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Volume 3
School Meal Costs and Revenues

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Final Report Volume 3:
School Meal Costs and Revenues

Authors:

Abt Associates
Christopher W. Logan
Vinh Tran
Maria Boyle
Ayesha Enver
Matthew Zeidenberg
Michele Mendelson

Submitted by:
Mathematica Policy Research
955 Massachusetts Avenue
Suite 801
Cambridge, MA 02139
Telephone: (609) 799-3535
Facsimile: (609) 799-0005

Submitted to:
Office of Policy Support
USDA Food and Nutrition Service
3101 Park Center Dr., Room 1014
Alexandria, VA 22302-1500

Project Director**:**
Mary Kay Fox

Project Officer:
John Endahl

Deputy Project Director:
Elizabeth Gearan

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We gratefully acknowledge the guidance and oversight received from John Endahl, the project officer in the Office of Policy Support, Food and Nutrition Service, U.S. Department of Agriculture. Many others contributed their time and expertise to the collection, processing, or analysis of data used in this report, and we acknowledge them here under their respective organizations.

Abt Associates

Mehera Baugher
Ashley Bradbury
Molly Brune
Patricia Connor
Meaghan Glenn
David Judkins
Don Laliberty
Kathleen Linton
Nancy McGarry
Erin Miles
Tyler Morrill
Hiren Nisar
Brenda Rodriguez
Tara Wommack

Relyon

Chris Macek

Agralytica

Andre Williamson
Justin Carnagey
Lynn Daft
Maureen Murphy
Nick Young
Salli Diakova
Tom Early

USDA, Food and Nutrition Service

Office of Policy Support

Kelley Scanlon
Maggie Applebaum
Alice Ann Gola

Child Nutrition Division

Madeline Becker
Ed Harper
Heather Hopwood
Kristen Hyatt
Meghan Mack
Sara Olson
Whitney Peters
Mike Rizzo

USDA, Economic Research Service

Joanne Guthrie

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LIST OF ACRONYMS

CACFP	Child and Adult Care Food Program
CEP	Community Eligibility Provision
CN	child nutrition
FFVP	Fresh Fruit and Vegetable Program
FNS	Food and Nutrition Service
FPL	Federal poverty level
HEI	Healthy Eating Index
HHFKA	Healthy, Hunger-Free Kids Act of 2010
NSLP	National School Lunch Program
RFF	Reimbursable Foods Form
SBP	School Breakfast Program
SE	standard error
SFA	school food authority
SLBCS-I	School Lunch and Breakfast Cost Study-I
SLBCS-II	School Lunch and Breakfast Cost Study-II
SNM	school nutrition manager
SNMCS	School Nutrition and Meal Cost Study
SY	school year
USDA	United States Department of Agriculture

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EXECUTIVE SUMMARY

The National School Lunch Program (NSLP) and School Breakfast Program (SBP) form the cornerstone of the nation's nutrition safety net for low-income children. These programs, which are administered by the U.S. Department of Agriculture (USDA), Food and Nutrition Service (FNS), provide 30 million Federally subsidized lunches and 15 million Federally subsidized breakfasts to children each school day.[1] FNS provides assistance for the NSLP and SBP in the form of cash reimbursements for each qualifying meal, with reimbursement rates for each program depending on whether the child is or is not approved for free or reduced-price meals. Federal assistance is intended to supplement State and local resources (including student payments) and help ensure children are provided nutritious school meals. In addition, FNS provides foods purchased by USDA (known as "USDA Foods") as additional support to schools for the SBP and NSLP.

In school year (SY) 2012–2013, the school meal programs began to undergo widespread changes, mainly stemming from the Healthy, Hunger-Free Kids Act of 2010 (HHFKA; Public Law 111-296). Key reforms included more fruits, vegetables, and whole grains in the school menu; updated nutrition standards to improve the nutritional quality of school meals and students' diets in order to reduce children's risk of developing chronic diseases; a new requirement that students select at least 1/2 cup of fruit or vegetables in order for their meal to be eligible for Federal reimbursement; equitable price-setting for paid (or full-price) meals; and the introduction of nutrition standards for all foods and beverages sold in competition with reimbursable meals in schools during the school day (competitive foods).

There is a critical need for information about how school food authorities (SFAs),[2] school districts, and schools are implementing these changes and about whether and how the changes are affecting school foodservice operations; the nutritional quality, cost, and acceptability of meals; student participation and satisfaction; plate waste; and the quality of students' diets. FNS sponsored the School Nutrition and Meal Cost Study (SNMCS) to ensure this information would be available to policymakers and other stakeholders. The SNMCS continues FNS's long-standing commitment to periodically assess the school meal programs and is the first nationally representative, comprehensive assessment of the programs since major reforms began in SY 2012–2013.

A. Overview of the School Nutrition and Meal Cost Study

The SNMCS addressed a broad array of research questions of interest to stakeholders at the national, State, and local levels. The research questions were grouped under four broad domains:

[1] Statistics reported for the NSLP and SBP were obtained from national-level annual summary tables generated by FNS. These tables are available at http://www.fns.usda.gov/pd/child-nutrition-tables. Accessed April 18, 2018.

[2] SFAs and school districts are distinct governing bodies. SFAs are the governing bodies responsible for school foodservice operations. But school districts or individual schools have some foodservice responsibilities, most notably determining eligibility for free or reduced-price meals, local wellness policies, and practices regarding competitive food sales. In this report, the text distinguishes between SFAs and school districts when referring to situations in which the finances of the SFA are distinct from those of the school district.

- School meal program operations and school nutrition environments
- Food and nutrient content of school meals and afterschool snacks and overall nutritional quality of meals
- School meal costs and school foodservice revenues
- Student participation, student and parent satisfaction, plate waste, and students' dietary intakes

To address these research questions, the SNMCS collected data from nationally representative samples of public SFAs and public, non-charter schools participating in the NSLP; students enrolled in these schools; and their parents. Data collection primarily occurred in the spring of SY 2014–2015. Study findings are presented in four report volumes plus a summary report that highlights key findings across the volumes. Report Volume 3 (this volume) provides a detailed examination of the costs to produce reimbursable school meals and of SFA revenues during SY 2014–2015.[3]

In light of the sweeping reforms that began in SY 2012–2013, including updated nutrition standards and new rules on the pricing of paid meals, there is particular interest in (1) comparing NSLP and SBP meal costs versus paid meal revenues and reimbursements for free meals, and (2) comparing overall SFA costs versus revenues. The goal is to examine how the updated nutrition standards for reimbursable meals and competitive foods, together with changes to Federal school meal requirements, may have affected SFAs' finances.

To support the analyses presented in this report, 310 SFAs and 972 schools participated in the data collection activities (sample sizes varied by instrument):

- SFA directors, school nutrition managers (SNMs),[4] and principals completed cost interviews to provide information about time staff spent on foodservice activities, annual expenses, and annual revenues. Business managers assisted SFA directors as needed.
- SNMs completed a detailed Menu Survey over the course of one school week. The Menu Survey collected detailed information about the foods offered and served in SBP breakfasts, NSLP lunches, and afterschool snacks served under the NSLP or the Child and Adult Care Food Program (CACFP), including reimbursable and nonreimbursable servings, portion sizes, and recipes for school-prepared foods.

[3] Volume 1 (Forrestal et al. 2019) provides updated information on SFA and school characteristics, foodservice operations, and school nutrition environments. Volume 2 (Gearan et al. 2019) focuses on the food and nutrient content of reimbursable meals and afterschool snacks and the overall nutritional quality of meals. Volume 4 (Fox et al. 2019) addresses students' participation in school meals, parents' and students' satisfaction with the meals, amounts of plate waste, and the influence of school meals on students' dietary intakes. A separate summary report (Fox and Gearan 2019) summarizes key findings across the report volumes, and a separate methodology report (Zeidman et al. 2019) provides technical details about study design, sampling, and data collection procedures.

[4] The term *school nutrition manager* is updated from prior School Nutrition Dietary Assessment studies, which used *foodservice manager* to refer to these staff.

- Directors of State Child Nutrition agencies and State education agency finance officers completed a survey about indirect costs.

B. Reported Costs of Producing Reimbursable Meals

An SFA must balance the costs and revenues of school foodservice so that it operates on a nonprofit basis. Under USDA regulations, this means that all revenues must be used solely to operate or improve meals and foodservice operations. The SFA must maintain a nonprofit foodservice account that accrues all Federal funds to support the NSLP, SBP, and other school meal programs. This account must be separate from other school district accounts. Nonprofit status is determined by the financial status of the school foodservice account *as a whole,* rather than the financial status of each Federal program separately. USDA rules do not require separate accounting for costs and revenues of NSLP, SBP, or other school meal programs.

An SFA may accumulate net cash resources (cumulative revenues less expenses) equal to no more than three months' mean expenditures. SFAs generally seek to "break even"; that is, to make sure that their total costs and revenues from all school meal programs and from the sale of non-program foods are equal. Non-program food sales include competitive foods, adult meals, catering, and meals provided to schools or day care programs outside the SFA.

Glossary of a School District's Foodservice Operations Costs

- ***Reported costs****—charged to the school foodservice account; for example, food, foodservice labor*
- ***Unreported costs****—not charged to the school foodservice account; for example, facilities costs that are paid by the school district and not passed on to the SFA*
- ***Full costs****—the sum of total reported costs and total unreported costs*

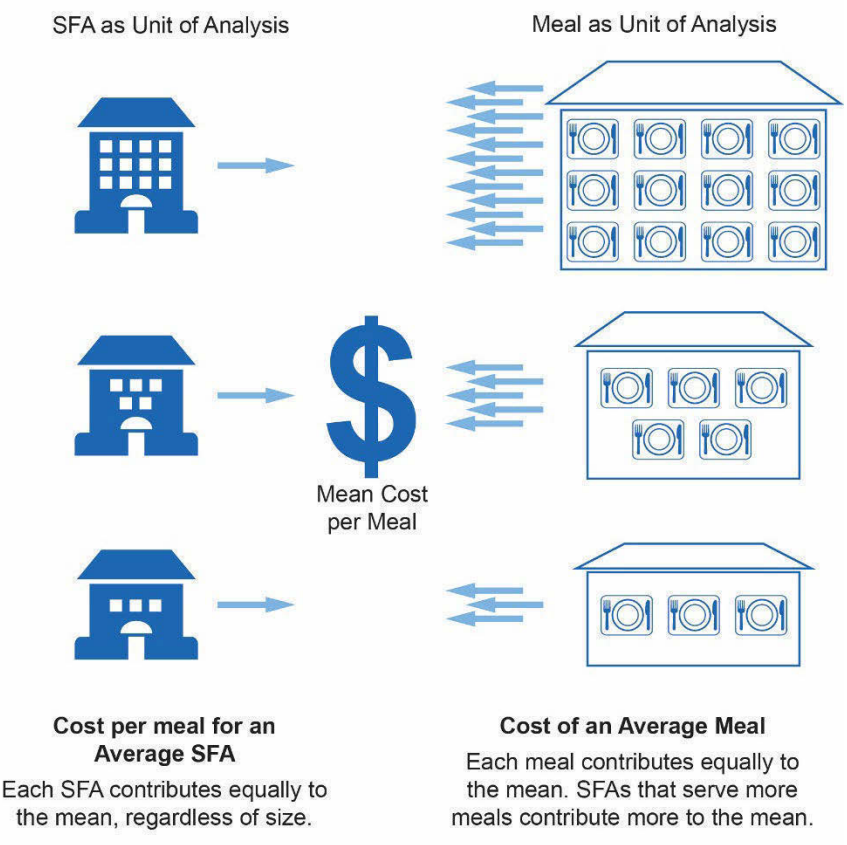
Analyses in this report and prior studies of school meal costs distinguish between reported, unreported, and full costs. ***Reported costs*** include only the costs that are charged to the school foodservice account. From the SFA's perspective, reported costs are the costs of running the foodservice operation that the SFA expects to be able to pay for from the foodservice account. Typically, the major components of reported costs are food, salaries and fringe benefits for foodservice personnel, supplies, and (less frequently) indirect cost charges for facilities, administrative support, or other services provided by the school district. ***Unreported costs*** are costs attributable to foodservice operations that are not charged to the school foodservice account, such as costs for non-foodservice personnel and facilities costs that are paid by the school district and not passed on to the SFA. The ***full costs*** of a school district's foodservice operations are the sum of total reported costs and total unreported costs.

To present standardized results of this analysis, this report includes mean (average) costs of producing reimbursable meals in the NSLP and SBP from two perspectives outlined below.

SFA as the Unit of Analysis	Meal as the Unit of Analysis
For this perspective, the study sample was weighted so that each SFA nationwide was represented equally, regardless of the number of meals served.	For this perspective, the study sample was weighted so that each meal served nationwide was represented equally.
SFAs serving more meals had the same influence as SFAs serving fewer meals in determining the mean cost per meal.	SFAs serving more meals had more influence than SFAs serving fewer meals in determining the mean cost per meal.
Cost estimates represent the mean costs of a typical SFA. This perspective is useful when considering costs from the SFA's point of view.	Cost estimates represent the average meal served. This perspective is useful when considering costs for the NSLP/SBP as a whole.

Figure ES.1 illustrates these two perspectives and how SFAs that serve different numbers of meals are treated under each perspective. On the left, when the SFA is the unit of analysis, each of the three SFAs contributes equally to computing the mean cost per meal. On the right, when the meal is the unit of analysis, SFAs that serve more meals make a larger contribution to the mean cost per meal. The first SFA serves more meals than the others, and the second SFA more than the third; therefore, the first SFA has the most weight in determining mean meal cost, and the second has more weight than the third.

Figure ES.1. Using SFA versus Meal as Unit of Analysis



In this report, "for the average SFA" means that the estimate used the SFA as the unit of analysis, while "for the average NSLP lunch" or "for the average SBP breakfast" means that the estimate used the meal as the unit of analysis. Most tables in the report present estimates that used the SFA as the unit of analysis. The SFA as the unit of analysis is most relevant from the point of view of the average SFA. That's because each SFA's costs and revenues affect its ability to break even, and SFAs are important stakeholders in the NSLP and SBP. The meal as the unit of analysis is most relevant for considering the NSLP and SBP more broadly, such as the relationship of the overall costs of operating these programs to the Federal subsidies provided.

The study team also analyzed costs using a third type of weighting with the school as the unit of analysis. These estimates represent the mean meal costs for a typical school. They are presented in Appendix C and, with the exception of Chapter 6, are not discussed in the text. In producing school-level estimates, the sample was weighted so that each school nationwide was represented equally, regardless of the number of meals it served. Chapter 6 presents findings from an analysis that examined the relationship of school-level meal costs to school and SFA characteristics, in particular, the relationship between meal costs and the nutritional quality of school meals.

1. Reported Cost per NSLP Lunch

In SY 2014–2015, the mean reported cost per NSLP lunch for the average SFA was $3.81 (Figure ES.2). The average SFA spent more to serve an NSLP lunch than the mean Federal subsidy of $3.32 per free NSLP lunch. This mean subsidy included $3.05 in USDA reimbursements and $0.27 worth of USDA Foods.[5] In approximately three out of five SFAs, the reported costs of producing a reimbursable lunch in SY 2014–2015 was greater than the mean Federal subsidy for a free lunch estimated for this report. In nearly three out of 10 SFAs, the reported cost per NSLP lunch was $4.00 or more. (Section C of this summary discusses the relationship of school foodservice revenues to costs.)

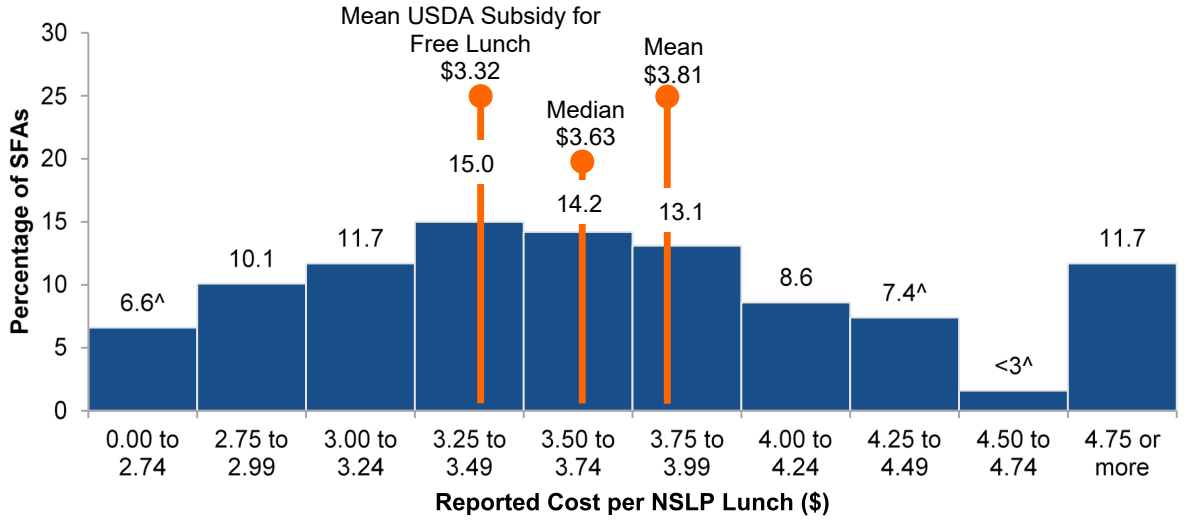
[5] In SY 2014–2015, the base Federal reimbursement rate for a free NSLP lunch was $2.98 for schools in the continental United States (USDA, FNS 2014). Schools that served 60 percent or more lunches at a free or reduced price in the second preceding school year received a higher reimbursement rate of $3.00 per NSLP lunch. In addition, SFAs that were certified by their State agency as being in compliance with the updated nutrition standards for both NSLP lunches and SBP breakfasts received an additional $0.06 per NSLP lunch.

For this report, the mean Federal reimbursement for a free NSLP lunch was computed from State meal claims data for the sample SFAs and weighted to estimate the national mean reimbursement of $3.05 per free NSLP lunch. This estimate reflects each SFA's mix of free lunches claimed at the lower and higher rates (as defined above) and the proportion of SFAs certified to receive the additional $0.06 per lunch. It is slightly less than the reimbursement for schools qualifying for the higher rate ($3.00) plus the additional $0.06 per lunch for compliance with updated nutrition standards.

The mean of $0.27 per NSLP lunch for USDA Foods was estimated from the cash value of USDA Foods used by the SFAs in the study sample and weighted to provide a national estimate. While SFAs were entitled to receive a base amount of $0.2475 per NSLP lunch in USDA Foods in SY 2014–2015, the estimate of $0.27 per NSLP lunch reflected the value of USDA Foods used from SFA inventories and bonus USDA Foods received in addition to the base amount.

Using the meal as the unit of analysis, the mean reported costs of the average NSLP lunch was $3.66. This cost was less than the mean reported cost for the average SFA of $3.81, but still substantially more than the mean Federal subsidy of $3.32 per free NSLP lunch. The difference in the two estimates of the mean reported cost reflects that the reported costs of the average NSLP lunch was smaller in the large SFAs, which produced a disproportionate share of NSLP lunches, than in the medium-sized SFAs, which were far more numerous.[6]

Figure ES.2. Distribution of SFAs by Reported Cost per NSLP Lunch, SY 2014–2015



Source: School Nutrition and Meal Cost Study, Menu Survey, School Nutrition Manager Cost Interview, and SFA Director and Business Manager Onsite and Follow-Up Cost Interviews, SY 2014–2015. Tabulations are weighted to be representative of all public SFAs offering the National School Lunch Program.

Note: SFA is the unit of analysis.

NSLP = National School Lunch Program; SFA = school food authority; SY = school year.

^ Point estimate is considered less precise than estimates that are not flagged because the sample size is small or the coefficient of variation is large. The rules used in flagging estimates are described in Chapter 1. When these rules are applied, percentages close to 0 or 100 are often flagged. In this figure, flagged percentages between 0 percent and 3 percent are displayed as <3 percent.

2. Reported Cost per SBP Breakfast

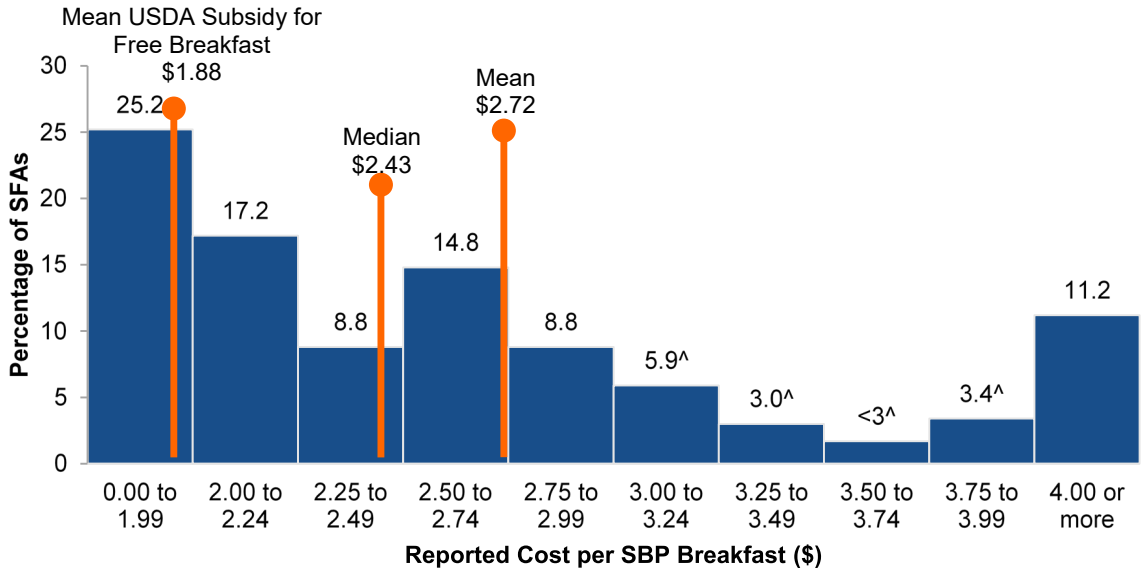
In SY 2014–2015, the average SFA had a reported cost of $2.72 per SBP breakfast (Figure ES.3). The Federal reimbursement rate for a free SBP breakfast was $1.62 to $1.93 (USDA, FNS 2014); the mean free breakfast reimbursement rate across SFAs as estimated for this report was $1.88.[7] Over three-quarters of SFAs spent more than the mean free breakfast reimbursement rate and one quarter of the SFAs (25 percent) spent $3.00 or more per SBP breakfast.

[6] About one in seven SFAs nationwide (14 percent) were large (more than 5,000 students), while 43 percent were medium-sized (1,000 to 5,000 students) and 43 percent were small (fewer than 1,000 students).

[7] SFAs received Federal reimbursement at the higher "severe need" rates for free and reduced-price SBP breakfasts served in schools classified as "severe need" because they served at least 40 percent of NSLP lunches free or at reduced price in the second preceding school year. For this report, the mean free SBP breakfast reimbursement rate

Using the meal as the unit of analysis, the mean reported cost of an SBP breakfast was $2.34. As with NSLP lunches, this mean was less than the reported cost for the average SFA of $2.72 per SBP breakfast due to the influence of large SFAs, but still more than the mean Federal reimbursement of $1.88 for a free breakfast.

Figure ES.3. Distribution of SFAs by Reported Cost per SBP Breakfast, SY 2014–2015



Source: School Nutrition and Meal Cost Study, Menu Survey, School Nutrition Manager Cost Interview, and SFA Director and Business Manager Onsite and Follow-Up Cost Interviews, SY 2014–2015. Tabulations are weighted to be representative of all public SFAs offering the National School Lunch Program.

Notes: SFA is the unit of analysis.

SBP = School Breakfast Program; SFA = school food authority; SY = school year.

^ Point estimate is considered less precise than estimates that are not flagged because the sample size is small or the coefficient of variation is large. The rules used in flagging estimates are described in Chapter 1. When these rules are applied, percentages close to 0 or 100 are often flagged. In this figure, flagged percentages between 0 percent and 3 percent are displayed as <3 percent.

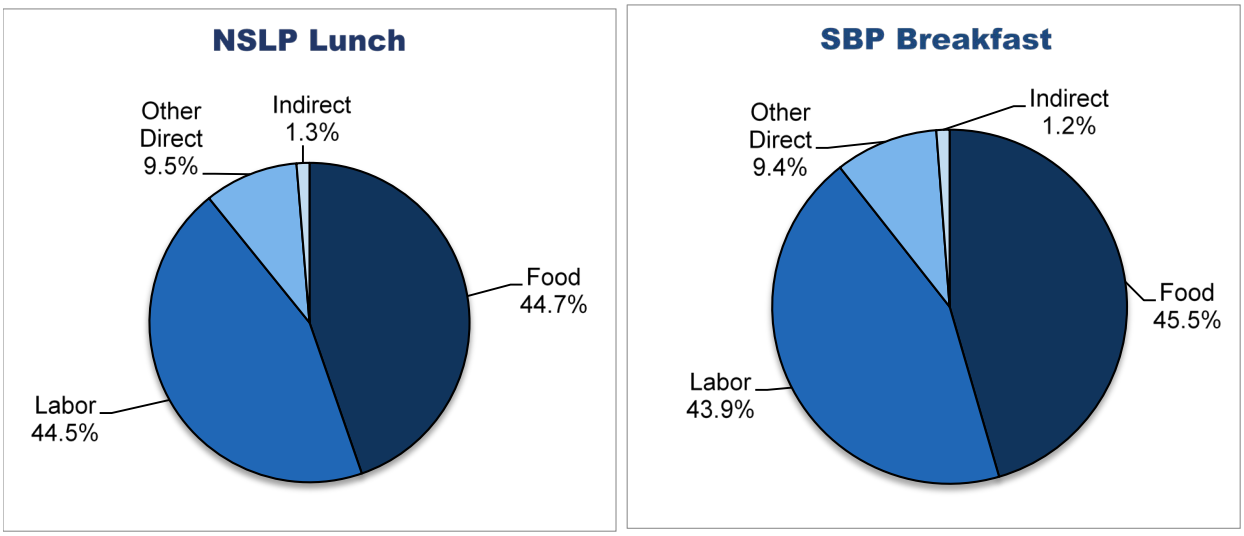
3. Composition of Reported Meal Costs

As one would expect, food and labor costs accounted for the vast majority (45 percent each for a total of 90 percent) of the average SFA's reported cost per NSLP lunch in SY 2014–2015 (Figure ES.4). Other reported direct costs constituted 10 percent of the reported cost per NSLP lunch. These costs may include non-food supplies, foodservice management company charges, other contracted services, equipment purchases and depreciation, utilities, and any other costs not classified as food, labor, or indirect costs. The remaining 1 percent of the reported costs comprised indirect costs, which are charges for the use of facilities, administrative support, or other services provided by the district to the school foodservice program. The composition of the

reflected the average SFA's proportions of free breakfasts claimed at the severe need and non-severe need rates. While SFAs may use USDA Foods in producing SBP breakfasts, USDA Foods were provided to SFAs on the basis of NSLP lunches served. Therefore, the value of USDA Foods used by SFAs was attributed solely to NSLP lunches in computing the mean Federal subsidies for NSLP lunches and SBP breakfasts.

reported costs was very similar for SBP breakfasts (Figure ES.4). In general, the composition of reported meal costs by component was consistent with the composition in SY 2005–2006 (School Lunch and Breakfast Cost Study-II; Bartlett et al. 2008) and SY 1992–1993 (School Lunch and Breakfast Cost Study-I; Glantz et al. 1994).

Figure ES.4. Composition of Reported Cost per NSLP Lunch and SBP Breakfast, SY 2014–2015



Source: School Nutrition and Meal Cost Study, Menu Survey, School Nutrition Manager Cost Interview, and SFA Director and Business Manager Onsite and Follow-Up Cost Interviews, SY 2014–2015. Tabulations are weighted to be representative of all public SFAs offering the National School Lunch Program.

Note: SFA is the unit of analysis.

NSLP = National School Lunch Program; SBP = School Breakfast Program; SFA = school food authority; SY = school year.

C. Composition of SFA Revenues and Comparison to Reported Cost

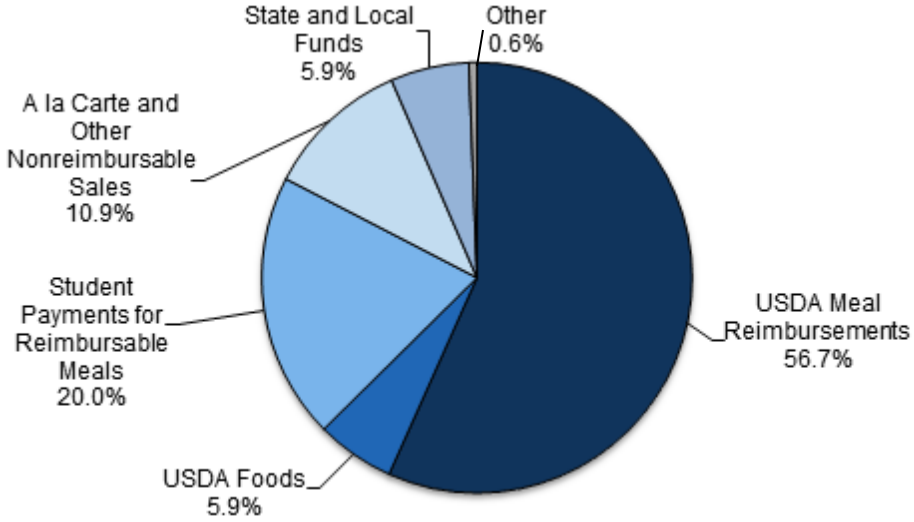
SFAs generate revenues through multiple sources: (1) USDA meal reimbursements, (2) USDA Foods, (3) student payments for reimbursable meals, (4) a la carte and other nonreimbursable sales, (5) State and local government funds, and (6) other cash revenues. In SY 2014–2015, revenues derived from USDA subsidies accounted for a mean of 63 percent of total SFA revenues, with 57 percent from meal reimbursements and 6 percent from USDA Foods (Figure ES.5).[8] Student payments for reimbursable meals accounted for a mean of 20 percent of total SFA revenues. A la carte sales, adult meals, and other nonreimbursable food sales represented about 11 percent of the average SFA's total revenues. Finally, State and local government funds accounted for 6 percent of total SFA revenues; other cash revenues were less than 1 percent.

Section 206 of the HHFKA sets rules concerning the revenues from nonreimbursable sales ("non-program foods," including a la carte sales, adult meals, vending and other

[8] Revenue from USDA Foods also includes donated food from non-USDA sources such as food banks. Few SFAs reported that they received non-USDA donations of foods.

nonreimbursable foods) and seeks to prevent program funds from subsidizing nonreimbursable sales. In particular, Section 206 requires the percentage of revenues from nonreimbursable sales to be at least equal to the percentage of food costs spent on these foods. Findings from the SNMCS indicate that the average SFA receives 11 percent of its revenues from a la carte and other nonreimbursable sales (Figure ES.5) and spends 5 percent of its food budget on food for nonreimbursable sales (Table 2.6), thus far exceeding the Section 206 standard. These results suggest that nonreimbursable sales may subsidize reimbursable meals.

Figure ES.5. Composition of SFA Revenues, SY 2014–2015



Source: School Nutrition and Meal Cost Study, Menu Survey, School Nutrition Manager Cost Interview, and SFA Director and Business Manager Onsite and Follow-Up Cost Interviews, SY 2014–2015. Tabulations are weighted to be representative of all public SFAs offering the National School Lunch Program.

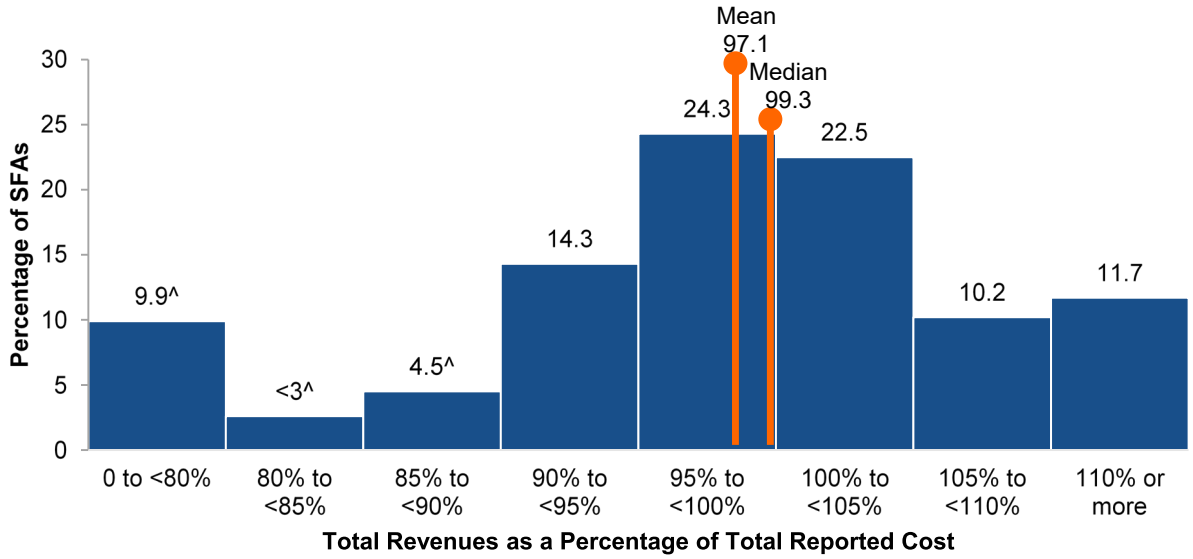
SFA = school food authority; SY = school year.

For the average SFA in SY 2014–2015, total SFA revenues covered only 97 percent of total reported costs, indicating that the average SFA operated at a small deficit (Figure ES.6). In almost half of SFAs (47 percent), total revenues were between 95 percent and 105 percent of total reported costs; that is, within 5 percentage points of the break-even point where revenues equal reported costs. On the other hand, 10 percent of SFAs had revenues that covered less than 80 percent of reported costs, and 12 percent had revenues that were equal to or greater than 110 percent of reported costs.

Revenues from NSLP lunches (including USDA meal reimbursements, USDA Foods, State and local funds, and student payments) fell short of the costs of producing those meals, covering only a mean of 93 percent of reported costs for NSLP lunches. The gap between revenues and costs was even larger for SBP breakfasts, with revenues from SBP breakfasts covering a mean of only 82 percent of reported costs. Net revenues from nonreimbursable food sales (that is, revenues from the sale of these foods less costs) supported school foodservice operations by partially offsetting the gap between costs and revenues for reimbursable meals. Thus, while nonreimbursable sales were a small source of revenue for most SFAs, for the average SFA they provided a revenue surplus that helped offset the extent to which SFA costs exceeded revenues for reimbursable meals. This finding differs from the SLBCS-II, which found the opposite

relationship—that revenues from reimbursable meals subsidized nonreimbursable sales (Bartlett et al. 2008). The findings from the SLBCS-II motivated Section 206 of the HHFKA, and the results from the SNMCS suggest that Section 206 or other changes introduced by the HHFKA may have shifted the pattern of cross-subsidization between reimbursable meals and nonreimbursable sales in the desired direction.

Figure ES.6. Total SFA Revenues as a Percentage of Total SFA Reported Costs



Source: School Nutrition and Meal Cost Study, Menu Survey, School Nutrition Manager Cost Interview, and SFA Director and Business Manager Onsite and Follow-Up Cost Interviews, SY 2014–2015. Tabulations are weighted to be representative of all public SFAs offering the National School Lunch Program.

Note: SFA is the unit of analysis.

^ Point estimate is considered less precise than estimates that are not flagged because the sample size is small or the coefficient of variation is large. The rules used in flagging estimates are described in Chapter 1. When these rules are applied, percentages close to 0 or 100 are often flagged. In this figure, flagged percentages between 0 percent and 3 percent are displayed as <3 percent.

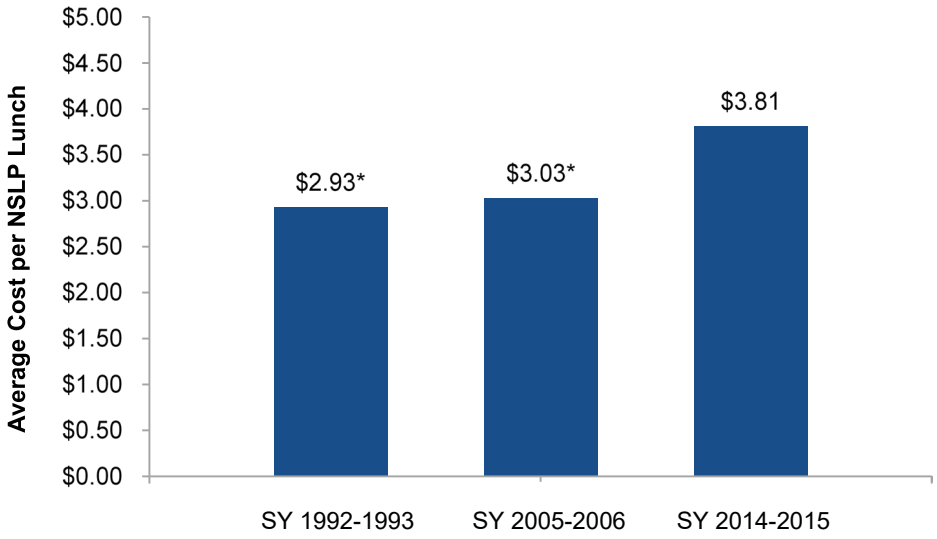
SFA = school food authority. SY = school year.

D. Comparisons to SY 1992–1993 and SY 2005–2006

There were statistically significant differences in the real (inflation-adjusted) reported costs of producing reimbursable meals in SY 2014–2015 compared with reported costs in SY 1992–1993 (School Lunch and Breakfast Cost Study-I) and SY 2005–2006 (School Lunch and Breakfast Cost Study-II). At $3.81, the average SFA's reported cost per NSLP lunch in SY 2014–2015 was 26 percent greater than the comparable (inflation-adjusted) cost in SY 2005–2006 ($3.03) and 30 percent greater than in SY 1992–1993 ($2.93) (Figure ES.7).[9] In contrast, the reported cost per NSLP lunch for the average SFA in SY 2005–2006 was not significantly different from the comparable cost in SY 1992–1993 (Bartlett et al. 2008).

[9] All costs from prior studies have been adjusted to 2015 dollars using the change in the Consumer Price Index for food away from home.

Figure ES.7. Comparison of Mean Reported Cost per NSLP Lunch: SY 1992–1993, SY 2005–2006, SY 2014–2015 (Inflation-Adjusted 2015 Dollars)



Source: Data for SY 1992–1993 are from the School Lunch and Breakfast Cost Study-I (Glantz et al. 1994); data for SY 2005–2006 are from the School Lunch and Breakfast Cost Study-II (Bartlett et al. 2008); and data for SY 2014–2015 are from the School Nutrition and Meal Cost Study (Menu Survey, School Nutrition Manager Cost Interview, and SFA Director and Business Manager Onsite and Follow-Up Cost Interviews). Tabulations are weighted to be representative of all public SFAs offering the National School Lunch Program at each point in time.

Note: SFA is the unit of analysis.

* Difference between SY 2014–2015 and prior SY is significantly different from zero at the 0.05 level.

NSLP = National School Lunch Program; SFA = school food authority; SY = school year.

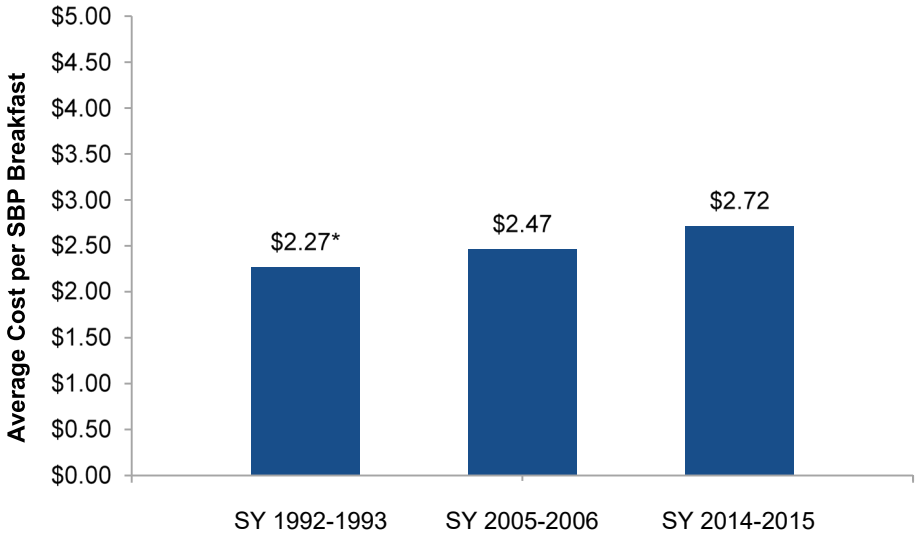
Similarly, for SBP breakfasts, the reported cost per SBP breakfast in 2015 dollars for the average SFA in SY 1992–1993 was $2.27, while in SY 2014–2015 it was 20 percent higher at $2.72 (Figure ES.8). However, the reported inflation-adjusted cost per SBP breakfast for the average SFA did not change significantly from SY 2005–2006 to SY 2014–2015. The inflation-adjusted mean cost per SBP breakfast also did not change significantly from SY 1992–1993 to SY 2005–2006.

Much has changed in the school meal programs since SY 2005–2006. Updated nutrition standards for reimbursable meals may have increased food costs (due to greater costs to purchase healthier foods), labor costs (if SFAs have shifted from commercially prepared foods to "scratch" cooking from raw ingredients), or both components. Indeed, food, labor, and other costs per NSLP lunch were significantly greater in SY 2014–2015 than in SY 2005–2006 and SY 1992–1993.[10] While available data do not permit precise comparisons, it appears that the composition of the reported cost per NSLP lunch was not materially different in SY 2014-2015 than in prior years, and that the magnitude of cost increases over time was similar for food, labor and other costs. Increases in the pricing of paid lunches (mandated by the HHFKA) may have reduced NSLP participation rates in lower-poverty SFAs. The smaller resulting volume of

[10] The estimated costs of food, labor, and other expenses per SBP breakfast also were greater in SY 2014–2015 than in the prior years, but not all of the differences were statistically significant.

lunches served may have reduced economies of scale and increased cost.[11] Following the establishment of nutrition standards for competitive foods, SFAs' revenues from these and other nonreimbursable foods have decreased (as discussed below), and SFAs' fixed costs may have shifted more to the NSLP and SBP.

Figure ES.8. Comparison of Mean Reported Cost per SBP Breakfast: SY 1992–1993, SY 2005–2006, SY 2014–2015 (Inflation-Adjusted 2015 Dollars)



Source: Data for SY 1992–1993 are from the School Lunch and Breakfast Cost Study-I (Glantz et al. 1994); data for SY 2005–2006 are from the School Lunch and Breakfast Cost Study-II (Bartlett et al. 2008); and data for SY 2014–2015 are from the School Nutrition and Meal Cost Study (Menu Survey, School Nutrition Manager Cost Interview, and SFA Director and Business Manager Onsite and Follow-Up Cost Interviews). Tabulations are weighted to be representative of all public SFAs offering the School Breakfast Program at each point in time.

Note: SFA is the unit of analysis.

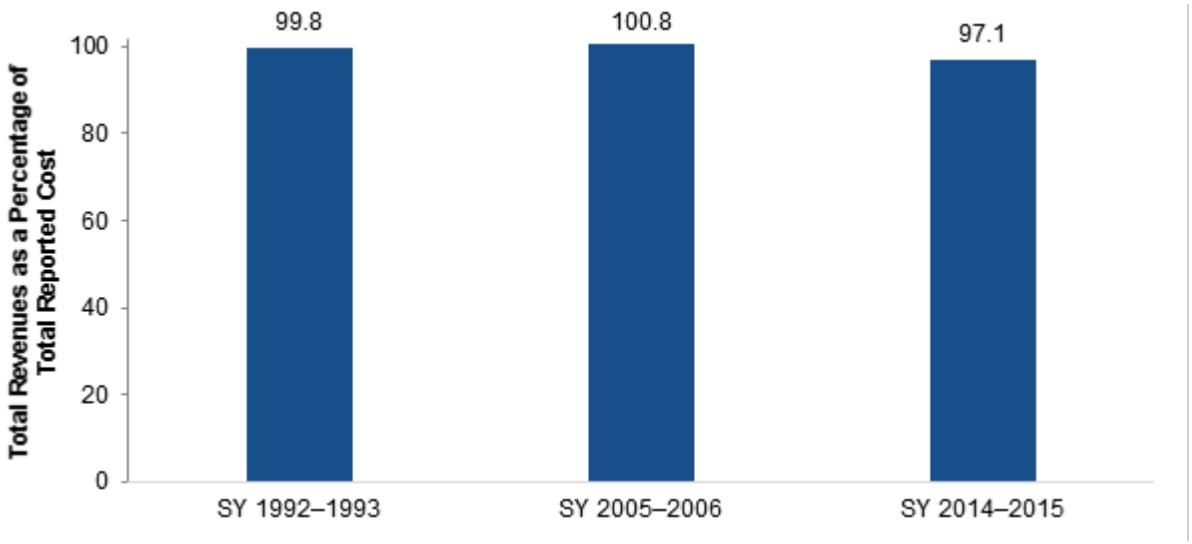
* Difference between SY 2014–2015 and prior SY is significantly different from zero at the 0.05 level.

SBP = School Breakfast Program; SFA = school food authority; SY = school year.

Although the reported cost per meal for NSLP lunches and SBP breakfasts increased significantly from levels in SY 1992–1993, total foodservice revenues kept pace with the trend in costs. The average SFA had revenues equal to 97 percent of reported costs in SY 2014–2015, and this measure was not significantly different from the "break-even" levels of approximately 100 percent (where revenues equal reported costs) in SY 2005–2006 and SY 1992–1993 (Figure ES.9).

[11] The mean price of a paid lunch increased by $0.49 from $1.93 in SY 2009–2010 to $2.42 in SY 2014–2015. In SY 2014–2015, a 10 cent increase in the price of a paid lunch was associated with a decline of 0.7 percentage points in the rate of paid meal participation (Forrestal et al. 2019). Lower poverty SFAs had more paid NSLP lunches (as a percentage of total lunches) than higher-poverty SFAs, so they likely experienced more of the impact from increasing prices mandated by the HHFKA.

Figure ES.9. Comparison of Total SFA Revenues to Reported Cost: SY 1992–1993, SY 2005–2006, SY 2014–2015 (Inflation-Adjusted 2015 Dollars)



Source: Data for SY 1992–1993 are from the School Lunch and Breakfast Cost Study-I (Glantz et al. 1994); data for SY 2005–2006 are from the School Lunch and Breakfast Cost Study-II (Bartlett et al. 2008); and data for SY 2014–2015 are from the School Nutrition and Meal Cost Study (Menu Survey, School Nutrition Manager Cost Interview, and SFA Director and Business Manager Onsite and Follow-Up Cost Interviews). Tabulations are weighted to be representative of all public SFAs offering the National School Lunch Program at each point in time.

Note: SFA is the unit of analysis.

None of the differences between SY 2014–2015 and prior SYs is significantly different from zero at the 0.05 level.

SFA = school food authority; SY = school year.

The share of SFA revenues from USDA subsidies was substantially higher in SY 2014–2015 (62 percent) than in SY 2005—2006 (51 percent) and SY 1992—1993 (47 percent) (Table ES.1). Over the same time period, the share of SFA revenues from student payments for reimbursable meals and a la carte and other nonreimbursable food sales declined. These changes are consistent with the recent increase in the percentage of meals claimed at the higher free and reduced-price rates, as well as the additional performance-based payment for SFAs meeting the updated nutrition standards for school meals and the alternative funding formula for the Community Eligibility Provision.

Between SY 2009–2010 and SY 2014–2015, the average price of a paid lunch increased by 25 percent (from $1.93 to $2.42) (Forrestal et al. 2019). This increase is consistent with the Paid Lunch Equity (PLE) rule, which went into effect in SY 2011–2012 and affected the minimum price SFAs may charge for paid lunches. The purpose of the PLE rule is to ensure that SFAs' foodservice accounts receive sufficient funds for paid lunches from student payments or other non-Federal sources so that paid lunches are not subsidized by the reimbursement for free and reduced-price meals. The standard of equity is that the price of a paid lunch equals or exceeds the difference in USDA reimbursements between paid and free lunches. A comparison of reimbursement rates and average prices charged for paid meals in SY 2009–2010 and SY 2014–2015 suggests that the increase in paid meal prices over time is having the intended effect. Over this time period, the gap between the price of a paid lunch and the difference between USDA reimbursement rates for free and paid lunches decreased by 44 percent (from $0.50 to $0.28) (data not shown; internal analysis completed by FNS staff).

