1 ❍	0 ❍	
ee. Conveyor/Wrapper system with containers configured to menu	1 ❍	0 ❍	
ff. Meal baskets and dollies	1 ❍	0 ❍	
Holding and transportation			
gg. Walk-in cooler (separate from Receiving/Storage walk-in refrigerator)	1 ❍	0 ❍	
hh. Hot and/or cold transport containers or carts	1 ❍	0 ❍	
ii. Non-refrigerated trucks	1 ❍	0 ❍	
jj. Refrigerated trucks	1 ❍	0 ❍	
Meal serving area			
kk. Cold food merchandisers	1 ❍	0 ❍	
ll Utility serving counters (5-foot length)	1 ❍	0 ❍	
mm. Mobile milk coolers	1 ❍	0 ❍	
nn. Mobile utility serving counter (5-foot length)	1 ❍	0 ❍	
oo. Hot food serving line counters (4-5 wells)	1 ❍	0 ❍	
pp. Cold food serving line counters (5-foot pan)	1 ❍	0 ❍	
qq. Salad or fruit/vegetable bar (free standing, self serve)	1 ❍	0 ❍	
rr. Student meal trays	1 ❍	0 ❍	
ss. Steam table pans (stainless steel or plastic)	1 ❍	0 ❍	
tt. Serving portion utensils	1 ❍	0 ❍	
Administrative			
uu. Computer	1 ❍	0 ❍	
vv. Software programs	1 ❍	0 ❍	
ww. Other (PLEASE SPECIFY) _____	1 ❍	0 ❍	

21. Does your school nutrition program have an equipment replacement and upgrade plan?

1 ❍ Yes
0 ❍ No
d ❍ Don't know

22. Do you have a line item for capital equipment purchases in your annual budget? By capital we mean purchases of equipment, usually at least $1,000, that can be depreciated over time.

1 ❍ Yes
0 ❍ No
d ❍ Don't know

GO TO Q.16

23. IF YES: Is the budgeted amount for capital purchases adequate to purchase the equipment required to implement the new meal requirements for lunch?

1 ❍ Yes
0 ❍ No
d ❍ Don't know

Infrastructure

ASK Q.24 ONLY IF SFA HAS CENTRAL PRODUCTION FACILITY. IF NO CENTRAL PRODUCTION FACILITY, GO TO Q.25.

24. Thinking about the changes needed to implement the new meal requirements for school lunch, which of the following infrastructure changes are essential at your central production facility/commissary? Please only think about what is critical as opposed to items that would be nice to have, but are not essential to meet the new meal requirements.

Does your central production facility/commissary need ... *Select one per row*

	Yes	No	Don't know
More fruit and vegetable items on daily menus			
a. More physical space for storage, preparation, or serving?	1 ❍	2 ❍	d ❍
b. More electrical, such as more amps, voltage, or locations of outlets?	1 ❍	2 ❍	d ❍
c. More natural gas, such as increased pressure or location of pipes?	1 ❍	2 ❍	d ❍
d. More plumbing, such as water supply or location of sinks and drains?	1 ❍	2 ❍	d ❍
e. More ventilation, such as exhaust hoods or fire suppression systems?	1 ❍	2 ❍	d ❍
f. Remodeling that would require bringing the facility up to local health department code?	1 ❍	2 ❍	d ❍

IF CENTRAL KITCHEN, USE 25.1 WORDING, ALL OTHERS USE 25.2.

25.1 Are the following kitchen infrastructure changes needed at any of your schools? And if so, at how many schools would the infrastructure changes be needed? Please only think about what is essential as opposed to items that would be nice to have but are not essential to meet the new meal requirements for lunch.

25.2 Thinking about the changes needed to implement the new meal requirements, are the following kitchen infrastructure changes needed at any of your schools? And if so, at how many schools would the infrastructure changes be needed? Please only think about what is essential as opposed to items that would be nice to have but are not essential to meet the new meal requirements for lunch.

Are infrastructure changes needed at any school kitchens in the area of ...

	Yes	No	Don't know	Number of schools requiring infrastructure upgrade
a. More physical space for storage, preparation, or serving?	1 ❍	0 ❍	d ❍	
b. More electrical, such as more amps, voltage, or locations of outlets?	1 ❍	0 ❍	d ❍	
c. More natural gas, such as increased pressure or location of pipes?	1 ❍	0 ❍	d ❍	
d. More plumbing, such as water supply or location of sinks and drains?	1 ❍	0 ❍	d ❍	
e. More ventilation, such as exhaust hoods or fire suppression systems?	1 ❍	0 ❍	d ❍	
f. Remodeling that would require bringing the facility up to local health department code?	1 ❍	0 ❍	d ❍	

26. What level of financial resources do you think your local education agency (LEA) is able to allocate to make the kitchen infrastructure and remodeling changes you believe are necessary to implement the new meal requirements for school lunch? *Select one only*

1 ❍ All or nearly all the resources needed to upgrade kitchen infrastructure
2 ❍ About three-fourths of the resources needed
3 ❍ About half
4 ❍ About a quarter
5 ❍ Less than a quarter
0 ❍ None
d ❍ Don't know

GO TO Q.28

27. IF GETTING ANY RESOURCES IN Q.26: What is your best estimate of the time frame for when kitchen remodeling would be completed? *Select one only*