Table ES.1. Comparison of the Composition of SFA Revenues: SY 1992–1993, SY 2005–2006, SY 2014–2015

Source of Revenues	Mean Percentage of SFA Revenues		
	SY 1992–1993	SY 2005–2006	SY 2014–2015
USDA subsidies	46.7*	50.6*	62.5
Student payments for reimbursable meals	35.0*	24.2*	20.0
A la carte and other nonreimbursable sales	15.4*	15.8*	10.9
State and local government funds	3.9	8.8	5.9
Other cash revenues	1.8*	0.6	0.6

Source: School Lunch and Breakfast Cost Study-I (Glantz et al. 1994); School Lunch and Breakfast Cost Study-II (Bartlett et al. 2008); School Nutrition and Meal Cost Study, Menu Survey, School Nutrition Manager Cost Interview, and SFA Director and Business Manager Cost Interviews (Onsite and Follow-Up), school year 2014–2015. Tabulations are weighted to be representative of all public SFAs offering the National School Lunch Program.

* Difference in means between prior study and SY 2014–2015 is significantly different from zero at the 0.05 level.

E. Full Costs of Producing Reimbursable Meals

The reported costs considered in the preceding analyses include only costs that are charged to the school foodservice account. In most SFAs, however, school foodservice operations—and therefore the *full* costs of producing both reimbursable school meals and nonreimbursable foods—also include costs incurred by the school district that are not charged to the SFA, because the school district cannot or chooses not to cover the costs with school foodservice revenues. These *unreported* costs may include costs associated with the time teachers spend at schools supervising students during meals, the time accountants spend on the payroll for foodservice employees, and fringe benefits associated with these labor costs. In addition, a portion of fringe benefit costs for foodservice personnel may be unreported costs if these costs are not fully charged to the foodservice account. Finally, unreported costs may include indirect costs, such as the costs of electricity, that are attributable to school foodservice operations but not charged to the SFA. In SY 2014–2015, only 21 percent of SFAs had reported indirect costs,[12] and more than 97 percent of SFAs had unreported indirect costs.

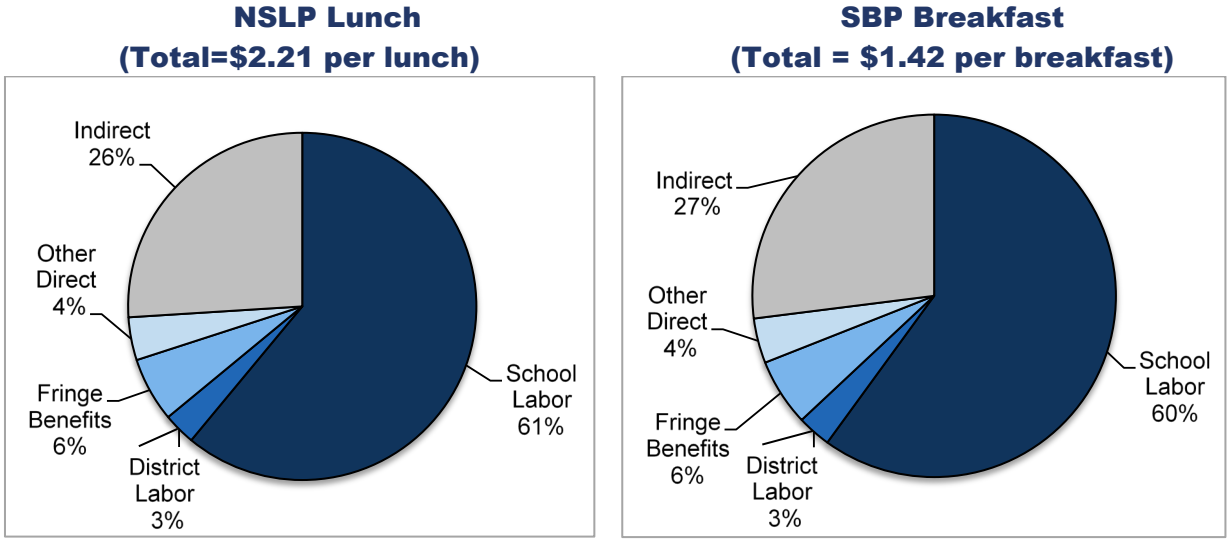
1. Composition of Unreported Cost

For the average SFA, the total unreported cost per NSLP lunch was $2.21. Labor costs (pay and benefits) for school personnel not paid by the school foodservice account were the largest component (61 percent) of the unreported cost per NSLP lunch (Figure ES.10). School personnel often oversee students in the cafeteria and provide cleaning, maintenance, and administrative support for school foodservice. The second largest component (26 percent) of the unreported cost per NSLP lunch was indirect costs. As noted above, only about one-fifth of SFAs reported any indirect costs for school foodservice, but nearly all had unreported indirect costs. The remainder of the unreported cost per NSLP lunch consisted of small amounts for district labor, fringe benefits, and other direct costs.

[12] Reported indirect costs are charges to the school foodservice account for resources provided by the school district when such charges are made by applying an indirect cost rate or other indirect cost allocation method.

The unreported cost per SBP breakfast was $1.42. The composition of this unreported cost was very similar to that of NSLP lunch (Figure ES.10).

Figure ES.10. Composition of Unreported Cost per NSLP Lunch and per SBP Breakfast, SY 2014–2015



Source: School Lunch and Breakfast Cost Study-I (Glantz et al. 1994); School Lunch and Breakfast Cost Study-II (Bartlett et al. 2008); School Nutrition and Meal Cost Study, Menu Survey, School Nutrition Manager Cost Interview, SFA Director and Business Manager Onsite and Follow-Up Cost Interviews, SY 2014–2015. Tabulations are weighted to be representative of all public SFAs offering the National School Lunch Program.

Note: SFA is the unit of analysis.

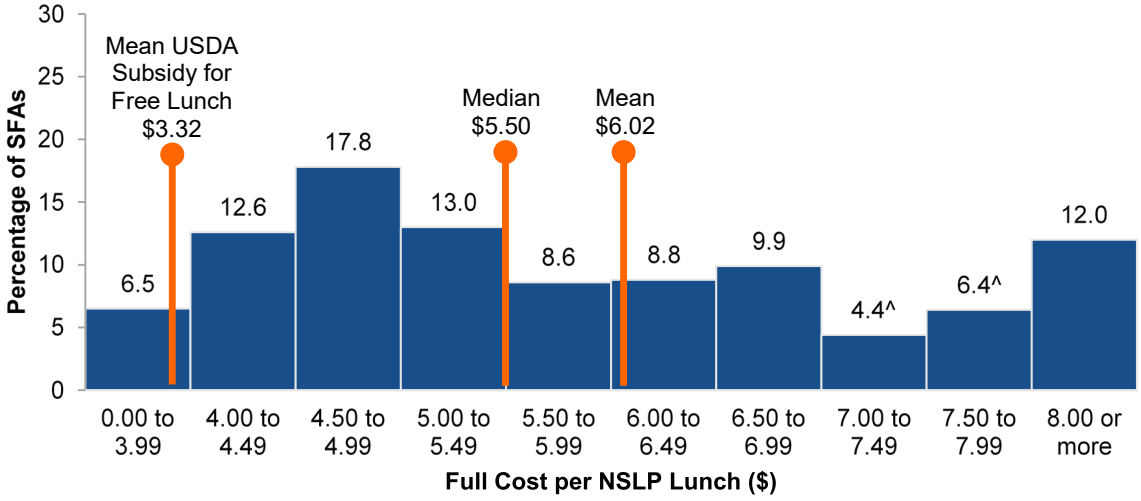
NSLP = National School Lunch Program; SBP = School Breakfast Program; SFA = school food authority; SY = school year.

2. Full Cost per NSLP Lunch

For the average SFA, the full cost per NSLP lunch in SY 2014–2015 was $6.02 (Figure ES.11). The mean full cost per NSLP lunch was 58 percent more than the mean reported cost ($3.81) and 81 percent more than the mean USDA subsidy for a free lunch ($3.32). More than one-third (37 percent) of SFAs had a full cost of less than $5.00 per NSLP lunch, while the top third of SFAs (33 percent) had a full cost of more than $6.50 per lunch.

Using the meal as the unit of analysis, the mean full cost of an NSLP lunch was $5.55. As with the reported cost, this mean was less than the full cost per NSLP lunch for the average SFA, due to the greater influence of large SFAs.

Figure ES.11. Distribution of SFAs by Full Cost per NSLP Lunch, SY 2014–2015



Source: School Nutrition and Meal Cost Study, Menu Survey, School Nutrition Manager Cost Interview, and SFA Director and Business Manager Onsite and Follow-Up Cost Interviews, SY 2014–2015. Tabulations are weighted to be representative of all public SFAs offering the National School Lunch Program.

Note: SFA is the unit of analysis.

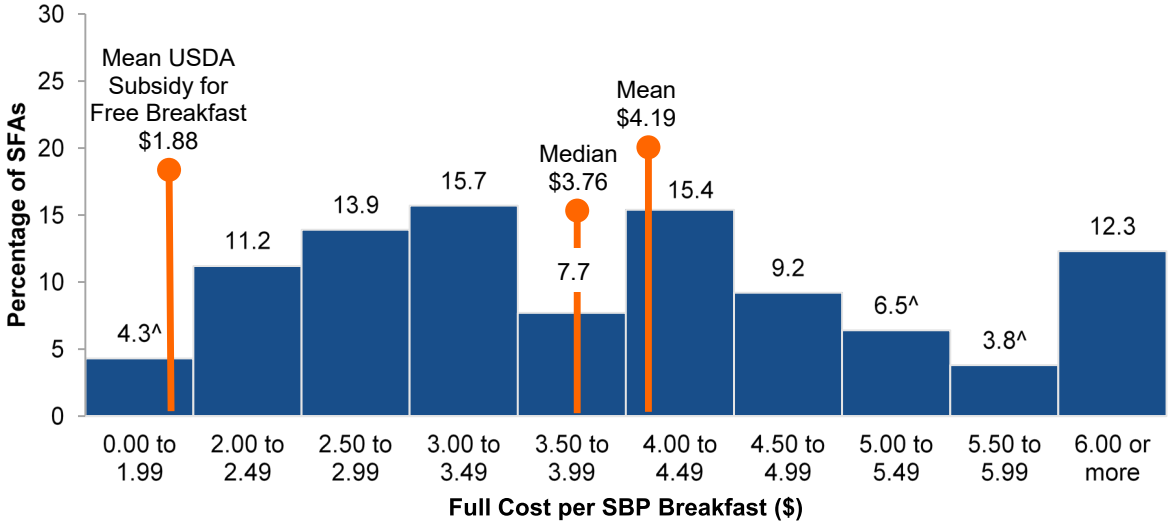
NSLP = National School Lunch Program; SFA = school food authority; SY = school year.

^ Point estimate is considered less precise than estimates that are not flagged because the sample size is small or the coefficient of variation is large. The rules used in flagging estimates are described in Chapter 1. When these rules are applied, percentages close to 0 or 100 are often flagged.

3. Full Cost per SBP Breakfast

For the average SFA, the full cost of producing a SBP breakfast in SY 2014–2015 was $4.19 (Figure ES.12). The mean full cost per SBP breakfast was 54 percent greater than the mean reported cost ($2.72) and more than twice the mean reimbursement rate for a free breakfast ($1.88). Less than one-third (29 percent) of SFAs had a full cost of less than $3.00 per SBP breakfast, while about one-third (32 percent) had a full cost of $4.50 or more per breakfast. The mean full cost of an SBP breakfast was $3.50 (using the meal rather than the SFA as the unit of analysis).

Figure ES.12. Distribution of SFAs by Full Cost per SBP Breakfast, SY 2014–2015



Source: School Nutrition and Meal Cost Study, Menu Survey, School Nutrition Manager Cost Interview, and SFA Director and Business Manager Onsite and Follow-Up Cost Interviews, SY 2014–2015. Tabulations are weighted to be representative of all public SFAs offering the National School Lunch Program.

Notes: SFA is the unit of analysis.

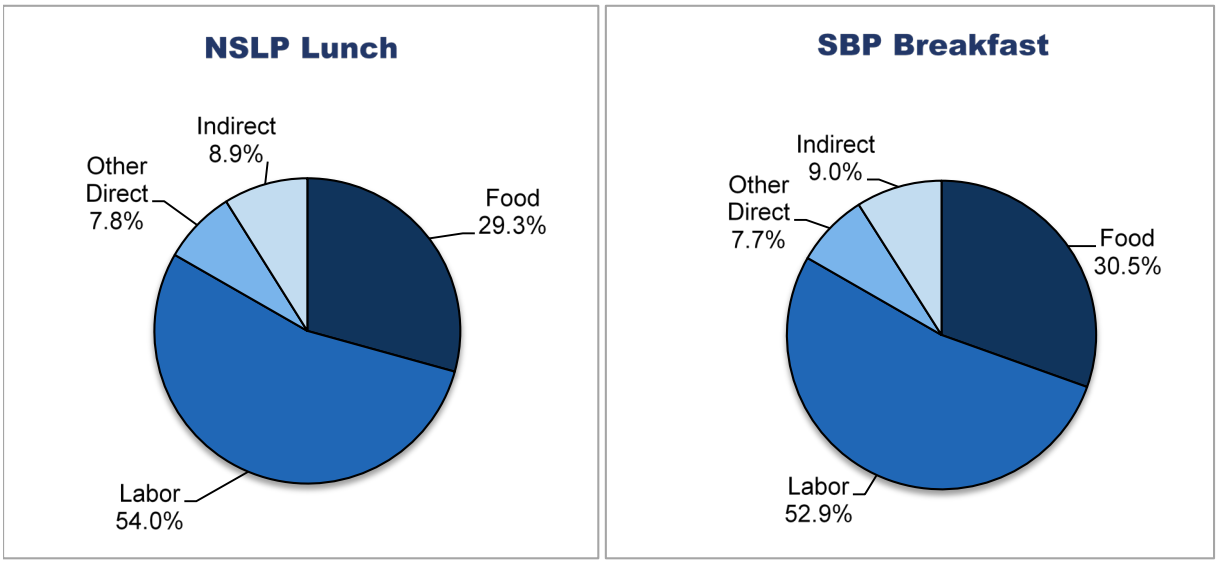
SBP = School Breakfast Program; SFA = school food authority; SY = school year...

^ Point estimate is considered less precise than estimates that are not flagged because the sample size is small or the coefficient of variation is large. The rules used in flagging estimates are described in Chapter 1. When these rules are applied, percentages close to 0 or 100 are often flagged.

4. Composition of Full Meal Costs

For the average SFA, food and labor costs accounted for 83 percent of the full cost per NSLP lunch (29 percent and 54 percent respectively) and per SBP breakfast (30 percent and 53 percent) (Figure ES.13). For both meals, indirect costs contributed 9 percent and other direct costs contributed 8 percent.

Figure ES.13. Composition of Full Cost per NSLP Lunch and SBP Breakfast, SY 2014–2015



Source: School Nutrition and Meal Cost Study, Menu Survey, School Nutrition Manager Cost Interview, and SFA Director and Business Manager Onsite and Follow-Up Cost Interviews, SY 2014–2015. Tabulations are weighted to be representative of all public SFAs offering the National School Lunch Program.

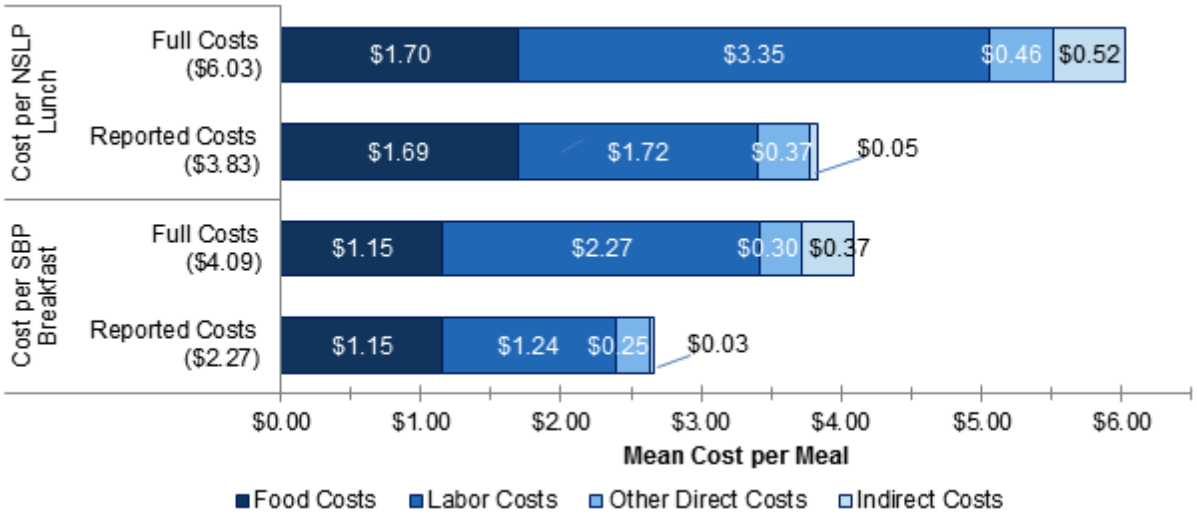
Note: SFA is the unit of analysis.

NSLP = National School Lunch Program; SBP = School Breakfast Program; SFA = school food authority; SY = school year.

Comparison of reported cost and full cost per NSLP lunch for the average SFA reveals how the key unreported cost components shifted the magnitude and composition of these costs (Figure ES.14). Unreported labor costs—mainly for school personnel not paid by the school foodservice account—were the largest component of unreported costs. When these costs were considered in the calculation of full costs, the labor cost per NSLP lunch increased from $1.72 (reported) to $3.35 (full). The majority of SFAs did not report their indirect costs, and the indirect cost per NSLP lunch increased from $0.05 (reported) to $0.52 (full). The difference in other direct costs between reported cost and full cost per NSLP lunch was much smaller, and reported and full food cost per NSLP lunch were the same.[13] The patterns of difference between reported cost and full cost in the average SFA per SBP breakfast were essentially the same as for NSLP lunches.

[13] The apparent difference of $0.01 per NSLP lunch between reported and full food cost was the result of a slight difference in the samples for the estimates. No SFAs identified any unreported food costs. The mean reported and full cost per NSLP lunch for all components combined in Figure ES.14 differ slightly from the mean values reported elsewhere in this section because of the exclusion of some SFAs from the estimates of costs by component.

Figure ES.14. Composition of Mean Reported and Full Cost per NSLP Lunch and SBP Breakfast, SY 2014–2015



Source: School Nutrition and Meal Cost Study, Menu Survey, School Nutrition Manager Cost Interview, and SFA Director and Business Manager Onsite and Follow-Up Cost Interviews, SY 2014–2015. Tabulations are weighted to be representative of all public SFAs offering the National School Lunch Program.

Note: The mean reported and full cost per meal for all components combined in Figure ES.14 differ slightly from the mean values reported elsewhere in this section due to the exclusion of some SFAs from the estimates of costs by component.

NSLP = National School Lunch Program; SBP = School Breakfast Program; SY = school year.

F. Relationships among Meal Costs, Revenues, and SFA and School Characteristics

To address multiple study research questions, the study team examined relationships at the school and/or SFA levels between school meal costs and key characteristics in five domains:

- Institutional and demographic characteristics (school-level and SFA-level)
- Key characteristics of reimbursable meals (school-level)
- Key characteristics of school foodservice operations (school-level and SFA-level)
- Key characteristics of the school food environment (school-level)
- Other SFA-level operating characteristics (SFA-level).

These analyses estimated the relationships between reported and full per-meal costs for the NSLP and SBP and the characteristics in each of the five domains of SFA and school characteristics. To facilitate comparisons and syntheses across analyses, the definitions of domains and the selection of the characteristics within these domains for the school-level models were based on the domains and characteristics used in the models of the nutritional quality of NSLP and SBP meals reported in Volume 2 of the SNMCS final report (Gearan et al. 2019).

Regression models provided estimates of differences in mean costs per meal between schools or SFAs that differed on each characteristic while controlling for all of the other characteristics in the domain and for institutional and demographic characteristics.[14,15] The same methods provided adjusted estimates of differences in mean revenues as a percentage of reported costs for the NSLP and SBP that were associated with the SFA-level characteristics in the analysis domains. Because the probability of finding significant associations by chance increases with the number of associations tested, findings from these analyses should be considered exploratory and interpreted with caution. In addition, it is important to understand that significant associations do not imply causality.

As a rule, relationships are discussed in this report only when a characteristic is associated with more than one outcome of the same type (that is, cost per meal or revenue as a percentage of cost) in the same direction. Given that the outcomes are associated with one another, a particular detected significant relationship's association with only one outcome increases the likelihood that it is due to random variation in the data as opposed to a true underlying difference.

The multivariate analyses tested one of the study's four confirmatory hypotheses—that healthier school meals cost more. The mean Healthy Eating Index (HEI)-2010 scores for NSLP lunches and SBP breakfasts in each sample school were used to measure the healthfulness of school meals.[16] HEI-2010 scores range from 0 to 100 with higher scores indicating healthier meals. Contrary to expectations, the analysis did not find a significant relationship between the HEI-2010 score and the reported cost per meal, either for NSLP lunches or for SBP breakfasts (findings for NSLP lunches are shown in Figure ES.15). That is, mean reported costs per meal were not significantly higher in schools that prepared more-nutritious meals—schools that had higher scores on the HEI-2010—than in schools that produced the least-nutritious meals—schools that scored the lowest on the HEI-2010.[17]

In addition, with two exceptions discussed below, there were no significant associations between compliance with updated nutrition standards and meal costs. At the school level, a modest number of other characteristics had a significant relationship to reimbursable meal costs:

- Reported and full costs per SBP breakfast were significantly higher in schools that met the minimum calorie level for breakfasts than in schools that did not meet this standard (those

[14] Institutional and demographic characteristics of SFAs and schools that were controlled for in models included SFA size, whether the SFA was composed of a single or multiple districts, FNS region, urbanicity, district child poverty rate, percentage of minority students, percentage of students approved for free or reduced-price meals, school size, and school type.

[15] The findings reflect the specific models estimated for this report, which are discussed in Chapter 6. Other models might yield different findings.

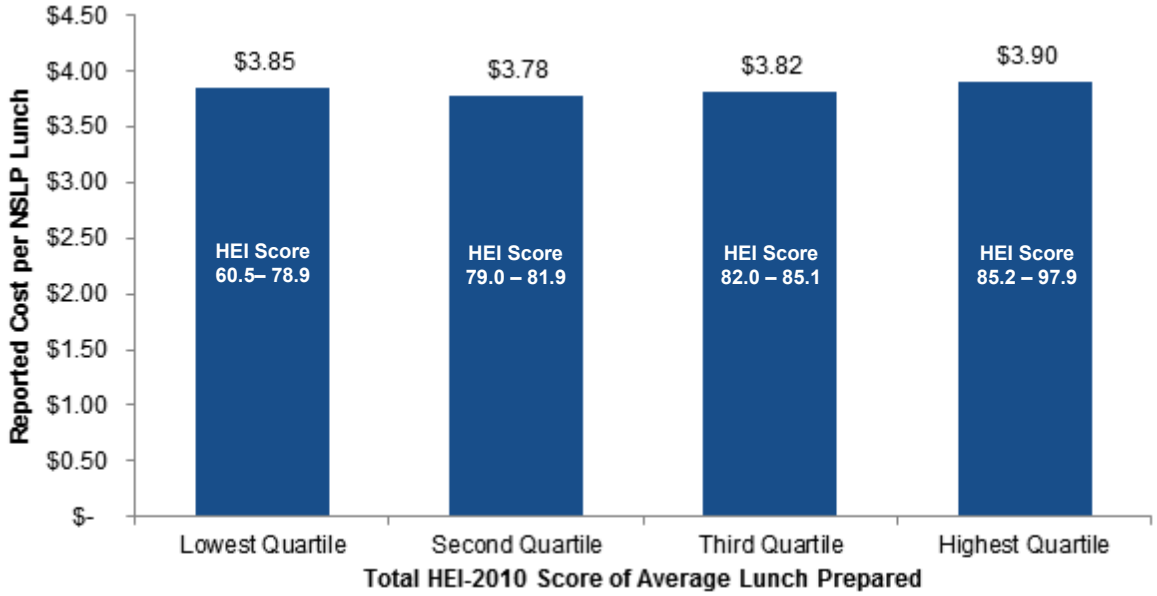
[16] Volume 2 of the SNMCS final report (Gearan et al. 2019) describes the HEI-2010 and how these scores were derived.

[17] This findings is at least partially explained by the fact that there was relatively little variation in mean HEI-2010 scores in SY 2014–2015. For example, there was an 8.9 point standard deviation in HEI-2010 scores for NSLP lunches in SY 2014–2015 (data not shown). In contrast, the variance in HEI-2010 scores for NSLP lunches in SY 2009-2010—when the updated nutrition standards were not in effect—was 32 percent larger (11.7 points versus 8.9 points; data not shown).

that provided fewer calories than required). In addition, reported and full costs per SBP breakfast and reported cost per NSLP lunch were significantly lower in schools that met the maximum calorie level than in schools that exceeded this standard (provided more calories than required). Consistent with expectations, these results suggest that breakfasts (and perhaps lunches) with fewer calories were less expensive.

- Schools that did not sell competitive foods during mealtimes had significantly higher reported and full cost per NSLP lunch. This finding is consistent with the expectation that sales of competitive foods help to reduce costs for reimbursable meals by sharing fixed costs of school foodservice (such as administrative staff). When competitive foods are extra servings of foods offered for reimbursable meals, the production costs of reimbursable meals may also be reduced through economies of scale.

Figure ES.15. Relationship between Meal Costs and Healthy Eating Index-2010 Scores: Regression-Adjusted Means for Reported Cost per NSLP Lunch



Source: School Nutrition and Meal Cost Study, School Nutrition Manager Cost Interview, School Principal Cost Interview, and SFA Director and Business Manager Cost Interviews (Onsite and Follow-Up), Menu Survey, school year 2014–2015. Regression-adjusted mean estimates are weighted to be representative of all public, non-charter schools offering the NSLP.

Notes: Outliers on cost measures were trimmed to avoid excessive influence on means. Cost measures at or below the 3rd percentile were set to the 3rd percentile, and measures at or above the 97th percentile were set to the 97th percentile.

Regression analysis was conducted at the school level. Standard errors are adjusted to account for clustering of schools within SFAs. Estimates are regression-adjusted means that control for institutional and demographic characteristics of each school and their SFA. Variables with rows labeled "Y" and "N" report adjusted mean values for the outcome listed in the column for schools that do and do not meet the variable criteria, respectively. Otherwise, regression-adjusted means are reported for each category within a variable. See Appendix B for more details on characteristic descriptions and selection methods.

None of the differences in means between the reference category (lowest quartile) and the other categories was statistically significant.

- Schools with breakfast in the classroom had significantly lower reported and full cost per SBP breakfast, suggesting that this approach may have saved costs as well as facilitated participation (see Fox et al. 2019, Figure 4.3). The model controlled for other characteristics of school foodservice operations, including whether breakfast was offered at no charge to all students (which was not a significant factor in SBP costs).
- Medium-sized (as measured by enrollment, controlling for school type and other factors) had significantly lower costs for the NSLP and SBP than small schools, and large schools also had significantly lower costs for the SBP than small schools, suggesting some economies of scale at the school level.
- Middle schools had significantly higher costs for the NSLP and SBP than elementary schools (after controlling for school size and other factors). High schools also had significantly higher costs for the NSLP. These findings may reflect differences in menus and meal pattern requirements.
- Schools and SFAs in districts with higher poverty rates had lower SBP costs and higher SBP revenues as a percentage of reported costs. This finding is consistent with the expectation that higher-poverty schools have higher rates of SBP participation by students, and that schools with higher SBP participation have lower costs per SBP breakfast.

At the SFA level, a similarly modest number of characteristics had a significant relationship to meal costs and revenues.

- SFAs that purchased fruits and vegetables through the U.S. Department of Defense Fresh Fruit and Vegetable Program had significantly higher reported and full cost per SBP breakfast.[18]
- For SFA directors, more education and certification by the School Nutrition Association were associated with lower costs and higher revenues relative to costs for the NSLP, SBP, or both.
- Two different patterns appeared in the relationship of equipment costs to overall meal costs. On the one hand, SFAs that used local education agency funds for equipment purchases had lower costs for NSLP and SBP meals than SFAs that did not. On the other hand, SFAs that purchased new equipment to meet updated nutrition standards had higher SBP costs and lower SBP revenues relative to costs, compared with SFAs that did not report this practice.
- NSLP costs were lower in the Midwest and Western regions than in the Mid-Atlantic region, which was used as the reference category.

[18] The Fresh Fruit and Vegetable Program allows SFAs to use their USDA Foods entitlement to buy produce from the Department of Defense instead of purchasing fruits and vegetables through commercial suppliers.

1. INTRODUCTION

The National School Lunch Program (NSLP) and School Breakfast Program (SBP) form the cornerstone of the nation's nutrition safety net for low-income children. These programs, which are administered by the U.S. Department of Agriculture (USDA), Food and Nutrition Service (FNS), provide 30 million Federally subsidized lunches and 15 million Federally subsidized breakfasts to children each school day (USDA, FNS 2018a and 2018b). Children whose families are living below 130 percent of the Federal poverty level (FPL) are eligible for free meals, although schools in high-poverty areas may provide free meals on a universal basis regardless of households' income. For children whose families earn between 130 and 185 percent of the FPL, meals can be purchased at a reduced price. Children who do not apply or qualify for free or reduced-price meals pay full price for the meals.

At the State level, the NSLP and SBP are administered by State child nutrition (CN) agencies and at the local level by school food authorities (SFAs).[19] State CN agencies are responsible for ensuring SFAs comply with Federal regulations, but SFAs and schools have operational discretion in how they administer the programs within Federal and State guidelines. For example, SFAs and schools have options in how they set meal prices, plan their menus, select methods of food production, and use nutrition promotion techniques.

SFAs that participate in the NSLP and SBP receive two types of Federal assistance: cash reimbursements and donated USDA Foods (formerly known as "commodity foods"). SFAs receive a cash reimbursement for each meal and snack served, with substantially higher rates of reimbursement for meals served free or at a reduced price to income-eligible students. In addition, SFAs that serve high proportions of low-income children are eligible to receive higher levels of reimbursement.

- For the NSLP, schools that served 60 percent or more of their reimbursable lunches free or at a reduced price in the second preceding school year receive $0.02 more per NSLP lunch than schools not meeting this criterion.
- For the SBP, SFAs receive Federal reimbursement at the higher "severe need" level for free and reduced-price SBP breakfasts served in schools classified as "severe need" because they served at least 40 percent of NSLP lunches free or at a reduced price in the second preceding school year (SY).

Finally, SFAs certified to be compliant with updated nutrition standards (discussed below) receive an additional $0.06 for each reimbursable lunch served. Table 1.1 provides the SY 2014–2015 Federal reimbursement rates for the NSLP and SBP for free, reduced-price, and paid (full-price) meals.[20]

[19] SFAs and school districts are distinct governing bodies. SFAs are the governing bodies responsible for school foodservice operations, but some of the responsibilities are fulfilled by school districts or individual schools, most notably determining eligibility for free or reduced-price meals, local wellness policies, and practices regarding competitive food sales. In this report, the text distinguishes between SFAs and school districts when referring to situations in which the finances of the SFA are distinct from those of the school district.

[20] The reimbursement rates presented in Table 1.1 are for the contiguous 48 States. SFAs in Alaska, Hawaii, and Puerto Rico receive higher reimbursement rates.

Table 1.1. USDA Reimbursement Rates for NSLP Lunches and SBP Breakfasts in SY 2014–2015

	NSLP Lunches		SBP Breakfasts[a]	
	Less than 60% of NSLP Lunches Free or Reduced Price	60% or More of NSLP Lunches Free or Reduced Price	Less than 40% of NSLP Lunches Free or Reduced Price	40% or More of NSLP Lunches Free or Reduced Price
Free meals ($)	2.98	3.00	1.62	1.93
Reduced-price meals ($)	2.58	2.60	1.32	1.63
Paid (full-price) meals ($)	0.28	0.30	0.28	0.28
Additional payment for meals compliant with nutrition standards ($)	0.06	0.06	n.a.	n.a.

Source: United States Department of Agriculture, Food and Nutrition Service, 2014.

[a]Schools with 40 percent or more of NSLP lunches served free or at a reduced price are designated as "severe need" for the purposes of the SBP.

NSLP = National School Lunch Program; SBP = School Breakfast Program; SFA = school food authority: SY =school year.

The value of each SFA's entitlement to donated USDA Foods is based on an established per-meal flat rate, which is applied to the number of reimbursable lunches served the preceding school year. The national average minimum value of donated foods, per lunch served in schools participating in NSLP during School Year 2014 – 2015 was 24.75 cents. Due to a regulation that requires 12 percent of total funding for school meals to come in the form of USDA Foods, SFAs might receive a higher amount of entitlement funding per lunch served. Subject to availability, SFAs may also be offered bonus USDA Foods in addition to their entitlement amount. The types and amounts of bonus USDA Foods available vary from year to year based on agricultural surpluses and purchasing decisions USDA makes. SFAs also receive funds from States, which are required to provide support as a condition of receiving Federal funds. With few exceptions,[21] States are required to contribute no less than 30 percent of the NSLP funds they received in SY 1980–1981 (7 CFR 210.17). Some SFAs also receive local funds. Federal assistance is intended to supplement State and local resources (including student payments) and help ensure children are provided nutritious school meals, not to cover all costs of producing school meals.

In SY 2012–2013, the school meal programs began to undergo widespread changes, mainly stemming from the Healthy, Hunger-Free Kids Act of 2010 (HHFKA; Public Law 111-296). Key reforms included more fruits, vegetables, and whole grains in the school menu; updated nutrition standards to improve the nutritional quality of school meals and students' diets to reduce children's risk of developing chronic diseases; a new requirement that students select at least 1/2 cup of fruit or vegetables for their meal to be eligible for Federal reimbursement; and the introduction of nutrition standards for all foods and beverages sold in competition with reimbursable meals in schools during the school day (competitive foods). As part of the HHFKA, FNS established the Paid Meals Equity requirement to require SFAs to balance revenues from paid and free lunches by increasing prices for paid meals where necessary to equal the difference

[21] States with a per capita income less than that of the United States as a whole have a reduced requirement.

between USDA reimbursements for free and paid lunches.[22] New pricing standards for competitive foods were also established in part as a response to research that indicated that net revenues from reimbursable meals were subsidizing the costs of serving competitive foods (Bartlett et al. 2008).

All of these reforms have important implications for the school meal programs. The updated nutrition standards are intended to improve the nutritional quality of school meals. However, complying with the updated standards may affect the costs schools face in producing school meals. In addition, meals that comply with the updated standards and new menu options that schools developed may not be as acceptable to students as some of the former options that were served. This could lead to changes in student participation if student acceptability is not taken into account. Students' decisions to eat school meals may also be affected by the requirement to take at least a 1/2 cup of fruits or vegetables or the prices charged for paid meals. The updated nutrition standards for competitive foods may affect students' consumption of these foods and the likelihood of purchasing reimbursable meals. Ultimately, changes in school meal participation and consumption of competitive foods may affect the quality of students' diets.

There is a critical need for information about how SFAs, school districts, and schools are doing in implementing the changes made in response to the HHFKA and about whether and how these changes affect school foodservice operations; the nutritional quality, cost, and acceptability of meals; student participation and satisfaction; plate waste; and the quality of students' diets. To ensure this information would be available to policymakers and other stakeholders, FNS sponsored the School Nutrition and Meal Cost Study (SNMCS). The SNMCS continues FNS's long-standing commitment to periodically assess the school meal programs. It is the first nationally representative, comprehensive assessment of the NSLP and SBP since major reforms began in SY 2012–2013.

The goal of the SNMCS was to describe the following after implementation of the updated nutrition standards:

- ***School meal program operations and school nutrition environments***
- ***Food and nutrient content of school meals and afterschool snacks and overall nutritional quality of school meals***
- ***School meal costs and school foodservice revenues***
- ***Student participation, student and parent satisfaction, plate waste, and students' dietary intakes***

Relative to prior studies of the school meal programs, the SNMCS is unique in three important ways. No previous national study of the school meal programs has (1) simultaneously examined the costs of producing school meals and the nutritional quality of those meals; (2) examined students' acceptance of school meals in a quantitative way, using data on the amount of food students waste (plate waste); or (3) examined associations between major outcomes of interest, for example, the association between the nutritional quality of school meals and student participation and the association between the cost and nutritional quality of school meals.

[22] The Paid Lunch Equity requirement allows the increase in paid lunch prices to be gradual and exempts certain SFAs with strong foodservice fund balances from the requirement.

A. Overview of the School Nutrition and Meal Cost Study

The SNMCS addressed a broad array of research questions of interest to stakeholders at the national, State, and local levels. Its research questions are grouped under four broad domains:

- School meal program operations and school nutrition environments
- Food and nutrient content of school meals and afterschool snacks and overall nutritional quality of meals
- School meal costs and school foodservice revenues
- Student participation, student and parent satisfaction, plate waste, and students' dietary intakes

To address these research questions, the SNMCS collected data from nationally representative samples of public SFAs and public, non-charter schools participating in the NSLP, students enrolled in these schools, and their parents. The sections that follow describe the SNMCS data collection instruments and activities, followed by the response rates and sample sizes for the components of the study covered in this report volume. Readers who are interested in technical details about the study design, sampling, and data collection procedures should refer to the SNMCS methodology report (Zeidman et al. 2019).

1. Data Collection Instruments and Activities

The SNMCS data collection instruments are summarized in Table 1.2 and the data collection activities are described below, organized by the four domains. With the exception of follow-up cost interviews, data collection activities were completed in spring of SY 2014–2015.

Table 1.2. Data Collection Instruments

Instrument	Respondent	Mode
School Meal Program Operations and School Nutrition Environments		
SFA Director Survey	SFA directors	Web
School Nutrition Manager Survey	School nutrition managers	Web
A la Carte Checklist	School nutrition managers	Web
Principal Survey	Principals	Web
Competitive Foods Checklists		
Vending Machine Checklist	School liaisons	Hard copy
Other Sources of Foods and Beverages Checklist	School liaisons	Hard copy
Cafeteria Observation Guide	Field staff, with school nutrition manager input	On-site observation
Nutritional Quality of School Meals		
Menu Survey	School nutrition managers	Web

Instrument	Respondent	Mode
School Meal Costs and School Foodservice Revenues		
State Education Agency Finance Officer Indirect Cost Survey	State Child Nutrition directors and State education agency finance officers	Telephone
Expanded Menu Survey	School nutrition managers	Web
SFA Director and Business Manager Cost Interview	SFA directors and business managers	In-person (plus telephone for follow-up interviews)
Principal Cost Interview	Principals	In-person
School Nutrition Manager Cost Interview	School nutrition managers	In-person
Student Participation, Student and Parent Satisfaction, Plate Waste, and Students' Dietary Intakes		
24-hour Dietary Recall	Students	In-person (plus telephone for second recalls in a subsample)
Child/Youth Interview	Students	In-person
Height and Weight Measurements	Students	In-person
Parent Interview	Parents	In-person or telephone
Reimbursable Meal Sales Administrative Data	Field staff	Hard copy
Plate Waste Observations	Field staff, with school nutrition manager input	On-site observation

Source: School Nutrition and Meal Cost Study, SY 2014–2015.
SFA = school food authority.

To describe **SFA and school characteristics, foodservice operations, and school nutrition environments:**

- SFA directors (staff who are responsible for the oversight of school meal operations across one or more schools within an SFA) completed the web-based SFA Director Survey, which asked about SFA-level foodservice operations and policies, implementation of the updated nutrition standards, nutrition promotion and outreach, and SFA directors' backgrounds. Although some SFAs were selected to complete only the SFA Director Survey, the majority of SFAs selected to participate in the SNMCS had schools that were also selected to participate in school-level data collection.
- School nutrition managers (SNMs; staff who are responsible for school-level foodservice operations, including the provision of meals to students) completed the web-based SNM Survey.[23] Topics included school-level foodservice operations, implementation of the updated nutrition standards, meal pricing, provision of afterschool snacks and suppers, and nutrition promotion and outreach. SNMs also completed the A la Carte Checklist to describe items available for a la carte purchase at breakfast or lunch.

[23] The term *school nutrition manager* is updated from prior School Nutrition Dietary Assessment studies, which used *foodservice manager* to refer to these staff.

- Principals completed the web-based Principal Survey, which asked about school characteristics, school meal policies, competitive foods sources and policies, and nutrition education and promotion.
- School liaisons (non-foodservice staff who were identified during school recruitment) completed two forms known collectively as the Competitive Foods Checklists. These forms captured information about the nonreimbursable items available for sale to students in locations such as vending machines or school stores.
- Trained field interviewers completed observations of the cafeteria environment (for example, serving line configurations and the availability of potable water) during breakfast and lunch. SNMs provided input to answer some of the questions on the form, called the Cafeteria Observation Guide.

To describe **the food and nutrient content of school meals and afterschool snacks and the overall nutritional quality of meals**, SNMs completed the web-based Menu Survey.[24] The Menu Survey collected detailed information about the foods offered and served in reimbursable meals and afterschool snacks during one school week, referred to as the "target week." Most SNMs completed an expanded version of the Menu Survey that collected additional information needed for cost analyses, including information on nonreimbursable foods and the total quantity of food used at each meal.

To describe **the costs of producing school meals and school foodservice revenues** presented in this volume, trained field interviewers completed cost interviews with SFA directors and business managers, SNMs, and school principals to capture the labor costs associated with producing school meals. SFA directors and business managers also answered questions related to SFA staffing and operations and indirect costs as part of their interview. During follow-up interviews, researchers reviewed each SFA's SY 2014–2015 annual financial statement with SFA and school district officials to verify reported costs, identify unreported costs, obtain information to impute the value of unreported costs, and determine the SFA's annual revenues. These cost interview data were combined with the data collected in the Menu Survey, as noted above, to determine the composition of school foodservice costs and revenues.

Finally, to describe **student participation, parent and student satisfaction, plate waste, and students' dietary intakes,** respondents participated in a variety of activities:

- Sampled students in participating schools completed a 24-hour dietary recall and the Child/Youth Interview, and they had their height and weight measured by trained field interviewers.
- The parents/guardians of students participating in the study completed the Parent Interview in person (for parents of elementary school students) or by telephone (for parents of middle and high school students).
- School foodservice staff provided administrative data, typically generated by point-of-sale systems, on whether the school recorded sampled students as having received a reimbursable breakfast or lunch on the day referenced in the 24-hour dietary recall.

[24] In some schools, other respondents, such as SFA directors or other SFA staff, completed the Menu Survey.

- Trained field interviewers conducted plate waste observations on a sample of breakfasts and lunches in participating schools. These observations documented the foods and beverages taken by students and the amounts of these foods that students wasted (did not consume).

Findings from the extensive analyses of data collected in the SNMCS are presented in four report volumes, plus a summary report (Fox and Gearan 2019) that highlights key findings across the volumes. Volume 1 (Forrestal et al. 2019) provides updated information about school meal program operations and school nutrition environments. Volume 2 (Gearan et al. 2019) focuses on the food and nutrient content of reimbursable meals and afterschool snacks and the overall nutritional quality of meals. Volume 3 (this volume) describes school meal costs and school foodservice revenues. Volume 4 (Fox et al. 2019) addresses students' participation in school meals, parents' and students' satisfaction with the meals, amounts of plate waste, and the influence of school meals on students' dietary intakes. A separate methodology report (Zeidman et al. 2019) provides technical details about the study design, sampling, and data collection procedures.

2. Response Rates and Sample Sizes

Table 1.3 shows initial and completed sample sizes and response rates for recruitment of SFAs and schools into the study and for each of the data collection instruments used for this report volume.[25] All response rates are weighted using raw sampling weights, which correct for unequal probability of selection.

The recruitment effort began by gaining approval for the SFA and its sampled schools (one to four schools per SFA) to participate. A total of 310 SFAs agreed to participate in the meal cost study portion of the SNMCS; a total of 284 provided complete and usable cost data (88 percent weighted response rate). At the school level, 972 sampled schools agreed to participate, and 877 provided complete and usable cost data (91 percent weighted response rate).

[25] The methodology report (Zeidman et al. 2019) provides response rates for all data collection instruments.

Table 1.3. Completed Sample Sizes and Response Rates

Instrument	Respondent Universe	Initial Recruited Sample	Completed Sample	Weighted Response Rate (%)
Data Collection				
SFA Cost Estimates[a]	15,260	310	284	87.9
School Cost Estimates[a]	93,780	972	877	90.8

Source: School Nutrition and Meal Cost Study, SY 2014–2015.

Notes: The respondent universe excluded outlying areas. The response rates are weighted using raw sampling weights—that is, weights that correct for unequal probability of selection before any nonresponse adjustments. The response rates reflect the percentages of eligible SFAs and schools that completed the cost study, given that the SFA/school had been recruited and agreed to participate in the study.

[a]The cost variables are constructed using a combination of data from the various instruments. The SFA and school are the units of analysis at which nonresponse is measured. In some cases, missing data was imputed for less critical instruments that were not completed, but doing so was rarely necessary.

SFA = school food authority.

3. Characteristics of the Cost Study Sample

The characteristics of public school districts and non-charter public schools included in the cost study sample are presented in Tables 1.4 and 1.5, respectively. The tables also present characteristics of public school districts and non-charter schools included in the full sample used to assess school foodservice operations and school food environments and summarized in Volume 1 of the SNMCS final report (Forrestal et al. 2019). (Charter schools are excluded from these tables because they were ineligible for the cost study.) The tables demonstrate that the characteristics of school districts and schools included in the full sample and in the cost study subsample are roughly equivalent (based on weighted percentages) in SFA size, urbanicity, district child poverty rates, FNS region, and share of minority students.

Table 1.4. Characteristics of Public School Districts in the Cost Study Sample and the Full Sample

	Cost Study Sample			Full Sample[d]		
	Number of Sample SFAs		Percentage of SFAs (Weighted)	Number of Sample SFAs		Percentage of SFAs (Weighted)
	Weighted	Unweighted		Weighted	Unweighted	
SFA Size[a]						
Fewer than 1,000 students	5,786	49[b]	42.5	6,143	108	45.2
1,000 to 5,000 students	5,858	125	43.1	5,448	189	40.1
More than 5,000 students	1,956	110	14.4	2,010	190	14.8
Urbanicity						
Urban	762	48[b]	5.6	922	76	6.8
Suburban	5,473	145	40.2	5,297	240	38.9
Rural	7,365	91	54.2	7,381	171	54.3
District Child Poverty Rate						
Lower (less than 20 percent)	8,059	165	59.3	7,635	274	56.1
Higher (20 percent or more)	5,542	119	40.7	5,966	213	43.9

	Cost Study Sample			Full Sample[d]		
	Number of Sample SFAs		Percentage of SFAs (Weighted)	Number of Sample SFAs		Percentage of SFAs (Weighted)
	Weighted	Unweighted		Weighted	Unweighted	
FNS Region						
Midwest	3,334	62	24.5	3,267	103	24.0
Mountain Plains	2,615	33	19.2	2,560	61	18.8
Southwest	1,777	40	13.1	2,109	73	15.5
Western	1,407	44	10.3	1,812	80	13.3
Northeast	2,042	34	15.0	1,672	51	12.3
Southeast	1,156	40	8.5	1,173	64	8.6
Mid-Atlantic	1,270	31	9.3	1,008	55	7.4
Share of Minority Students[c]						
Less than 20 percent	7,873	120	57.9	7,819	200	57.5
20 to 39 percent	2,267	59	16.7	2,402	104	17.7
40 to 59 percent	1,486	38	10.9	1,349	71	9.9
60 to 79 percent	985	34	7.2	945	60	6.9
80 percent or more	953	31	7.0	924	46	6.8
Missing	35	2	0.3	162	6	1.2
Number of SFAs	**13,601**	**284**		**13,601**	**487**	

Source: School Nutrition and Meal Cost Study, SY 2014–2015. Tabulations are weighted to be representative of all public SFAs offering the NSLP.

Notes: Data on SFA size, urbanicity, and minority students were from the U.S. Department of Education's Common Core of Data (CCD) 2011–2012. Data on child poverty rates were from the 2011 U.S. Census Bureau's Small Area Income and Poverty Estimates school district file. Data on FNS region were from the Food and Nutrition Service's SFA Verification Summary Report 2012–2013.

[a]CCD 2011–2012 district enrollment data and SFA Verification Summary Report 2012–2013 data were used to impute enrollments for multidistrict SFAs and districts with missing data.

[b]Estimates for the subgroups of small SFAs (n = 49) and urban SFAs (n = 48) are flagged in this report as being potentially unreliable due to the small sample, as discussed in the section (1.A.4) on statistical reporting standards.

[c]Minority race/ethnicity categories in the CCD data set include Black non-Hispanic, Hispanic, Asian, American Indian/Alaska Native, Hawaiian Native/Pacific Islander, and students belonging to two or more races/ethnicities.

[d]For purposes of this comparison, charter school SFAs, which were ineligible for the cost study, were excluded from the full sample.

FNS = Food and Nutrition Service; SFA = school food authority.

Table 1.5. Characteristics of Public, Non-charter Schools in the Cost Study Sample and the Full Sample

	Cost Study Sample			Full Sample		
	Number of Sample Schools		Percentage of Schools (Weighted)	Number of Sample Schools		Percentage of Schools (Weighted)
	Weighted	Unweighted		Weighted	Unweighted	
School Size						
Small (fewer than 500 students)	46,205	339	49.3	45,400	427	48.4
Medium (500 to 999 students)	36,798	354	39.2	36,900	495	39.4
Large (1,000 or more students)	10,777	184	11.5	11,400	279	12.2
Urbanicity						
Urban	20,508	161	21.9	20,100	236	21.4
Suburban	40,717	433	43.4	40,900	604	43.7
Rural	32,555	283	34.7	32,800	361	34.9
District Child Poverty Rate						
Lower (less than 20 percent)	48,914	512	52.2	51,000	676	54.4
Higher (20 percent or more)	44,866	365	47.8	42,800	525	45.6
FNS Region						
Midwest	16,414	183	17.5	17,700	248	18.9
Mountain Plains	12,409	96	13.2	12,300	129	13.1
Southwest	12,774	127	13.6	13,400	172	14.3
Western	15,747	140	16.8	15,600	213	16.6
Northeast	7,761	94	8.3	6,900	115	7.4
Southeast	16,337	136	17.4	15,600	187	16.6
Mid-Atlantic	12,337	101	13.2	12,300	137	13.1
Share of Students Approved for F/RP Meals[a]						
Less than 20 percent	10,639	120	11.3	10,600	152	11.4
20 to 39 percent	18,203	220	19.4	17,600	272	18.7
40 to 59 percent	24,111	225	25.7	23,400	305	25.0
60 to 79 percent	16,718	150	17.8	17,100	212	18.2
80 percent or more	21,230	134	22.6	22,500	225	24.0
Missing	2,879	28	3.1	2,600	35	2.8
Number of Schools	**93,780**	**877**		**93,800**	**1,201**	

Source: School Nutrition and Meal Cost Study, school year 2014–2015. Tabulations are weighted to be representative of all public, non-charter schools offering the NSLP.

Notes: Data on school size (student enrollment) were reported in the SFA Director Survey or from the U.S. Department of Education's Common Core of Data (CCD) 2011–2012. Data on free and reduced-price meals were reported in the SFA Director Survey. Data on urbanicity were from the CCD 2011–2012. Data on child poverty rates were from the 2011 U.S. Census Bureau's Small Area Income and Poverty Estimates school district file. Data on FNS region were from the Food and Nutrition Service's SFA Verification Summary Report 2012–2013.

[a]Forty-two respondents reported that the total number of students receiving free or reduced-price meals exceeded total enrollment. These responses were set to 100 percent.

FNS = Food and Nutrition Service; F/RP = free or reduced-price; SFA = school food authority.

4. Statistical Reporting Standards

To help readers assess the reliability of estimates, reporting standards based on those of the joint USDA/National Center for Health Statistics Working Group (Federation of American Societies for Experimental Biology 1995) were applied. Specifically, based on a broadly estimated mean design effect of 2.0 for SFA-level estimates of costs and revenues, estimates have been flagged as potentially unreliable for any subgroup with fewer than 60 SFAs (30 * mean design effect of 2.0).[26] In addition, estimates with a coefficient of variation greater than 30 percent are flagged (with ^). The study team also estimated percentages based on unweighted counts of responses below specified thresholds. Specifically, estimated percentages in the tails of the distribution (less than 25 percent or greater than 75 percent) are flagged (with ^) when the number of observations represented by the percentage was less than 16 for SFA-level estimates or less than 27 for school-level estimates (8 * mean design effect of 3.4 for school-level estimates).

Tabulations and figures in the chapter include results of statistical testing at the 0.05 level. The variances used in these tests take into account the complex sampling design. These tests of statistical significance were exploratory; the study team made no adjustments for multiple comparisons.

In discussing findings from the study's many analyses, authors generally did not cite flagged point estimates in the text. However, in some cases this was unavoidable. Because flagged point estimates are less precise, readers should interpret them with caution. If a table shows that a difference in means or percentages between two groups is statistically significant, the finding is valid even if one or both of the point estimates are considered imprecise.

B. Overview of the Volume 3 Report

This volume describes meal costs and school foodservice revenues in SY 2014–2015. In addition, it provides the first national estimates of the costs of NSLP afterschool snacks, Child and Adult Care Food Program (CACFP) snacks and suppers served in afterschool programs, and Fresh Fruit and Vegetable Program (FFVP) snacks. It also compares the costs of producing reimbursable school lunches and breakfasts in SY 2014–2015 with two previous FNS-sponsored studies of meal costs in the NSLP and SBP—the SLBCS-I and -II studies (Glantz et al. 1994 and Bartlett et al. 2008). SLBCS-I was completed in 1994 and used data collected during SY 1992–1993. SLBCS-II was completed in 2008 and used data collected during SY 2005–2006.

All of the findings presented in this report are based on analysis of data from cost interviews and a review of SFAs' annual financial statements. Cost interviews collected information about staff time and salaries related to school meal and snack production, other meal production,

[26] The same standards were applied to the school-level cost estimates in Appendix C. The criterion for potentially unreliable estimates at the school level is any subgroup with fewer than 102 schools (30 * mean design effect of 3.4), but all of the estimates were based on larger subgroups, so none were unreliable.

nutrition education and promotion, and other administrative activities. Labor costs were collected for both labor costs charged to the foodservice account (reported labor) and labor costs paid out of other accounts (unreported labor). Estimates of meal costs were determined using the direct measurement methodology developed by Abt Associates for FNS and used in previous studies of meal costs, with adaptations for the design and requirements of the SNMCS.[27]

This report presents mean costs of producing reimbursable meals in the NSLP and SBP from two perspectives outlined below.

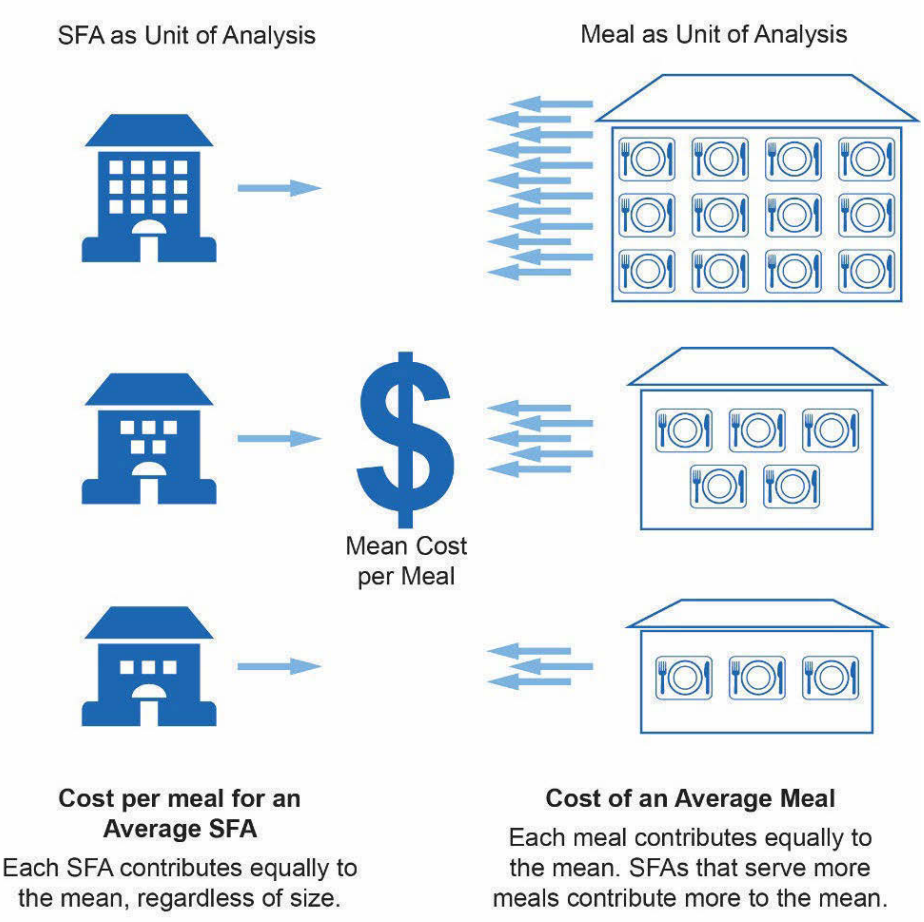
SFA as the Unit of Analysis	Meal as the Unit of Analysis
For this perspective, the study sample was weighted so that each SFA nationwide was represented equally, regardless of the number of meals served.	For this perspective, the study sample was weighted so that each meal served nationwide was represented equally.
SFAs serving more meals had the same influence as SFAs serving fewer meals in determining the mean cost per meal.	SFAs serving more meals had more influence than SFAs serving fewer meals in determining the mean cost per meal.
Cost estimates represent the mean costs of a typical SFA. This perspective is useful when considering costs from the SFA's point of view.	Cost estimates represent the average meal served. This perspective is useful when considering costs for the NSLP/SBP as a whole.

Figure 1.1 illustrates these two perspectives and how SFAs that serve different numbers of meals are treated under each perspective. On the left, when the SFA is the unit of analysis, each of the three SFAs contributes equally to computing the mean cost per meal. On the right, when the meal is the unit of analysis, SFAs that serve more meals than the others make a larger contribution to the mean cost per meal. The first SFA serves more meals than the others, and the second SFA more than the third, and therefore the first SFA has the most weight in determining mean cost per meal, and the second has more weight than the third.

In this report, "for the average SFA" means that the estimate used the SFA as the unit of analysis, while "for the average NSLP lunch" or "for the average SBP breakfast" means that the estimate used the meal as the unit of analysis. Most tables in the report present estimates that used the SFA as the unit of analysis. The SFA as the unit of analysis is most relevant from the point of view of the average SFA, which is relevant because SFAs are important stakeholders in the NSLP and SBP. If the average SFA can balance its school meal costs and revenues, then the average SFA will be more likely to continue participating in the NSLP and SBP. The meal as the unit of analysis is most relevant for considering the NSLP and SBP more broadly. For example, from the Federal perspective, a key question is the relationship of the overall costs of operating these programs to the value of Federal subsidies provided. Both units of analysis have been used in prior studies (such as Bartlett et al. 2008), so both perspectives are useful for comparisons to prior estimates of average meal costs. Key subgroups presented for meal costs and revenues include basic SFA environment characteristics (district child poverty rate, SFA size, SFA urbanicity) and basic school characteristics (school type, school size, urbanicity).

[27] See Appendix A for details.

Figure 1.1. Using SFA versus Meal as Unit of Analysis



The study team also analyzed costs using a third type of weighting with the school as the unit of analysis. These estimates represent the mean meal costs for a typical school. Chapter 6 presents analyses of the relationship of meal costs to school characteristics. This report is the first national study of school meal costs to provide such an analysis. In addition, Appendix C presents tabulations of mean and median meal costs for a typical school. For simplicity, the text does not otherwise discuss meal costs from the school perspective. In producing school-level estimates, the sample was weighted so that each school nationwide was represented equally, regardless of the number of meals it served.

The remainder of this volume is organized into five chapters:

- Chapter 2 describes the reported costs of producing reimbursable meals, including the mean reported cost per NSLP lunch and per SBP breakfast
- Chapter 3 describes the estimates of the full costs of producing reimbursable meals
- Chapter 4 presents the composition of SFA revenues by source, including a comparison with meal costs.
- Chapter 5 presents the comparisons of reported and full costs versus the SY 1992–1993 and SY 2005–2006
- Chapter 6 presents the results of multivariate analyses of the relationship of school foodservice costs and revenues to the characteristics of SFAs, schools, and meals

Appendix A presents the methods for allocating costs to meals and for analyzing revenue data used in this volume. Appendix B presents the methods used for the multivariate analyses presented in Chapter 6. Appendix C presents supplementary descriptive tables and Appendix D presents supplementary tables for the multivariate analyses.

2. REPORTED COSTS OF PRODUCING SCHOOL MEALS

An SFA must balance the costs and revenues of school foodservice so that it operates on a nonprofit basis. For the purposes of this report, "school foodservice" refers to all activities carried out by the SFA, including meal production and service, administering the school meal programs, and other non-production activities to support meal production and service. Under USDA regulations, this means that all revenues must be used solely to operate or improve meals and foodservice operations. The SFA must maintain a separate, nonprofit foodservice account that accrues all Federal funds to support the NSLP, SBP, and other school meal programs. Nonprofit status is determined by the financial status of the school foodservice account as a whole rather than the financial status of each Federal program separately. USDA rules do not require separate accounting for costs and revenues of NSLP, SBP, or other school meal programs.

An SFA may accumulate net cash resources (cumulative revenues less expenses) equal to no more than three months' mean expenditures. SFAs generally seek to "break even," that is, to make sure that their total costs and revenues from all school meal programs and from the sale of non-program foods are equal. Non-program food sales include competitive foods, adult meals, catering, and meals provided to schools or day care programs outside the SFA.

Glossary of a School District's Foodservice Operations Costs

- ***Reported costs****—charged to the school foodservice account; for example, food, foodservice labor*
- ***Unreported costs****—not charged to the school foodservice account; for example, facilities costs that are paid by the school district and not passed on to the SFA*
- ***Full costs****—the sum of total reported costs and total unreported costs*

Analyses in this report and prior studies of school meal costs distinguish between reported, unreported, and full costs. Reported costs include only the costs that are charged to the school foodservice account. From the SFA's perspective, reported costs are the costs of running the foodservice operation that the SFA expects to be able to pay for from the foodservice account. Typically, reported costs include food, salaries, and fringe benefits for foodservice personnel, supplies, and (less frequently) charges for facilities and other resources provided by the school district. More details on the composition of reported costs are in Section 2.B. However, reported costs often do not reflect all costs attributable to foodservice operations. Nearly all school districts incur some costs to support foodservice operations that are not charged to the nonprofit foodservice account. Unreported costs are costs attributable to foodservice operations that are not charged to the school foodservice account, such as non-foodservice personnel and facilities costs that are paid by the school district and not passed on to the SFA. The full costs of a school district's foodservice operations are the sum of total reported costs and total unreported costs.

This chapter presents an analysis of SFAs' reported costs, which are only those costs that were charged to school foodservice accounts for SY 2014–2015. The chapter first considers the total mean reported costs of producing reimbursable meals and then the composition of reported

costs. Chapter 3 examines the magnitude and composition of the unreported and full costs of school meals.

A. Reported Costs of Producing Reimbursable Meals

This section presents the national estimates of reported costs for NSLP lunches, SBP breakfasts, and other reimbursable meals overall by district child poverty rate, SFA size, and SFA urbanicity. Estimates of means, medians, and standard errors (SEs) are provided in tables using both the SFA and the meal as the unit of analysis. In addition, figures summarize the distribution of reported cost per NSLP lunch and cost per SBP breakfast.

The reported costs of producing an NSLP lunch in the average SFA was $3.81 in SY 2014–2015. About three out of five SFAs had a reported cost per NSLP lunch that was greater than the Federal subsidy for a free lunch.

As discussed in Chapter 1, estimates using the SFA as the unit of analysis represent cost for the average SFA and are useful when considering costs from the SFA's point of view. Estimates using the meal as the unit of analysis represent cost for the average meal and are useful when considering costs for the program as a whole. When the costs for the average SFA differ from the costs for the average meal, this result reflects the greater influence of larger SFAs (as measured by number of meals served) on the cost of the average meal. School-level estimates and supplementary tables of reported cost distributions are provided in Appendix C.

1. Reported Cost per NSLP Lunch

Table 2.1 summarizes the national mean reported cost of producing an NSLP lunch using the SFA and meal as the units of analysis.

In SY 2014–2015, the mean reported cost per NSLP lunch for the average SFA was $3.81. The average SFA spent more to serve an NSLP lunch than the mean Federal subsidy of $3.32 per NSLP lunch. This mean subsidy included $3.05 in USDA reimbursements and $0.27 worth of USDA Foods.[28] In approximately three out of five SFAs, the reported cost of producing a reimbursable lunch in SY 2014-15 was greater than the mean Federal subsidy for a free lunch of $3.32 (Figure 2.1). In nearly three out of 10 SFAs, the reported cost per NSLP lunch was $4.00 or more.[29]

[28] See Table 1.1 for SY 2014–2015 Federal reimbursement rates. For this report, the mean Federal reimbursement for a free NSLP lunch was computed from State meal claims data for the sample SFAs and weighted to estimate the national mean reimbursement of $3.05 per free NSLP lunch. This estimate reflects each SFA's mix of free lunches claimed at the lower and higher rates (as discussed in Chapter 1) and the proportion of SFAs certified to receive the additional $0.06 per lunch. It is slightly less than the reimbursement for schools qualifying for the higher rate ($3.00) plus the additional $0.06 per lunch for compliance with updated nutrition standards. The mean of $0.27 per NSLP lunch for USDA Foods was estimated from the cash value of USDA Foods used by the SFAs in the study sample and weighted to provide a national estimate. While SFAs were entitled to receive a base amount $0.2475 per NSLP lunch in USDA Foods in SY 2014–2015, the estimate of $0.27 per NSLP lunch reflected the value of USDA Foods used from SFA inventories and bonus USDA Foods received in addition to the base amount.

[29] The distributions of SFAs and schools by reported cost per NSLP lunch are provided in Tables C.5 and C.6.

In Table 2.1 and similar tables, estimates of the mean and median cost per meal are provided for subgroups of SFAs by district child poverty rate, SFA size (enrollment), and SFA urbanicity. No significant differences in the mean reported cost per NSLP lunch were found among subgroups when the unit of analysis was SFA.

Table 2.1. Mean Reported Cost per NSLP Lunch: SFA Level, SY 2014–2015

	Unit of Analysis Is SFA			Unit of Analysis Is NSLP Lunch			SFA Sample Size	
	Mean ($)	Median ($)	SE ($)	Mean ($)	Median ($)	SE ($)	Weighted	Unweighted
All SFAs	**3.81**	**3.63**	**0.08**	**3.66**	**3.49**	**0.06**	**13,601**	**284**
District Child Poverty Rate								
Lower (less than 20 percent)	3.88	3.69	0.11	3.76	3.72	0.05	8,059	165
Higher (20 percent or more)	3.71	3.42	0.13	3.59	3.36	0.09	5,542	119
SFA Size								
Fewer than 1,000 students	3.72	3.50	0.17	3.54*	3.41	0.13	5,786	49[a]
1,000 to 5,000 students	3.91	3.63	0.09	3.89†	3.62	0.09	5,858	125
More than 5,000 students	3.77	3.62	0.07	3.58	3.43	0.07	1,956	110
SFA Urbanicity								
Urban	3.68	3.48	0.12	3.44*	3.23	0.11	762	48[a]
Suburban	3.87	3.69	0.09	3.80	3.70	0.07	5,473	145
Rural	3.77	3.57	0.14	3.65	3.48	0.09	7,365	91

Source: School Nutrition and Meal Cost Study, Menu Survey, School Nutrition Manager Cost Interview, and SFA Director and Business Manager Cost Interviews (Onsite and Follow-Up), school year 2014–2015. Tabulations are weighted to be representative of all public SFAs offering the National School Lunch Program.

Notes: Outliers were trimmed to avoid excessive influence on means. Reported cost per NSLP lunch was set to the 3rd percentile for nine SFAs with cost per NSLP lunch at or below the 3rd percentile. Likewise, reported cost per NSLP lunch was set to the 97th percentile for nine SFAs with cost per NSLP lunch at or above the 97th percentile.

Differences in medians were not tested for statistical significance.

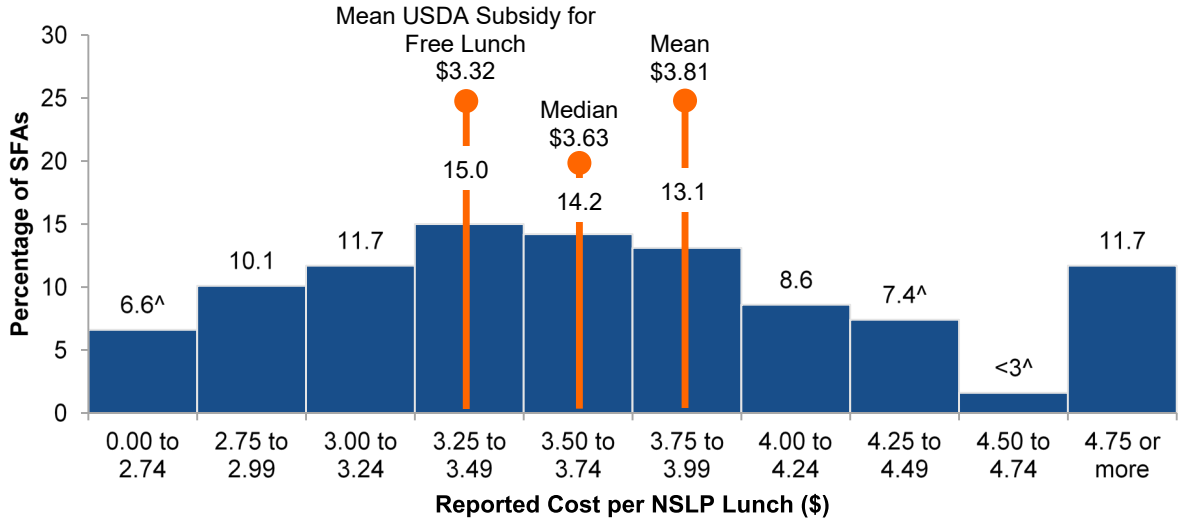
[a]Estimates for small SFAs (n = 49) and urban SFAs (n = 48) may be unreliable due to the small sample for these groups (see discussion of statistical reporting standards for details).

* Difference between first and second subgroups is significantly different from zero at the 0.05 level.

† Difference between second and third subgroups is significantly different from zero at the 0.05 level.

NSLP = National School Lunch Program; SE = standard error of the mean; SFA = school food authority; SY = school year.

Figure 2.1. Distribution of SFAs by Reported Cost per NSLP Lunch, SY 2014–2015



Source: School Nutrition and Meal Cost Study, Menu Survey, School Nutrition Manager Cost Interview, and SFA Director and Business Manager Onsite and Follow-Up Cost Interviews, SY 2014–2015. Tabulations are weighted to be representative of all public SFAs offering the National School Lunch Program.

Note: SFA is the unit of analysis.

NSLP = National School Lunch Program; SFA = school food authority; SY =school year.

^ Point estimate is considered less precise than estimates that are not flagged because the sample size is small or the coefficient of variation is large. The rules used in flagging estimates are described in Chapter 1. When these rules are applied, percentages close to 0 or 100 are often flagged. In this figure, flagged percentages between 0 percent and 3 percent are displayed as <3 percent.

Using the meal as the unit of analysis, the mean reported cost of the average NSLP lunch was $3.66. This cost was less than the mean reported cost for the average SFA of $3.81, but still substantially more than the mean Federal subsidy for a free lunch of $3.32 (Table 2.1). The difference between the two estimates of the mean reported cost reflects the fact that the reported cost of the average NSLP lunch was lower in large SFAs, which produced a disproportionate share of NSLP lunches, than in medium-sized SFAs, which were far more numerous.[30]

The reported cost per NSLP lunch varied significantly between some subgroups of SFAs when the meal was the unit of analysis. The mean reported cost of the average NSLP lunch in small SFAs was significantly less than in medium-sized SFAs, and the mean reported cost was significantly greater in medium-sized SFAs than in large SFAs. The cost per NSLP lunch for urban SFAs was significantly less than for suburban SFAs ($3.44 versus $3.80). No other comparisons of subgroups in Table 2.1 were statistically significant. School-level estimates of the reported cost per NSLP lunch are provided in Table C.1.

[30] About one in seven SFAs (14 percent) were large (more than 5,000 students), while 43 percent were medium-sized (1,000 to 5,000 students) and 43 percent were small (fewer than 1,000 students) (Table 1.4). Differences between estimates with the SFA and meal as the unit of analysis were not tested for significance.

2. Reported Cost per SBP Breakfast

In SY 2014–2015, the average SFA had a reported cost of $2.72 per SBP breakfast (Table 2.2). The mean Federal reimbursement rate for a free SBP breakfast across SFAs was $1.88.[31]

The reported cost of producing an SBP breakfast in the average SFA was $2.72 in SY 2014–2015. More than three-quarters of SFAs had a reported cost per SBP breakfast that was greater than the Federal subsidy for a free breakfast.

As with the reported cost per NSLP lunch, the USDA subsidy for a free breakfast was substantially less than the reported cost per SBP breakfast for the average SFA. More than three-quarters (77 percent) of SFAs needed additional non-Federal resources to cover the costs of a free breakfast (Figure 2.2). One quarter of SFAs (25 percent) spent $3.00 or more per SBP breakfast. The distributions of SFAs and schools by reported cost per SBP breakfast are provided in Tables C.7 and C.8.

Table 2.2. Mean Reported Cost per SBP Breakfast: SFA Level, SY 2014–2015

	Unit of Analysis Is SFA			Unit of Analysis Is SBP Breakfast			SFA Sample Size	
	Mean ($)	Median ($)	SE ($)	Mean ($)	Median ($)	SE ($)	Weighted	Unweighted
All SFAs	**2.72**	**2.43**	**0.10**	**2.34**	**2.10**	**0.08**	**12,805**	**270**
District Child Poverty Rate								
Lower (less than 20 percent)	3.02*	2.69	0.15	2.52	2.35	0.07	7,219	152
Higher (20 percent or more)	2.32	2.07	0.11	2.27	2.02	0.11	5,586	118
SFA Size								
Fewer than 1,000 students	2.70	2.52	0.21	2.27	2.06	0.13	5,221	43[a]
1,000 to 5,000 students	2.78	2.47	0.11	2.42	2.17	0.09	5,665	119
More than 5,000 students	2.56	2.27	0.11	2.32	2.09	0.11	1,919	108
SFA Urbanicity								
Urban	2.31*	2.00	0.15	2.41	2.08	0.18	747	47[a]
Suburban	2.70	2.57	0.10	2.25	2.18	0.08	4,884	134
Rural	2.77#	2.44	0.17	2.41	2.19	0.09	7,175	89

Source: School Nutrition and Meal Cost Study, Menu Survey, School Nutrition Manager Cost Interview, and SFA Director and Business Manager Cost Interviews (Onsite and Follow-Up), school year 2014–2015. Tabulations are weighted to be representative of all public SFAs offering the National School Lunch Program.

[31] SFAs received Federal reimbursement at the higher "severe need" level for free and reduced-price SBP breakfasts served in schools classified as "severe need" because they served at least 40 percent of NSLP lunches free or at reduced price in the second preceding school year. The mean free SBP breakfast reimbursement rate reflected the average SFA's proportions of free breakfasts claimed at the severe need and non-severe need rates. While SFAs may use USDA Foods in producing SBP breakfasts, USDA Foods were provided to SFAs on the basis of NSLP lunches served. Therefore, the value of USDA Foods used by SFAs was attributed solely to NSLP lunches in computing the mean Federal subsidies for NSLP lunches and SBP breakfasts.

Notes: Estimates exclude 14 SFAs with no SBP. Outliers were trimmed to avoid excessive influence on means. Reported cost per SBP breakfast was set to the 3rd percentile for nine SFAs with cost per SBP breakfast at or below the 3rd percentile. Likewise, reported cost per SBP breakfast was set to the 97th percentile for nine SFAs with cost per SBP breakfast at or above the 97th percentile.

Differences in medians were not tested for statistical significance.

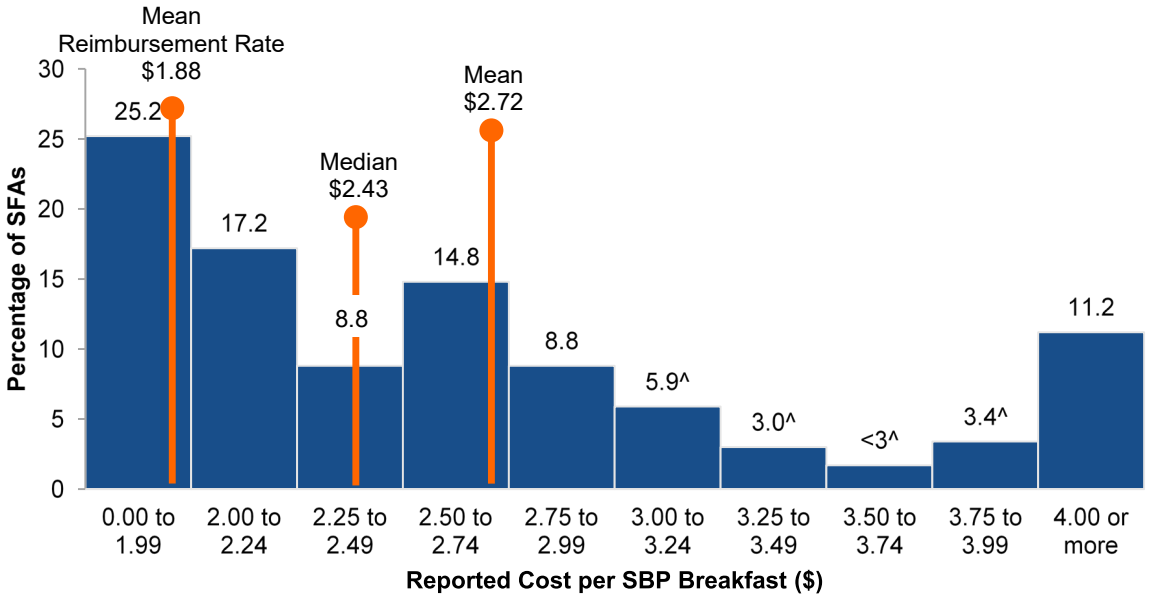
[a]Estimates for small SFAs (n = 43) and urban SFAs (n = 47) may be unreliable due to the small sample for these groups (see discussion of statistical reporting standards for details).

* Difference between first and second subgroups is significantly different from zero at the 0.05 level.

Difference between first and third subgroups is significantly different from zero at the 0.05 level.

SBP = School Breakfast Program; SE = standard error of the mean; SFA = school food authority.

Figure 2.2. Distribution of SFAs by Reported Cost per SBP Breakfast, SY 2014–2015



Source: School Nutrition and Meal Cost Study, Menu Survey, School Nutrition Manager Cost Interview, and SFA Director and Business Manager Onsite and Follow-Up Cost Interviews, SY 2014–2015. Tabulations are weighted to be representative of all public SFAs offering the National School Lunch Program.

Notes: SFA is the unit of analysis.

SBP = School Breakfast Program; SFA = school food authority; SY = school year.

^ Point estimate is considered less precise than estimates that are not flagged because the sample size is small or the coefficient of variation is large. The rules used in flagging estimates are described in Chapter 1. When these rules are applied, percentages close to 0 or 100 are often flagged. In this figure, flagged percentages between 0 percent and 3 percent are displayed as <3 percent.

Using the meal as the unit of analysis, the mean reported cost of an SBP breakfast was $2.34. This cost was less than the mean reported cost for the average SFA of $2.72, but still 24 percent more than the mean Federal reimbursement for a free breakfast. The difference between the two estimates suggests that SFAs with larger breakfast programs might have had a lower cost per SBP breakfast.[32] However, there were no statistically significant differences in the

[32] As indicated in the notes to Table 2.2, estimates for small SFAs may be unreliable due to the small sample; this limitation may affect the tests for significant relationship between SFA size and mean reported cost per SBP

mean reported cost per SBP breakfast by SFA size using either the SFA or the meal as the unit of analysis. More generally, there were no significant differences in the mean reported cost of the average SBP breakfast among the subgroups of SFAs shown in Table 2.2.[33]

The mean reported cost per SBP breakfast for SFAs located in school districts with a lower child poverty rate ($3.02) was significantly higher than the mean for SFAs in higher-poverty school districts ($2.32). The mean reported cost per SBP breakfast in urban SFAs ($2.31) was significantly lower than in the means in suburban SFAs ($2.70) and in rural SFAs ($2.77).

3. Reported Costs of Reimbursable Meals and Snacks by Program

In addition to NSLP lunches and SBP breakfasts, some SFAs operate other school meal programs. SFAs can provide reimbursable snacks to students in qualifying afterschool programs under the NSLP or CACFP, which also provides reimbursements for afterschool suppers in some schools. In addition, high-poverty schools can receive Federal funds for the FFVP, which provides snacks during the school day. This section provides national estimates of the reported cost per NSLP afterschool snack and per CACFP afterschool snack or supper and annual and daily FFVP cost per student. These estimates use the SFA as the unit of analysis and thus represent costs in the average SFA. Relatively few SFAs offer these programs, so the cost estimates are less reliable than for NSLP lunches and SBP breakfasts.

As discussed in previous sections, for the average SFA, the mean reported cost per NSLP lunch was $3.81 and the mean reported cost per SBP breakfast was $2.72. For NSLP afterschool snacks, the mean reported cost per snack was $1.42 (Table 2.3). For the CACFP, the mean reported cost per snack or supper was $2.01.[34]

Table 2.3. Reported Cost per Reimbursable Meal by Program, SY 2014–2015

	Reported Cost Unit of Analysis is SFA		
	Mean ($)	Median ($)	SE ($)
NSLP Lunch (n = 284)	3.81	3.63	0.08
SBP Breakfast (n = 270)	2.72	2.43	0.10
NSLP Afterschool Snack (n = 61)	1.42	1.02	0.17
CACFP Snack or Supper[a] (n = 20[b])	2.01	1.84	0.16
FFVP (Annual Cost per Student)[c] (n = 76)	40.00	41.30	2.93

Source: School Nutrition and Meal Cost Study, Menu Survey, School Nutrition Manager Cost Interview, and SFA Director and Business Manager Cost Interviews (Onsite and Follow-Up), school year 2014–2015. Tabulations are weighted to be representative of all public SFAs offering the National School Lunch Program.

breakfast. The difference between estimates with the SFA and meal as the unit of analysis has not been tested for statistical significance.

[33] School-level estimates of the reported cost per SBP breakfast are provided in Table C.2.

[34] The reported cost per meal for CACFP includes both snacks and suppers and is not specifically representative of the cost per CACFP snack or the cost per CACFP supper. Due to the small number of SFAs with the CACFP and burden considerations, costs of CACFP snacks and suppers were not tracked separately.

Notes: Outliers were trimmed to avoid excessive influence on means. Reported cost per NSLP lunch was set to the 3rd percentile for nine SFAs with cost per NSLP lunch at or below the 3rd percentile. Likewise, reported cost per NSLP lunch was set to the 97th percentile for nine SFAs with cost per NSLP lunch at or above the 97th percentile. Reported cost per SBP breakfast was set to the 3rd percentile for nine SFAs with cost per SBP breakfast at or below the 3rd percentile. Likewise, reported cost per SBP breakfast was set to the 97th percentile for nine SFAs with cost per SBP breakfast at or above the 97th percentile. SBP estimates exclude 14 SFAs with no SBP. NSLP afterschool snack estimates exclude 223 SFAs without NSLP afterschool snacks. CACFP snack and supper estimates are based on 20 SFAs that offered CACFP snacks or suppers. FFVP estimates are based on 76 SFAs with at least one school that participated in the FFVP and reported FFVP food costs. Due to the small number of SFAs with NSLP afterschool snacks, CACFP snacks or suppers, and the FFVP, and the lack of prior data, there was no basis for determining that SFAs had outlier values for the reported cost per meal (or per student) for these programs.

[a]The reported cost per meal for CACFP includes both snacks and suppers and is not specifically representative of the cost per CACFP snack or the cost per CACFP supper (as explained in the text).

[b]The estimated cost per CACFP snacks or supper may be unreliable due to the small sample for this group (n = 20) (see discussion of statistical reporting standards in Chapter 1 for details).

[c]No meal counts were available for the FFVP, so this table presents the reported annual cost per student. See text for discussion.

CACFP = Child and Adult Care Food Program; FFVP = Fresh Fruit and Vegetable Program; NSLP = National School Lunch Program; SBP = School Breakfast Program; SE = standard error of the mean; SFA = school food authority; SY = school year.

Among SFAs with at least one school that participated in the FFVP, the mean annual reported cost was $40.00 per student in FFVP schools. This estimate is expressed on a per-student basis because no meal counts were available for the FFVP. For comparison with the per-meal cost for other programs, the estimated mean daily reported cost per student for the FFVP was $0.37 based on three FFVP snack days per week and 36 weeks per school year.[35] Unlike the NSLP, SBP, and CACFP, which provide reimbursements at a fixed rate per meal, the FFVP provides reimbursement on the basis of SFAs' actual costs.

B. Composition of Reported Costs

Food and labor costs accounted for nearly 90 percent of the reported costs of NSLP lunches and SBP breakfasts.

As defined previously, reported costs include only costs that are charged to the foodservice account. The major components of reported costs are food costs, labor costs, other direct costs, and indirect costs. Reported food costs consist of the costs of all food used by the SFA, including food purchased, USDA Foods received by the SFA, and the value of food used from inventory. Reported labor costs include salaries, wages, and fringe benefits for foodservice personnel. Other reported direct costs may include non-food supplies, foodservice management company charges, other contracted services, equipment purchases and depreciation, utilities, and any other costs not

[35] Unlike the NSLP and SBP, the FFVP is limited to high-poverty elementary schools and therefore is available only in a subset of schools in participating SFAs. The annual FFVP cost per student was estimated using data from FFVP schools in the study sample and averaged within an SFA if more than one FFVP school was present. The assumption of three FFVP snack days per week and 36 weeks per school year is based on data from Briefel et al. (2017).

classified as food, labor, or indirect costs. Reported indirect costs are charges for the use of facilities, administrative support, or other services provided by the school district.[36]

1. Composition of Reported NSLP and SBP Costs by Component

Table 2.4 presents the composition of reported costs for NSLP lunches and SBP breakfasts by component (food, labor, and other direct and indirect costs) in SY 2014–2015, with the SFA as the unit of analysis. For the average SFA, food and labor each represented 45 percent of the reported cost per NSLP lunch in SY 2014–2015, other direct costs (such as supplies and contracted services) constituted almost 10 percent, and indirect costs were about 1 percent. The average percentages of the reported cost per SBP breakfast were similar: 46 percent for food, 44 percent for labor, 9 percent for other direct costs, and 1 percent for indirect costs.

For the average SFA, the reported cost per NSLP lunch broke down by component as follows: $1.69 for food, $1.72 for labor, $0.37 for other direct costs, and $0.05 for indirect costs. The mean reported cost per SBP breakfast comprised $1.15 for food, $1.24 for labor, $0.25 for other direct costs, and $0.03 for indirect costs.[37]

2. Composition of Reported Food Costs

To provide a perspective on how SFAs allocate their food budgets, Table 2.5 presents the percentage of reported food costs used, in the average SFA, to produce reimbursable meals and snacks in the NSLP, SBP, CACFP, and FFVP. The table also presents data on the percentage of reported food costs used to produce all types of reimbursable meals and snacks and all types of nonreimbursable meals (including foods sold a la carte, in vending machines, or at snack bars; adult meals; and catering). This distribution reflects the fact that, while all SFAs offered the NSLP and the vast majority offered the SBP, relatively few offered other types of reimbursable meals or snacks. So on average for all SFAs, these other types of reimbursable snacks and meals necessarily represented a small share of reported food costs.

[36] Administrative support provided by the school district to school foodservice may include purchasing, contracting, payroll, human resources management, information systems, or other administrative functions. Other services provided by the school district may include equipment maintenance, transportation or storage of food or supplies, security, or other non-administrative functions

[37] The components of the mean cost per NSLP lunch and cost per SBP breakfast shown in Table 2.5 do not sum exactly to the total mean cost per NSLP lunch in Table 2.1 and cost per SBP breakfast in Table 2.2 due to differences in the samples used. Details are provided in Table 2.5 footnotes.

Table 2.4. Composition of Reported Cost (by Percentage and Dollar Amount) per NSLP Lunch and SBP Breakfast, SY 2014–2015

	Cost per Meal by Component Unit of Analysis Is SFA											
	Food Costs[a] (%)			Labor Costs[b] (%)			Other Direct Costs[c] (%)			Indirect Costs[d] (%)		
Percentage	Mean	Median	SE	Mean	Median	SE	Mean	Median	SE	Mean	Median	SE
Meal Type												
NSLP lunch	44.7	44.8	0.8	44.5	44.3	0.8	9.5	7.3	0.6	1.3	0.0	0.2
SBP breakfast	45.5	44.6	1.0	43.9	43.0	1.1	9.4	7.2	0.6	1.2	0.0	0.2
	Food Costs[a] ($)			Labor Costs[b] ($)			Other Direct Costs[c] ($)			Indirect Costs[d] ($)		
Dollar Amount	Mean	Median	SE	Mean	Median	SE	Mean	Median	SE	Mean	Median	SE
Meal Type												
NSLP lunch	1.69	1.64	0.04	1.72	1.58	0.06	0.37	0.28	0.02	0.05	0.00	0.01
SBP breakfast	1.15	1.07	0.04	1.24	1.03	0.09	0.25	0.18	0.02	0.03	0.00	<0.01
Number of SFAs	**264**											

Source: School Nutrition and Meal Cost Study, Menu Survey, School Nutrition Manager Cost Interview, and SFA Director and Business Manager Cost Interviews (Onsite and Follow-Up), school year 2014–2015. Tabulations are weighted to be representative of all public SFAs offering the National School Lunch Program.

Notes: Estimates of the components of cost per NSLP lunch exclude 20 SFAs with reported labor costs above 80 percent or below 15 percent of total costs, or reported food costs above 70 percent or below 15 percent of total costs. The data for these SFAs did not appear to provide an accurate decomposition of costs (for example, significant labor costs were included in other direct costs). Of these 20 SFAs, 18 SFAs that have SBP are excluded from estimates of the components of cost per SBP breakfast. In addition, SBP estimates exclude 14 SFAs with no SBP.

For SFAs with trimmed total cost per NSLP lunch and SBP breakfast that have been set to the 3rd percentile or 97th percentile, respectively, the cost components have been adjusted so that they sum to the trimmed total cost per meal. The adjustment maintains the same percentages of cost components before adjustment.

[a]Food costs include food purchases, USDA Foods received by the SFA, and value of food used from inventory.

[b]Labor costs include salaries, wages, and fringe benefits.

[c]Other direct costs include non-food supplies, foodservice management company charges, other contracted services, equipment purchases and depreciation, utilities, and any other costs not classified as food, labor, or indirect costs.

[d]Indirect costs include charges to the school foodservice account for resources provided by the school district when such charges are made by applying an indirect cost rate or other indirect cost allocation method.

NSLP = National School Lunch Program; SBP = School Breakfast Program; SE = standard error of the mean; SFA = school food authority; USDA = United States Department of Agriculture; SY = school year

Table 2.5. Composition of Reported Food Costs, SY 2014–2015

	Percentage of Total SFA Food Costs[a]		
	Mean	Median	SE
Meal Type			
NSLP lunch	73.2	72.6	0.9
SBP breakfast	19.0	19.6	0.8
NSLP afterschool snacks	0.5 ^	0.0	0.2
CACFP snacks or suppers	0.1 ^	0.0	<0.1
FFVP	2.2	0.0	0.4
All reimbursable meals	95.0	97.0	0.6
All nonreimbursable meals	5.0	3.0	0.6
Number of SFAs		**264**	

Source: School Nutrition and Meal Cost Study, Menu Survey and SFA Director and Business Manager Cost Interviews (Onsite and Follow-Up), school year 2014–2015. Tabulations are weighted to be representative of all public SFAs offering the National School Lunch Program.

Note: Estimates of the composition of food costs exclude 20 SFAs with reported labor costs above 80 percent or below 15 percent of total costs, or reported food costs above 70 percent or below 15 percent of total costs.

[a]Food costs include food purchases, USDA Foods received by the SFA, and value of food used from inventory.

^ Point estimate is considered less precise than estimates that are not flagged because the sample size is small or the coefficient of variation is large. The rules used in flagging estimates are described in Chapter 1.

CACFP = Child and Adult Care Food Program; FFVP = Fresh Fruit and Vegetable Program; NSLP = National School Lunch Program; SBP = School Breakfast Program; SE = standard error of the mean; SFA = school food authority; SY = school year.

For the average SFA, NSLP lunches represented nearly three-quarters (73 percent) of total reported food costs and SBP breakfasts represented about one-fifth (19 percent) of total reported food costs (Table 2.5). All other reimbursable meals and snacks (NSLP afterschool snacks, CACFP snacks and suppers, and the FFVP) comprised a mean of 3 percent of total reported food costs. Almost all total reported food costs (95 percent) went toward reimbursable meals, and only 5 percent was allocated to nonreimbursable meals.[38]

3. Composition of Reported Labor Costs by Function

Reported labor costs include costs for four main functions:

1. school meal/snack production, which includes the time school- and SFA-level staff spend to produce and serve lunches, breakfasts, and snacks for students and staff in schools[39]
2. other production, which is the labor costs to produce and serve any other meals, such as meals a school might produce and ship to child care or senior centers
3. nutrition education and promotion, which is non-production time spent on tasks such as promoting healthy eating habits and participation in the school meal programs

[38] This report uses the terms "nonreimbursable meals" and "nonreimbursable food sales" interchangeably.

[39] Includes reimbursable and nonreimbursable servings.

4. other non-production, which includes administration of school meal programs, including collecting/processing school meal applications and other non-production activities to support school meals, such as cleaning and maintenance of kitchens, warehousing, and transportation costs.

For the average SFA, school meal/snack production accounted for 79 percent of reported labor costs in SY 2014–2015 (Table 2.6). Other non-production labor accounted for 20 percent of reported labor costs. Labor for other production functions and nutrition education and promotion together accounted for less than 2 percent of reported labor costs.

Table 2.6. Composition of Reported Labor Costs, SY 2014–2015

	Percentage of Total SFA Labor		
	Mean	Median	SE
Function			
School meal/snack production[a]	78.7	79.1	0.8
Other production[b]	0.8	0.0	0.1
Nutrition education and promotion	0.7	0.0	0.1
Other non-production labor[c]	19.8	19.3	0.7
Number of SFAs		**264**	

Source: School Nutrition and Meal Cost Study, School Nutrition Manager Cost Interview, and SFA Director and Business Manager Cost Interviews (Onsite and Follow-Up), school year 2014–2015. Tabulations are weighted to be representative of all public SFAs offering the National School Lunch Program.

Note: Estimates of the composition of labor costs exclude 20 SFAs with reported labor costs above 80 percent or below 15 percent of total costs or reported food costs above 70 percent or below 15 percent of total costs.

[a]School meal/snack production labor includes time for school-level and SFA-level staff to produce and serve breakfast, lunch, and snacks for students and staff in schools. These meals/snacks may include both reimbursable and nonreimbursable servings.

[b]Other production labor includes time to produce and serve any meals other than breakfast, lunch, and snacks, such as food for child care or senior centers or catering for school or community events.

[c]Other non-production labor excludes nutrition education and promotion and includes administration of school meal programs and other non-production activities to support school meals, such as cleaning and maintenance of kitchens, warehousing, and transportation costs.

SE = standard error of the mean; SFA = school food authority; SY = school year.

3. FULL COSTS OF PRODUCING SCHOOL MEALS

Chapter 2 presented estimates of the reported costs of producing reimbursable school meals and the composition of reported costs for all school foodservice activities (including the school meal programs and non-program food sales). This chapter presents estimates of the full costs of producing reimbursable meals and nonreimbursable foods and the composition of full costs of all school foodservice activities.

In most SFAs, reported costs for SY 2014–2015 did not reflect all costs attributable to school foodservice activities. The vast majority of school districts incurred some costs to support school foodservice activities that were not charged to the school foodservice account. For example, school- and district-level personnel who were not on the foodservice payroll often spent time on activities to support the school meal programs, such as cleaning cafeterias, collecting applications for free and reduced-price meals, and purchasing food. Since these personnel costs were not part of the foodservice payroll, they were often not charged to the foodservice account. Such costs are referred to as unreported costs. The full costs of school foodservice activities in any SFA are the sum of total reported costs and total unreported costs, and represent the complete set of resources used for these activities.

Table 3.1 identifies the kinds of reported and unreported costs that SFAs often incur in each of the four major cost components and how these costs combine to make up the full costs of school foodservice activities. The reported and unreported costs included in the table are examples. There was variation across SFAs in the extent to which components of full costs were reported. As discussed in Chapter 1 and Appendix A, unreported costs for school foodservice activities were estimated with data from detailed interviews with school principals and district officials.

This chapter presents an analysis of SFAs' full costs for producing reimbursable school meals in SY 2014–2015. The chapter first describes the unreported costs of producing reimbursable meals. It then describes the full costs of producing reimbursable meals—which reflect the sum of reported and unreported costs—and then the composition of full costs of both reimbursable meals and non-program food sales.

A. Unreported Costs of Producing Reimbursable Meals

This section presents estimates of the unreported cost per NSLP lunch and per SBP breakfast, broken down by component, in SY 2014–2015. The estimates identify which types of costs contributed most to the unreported costs of reimbursable meals. In addition, the section presents findings on the extent to which indirect costs were reported by SFAs, both overall and by key subgroups. Throughout this section, all estimates use the SFA as the unit of analysis and thus describe the average SFA.