1 ❍ During this school year (2012-2013)
2 ❍ In the next 2 to 3 years
3 ❍ In the next 4 to 10 years
4 ❍ More than 10 years from now
d ❍ Don't know

Background Questions

28. What is the title of your position within the local education agency? (If you have multiple titles and one is Director, please select Director.) *Select all that apply*

1 ❍ School Food Service Director or School Nutrition Director
2 ❍ Area Supervisor, Area Manager, or Area Coordinator
3 ❍ Contract company's Food Service Manager
4 ❍ Kitchen/Cafeteria/Food Service Manager or Lead Cook
5 ❍ Business Manager
6 ❍ Dietitian or Nutritionist
99 ❍ Other (PLEASE SPECIFY) _____

29a. IF DIRECTOR, ASK: How long have you been a School Food Service or School Nutrition Director?

_____ YEARS and/or _____ MONTHS **GO TO Q.30**

29b. IF NOT DIRECTOR, ASK: How long have you been a [FILL FROM Q.28]?

_____ YEARS and/or _____ MONTHS

30. Do you work for the local education agency (LEA) or a food service management company? *Select one only*

1 ❍ LEA
2 ❍ Food Service Management Company
99 ❍ Other (PLEASE SPECIFY) _____

31. Which of the following credentials do you hold? *Select all that apply*

1 ❍ Associate's degree in consumer science, food service management, baking/culinary arts, etc.
2 ❍ Bachelor's degree in consumer science, nutrition, food service management, hotel/restaurant management, baking/culinary arts, etc.
3 ❍ Advanced degree in business, foods and nutrition, public health
4 ❍ On-the-job training
5 ❍ Registered dietitian
6 ❍ School Nutrition Specialist (SNA certified)
7 ❍ SNA Certified Level I
8 ❍ SNA Certified Level II
9 ❍ SNA Certified Level III
10 ❍ State food service certificate
99 ❍ Other (PLEASE SPECIFY) _____

ANSWER Q.32a AND Q.32b IF MIDDLE RESPONSE "INADEQUATE BUT MAKING DO" TO ANY ITEM IN Q.17 OR Q.19

32a. Earlier in the survey we asked about adequacy of equipment to meet the new meal standards and you indicated that in some areas your equipment was inadequate to meet standards, but that you were making do with a workaround ...

Could you give some examples of workarounds that you are using, that while helping you make do, are still inadequate to meet the new meal standards?

(PLEASE SPECIFY) _____

32b. Which of the following are reasons you feel your workarounds are inadequate to meet the new meal standards? *Select all that apply*

1 ❍ Expensive

2 ❍ Inefficient

3 ❍ Unsustainable

4 ❍ Can't meet increasing needs

5 ❍ Too labor intensive

99 ❍ Other (PLEASE SPECIFY) _____

If you used this PDF version of the KITS Study questionnaire as a worksheet to collect and/or organize information about your school food authority/school district, please go to the website https://www.kitsstudy.com and enter your answers.

Or you can fax or mail the completed questionnaire to Jennifer McGovern at:

Mathematica Policy Research
P.O. Box 2393
Princeton, NJ 08543-2393
Attention: Jennifer McGovern
Fax number: 609-799-0005

Please complete the following information:

SFA Name: _____

State: _____

Your Name: _____

Email Address: _____

Phone Number: _____

We will contact you only if we have questions about your responses.

If you have any questions about the survey or the KITS Study, please call our toll-free study hotline at 1-855-528-4550 or send an email to the study mailbox KITSStudy@mathematica-mpr.com.

Thank you for your interest in the KITS Study!

Endnotes

1 C.L. Ogden et al., "Prevalence and Tends in Overweight Among US Children and Adolescents, 1999-2000," *Journal of the American Medical Association* 288, no. 14 (2002): 1728–32; C.L. Ogden et al., "Prevalence of Overweight and Obesity in the United States, 1999-2004," *Journal of the American Medical Association* 295, no. 13 (2006): 1549–55; Centers for Disease Control and Prevention. "QuickStats: Prevalence of Overweight Among Children and Teenagers, by Age Group and Selected Period—United States, 1963-2002," *Morbidity and Mortality Weekly Report* 54, no. 8 (2005): 203.

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8 M.K. Fox, E. Condon, M.K. Crepinsek, K. Niland, D. Mercury, S. Forrestal, C. Cabili, V. Oddo, A. Gordon, N. Wozny, and A. Killewald. 2012. *School Nutrition Dietary Assessment Study-IV: Volume I: School Foodservice Operations, School Environments, and Meals Offered and Served.* Alexandria, VA: U.S. Department of Agriculture, Food and Nutrition Service, Office of Research and Analysis.

9 Federal Register. 2012a. *7 CFR Parts 210 and 220, Nutrition Standards in the National School Lunch and School Breakfast Programs: Final Rule.* U.S. Department of Agriculture, 77 (17) (January 26, 2012).

10 U.S. Department of Agriculture, Food and Nutrition Service, with the National Food Service Management Institute (NFSMI). 2002a. *A Guide to Centralized Food Service.* University, MS: NFSMI. http://nfsmi.org/documentlibraryfiles/PDF/20120604113039.pdf. Accessed May 13, 2013.

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