Table 3.1. Examples of Reported and Unreported Components of the Full Costs of School Foodservice Activities

Component	Reported Costs	Unreported Costs	Full Costs
Food	Food purchases USDA Foods received Food used from inventory	(not applicable)	Food purchases USDA Foods received Food used from inventory
Labor	Salaries for foodservice personnel Fringe benefits for foodservice personnel charged to school foodservice account	Salaries and fringe benefits for non-foodservice personnel supporting foodservice activities Fringe benefits for foodservice personnel not charged to school foodservice account	All pay and fringe benefits for foodservice personnel Pay and fringe benefits for non-foodservice personnel supporting foodservice activities
Other direct	Supplies, equipment, or services charged to school foodservice account	Supplies, equipment, or services not charged to school foodservice account	All supplies, equipment, and services used for school foodservice
Indirect	Indirect costs charged to the school foodservice account for use of facilities, administrative support, or other services provided by the school district[a]	Indirect costs for use of facilities, administrative support, or other services provided by the school district that are not charged to school foodservice account	All indirect costs for use of facilities, administrative support, or other services provided by the school district

[a]Administrative support provided by the school district to school foodservice may include purchasing, contracting, payroll, human resources management, information systems, or other administrative functions. Other services provided by the school district may include equipment maintenance, transportation or storage of food or supplies, security, or other non-administrative functions.

1. Unreported Cost per NSLP Lunch

In the average SFA, labor costs (salaries and benefits) for school-level non-foodservice personnel were the largest component (61 percent) of unreported cost per NSLP lunch (Table 3.2). School personnel (such as teachers, aides, custodians, and administrators) often oversee students in the cafeteria, clean and maintain cafeterias and kitchen equipment, distribute and collect applications for free and reduced-price meals, accept and manage student payments and other cash, and provide other administrative and support services for school foodservice. Indirect costs were the second largest component (26 percent) of unreported NSLP costs. Unreported indirect costs for school foodservice include costs that the school district could but does not charge to the school foodservice account for use of shared facilities, staff and services. The third largest component of unreported NSLP costs (6 percent) consisted of unreported fringe benefits for foodservice personnel. Unreported labor costs for district-level non-foodservice personnel accounted for 3 percent of unreported costs per NSLP lunch. These costs generally represented administrative support or other services to support school foodservice operations. One reason district-level personnel represented such a small percentage of the unreported costs is that they were often included in the unreported indirect costs. Similarly, other direct costs represented just 4 percent of the unreported costs, in part because such non-personnel costs as utilities were often included in the unreported indirect costs.

For the average SFA, the total unreported cost per NSLP lunch was $2.21, and the largest components of the unreported cost per NSLP lunch were $1.43 for labor costs for school personnel and $0.49 for indirect costs. The other components included $0.08 to $0.12 per NSLP lunch in the average SFA for district personnel labor costs, foodservice fringe benefits, and other direct costs.

Table 3.2. Composition of Unreported Cost per NSLP Lunch, SY 2014–2015

	Cost per Lunch by Component Unit of Analysis Is SFA					
	Percentage of Total Unreported Cost per NSLP Lunch (%)			Unreported Cost per NSLP Lunch ($)		
Component	Mean	Median	SE	Mean	Median	SE
School labor[a]	61.0	59.5	0.01	1.43	1.05	0.11
Indirect costs[b]	26.1	22.7	0.01	0.49	0.42	0.03
Fringe benefits for foodservice personnel	5.6	2.0	0.01	0.12	0.04	0.02
Other direct costs[c]	4.4	2.7	0.01	0.09	0.05	0.01
District labor[d]	2.9	0.00	0.01	0.08	0.00	0.02
Total unreported costs				2.21	1.78	0.13
Number of SFAs			**263**			

Source: School Nutrition and Meal Cost Study, Menu Survey, School Nutrition Manager Cost Interview, School Principal Cost Interview, and SFA Director and Business Manager Cost Interviews (Onsite and Follow-Up), school year 2014–2015. Tabulations are weighted to be representative of all public SFAs offering the National School Lunch Program.

Notes: Estimates of the components of cost per NSLP lunch exclude 21 SFAs with reported or full labor costs above 80 percent or below 15 percent of total costs or reported or full food costs above 70 percent or below 15 percent of total costs. The data for these SFAs did not appear to provide an accurate decomposition of costs (for example, significant labor costs were included in other direct costs).

For SFAs with trimmed total full or reported costs that have been set to the 3rd percentile or 97th percentile, respectively, the unreported cost components have been adjusted so that they sum to the difference between the trimmed total full and reported cost per NSLP lunch. The adjustment maintains the same percentages of cost components before adjustment.

[a]Unreported school labor costs include salaries and fringe benefits for time that school-based non-foodservice personnel spent on meal production and service, nutrition education and promotion, and other activities to support the NSLP.

[b]Unreported indirect costs are the difference between the reported indirect costs and the full indirect costs that the SFA could charge (based on the district's indirect cost rate and the reported direct costs of the NSLP).

[c]Unreported other direct costs include any direct costs for school foodservice such as supplies or contracted services that the SFA identified but did not charge to the school foodservice account.

[d]Unreported district labor costs include pay and fringe benefits for time that district-level non-foodservice personnel spent on meal production and service, nutrition education and promotion, and other activities to support the NSLP.

NSLP = National School Lunch Program; SFA = school food authority; SY = school year.

2. Unreported Cost per SBP Breakfast

The composition of the unreported cost per SBP breakfast was very similar to that of NSLP lunch, with school personnel labor representing the majority (60 percent) and indirect costs at 27 percent (Table 3.3). As with NSLP lunch, unreported costs for district labor, foodservice personnel fringe benefits, and other direct costs represented small percentages (3 percent to 6 percent of the total unreported costs). The total unreported cost per SBP breakfast for the average SFA was $1.42, substantially less than for NSLP lunch.

3. Reported and Unreported Indirect Costs

As described above, more than one-quarter of the unreported cost per NSLP lunch and SBP breakfast was for indirect costs. School districts have expenses for resources that support school meals and other programs but cannot readily be charged directly to those programs based on actual usage, so they may treat these expenses as indirect costs. For example, the district's chief financial officer oversees accounting for all of the district's programs, including school foodservice, but cannot readily track the time spent on each program. Instead, the district's cost accounting may treat the chief financial officer's pay and benefits as indirect costs. When school districts want or need to charge indirect costs to a program, they most often use indirect cost rates, but some districts use other indirect cost allocation methods. [40]

Reported indirect costs are charges to the school foodservice account for resources provided by the school district when such charges are made by applying an indirect cost rate or other indirect cost allocation method. The full indirect costs of school foodservice are the amount that the school district could charge to the school foodservice account. If the district has an indirect cost rate, the full costs are the product of this rate and the reported direct costs charged to the school foodservice account. The unreported indirect costs are the difference between the full indirect costs of school foodservice and the reported indirect costs charged to the foodservice account. School districts often do not charge indirect costs to the school foodservice account either because they do not charge any indirect costs to individual grants or programs within the district or because the school foodservice account does not have the funds to cover the indirect costs (Glantz et al. 2014).

In SY 2014–2015, only about one in five SFAs (21 percent) charged the school foodservice account for at least some indirect costs (Table 3.4). These indirect costs were included in the estimates of reported costs presented in Chapter 2. Virtually all SFAs had indirect costs that were not charged to the school foodservice account (data not shown). These indirect costs were included in estimates of full costs (discussed below) but not in estimates of reported costs (Chapter 2).

In SY 2014–2015, virtually all SFAs had indirect costs for school meals but only one in five SFAs charged any indirect costs to the school foodservice account.

[40] An indirect cost rate is a percentage computed by dividing the district's indirect costs by its direct costs. Some school districts use indirect cost allocation plans based on factors such as the indirect cost per full-time equivalent staff member.

Table 3.3. Composition of Unreported Cost per SBP Breakfast, SY 2014–2015

	Cost per Breakfast by Component Unit of Analysis Is SFA					
	Percentage of Total Unreported Cost per SBP Breakfast (%)			Unreported Cost per SBP Breakfast ($)		
Component	Mean	Median	SE	Mean	Median	SE
School labor[a]	59.8	58.5	0.02	0.89	0.66	0.06
Indirect costs[b]	26.9	23.3	0.01	0.34	0.28	0.02
Fringe benefits for foodservice personnel	5.6	2.1	0.01	0.08	0.03	0.01
Other direct costs[c]	4.3	2.3	0.01	0.06	0.03	0.01
District labor[d]	3.4	0.00	0.01	0.06	0.00	0.01
Total unreported costs				1.42	1.27	0.08
Number of SFAs			**252**			

Source: School Nutrition and Meal Cost Study, Menu Survey, School Nutrition Manager Cost Interview, School Principal Cost Interview, and SFA Director and Business Manager Cost Interviews (Onsite and Follow-Up), school year 2014–2015. Tabulations are weighted to be representative of all public SFAs offering the National School Lunch Program.

Notes: Estimates of the components of cost per SBP breakfast exclude 18 SFAs with reported or full labor costs above 80 percent or below 15 percent of total costs or reported or full food costs above 70 percent or below 15 percent of total costs. The data for these SFAs did not appear to provide an accurate decomposition of costs (for example, significant labor costs were included in other direct costs). In addition, SBP estimates exclude 14 SFAs with no SBP.

For SFAs with trimmed total cost per NSLP lunch and per SBP breakfast that have been set to the 3rd percentile or 97th percentile, respectively, the cost components have been adjusted so that they sum to the trimmed total cost per meal. The adjustment maintains the same percentages of cost components before adjustment.

[a]Unreported school labor costs include pay and fringe benefits for time that school-based non-foodservice personnel spent on meal production and service, nutrition education and promotion, and other activities to support the NSLP.

[b]Unreported indirect costs are the difference between the reported indirect costs and the full indirect costs that the SFA could charge (based on the district's indirect cost rate and the reported direct costs of the NSLP).

[c]Unreported other direct costs include any direct costs for school foodservice such as supplies or contracted services that the SFA identified but did not charge to the school foodservice account.

[d]Unreported district labor costs include pay and fringe benefits for time that district-level non-foodservice personnel spent on meal production and service, nutrition education and promotion, and other activities to support the NSLP.

SBP = School Breakfast Program; SFA = school food authority; SY = school year.

Handling of indirect costs varied with SFA size and urbanicity. Large SFAs were significantly more likely than medium-sized SFAs to charge at least some indirect costs to the school foodservice account (55 percent versus 20 percent), and medium-sized SFAs were more likely to do so than small SFAs (11 percent). Additionally, urban SFAs were significantly more likely than either suburban or rural SFAs to charge indirect costs to the school foodservice account (60 percent versus 25 percent and 15 percent, respectively).

Table 3.4. Percentage of SFAs with Reported Indirect Costs, SY 2014–2015

	Percentage of SFAs	SE	SFA Sample Size	
			Weighted	Unweighted
All SFAs	**21.3**	**2.8**	**13,601**	**284**
District Child Poverty Rate				
Lower (less than 20 percent)	18.7	3.5	8,059	165
Higher (20 percent or more)	25.1	4.7	5,542	119
SFA Size				
Fewer than 1,000 students	11.4	4.7	5,786	49[a]
1,000 to 5,000 students	19.9[†]	3.8	5,858	125
More than 5,000 students	54.8[#]	5.3	1,956	110
SFA Urbanicity				
Urban	60.4*	8.1	762	48[a]
Suburban	24.7	4.1	5,473	145
Rural	14.7[#]	3.9	7,365	91

Source: School Nutrition and Meal Cost Study, SFA Director and Business Manager Cost Interviews (Onsite and Follow-Up), SY 2014–2015. Tabulations are weighted to be representative of all public SFAs offering the National School Lunch Program.

Notes: This table is based on inclusion of indirect costs in reported cost per NSLP lunch but percentages of SFAs are the same for the SBP.

[a]Estimates for small SFAs (n = 49) and urban SFAs (n = 48) may be unreliable due to the small sample for these groups (see discussion of statistical reporting standards for details).

* Difference between first and second subgroups is significantly different from zero at the 0.05 level.

[#] Difference between first and third subgroups is significantly different from zero at the 0.05 level.

[†] Difference between second and third subgroups is significantly different from zero at the 0.05 level.

NSLP = National School Lunch Program; SE = standard error; SFA = school food authority, SY = school year.

B. Full Costs of Producing Reimbursable Meals

In SY 2014–2015, the full cost of producing an NSLP lunch in the average SFA was $6.02, or 58 percent higher than the reported cost of $3.81.

This section presents national estimates of the full costs for reimbursable meals overall and by district child poverty rate, SFA size, and SFA urbanicity. Estimates of means, medians, and standard errors are provided at both the SFA level and meal level. As discussed in Chapter 1, estimates using the SFA as the unit of analysis represent cost for the average SFA and are useful when considering costs from the SFA's point of view. Estimates using the meal as the unit of analysis represent cost for the average meal and are useful when considering costs for the program as a whole. In

addition, figures summarize the distribution of the full cost per NSLP lunch and per SBP breakfast.[41]

1. Full Cost per NSLP Lunch

In SY 2014–2015, the mean full cost per NSLP lunch for the average SFA was $6.02, 58 percent more than the mean reported cost per NSLP lunch ($3.81) (Table 3.5 and Table 2.1) and 81 percent more than the mean USDA subsidy for a free lunch ($3.32). There were no statistically significant differences in the mean full cost per NSLP lunch for the average SFA across subgroups of SFAs defined by district child poverty rate, size, or urbanicity.[42]

Table 3.5. Mean Full Cost per NSLP Lunch: SFA Level, SY 2014–2015

	Unit of Analysis Is SFA			Unit of Analysis Is NSLP Lunch			SFA Sample Size	
	Mean ($)	Median ($)	SE ($)	Mean ($)	Median ($)	SE ($)	Weighted	Unweighted
All SFAs	**6.02**	**5.50**	**0.15**	**5.55**	**5.27**	**0.11**	**13,601**	**284**
District Child Poverty Rate								
Lower (less than 20 percent)	6.13	5.62	0.20	5.70	5.35	0.12	8,059	165
Higher (20 percent or more)	5.86	5.32	0.24	5.43	5.14	0.17	5,542	119
SFA Size								
Fewer than 1,000 students	6.03	5.66	0.30	5.61	5.01	0.23	5,786	49[a]
1,000 to 5,000 students	6.13	5.51	0.20	6.05†	5.40	0.20	5,858	125
More than 5,000 students	5.66	5.26	0.15	5.35	5.25	0.14	1,956	110
SFA Urbanicity								
Urban	5.62	5.25	0.29	5.16*	4.91	0.21	762	48[a]
Suburban	5.86	5.37	0.16	5.72	5.38	0.15	5,473	145
Rural	6.18	5.63	0.25	5.73	5.23	0.21	7,365	91

Source: School Nutrition and Meal Cost Study, Menu Survey, School Nutrition Manager Cost Interview, School Principal Cost Interview, and SFA Director and Business Manager Cost Interviews (Onsite and Follow-Up), school year 2014–2015. Tabulations are weighted to be representative of all public SFAs offering the National School Lunch Program.

Notes: Outliers were trimmed to avoid excessive influence on means. Full cost per NSLP lunch was set to the 3rd percentile for nine SFAs with cost per NSLP lunch at or below the 3rd percentile. Likewise, full cost per NSLP lunch was set to the 97th percentile for nine SFAs with cost per NSLP lunch at or above the 97th percentile. Differences in medians were not tested for statistical significance.

[a]Estimates for small SFAs (n = 49) and urban SFAs (n = 48) may be unreliable due to the small sample for these groups (see discussion of statistical reporting standards for details).

* Difference between first and second subgroups is significantly different from zero at the 0.05 level.

† Difference between second and third subgroups is significantly different from zero at the 0.05 level.

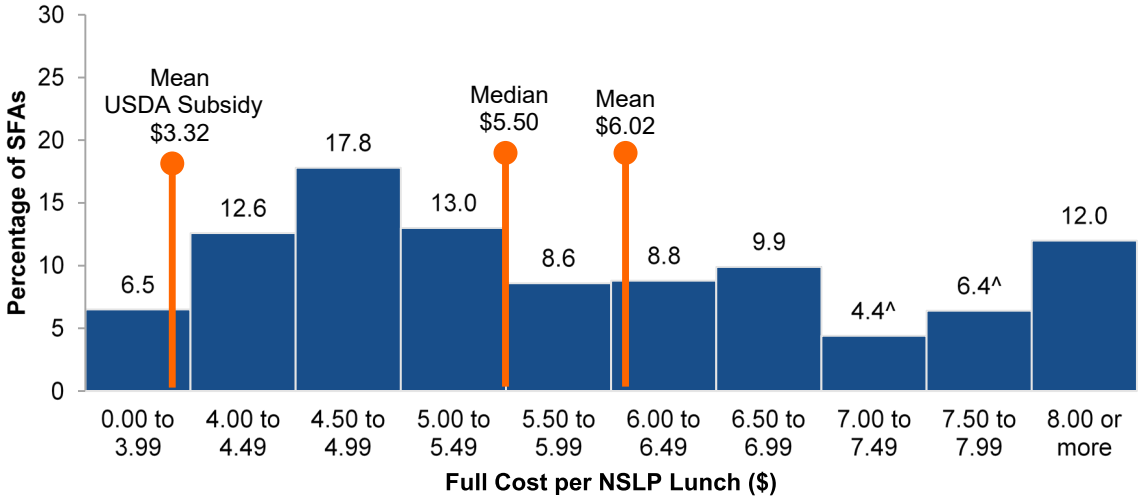
NSLP = National School Lunch Program; SE = standard error of the mean; SFA = school food authority; SY = school year.

[41] Supplementary tables of distributions and school-level estimates of full costs are provided in Appendix C.

[42] School-level estimates of the full cost per NSLP lunch are provided in Table C.3.

More than one-third of SFAs (37 percent) had a full cost of less than $5.00 per NSLP lunch, while the top third of SFAs (33 percent) had a full cost of $6.50 per lunch or more (Figure 3.1). Over 94 percent of SFAs had full costs above the mean USDA subsidy of $3.32 per NSLP lunch.[43]

Figure 3.1. Distribution of SFAs by Full Cost per NSLP Lunch, SY 2014–2015



Source: School Nutrition and Meal Cost Study, Menu Survey, School Nutrition Manager Cost Interview, and SFA Director and Business Manager Onsite and Follow-Up Cost Interviews, SY 2014–2015. Tabulations are weighted to be representative of all public SFAs offering the National School Lunch Program.

Note: SFA is the unit of analysis.

NSLP = National School Lunch Program; SFA = school food authority; SY = school year.

^ Point estimate is considered less precise than estimates that are not flagged because the sample size is small or the coefficient of variation is large. The rules used in flagging estimates are described in Chapter 1. When these rules are applied, percentages close to 0 or 100 are often flagged.

Using the meal as the unit of analysis, the mean full cost per NSLP lunch was $5.55. As noted in Chapter 2, estimates using the meal as the unit of analysis give more weight to SFAs that serve more meals, whereas estimates using the SFA as the unit of analysis give equal weight to each SFA. The difference between the two estimates of the mean full cost per NSLP lunch ($6.02 versus $5.55) reflects the fact that the mean full cost of the average NSLP lunch was significantly smaller ($0.70 less) in large SFAs, which produced a disproportionate share of NSLP lunches, than in the medium-sized SFAs, which were far more numerous.[44] The mean full cost of an NSLP lunch was also significantly lower among urban SFAs than among suburban SFAs ($5.16 versus $5.72).

2. Unreported Costs as a Percentage of Full Costs per NSLP Lunch

For the average SFA, unreported costs contributed about one-third (34 percent) of the full costs per NSLP lunch (Table 3.6). Large SFAs had significantly less of their full costs that were

[43] The distributions of SFAs and schools by full cost per NSLP lunch are provided in Tables C.9 and C.10.

[44] See Figure 1.1 for an illustration of the difference between the meal and SFA as the unit of analysis.

unreported costs than did small SFAs (32 percent versus 36 percent). Likewise, the unreported costs were a significantly smaller share of the full costs for suburban SFAs (32 percent) than for rural SFAs (37 percent). The unreported costs percentages were essentially the same for the average NSLP lunch and for the average SFA.[45]

Table 3.6. Unreported Costs as a Percentage of Full Costs per NSLP Lunch: SFA Level, SY 2014–2015

	Unit of Analysis Is SFA			Unit of Analysis Is NSLP Lunch			SFA Sample Size	
	Mean (%)	Median (%)	SE (%)	Mean (%)	Median (%)	SE (%)	Weighted	Unweighted
All SFAs	**34.4**	**32.9**	**1.1**	**31.9**	**31.3**	**1.0**	**13,601**	**284**
District Child Poverty Rate								
Lower (less than 20 percent)	34.4	31.5	1.3	32.3	30.3	1.0	8,059	165
Higher (20 percent or more)	34.2	33.3	1.8	31.7	32.4	1.6	5,542	119
SFA Size								
Fewer than 1,000 students	36.2	35.5	2.1	35.1	34.2	1.7	5,786	49[a]
1,000 to 5,000 students	33.5	31.2	1.3	33.1	31.4	1.1	5,858	125
More than 5,000 students	31.5[#]	30.3	1.1	31.2	30.6	1.4	1,956	110
SFA Urbanicity								
Urban	31.8	30.0	1.8	31.4	30.6	2.4	762	48[a]
Suburban	31.9[†]	30.1	1.1	31.4	30.2	1.3	5,473	145
Rural	36.5	35.3	1.7	34.1	33.6	1.2	7,365	91

Source: School Nutrition and Meal Cost Study, Menu Survey, School Nutrition Manager Cost Interview, School Principal Cost Interview, and SFA Director and Business Manager Cost Interviews (Onsite and Follow-Up), school year 2014–2015. Tabulations are weighted to be representative of all public SFAs offering the National School Lunch Program.

Notes: Outliers were trimmed to avoid excessive influence on means. Unreported cost per NSLP lunch was calculated using trimmed values of reported and full cost per NSLP lunch. Full cost per NSLP lunch was set to the 3rd percentile for nine SFAs with cost per NSLP lunch at or below the 3rd percentile. Likewise, full cost per NSLP lunch was set to the 97th percentile for nine SFAs with cost per NSLP lunch at or above the 97th percentile.

Differences in medians were not tested for statistical significance.

[a]Estimates for small SFAs (n = 49) and urban SFAs (n = 48) may be unreliable due to the small sample for these groups (see discussion of statistical reporting standards for details).

[#] Difference between first and third subgroups is significantly different from zero at the 0.05 level.

[†] Difference between second and third subgroups is significantly different from zero at the 0.05 level.

NSLP = National School Lunch Program; SE = standard error of the mean; SFA = school food authority; SY = school year.

[45] The distribution of SFAs by unreported costs as a percentage of the full cost per NSLP lunch is provided in Table C.11.

3. Full Cost per SBP Breakfast

For the average SFA, the full cost of producing an SBP breakfast in SY 2014–2015 was $4.19 (Table 3.7). The mean full cost per SBP breakfast was 54 percent greater than the mean reported cost of $2.72 (Table 2.2) and more than twice the $1.88 mean reimbursement rate for a free breakfast.

In SY 2014–2015, the full cost of producing an SBP breakfast in the average SFA was $4.19, or 54 percent higher than the reported cost of $2.72.

Across all SFAs, regardless of size, there were significant differences between lower-poverty SFAs and higher-poverty SFAs and between urban and rural SFAs. Lower-poverty SFAs had a mean full cost per SBP breakfast of $4.73 compared with $3.50 for higher-poverty SFAs. Urban SFAs had a mean full cost per SBP breakfast of $3.47 compared with $4.37 for rural SFAs. Both of these differences are consistent with a pattern where SFAs with larger breakfast programs (in terms of volume or participation) have a lower cost per SBP breakfast.[46]

Less than one-third (29 percent) of SFAs had a full cost of less than $3.00 per SBP breakfast, while about one-third (32 percent) had a full cost of $4.50 or more per breakfast.[47]

In SY 2014–2015, the mean full cost per reimbursable breakfast was $3.50 for an average meal, also substantially more than the mean reported cost per SBP breakfast with the meal as the unit of analysis ($2.34).

Table 3.7. Mean Full Cost per SBP Breakfast: SFA Level, SY 2014–2015

	Unit of Analysis Is SFA			Unit of Analysis Is SBP Breakfast			SFA Sample Size	
	Mean ($)	Median ($)	SE ($)	Mean ($)	Median ($)	SE ($)	Weighted	Unweighted
All SFAs	**4.19**	**3.76**	**0.15**	**3.50**	**2.99**	**0.17**	**12,805**	**270**
District Child Poverty Rate								
Lower (less than 20 percent)	4.73*	4.29	0.22	3.80	3.46	0.15	7,219	152
Higher (20 percent or more)	3.50	3.05	0.17	3.39	2.79	0.24	5,586	118
SFA Size								
Fewer than 1,000 students	4.30	4.14	0.30	3.57	3.31	0.21	5,221	43[a]
1,000 to 5,000 students	4.21	3.74	0.20	3.56	3.06	0.15	5,665	119
More than 5,000 students	3.87	3.13	0.22	3.48	2.93	0.24	1,919	108
SFA Urbanicity								
Urban	3.47	2.72	0.30	3.65	2.78	0.41	747	47[a]
Suburban	4.05	3.47	0.18	3.34	2.99	0.14	4,884	134
Rural	4.37#	4.12	0.24	3.61	3.10	0.16	7,175	89

Source: School Nutrition and Meal Cost Study, Menu Survey School Nutrition Manager Cost Interview, School Principal Cost Interview, and SFA Director and Business Manager Cost Interviews (Onsite and Follow-Up), school year 2014–2015. Tabulations are weighted to be representative of all public SFAs offering the National School Lunch Program.

[46] School-level estimates of the full cost per SBP breakfast are provided in Table C.4.

[47] The distributions of SFAs and schools by full cost per SBP breakfast are provided in Tables C.12 and C.13.

Notes: SBP estimates exclude 14 SFAs with no SBP. Outliers were trimmed to avoid excessive influence on means. Full cost per SBP breakfast was set to the 3rd percentile for nine SFAs with cost per SBP breakfast at or below the 3rd percentile. Likewise, full cost per SBP breakfast was set to the 97th percentile for nine SFAs with cost per SBP breakfast at or above the 97th percentile.

Differences in medians were not tested for statistical significance.

[a]Estimates for small SFAs (n = 43) and urban SFAs (n = 47) may be unreliable due to the small sample for these groups (see discussion of statistical reporting standards for details).

* Difference between first and second subgroups is significantly different from zero at the 0.05 level.

Difference between first and third subgroups is significantly different from zero at the 0.05 level.

SBP = School Breakfast Program; SE = standard error of the mean; SFA = school food authority; SY = school year.

4. Unreported Cost as a Percentage of Full Costs per SBP Breakfast

For the average SFA, unreported costs contributed one-third (33 percent) of the full costs per SBP breakfast (Table 3.8). Large SFAs had significantly lower unreported cost percentages than did small SFAs (31 percent versus 36 percent). Likewise, unreported costs were a significantly smaller share of the full cost per SBP breakfast for urban (30 percent) and suburban SFAs (31 percent) than for rural SFAs (35 percent). The unreported share of the full costs was essentially the same for the average SBP breakfast (31 percent) as for the average SFA (33 percent).[48]

Table 3.8. Unreported Costs as a Percentage of Full Costs per SBP Breakfast: SFA Level, SY 2014–2015

	Unit of Analysis Is SFA			Unit of Analysis Is SBP Breakfast			SFA Sample Size	
	Mean (%)	Median (%)	SE (%)	Mean (%)	Median (%)	SE (%)	Weighted	Unweighted
All SFAs	**33.1**	**32.2**	**1.0**	**30.6**	**28.8**	**1.4**	**12,805**	**270**
District Child Poverty Rate	34.1	32.9	1.3	31.2	29.4	1.2	7,219	152
Lower (less than 20 percent)								
Higher (20 percent or more)	31.7	30.2	1.6	30.3	28.6	1.8	5,586	118
SFA Size								
Fewer than 1,000 students	35.9	37.5	2.1	34.8*	35.8	2.0	5,221	43[a]
1,000 to 5,000 students	31.4	29.4	1.1	30.2	29.4	1.1	5,665	119
More than 5,000 students	30.1#	27.4	1.2	30.4	27.8	1.9	1,919	108
SFA Urbanicity								
Urban	30.2	27.7	1.6	30.9	29.9	2.7	747	47[a]
Suburban	30.6†	28.2	1.1	30.0	27.1	2.0	4,884	134
Rural	35.0#	34.6	1.6	31.5	29.9	1.3	7,175	89

Source: School Nutrition and Meal Cost Study, Menu Survey, School Nutrition Manager Cost Interview, School Principal Cost Interview, and SFA Director and Business Manager Cost Interviews (Onsite and Follow-Up), school year 2014–2015. Tabulations are weighted to be representative of all public SFAs offering the National School Lunch Program.

Notes: Outliers were trimmed to avoid excessive influence on means. Unreported cost per SBP breakfast was calculated using trimmed values of reported and full cost per SBP breakfast. Full cost per SBP breakfast was set to the 3rd percentile for nine SFAs with cost per SBP breakfast at or below the 3rd percentile.

[48] Table C.14 provides the distribution of SFAs by unreported costs as a percentage of the full cost per SBP breakfast.

Likewise, full cost per SBP breakfast was set to the 97th percentile for nine SFAs with cost per SBP breakfast at or above the 97th percentile.

[a]Estimates for small SFAs (n = 43) and urban SFAs (n = 47) may be unreliable due to the small sample for these groups (see discussion of statistical reporting standards for details).

Differences in medians were not tested for statistical significance.

* Difference between first and second subgroups is significantly different from zero at the 0.05 level.

† Difference between second and third subgroups is significantly different from zero at the 0.05 level.

Difference between first and third subgroups is significantly different from zero at the 0.05 level.

SBP = School Breakfast Program; SE = standard error of the mean; SFA = school food authority; SY = school year.

5. Full Cost per Reimbursable Meal by Program

As noted in Chapter 2, some SFAs provide afterschool snacks under the NSLP or CACFP, and some schools provide snacks during the school day under the FFVP. Table 3.9 provides the mean full cost per meal or snack for these programs and the NSLP and SBP, using the SFA as the unit of analysis. The mean full cost for a typical SFA was $6.02 per NSLP lunch and $4.19 per SBP breakfast. The mean full cost per reimbursable afterschool snack under the NSLP was $1.98. For the CACFP, the mean full cost per snack or supper was $2.62 for a typical SFA.[49]

Table 3.9. Full Cost per Reimbursable Meal by Program, SY 2014–2015

	Full Cost per Meal ($) Unit of Analysis is SFA		
	Mean	Median	SE
NSLP Lunch (n = 284)	6.02	5.50	0.15
SBP Breakfast (n = 270)	4.19	3.76	0.15
NSLP Afterschool Snacks (n = 61)	1.98	1.24	0.32
CACFP Snack or Supper[a] (n = 20[b])	2.62	2.02	0.20
FFVP (Cost per Student)[c] (n = 76)	47.72	45.83	3.57
Number of SFAs		**284**	

Source: School Nutrition and Meal Cost Study, Menu Survey, School Nutrition Manager Cost Interview, School Principal Cost Interview, and SFA Director and Business Manager Cost Interviews (Onsite and Follow-Up), school year 2014–2015. Tabulations are weighted to be representative of all public SFAs offering the National School Lunch Program.

Notes: Outliers were trimmed to avoid excessive influence on means. Full cost per NSLP lunch was set to the 3rd percentile for nine SFAs with cost per lunch at or below the 3rd percentile. Likewise, reported cost per lunch was set to the 97th percentile for nine SFAs with cost per lunch at or above the 97th percentile. SBP estimates exclude 14 SFAs with no SBP. NSLP afterschool snack estimates exclude 223 SFAs without NSLP afterschool snacks. CACFP snack and supper estimates exclude 264 SFAs without CACFP snacks or suppers. FFVP estimates exclude 199 SFAs with no FFVP schools, and exclude an additional 9 SFAs with FFVP schools that did not report FFVP food costs. Due to the small number of SFAs with NSLP afterschool snacks, CACFP snacks or suppers, and FFVP and the lack of prior data, there was no basis for determining that SFAs had outlier values for the reported cost per meal (or per student) for these programs.

[a]The full cost per meal for CACFP includes both snacks and suppers and thus is not representative of the cost per CACFP snack or the cost per CACFP supper.

[b]The estimated cost per CACFP snack or supper may be unreliable due to the small sample for this group (n = 20) (see discussion of statistical reporting standards for details).

[49] The full cost per meal for CACFP includes both snacks and suppers and is not representative of the cost per CACFP snack or the cost per CACFP supper. Due to the small number of SFAs with the CACFP and burden considerations, costs of CACFP snacks and suppers were not tracked separately.

[c]No meal counts are available for FFVP, so this table presents the full annual cost per student. See text for discussion.

CACFP = Child and Adult Care Food Program; FFVP = Fresh Fruit and Vegetable Program; NSLP = National School Lunch Program; SBP = School Breakfast Program; SE = standard error of the mean; SFA = school food authority; SY = school year.

Among SFAs with at least one school that participated in the FFVP, the mean annual full cost was $47.72 per student in FFVP schools. As noted in Chapter 2, no meal counts were available for the FFVP, and the FFVP provides reimbursement on the basis of SFAs' actual costs. For comparison with the per-meal cost for other programs, the estimated mean daily full cost per student for the FFVP was $0.44 based on three FFVP snack days per week and 36 weeks per school year.[50] For all meals, the full cost per reimbursable meal was greater than the reported cost per reimbursable meal, as expected.

Food and labor costs accounted for 83 percent of the full cost per NSLP lunch and SBP breakfast.

C. Composition of Full Costs

As discussed in the introduction to Chapter 3, the major components of full cost per meal were food costs, labor costs, other direct costs, and indirect costs. Table 3.10 identifies individual costs that make up the components of the full costs.

This section first provides estimates of the percentage of the full cost and dollar amount per meal for the four major cost components using the SFA as the unit of analysis. These estimates reflect the contributions of reported and unreported costs to the full costs of each component in the average SFA. As described in Section A of this chapter, the largest components of unreported costs were salaries and benefits for school personnel and indirect costs, while unreported salaries and benefits for district personnel, fringe benefits for school foodservice personnel, and other direct costs were much smaller components (Table 3.2). As a result, labor and indirect costs contributed greater shares of full costs than of reported costs, as discussed below.

Following the discussion of the composition of the full cost per meal by component, this section provides the breakdown of full labor costs by function.

1. Composition of Full NSLP and SBP Costs by Component

For the average SFA, food and labor costs together accounted for 83 percent of the full cost both per NSLP lunch (29 percent for food and 54 percent for labor) and per SBP breakfast (30 percent and 53 percent, respectively) (Table 3.10). For both meal types, indirect costs contributed 9 percent and other direct costs contributed 8 percent.

[50] Unlike the NSLP and SBP, the FFVP is limited to high-poverty elementary schools and therefore is available only in a subset of schools in participating SFAs. The annual FFVP cost per student was estimated using data from FFVP schools in the study sample and averaged within an SFA if more than one FFVP school was present. The assumption of three FFVP snack days per week and 36 weeks per school year is based on data from Briefel et al. 2017.

Table 3.10. Composition of Full Cost (by Percentage and Dollar Amount) per NSLP Lunch and SBP Breakfast, SY 2014–2015

Percentage	Cost per Meal by Component Unit of Analysis Is SFA											
	Food Costs[a] (%)			Labor Costs[b] (%)			Other Direct Costs[c] (%)			Indirect Costs[d] (%)		
	Mean	Median	SE	Mean	Median	SE	Mean	Median	SE	Mean	Median	SE
Meal Type												
NSLP lunch	29.3	29.3	0.7	54.0	52.5	0.9	7.8	6.5	0.4	8.9	8.4	0.4
SBP breakfast	30.5	30.3	0.9	52.9	53.6	1.0	7.7	6.6	0.4	9.0	8.4	0.5
Dollar Amount	**Food Costs[a] ($)**			**Labor Costs[b] ($)**			**Other Direct Costs[c] ($)**			**Indirect Costs[d] ($)**		
	Mean	Median	SE	Mean	Median	SE	Mean	Median	SE	Mean	Median	SE
Meal Type												
NSLP lunch	1.70	1.64	0.05	3.35	2.84	0.14	0.46	0.36	0.03	0.52	0.46	0.03
SBP breakfast	1.15	1.07	0.04	2.27	1.92	0.12	0.30	0.22	0.02	0.37	0.30	0.03
Number of SFAs	**263**											

Source: School Nutrition and Meal Cost Study, Menu Survey, School Nutrition Manager Cost Interview, School Principal Cost Interview, and SFA Director and Business Manager Cost Interviews (Onsite and Follow-Up), school year 2014–2015. Tabulations are weighted to be representative of all public SFAs offering the National School Lunch Program.

Notes: Estimates of the components of cost per NSLP lunch exclude 21 SFAs with reported or full labor costs above 80 percent or below 15 percent of total costs, or reported or full food costs above 70 percent or below 15 percent of total costs. The data for these SFAs did not appear to provide an accurate decomposition of costs (for example, significant labor costs were included in other direct costs). Of these 21 SFAs, 18 SFAs that have SBP are excluded from estimates of the components of cost per SBP breakfast. In addition, SBP estimates exclude 14 SFAs with no SBP.

For SFAs with trimmed total cost per NSLP lunch and SBP breakfast that have been set to the 3rd percentile or 97th percentile, respectively, the cost components have been adjusted so that they sum to the trimmed total cost per meal. The adjustment maintains the same percentages of cost components before adjustment.

[a]Food costs include food purchases, USDA Foods received by the SFA, and value of food used from inventory.

[b]Labor costs include salaries, wages, and fringe benefits.

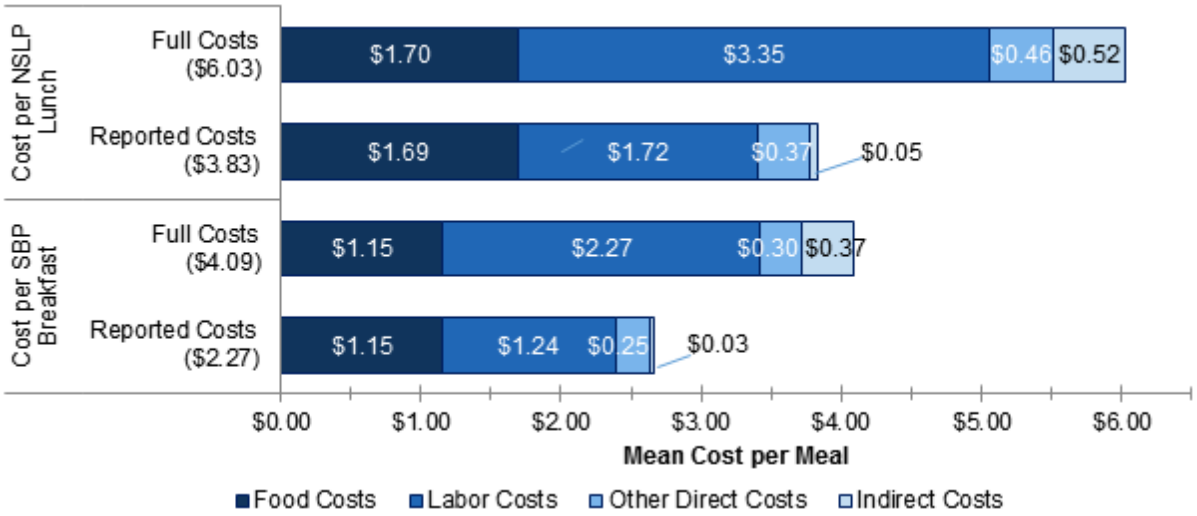
[c]Other direct costs include non-food supplies, foodservice management company charges, other contracted services, equipment purchases and depreciation, utilities, and any other costs not classified as food, labor, or indirect costs.

[d]Indirect costs include charges for resources provided by the school district when such charges are or could be made by applying an indirect cost rate or other indirect cost allocation method.

NSLP = National School Lunch Program; SBP = School Breakfast Program; SE = standard error of the mean; SFA = school food authority; SY = school year.

Comparison of reported cost and full cost per NSLP lunch for the average SFA reveals how the key unreported cost components shifted the magnitude and composition of these costs (Figure 3.2). Unreported labor costs—mainly for school personnel not paid by the school foodservice account—were the largest component of unreported costs and increased the labor cost per NSLP lunch from $1.72 (reported) to $3.35 (full). The majority of SFAs did not include their indirect costs as reported costs, and the indirect cost per NSLP lunch increased the full cost from the reported $0.05 to $0.52. The difference in other direct costs between reported cost and full cost per NSLP lunch was much smaller, and reported and full food costs per NSLP lunch were not statistically significant.[51]

Figure 3.2. Composition of Mean Reported and Full Cost per NSLP Lunch and SBP Breakfast, SY 2014–2015



Source: School Nutrition and Meal Cost Study, Menu Survey, School Nutrition Manager Cost Interview, and SFA Director and Business Manager Onsite and Follow-Up Cost Interviews, SY 2014–2015. Tabulations are weighted to be representative of all public SFAs offering the National School Lunch Program.

Note: The mean reported and full cost per meal for all components combined in Figure 3.2 differ slightly from the mean values reported elsewhere in this section due to the exclusion of some SFAs from the estimates of costs by component.

NSLP = National School Lunch Program; SBP = School Breakfast Program, SY = school year

The patterns of difference between reported and full cost in the average SFA per SBP breakfast were essentially the same as for NSLP lunch. The mean full cost per SBP breakfast consisted of $1.15 for food, $2.27 for labor, $0.30 for other direct costs, and $0.37 for indirect costs. Thus, the full labor cost per SBP breakfast was more than a dollar above the mean reported labor cost of $1.24. As with the NSLP, the full indirect cost per SBP breakfast was substantially greater than the reported indirect cost ($0.37 versus $0.03).

[51] The apparent difference of $0.01 per NSLP lunch between reported and full food costs was the result of a slight difference in the samples for the estimates. No SFAs identified any unreported food costs. The mean reported and full costs per NSLP lunch for all components combined in Figure 3.2 differ slightly from the mean values reported elsewhere in this section because of the exclusion of some SFAs from the estimates of costs by component.

2. Composition of Full Labor Costs by Function

For the average SFA, school meal/snack production contributed 67 percent of full labor costs (Table 3.11) in SY 2014–2015, while other non-production labor contributed nearly all of the rest (29 percent). This distribution differed from the distribution of reported labor costs (Table 2.7). When considering full labor costs, other non-production labor accounted for a greater percentage of total SFA labor because the unreported labor costs consisted primarily of expenses for labor at the school level, including teachers and aides monitoring students during mealtime, office personnel accepting and managing student payments and applications for free or reduced-price meals, custodians cleaning and maintaining cafeterias, and other non-production labor. "Other production" and "nutrition education and promotion" combined represented a mean of about 4 percent of full labor costs.

Table 3.11. Composition of Full Labor Costs, SY 2014–2015

	Percentage of Total SFA Labor		
	Mean	Median	SE
Function			
School meal/snack production[a]	66.5	68.0	1.0
Other production[b]	0.5	0.0	0.1
Nutrition education and promotion	3.9	1.9	0.4
Other non-production labor[c]	29.2	27.7	0.9
Number of SFAs		**263**	

Source: School Nutrition and Meal Cost Study, School Nutrition Manager Cost Interview, School Principal Cost Interview, and SFA Director and Business Manager Cost Interviews (Onsite and Follow-Up), school year 2014–2015. Tabulations are weighted to be representative of all public SFAs offering the National School Lunch Program.

Notes: Estimates of the labor cost composition exclude 21 SFAs with reported or full labor costs above 80 percent or below 15 percent of total costs or reported or full food costs above 70 percent or below 15 percent of total costs. The data for these SFAs did not appear to provide an accurate decomposition of costs (for example, significant labor costs were included in other direct costs).

[a]School meal/snack production labor includes time for school-level and SFA-level staff to produce and serve breakfast, lunch, and snacks for students and staff in schools.

[b]Other production labor includes time to produce and serve any other meals, such as food for child care or senior centers.

[c]Other non-production labor excludes nutrition education and promotion and includes administration of school meal programs and other non-production activities to support school meals, such as cleaning and maintenance of kitchens, warehousing, and transportation costs.

SE = standard error of the mean; SFA = school food authority; SY = school year.

4. COMPOSITION OF SFA REVENUES AND COMPARISON TO COSTS

SFAs generate revenues from multiple sources. USDA provides meal reimbursements and USDA Foods. Some students pay for reimbursable meals, and both students and adults purchase nonreimbursable meals (including from a la carte sales, vending machines, snack bars, adult meals, and catering).[52] Other sources of revenues include State and local funds to support school meals and revenues from activities other than serving meals (such as interest on deposits and sale of equipment). This chapter describes the sources of SFAs' revenues and variations in the relative contribution of different sources across subgroups of SFAs. The chapter also examines revenues as a percentage of costs for SY 2014–2015.[53]

In SY 2014–2015, USDA subsidies (meal reimbursements and the cash value of USDA Foods) represented nearly two-thirds of total SFA revenues. Revenues from student payments for reimbursable meals accounted for one-fifth of total SFA revenues.

A. Composition of SFA Revenues by Source

On average, USDA subsidies, which include meal reimbursements and USDA Foods, represented nearly two-thirds (63 percent) of total SFA revenues in SY 2014–2015 (Table 4.1).[54] USDA reimbursements contributed 57 percent of SFA revenues and USDA Foods contributed 6 percent. Revenues from student payments for reimbursable meals accounted for 20 percent of SFA revenues. The next largest revenue sources were a la carte and other nonreimbursable sales (11 percent) and local government funds (3 percent). State funds contributed about 3 percent of SFA revenues, and other cash revenues were less than 1 percent.

Higher-poverty SFAs received more of their revenues from USDA subsidies than did lower-poverty SFAs, which received more of their revenues from student payments than higher-poverty SFAs did.

[52] This report uses the terms "nonreimbursable meals" and "nonreimbursable food sales" interchangeably. In the analysis of revenues presented in this chapter, revenues from all nonreimbursable food sales have been combined into a single category—a la carte and other nonreimbursable food sales.

[53] The revenue analysis sample includes the SFAs in the cost analysis sample with the following exceptions: excludes 11 SFAs with unreliable USDA reimbursements data, 1 SFA that did not provide any revenue data, and 54 SFAs that did not provide sufficient detail to determine the composition of revenue (that is, categories of revenue were combined in ways that could not be reliably decomposed).

[54] The value of USDA Foods for each SFA included the value it reported receiving (based on its financial statements) plus the value of USDA Foods used from inventory. Revenue from USDA Foods also includes donated food from non-USDA sources such as food banks. Few SFAs reported that they received non-USDA donations of foods.

Table 4.1. Composition of SFA Revenues, SY 2014–2015

Source of Revenues	Percentage of SFA Revenues		
	Mean	Median	SE
USDA Subsidies	62.5	63.5	1.9
Meal reimbursements	56.7	57.7	1.9
USDA Foods[a]	5.9	5.6	0.3
Student Payments for Reimbursable Meals	20.0	18.6	1.4
A la Carte and Other Nonreimbursable Sales	10.9	8.4	0.8
Local Government Funds	3.3	0.0	0.8
State Funds	2.5	1.2	0.3
Other Cash Revenues[a]	0.6	0.0	0.1
Number of SFAs			
Weighted		**13,601**	
Unweighted		**218**	

Source: School Nutrition and Meal Cost Study, SFA Director and Business Manager Cost Interviews (Onsite and Follow-Up), SY 2014–2015. Tabulations are weighted to be representative of all public SFAs offering the National School Lunch Program.

Notes: The revenue analysis sample includes the SFAs in the cost analysis sample with the following exceptions: excludes 11 SFAs with unreliable USDA reimbursements data, 1 SFA that did not provide any revenue data, and 54 SFAs that did not provide sufficient detail to determine the composition of revenues.

[a]Revenues from USDA Foods also include donated food from non-USDA sources such as food banks. Few SFAs reported that they received non-USDA donations of foods.

[b]Other cash revenues include proceeds from sale of equipment, interest on deposits, sales tax receipts, and other revenues not derived directly from meal and snack service or nonreimbursable food sales.

SE = standard error of the mean; SFA = school food authority; USDA = United States Department of Agriculture; SY = school year.

On average, higher-poverty SFAs received 78 percent of their revenues from total USDA subsidies, while lower-poverty SFAs received significantly less, 49 percent (Table 4.2). The higher-poverty SFAs received a higher share of their total revenues from USDA subsidies because they had a greater proportion of meals provided free or at reduced price. In addition, these SFAs were more likely to have meals reimbursed at higher rates due to their higher poverty levels (as discussed in Chapter 1). Some may have benefitted from the impact of the Community Eligibility Provision (CEP) on average Federal revenue per NSLP lunch and SBP breakfast.[55]

About half of SFAs (52 percent) had all of their schools qualify for the higher NSLP reimbursement rates and 1 percent had some schools qualify in SY 2014–2015 (Table C.15). In SY 2014–2015, 70 percent of SFAs had all schools eligible for severe-need SBP rates, and

[55] Eligibility for CEP is based on the percentage of students identified as eligible for free meals based on participation in means-tested programs and thus is linked to the child poverty rate. Prior research indicates that participating in the CEP increases the SFA's revenue per NSLP lunch and per SBP breakfast from Federal reimbursements in part due to the CEP reimbursement formula (Logan et al. 2014).

18 percent had some schools eligible. Higher-poverty SFAs were more likely to have schools qualify for higher NSLP rates and severe-need schools qualify for SBP.

Table 4.2. USDA Subsidies as a Percentage of Total SFA Revenues, SY 2014–2015

	Total USDA Subsidies[a] (%)			USDA Meal Reimbursements (%)			SFA Sample Size	
	Mean	Median	SE	Mean	Median	SE	Weighted	Unweighted
All SFAs	**62.5**	**63.5**	**1.9**	**56.7**	**57.7**	**1.9**	**13,601**	**218**
District Child Poverty Rate								
Lower (less than 20 percent)	48.9*	51.3	1.7	43.1*	45.1	1.7	7,269	122
Higher (20 percent or more)	78.2	79.8	2.0	72.2	74.8	1.9	6,332	96
SFA Size								
Fewer than 1,000 students	63.8	63.6	3.8	57.5	58.2	3.6	5,924	39[b]
1,000 to 5,000 students	60.9	62.6	2.2	55.2	57.1	2.2	5,660	96
More than 5,000 students	63.4	66.2	2.7	58.2	60.3	2.7	2,017	83
SFA Urbanicity								
Urban	72.7*	77.7	4.0	68.4*	74.9	4.1	717	31[b]
Suburban	60.7	66.9	2.4	54.9	60.9	2.4	5,421	116
Rural	62.9	62.1	3.0	56.8#	57.1	2.9	7,463	71

Source: School Nutrition and Meal Cost Study, School Foodservice Revenue Statement, SY 2014–2015. Tabulations are weighted to be representative of all public SFAs offering the National School Lunch Program.

Notes: The revenue analysis sample includes the SFAs in the cost analysis sample with the following exceptions: excludes 11 SFAs with unreliable USDA reimbursements data, 1 SFA that did not provide any revenue data, and 54 SFAs that did not provide sufficient detail to determine the composition of revenues.

Differences in medians were not tested for statistical significance.

[a]Total USDA subsidies include meal reimbursements and value of USDA Foods received.

[b]Estimates for small SFAs (n = 39) and urban SFAs (n = 31) may be unreliable due to the small sample for these groups (see discussion of statistical reporting standards for details).

* Difference between first and second subgroups is significantly different from zero at the 0.05 level.

Difference between first and third subgroups is significantly different from zero at the 0.05 level.

SE = standard error of the mean; SFA = school food authority; USDA = United States Department of Agriculture; SY = school year.

Urban SFAs derived significantly higher of their total revenues from USDA subsidies (73 percent) than did suburban SFAs (61 percent). The percentage of total revenues from USDA subsidies did not vary significantly by SFA size.

USDA Subsidies

Focusing more narrowly just on USDA meal reimbursements, the differences across SFA subgroups were similar to differences for total USDA subsidies. Higher-poverty SFAs received 72 percent of their revenues from USDA meal reimbursements, significantly higher than the 43 percent for lower-poverty SFAs (Table 4.2). As noted above, higher reimbursement rates and participation in the CEP were likely factors in this difference. Urban SFAs derived significantly

more of their total revenues from USDA meal reimbursements (68 percent) than did rural (57 percent) and suburban SFAs (55 percent).

Revenues from USDA Foods represented a mean of 6 percent of total SFA revenues in SY 2014–2015 (Table 4.3). All SFAs are entitled to the same level of USDA Foods assistance on a per-meal basis ($0.2475 per NSLP lunch in SY 2014–2015), so variation in the percentage of total revenues contributed by USDA Foods across subgroups of SFAs largely reflects differences in other sources of revenues.[56] There were small but statistically significant differences between subgroups of SFAs. Large SFAs derived significantly less of their total revenues from USDA Foods (5 percent) than did small SFAs (6 percent). Urban SFAs derived significantly less of their revenues (4 percent of total revenues) from USDA Foods than did suburban and rural SFAs (both at 6 percent). Thus, urban SFAs' greater share of revenues from USDA reimbursements was offset in part by a smaller share of revenues from USDA Foods. The percentage of total revenues derived from USDA Foods did not vary significantly by SFA poverty level.

Table 4.3. USDA Foods as a Percentage of Total SFA Revenues, SY 2014–2015

	USDA Foods[a] (%)			SFA Sample Size	
	Mean	Median	SE	Weighted	Unweighted
All SFAs	**5.9**	**5.6**	**0.3**	**13,601**	**218**
District Child Poverty Rate					
Lower (less than 20 percent)	5.8	5.7	0.4	7,269	122
Higher (20 percent or more)	6.0	5.5	0.4	6,332	96
SFA Size					
Fewer than 1,000 students	6.4	5.7	0.6	5,924	39[b]
1,000 to 5,000 students	5.7	5.6	0.2	5,660	96
More than 5,000 students	5.1[#]	5.2	0.2	2,017	83
SFA Urbanicity					
Urban	4.2*	4.3	0.4	717	31[b]
Suburban	5.8	5.7	0.3	5,421	116
Rural	6.1[#]	5.5	0.4	7,463	71

Source: School Nutrition and Meal Cost Study, School Foodservice Revenue Statement, SY 2014–2015. Tabulations are weighted to be representative of all public SFAs offering the National School Lunch Program.

Notes: The revenue analysis sample includes the SFAs in the cost analysis sample with the following exceptions: excludes 11 SFAs with unreliable USDA reimbursements data, 1 SFA that did not provide any revenue data, and 54 SFAs that did not provide sufficient detail to determine the composition of revenues.

Differences in medians were not tested for statistical significance.

[56] The national average minimum value of donated foods, per lunch served in schools participating in NSLP during School Year 2014 – 2015 was 24.75 cents. Due to a regulation that requires 12 percent of total funding for school meals to come in the form of USDA Foods, SFAs might receive a higher amount of entitlement funding per lunch served. SFAs vary in their utilization of their USDA Foods entitlement, and SFAs may receive bonus products in addition.

[a]Revenues from USDA Foods also include donated food from non-USDA sources such as food banks. Few SFAs reported that they received non-USDA donations of foods.

[b]Estimates for small SFAs (n = 39) and urban SFAs (n = 31) may be unreliable due to the small sample for these groups (see discussion of statistical reporting standards for details).

* Difference between first and second subgroups is significantly different from zero at the 0.05 level.

Difference between first and third subgroups is significantly different from zero at the 0.05 level.

SE = standard error of the mean; SFA = school food authority; USDA = United States Department of Agriculture; SY = school year.

Student Payments

Student payments for reduced-price and paid meals were the second largest source of SFA revenues, accounting for a mean of 20 percent of total SFA revenues (Table 4.4). On average, higher-poverty SFAs derived significantly less of their total revenues from student payments for reimbursable meals compared with lower-poverty SFAs (9 percent versus 30 percent). Higher-poverty SFAs received a smaller share of revenues from student payments because they served more free and reduced-price meals, as discussed above.

Urban SFAs (13 percent) obtained significantly less of their total revenues from student payments compared with suburban SFAs (21 percent) and rural SFAs (20 percent). The share of revenues contributed by student payments for reimbursable meals did not vary significantly by SFA size.

Table 4.4. Student Payments for Reimbursable Meals as a Percentage of Total SFA Revenues, SY 2014–2015

	Student Payments for Reimbursable Meals (%)			SFA Sample Size	
	Mean	Median	SE	Weighted	Unweighted
All SFAs	**20.0**	**18.6**	**1.4**	**13,601**	**218**
District Child Poverty Rate					
Lower (less than 20 percent)	29.6*	30.5	1.5	7,269	122
Higher (20 percent or more)	9.0	5.2	1.3	6,332	96
SFA Size					
Fewer than 1,000 students	20.9	20.4	3.0	5,924	39[a]
1,000 to 5,000 students	19.5	17.7	1.4	5,660	96
More than 5,000 students	18.8	17.0	1.7	2,017	83
SFA Urbanicity					
Urban	12.8*	7.2	2.6	717	31[a]
Suburban	20.7	18.0	1.8	5,421	116
Rural	20.2#	21.2	2.3	7,463	71

Source: School Nutrition and Meal Cost Study, School Foodservice Revenue Statement, SY 2014–2015. Tabulations are weighted to be representative of all public SFAs offering the National School Lunch Program.

Notes: The revenue analysis sample includes the SFAs in the cost analysis sample with the following exceptions: excludes 11 SFAs with unreliable USDA reimbursements data, 1 SFA that did not provide any revenue data, and 54 SFAs that did not provide sufficient detail to determine the composition of revenues.

Differences in medians were not tested for statistical significance.

[a]Estimates for small SFAs (n=39) and urban SFAs (n=31) may be unreliable due to the small sample for these groups (see discussion of statistical reporting standards for details).

* Difference between first and second subgroups is significantly different from zero at the 0.05 level.

Difference between first and third subgroups is significantly different from zero at the 0.05 level.

SE = standard error of the mean; SFA = school food authority; SY =school year.

State and Local Funds

State and local funds contributed relatively little to SFA revenues. On average, State funds accounted for less than 3 percent of total SFA revenues in SY 2014–2015 and local funds about 3 percent (Table 4.1). States are required to provide funds to SFAs to supplement USDA assistance, typically based on 30 percent of the NSLP funds received in SY 1980–1981. (7 CFR 210.17). The State School Meal Mandates and Reimbursements report produced by the School Nutrition Association (2017) indicates that in SY 2014–2015, more than seven out of 10 States provided additional reimbursement on top of the Federally required amount. These additional State funds range from a per meal reimbursement to salary support to general funds to assist with program operations. There was no significant difference by district child poverty rate, SFA size, or SFA urbanicity in the percentage of revenues State funds contributed (Table 4.5).

Table 4.5. State Funds as a Percentage of Total SFA Revenues, SY 2014–2015

	State Funds (%)			SFA Sample Size	
	Mean	Median	SE	Weighted	Unweighted
All SFAs	**2.5**	**1.2**	**0.3**	**13,601**	**218**
District Child Poverty Rate					
Lower (less than 20 percent)	2.3	1.1	0.4	7,269	122
Higher (20 percent or more)	2.8	1.5	0.4	6,332	96
SFA Size					
Fewer than 1,000 students	2.1	1.0	0.4	5,924	39[a]
1,000 to 5,000 students	2.9	1.3	0.6	5,660	96
More than 5,000 students	2.7	1.5	0.4	2,017	83
SFA Urbanicity					
Urban	2.9	1.8	0.7	717	31[a]
Suburban	2.8	1.2	0.5	5,421	116
Rural	2.3	1.2	0.3	7,463	71

Source: School Nutrition and Meal Cost Study, School Foodservice Revenue Statement, SY 2014–2015. Tabulations are weighted to be representative of all public SFAs offering the National School Lunch Program.

Notes: The revenue analysis sample includes the SFAs in the cost analysis sample with the following exceptions: excludes 11 SFAs with unreliable USDA reimbursements data, 1 SFA that did not provide any revenue data, and 54 SFAs that did not provide sufficient detail to determine the composition of revenues.

Differences in medians were not tested for statistical significance.

[a]Estimates for small SFAs (n = 39) and urban SFAs (n = 31) may be unreliable due to the small sample for these groups (see discussion of statistical reporting standards for details).

None of the differences in subgroup means was statistically significant.

SE = standard error of the mean; SFA = school food authority; SY = school year.

Local funds usually are not tied to types of meals. These funds fill the gap between total revenues from all other sources and total expenses. In some SFAs, local funds covered the revenues lost when breakfast or lunch was offered at no charge to all students regardless of eligibility for free or reduced-price meals.[57] There were no significant differences in the percentage of revenues from local funds by district child poverty level. Large SFAs had a significantly smaller percentage of total SFA revenues from local funds than did small SFAs: 1 percent versus 5 percent (Table 4.6). Urban SFAs had less than 1 percent of revenues from local funds, significantly less than local suburban SFAs (2 percent) and rural SFAs (5 percent).

Table 4.6. Local Funds as a Percentage of Total SFA Revenues, SY 2014–2015

	Local Funds[a] (%)			SFA Sample Size	
	Mean	Median	SE	Weighted	Unweighted
All SFAs	**3.3**	**0.0**	**0.8**	**13,601**	**218**
District Child Poverty Rate					
Lower (less than 20 percent)	2.9 ^	0.0	1.1	7,269	122
Higher (20 percent or more)	3.9 ^	0.0	1.2	6,332	96
SFA Size					
Fewer than 1,000 students	5.0 ^	0.0	1.8	5,924	39[b]
1,000 to 5,000 students	2.5	0.0	0.7	5,660	96
More than 5,000 students	1.0#^	0.0	0.4	2,017	83
SFA Urbanicity					
Urban	0.4*^	0.0	0.3	717	31[b]
Suburban	1.8 ^	0.0	0.6	5,421	116
Rural	4.7#^	0.0	1.4	7,463	71

Source: School Nutrition and Meal Cost Study, School Foodservice Revenue Statement, SY 2014–2015. Tabulations are weighted to be representative of all public SFAs offering the National School Lunch Program.

Notes: The revenue analysis sample includes the SFAs in the cost analysis sample with the following exceptions: excludes 11 SFAs with unreliable USDA reimbursements data, 1 SFA that did not provide any revenue data, and 54 SFAs that did not provide sufficient detail to determine the composition of revenues.

Differences in medians were not tested for statistical significance.

[a]Local funds include all local funds provided to support reimbursable meals and snacks.

[b]Estimates for small SFAs (n = 39) and urban SFAs (n = 31) may be unreliable due to the small sample for these groups (see discussion of statistical reporting standards for details).

* Difference between first and second subgroups is significantly different from zero at the 0.05 level.

Difference between first and third subgroups is significantly different from zero at the 0.05 level.

[57] SFAs must use non-Federal funding sources to cover operational costs when the level of Federal reimbursement received under a Provision 2, Provision 3, or the Community Eligibility Provision is less than the cost of providing meals at no cost to all students, and when participation increases and other cost-saving impacts do not make up the difference. In addition to local funds, other examples of non-Federal funding sources include profits from a la carte sales and any portion of State revenue matching funds that exceeds the minimum requirement established in 7 CFR Part 210.17.

^ Point estimate is considered less precise than estimates that are not flagged because the sample size is small or the coefficient of variation is large. The rules used in flagging estimates are described in Chapter 1.

SE = standard error of the mean; SFA = school food authority; SY =school year.

Nonreimbursable Food Sales

Nonreimbursable food sales—including a la carte items, adult meals, vending machines items, and catering—represented a mean of 11 percent of total SFA revenues (Table 4.7). There were significant variations in the contribution of nonreimbursable food sales to SFA revenues for SFAs of different poverty levels, sizes, and urbanicity. For SFAs with a lower district child poverty rate, a la carte and other nonreimbursable sales were 15 percent of total SFA revenues, significantly greater than for districts with a higher poverty rate (6 percent). Large SFAs and medium-sized SFAs had significantly greater percentages of revenues from nonreimbursable food sales (13 percent each) than did small SFAs (8 percent). Suburban SFAs averaged 13 percent of revenues from nonreimbursable foods, significantly more than rural SFAs (10 percent) but not significantly different from urban SFAs (11 percent).

Table 4.7. A la Carte and Other Nonreimbursable Sales as a Percentage of Total SFA Revenues, SY 2014–2015

	A la Carte/Other Nonreimbursable Sales (%)			SFA Sample Size	
	Mean	Median	SE	Weighted	Unweighted
All SFAs	**10.9**	**8.4**	**0.8**	**13,601**	**218**
District Child Poverty Rate					
Lower (less than 20 percent)	15.3*	11.9	1.1	7,269	122
Higher (20 percent or more)	5.9	3.6	0.8	6,332	96
SFA Size					
Fewer than 1,000 students	8.0*	5.6	1.2	5,924	39[a]
1,000 to 5,000 students	13.1	10.5	1.3	5,660	96
More than 5,000 students	13.3#	9.3	1.5	2,017	83
SFA Urbanicity					
Urban	10.8	6.4	1.9	717	31[a]
Suburban	12.9†	8.6	1.2	5,421	116
Rural	9.5	7.1	1.1	7,463	71

Source: School Nutrition and Meal Cost Study, School Foodservice Revenue Statement, SY 2014–2015. Tabulations are weighted to be representative of all public SFAs offering the National School Lunch Program.

Notes: The revenue analysis sample includes the SFAs in the cost analysis sample with the following exceptions: excludes 11 SFAs with unreliable USDA reimbursements data, 1 SFA that did not provide any revenue data, and 54 SFAs that did not provide sufficient detail to determine the composition of revenues.

Differences in medians were not tested for statistical significance.

[a]Estimates for small SFAs (n = 39) and urban SFAs (n = 31) may be unreliable due to the small sample for these groups (see discussion of statistical reporting standards for details).

* Difference between first and second subgroups is significantly different from zero at the 0.05 level.

† Difference between second and third subgroups is significantly different from zero at the 0.05 level.

Difference between first and third subgroups is significantly different from zero at the 0.05 level.

SE = standard error of the mean; SFA = school food authority; SY = school year.

Other Revenues

On average, other cash revenues were less than 1 percent of total SFA revenues (Table 4.8). These other miscellaneous revenues include interest on deposits, sales of used equipment, sales tax receipts. Higher-poverty SFAs had significantly less other cash revenues, as a percentage of total revenues, than lower-poverty SFAs.[58] Small SFAs received significantly less revenues from other cash revenues by the same metric than medium-sized SFAs. Suburban SFAs received significantly more revenues from other cash revenues than did urban and rural SFAs. Thus, similar to revenues from nonreimbursable sales, poverty level, size and urbanicity were associated with differences in SFA revenues from other cash sources.

Table 4.8. Other Cash Revenues as a Percentage of Total SFA Revenues, SY 2014–2015

	Other Cash Revenues[a] (%)			SFA Sample Size	
	Mean	Median	SE	Weighted	Unweighted
All SFAs	**0.6**	**0.0**	**0.1**	**13,601**	**218**
District Child Poverty Rate					
Lower (less than 20 percent)	0.9*	0.0	0.2	7,269	122
Higher (20 percent or more)	0.3 ^	0.0	0.1	6,332	96
SFA Size					
Fewer than 1,000 students	0.2*^	0.0	0.1	5,924	39[b]
1,000 to 5,000 students	1.0	0.0	0.3	5,660	96
More than 5,000 students	0.7 ^	0.1	0.3	2,017	83
SFA Urbanicity					
Urban	0.4*^	0.1	0.1	717	31[b]
Suburban	1.1†	0.1	0.3	5,421	116
Rural	0.3 ^	0.0	0.1	7,463	71

Source: School Nutrition and Meal Cost Study, School Foodservice Revenue Statement, SY 2014–2015. Tabulations are weighted to be representative of all public SFAs offering the National School Lunch Program.

Notes: The revenue analysis sample includes the SFAs in the cost analysis sample with the following exceptions: excludes 11 SFAs with unreliable USDA reimbursements data, 1 SFA that did not provide any revenue data, and 54 SFAs that did not provide sufficient detail to determine the composition of revenues. Differences in medians were not tested for statistical significance.

[a]Other cash revenues include proceeds from sale of equipment, interest on deposits, sales tax receipts, and other revenues not derived directly from meal and snack service or nonreimbursable food sales.

[b]Estimates for small SFAs (n = 39) and urban SFAs (n = 31) may be unreliable due to the small sample for these groups (see discussion of statistical reporting standards for details).

* Difference between first and second subgroups is significantly different from zero at the 0.05 level.

† Difference between second and third subgroups is significantly different from zero at the 0.05 level.

[58] As noted in Table 4.8, point estimates for most subgroups of SFAs were flagged as less precise than estimates not flagged and therefore are not cited in the text. Less than half of SFAs had any other cash revenue (median of 0 percent).

^ Point estimate is considered less precise than estimates that are not flagged because the sample size is small or the coefficient of variation is large. The rules used in flagging estimates are described in Chapter 1.
SE = standard error of the mean; SFA = school food authority; SY = school year.

Summary of Revenue Sources

Comparing differences in sources of revenues across Tables 4.2 through 4.8, large SFAs relied less on USDA Foods and local funds but more on a la carte and other nonreimbursable food sales than small SFAs. Urban SFAs relied more on USDA reimbursements and less on student payments, local funds, and other sources (not including USDA Foods, State funds, and a la carte and other nonreimbursable food sales) than suburban and rural SFAs.

B. Revenue per Meal for NSLP and SBP

Focusing on the NSLP and SBP rather than all school foodservice operations, this section provides information on the revenue per meal and the contribution of each revenue source. The analysis provides insight into the contributions of USDA subsidies, student payments, and state and local funds to the revenues that SFAs receive to (ideally) cover the costs of NSLP lunches and SBP breakfasts.

The composition of revenues for specific meals may differ from the overall composition of SFA revenues for three reasons. First, some revenue sources are provided only for certain meals (for example, revenues from USDA Foods are determined by the number of NSLP lunches served). Second, the mean USDA reimbursement per meal depends on the proportion of meals served at the various rates, which may vary between the NSLP and SBP. Third, the overall composition of SFA revenues reflects the mix of meals served by program and the role of nonreimbursable food sales.

For the average SFA, the total revenue received per NSLP lunch was $3.39 (Table 4.9). Revenues from USDA reimbursements contributed the most to SFA revenue per meal, with a mean of $1.99. This was followed by student payments ($0.88) and USDA Foods ($0.27).[59] As previously reported, revenues from USDA Foods represented a mean of 6 percent of total SFA revenues in SY 2014–2015 (Table 4.3). State and local funds contributed less than $0.16 each to SFA revenue per NSLP lunch.

The total revenue per SBP breakfast in an average SFA was $1.91 (Table 4.9). As with NSLP lunch, USDA reimbursements contributed the most to revenue per SBP breakfast, with a mean of $1.51. Student payments contributed $0.25. State and local funds contributed less than $0.10 each to SFA revenue per SBP breakfast.

[59] While SFAs were entitled to receive a base amount $0.2475 per NSLP lunch in USDA Foods SY 2014–2015, the estimate of $0.27 per NSLP lunch reflected the value of USDA Foods used from SFA inventories and bonus USDA Foods received in addition to the base amount.

Table 4.9. Composition of SFA Revenue per Meal from NSLP Lunches and SBP Breakfasts, SY 2014–2015

	Revenue Per Meal ($)		
	Mean	Median	SE
NSLP Lunches			
USDA reimbursements	1.99	1.99	0.05
Student payments	0.88	0.78	0.06
USDA Foods[a]	0.27	0.26	0.01
Local funds	0.16	0.00	0.04
State funds	0.09	0.05	0.01
Total	**3.39**	**3.25**	**0.05**
Number of SFAs[b]			
Weighted		**13,601**	
Unweighted		**218**	
SBP Breakfasts			
USDA reimbursements	1.51	1.54	0.03
Student payments	0.25	0.20	0.03
Local funds	0.09	0.00	0.03
State funds	0.06	0.02	0.01
Total	**1.91**	**1.85**	**0.03**
Number of SFAs[c]			
Weighted		**12,805**	
Unweighted		**208**	

Source: School Nutrition and Meal Cost Study, School Nutrition Manager Cost Interview, School Principal Cost Interview, and SFA Director and Business Manager Cost Interviews (Onsite and Follow-Up), SY 2014–2015. Tabulations are weighted to be representative of all public SFAs offering the National School Lunch Program.

Note: Outliers were trimmed to avoid excessive influence on means. Revenue per NSLP lunch was set to the 3rd percentile for 7 SFAs with revenue per NSLP lunch less than the 3rd percentile. Likewise, revenue per NSLP lunch was set to the 97th percentile for 7 SFAs with revenue per NSLP lunch above the 97th percentile. Revenue per SBP breakfast was set to the 3rd percentile for 7 SFAs with revenue per SBP breakfast less than the 3rd percentile. Likewise, revenue per SBP breakfast was set to the 97th percentile for 7 SFAs with revenue per SBP breakfast above the 97th percentile. For SFAs with trimmed total revenue per NSLP lunch and SBP breakfast that have been set to the 3rd percentile or 97th percentiles, respectively, the revenue components have been adjusted so that they sum to the trimmed total revenue per meal. The adjustment maintains the same percentages of cost components before adjustment.

[a]USDA Foods revenues are allocated entirely to NSLP, as the entitlement for these foods is based on lunches served.

[b]Number of SFAs for NSLP lunches excludes 11 SFAs with unreliable USDA reimbursements data, 1 SFA that did not provide any revenue data, and 54 SFAs that did not provide sufficient detail to determine the composition of revenues.

[c]Number of SFAs for SBP breakfasts excludes 14 SFAs that did not serve breakfast, 11 SFAs with unreliable USDA reimbursements data, and 51 SFAs that did not provide sufficient detail to determine the composition of revenues.

SE = standard error of the mean; SFA = school food authority; USDA = United States Department of Agriculture; SY = school year.

C. Total Revenues Compared with Meal Costs

As previously discussed, SFAs must balance the costs and revenues of their school meal programs so that they operate on a nonprofit basis. An SFA is said to operate at the break-even level if its total costs and revenues from all school meal programs and the sale of nonreimbursable meals are equal. The relationship of revenues to costs for reimbursable and nonreimbursable meals determines whether nonreimbursable meals subsidize reimbursable meals or vice versa.[60] The SLBCS-II study found that NSLP revenues subsidized both the SBP and nonreimbursable meals (Bartlett et al. 2008).

This section compares SFAs' revenues in SY 2014–2015 to their reported costs, for the SFA overall and per reimbursable meal served in SY 2014–2015. In addition, the section summarizes an analysis of the relationship between revenues and costs for nonreimbursable meals.

1. Total SFA Revenues Compared with Total Reported SFA Costs

For the average SFA, total revenues were less than reported costs in SY 2014–2015. On average, total revenues covered 97 percent of total costs.

For the average SFA in SY 2014–2015, total revenues covered only 97 percent of total reported costs (Table 4.10). Thus, in the average SFA, total revenues did not quite cover the reported costs of foodservice operations.[61] This general pattern was observed among all subgroups of SFAs defined by district child poverty rate, size, and urbanicity (Table 4.10). There were no significant differences in mean total revenues as a percentage of total reported costs among subgroups of SFAs. Based on the median of 99 percent, SFAs were almost equally divided between those with revenues at the break-even point of 100 percent of total reported costs and those below the break-even point.

In half of SFAs (47 percent) total revenues were between 95 percent and 105 percent of total reported costs, that is, within 5 percentage points of the break-even point where revenues equal reported costs (Figure 4.1). At the low end of the distribution, 10 percent of SFAs had revenues that were less than 80 percent of reported costs. At the high end of the distribution, 12 percent of SFAs had revenues equal to or greater than 110 percent of reported costs.

[60] As discussed previously, costs attributable to all types of nonreimbursable meals were combined into a single category. Similarly, all sources of revenue from nonreimbursable meals were combined into a single category. It is therefore not possible to compare costs and revenues separately for each type of nonreimbursable meal.

[61] In principle, an SFA that has reported costs exceeding its revenue will need a transfer of local funds to cover the excess costs, unless the SFA has a surplus of funds from the prior year. In practice, SFAs do not always recognize these transfers on their year-end financial statements for school foodservice accounts and thus show expenses exceeding revenue.

Table 4.10. Total SFA Revenues Compared with Total Reported Costs, SY 2014–2015

	Revenues as a Percentage of Costs			SFA Sample Size	
	Mean	Median	SE	Weighted	Unweighted
All SFAs	**97.1**	**99.3**	**1.7**	**13,601**	**218**
District Child Poverty Rate					
Lower (less than 20 percent)	95.8	98.0	2.3	7,269	122
Higher (20 percent or more)	98.6	99.9	2.6	6,332	96
SFA Size					
Fewer than 1,000 students	95.0	99.2	3.6	5,924	39[a]
1,000 to 5,000 students	98.5	99.3	1.5	5,660	96
More than 5,000 students	99.4	99.5	1.2	2,017	83
SFA Urbanicity					
Urban	101.7	99.9	2.2	717	31[a]
Suburban	98.0	99.3	1.4	5,421	116
Rural	96.0	99.2	3.0	7,463	71

Source: School Nutrition and Meal Cost Study, SFA Director and Business Manager Cost Interviews (Onsite and Follow-Up), SY 2014–2015. Tabulations are weighted to be representative of all public SFAs offering the National School Lunch Program.

Note: The revenue analysis sample includes the SFAs in the cost analysis sample with the following exceptions: excludes 11 SFAs with unreliable USDA reimbursements data, 1 SFA that did not provide any revenue data, and 54 SFAs that did not provide sufficient detail to determine the composition of revenues.

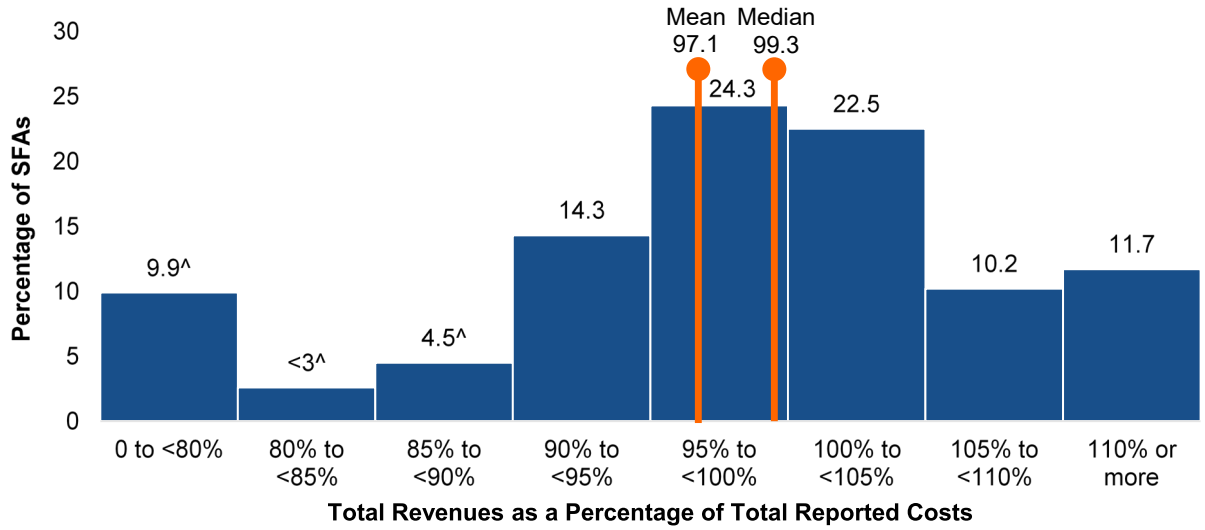
Differences in medians were not tested for statistical significance.

[a]Estimates for small SFAs (n = 39) and urban SFAs (n = 31) may be unreliable due to the small sample for these groups (see discussion of statistical reporting standards for details).

None of the differences in subgroup means was statistically significant.

SE = standard error of the mean; SFA = school food authority; SY = school year.

Figure 4.1. Total Revenues as a Percentage of Total Reported Costs, SY 2014–2015



Source: School Nutrition and Meal Cost Study, Menu Survey, School Nutrition Manager Cost Interview, and SFA Director and Business Manager Onsite and Follow-Up Cost Interviews, SY 2014–2015. Tabulations are weighted to be representative of all public SFAs offering the National School Lunch Program.

Note: SFA is the unit of analysis.

^ Point estimate is considered less precise than estimates that are not flagged because the sample size is small or the coefficient of variation is large. The rules used in flagging estimates are described in Chapter 1. When these rules are applied, percentages close to 0 or 100 are often flagged. In this figure, flagged percentages between 0 percent and 3 percent are displayed as <3 percent.

SFA = school food authority; SY = school year.

The gap between revenues and costs was greater when the full costs of producing reimbursable meals are considered. The average SFA had total revenues equal to 64 percent of full costs in SY 2014–2015 (Table C.17). Total revenues in large SFAs covered a higher percentage of full costs than total revenues in small SFAs (68 percent versus 61 percent). In addition, total revenues in rural SFAs covered a significantly smaller percentage of full costs (62 percent) than total revenues in urban (69 percent) and suburban SFAs (67 percent). These results appear to be at least partly related to differences in full costs. For example, the full cost per average meal (NSLP and SBP) was significantly lower in large SFAs than in medium SFAs and significantly lower in urban SFAs and suburban SFAs (Table 3.5). The full cost per meal did not differ significantly between medium and small SFAs or between suburban and rural SFAs.

2. Reimbursable Meals

Turning from overall SFA revenues to the revenues from reimbursable meals provides a perspective on whether SFAs covered the costs of these meals. As indicated in Table 4.9, revenues from reimbursable meals include USDA reimbursements, USDA Foods, student payments, and State and local funds. On average, across all SFAs, revenues from reimbursable meals were less than the reported costs of producing the meals in SY 2014–2015 (Table 4.11). In the average SFA, revenues from reimbursable meals were equal to 91 percent of reported costs for reimbursable meals.

Table 4.11. Total SFA Revenues from Reimbursable Meals as a Percentage of Total Reported Costs of Producing Reimbursable Meals, SY 2014–2015

	Revenues as a Percentage of Costs			SFA Sample Size	
	Mean	Median	SE	Weighted	Unweighted
All SFAs	**91.3**	**92.3**	**1.8**	**13,601**	**218**
District Child Poverty Rate					
Lower (less than 20 percent)	87.7*	88.3	2.3	7,269	122
Higher (20 percent or more)	95.4	97.8	2.6	6,332	96
SFA Size					
Fewer than 1,000 students	92.4	95.3	3.7	5,924	39[a]
1,000 to 5,000 students	89.9	91.4	1.5	5,660	96
More than 5,000 students	92.3	92.7	1.5	2,017	83
SFA Urbanicity					
Urban	95.1	93.2	2.3	717	31[a]
Suburban	91.0	90.3	1.7	5,421	116
Rural	91.2	94.6	2.9	7,463	71

Source: School Nutrition and Meal Cost Study, SFA Director and Business Manager Cost Interviews (Onsite and Follow-Up), SY 2014–2015. Tabulations are weighted to be representative of all public SFAs offering the National School Lunch Program.

Notes: The revenue analysis sample includes the SFAs in the cost analysis sample with the following exceptions: excludes 11 SFAs with unreliable USDA reimbursements data, 1 SFA that did not provide any revenue data, and 54 SFAs that did not provide sufficient detail to determine the composition of revenues.

Differences in medians were not tested for statistical significance.

[a]Estimates for small SFAs (n = 39) and urban SFAs (n = 31) may be unreliable due to the small sample for these groups (see discussion of statistical reporting standards for details).

* Difference between first and second subgroups is significantly different from zero at the 0.05 level.

SE = standard error of the mean; SFA = school food authority; SY = school year.

Higher-poverty SFAs had revenues covering significantly more of their costs for reimbursable meals than lower-poverty SFAs. The mean revenues as a percentage of costs for reimbursable meals were 95 percent for higher-poverty SFAs and only 88 percent for lower-poverty SFAs. Thus, higher-poverty SFAs were less dependent on revenues from nonreimbursable meals to balance their overall revenues and costs. Three factors appeared to contribute to this difference.

- First, higher-poverty SFAs had a lower reported cost per SBP breakfast (Table 2.2)
- Second, higher-poverty SFAs had a greater proportion of revenues from USDA reimbursements, while lower-poverty SFAs depended more on student payments for reimbursable meals (Tables 4.2 and 4.4, respectively). The latter fact is important because some SFAs underpriced their paid (full-price) meals so that the total revenues from a paid meal (including USDA subsidies, student payments, and other sources) were less than the

revenues from a free or reduced-price meal.[62] To the extent that lower-poverty SFAs underpriced their paid meals, they would have received less revenue per meal overall than higher-poverty SFAs.

- Third, as noted in the discussion of Table 4.2, the NSLP and SBP provide higher reimbursement rates for higher-poverty schools.

There were no significant differences in the mean revenues as a percentage of reported costs for reimbursable meals between subgroups for SFA size and SFA urbanicity. There were no subgroups for which SFA revenues from reimbursable meals for the average SFA covered the total reported costs of producing those reimbursable meals.

3. Relationship of Revenues to Costs for Nonreimbursable Meals

Section 206 of the HHFKA sets rules concerning the revenues from nonreimbursable meals ("non-program foods," including a la carte sales, adult meals, vending and other nonreimbursable foods) and seeks to prevent program funds from subsidizing nonreimbursable meals. In particular, Section 206 requires the percentage of revenues from nonreimbursable meals to be at least equal to the percentage of food costs spent on these meals. Findings from the SNMCS indicate that the average SFA receives 11 percent of its revenues from nonreimbursable meals (Table 4.1) and spends 5 percent of its food budget on food for nonreimbursable meals (Table 2.6), thus far exceeding the Section 206 standard. These results suggest that nonreimbursable meals may subsidize reimbursable meals, and the additional analyses summarized in this section provide further evidence to support this conclusion.

Preceding tables (4.10 and 4.11) use the revenues as a percentage of reported costs as the metric for determining whether SFAs break even overall or for specific programs. Past studies (Glantz et al. 1994; Bartlett et al. 2008) computed the average SFA revenues from nonreimbursable meals as a percentage of reported costs of those meals. However, this measure was insufficiently precise as a result of data limitations described in Appendix A. Instead, an alternative approach using regression analysis, as described in Appendix A, provided a more reliable measure of this relationship. This analysis tested several alternate specifications to reduce the influence of outliers on the result. The preferred specification from this analysis (that is, the approach that best balanced inclusion of data with exclusion of the most influential outliers) indicated that, on average, SFAs received $1.52 in revenue for every dollar in costs incurred for nonreimbursable meals.[63]

Thus, while nonreimbursable meals were a small source of revenues for most SFAs, for the average SFA they provided a revenue surplus that helped offset the extent to which SFA costs exceeded revenues for reimbursable meals. This finding differs from the SLBCS-II, which found the opposite relationship: Revenues from reimbursable meals subsidized nonreimbursable meals, which generated less revenues than their reported costs (Bartlett et al. 2008). The findings from the SLBCS-II motivated Section 206 of the HHFKA, and the results suggest that Section 206 or

[62] As part of the HHFKA, FNS established the Paid Meals Equity rule to require SFAs to balance revenue from paid and free meals, but the rule allowed for gradual implementation.

[63] The standard error of this estimate is $0.10; it was based on an unweighted sample of 206 SFAs. Most other specifications yielded substantially similar estimates.

other changes introduced by the HHFKA may have shifted the pattern of cross-subsidization between reimbursable and nonreimbursable meals in the desired direction.

4. Revenues Compared with Reported Costs for the NSLP and SBP

While the preceding discussion examined the relationship of revenues to reported costs overall and for reimbursable meals in general, another important perspective is the comparison of revenues to reported costs specifically for the NSLP and SBP. This comparison illuminates the extent to which SFAs were able to cover the costs charged to the foodservice account for these individual programs and thus provides insight into the financial viability of the programs from the SFAs' perspective. As noted in the discussion of Table 4.9, NSLP revenues include USDA reimbursements, USDA Foods, student payments, and State and local funds, and SBP revenues include the same sources except for USDA Foods.

For the average SFA in SY 2014–2015, revenues from NSLP lunches fell short of the costs of producing those meals, with the average SFA having revenues equal to 93 percent of reported costs (Table 4.12).[64] There were no significant differences in NSLP revenues as a percentage of reported costs by SFA poverty level, size, or urbanicity.

Another perspective on the relationship of NSLP revenues to costs comes from examining the applicable free lunch reimbursement rate as a percentage of the SFAs' reported cost per NSLP lunch.[65] This perspective shows how much of the reported costs of NSLP lunches were covered by USDA reimbursements. It does not include the additional subsidy provided through USDA Foods. For the average SFA, the applicable free lunch reimbursement rate was 84 percent of the reported costs (Table 4.13). There were no significant differences in this percentage by SFA poverty level, size, or urbanicity.

In SY 2014–2015, only 18 percent of SFAs had a reported cost per NSLP lunch that was less than the SFA's applicable free lunch reimbursement rate (Table 4.14). This means that for more than four out of five SFAs, the reported cost per NSLP lunch was greater than the applicable free lunch reimbursement rate.

[64] No statistical test was performed on the differences between the different estimates of mean revenues as a percentage of costs (overall, for reimbursable meals, and for the NSLP and SBP). However, given the sizes of the differences and the standard errors of the means, it is likely that such a test would fail to reject the hypothesis that the means were not different.

[65] The applicable free lunch reimbursement rate is the average amount of Federal reimbursement that the SFA receives for a free lunch. See notes to Table 4.13 for details. In addition to cash reimbursements, the average SFA received $0.27 per lunch in USDA foods, as shown in Table 4.9.

Table 4.12. Total SFA Revenues from NSLP Lunches as a Percentage of Total Reported Costs of Producing NSLP Lunches, SY 2014–2015

	Revenues as a Percentage of Reported Costs			SFA Sample Size	
	Mean	Median	SE	Weighted	Unweighted
All SFAs	**92.5**	**93.4**	**2.0**	**13,601**	**218**
District Child Poverty Rate					
Lower (less than 20 percent)	89.7	89.5	2.5	7,269	122
Higher (20 percent or more)	95.8	97.1	3.1	6,332	96
SFA Size					
Fewer than 1,000 students	94.8 ^	95.6	4.2	5,924	39[a]
1,000 to 5,000 students	90.1	91.8	1.8	5,660	96
More than 5,000 students	92.7	92.6	1.8	2,017	83
SFA Urbanicity					
Urban	92.9 ^	91.0	3.0	717	31[a]
Suburban	92.4	91.3	2.2	5,421	116
Rural	92.6	93.9	3.2	7,463	71

Source: School Nutrition and Meal Cost Study, SFA Director and Business Manager Cost Interviews (Onsite and Follow-Up), SY 2014–2015. Tabulations are weighted to be representative of all public SFAs offering the National School Lunch Program.

Notes: The revenue analysis sample includes the SFAs in the cost analysis sample with the following exceptions: excludes 11 SFAs with unreliable USDA reimbursements data, 1 SFA that did not provide any revenue data, and 54 SFAs that did not provide sufficient detail to determine the composition of revenues.

None of the differences in subgroup means was statistically significant. Differences in medians were not tested for statistical significance.

[a]Estimates for small SFAs (n = 39) and urban SFAs (n = 31) may be unreliable due to the small sample for these groups (see discussion of statistical reporting standards for details).

^ Point estimate is considered less precise than estimates that are not flagged because the sample size is small or the coefficient of variation is large. The rules used in flagging estimates are described in Chapter 1.

SE = standard error of the mean; SFA = school food authority; SY = school year.

Table 4.13. Free Lunch Reimbursement Rate as a Percentage of the SFA's Reported Cost per NSLP Lunch, SY 2014–2015

	Reimbursement[a] as a Percentage of Costs			SFA Sample Size	
	Mean	Median	SE	Weighted	Unweighted
All SFAs	**84.3**	**83.8**	**1.5**	**13,601**	**284**
District Child Poverty Rate					
Lower (less than 20 percent)	82.1	82.1	1.7	8,059	165
Higher (20 percent or more)	87.5	89.1	2.5	5,542	119
SFA Size					
Fewer than 1,000 students	86.8 ^	84.4	3.0	5,786	49[b]
1,000 to 5,000 students	82.2	83.5	1.7	5,858	125
More than 5,000 students	83.3	83.8	1.4	1,956	110
SFA Urbanicity					
Urban	86.0 ^	86.1	2.3	762	48[b]
Suburban	82.5	82.2	1.6	5,473	145
Rural	85.5	84.5	2.5	7,365	91

Source: School Nutrition and Meal Cost Study, SFA Director and Business Manager Cost Interviews (Onsite and Follow-Up), SY 2014–2015. Tabulations are weighted to be representative of all public SFAs offering the National School Lunch Program.

Notes: The revenue analysis sample includes the SFAs in the cost analysis sample.

None of the differences in subgroup means was statistically significant. Differences in medians were not tested for statistical significance.

[a]For each SFA, the applicable NSLP free lunch reimbursement rate was determined by one of two procedures. Where possible, the mean free lunch reimbursement rate for the SFA was computed as the weighted mean of the lower and higher reimbursement rates for free lunches, using counts of lunches claimed at the two rates. (See Table 1.1 for the reimbursement rates and the associated criteria.) Otherwise, if the SFA served 60 percent of NSLP lunches or more at free or reduced price, the SFA was assigned the higher rate, and SFAs with fewer than 60 percent of NSLP lunches served at free or reduced price were assigned the lower rate. The $.06 per meal performance-based reimbursement was added to the NSLP free lunch rate for SFAs certified to receive this additional reimbursement.

[b]Estimates for small SFAs (n = 49) and urban SFAs (n = 48) may be unreliable due to the small sample for these groups (see discussion of statistical reporting standards for details).

^ Point estimate is considered less precise than estimates that are not flagged because the sample size is small or the coefficient of variation is large. The rules used in flagging estimates are described in Chapter 1.

SE = standard error of the mean; SFA = school food authority; SY = school year.

Table 4.14. Percentage of SFAs with Reported Cost per NSLP Lunch Less than the Applicable Free Reimbursement Rate, SY 2014–2015

			SFA Sample Size	
	Percentage of SFAs[a]	SE	Weighted	Unweighted
All SFAs	**18.4**	**3.2**	**13,601**	**284**
District Child Poverty Rate				
Lower (less than 20 percent)	10.5*	3.1	8,059	165
Higher (20 percent or more)	29.8	6.2	5,542	119
SFA Size				
Fewer than 1,000 students	28.0*^	6.8	5,786	49[b]
1,000 to 5,000 students	12.5	3.3	5,858	125
More than 5,000 students	7.5#^	2.6	1,956	110
SFA Urbanicity				
Urban	17.4	6.0	762	48[b]
Suburban	12.4	3.4	5,473	145
Rural	22.9	5.4	7,365	91

Source: School Nutrition and Meal Cost Study, SFA Director and Business Manager Cost Interviews (Onsite and Follow-Up), SY 2014–2015. Tabulations are weighted to be representative of all public SFAs offering the National School Lunch Program.

Notes: The revenue analysis sample includes the SFAs in the cost analysis sample.

Differences in medians were not tested for statistical significance.

[a]For each SFA, the applicable NSLP free lunch reimbursement rate was determined by one of two procedures. Where possible, the mean free lunch reimbursement rate for the SFA was computed as the weighted mean of the lower and higher reimbursement rates for free lunches, using counts of lunches claimed at the two rates. (See Table 1.1 for the reimbursement rates and the associated criteria.) Otherwise, if the SFA served 60 percent of NSLP lunches or more at free or reduced price, the SFA was assigned the higher rate, and SFAs with fewer than 60 percent of NSLP lunches served at free or reduced price were assigned the lower rate. The $.06 per meal performance-based reimbursement was added to the NSLP free lunch rate for SFAs certified to receive this additional reimbursement.

[b]Estimates for small SFAs (n = 49) and urban SFAs (n = 48) may be unreliable due to the small sample for these groups (see discussion of statistical reporting standards for details).

* Difference between first and second subgroups is significantly different from zero at the 0.05 level.

Difference between first and third subgroups is significantly different from zero at the 0.05 level.

^ Point estimate is considered less precise than estimates that are not flagged because the sample size is small or the coefficient of variation is large. The rules used in flagging estimates are described in Chapter 1.

SE = standard error; SFA = school food authority; SY =school year.

Higher-poverty SFAs were almost three times more likely than lower-poverty SFAs to have a reported cost per NSLP lunch that was less than the applicable free lunch reimbursement rate (30 percent versus 11 percent). This difference was most likely due to the higher NSLP reimbursement rates received by higher-poverty SFAs under the tiered rates for free, reduced-price and paid meals (as indicated in Table 1.1 and further explained in the discussion of Table 4.2). Small SFAs (28 percent) had a significantly greater percentage of SFAs with a reported cost per NSLP lunch that was less than the free lunch reimbursement rate compared with medium-sized (13 percent) and large SFAs (8 percent). The percentage of SFAs with reported cost per

NSLP lunch less than the applicable reimbursement rate did not significantly vary by SFA urbanicity.

To a greater degree than for NSLP lunches, revenues from SBP breakfasts for the average SFA in SY 2014–2015 fell short of covering the reported costs of producing those meals, with the average SFA receiving revenues equal to only 82 percent of reported costs (Table 4.15), compared with 92 percent for NSLP lunches.[66] Similar to NSLP lunches, for SBP breakfasts, SFAs with a higher poverty rate had a significantly higher percentage than did SFAs with a lower poverty rate (93 percent versus 70 percent). The percentage did not vary significantly by SFA size.

Table 4.15. Total SFA Revenues from SBP Breakfasts as a Percentage of Total Reported Costs of Producing SBP Breakfasts, SY 2014–2015

	Revenues as a Percentage of Costs			SFA Sample Size	
	Mean	Median	SE	Weighted	Unweighted
All SFAs	**81.7**	**80.5**	**2.8**	**12,805**	**208**
District Child Poverty Rate					
Lower (less than 20 percent)	70.4*	64.5	3.2	6,482	113
Higher (20 percent or more)	93.2	93.2	4.1	6,324	95
SFA Size					
Fewer than 1,000 students	82.8 ^	81.0	5.8	5,501	35[a]
1,000 to 5,000 students	79.4	77.6	2.6	5,419	92
More than 5,000 students	84.7	83.1	3.7	1,885	81
SFA Urbanicity					
Urban	100.1*^	92.4	6.2	692	30[a]
Suburban	78.1	78.6	2.6	4,958	109
Rural	82.4#	80.3	4.6	7,155	69

Source: School Nutrition and Meal Cost Study, SFA Director and Business Manager Cost Interviews (Onsite and Follow-Up), SY 2014–2015. Tabulations are weighted to be representative of all public SFAs offering the National School Lunch Program.

Notes: The revenue analysis sample includes the SFAs in the cost analysis sample with the following exceptions: excludes 14 SFAs with no SBP, 11 SFAs with unreliable USDA reimbursements data, and 51 SFAs that did not provide sufficient detail to determine the composition of revenues.

Differences in medians were not tested for statistical significance.

[a]Estimates for small SFAs (n = 35) and urban SFAs (n = 30) may be unreliable due to the small sample for these groups (see discussion of statistical reporting standards for details).

* Difference between first and second subgroups is significantly different from zero at the 0.05 level.

Difference between first and third subgroups is significantly different from zero at the 0.05 level.

^ Point estimate is considered less precise than estimates that are not flagged because the sample size is small or the coefficient of variation is large. The rules used in flagging estimates are described in Chapter 1.

SE = standard error of the mean; SFA = school food authority; SY = school year.

[66] Differences between estimates for NSLP and SBP have not been tested for significance.

On average, urban SFAs had revenues from SBP breakfasts that were about equal to total reported costs of producing those meals (with revenues equal to 100 percent of reported costs). The percentage was significantly less for suburban SFAs (78 percent) and rural SFAs (82 percent).

For the average SFA, the applicable free breakfast reimbursement rate was 80 percent of the reported cost per SBP breakfast (Table 4.16). This percentage was significantly and substantially greater for higher-poverty SFAs than lower-poverty SFAs (92 percent versus 70 percent). The percentage of free breakfast reimbursement rate to reported cost per SBP breakfast did not vary significantly by SFA size. On average, urban SFAs had free breakfast reimbursement rates that were 92 percent of the reported cost per SBP breakfast, significantly higher suburban and rural SFAs (each at 79 percent). Thus, reimbursements for free breakfasts covered significantly more of the reported SBP cost per meal for larger and urban SFAs than for other types of SFAs.

Table 4.16. Free Breakfast Reimbursement Rate as a Percentage of the SFAs' Reported Cost per SBP Breakfast, SY 2014–2015

	Reimbursement[a] as a Percentage of Costs			SFA Sample Size	
	Mean	Median	SE	Weighted	Unweighted
All SFAs	**79.6**	**76.3**	**2.2**	**12,805**	**270**
District Child Poverty Rate					
Lower (less than 20 percent)	70.2*	68.7	2.6	7,219	152
Higher (20 percent or more)	91.8	93.3	3.2	5,586	118
SFA Size					
Fewer than 1,000 students	80.2 ^	75.0	4.5	5,221	43[b]
1,000 to 5,000 students	77.8	75.9	2.6	5,665	119
More than 5,000 students	83.1	84.8	2.7	1,919	108
SFA Urbanicity					
Urban	92.1*^	93.7	3.9	747	47[b]
Suburban	78.9	74.6	2.4	4,884	134
Rural	78.8#	75.9	3.6	7,175	89

Source: School Nutrition and Meal Cost Study, SFA Director and Business Manager Cost Interviews (Onsite and Follow-Up), SY 2014–2015. Tabulations are weighted to be representative of all public SFAs offering the National School Lunch Program.

Notes: The revenue analysis sample includes the SFAs in the cost analysis sample.

Differences in medians were not tested for statistical significance.

[a]For each SFA, the applicable SBP free-breakfast reimbursement rate was determined by one of two procedures. Where possible, the mean free-breakfast reimbursement rate for the SFA was computed as the weighted mean of the rates for severe-need and regular free breakfasts, using counts of breakfasts claimed at the severe-need and regular rates. Otherwise, if the SFA served 40 percent of NSLP lunches or more at free or reduced price, the SFA was assigned the severe-need rate, and SFAs with fewer than 40 percent of NSLP lunches served at free or reduced price were assigned the regular rate.

[b]Estimates for small SFAs (n = 43) and urban SFAs (n = 47) may be unreliable due to the small sample for these groups (see discussion of statistical reporting standards for details).

* Difference between first and second subgroups is significantly different from zero at the 0.05 level.

Difference between first and third subgroups is significantly different from zero at the 0.05 level.

^ Point estimate is considered less precise than estimates that are not flagged because the sample size is small or the coefficient of variation is large. The rules used in flagging estimates are described in Chapter 1.

SE = standard error of the mean; SFA = school food authority; SY = school year

On average, about one-quarter of SFAs in SY 2014–2015 (23 percent) had a reported cost per SBP breakfast that was less than the applicable free breakfast reimbursement rate (Table 4.17). This means that for three-quarters of SFAs, their reported cost per SBP breakfast was greater than the applicable free breakfast reimbursement rate. The percentage of lower-poverty SFAs with a reported cost per SBP breakfast that was less than the applicable free breakfast reimbursement rate (12 percent) was significantly less than the percentage of higher-poverty SFAs (37 percent), which receive higher reimbursement rates for free meals. The percentage of SFAs with reported cost per SBP breakfast that was less than the applicable reimbursement rate did not vary significantly by SFA size or urbanicity.

Table 4.17. Percentage of SFAs with Reported Cost per SBP Breakfast Less than the Applicable Free Reimbursement Rate, SY 2014–2015

			SFA Sample Size	
	Percentage of SFAs[a]	SE	Weighted	Unweighted
All SFAs	**22.8**	**3.4**	**12,805**	**270**
District Child Poverty Rate				
Lower (less than 20 percent)	11.7*	3.0	7,219	152
Higher (20 percent or more)	37.1	6.1	5,586	118
SFA Size				
Fewer than 1,000 students	22.6	6.9	5,221	43[b]
1,000 to 5,000 students	22.5	4.0	5,665	119
More than 5,000 students	24.2	4.5	1,919	108
SFA Urbanicity				
Urban	39.1	8.2	747	47[b]
Suburban	23.1	4.1	4,884	134
Rural	20.9	5.3	7,175	89

Source: School Nutrition and Meal Cost Study, SFA Director and Business Manager Cost Interviews (Onsite and Follow-Up), SY 2014–2015. Tabulations are weighted to be representative of all public SFAs offering the National School Lunch Program.

Notes: The revenue analysis sample includes the SFAs in the cost analysis sample.

Differences in medians were not tested for statistical significance.

[a]For each SFA, the applicable SBP free-breakfast reimbursement rate was determined by one of two procedures. Where possible, the mean free-breakfast reimbursement rate for the SFA was computed as the weighted mean of the rates for severe-need and regular free breakfasts, using counts of breakfasts claimed at the severe-need and regular rates. Otherwise, if the SFA served 40 percent of NSLP lunches or more at free or reduced price, the SFA was assigned the severe-need rate, and SFAs with fewer than 40 percent of NSLP lunches served at free or reduced price were assigned the regular rate.

[b]Estimates for small SFAs (n = 43) and urban SFAs (n = 47) may be unreliable due to the small sample for these groups (see discussion of statistical reporting standards for details).

* Difference between first and second subgroups is significantly different from zero at the 0.05 level.

SE = standard error; SFA = school food authority; SY = school year.

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5. COMPARISON OF FINDINGS TO PRIOR SCHOOL MEAL COST STUDIES

This chapter compares findings from the SNMCS with findings from two prior studies of school meal costs and revenues: SLBCS-I, which was conducted in SY 1992–1993, and SLBCS-II, which was conducted in SY 2005–2006. All three studies used the same basic methodology to measure reported costs. Both the reported and full cost estimates from SLBCS-I and -II are directly comparable (with some caution) to SNMCS estimates.[67] The study team used SY 2014–2015 values to adjust the SLBCS-I and SLBCS-II costs for SY 1992–1993 and SY 2005–2006 to reflect changes in the Consumer Price Index for food away from home. Thus, values reported for all three periods reflect 2015 dollars. The chapter first presents comparisons of reported NSLP and SBP cost per meal, their composition, and their relationship to SFA revenues. Next, the chapter presents comparisons of full cost per NSLP lunch and per SBP breakfast. Finally, the chapter compares the composition of SFA revenues.[68]

The reported cost of producing an NSLP lunch in SY 2014–2015 was significantly higher than in SY 1992–1993 and SY 2005–2006. The reported cost of producing an SBP breakfast in SY 2014–2015 was significantly higher than in SY 1992–1993.

A key question for the SNMCS is the extent to which changes to the school meal programs implemented in recent years, including updated nutrition standards, the Paid Lunch Equity rule, the Community Eligibility Provision, and other provisions of the HHFKA, have affected school meal costs and revenues. The potential cost impact of the updated nutrition standards was a significant concern when they were enacted. The additional $0.06 per NSLP lunch for qualifying SFAs was intended to offset the expected impact. Comparisons to prior studies provide some perspective on this question. However, these comparisons do not control for changes in the larger context of the school meal programs that were not mandated by HHFKA. For example, results in previous chapters suggest that higher-poverty SFAs had a lower cost per SBP breakfast and higher revenues as a percentage of reported costs (that is, they came closer to breaking even). The child poverty rate increased by 2.5 percentage points from 2006 to 2015 (U.S. Census Bureau, 2017). This trend in child poverty might have pushed down the national mean cost per SBP breakfast and pushed up mean revenues as a percentage of reported costs due to the relationship of the SFA poverty rate to these outcomes even if HHFKA had not been enacted. Readers should bear this limitation in mind when considering the comparisons presented in this chapter.

[67] As noted in Section 5.B, SLBCS-I did not include supervision of students during meals or other meal-related labor by school non-foodservice personnel in the definition of full costs of school meals, while SLBCS-II and SNMCS did include these activities in full costs. SNMCS differed from prior studies in several details of the sampling and data collection methods. These differences may have a minor influence on comparisons between SNMCS and prior studies, but the magnitude of the differences reported in this chapter is clearly reflective of real changes in school meal costs and revenue over time.

[68] The inflation factor used between SY 1992–1993 to SY 2005–2006 was 1.39; the inflation factor used between SY 2005–2006 to SY 2014–2015 was 1.28. Standard errors (SE) of estimates were not explicitly reported in SLBCS-I, but they have been computed from the published information.

A. Reported Costs

This section provides several comparisons of the estimates of mean reported costs for SY 2014–2015 with estimates for SY 2005–2006 and SY 1992–1993 from the prior SLBCS studies. First, is the comparison of reported cost per NSLP lunch and SBP breakfast using both the SFA and the meal as the unit of analysis. Next, is the comparison of the mean composition of reported costs for both the NSLP and SBP using the SFA as the unit of analysis. Last is the comparison of the mean total SFA revenues as a percentage of reported costs for all school foodservice operations. The SFA is the primary unit of analysis to focus on the perspective of the average SFA. This is consistent with the primary focus on this unit of analysis in Chapters 2, 3, and 4. Selected tables include means by SFA size as well as overall. These comparisons highlight the similarities and differences in reported costs for reimbursable meals and the relationship of SFA revenues to costs over the three periods for which comparable estimates are available.

1. Reported Cost per NSLP Lunch and SBP Breakfast

Table 5.1 presents the estimates of the mean reported cost of producing an NSLP lunch and SBP breakfast in SY 1992–1993, SY 2005–2006, and SY 2014–2015. At $3.81, the average SFA's reported cost per NSLP lunch in SY 2014–2015 was 26 percent greater than the comparable (inflation-adjusted) cost in SY 2005–2006 ($3.03) and 30 percent greater than in SY 1992–1993 ($2.93).[69] Similarly, for SBP breakfasts, the reported cost per SBP breakfast in 2015 dollars for the average SFA in SY 1992–1993 was $2.27, while in SY 2014–2015 it was 20 percent higher at $2.72. However, the reported cost per SBP breakfast for the average SFA did not change significantly from SY 2005–2006 to SY 2014–2015 after adjusting for inflation.[70]

A similar pattern was observed when examining the mean cost per meal nationwide—that is, using the meal as the unit of analysis. The mean reported cost per NSLP lunch in SY 2014–2015 was $3.66 compared with $2.93 in SY 2005–2006 and $3.02 in SY 1992–1993. The mean reported cost per SBP breakfast in SY 2014–2015 was $2.34 compared with $1.88 in SY 2005–2006 and $1.99 in SY 1992–1993. For the average meal, the SY 2014–2015 reported cost per NSLP lunch and cost per SBP breakfast were significantly higher than all prior estimates.

[69] The reported cost per NSLP lunch for the average SFA in SY 2005–2006 was not significantly different from the comparable cost in SY 1992–1993 (Bartlett et al. 2008).

[70] The inflation-adjusted mean cost per SBP breakfast did not change significantly from SY 1992–1993 to SY 2005–2006.

Table 5.1. Comparison of Reported Cost per NSLP Lunch and SBP Breakfast: SY 1992–1993, SY 2005–2006, SY 2014–2015 (Inflation-Adjusted 2015 Dollars)

Reported Cost Measure	Unit of Analysis	Mean Reported Cost Per Meal (SE) SY 1992–1993-I[a,b] ($)	SY 2005–2006[b] ($)	SY 2014–2015 ($)
Cost per NSLP lunch	SFA	2.93* (0.06)	3.03* (0.12)	$3.81 (0.08)
Cost per NSLP lunch	Meal	3.02* (0.05)	2.93* (0.05)	$3.66 (0.06)
Cost per SBP breakfast	SFA	2.27* (0.12)	2.47 (0.23)	$2.72 (0.10)
Cost per SBP breakfast	Meal	1.99* (0.05)	1.88* (0.08)	$2.34 (0.08)
Number of SFAs[c]		**94**	**120**	**284**

Source: School Lunch and Breakfast Cost Study-I (Glantz et al. 1994); School Lunch and Breakfast Cost Study-II (Bartlett et al. 2008); School Nutrition and Meal Cost Study, Menu Survey, School Nutrition Manager Cost Interview, SFA Director and Business Manager Cost Interviews (Onsite and Follow-Up), school year 2014–2015. Tabulations are weighted to be representative of all public SFAs offering the National School Lunch Program.

Notes: Outliers of SY 2014–2015 cost per meal were trimmed to avoid excessive influence on means. Reported cost per NSLP lunch was set to the 3rd percentile for nine SFAs with cost per lunch at or below the 3rd percentile. Likewise, reported cost per NSLP lunch was set to the 97th percentile for nine SFAs with cost per NSLP lunch at or above the 97th percentile. Reported cost per SBP breakfast was set to the 3rd percentile for nine SFAs with cost per SBP breakfast at or below the 3rd percentile. Likewise, reported cost per SBP breakfast was set to the 97th percentile for nine SFAs with cost per breakfast at or above the 97th percentile.

[a]The standard errors (SE) of estimates for SY 1992–1993 have been estimated from the published standard deviations. This method may underestimate the SE.

[b]The results for SY 1992–1993 and SY 2005–2006-II have been inflated to school year 2014–2015 values using the change in the Consumer Price Index for food away from home.

[c]Number of SFAs for SBP breakfasts for SY 1992–1993 is 78; excludes 16 SFAs that did not serve breakfast. Number of SFAs for SBP breakfasts for SY 2005–2006 is 116; excludes 4 SFAs that did not serve breakfast. Number of SFAs for SBP breakfasts for SY 2014–2015 is 270; excludes 14 SFAs that did not serve breakfast.

* Difference in means between prior study and SY 2014–2015 is significantly different from zero at the 0.05 level.

NSLP = National School Lunch Program; SBP = School Breakfast Program; SE = standard error of the mean; SFA = school food authority; SY =school year.

a. Comparison of Reported Cost per Meal by SFA Size

Table 5.2 compares the reported cost per NSLP lunch by SFA size over time. For all three SFA size groups and overall, the SY 2014–2015 reported cost per NSLP lunch was significantly higher than the costs from the two prior periods. For the average SFA, the mean reported cost per NSLP lunch in small SFAs was $3.72 in SY 2014–2015 compared with an inflation-adjusted $3.17 in 2005–2006 and $2.98 in 1992–1993. Similar trends occurred among medium-sized SFAs and large SFAs.

Table 5.2. Comparison of Reported Cost per NSLP Lunch by SFA Size: SY 1992–1993, SY 2005–2006, SY 2014–2015 (Inflation-Adjusted 2015 Dollars)

	Reported Cost per NSLP Lunch SFA as Unit of Analysis					
	SY 1992–1993[a] ($)		SY 2005–2006[a] ($)		SY 2014–2015 ($)	
	Mean (SE)[b]	Median	Mean (SE)	Median	Mean (SE)	Median
All SFAs	2.93*	2.91	3.03*	2.85	3.81	3.63
	(0.06)		(0.12)		(0.08)	
SFA Size[c]						
Fewer than 1,000 students	2.98*	3.18	3.17*	2.85	3.72	3.50
	(0.18)		(0.06)		(0.17)	
1,000 to 5,000 students	2.84*	2.89	2.92*	2.83	3.91	3.63
	(0.12)		(0.13)		(0.09)	
More than 5,000 students	2.93*	2.82	2.98*	2.99	3.77	3.62
	(0.08)		(0.09)		(0.07)	
Number of SFAs	**94**		**120**		**284**	

Source: School Lunch and Breakfast Cost Study-I (Glantz et al. 1994); School Lunch and Breakfast Cost Study-II (Bartlett et al. 2008); School Nutrition and Meal Cost Study, Menu Survey, School Nutrition Manager Cost Interview SFA Director and Business Manager Cost Interviews (Onsite and Follow-Up), school year 2014–2015. Tabulations are weighted to be representative of all public SFAs offering the National School Lunch Program

Notes: Outliers of SY 2014–2015 cost per meal were trimmed to avoid excessive influence on means. Reported cost per NSLP lunch was set to the 3rd percentile for nine SFAs with cost per lunch at or below the 3rd percentile. Likewise, reported cost per NSLP lunch was set to the 97th percentile for nine SFAs with cost per NSLP lunch at or above the 97th percentile.

Differences in medians were not tested for statistical significance.

[a]The results for SY 1992–1993 and SY 2005–2006 have been inflated to school year 2014–2015 values using the change in the Consumer Price Index for food away from home.

[b]The standard errors (SE) of estimates for SY 1992–1993 have been estimated from the published standard deviations. This method may underestimate the SE.

[c]SY 1992–1993 and SY 2005–2006 defined SFA size subgroups as follows: Small (1-999); Medium (1,000-4,999); and Large (5,000+).

* Difference in means between prior study and SY 2014–2015 is significantly different from zero at the 0.05 level.

NSLP = National School Lunch Program; SE = standard error of the mean; SFA = school food authority; SY = school year.

Table 5.3 compares the reported cost per SBP breakfast for all SFAs and by SFA size. The mean reported cost per SBP breakfast in small SFAs was $2.70 in SY 2014–2015, not significantly less than in SY 2005–2006 but significantly more than the $1.93 in SY 1992–1993. For medium-sized SFAs, the mean reported cost per SBP breakfast was $2.78 in SY 2014–2015, a significant increase from the $1.90 in SY 2005–2006 but not significantly less than in SY 1992–1993. For large SFAs, the mean reported cost per SBP breakfast in SY 2014–2015 ($2.56) was not significantly different from the means in SY 2005–2006 and SY 1992–1993.

Table 5.3. Comparison of Reported Cost per SBP Breakfast by SFA Size: SY 1992–1993, SY 2005–2006, SY 2014–2015 (Inflation-Adjusted 2015 Dollars)

	Reported Cost per SBP Breakfast SFA as Unit of Analysis					
	SY 1992–1993[a] ($)		SY 2005–2006[a] ($)		SY 2014–2015 ($)	
	Mean (SE)[b]	Median	Mean (SE)	Median	Mean (SE)	Median
All SFAs	2.27*	1.87	2.47	2.12	2.72	2.43
	(0.12)		(0.23)		(0.10)	
SFA Size[c]						
Fewer than 1,000 students	1.93*	1.87	3.06	2.32	2.70	2.52
	(0.11)		(0.50)		(0.21)	
1,000 to 5,000 students	2.95	2.05	1.90*	1.59	2.78	2.47
	(0.36)		(0.10)		(0.11)	
More than 5,000 students	2.39	1.95	2.41	2.26	2.56	2.27
	(0.18)		(0.18)		(0.11)	
Number of SFAs[d]	**78**		**116**		**270**	

Source: School Lunch and Breakfast Cost Study-I (Glantz et al. 1994); School Lunch and Breakfast Cost Study-II (Bartlett et al. 2008); School Nutrition and Meal Cost Study, Menu Survey, School Nutrition Manager Cost Interview, and SFA Director and Business Manager Cost Interviews (Onsite and Follow-Up), school year 2014–2015. Tabulations are weighted to be representative of all public SFAs offering the National School Lunch Program.

Note: Outliers of SNMCS cost per meal were trimmed to avoid excessive influence on means. Reported cost per SBP breakfast was set to the 3rd percentile for nine SFAs with cost per SBP breakfast at or below the 3rd percentile. Likewise, reported cost per SBP breakfast was set to the 97th percentile for nine SFAs with cost per SBP breakfast at or above the 97th percentile.

Differences in medians were not tested for statistical significance.

[a]The results for SY 1992–1993 and SY 2005–2006 have been inflated to school year 2014–2015 values using the change in the Consumer Price Index for food away from home.

[b]The standard errors (SE) of estimates for SY 1992–1993 have been estimated from the published standard deviations. This method may underestimate the SE.

[c]SY 1992–1993 and SY 2005–2006 defined SFA size subgroups as follows: Small (1-999); Medium-sized (1,000-4,999); and Large (5,000+).

[d]SY 1992–1993 excludes 16 SFAs that did not serve breakfast. SY 2005–2006 excludes 4 SFAs that did not serve breakfast. SY 2014–2015 excludes 14 SFAs that did not serve breakfast.

* Difference in means between prior study and SY 2014–2015 is significantly different from zero at the 0.05 level.

SBP = School Breakfast Program; SE = standard error of the mean; SFA = school food authority; SY = school year.

b. Composition of Reported Cost per NSLP Lunch and SBP Breakfast

Table 5.4 compares the composition of reported cost per NSLP lunch and cost per SBP breakfast meal in SY 1992–1993, SY 2005–2006, and SY 2014–2015 in the average SFA. For NSLP lunches, the costs of all three factors of production were significantly higher in SY 2014–2015 than in prior years. Food accounted for a mean of $1.69 of reported cost per reimbursable lunch in SY 2014–2015, while the reported food costs were significantly less in SY 2005–2006 ($1.40) and SY 1992–1993 ($1.41). Reported labor costs accounted for a mean of $1.72 per

NSLP lunch in SY 2014–2015 and significantly less in SY 2005–2006 ($1.35) and SY 1992–1993 ($1.27). Other reported costs, which for this table include other direct costs (as previously defined) and indirect costs, accounted for a mean of $0.41 per reimbursable NSLP lunch in 2014–2015 and significantly less in SY 2005–2006 ($0.30) and SY 1992–1993 ($0.23).

For SBP breakfasts, the reported food costs accounted for $1.15 per meal for SY 2014–2015, significantly greater than in SY 2005–2006 ($0.94) and SY 1992–1993 ($1.00). The reported labor cost per SBP breakfast in SY 2014–2015 was not significantly different from the comparable cost in SY 2005–2006 and SY 1992–1993. Other costs per SBP breakfast in SY 2014–2015 were significantly greater than in SY 1992–1993 but not in SY 2005–2006.

An increase in the reporting of indirect costs contributed to the higher reported costs other than food and labor in SY 2014–2015 for NSLP lunch. As Table 3.4 shows, 21 percent of SFAs reported indirect costs in SY 2014–2015. In contrast, only 16 percent of SFAs reported indirect costs in SY 2005–2006 (Bartlett et al. 2008).

Thus, all three cost components (food, labor, and other) contributed to the increase in reported cost per NSLP lunch, while only food and (to a lesser degree) other costs contributed to the SBP cost increase. The increase in food costs is consistent with expectations that the updated nutrition standards would increase food costs (Institute of Medicine (IOM), 2009). Changes in food preparation methods related to menu changes (such as less use of commercially prepared foods and more “scratch” cooking from raw ingredients) might explain the increase in the reported labor cost per NSLP lunch. While available data do not permit precise comparisons, it appears that the composition of the reported cost per NSLP lunch was not materially different in SY 2014-2015 than in prior years, and that the magnitude of cost increases over time was similar for food, labor and other costs.

For the SBP, the finding that the food cost per SBP breakfast increased while the reported labor cost did not might be explained in one of two ways. First, the updated nutrition standards might not have affected food preparation methods. Second, if they did, this effect might have been offset by greater efficiencies due to the increased scale of the SBP. Mean daily participation (ADP) in the SBP more than doubled from Fiscal Year (FY) 1993 to FY 2015 relative to ADP in the NSLP. The ADP for the SBP was 22 percent of the ADP for the NSLP in FY1993, 32 percent in FY 2005, and 46 percent in FY 2015 (USDA-FNS 2017a). The major trend helps to explain the differences in cost trends between the NSLP and SBP over this period.

Table 5.4. Comparison of the Composition of Reported Cost per NSLP Lunch and SBP Breakfast: SY 1992–1993, SY 2005–2006 and SY 2014–2015 (Inflation-Adjusted 2015 Dollars)

	Food Costs[a] ($)			Labor Costs[b] ($)			Other Costs[c] ($)			
	Mean	Median	SE	Mean	Median	SE	Mean	Median	SE	Number of SFAs
NSLP Lunch										
SY 1992–1993	1.41*	1.37	0.05	1.27*	1.25	0.05	0.23*	0.21	0.02	94
SY 2005–2006[d]	1.40*	1.28	0.05	1.35*	1.23	0.06	0.30*	0.23	0.04	120
SY 2014–2015	1.69	1.64	0.04	1.72	1.58	0.06	0.41	0.31	0.03	264
SBP Breakfast										
SY 1992–1993	1.00*	0.98	0.03	1.11	0.87	0.10	0.18*	0.16	0.01	78
SY 2005–2006[d]	0.94*	0.86	0.04	1.31	1.04	0.21	0.22	0.18	0.03	116
SY 2014–2015	1.15	1.07	0.04	1.24	1.03	0.09	0.28	0.20	0.02	252

Source: School Lunch and Breakfast Cost Study-I (Glantz et al. 1994); School Lunch and Breakfast Cost Study-II (Bartlett et al. 2008); School Nutrition and Meal Cost Study, Menu Survey, School Nutrition Manager Cost Interview, and SFA Director and Business Manager Cost Interviews (Onsite and Follow-Up), school year 2014–2015. Tabulations are weighted to be representative of all public SFAs offering the National School Lunch Program.

Notes: SY 2014–2015 estimates of the cost components per NSLP lunch exclude 20 SFAs with reported labor costs above 80 percent or below 15 percent of total costs, or reported food costs above 70 percent or below 15 percent of total costs. The data for these SFAs did not appear to provide an accurate decomposition of costs (for example, significant labor costs were included in other direct costs). Of these 20 SFAs, 18 SFAs that have SBP are excluded from estimates of the cost components per SBP breakfast. In addition, SBP estimates exclude 14 SFAs with no SBP.

For SFAs with trimmed total costs per NSLP lunch and SBP breakfast that have been set to the 3rd percentile or 97th percentile, respectively, the cost components have been adjusted so that they sum to the trimmed total cost per meal. The adjustment maintains the same percentages of cost components before adjustment.

Differences in medians were not tested for statistical significance.

[a]Food costs include food purchases, USDA Foods received by the SFA, and value of food used from inventory.

[b]Labor costs include salaries, wages, and fringe benefits.

[c]Other costs include non-food supplies, foodservice management company charges, other contracted services, equipment purchases and depreciation, utilities, and any other costs not classified as food, labor, or other indirect costs. Also includes indirect costs including charges to the school foodservice account for resources provided by the school district when such charges are made by applying an indirect cost rate or other indirect cost allocation method.

[d]The results for SY 1992–1993 and SY 2005–2006 have been inflated to school year 2014–2015 values using the change in the Consumer Price Index for food away from home.

* Difference in means between prior years and SY 2014–2015 is significantly different from zero at the 0.05 level.

SBP = School Breakfast Program; SE = standard error of the mean; SFA = school food authority; SY =school year.

c. SFA Revenues as a Percentage of Reported Costs

Table 5.5 compares total SFA revenues as a percentage of reported costs in SY 1992–1993, SY 2005–2006, and SY 2014–2015 in the average SFA. This measure of the SFAs' financial status did not change significantly over time for all SFAs together or for small and medium-sized SFAs. For large SFAs, total revenues as a percentage of costs decreased significantly from 105 percent (that is, a 5 percent surplus) in SY 1992–1993 to 99 percent in SY 2014–2015.

Table 5.5. Comparison of Total SFA Revenues to Reported Costs: SY 1992–1993, SY 2005–2006, SY 2014–2015 (Inflation-Adjusted 2015 Dollars)

	Mean Revenues as a Percentage of Reported Costs		
	SY 1992–1993 Mean (SE)[a]	SY 2005–2006 Mean (SE)	SY 2014–2015 Mean (SE)
Revenues/Costs Comparison			
Total revenues to reported costs	99.8 (1.4)	100.8 (1.1)	97.1 (1.7)
SFA Size[b]			
Fewer than 1,000 students	97.1 (5.1)	99.9 (2.5)	95.0 (3.6)
1,000 to 5,000 students	101.2 (1.6)	101.3 (0.9)	98.5 (1.5)
More than 5,000 students	105.1* (1.1)	102.0 (0.7)	99.4 (1.2)
Number of SFAs (unweighted)[c]	**94**	**120**	**218**

Source: School Nutrition and Meal Cost Study, Menu Survey, Principal Cost Interview, School Nutrition Manager Cost Interview, and SFA Director and Business Manager Cost Interviews (Onsite and Follow-Up), SY 2014–2015. Tabulations are weighted to be representative of all public SFAs offering the National School Lunch Program.

Notes: Data for SY 1992–1993 from SLBCS-I, data for SY 2005–2006 from SLBCS-II, data for SY 2014–2015 from SNMCS.

[a]The standard error (SE) of the means for SY 1992–1993 have been estimated from the published standard deviations. This method may underestimate the SE.

[b]SY 1992–1993 and SY 2005–2006 defined SFA size subgroups as follows: Small (1-999); Medium-sized (1,000-4,999); and Large (5,000+)

[c]SY 2014–2015 revenue analysis sample includes the SFAs in the cost analysis sample with the following exceptions: excludes 11 SFAs with unreliable USDA reimbursements data, 1 SFA that did not provide any revenue data, and 54 SFAs that did not provide sufficient detail to determine the composition of revenues.

* Difference between prior study and SY 2014–2015 is significantly different from zero at the 0.05 level.

SE = standard error of the mean; SFA = school food authority; SY =school year.

Comparing the distribution of total SFA revenues as a percentage of reported costs between SY 2014–2015 and SY 2005–2006, the medians were similar (99 percent versus 101 percent) but the distribution in SY 2014–2015 was more dispersed (Table C.18). In particular, 47 percent of SFAs were between 95 percent and 105 percent, down from 58 percent. At the high end, however, 12 percent of SFAs were at 110 percent or more, up from 8 percent. At the lower end of the distribution, almost twice as many SFAs were below 90 percent (18 percent in SY 2014–2015 and 10 percent in SY 2005–2006).[71]

B. Full Costs

This section compares the estimates of the mean full costs of producing NSLP lunches and SBP breakfasts over time. Table 5.6 provides an overview of these full costs. The SY 2014–2015 mean full cost per NSLP lunch in a typical SFA was $6.02, significantly and substantially greater than the mean inflation-adjusted cost of $3.74 in SY 2005–2006 and $3.81 in SY 1992–1993. Similarly, the SY 2014–2015 mean full cost per SBP breakfast was $4.19, significantly and substantially greater than the $3.21 in SY 2005–2006 and $2.98 in SY 1992–1993.

With the meal as the unit of analysis (rather than the SFA), the SY 2014–2015 mean full cost per NSLP lunch was $5.55, significantly more than the mean inflation-adjusted amounts of $3.58 in SY 2005–2006 and $3.48 in SY 1992–1993. The SY 2014–2015 mean full cost per SBP breakfast was $3.50, again significantly more than the $2.32 in SY 2005–2006 and $2.29 in SY 1992–1993.

Thus, both NSLP and SBP full costs per meal were significantly greater than in prior years, whether the unit of analysis was the SFA or the meal.

The full cost per NSLP lunch in SY 2014–2015 was significantly greater than in prior years for all three SFA subgroups by size (Table 5.7). For example, the comparable mean full cost per NSLP lunch for small SFAs was $6.03 in SY 2014–2015, $3.90 in SY 2005–2006, and $4.34 in SY 1992–1993.

[71] No tests have been performed on the significance of differences among these percentages. The 2004–2005 study did not report standard errors for the percentages of SFAs in the exhibit showing the distribution of SFAs by total revenue as a percentage of total reported costs (D.55).

Table 5.6. Comparison of Full Cost per Reimbursable Meal: SY 1992–1993, SY 2005–2006, SY 2014–2015 (Inflation-Adjusted 2015 Dollars)

Full Cost Measure	Unit of Analysis	Mean Full Cost Per Meal (SE)[a] SY 1992–1993[b] ($)	SY 2005–2006[b] ($)	SY 2014–2015 ($)
Cost per NSLP lunch	SFA	3.81* (0.17)	3.74* (0.13)	6.02 (0.15)
Cost per NSLP lunch	Meal	3.48* (0.08)	3.58* (0.06)	5.55 (0.11)
Cost per SBP breakfast	SFA	2.98* (0.15)	3.21* (0.28)	4.19 (0.15)
Cost per SBP breakfast	Meal	2.29* (0.08)	2.32* (0.09)	3.50 (0.17)
Number of SFAs[c]		**93**	**120**	**284**

Source: School Lunch and Breakfast Cost Study-I (Glantz et al. 1994); School Lunch and Breakfast Cost Study-II (Bartlett et al. 2008); School Nutrition and Meal Cost Study, Menu Survey, School Nutrition Manager Cost Interview, SFA Director and Business Manager Cost Interviews (Onsite and Follow-Up), school year 2014–2015. Tabulations are weighted to be representative of all public SFAs offering the National School Lunch Program.

Notes: SY 1992–1993 costs do not include supervision of students by school (off-budget) personnel. These costs are included in full costs for SY 2005–2006 and SY 2014–2015. Outliers of SY 2014–2015 cost per meal were trimmed to avoid excessive influence on means. Full cost per NSLP lunch was set to the 3rd percentile for nine SFAs with cost per lunch at or below the 3rd percentile. Likewise, full cost per NSLP lunch was set to the 97th percentile for nine SFAs with cost per NSLP lunch at or above the 97th percentile. Full cost per SBP breakfast was set to the 3rd percentile for nine SFAs with cost per SBP breakfast at or below the 3rd percentile. Likewise, full cost per SBP breakfast was set to the 97th percentile for nine SFAs with cost per SBP breakfast at or above the 97th percentile.

Differences in medians were not tested for statistical significance.

[a]The standard errors (SE) of estimates for SY 1992–1993 have been estimated from the published standard deviations. This method may underestimate the SE.

[b]The results for SY 1992–1993 and SY 2005–2006 have been inflated to school year 2014–2015 values using the change in the Consumer Price Index for food away from home.

[c]SY 1992–1993 excludes 1 SFA with no data on unreported costs. Number of SFAs for SBP breakfasts for SY 1992–1993 is 77; excludes 16 SFAs that did not serve breakfast. Number of SFAs for SBP breakfasts for SY 2005–2006 is 116; excludes 4 SFAs that did not serve breakfast. Number of SFAs for SBP breakfasts for SY 2014–2015 is 270; excludes 14 SFAs that did not serve breakfast.

* Difference in means between prior study and SY 2014–2015 is significantly different from zero at the 0.05 level.

NSLP = National School Lunch Program; SBP = School Breakfast Program; SE = standard error of the mean; SFA = school food authority; SY = school year.

Table 5.7. Comparison of Full Cost per NSLP Lunch by SFA Size, SFA as Unit of Analysis: SY 1992–1993, SY 2005–2006, SY 2014–2015 (Inflation-Adjusted 2015 Dollars)

	Full Cost per NSLP Lunch SFA as Unit of Analysis					
	SY 1992–1993[a] ($)		SY 2005–2006[a] ($)		SY 2014–2015 ($)	
	Mean (SE)[b]	Median	Mean (SE)	Median	Mean (SE)	Median
All SFAs	3.81*	3.36	3.74*	3.53	6.02	5.50
	(0.18)		(0.13)		(0.15)	
SFA Size[c]						
Fewer than 1,000 students	4.34*	3.71	3.90*	3.72	6.03	5.66
	(0.62)		(0.13)		(0.30)	
1,000 to 5,000 students	3.30*	3.23	3.58*	3.30	6.13	5.51
	(0.17)		(0.12)		(0.20)	
More than 5,000 students	3.41*	3.36	3.67*	3.70	5.66	5.26
	(0.09)		(0.10)		(0.15)	
Number of SFAs[d]	**93**		**120**		**284**	

Source: School Lunch and Breakfast Cost Study-I (Glantz et al. 1994); School Lunch and Breakfast Cost Study-II (Bartlett et al. 2008); School Nutrition and Meal Cost Study, Menu Survey, School Nutrition Manager Cost Interview, and SFA Director and Business Manager Cost Interviews (Onsite and Follow-Up), school year 2014–2015. Tabulations are weighted to be representative of all public SFAs offering the National School Lunch Program.

Notes: SY 1992–1993 costs do not include supervision of students by school (off-budget) personnel. Outliers of SY 2014–2015 cost per meal were trimmed to avoid excessive influence on means. Full cost per SBP breakfast was set to the 3rd percentile for nine SFAs with cost per breakfast at or below the 3rd percentile. Likewise, full cost per SBP breakfast was set to the 97th percentile for nine SFAs with cost per SBP breakfast at or above the 97th percentile.

Differences in medians were not tested for statistical significance.

[a]The results for SY 1992–1993 and SY 2005–2006 have been inflated to school year 2014–2015 values using the change in the Consumer Price Index for food away from home.

[b]The standard errors (SE) of estimates for SY 1992–1993 have been estimated from the published standard deviations. This method may underestimate the SE.

[c]SY 1992–1993 and SY 2005–2006 defined SFA size subgroups as follows: Small (1-999); Medium (1,000-4,999); and Large (5,000+).

[d]SY 1992–1993 excludes 1 SFA with no data on unreported costs.

* Difference in means between prior study and SY 2014–2015 is significantly different from zero at the 0.05 level.

NSLP = National School Lunch Program; SE = standard error of the mean; SFA = school food authority; SY =school year.

The differences in full cost per SBP breakfast by SFA size subgroup were similar to the pattern for NSLP lunches, but not all SBP differences are significant (Table 5.8). For small SFAs, the mean full cost per SBP breakfast in SY 2014–2015 ($4.30) was significantly higher than the mean inflation-adjusted amount in SY 1992–1993 ($2.84) but not significantly higher than in SY 2005–2006. For medium-sized SFAs, the mean full cost per SBP breakfast in SY 2014–2015 ($4.21) was significantly higher than comparable mean full costs per SBP breakfast

in SY 2005–2006 ($2.53). For large SFAs, the full cost per SBP breakfast was significantly greater in SY 2014–2015 ($3.87), than in both SY 1992–1993 ($2.86) and SY 2005–2006 ($2.86).

Table 5.8. Comparison of Full Cost per SBP Breakfast by SFA Size, SFA as Unit of Analysis: SY 1992–1993, SY 2005–2006, SY 2014–2015 (Inflation-Adjusted 2015 Dollars)

	Full Cost per SBP Breakfast SFA as Unit of Analysis					
	SY 1992–1993[a] ($)		SY 2005–2006[a] ($)		SY 2014–2015 ($)	
	Mean (SE)[b]	Median	Mean (SE)	Median	Mean (SE)	Median
All SFAs	2.98* (0.15)	2.46	3.21* (0.28)	2.88	4.19 (0.15)	3.76
SFA Size[c]						
Fewer than 1,000 students	2.84* (0.28)	2.46	4.05 (0.64)	3.44	4.30 (0.30)	4.14
1,000 to 5,000 students	3.37 (0.43)	2.29	2.53* (0.15)	2.18	4.21 (0.20)	3.74
More than 5,000 students	2.86* (0.23)	2.21	2.86* (0.18)	2.76	3.87 (0.22)	3.13
Number of SFAs[d]	**77**		**116**		**270**	

Source: School Lunch and Breakfast Cost Study-I (Glantz et al. 1994); School Lunch and Breakfast Cost Study-II (Bartlett et al. 2008); School Nutrition and Meal Cost Study, Menu Survey, School Nutrition Manager Cost Interview, and SFA Director and Business Manager Cost Interviews (Onsite and Follow-Up), school year 2014–2015. Tabulations are weighted to be representative of all public SFAs offering the National School Lunch Program.

Note: SY 1992–1993 costs do not include supervision of students by school (off-budget) personnel. These costs are included in full costs for SY 2005–2006 and SY 2014–2015. SBP estimates exclude 14 SFAs with no SBP. Outliers of SY 2014–2015 estimates were trimmed to avoid excessive influence on means. Full cost per SBP breakfast was set to the 3rd percentile for nine SFAs with cost per SBP breakfast at or below the 3rd percentile. Likewise, full cost per SBP breakfast was set to the 97th percentile for nine SFAs with cost per SBP breakfast at or above the 97th percentile.

Differences in medians were not tested for statistical significance.

[a]The results for SY 1992–1993 and SY 2005–2006 have been inflated to school year 2014–2015 values using the change in the Consumer Price Index for food away from home.

[b]The standard errors (SE) of estimates for SY 1992–1993 have been estimated from the published standard deviations. This method may underestimate the SE.

[c]SY 1992–1993 and SY 2005–2006 defined SFA size subgroups as follows: Small (1-999); Medium –sized (1,000-4,999); and Large (5,000+).

[d]SY 1992–1993 excludes 16 SFAs that did not serve breakfast and 1 SFA with missing data on full costs. SY 2005–2006 excludes 4 SFAs that did not serve breakfast. SY 2014–2015 excludes 14 SFAs that did not serve breakfast.

* Difference in means between prior study and SY 2014–2015 is significantly different from zero at the 0.05 level.

SBP = School Breakfast Program; SE = standard error of the mean; SFA = school food authority; SY = school year.

Turning to the composition of full costs, all three components (food, labor and other expenses) were significantly greater for the NSLP in SY 2014–2015 than in SY 2004-05 and in SY 1992–1993, with the SFA as the unit of analysis (Table 5.9). As previously discussed, the food cost of $1.70 per NSLP lunch in SY 2014–2015 was significantly more than the comparable costs in SY 2005–2006 and in SY 1992–1993. The full labor cost of $3.35 per NSLP lunch in SY 2014–2015 substantially exceeded the comparable prior costs, as did the other expenses of $0.99 per NSLP lunch (including other direct costs and indirect costs). As with reported costs, the available data do not permit precise estimates of changes in the percentage composition of full costs. Unlike reported costs, however, the results suggest that full costs per NSLP lunch for labor and other costs increased more than food costs (in both percentage and dollar terms), and therefore labor and other costs made up greater shares of the total full cost per NSLP lunch, as compared with the full costs in SY 2005-2006. Thus, the trend of the full cost per NSLP lunch appears to be a product of both the overall, consistent trend in reported costs across components and additional increases in labor and other costs.

Table 5.9. Comparison of the Composition of Full Cost per NSLP Lunch and SBP Breakfast: SY 1992–1993, SY 2005–2006 and SY 2014–2015 (Inflation-Adjusted 2015 Dollars)

	Food Costs[a] ($)			Labor Costs[b] ($)			Other Costs[c] ($)			
	Mean	Median	SE	Mean	Median	SE	Mean	Median	SE	Number of SFAs
NSLP Lunch										
SY 1992–1993	1.41	1.37	0.05	1.79	1.46	0.10	0.62	0.54	0.04	94
SY 2005–2006[d]	1.40*	1.28	0.05	1.79*	1.59	0.08	0.55*	0.49	0.04	120
SY 2014–2015	1.70*	1.64	0.05	3.35*	2.84	0.14	0.99*	0.87	0.04	264
SBP Breakfast										
SY 1992–1993	1.00	0.98	0.03	1.50	1.14	0.11	0.48	0.37	0.03	78
SY 2005–2006[d]	0.94*	0.86	0.04	1.77*	1.43	0.23	0.49*	0.41	0.05	116
SY 2014–2015	1.15*	1.07	0.04	2.27	1.92	0.12	0.67*	0.56	0.03	252

Source: School Lunch and Breakfast Cost Study-I (Glantz et al. 1994); School Lunch and Breakfast Cost Study-II (Bartlett et al. 2008); School Nutrition and Meal Cost Study, Menu Survey, School Nutrition Manager Cost Interview, and SFA Director and Business Manager Cost Interviews (Onsite and Follow-Up), school year 2014–2015. Tabulations are weighted to be representative of all public SFAs offering the National School Lunch Program.

Note: SY 2014–2015 estimates of the cost components per NSLP lunch exclude 20 SFAs with reported labor costs above 80 percent or below 15 percent of total costs, or reported food costs above 70 percent or below 15 percent of total costs. The data for these SFAs did not appear to provide an accurate decomposition of costs (for example, significant labor costs were included in other direct costs). Of these 20 SFAs, 18 SFAs that have SBP are excluded from estimates of the cost components per SBP breakfast. In addition, SBP estimates exclude 14 SFAs with no SBP.

For SFAs with trimmed total costs per NSLP lunch and SBP breakfast that have been set to the 3rd percentile or 97th percentile, respectively, the cost components have been adjusted so that they sum to the trimmed total cost per meal. The adjustment maintains the same percentages of cost components before adjustment.

Differences in medians were not tested for statistical significance.

[a]Food costs include food purchases, USDA Foods received by the SFA, and value of food used from inventory.

[b]Labor costs include salaries, wages, and fringe benefits.

[c]Other costs include non-food supplies, foodservice management company charges, other contracted services, equipment purchases and depreciation, utilities, and any other costs not classified as food, labor, or other indirect costs. Also includes indirect costs including charges to the school foodservice account for resources provided by the school district when such charges are made by applying an indirect cost rate or other indirect cost allocation method.

[d]The results for SY 1992–1993 and SY 2005–2006 have been inflated to school year 2014–2015 values using the change in the Consumer Price Index for food away from home.

* Difference in means between prior years and SY 2014–2015 is significantly different from zero at the 0.05 level.

SBP = School Breakfast Program; SE = standard error of the mean; SFA = school food authority; SY =school year.

The changes in the composition of the full cost per SBP breakfast were similar to those for NSLP lunch. The full food and other cost per SBP breakfast in SY 2014–2015 ($1.15 and $0.67) were significantly greater than in both SY 2005-2006 and SY 1992-1993. The full labor cost per SBP breakfast was not significantly greater than in SY 2005-2006 but was significantly greater than in SY 1992-1993. Unlike the trends for the NSLP, however, it appears that the increases in the full costs of food, labor and other expenses from SY 2005-2006 to SY 2014-2015 were similar, within the limitations of the available data.

C. Revenues

Table 5.10 shows a number of important shifts in the composition of SFA revenues when comparing SY 2014–2015 with the prior years. USDA subsidies in SY 2014–2015 were a significantly larger share of SFA revenues (63 percent) versus 51 percent in SY 2005–2006 and 47 percent in SY 1992–1993. This was due to a larger share for meal reimbursements compared with prior years. The increase in USDA reimbursements as a share of SFA revenues is consistent with the recent increase in the percentage of meals claimed at the higher free and reduced-price rates, as well as the additional performance-based payment for SFAs meeting the new school meal nutrition standards and the alternative funding formula for the Community Eligibility Provision. The percentage of NSLP lunches served free or at reduced price rose from 55 percent in Fiscal Year (FY) 1993 to 59 percent in FY 2006 and 73 percent in FY 2015 (USDA, FNS 2017b).[72] USDA Foods contributed a significantly smaller share of SY 2014–2015 SFA revenues (6 percent) compared with 8 percent in SY 1992–1993 (but not significantly different from SY 2005–2006). This trend may be related to menu planning and food purchasing decisions of SFAs or variations in the amount of USDA Foods available, including entitlements and bonus commodities. Student payments for reimbursable meals were a significantly smaller percentage (20 percent) versus 24 percent in 2005–2006 and 35 percent in 1992–1993, as were a la carte and other nonreimbursable sales (11 percent versus 16 percent and 15 percent). The decline in student payments for reimbursable meals is directly related to the increase in the percentage of lunches served free or at reduced price. For nonreimbursable sales, the decline in the percentage of revenues is significant in light of the finding that SFAs report significant challenges in implementing the Smart Snacks in Schools standards for competitive foods (see Volume 1 of the SNMCS final report (Forrestal et al. 2019)).

[72] For the SBP, the comparable percentages decreased from 88 percent in FY 1993 to 81 percent in FY 2006, then rose again to 85 percent in FY 2015 (USDA,FNS 2017a). As noted earlier in this chapter, the SBP expanded during this period and this expansion was related to changes in the percentage of breakfasts served free or at reduced price.

The decline in the share of revenues from nonreimbursable food sales is notable given the evidence that SFAs' revenues from nonreimbursable food sales as a percentage of costs was greater in SY 2014–2015 than in SY 2005–2006 (as discussed in Section 4.C.3). The shares from State and local government funds did not significantly change across the years, but other cash revenues were significantly less in 2014–2015 than in SY 1992–1993)[73].

Table 5.10. Comparison of the Composition of SFA Revenues: SY 1992–1993, SY 2005–2006, SY 2014–2015

	Percentage of SFA Revenues SFA as Unit of Analysis					
	SY 1992–1993 (%)		SY 2005–2006 (%)		SY 2014–2015 (%)	
Source of Revenues	Mean	SE[a]	Mean	SE	Mean	SE
USDA Subsidies	46.7*	1.8	50.6*	2.1	62.5	1.9
Meal reimbursements	38.5*	1.7	45.4*	1.8	56.7	1.9
USDA Foods	8.2*	0.3	5.2	0.4	5.9	0.3
Student Payments for Reimbursable Meals	35.0*	1.3	24.2*	1.5	20.0	1.4
A la Carte and Other Nonreimbursable Sales	15.4*	1.2	15.8*	2.0	10.9	0.8
State and Local Government Funds	3.9	0.5	8.8	2.0	5.9	0.9
Local Government Funds			6.4	2.0	3.3	0.8
State Funds			2.4	0.3	2.5	0.3
Other Cash Revenues[b]	1.8*	0.5	0.6	0.1	0.6	0.1
Number of SFAs	**94**		**120**		**218**	

Source: School Lunch and Breakfast Cost Study-I (Glantz et al. 1994); School Lunch and Breakfast Cost Study-II (Bartlett et al. 2008); School Nutrition and Meal Cost Study, Menu Survey, School Nutrition Manager Cost Interview, and SFA Director and Business Manager Cost Interviews (Onsite and Follow-Up), school year 2014–2015. Tabulations are weighted to be representative of all public SFAs offering the National School Lunch Program.

Note: The revenue analysis sample includes the SFAs in the cost analysis sample with the following exceptions: excludes 11 SFAs with unreliable USDA reimbursements data, 1 SFA that did not provide any revenue data, and 54 SFAs that did not provide sufficient detail to determine the composition of revenues.

[a]The standard errors (SE) of estimates for SY 1992–1993 have been estimated from the published standard deviations. This method may underestimate the SE.

[b]Other cash revenues include proceeds from sale of equipment, interest on deposits, sales tax receipts, and other revenues not derived directly from meal and snack service or nonreimbursable food sales.

* Difference in means between prior study and SY 2014–2015 is significantly different from zero at the 0.05 level.

SE = standard error of the mean; SFA = school food authority; USDA = United States Department of Agriculture; SY = school year.

[73] As shown in Table 5.9, the percentage from State and local government funds was combined in reporting for SY 1992–1993.

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6. RELATIONSHIPS BETWEEN MEAL COSTS AND SCHOOL AND SFA CHARACTERISTICS

School meal costs vary widely among SFAs and increased substantially since the implementation of the HHFKA. A key objective of the SNMCS was to examine the factors that contribute to variation in costs, including characteristics related to the implementation of the HHFKA. To address this objective, the SNMCS combined—for the first time in a national study—collected data on school meal costs and revenues with data on the characteristics of school meals, schools, and SFAs. This chapter presents results of multivariate analyses that examined relationships between these domains.

A. Overview of Analytic Approach

The study team examined relationships at the school and/or SFA-level between school meal costs and key characteristics in five domains:

- Institutional and demographic characteristics (school-level and SFA-level)
- Key characteristics of school meals (school-level)
- Key characteristics of the school food environment (school-level)
- Key characteristics of school foodservice operations (school-level and SFA-level)
- Other SFA-level operating characteristics (SFA-level)

For each of these domains, the study team identified an initial set of characteristics consisting of relevant variables from a variety of study instruments. The final set of characteristics was identified by eliminating, from the pool of potential characteristics, those which (1) contained valid values for a relatively low proportion of the sample, (2) exhibited insufficient variation within the sample, or (3) were highly correlated with other considered characteristics that better explained variation in the outcome of interest. Appendix B provides additional details on the exclusion criteria used in identifying the final set of variables as well as a technical description of the methods used to produce the results presented in this chapter.

Separate multivariate regression models were implemented to explore relationships between characteristics in the above domains and the reported and full costs per NSLP lunch and per SBP breakfast. At the SFA level, the study team also modeled relationships between SFA characteristics and revenues as a percentage of reported costs per NSLP lunch and per SBP breakfast. The analysis samples included all schools and SFAs with valid data for the corresponding descriptive analyses of costs. The samples differ by outcome as noted in the tables. Analyses used weights that accounted for the design of the sample and adjusted for non-response so that estimates are nationally representative of public, non-charter schools and SFAs offering the NSLP or SBP (depending on the outcome).

Linear regression models provided estimates of differences in the mean cost per meal between schools or SFAs that differed on each characteristic while controlling for all of the other

characteristics in the domain and also for institutional and demographic characteristics.[74] The study team separately estimated models for each of the five domains so that each model had sufficient degrees of freedom to detect significant relationships between costs and the characteristics in the model.

To facilitate comparisons and syntheses across analyses, the definitions of domains and the selection of the characteristics within these domains for the school-level models were based on the domains and characteristics used in the models that examined factors associated with the nutrition quality of schools meals in Volume 2 of the SNMCS final report (Gearan et al. 2019). The meal quality analysis estimated models at the school level for the domains of institutional and demographic characteristics, meal characteristics, the school food environment, and school foodservice operations. These domains included school-level and SFA-level variables. With some exceptions, the domains and characteristics for models at the school level were the same for the meal quality and cost analyses. Notably, the meal quality models used the Healthy Eating Index (HEI)-2010 total score as the outcome variable to examine the quality of NSLP lunches and SBP breakfasts. Following the study's recursive approach, the models of costs at the school level included the HEI-2010 score in the domain of meal characteristics.[75]

At the SFA level, the analysis focused on characteristics at the SFA level in three domains: institutional and demographic characteristics, school foodservice operations, and other key characteristics of SFA operations. The same SFA-level institutional and demographic characteristics were used in SFA-level and school-level models; the latter also included school-level characteristics. For the other two domains, SFA-level characteristics included those included in school-level models and additional characteristics identified as potentially relevant to meal costs by the study's research questions.

Regression-adjusted means are reported in main text tables for each model. The differences between means represent differences associated with the characteristic of interest. Appendix D provides supplementary tables, including regression-adjusted means for domains that are not discussed in the text and parameter estimates for all models and outcomes.

Characteristics of interest were represented in the model by categorical and binary variables. For each of these, one of the levels of each categorical or binary variable was set as the reference category in the regressions. The tables provide regression-adjusted means of outcomes for the reference category and the other categories. They also show, for the categories other than the reference category, the significance level of a test that the regression-adjusted mean for the category in question is different from the reference category. These are the only significance tests for differences between categories, so any other apparent differences should not be interpreted to be significant.

The discussion in this chapter focuses on the relationships that have relatively strong evidence of significance. For these relationships, the text describes SFAs or schools in one

[74] The findings reflect the specific models estimated for this report, which are discussed in Chapter 6. Other models might yield different findings.

[75] Other differences between models of meal quality and costs arose because of factors that led to certain characteristics being dropped from the cost models. Appendix B explains the criteria for these exclusions.

category as having different costs from SFAs or schools in another category. This phrasing simplifies the exact finding, which is that one category had a significantly higher or lower regression-adjusted mean cost than the other category. As a rule, relationships are discussed only when a characteristic is associated with more than one outcome of the same type (i.e., cost per meal or revenue as a percentage of cost) in the same direction. Given that the outcomes are associated with one another, the fact that a particular detected significant relationship is associated with only one outcome makes it more likely to be due to random variation in the data as opposed to an actual pattern. However, for certain characteristics of particular importance, the lack of a significant finding is noted.

Because the probability of finding significant associations by chance increases with the number of associations tested, findings from these analyses should be considered exploratory and interpreted with caution. There is one exception to this rule: the multivariate analysis for this report tested the confirmatory hypothesis that healthier NSLP lunches cost more.[76] In addition, it is important to understand that significant associations do not imply causality, given the cross-sectional design of the study.

B. Relationships between NSLP and SBP Meal Costs and Institutional and Demographic Characteristics of Schools and SFAs

As noted above, all regression models controlled for differences in institutional and demographic characteristics of schools and SFAs. Institutional characteristics of interest for SFAs include SFA size (enrollment) and whether an SFA is composed of a single school district or multiple districts. At the school level, school size and type (elementary, middle or high) are key institutional characteristics. Relevant demographic characteristics include the FNS region, whether the SFA is located in an urban, suburban, or rural area, the percentage of minority students, the district child poverty rate, and the percentage of students approved for free or reduced-price meals. These characteristics could affect costs through associations with wage and benefit rates for employees, food costs, menu choices, or student participation in the NSLP or SBP.

When considered separately, some of these institutional and demographic characteristics have significant relationships to NSLP and SBP costs at the school level. These observed relationships may arise because variables in the model are associated with characteristics in the other domains discussed in subsequent sections (such as, differences in compliance with standards for calorie levels for the SBP), or they may reflect other factors that vary with institutional and demographic characteristics (such as, differences in food prices or wage rates). Table 6.1 presents the regression-adjusted means of NSLP and SBP cost per meal at the school level. Associated parameter estimates for these models are provided in Tables D.1 and D.2. As noted in Section A, relationships are discussed only when a characteristic is associated with more than one outcome in the same direction.

[76] This hypothesis was designated in advance as confirmatory so that results of statistical tests of this relationship could be considered without adjustment for the many other statistical tests conducted on an exploratory basis.

Table 6.1. Relationships between NSLP and SBP Meal Costs and Key Institutional and Demographic Characteristics of SFAs and Schools: Regression-Adjusted Mean for Reported Cost and Full Cost per Meal for Schools

	Regression-Adjusted Mean			
	Unit of Analysis Is School			
	Reported Cost per NSLP Lunch ($)	Full Cost per NSLP Lunch ($)	Reported Cost per SBP Breakfast ($)	Full Cost per SBP Breakfast ($)
Overall Weighted Mean	3.84	5.79	2.65	3.93
SFA Size				
Fewer than 1,000 students (*reference category*)	3.69	5.77	2.46	3.96
More than 1,000 students	3.87	5.80	2.69	3.93
SFA Type				
Single district (*reference category*)	3.88	5.70	2.68	3.87
Multi-district	3.65	5.76	2.52	4.04
School Size				
Fewer than 500 students (*reference category*)	4.05	6.13	2.89	4.25
500 to 999 students	3.61*	5.45*	2.45*	3.67*
1,000 or more students	3.72	5.52	2.40*	3.54*
School Type				
Elementary (reference category)	3.70	5.63	2.55	3.82
Middle	3.92*	5.88	2.87*	4.21*
High	4.17*	6.19*	2.77	4.01
FNS Region				
Mid-Atlantic (reference category)	3.90	6.27	2.78	4.29
Northeast	3.91	6.57	2.71	4.23
Southeast	4.24	6.34	2.98	4.58
Midwest	3.57	5.41*	2.36	3.65
Southwest	3.89	6.07	2.71	3.93
Mountain Plains	3.80	5.53	2.56	3.78
Western	3.61	4.85*	2.50	3.24*
SFA Urbanicity				
Urban (reference category)	3.80	5.59	2.67	4.04
Suburban	3.94	5.87	2.63	3.84
Rural	3.73	5.82	2.68	3.98

	Regression-Adjusted Mean			
	Unit of Analysis Is School			
	Reported Cost per NSLP Lunch ($)	Full Cost per NSLP Lunch ($)	Reported Cost per SBP Breakfast ($)	Full Cost per SBP Breakfast ($)
Share of Minority Students in SFA				
Less than 20 percent (*reference category*)	3.72	5.53	2.59	3.73
20 to 39 percent	4.09	6.00	2.87	4.25
40 to 59 percent	3.82	6.09	2.58	4.06
60 to 79 percent	3.55	5.27	2.36	3.45
80 percent or more	4.11	6.38	2.93	4.37
District Child Poverty Rate				
Lower (less than 20 percent) (*reference category*)	3.88	5.85	2.90	4.43
Higher (20 percent or more)	3.79	5.73	2.41*	3.43*
Share of Students in School Approved for Free or Reduced-Price Meals				
Less than 40 percent (*reference category*)	4.22	6.23	3.06	4.13
40 percent or more	3.80	5.75	2.62	3.92
Number of Schools	**876**	**876**	**814**	**814**

Source: School Nutrition and Meal Cost Study, School Nutrition Manager Cost Interview, School Principal Cost Interview, and SFA Director and Business Manager Cost Interviews (Onsite and Follow-Up), Menu Survey, School Food Authority Director Survey, Common Core of Data (CCD) 2011-2012, 2011 U.S. Census Bureau's Small Area Income and Poverty Estimates school district file, and Food and Nutrition Service's SFA Verification Summary Report 2012-2013, school year 2014–2015. Regression-adjusted mean estimates are weighted to be representative of all public, non-charter schools offering the NSLP.

Notes: Outliers on cost measures were trimmed to avoid excessive influence on means. Cost measures at or below the 3rd percentile were set to the 3rd percentile, and measures at or above the 97th percentile were set to the 97th percentile.

Regression analysis was conducted at the school level. Standard errors are adjusted to account for clustering of schools within SFAs. Estimates are regression-adjusted means that control for institutional and demographic characteristics of each school and their SFA. The variable row reports the adjusted mean values for the outcome listed in the column for schools. Regression-adjusted means are reported for each category within a variable. See Appendix B for more details on characteristic descriptions and selection methods.

* Within each column, * denotes that the difference between schools in the corresponding category and schools in the reference category is statistically different from zero at the 0.05 level.

FNS = Food and Nutrition Service; NSLP = National School Lunch Program; SBP = School Breakfast Program; SFA = school food authority.

Medium-sized schools (500-999 students) and large schools (over 1000 students) had significantly lower costs for the SBP than small schools (less than 500 students). In fact, medium-sized schools had significantly lower costs for all four outcomes than small schools, that is, both reported and full cost for both the NSLP and SBP (Table 6.1). Large schools had significantly lower costs than small schools for reported and full cost per SBP breakfast. For the reported cost per NSLP lunch, the mean was $3.61 for medium-sized schools, which was

significantly less than the mean of $4.05 for small schools. These results strongly suggest economies of scale at the school level in operating the SBP and, to a lesser extent, the NSLP.

For some of the cost measures, schools serving older students had significantly higher costs. Middle schools had a significantly higher reported cost per NSLP lunch ($3.92 vs. $3.70) and reported cost ($2.87 vs. $2.55) and full cost ($4.21 vs. $3.82) per SBP breakfast, compared with elementary schools. High schools had a higher cost per NSLP lunch, both reported ($4.17 vs. $3.70) and full ($6.19 vs. $5.63), again compared with elementary schools. These differences between school types may reflect differences in the nutrition standards for school meals (for example, high schools generally have higher meal pattern requirements than middle and high schools) or differences in student participation rates and thus in operational efficiency (as discussed further below).

Schools with higher district child poverty rates (20 percent or more) had significantly lower reported and full cost per SBP breakfast. For higher-poverty schools, the reported cost per SBP breakfast was $2.41 as opposed to $2.90 for lower-poverty schools; the respective figures for the full cost were $3.43 and $4.48. Schools in the Western region had significantly lower full costs per NSLP lunch and SBP breakfast than those in the Mid-Atlantic region (the reference region).

SFA-level results for the relationships between institutional and demographic characteristics and NSLP and SBP costs are presented in Table 6.2 (for regression-adjusted means) and Tables D.3 and D.4 (for regression parameters). Of note, SFA size, type, and urbanicity were not significantly associated with any of the cost outcomes, after controlling for the other institutional and demographic characteristics in the model.

NSLP cost measures differed significantly by region at the SFA level. Specifically, the regression-adjusted reported and full costs per NSLP lunch were significantly lower in the Midwest and Western regions than in the Mid-Atlantic region. Reported and full costs per NSLP lunch were $4.31 and $7.35 respectively for the Mid-Atlantic; $3.57 and $5.79 for the Midwest; and $3.38 and $4.61 for the Western region.

At the SFA level, the share of students approved for free or reduced-price meals had significant associations with SBP breakfast costs. SFAs with 40 percent or more of students approved for free or reduced-price meals had significantly lower reported cost ($2.44 vs. $3.21) and full cost ($3.65 vs. $5.17) per SBP breakfast. This relationship is consistent with the descriptive findings which found that higher percentages of students approved for free or reduced-price meals were associated with both higher student participation and lower costs for the SBP. As discussed in Chapter 5, SBP costs did not increase significantly between SY 2005–2006 and SY 2014–2015, but NSLP costs did, and one possible explanation is that the growth of the SBP relative to the NSLP over this period may have increased the efficiency of the SBP in the average SFA.

Table 6.2. Relationships between NSLP and SBP Meal Costs and Key Institutional and Demographic Characteristics of SFAs: Regression-Adjusted Mean for Reported Cost and Full Cost per Meal

	Regression-Adjusted Mean			
	Unit of Analysis Is SFA			
	Reported Cost per NSLP Lunch ($)	Full Cost per NSLP Lunch ($)	Reported Cost per SBP Breakfast ($)	Full Cost per SBP Breakfast ($)
Overall Weighted Mean	3.81	6.02	2.72	4.19
SFA Size				
Fewer than 1,000 students (*reference category*)	3.81	5.99	2.75	4.35
More than 1,000 students	3.80	6.04	2.69	4.09
SFA Type				
Single district (*reference category*)	3.90	5.96	2.80	4.23
Multi-district	3.52	5.99	2.50	4.22
FNS Region				
Mid-Atlantic (reference category)	4.31	7.35	2.73	4.19
Northeast	3.96	6.93	2.82	4.65
Southeast	4.27	6.50	2.97	4.47
Midwest	3.57*	5.79*	2.46	3.93
Southwest	3.84	5.76*	2.75	3.99
Mountain Plains	3.75	5.68*	2.88	4.55
Western	3.38*	4.61*	2.52	3.42
SFA Urbanicity				
Urban/suburban (reference category)	3.85	5.81	2.69	4.09
Rural	3.77	6.19	2.74	4.28
Share of Minority Students in SFA				
Less than 20 percent (*reference category*)	3.71	5.85	2.65	4.04
20 to 39 percent	3.99	6.16	2.99	4.63
40 to 59 percent	4.11	6.47	2.83	4.42
60 to 79 percent	3.37	5.84	2.36	3.89
80 percent or more	4.12	6.65	2.87	4.47
District Child Poverty Rate				
Lower (less than 20 percent) (*reference category*)	3.90	6.05	2.85	4.38
Higher (20 percent or more)	3.67	5.98	2.54*	3.95
Share of Students in SFA Approved for Free or Reduced-Price Meals				
Less than 40 percent (*reference category*)	3.75	6.03	3.21	5.17
40 percent or more	3.84	6.01	2.44*	3.65*
Number of SFAs	**284**	**284**	**270**	**270**

Source: School Nutrition and Meal Cost Study, School Nutrition Manager Cost Interview, School Principal Cost Interview, and SFA Director and Business Manager Cost Interviews (Onsite and Follow-Up), Menu Survey, School Food Authority Director Survey, Common Core of Data (CCD) 2011-2012, 2011 U.S. Census Bureau's Small Area Income and Poverty Estimates school district file, and Food and Nutrition Service's SFA Verification Summary Report 2012-2013, school year 2014–2015. Regression-adjusted mean estimates are weighted to be representative of all public SFAs offering the National School Lunch Program.

Notes: Outliers on cost measures were trimmed to avoid excessive influence on means. Cost measures at or below the 3rd percentile were set to the 3rd percentile, and measures at or above the 97th percentile were set to the 97th percentile.

Regression analysis was conducted at the SFA level. Estimates are regression-adjusted means that control for institutional and demographic characteristics of each school and their SFA. The variable row reports the adjusted mean values for the outcome listed in the column for SFAs. Regression-adjusted means are reported for each category within a variable. See Appendix B for more details on characteristic descriptions and selection methods.

* Within each column, * denotes that the difference between schools in the corresponding category and schools in the reference category is statistically different from zero at the 0.05 level.

FNS = Food and Nutrition Service; NSLP = National School Lunch Program; SBP = School Breakfast Program; SFA = school food authority.

C. Relationships between NSLP and SBP Meal Costs and Key Characteristics of Reimbursable Meals

The most important question for multivariate analysis of school meal costs and characteristics was whether healthier school meals cost more. The mean total HEI-2010 scores for NSLP lunches and SBP breakfasts in each sample school were used to measure the healthfulness (nutritional quality) of the meals.[77] HEI-2010 scores range from 0 to 100 with higher scores indicating healthier meals. In addition, the multivariate models included measures of the types of foods offered and compliance with selected nutrition standards.[78]

Table 6.3 shows results from the school-level models that examined the characteristics of NSLP lunches and their relationships to reported and full cost per lunch. The parameter estimates for this model are provided in Table D.5. The overall weighted mean reported and full cost per NSLP lunch (and other outcomes) at the school level differ from the estimated means using the SFA and meal as the unit of analysis (as reported in Chapters 2, 3, and 4) because of differences in weighting.

None of the meal characteristics in the model had consistent significant relationships with both the reported and full cost per NSLP lunch. There is limited evidence of a relationship for one compliance measure.[79] Meeting the maximum calorie level was associated with lower

[77] The HEI-2010 is a diet quality index that measures conformance to key recommendations of the 2010 *Dietary Guidelines for Americans*. The HEI-2010 was used in this study to measure the overall nutritional quality of school meals (see Volume 2 of the SNMCS final report; Gearan et al. 2019) and students' diets (see Volume 4; Fox et al. 2019.). Volume 2 explains the basis of this score and describes how these scores were assigned in the analysis of data collected on menus for the NSLP and SBP.

[78] The study team collaborated with FNS to identify a parsimonious set of variables to characterize compliance with NSLP and SBP nutrition standards, focusing on standards that were more challenging for one or more school types to meet and had sufficient variation within the sample. See Volume 2 of the SNMCS final report (Gearan et al. 2019) for a comprehensive description of the nutrition standards.

[79] As noted in Section A, relationships are considered significant only when a characteristic is associated with more than one outcome in the same direction.

reported costs, indicating that average weekly lunches that provided more calories than required were more expensive. Although this association was not significant for full costs, the differences were in the same direction and consistent with findings for the SBP as discussed below. Notably, for NSLP lunches, there was no consistent significant relationship between both cost measures and HEI-2010 scores or other meal characteristics.

Table 6.3. Relationships between NSLP Meal Costs and Key Characteristics of School Lunches: Regression-Adjusted Mean for Reported and Full Cost per NSLP Lunch for Schools

		Regression-Adjusted Mean	
		Unit of Analysis Is School	
	Yes/ No	Reported Cost per NSLP Lunch ($)	Full Cost per NSLP Lunch ($)
Overall Weighted Mean		3.84	5.79
Overall Nutritional Quality of NSLP Lunches Prepared			
Total HEI-2010 Score of Average Lunch Prepared			
Lowest Quartile—60.5 to 78.9 points (reference category)		3.85	5.85
Second Quartile—79.0 to 81.9 points		3.78	5.76
Third Quartile—82.0 to 85.1 points		3.82	5.79
Highest Quartile—85.2 to 97.9 points		3.90	5.77
Compliance of Daily and Weekly Lunch Menus with NSLP Nutrition Standards			
Met Daily Quantity Requirement for Meats/Meat Alternates	Y	3.81	5.77
	N	3.98	5.88
Met Weekly Quantity Requirement for Meats/Meat Alternates	Y	3.91	5.90
	N	3.73	5.63
Met Daily Quantity Requirement for Vegetables	Y	3.81	5.82
	N	3.89	5.74
Met Weekly Quantity Requirement for Vegetables	Y	3.86	5.76
	N	3.75	5.93
Met Daily Quantity Requirement for Grains	Y	3.82	5.78
	N	3.88	5.81
Met Requirement that at Least Half of Weekly Grains Are Whole Grain-Rich	Y	3.88*	5.82
	N	3.58	5.64
Met Minimum Calorie Level	Y	3.79	5.78
	N	3.95	5.82
Met Maximum Calorie Level	Y	3.65*	5.67
	N	4.14	6.00
Met Target 1 Sodium Limit	Y	3.83	5.76
	N	3.86	5.88

		Regression-Adjusted Mean	
		Unit of Analysis Is School	
	Yes/ No	Reported Cost per NSLP Lunch ($)	Full Cost per NSLP Lunch ($)
Types of Foods Offered in Lunch Menus			
All Daily Menus Offered Raw Vegetables	Y	3.87	5.93
	N	3.82	5.67
Median Number of Vegetable Choices Offered per Day			
Less than 2 (reference category)		3.62	5.78
2		3.78	5.75
3 to 4		4.00	5.98
5 or more		3.92	5.48
More than Half of Daily Menus Offered Dark Green Vegetables or Legumes	Y	3.85	5.97
	N	3.83	5.66
More than Half of Daily Menus Offered Red and Orange Vegetables	Y	3.70	5.59
	N	3.93	5.93
At Least One Daily Menu Offered Side Salad Bar or Entrée Salad Bar	Y	4.02	6.19*
	N	3.79	5.68
More than Half of Daily Menus Offered Pizza or Pizza Products	Y	3.67	5.57
	N	3.89	5.86
At Least One Daily Menu Offered Breaded Meat (as Separate Choice or as Part of a Sandwich)	Y	3.88	5.87
	N	3.64	5.43
No Daily Menus Offered French Fries or Similar Potato Products	Y	3.80	5.67
	N	3.86	5.87
Number of Schools		**876**	**876**

Source: School Nutrition and Meal Cost Study, School Nutrition Manager Cost Interview, School Principal Cost Interview, and SFA Director and Business Manager Cost Interviews (Onsite and Follow-Up), Menu Survey, school year 2014–2015. Regression-adjusted mean estimates are weighted to be representative of all public, non-charter schools offering the NSLP.

Notes: Outliers on cost measures were trimmed to avoid excessive influence on means. Cost measures at or below the 3rd percentile were set to the 3rd percentile, and measures at or above the 97th percentile were set to the 97th percentile.

Regression analysis was conducted at the school level. Standard errors are adjusted to account for clustering of schools within SFAs. Estimates are regression-adjusted means that control for institutional and demographic characteristics of each school and their SFA. Variables with rows labeled “Y” and “N” report adjusted mean values for the outcome listed in the column for schools that do and do not meet the variable criteria, respectively. Otherwise, regression-adjusted means are reported for each category within a variable. See Appendix B for more details on characteristic descriptions and selection methods.

* Within each column, * denotes that the difference between schools with and without a dichotomous characteristic is statistically different from zero at the 0.05 level. For variables containing multiple categories, * denotes that the difference between schools in the corresponding category and schools in the reference category is statistically different from zero at the 0.05 level.

HEI = Healthy Eating Index; NSLP = National School Lunch Program; SFA = school food authority.

Table 6.4 presents results from the school-level models that examined the characteristics of SBP breakfasts and their relationships to reported and full cost per breakfast. Parameter estimates for this model are provided in Table D.6. For SBP breakfasts, two related predictors showed significant differences on both reported and full cost per breakfast. Schools that met the minimum calorie level for SBP breakfasts had significantly higher reported cost ($2.71) and full cost ($4.02) per SBP breakfast than did schools that did not meet this standard. Schools that did not meet the standard because they provided fewer calories than required had a reported cost of $2.17 and full cost of $3.12. In addition, schools that met the maximum calorie level for SBP breakfasts had a reported cost of $2.44 and full cost of $3.67. Those costs were significantly lower than the reported cost ($3.04) and full cost ($4.41) in schools that exceeded this standard, that is, provided more calories than required. These results are consistent with expectations. They suggest that breakfasts with fewer calories were less expensive. Contrary to expectations, SBP breakfast costs were not significantly related to any other meal characteristics, including the HEI-2010 score.

Table 6.4. Relationships between SBP Meal Costs and Key Characteristics of School Breakfasts: Regression-Adjusted Mean for Reported and Full Cost per SBP Breakfast for Schools

		Regression-Adjusted Mean	
		Unit of Analysis Is School	
	Yes/ No	Reported Cost per SBP Breakfast ($)	Full Cost per SBP Breakfast ($)
Overall Weighted Mean		2.65	3.93
Overall Nutritional Quality of SBP Breakfast Prepared			
Total HEI-2010 Score of Average Breakfast Prepared			
Lowest Quartile—50.5 to 67.7 points (*reference category*)		2.82	4.15
Second Quartile—67.8 to 71.3 points		2.70	4.18
Third Quartile—71.4 to 74.6 points		2.60	3.79
Highest Quartile—74.7 to 87.2 points		2.49	3.59
Compliance of Daily and Weekly Breakfast Menus with SBP Nutrition Standards			
Met Daily Quantity Requirement for Grains	Y	2.64	3.98
	N	2.69	3.82
Met Minimum Calorie Level	Y	2.71*	4.02*
	N	2.17	3.12
Met Maximum Calorie Level	Y	2.44*	3.67*
	N	3.04	4.41
Met Target 1 Sodium Limit	Y	2.62	3.92
	N	2.72	3.96

		Regression-Adjusted Mean	
		Unit of Analysis Is School	
	Yes/ No	Reported Cost per SBP Breakfast ($)	Full Cost per SBP Breakfast ($)
Types of Foods Offered in Breakfast Menus			
All Daily Menus Offered Cold Cereal	Y	2.60	3.84
	N	2.75	4.09
More than Half of Daily Menus Offered Breakfast Pastries or Muffins	Y	2.56	3.62*
	N	2.70	4.09
At Least One Daily Menu Offered Pizza or Pizza Products	Y	2.78	4.08
	N	2.56	3.81
No Daily Menus Offered French Fries or Similar Potato Products	Y	2.69	3.96
	N	2.64	3.92
Number of Schools		**814**	**814**

Source: School Nutrition and Meal Cost Study, School Nutrition Manager Cost Interview, School Principal Cost Interview, and SFA Director and Business Manager Cost Interviews (Onsite and Follow-Up), Menu Survey, school year 2014–2015. Regression-adjusted mean estimates are weighted to be representative of all public, non-charter schools offering the NSLP.

Notes: Outliers on cost measures were trimmed to avoid excessive influence on means. Cost measures at or below the 3rd percentile were set to the 3rd percentile, and measures at or above the 97th percentile were set to the 97th percentile.

Regression analysis was conducted at the school level. Standard errors are adjusted to account for clustering of schools within SFAs. Estimates are regression-adjusted means that control for institutional and demographic characteristics of each school and their SFA. Variables with rows labeled "Y" and "N" report adjusted mean values for the outcome listed in the column for schools that do and do not meet the variable criteria, respectively. Otherwise, regression-adjusted means are reported for each category within a variable. See Appendix B for more details on characteristic descriptions and selection methods.

* Within each column, * denotes that the difference between schools with and without a dichotomous characteristic is statistically different from zero at the 0.05 level. For variables containing multiple categories, * denotes that the difference between schools in the corresponding category and schools in the reference category is statistically different from zero at the 0.05 level.

HEI = Healthy Eating Index; SBP = School Breakfast Program; SFA = school food authority.

The cross-sectional multivariate analysis did not find a relationship between total HEI-2010 scores and meal costs in SY 2014-2015, after controlling for types of foods offered, whether schools met specific nutrition standards, and institutional and demographic characteristics of SFAs and schools, despite the fact that both the nutritional quality and costs of school meals have increased significantly over time. There are at least two potential reasons the cross-sectional multivariate analysis did not find a significant relationship between the nutritional quality and cost of school meals in SY 2014-2015:

- Although mean total HEI scores for NSLP lunches increased 24 points between SY 2009-2010 and SY 2014-2015 (Gearan et al. 2019), these scores varied relatively little between schools during SY 2014-2015 (8.9 point standard deviation; data not shown). In contrast, the variance in HEI-2010 scores for NSLP lunches in SY 2009-2010—when the updated nutrition standards were not in effect—was 32 percent larger (11.7 points versus 8.9 points; data not shown). Moreover, other factors simultaneously controlled for in the analysis,

including types of foods offered and compliance with nutrition standards, exhibited more variation between schools and were better able to account for differences in meal costs.

- Numerous other program changes that occurred between SY 2005-2006 (when the last national study of school meal costs was conducted) and SY 2014-2015, including rules on pricing of paid meals and competitive foods, nutrition standards for competitive foods, and the Community Eligibility Provision, could also have simultaneously affected trends in the cost and nutritional quality of school meals. For example, as discussed above, the presence of competitive foods at lunch was associated with lower costs per NSLP lunch. The presence of competitive foods at lunch was also associated with lower total HEI scores.[80] So the decline in sales of competitive foods over this period may have contributed to increases in both the cost and nutritional quality of school meals.

In summary, the large number of program changes that have occurred since prior studies of the costs and nutritional quality of school meals posed a challenge for interpretation of the multivariate analysis, as in any cross-sectional study of a complex program, because the multivariate models could only include a moderate number of variables. Thus, it is plausible that the increases in meal costs and nutritional quality over time were related but, by SY 2014-2015, this relationship was not readily identifiable given the reduced variability in HEI scores among schools and many other changes in the school meal programs over the period.

D. Relationships between NSLP and SBP Meal Costs and Key Characteristics of the School Food Environment

The school food environment includes policies and practices regarding wellness, availability of competitive foods, and meal schedules and service. These aspects of the school food environment might affect activities that contribute to costs, cost-sharing between school meals and competitive foods, or participation in school meals.[81] Table 6.5 presents regression-adjusted means of NSLP lunch cost outcomes for schools with key characteristics of the school food environment. Parameter estimates for this model are provided in Table D.7.

For NSLP lunches, only one of these characteristics was associated with significant differences in costs for both outcomes: those schools that did not sell any competitive foods during mealtimes had significantly higher regression-adjusted reported ($4.41) and full ($6.70) cost per NSLP lunch versus those that sell competitive foods during mealtimes: reported cost of $3.70 and full cost of $5.57. This finding is consistent with the expectation that sales of competitive foods help to reduce costs for reimbursable meals by sharing fixed costs of school foodservice (such as administrative staff). When competitive foods are extra servings of foods offered for reimbursable meals, the production costs of reimbursable meals may also be reduced through economies of scale.

[80] See Table 6.5 in this report and Table 5.4 in Volume 2 of the SNMCS final report (Gearan et al. 2019).

[81] If there are economies of scale in producing school meals (such as fixed or quasi-fixed costs), then schools with higher levels of participation in school meals will have a lower cost per meal, all else equal. The analysis for this volume focused on factors that may be related to costs, and these factors may also be related to participation. Volume 4 of the SNMCS final report (Fox et al. 2019) addresses the relationship between school characteristics and student participation in school meals.

For SBP breakfast, none of the school environment characteristics in the model – including those related to competitive foods – had significant relationships to both of the cost outcomes (Table 6.6). Parameter estimates for this model are provided in Table D.6.

Table 6.5. Relationships between NSLP Meal Costs and Key Characteristics of the School Food Environment: Regression-Adjusted Mean for Reported and Full Cost per NSLP Lunch for Schools

		Regression-Adjusted Mean	
		Unit of Analysis Is School	
	Yes/ No	Reported Cost per NSLP Lunch ($)	Full Cost per NSLP Lunch ($)
Overall Weighted Mean		3.84	5.79
Wellness Policies and Practices			
SFA Has Nutrition Standards for School Meals that Exceed Federal Standards	Y	3.85	5.85
	N	3.83	5.76
SFA Has Plan for Informing Public About Wellness Policy Content and Implementation	Y	3.75	5.77
	N	3.96	5.83
School Has School-Level Wellness Policy in Addition to District Wellness Policy	Y	3.93	5.93
	N	3.82	5.76
SFA Wellness Policy Includes Nutrition Promotion	Y	3.87	5.88
	N	3.73	5.52
School Conducted a Nutrition Education Activity in the Classroom or Foodservice Area	Y	3.91	5.95
	N	3.77	5.64
School Operates a School Garden	Y	3.93	5.72
	N	3.83	5.80
Competitive Foods			
School Does Not Sell Competitive Foods during Mealtimes	Y	4.41*	6.70*
	N	3.70	5.57
School Sells Foods Other than Milk on an A la Carte Basis	Y	3.86	5.78
	N	3.79	5.84
School Sells Foods and Beverages in Vending Machine	Y	3.74	5.75
	N	3.87	5.81
School Sells Foods and Beverages in School Store and/or Snack Bar	Y	4.09	6.09
	N	3.80	5.75
SFA Has Standards for Competitive Foods that Exceed Smart Snacks in Schools Standards	Y	3.88	5.95
	N	3.82	5.71
Meal Schedules and Service			
Length of Lunch Period			
Less than 30 minutes (*reference category*)		3.87	5.98
30 to 44 minutes		3.94	5.90
45 minutes or more		3.77	5.76

		Regression-Adjusted Mean	
		Unit of Analysis Is School	
	Yes/ No	Reported Cost per NSLP Lunch ($)	Full Cost per NSLP Lunch ($)
School Has Other Activities Scheduled during Lunch Period	Y	3.76	5.52
	N	3.86	5.88
School Has More than One Line or Station that Offers Reimbursable Lunches or Components of Reimbursable Lunches	Y	3.80	5.82
	N	3.87	5.77
Number of Schools		**876**	**876**

Source: School Nutrition and Meal Cost Study, School Nutrition Manager Cost Interview, School Principal Cost Interview, and SFA Director and Business Manager Cost Interviews (Onsite and Follow-Up, Menu Survey, School Food Authority Director Survey, School Nutrition Manager Survey, Principal Survey, Vending Machine and Other Sources of Foods and Beverages Checklist, A la Carte Checklist, and Cafeteria Observation Guide, school year 2014–2015. Regression-adjusted mean estimates are weighted to be representative of all public, non-charter schools offering the NSLP.

Notes: Outliers on cost measures were trimmed to avoid excessive influence on means. Cost measures at or below the 3rd percentile were set to the 3rd percentile, and measures at or above the 97th percentile were set to the 97th percentile.

Regression analysis was conducted at the school level. Standard errors are adjusted to account for clustering of schools within SFAs. Estimates are regression-adjusted means that control for institutional and demographic characteristics of each school and their SFA. Variables with rows labeled “Y” and “N” report adjusted mean values for the outcome listed in the column for schools that do and do not meet the variable criteria, respectively. Otherwise, regression-adjusted means are reported for each category within a variable. See Appendix B for more details on characteristic descriptions and selection methods.

* Within each column, * denotes that the difference between schools with and without a dichotomous characteristic is statistically different from zero at the 0.05 level. For variables containing multiple categories, * denotes that the difference between schools in the corresponding category and schools in the reference category is statistically different from zero at the 0.05 level.

NSLP = National School Lunch Program; SFA = school food authority.

Table 6.6. Relationships between SBP Meal Costs and Key Characteristics of the School Food Environment: Regression-Adjusted Mean for Reported and Full Cost per SBP Breakfast for Schools

		Regression-Adjusted Mean	
		Unit of Analysis Is School	
	Yes/ No	Reported Cost per SBP Breakfast ($)	Full Cost per SBP Breakfast ($)
Overall Weighted Mean		2.65	3.93
Wellness Policies and Practices			
SFA Has Nutrition Standards for School Meals that Exceed Federal Standards	Y	2.81	4.17
	N	2.54	3.76
SFA Has Plan for Informing Public About Wellness Policy Content and Implementation	Y	2.53	3.79
	N	2.82	4.12
School Has School-Level Wellness Policy in Addition to District Wellness Policy	Y	2.58	3.81
	N	2.67	3.96
SFA Wellness Policy Includes Nutrition Promotion	Y	2.68	3.97
	N	2.57	3.81
School Conducted a Nutrition Education Activity in the Classroom or Foodservice Area	Y	2.77	4.19*
	N	2.55	3.69
School Operates a School Garden	Y	2.76	4.09
	N	2.64	3.92
Competitive Foods			
School Sells Foods Other than Milk on an A la Carte Basis	Y	2.63	3.85
	N	2.71	4.15
School Sells Foods and Beverages in Vending Machine	Y	2.59	3.79
	N	2.68	3.99
School Sells Foods and Beverages in School Store and/or Snack Bar	Y	2.59	3.86
	N	2.66	3.94
Meal Schedules and Service			
Length of Breakfast Period			
Less than 25 minutes (*reference category*)		2.63	3.84
25 to 39 minutes		2.83	4.27
40 minutes or more		2.50	3.72
First Bus Arrives before or at Same Time as Breakfast	Y	2.66	3.86
	N	2.65	4.01

		Regression-Adjusted Mean	
		Unit of Analysis Is School	
	Yes/ No	Reported Cost per SBP Breakfast ($)	Full Cost per SBP Breakfast ($)
Last Bus Arrives before or at Same Time as Breakfast	Y	2.56	3.91
	N	2.67	3.94
Number of Schools		**814**	**814**

Source: School Nutrition and Meal Cost Study, School Nutrition Manager Cost Interview, School Principal Cost Interview, and SFA Director and Business Manager Cost Interviews (Onsite and Follow-Up, Menu Survey, School Food Authority Director Survey, School Nutrition Manager Survey, Principal Survey, Vending Machine and Other Sources of Foods and Beverages Checklist, A la Carte Checklist, and Cafeteria Observation Guide, school year 2014–2015. Regression-adjusted mean estimates are weighted to be representative of all public, non-charter schools offering the NSLP.

Notes: Outliers on cost measures were trimmed to avoid excessive influence on means. Cost measures at or below the 3rd percentile were set to the 3rd percentile, and measures at or above the 97th percentile were set to the 97th percentile.

Regression analysis was conducted at the school level. Standard errors are adjusted to account for clustering of schools within SFAs. Estimates are regression-adjusted means that control for institutional and demographic characteristics of each school and their SFA. Variables with rows labeled "Y" and "N" report adjusted mean values for the outcome listed in the column for schools that do and do not meet the variable criteria, respectively. Otherwise, regression-adjusted means are reported for each category within a variable. See Appendix B for more details on characteristic descriptions and selection methods.

* Within each column, * denotes that the difference between schools with and without a dichotomous characteristic is statistically different from zero at the 0.05 level. For variables containing multiple categories, * denotes that the difference between schools in the corresponding category and schools in the reference category is statistically different from zero at the 0.05 level.

SBP = School Breakfast Program; SFA = school food authority.

E. Relationships between NSLP and SBP Meal Costs and Key Characteristics of School and SFA Foodservice Operations

This section describes significant relationships between key characteristics of both school and SFA foodservice operations and NSLP and SBP meal costs. In addition, the section describes significant relationships of meal costs to other SFA operating characteristics. The characteristics included in these domains might affect costs by shaping the activities performed by foodservice personnel, other aspects of the meal production process, cost-sharing with other school meal programs, menus, or student participation.

1. School-Level Foodservice Operations

At the school level, Table 6.7 presents regression-adjusted means of reported and full cost per NSLP lunch and SBP breakfast associated with variations in characteristics of school foodservice operations. The parameter estimates for this model are provided in Table D.9. The characteristics include participation in school meal programs other than the NSLP and SBP, serving breakfast via the grab-and-go model or in the classroom, and meal service characteristics such as offer-versus-serve, offering free meals to all students, and prices charged for paid meals.

For NSLP lunches, none of the school foodservice characteristics in the school-level model had significant relationships to both of the cost outcomes. Notably, schools that offered free lunches to all students did not have significantly different NSLP lunch costs than those that did not.

The only characteristic in this model with a significant relationship to both measures of SBP meal costs was whether students have the option of eating breakfast in the classroom. Controlling for other characteristics of school foodservice operations and institutional and demographic characteristics, schools offering breakfast in the classroom had lower reported cost ($2.26) and full cost ($3.38) per SBP breakfast compared with those schools that did not allow this. The latter had a reported cost of $2.77 and full cost of $4.10. Thus, breakfast in the classroom may have saved costs and facilitated participation (see Fox et al. 2019, Figure 4.3).

Table 6.7. Relationships between NSLP and SBP Meal Costs and Key Characteristics of School Foodservice Operations: Regression-Adjusted Mean for Reported and Full Cost per Meal for Schools

		Regression-Adjusted Mean			
		Unit of Analysis Is School			
	Yes/ No	Reported Cost per NSLP Lunch ($)	Full Cost per NSLP Lunch ($)	Reported Cost per SBP Breakfast ($)	Full Cost per SBP Breakfast ($)
Overall Weighted Mean		3.84	5.79	2.65	3.93
Characteristics of the School Meal Programs					
School Participates in the Fresh Fruit and Vegetable Program	Y	4.10	6.05	2.74	3.86
	N	3.78	5.73	2.63	3.95
School Provides Afterschool Snacks or Suppers	Y	3.73	5.63	2.44	3.53*
	N	3.87	5.84	2.72	4.06
School Participates in Farm to School Program	Y	3.79	5.87	2.48	3.71
	N	3.85	5.78	2.69	3.98
School Offers Grab-and-Go Option at Breakfast	Y	n.a.	n.a.	2.59	3.74
	N	n.a.	n.a.	2.66	3.96
Students Have Option of Eating Breakfast in the Classroom	Y	n.a.	n.a.	2.26*	3.38*
	N	n.a.	n.a.	2.77	4.10
Meal Service Characteristics					
School Receives Fully or Partially Prepared Meals from a Separate Production or Central Kitchen	Y	3.88	6.16	2.82	4.43
	N	3.83	5.74	2.63	3.86
School Uses Offer-Versus-Serve at Breakfast	Y	n.a.	n.a.	2.66	3.95
	N	n.a.	n.a.	2.65	3.79
School Has Policies and Procedures for Accommodating Students with Food Allergies or Special Dietary Needs	Y	3.91*	5.89	2.69	3.99
	N	3.46	5.27	2.45	3.60

		Regression-Adjusted Mean			
		Unit of Analysis Is School			
	Yes/ No	Reported Cost per NSLP Lunch ($)	Full Cost per NSLP Lunch ($)	Reported Cost per SBP Breakfast ($)	Full Cost per SBP Breakfast ($)
Number of Healthier US School Challenge Smarter Lunchroom Techniques Used					
Zero (*reference category*)		3.87	5.76	2.79	4.10
1		3.83	5.78	2.60	3.76
2 to 3		3.87	5.86	2.64	3.98
4 to 7		3.74	5.65	2.69	4.02
Price Charged for Paid Breakfasts					
School Offered Free Breakfast to All Students		n.a.	n.a.	2.55	3.74
Less than $1.25 (*reference category*)		n.a.	n.a.	2.58	3.73
$1.25 to $1.49		n.a.	n.a.	2.68	3.85
$1.50 to $1.99		n.a.	n.a.	2.72	4.03
$2.00 or more		n.a.	n.a.	3.09	5.27*
Price Charged for Paid Lunches					
School Offered Free Lunch to All Students		3.97	5.99	n.a.	n.a.
$2.25 or less (*reference category*)		3.75	5.35	n.a.	n.a.
$2.26 to $2.50		3.77	5.72	n.a.	n.a.
$2.51 to $2.75		3.70	5.76	n.a.	n.a.
$2.76 or more		3.90	6.25*	n.a.	n.a.
Number of Schools		**876**	**876**	**814**	**814**

Source: School Nutrition and Meal Cost Study, School Nutrition Manager Cost Interview, School Principal Cost Interview, and SFA Director and Business Manager Cost Interviews (Onsite and Follow-Up), Menu Survey, School Food Authority Director Survey, School Nutrition Manager Survey, and Cafeteria Observation Guide, school year 2014–2015. Regression-adjusted mean estimates are weighted to be representative of all public, non-charter schools offering the NSLP.

Notes: Outliers on cost measures were trimmed to avoid excessive influence on means. Cost measures at or below the 3rd percentile were set to the 3rd percentile, and measures at or above the 97th percentile were set to the 97th percentile.

Regression analysis was conducted at the school level. Standard errors are adjusted to account for clustering of schools within SFAs. Estimates are regression-adjusted means that control for institutional and demographic characteristics of each school and their SFA. Variables with rows labeled “Y” and “N” report adjusted mean values for the outcome listed in the column for schools that do and do not meet the variable criteria, respectively. Otherwise, regression-adjusted means are reported for each category within a variable. See Appendix B for more details on characteristic descriptions and selection methods.

* Within each column, * denotes that the difference between schools with and without a dichotomous characteristic is statistically different from zero at the 0.05 level. For variables containing multiple categories, * denotes that the difference between schools in the corresponding category and schools in the reference category is statistically different from zero at the 0.05 level.

n.a. = Characteristic did not apply to this meal type.

NSLP = National School Lunch Program; SBP = School Breakfast Program; SFA = school food authority.

2. SFA-Level Foodservice Operations

At the SFA level, the analysis considered the relationship of costs for NSLP lunches and SBP breakfasts to an array of characteristics of school foodservice operations. Food purchasing practices in the model included participation in a food purchasing cooperative, use of brand-name or chain restaurant foods, and use of a foodservice management company. In addition, the model included menu planning characteristics such as whether all menus are planned at the SFA level, conducting nutrient analysis of menus, and challenges in meeting the updated nutrition standards for school meals. Regression-adjusted means associated with these characteristics are shown in Table 6.8. The parameter estimates for this model are provided in Tables D.11 and D.12.

None of the SFA-level characteristics of school foodservice operations—including use of food purchasing cooperatives and foodservice management companies— had significant relationships to more than one cost outcome for the NSLP.

Among the characteristics in this domain, only one characteristic was significantly associated with multiple outcomes for the SBP. In particular, SFAs using the Department of Defense (DoD) Fresh program to purchase fresh produce had significantly greater reported cost ($2.92) and full cost ($4.51) per SBP breakfast than those that did not use this program. The latter had a reported cost of $2.55 and full cost of $3.94. This result does not necessarily imply that use of the DoD Fresh program increased costs. One alternative explanation is that SFAs chose to use this program when they had more difficulty acquiring affordable produce through regular commercial channels.

Table 6.8. Relationships between NSLP and SBP Meal Costs and Key Characteristics of School Foodservice Operations of SFAs: Regression-Adjusted Mean for Reported Cost and Full Cost per Meal

		Regression-Adjusted Mean			
		Unit of Analysis Is SFA			
	Yes/ No	Reported Cost per NSLP Lunch ($)	Full Cost per NSLP Lunch ($)	Reported Cost per SBP Breakfast ($)	Full Cost per SBP Breakfast ($)
Overall Weighted Mean		3.81	6.02	2.72	4.19
Food Purchasing Characteristics					
SFA Uses Alliance for a Healthier Generation or Other Similar Tools for Selecting and Purchasing Healthy Foods	Y	3.70	5.70	2.78	4.21
	N	3.85	6.17	2.69	4.18
SFA Participates in a Food Purchasing Cooperative	Y	3.79	6.03	2.72	4.24
	N	3.82	6.01	2.71	4.13
SFA Is Engaged in a Pouring Rights Contract	Y	3.71	5.97	2.51	3.98
	N	3.83	6.03	2.77	4.25
Schools in SFA Offer Brand-Name or Chain Restaurant Foods	Y	3.94	5.96	2.67	3.97
	N	3.79	6.03	2.72	4.22
SFA Uses a Foodservice Management Company	Y	3.55	6.07	2.72	4.47
	N	3.84	6.01	2.72	4.16
SFA Purchases Fruits and Vegetables through the Department of Defense Fresh Program	Y	3.92	6.10	2.92*	4.51*
	N	3.72	5.96	2.55	3.94
Menu Planning Characteristics					
All Menus Are Planned at the SFA Level	Y	3.84	6.17*	2.64	4.14
	N	3.64	5.18	3.19	4.54
SFA Conducts Nutrient Analysis of Menus	Y	3.81	6.08	2.72	4.22
	N	3.79	5.89	2.71	4.14
Number of Challenges in Meeting the Updated Nutrition Standards that SFA Rated as 3 or Higher on a Scale of 1 (Not a Challenge) to 5 (Significant Challenge)					
4 or less (*reference category*)		3.87	5.84	2.96	4.54
5 to 7		3.85	6.02	2.67	4.05
8		3.77	5.86	2.79	4.37
SFA Perception of New Meal Requirements' Helpfulness in Improving the Nutritional Quality of Meals					
Not at all helpful (*reference category*)		3.76	5.82	2.72	4.20
Somewhat helpful		3.83	6.22	2.79	4.41
Very helpful		3.74	5.94	2.39	3.63
SFA was already improving the nutritional quality of meals prior to the new meal requirements		3.87	5.86	2.91	4.28

		Regression-Adjusted Mean			
		Unit of Analysis Is SFA			
	Yes/ No	Reported Cost per NSLP Lunch ($)	Full Cost per NSLP Lunch ($)	Reported Cost per SBP Breakfast ($)	Full Cost per SBP Breakfast ($)
Number of SFAs		**284**	**284**	**270**	**270**

Source: School Nutrition and Meal Cost Study, School Nutrition Manager Cost Interview, School Principal Cost Interview, and SFA Director and Business Manager Cost Interviews (Onsite and Follow-Up), Menu Survey, School Food Authority Director Survey, School Nutrition Manager Survey, and Cafeteria Observation Guide, school year 2014–2015. Regression-adjusted mean estimates are weighted to be representative of all public SFAs offering the National School Lunch Program.

Notes: Outliers on cost measures were trimmed to avoid excessive influence on means. Cost measures at or below the 3rd percentile were set to the 3rd percentile, and measures at or above the 97th percentile were set to the 97th percentile.

Regression analysis was conducted at the SFA level. Estimates are regression-adjusted means that control for institutional and demographic characteristics of each school and their SFA. Variables with rows labeled "Y" and "N" report adjusted mean values for the outcome listed in the column for SFAs that do and do not meet the variable criteria, respectively. Otherwise, regression-adjusted means are reported for each category within a variable. See Appendix B for more details on characteristic descriptions and selection methods.

* Within each column, * denotes that the difference between schools with and without a dichotomous characteristic is statistically different from zero at the 0.05 level. For variables containing multiple categories, * denotes that the difference between schools in the corresponding category and schools in the reference category is statistically different from zero at the 0.05 level.

NSLP = National School Lunch Program; SBP = School Breakfast Program; SFA = school food authority.

3. Other Key Characteristics of SFA Operations

Other key SFA operating characteristics with potential impacts on NSLP and SBP costs include a la carte pricing; SFA director experience, education, and credentials; employee health benefits; and sources of funding for equipment. Several of these characteristics had significant relationships to multiple cost outcomes for NSLP lunch and for SBP breakfast, as shown in Table 6.9 and discussed below. Parameter estimates for this model are provided in Tables D.13 and D.14.

SFAs where the director's highest degree was an associate degree had significantly lower reported cost ($3.42 vs. $4.06) and full cost ($5.08 vs. $6.11) per NSLP lunch and reported cost per SBP breakfast ($2.47 vs. $3.19). These comparisons are relative to the reference category, which was that the SFA director had no more than a high school education. A bachelor's degree and higher levels of education were not associated with significant differences in two or more cost outcomes. These results alone do not provide evidence of a broad relationship of SFA director education to meal costs. However, results in Section F point to evidence that higher education for the SFA director was associated with higher revenues as a percentage of reported SBP costs.

Table 6.9. Relationships between NSLP and SBP Meal Costs and Other Key Operating Characteristics of SFAs: Regression-Adjusted Mean for Reported Cost and Full Cost per Meal

		Regression-Adjusted Mean			
		Unit of Analysis Is SFA			
	Yes/ No	Reported Cost per NSLP Lunch ($)	Full Cost per NSLP Lunch ($)	Reported Cost per SBP Breakfast ($)	Full Cost per SBP Breakfast ($)
Overall Weighted Mean		3.81	6.02	2.72	4.19
Factors Considered in Pricing A la Carte Items					
Costs (food, labor, other direct or indirect)	Y	3.82	6.29*	2.60	4.07
	N	3.76	5.29	3.03	4.53
Incentive for consumption of specific items or participation in reimbursable meal program	Y	3.79	6.06	2.63	4.28
	N	3.81	6.01	2.75	4.16
Other factors (ease of payment, school principal, other, don't know)	Y	4.06*	6.31	2.82	4.09
	N	3.74	5.95	2.69	4.22
No a la carte items sold in any school cafeteria	Y	3.84	6.94*	2.97	4.85
	N	3.80	5.90	2.68	4.10
SFA Director Experience					
Fewer than 5 years (*reference category*)		3.79	5.91	2.73	4.08
5 to 9 years		4.06	6.25	2.56	3.91
10 to 16 years		3.90	6.24	2.59	4.03
17 years or more		3.54	5.77	2.95	4.73
Highest Level of Education Completed by SFA Director					
High school graduate or less than high school (*reference category*)		4.06	6.11	3.19	4.69
Some college, no degree		4.27	6.92*	2.98	4.62
Associate's degree		3.42*	5.08*	2.47*	3.85
Bachelor's degree		3.67	5.69	2.57*	4.07
Master's degree		3.90	5.67	3.06	4.53
Graduate credits beyond a Master's degree or doctorate		4.25	6.11	3.39	4.74
SFA Director Credentials					
SFA Director Has Degree in Field Related to Food and Nutrition or Public/School Administration	Y	3.80	6.27	2.75	4.28
	N	3.81	5.85	2.70	4.13
Licensed Nutritionist or Dietitian, or Registered Dietitian	Y	3.89	6.30	2.72	4.23
	N	3.80	6.00	2.72	4.19
School Nutrition Association Certification Level 1, 2 or 3	Y	3.56*	5.26*	2.49	3.68*
	N	3.89	6.29	2.81	4.39
School Nutrition Specialist	Y	4.21	6.10	3.04	4.16
	N	3.77	6.01	2.68	4.20

		Regression-Adjusted Mean			
		Unit of Analysis Is SFA			
	Yes/ No	Reported Cost per NSLP Lunch ($)	Full Cost per NSLP Lunch ($)	Reported Cost per SBP Breakfast ($)	Full Cost per SBP Breakfast ($)
State foodservice certificate	Y	3.83	5.87	2.87	4.30
	N	3.80	6.05	2.69	4.17
Food safety certification	Y	3.84	6.16	2.74	4.31
	N	3.76	5.85	2.69	4.05
Health department certification	Y	3.81	6.18	2.88	4.55
	N	3.81	6.00	2.69	4.14
Other credentials	Y	4.17*	5.80	2.91	3.99
	N	3.76	6.05	2.69	4.22
None of the above	Y	3.91	6.09	3.11	4.95
	N	3.79	6.00	2.64	4.05
Proportion of Full-Time SFA Employees Receiving Health Benefits					
None (*reference category*)		3.93	6.00	2.76	4.09
Some		3.82	6.12	2.69	4.06
Most		3.60	5.91	2.72	4.51
All		4.06	6.63	2.68	4.22
Sources of Funding for Capital Equipment Purchases and Repairs					
SFA budget	Y	3.69	5.71	2.63	4.08
	N	3.97	6.44	2.85	4.36
USDA grant	Y	3.64	6.20	2.24*	3.75
	N	3.82	6.00	2.76	4.23
State grant	Y	3.70	6.09	2.58	4.03
	N	3.81	6.01	2.73	4.21
Local education agency funds	Y	3.30*	5.31*	2.04*	3.32*
	N	3.85	6.07	2.76	4.25
School funds	Y	3.99	5.85	3.11*	4.58
	N	3.77	6.06	2.62	4.10
SFA Has Purchased New Equipment to Implement Updated Nutrition Standards for School Meals	Y	4.00	6.10	3.06*	4.64*
	N	3.73	5.99	2.58	4.01
Number of SFAs		**284**	**284**	**270**	**270**

Source: School Nutrition and Meal Cost Study School Nutrition Manager Cost Interview, School Principal Cost Interview, and SFA Director and Business Manager Cost Interviews (Onsite and Follow-Up), School Food Authority Director Survey, school year 2014–2015. Regression-adjusted mean estimates are weighted to be representative of all public SFAs offering the National School Lunch Program.

Notes: Outliers on cost measures were trimmed to avoid excessive influence on means. Cost measures at or below the 3rd percentile were set to the 3rd percentile, and measures at or above the 97th percentile were set to the 97th percentile.

Regression analysis was conducted at the SFA level. Estimates are regression-adjusted means that control for institutional and demographic characteristics of each school and their SFA. Variables with rows labeled "Y" and "N" report adjusted mean values for the outcome listed in the column for SFAs that do and do not meet the variable criteria, respectively. Otherwise, regression-adjusted means are reported for each category within a variable. See Appendix B for more details on characteristic descriptions and selection methods.

* Within each column, * denotes that the difference between schools with and without a dichotomous characteristic is statistically different from zero at the 0.05 level. For variables containing multiple categories, * denotes that the difference between schools in the corresponding category and schools in the reference category is statistically different from zero at the 0.05 level.

NSLP = National School Lunch Program; SBP = School Breakfast Program; SFA = school food authority.

It is noteworthy that there appears to be no significant relationship between NSLP and SBP costs and whether the director had a degree in food and nutrition or a related field. However, if the director had a School Nutrition Association (SNA) certification, that was associated with lower reported cost ($3.56 vs. $3.89) and full cost ($5.26 vs. $6.29) per NSLP lunch and lower full cost per SBP breakfast ($3.68 vs. $4.39). Thus, there is substantial evidence that the competencies required for SNA certification are significantly related to the costs of reimbursable meals.

Two different patterns appeared in the relationship of equipment costs to overall meal costs. On the one hand, SFAs that used local education agency funds to pay for capital equipment had a significantly lower reported cost than those that did not use such funds for equipment ($3.30 vs. $3.85) and full cost ($5.31 vs. $6.07) per NSLP lunch, as well as a significantly lower reported cost ($2.04 vs. $2.76) and full cost ($3.32 vs. $4.25) per SBP breakfast. The availability of local funds for equipment might be associated with the availability of more efficient or more reliable equipment, which would in turn help reduce operating costs. On the other hand, SFAs that purchased new equipment to implement updated nutrition standards had higher reported cost ($3.06 vs. $2.58) and full cost ($4.64 vs. $4.01) per SBP breakfast and lower revenues as a percentage of reported costs for SBP breakfast (74 percent vs. 85 percent), compared with SFAs that did not report this practice. This result appears counter to expectations and the finding about local agency funding for equipment. One possible explanation is that SFAs that purchased new equipment for this reason made changes to menus or production processes that increased their costs relative to those that did not.

F. Relationships between NSLP and SBP Revenues as a Percentage of Meal Costs and SFA Characteristics

This section presents the findings for models using NSLP and SBP revenues as a percentage of reported costs as the outcomes. Each table presents findings for one of the three domains of SFA-level variables: institutional and demographic characteristics, school foodservice operations, and other key operating characteristics. Due to the fact that these models only consider two outcomes, the section identifies as significant all characteristics with a substantively important difference (10 percentage points or more) in one of the two outcomes.

Table 6.10 presents the relationships between NSLP and SBP revenues as a percentage of reported costs and key institutional and demographic characteristics of SFAs. This table indicates the following significant characteristics (based on the criteria for this section):

- Multi-district SFAs had significantly higher NSLP revenues as a percentage of reported costs than single district SFAs (104 percent versus 91 percent).
- SFAs with higher district child poverty rates had significantly higher SBP revenues as a percentage of reported costs (89 percent versus 75 percent for SFAs with lower district poverty rates). This finding is consistent with the lower reported and full costs per SBP breakfast for higher-poverty SFAs.
- SFAs in the Southwest region had significantly lower SBP revenues as a percentage of reported costs than those in the Mid-Atlantic (reference) region (69 percent versus 91 percent).
- SBP revenues as a percentage of reported costs were significantly higher for SFAs with 40 percent of students or more approved for free or reduced-price meals (86 percent versus 73 percent for other SFAs).

As with the analysis of cost outcomes, these findings for revenues as a percentage of costs may reflect differences in characteristics in other domains or other unmeasured characteristics that are associated with institutional and demographic characteristics. Parameter estimates for this model are provided in Tables D.15 and D.16.

Table 6.10. Relationships between NSLP and SBP Revenues as a Percentage of Reported Costs and Key Institutional and Demographic Characteristics of SFAs: Regression-Adjusted Mean for Revenues as Percentage of Reported Costs

	Regression-Adjusted Mean	
	Unit of Analysis Is SFA	
	Revenues as a Percentage of Reported Cost for NSLP Lunch (%)	Revenues as a Percentage of Reported Costs for SBP Breakfast (%)
Overall Weighted Mean	92.5	81.7
SFA Size		
Fewer than 1,000 students (*reference category*)	97.4	79.8
More than 1,000 students	88.8	83.0
SFA Type		
Single district (*reference category*)	90.9	83.0
Multi-district	104.1*	77.4
FNS Region		
Mid-Atlantic (*reference category*)	93.4	90.6
Northeast	86.4	89.0
Southeast	92.7	80.3
Midwest	95.7	82.2
Southwest	91.3	69.3*
Mountain Plains	91.3	82.0
Western	95.9	78.4
SFA Urbanicity		
Urban/suburban (*reference category*)	93.7	78.4
Rural	91.6	84.2
Share of Minority Students in SFA		
Less than 20 percent (*reference category*)	92.8	81.0
20 to 39 percent	94.3	76.1
40 to 59 percent	88.7	83.5
60 to 79 percent	96.7	96.2
80 percent or more	87.6	78.4
District Child Poverty Rate		
Lower (less than 20 percent) (*reference category*)	90.9	74.7
Higher (20 percent or more)	94.4	88.8*
Share of Students in SFA Approved for Free or Reduced-Price Meals		
Less than 40 percent (*reference category*)	93.5	73.0
40 percent or more	92.0	86.0*
Number of SFAs	**218**	**208**

Source: School Nutrition and Meal Cost Study, School Nutrition Manager Cost Interview, School Principal Cost Interview, and SFA Director and Business Manager Cost Interviews (Onsite and Follow-Up), Menu Survey, School Food Authority Director Survey, Common Core of Data (CCD) 2011-2012, 2011 U.S. Census Bureau's Small Area Income and Poverty Estimates school district file, and Food and Nutrition Service's SFA Verification Summary Report 2012-2013, school year 2014–2015. Regression-adjusted mean estimates are weighted to be representative of all public SFAs offering the National School Lunch Program.

Notes: Outliers on cost measures were trimmed to avoid excessive influence on means. Cost measures at or below the 3rd percentile were set to the 3rd percentile, and measures at or above the 97th percentile were set to the 97th percentile.

Regression analysis was conducted at the SFA level. Estimates are regression-adjusted means that control for institutional and demographic characteristics of each school and their SFA. The variable row reports the adjusted mean values for the outcome listed in the column for SFAs. Regression-adjusted means are reported for each category within a variable. See Appendix B for more details on characteristic descriptions and selection methods.

The NSLP lunch revenue analysis sample includes the SFAs in the cost analysis sample with the following exceptions: excludes 11 SFAs with unreliable USDA reimbursements data, 1 SFA that did not provide any revenue data, and 54 SFAs that did not provide sufficient detail to determine the composition of revenues. The SBP breakfast revenue analysis sample includes the SFAs in the cost analysis sample with the following exceptions: excludes 14 SFAs with no SBP, 11 SFAs with unreliable USDA reimbursements data, and 51 SFAs that did not provide sufficient detail to determine the composition of revenues.

* Within each column, * denotes that the difference between schools in the corresponding category and schools in the reference category is statistically different from zero at the 0.05 level.

FNS = Food and Nutrition Service; NSLP = National School Lunch Program; SBP = School Breakfast Program; SFA = school food authority.

In Table 6.11, results appear for the relationships between NSLP and SBP revenues as a percentage of reported costs and key characteristics of school foodservice operations of SFAs. For this domain the only significant relationship was that SFAs that planned all menus at the SFA level had higher SBP revenues as a percentage of reported costs than SFAs that did not (84 percent versus 69 percent). Parameter estimates for this model are provided in Tables D.17 and D.18.

Table 6.11. Relationships between NSLP and SBP Revenues as a Percentage of Reported Costs and Key Characteristics of School Foodservice Operations of SFAs: Regression-Adjusted Mean for Revenues as a Percentage of Reported Costs

		Regression-Adjusted Mean	
		Unit of Analysis Is SFA	
	Yes/ No	Revenues as a Percentage of Reported Cost for NSLP Lunch (%)	Revenues as a Percentage of Reported Costs per SBP Breakfast (%)
Overall Weighted Mean		92.5	81.7
Food Purchasing Characteristics			
SFA Uses Alliance for a Healthier Generation or Other Similar Tools for Selecting and Purchasing Healthy Foods	Y	97.9*	76.1
	N	90.2	84.1
SFA Participates in a Food Purchasing Cooperative	Y	93.6	81.4
	N	91.3	82.0
SFA Is Engaged in a Pouring Rights Contract	Y	93.5	79.1
	N	92.3	82.4
Schools in SFA Offer Brand-Name or Chain Restaurant Foods	Y	91.7	84.0
	N	92.6	81.4
SFA Uses a Foodservice Management Company	Y	85.7	77.9
	N	93.3	82.1
SFA Purchases Fruits and Vegetables through the Department of Defense Fresh Program	Y	93.2	81.8
	N	92.1	81.6
Menu Planning Characteristics			
All Menus Are Planned at the SFA Level	Y	91.7	84.0*
	N	96.7	69.4
SFA Conducts Nutrient Analysis of Menus	Y	91.3	79.2
	N	95.1	86.7
Number of Challenges in Meeting the Updated Nutrition Standards that SFA Rated as 3 or Higher on a Scale of 1 (Not a Challenge) to 5 (Significant Challenge)			
4 or less (*reference category*)		93.6	81.2
5 to 7		92.2	81.0
8		91.4	82.6
SFA Perception of New Meal Requirements' Helpfulness in Improving the Nutritional Quality of Meals			
Not at all helpful (*reference category*)		97.3	85.9
Somewhat helpful		92.2	77.2
Very helpful		88.1	86.7
SFA was already improving the nutritional quality of meals prior to the new meal requirements		92.8	83.4

		Regression-Adjusted Mean	
		Unit of Analysis Is SFA	
	Yes/ No	Revenues as a Percentage of Reported Cost for NSLP Lunch (%)	Revenues as a Percentage of Reported Costs per SBP Breakfast (%)
Number of SFAs		**218**	**208**

Source: School Nutrition and Meal Cost Study, School Nutrition Manager Cost Interview, School Principal Cost Interview, and SFA Director and Business Manager Cost Interviews (Onsite and Follow-Up), Menu Survey, School Food Authority Director Survey, School Nutrition Manager Survey, and Cafeteria Observation Guide, school year 2014–2015. Regression-adjusted mean estimates are weighted to be representative of all public SFAs offering the National School Lunch Program.

Notes: Outliers on cost measures were trimmed to avoid excessive influence on means. Cost measures at or below the 3rd percentile were set to the 3rd percentile, and measures at or above the 97th percentile were set to the 97th percentile.

Regression analysis was conducted at the SFA level. Estimates are regression-adjusted means that control for institutional and demographic characteristics of each school and their SFA. Variables with rows labeled "Y" and "N" report adjusted mean values for the outcome listed in the column for SFAs that do and do not meet the variable criteria, respectively. Otherwise, regression-adjusted means are reported for each category within a variable. See Appendix B for more details on characteristic descriptions and selection methods.

The NSLP lunch revenue analysis sample includes the SFAs in the cost analysis sample with the following exceptions: excludes 11 SFAs with unreliable USDA reimbursements data, 1 SFA that did not provide any revenue data, and 54 SFAs that did not provide sufficient detail to determine the composition of revenues.

The SBP breakfast revenue analysis sample includes the SFAs in the cost analysis sample with the following exceptions: excludes 14 SFAs with no SBP, 11 SFAs with unreliable USDA reimbursements data, and 51 SFAs that did not provide sufficient detail to determine the composition of revenues.

* Within each column, * denotes that the difference between schools with and without a dichotomous characteristic is statistically different from zero at the 0.05 level. For variables containing multiple categories, * denotes that the difference between schools in the corresponding category and schools in the reference category is statistically different from zero at the 0.05 level.

NSLP = National School Lunch Program; SBP = School Breakfast Program; SFA = school food authority.

As shown in Table 6.12, there were several significant relationships between NSLP and SBP revenues as a percentage of reported costs and other key operating characteristics of SFAs. These included SFA director education and SNA certification, and purchase of new equipment to implement the updated nutrition standards. Parameter estimates for this model are provided in Tables D.19 and D.20.

Table 6.12. Relationships between NSLP and SBP Revenues as a Percentage of Reported Costs and Other Key Operating Characteristics of SFAs: Regression-Adjusted Mean for Revenues as Percentage of Reported Costs

		Regression-Adjusted Mean	
		Unit of Analysis Is SFA	
	Yes/ No	Revenues as a Percentage of Reported Cost per NSLP Lunch (%)	Revenues as a Percentage of Reported Costs per SBP Breakfast (%)
Overall Weighted Mean		92.5	81.7
Factors Considered in Pricing A la Carte Items			
Costs (food, labor, other direct or indirect)	Y	94.1	85.6
	N	89.0	72.7
Incentive for consumption of specific items or participation in reimbursable meal program	Y	92.2	78.5
	N	92.7	82.7
Other factors (ease of payment, school principal, other, don't know)	Y	89.5	74.6
	N	93.4	83.7
No a la carte items sold in any school cafeteria	Y	89.6	87.0
	N	93.0	80.8
SFA Director Experience			
Fewer than 5 years (*reference category*)		92.4	75.3
5 to 9 years		89.1	86.4
10 to 16 years		89.2	84.0
17 years or more		99.6	83.0
Highest Level of Education Completed by SFA Director			
High school graduate or less than high school (*reference category*)		87.1	63.4
Some college, no degree		87.3	65.2
Associate's degree		94.0	81.8*
Bachelor's degree		96.6	86.6*
Master's degree		99.9*	98.8*
Graduate credits beyond a Master's degree or doctorate		80.0	101.7*
SFA Director Credentials			
SFA Director Has Degree in Field Related to Food and Nutrition or Public/School Administration	Y	89.8	75.7
	N	94.2	85.5
Licensed Nutritionist or Dietitian, or Registered Dietitian	Y	91.9	77.0
	N	92.6	82.0
School Nutrition Association Certification Level 1, 2 or 3	Y	93.2	89.6*
	N	92.3	78.6
School Nutrition Specialist	Y	87.1	77.2
	N	93.1	82.1

	Yes/ No	Regression-Adjusted Mean Unit of Analysis Is SFA Revenues as a Percentage of Reported Cost per NSLP Lunch (%)	Regression-Adjusted Mean Unit of Analysis Is SFA Revenues as a Percentage of Reported Costs per SBP Breakfast (%)
State foodservice certificate	Y	96.8	89.6
	N	91.7	80.0
Food safety certification	Y	90.5	80.8
	N	95.2	82.8
Health department certification	Y	91.4	81.5
	N	92.7	81.7
Other credentials	Y	88.1	89.6
	N	93.1	80.7
None of the above	Y	85.8	76.2
	N	93.9	82.7
Proportion of Full-Time SFA Employees Receiving Health Benefits			
None (*reference category*)		89.6	73.6
Some		94.4	81.9
Most		97.5	85.6
All		87.8	84.8
Sources of Funding for Capital Equipment Purchases and Repairs			
SFA budget	Y	93.5	85.5
	N	91.3	76.2
USDA grant	Y	86.8	84.0
	N	93.1	81.4
State grant	Y	91.6	80.2
	N	92.6	81.8
Local education agency funds	Y	101.9	87.6
	N	92.0	81.3
School funds	Y	91.8	79.6
	N	92.7	82.2
SFA Has Purchased New Equipment to Implement Updated Nutrition Standards for School Meals	Y	92.2	73.8*
	N	92.7	85.0
Number of SFAs		**218**	**208**

Source: School Nutrition and Meal Cost Study, School Nutrition Manager Cost Interview, School Principal Cost Interview, and SFA Director and Business Manager Cost Interviews (Onsite and Follow-Up), School Food Authority Director Survey, school year 2014–2015. Regression-adjusted mean estimates are weighted to be representative of all public SFAs offering the National School Lunch Program.

Notes: Outliers on cost measures were trimmed to avoid excessive influence on means. Cost measures at or below the 3rd percentile were set to the 3rd percentile, and measures at or above the 97th percentile were set to the 97th percentile.

Regression analysis was conducted at the SFA level. Estimates are regression-adjusted means that control for institutional and demographic characteristics of each school and their SFA. Variables with rows labeled "Y" and "N" report adjusted mean values for the outcome listed in the column for SFAs that do and do not meet the variable criteria, respectively. Otherwise, regression-adjusted means are reported for each category within a variable. See Appendix B for more details on characteristic descriptions and selection methods.

The NSLP lunch revenue analysis sample includes the SFAs in the cost analysis sample with the following exceptions: excludes 11 SFAs with unreliable USDA reimbursements data, 1 SFA that did not provide any revenue data, and 54 SFAs that did not provide sufficient detail to determine the composition of revenues. The SBP breakfast revenue analysis sample includes the SFAs in the cost analysis sample with the following exceptions: excludes 14 SFAs with no SBP, 11 SFAs with unreliable USDA reimbursements data, and 51 SFAs that did not provide sufficient detail to determine the composition of revenues.

* Within each column, * denotes that the difference between schools with and without a dichotomous characteristic is statistically different from zero at the 0.05 level. For variables containing multiple categories, * denotes that the difference between schools in the corresponding category and schools in the reference category is statistically different from zero at the 0.05 level.

NSLP = National School Lunch Program; SBP = School Breakfast Program; SFA = school food authority.

More SFA director education was associated with significantly higher revenues as a percentage of reported costs for the SBP. SFAs had higher revenues as a percentage of reported costs for SBP breakfast when the director had an Associate's degree (82 percent), a Bachelor's degree (87 percent), a Master's degree (99 percent) or graduate credits beyond a Master's degree (102 percent). These comparisons are relative to the reference category, which was that the SFA director had no more than a high school education, for which the mean was 63 percent. For the NSLP, revenue as a percentage of reported costs was also higher for SFAs where the director had a Master's degree (100 percent versus 87 percent with no more than a high school education), and the pattern for Associates' and Bachelor's degrees was consistent with the pattern for the SBP, even though these relationships were not significant. Thus the evidence of an association of SFA director education with better financial outcomes was stronger for the revenues as a percentage of reported costs than for the cost per meal outcomes.

SNA certification was associated with better financial outcomes for both cost per meal and revenues as a percentage of reported costs. In particular, SFAs where the director had some form of SNA certification had higher SBP revenues as a percentage of reported costs than those that did not (90 percent versus 79 percent).

Finally, SFAs that purchased new equipment to implement the updated nutrition standards for school meals had significantly lower SBP revenues as a percentage of reported costs than those that did not (74 percent versus 85 percent). This result is consistent with the finding of higher costs per meal for SFAs that purchased new equipment for this purpose. As discussed in Section E, this association may be caused by factors other the equipment purchase itself.

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APPENDIX A

COST ALLOCATION METHODOLOGY AND REVENUE ANALYSIS METHODS

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TABLES

FIGURES

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This appendix presents details of the methods used to estimate the costs of producing reimbursable school meals and to examine the relationships between meal costs and school foodservice revenues. As discussed in Chapter 1, the report draws on several data sources, including the Expanded Menu Survey; the SFA Director and Business Manager, School Nutrition Manager and Principal Cost Interviews; and the State Education Agency Finance Officer Indirect Cost Survey. The SFA Director and Business Manager Cost Interview had two phases: in-person (at the time of the other cost interviews) and telephone follow-up (after the close of SY 2014–2015, to gather final data regarding SY 2014–2015 operations and financial statements). Details about the data collection instruments and the methods used to collect, process, and weight the data are provided in a separate methodology report (Zeidman et al. 2019).

This appendix has three sections. Section A describes the cost allocation methodology, that is, the methods used for combining data from the study sources to estimate the reported and full costs of reimbursable and nonreimbursable meals. As defined in Chapters 2 and 3, reported costs are those that are charged to the SFA's nonprofit foodservice account, while full costs include both reported costs and additional unreported costs that are attributable to foodservice operations but not charged to the nonprofit foodservice account. Section B describes the methods used for estimating the components of SFA revenues when those components were combined in the financial data provided by SFAs for this study. Section C describes the methods used to analyze the relationship of revenues to costs for nonreimbursable meals.

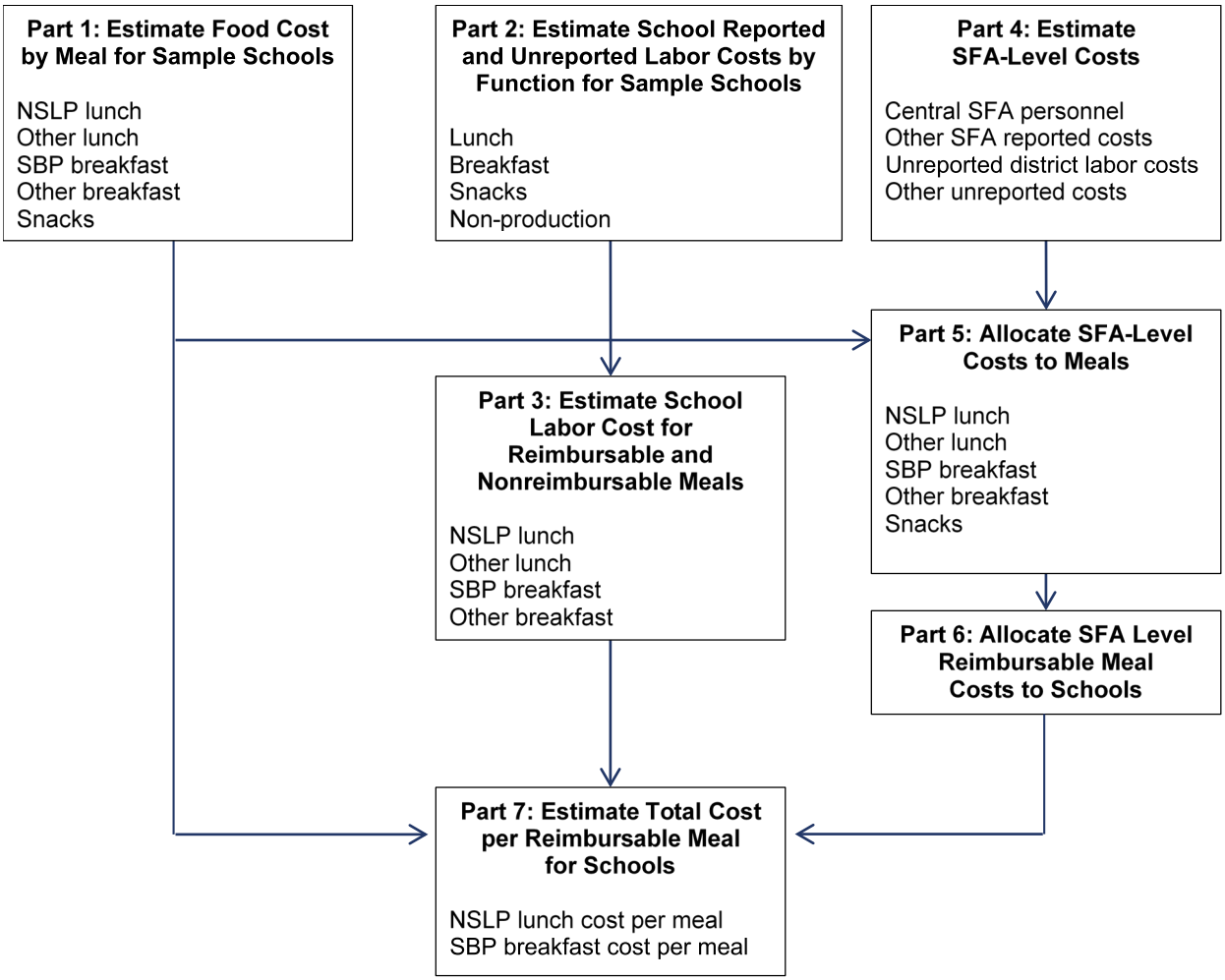
A. Cost Allocation Methodology

SFAs do not typically separate the costs of NSLP lunches, SBP breakfasts, other reimbursable meals, and nonreimbursable meals. To address this challenge, the study team adapted the direct measurement methodology used in previous studies of school meal costs (SLBCS-I and -II). Below is an overview of the cost allocation methodology, followed by a step-by-step description.

1. Overview of the Cost Allocation Methodology

The cost allocation methodology estimated the costs of NSLP lunches, SBP breakfasts, other reimbursable meals, and nonreimbursable meals by combining SFAs' total costs for the school year with detailed data on how SFAs' used resources for meal production and other foodservice operations. The methodology accounted for all resources used in school foodservice including food, labor, other direct costs (such as supplies and contracted services), and indirect costs (costs of facilities and other resources provided by the school district, when such costs are determined by applying an indirect cost rate or other indirect cost allocation method). The data collected for the study included the SFA's total reported costs and the unreported costs of school foodservice, thus accounting for the full costs of school foodservice. In addition, the data collection provided detailed information on the use of food and labor so that reported, unreported and full costs of these resources could be allocated among NSLP lunches, SBP breakfasts, other reimbursable meals, and nonreimbursable meals. The proportions of food and labor costs by meal type provided the basis for allocating other direct costs and indirect costs among the meal types. Figure A.1 illustrates the seven parts of the cost allocation methodology, and the following sections describe each part in detail.

Figure A.1. Estimation of Reimbursable Meal Costs for Sample Schools



Note: "Other lunch" costs include costs associated with foods offered in reimbursable lunches that were sold a la carte or to adults plus costs associated with foods that were sold only on a nonreimbursable basis at any time of day. "Other breakfast" costs include costs associated with foods offered in reimbursable breakfasts that were sold a la carte or to adults. Snacks include NSLP afterschool snacks, CACFP snacks and suppers, and FFVP snacks. Food cost computations for FFVP snacks differed from the food cost computations for all other meals and snacks, as discussed in the text.

Part 1: Estimate Food Cost by Meal for Sample Schools

In Part 1, the study team estimated the food costs for NSLP lunch, SBP breakfast, other reimbursable meals (NSLP afterschool snacks, CACFP snacks and suppers, and FFVP snacks), and nonreimbursable meals during a single week (the "target week") and then adjusted these costs to align with annual SFA food costs.[1] In addition, the team computed the food cost per student for the FFVP. This process consisted of the following steps:

[1] A separate methodology report (Zeidman et al. 2019) and Report Volume 2 provide details on the methods of collecting and processing the Menu Survey data.

A. The team used Expanded Menu Survey data from the sampled schools to compute quantities of foods used for reimbursable and nonreimbursable meals.

B. The team used price documentation from the SFA Director and Business Manager Cost Interview to determine the unit cost of these foods.

C. By combining data on the quantities, prices, and portions served in reimbursable meals, the study team computed the cost of food for NSLP lunches, SBP breakfasts, and nonreimbursable meals for the sampled schools during the target week.

D. For schools serving NSLP afterschool snacks or CACFP snacks or suppers, the team combined data on the quantities, prices and portions served to compute the cost of food for these meals and snacks for the sampled schools during the target week.

E. Combining the costs of food for reimbursable meals from steps C and D with the number of meals served in the target week, the team computed the raw mean food cost per NSLP lunch, SBP breakfast, and other reimbursable meal/snack for the sampled schools. (Food costs from Steps C-E were "raw" in the sense that they were based on food usage in the target week and needed to be adjusted to align with annual costs in step G.)

F. The team computed the raw weighted mean food cost per meal for the SFA for NSLP lunches, SBP breakfasts, NSLP afterschool snacks or CACFP snacks or suppers.

G. The team adjusted the raw food costs at the school and SFA level so that food costs for reimbursable and nonreimbursable meals summed to the reported total annual food cost for the SFA in SY 2014–2015.

H. For the sampled schools and the SFA as a whole, the study team computed the annual FFVP food cost per student.

The remainder of this section provides more details on these steps.

Step A: Compute Quantities of Foods Used. This step used data from Expanded Menu Survey, which included several forms.

- The Reimbursable Foods Form (RFF) documented quantities of foods offered for reimbursable meals (which often were also available as nonreimbursable foods, such as a la carte servings or components of adult meals). For these foods, the RFF obtained counts of the following: reimbursable portions served, a la carte/adult portions served, portions left over and saved for later use, portions wasted, and (for production kitchens) portions sent offsite. The RFF also provided portion sizes.
- The Nonreimbursable Foods Form and the Nonreimbursable Foods Inventory Worksheet provided data on the quantities of portion sizes and counts of portions served, left over, or wasted for foods offered only on a nonreimbursable basis.
- Field interviewers completed the Self-Serve/Made-to-Order Food Bar Form to document the quantities of foods made available and left over on these types of bars. Counts of students using self-serve/made-to-order bars came from the RFF.

Step B: Determine the unit costs of foods used. The SFA Director and Business Manager Cost Interview provided documentation of food prices from invoices and other SFA records.

Coders used these documents to enter the prices and quantities of foods as purchased into a database for the computation of the unit cost of each food identified through the Expanded Menu Survey as served individually or as a recipe ingredient. USDA provided the national mean unit cost of USDA foods [2]

Step C: Compute the cost of food served in NSLP lunches, SBP breakfasts, and nonreimbursable meals. The study team computed the food cost per portion using the portion size for each food as served in each school (from the Expanded Menu Survey) and the unit cost data (from the price documents) to compute the food cost per portion.

Production data from the Expanded Menu Survey provided the number of portions served onsite for reimbursable meals and nonreimbursable meals (including a la carte, adult meals, and competitive foods offered only on a nonreimbursable basis), the number of portions sent offsite from production kitchens, and the number of portions wasted.

For each sampled school, the study team computed the total cost of food for NSLP lunches and SBP breakfasts during the target week. This computation combined the data on the portions served and wasted for items offered as part of reimbursable meals with the food cost per portion for each food, and then summed food costs for all foods served. If items from the menu for a reimbursable meal were also offered on a nonreimbursable basis, the team also computed the total food cost for the nonreimbursable servings of these items at breakfast and lunch during the target week. (For simplicity this discussion refers to nonreimbursable meals, but most nonreimbursable food sales were on a per-item or a la carte basis.) The details of this process were as follows:

1. For breakfast and lunch, the total food cost of each item offered for both reimbursable meals and nonreimbursable meals was allocated between reimbursable and nonreimbursable meals based on the proportions of the servings of the item in reimbursable and nonreimbursable meals (after adjusting for leftovers and waste).
2. Then the total food costs for reimbursable meals and nonreimbursable meals during the target week were computed by summing the costs of individual items offered for reimbursable meals.

The estimated weekly food cost for nonreimbursable meals included both nonreimbursable servings of items offered as part of the menus for reimbursable meals and items available only on a nonreimbursable basis. Data for these additional items came from the Nonreimbursable Foods Form and the Nonreimbursable Foods Inventory Worksheet. The weekly food costs for these items were computed from servings and price data following the same procedure for items offered on menus for reimbursable meals. As in prior school meal cost studies, the total weekly cost of these items was included in the total nonreimbursable food costs for lunch. It was not feasible to divide these food costs between lunch and breakfast, because of the burden that such data collection would entail. Using the weekly total food costs, the percentages of total food costs for reimbursable and nonreimbursable meals were computed for breakfast and lunch, for

[2] The methodology report (Zeidman et al. 2019) provides further details on the food price coding and the treatment of direct-delivered ("brown box") and processed USDA Foods.

use in the food cost adjustment computation described below and for allocating labor costs in Part 4.

Step D: Compute Food Costs for NSLP Afterschool Snacks and CACFP Snacks and Suppers. Separate Expanded Menu Survey forms identified foods and quantities served for NSLP afterschool snacks and CACFP snacks and suppers, so separate food costs were computed for these programs using the quantity and unit price data. Food costs for CACFP snacks and suppers were combined; the small number of SFAs operating the CACFP precluded a more detailed analysis of these food costs. For NSLP afterschool snacks and the CACFP, all food costs were considered reimbursable.

Step E: Compute Mean Food Cost per Meal/Snack. The Daily Meal Counts Form provided counts of NSLP lunches and SBP breakfasts for each day, by free, reduced-price, and paid status. (This form also provided the daily total revenues from nonreimbursable food sales.) Total food costs for SBP breakfasts and NSLP lunches during the target week were divided by the numbers of reimbursable meals served during the target week to compute the "raw" food cost per SBP breakfast and NSLP lunch for each sampled school. ("Raw" food costs were preliminary estimates and were adjusted as described below.) Where applicable, the total target week food costs for NSLP afterschool snacks and CACFP snacks and suppers were divided by counts of these snacks/suppers to compute the raw food cost per NSLP afterschool snack and per CACFP snack/supper for the sampled schools.

Step F: Compute SFA Mean Food Cost per Meal/Snack. The weighted mean raw food costs per NSLP lunch, SBP breakfast, NSLP afterschool snack, and CACFP snack/supper were computed for each SFA, using data from the sample schools and weights to account for the sampling of schools within SFAs. Subsequent computations used the total food cost for nonreimbursable meals since there was no equivalent to meal counts for nonreimbursable meals.

Step G: Adjust Raw Food Costs to Sum to SFA Totals. The mean raw food costs were adjusted so that food costs for reimbursable and nonreimbursable meals summed to the reported total annual food cost for the SFA in SY 2014–2015 as reported on the SFA expense statement. For this computation, the SFA mean raw food cost per meal for reimbursable meals was multiplied by the SFA's total meal counts for SY 2014–2015 to compute the raw total annual food cost for reimbursable meals. This total was divided by the mean percentage of total target week food cost attributable to reimbursable meals to estimate the raw total annual food cost for the SFA including both reimbursable and nonreimbursable meals and the raw total annual food cost for nonreimbursable meals.[3] The percentage of the reported total annual food cost to the raw total annual food cost was computed as the food cost adjustment factor. This adjustment factor was multiplied by the raw food cost per meal for NSLP, SBP, NSLP afterschool snacks, and CACFP snacks and suppers to compute the final food cost per meal for these programs at the

[3] The within-SFA weights for schools were designed for computing means, not totals, and were based on the expected shares of each type of school in the SFA's total costs for reimbursable meals. Therefore, it was not feasible to weight up the total food costs for nonreimbursable meals from the sample schools to the SFA. However, the school weights were suitable for computing the mean percentage of food costs for reimbursable meals for the SFA. Using this percentage to estimate the raw total annual food cost for the SFA from the raw total annual reimbursable food cost was a simple algebraic exercise.

SFA and school levels. The adjustment factor was also applied to the raw total annual food cost for nonreimbursable meals to compute the final total food cost for nonreimbursable meals.

Step H. Compute the Annual FFVP Food Cost per Student. For the sampled schools and the SFA as a whole, the study team computed the annual FFVP food cost per student. For this computation, the SFA Director and Business Manager Cost Interview provided total annual food costs for the FFVP and counts of students in FFVP schools. The study did not collect data on the number of FFVP serving days, and so it was not possible to compute an accurate daily FFVP cost per student—the measure most comparable to NSLP and SBP meal costs. As the annual FFVP cost per student was based on annual accounting data, it was final, not raw, and did not require adjustment.

Part 2: Estimate School Reported and Unreported Labor Cost by Function for Sample Schools

In Part 2, the study team estimated labor costs for school foodservice in the sampled schools.

Step A: Estimate Labor Costs in Sampled Schools. The study team estimated the sampled schools' reported labor costs for meal production and nonproduction functions using the time use and pay data collected through the School Nutrition Manager cost interviews. The team also estimated unreported labor costs using time use and pay data from the Principal Cost Interview. Meal production labor cost estimates included separate amounts for breakfast, lunch, snacks, and other meals production such as catering. For breakfast and lunch, meal production labor included reimbursable and nonreimbursable meals. Nonproduction labor cost estimates included separate amounts for administration, nutrition education and promotion, and other nonproduction functions (such as storage, transportation and maintenance).

Step B: Allocate Labor Costs in Production Kitchens to Receiving Kitchens. In addition to the labor costs for the sampled schools, the study team estimated labor costs for production kitchens that served sampled schools but were not sampled directly for the study. Production kitchens serve meals to students onsite and prepare foods served in receiving kitchens located in other schools. The labor cost of meals served by a receiving kitchen includes a share of the labor cost for preparing meals in the associated production kitchen. For a production kitchen, the labor costs for preparing meals sent offsite are not part of the labor cost of the meals served onsite.

To fully account for the labor to produce meals served in sampled receiving kitchens, a share of labor costs in production kitchens was allocated to receiving kitchens in sampled schools in two steps using food cost proportions.

1. Allocate Production Labor between Onsite and Offsite Meals. First, all labor costs for meal production in the production kitchen for each type of meal were allocated between meals served onsite (if any) at the production kitchen and meals sent offsite to receiving kitchens. The share of labor costs for meals served onsite was equal to the cost of food served onsite divided by the total cost of food produced onsite; these food costs were computed using the Expanded Menu Survey data on portions served onsite and sent offsite and the cost per portion for each food. Labor costs for serving meals were allocated entirely to the production kitchen.

2. Allocate Production Labor to Receiving Kitchens. Second, for a receiving kitchen in the sample, its share of the production kitchen's labor cost for meals sent offsite was equal to the ratio of its weekly food cost (based on its Menu Survey and price data) to the total weekly cost of food sent offsite by the production kitchen. This ratio was multiplied by the production kitchen's labor costs for meals sent offsite to allocate the appropriate share of production kitchen labor costs to the receiving kitchen.

Part 3: Estimate School Labor Costs for Reimbursable and Nonreimbursable Meals

In Part 3, the study team estimated the school labor costs for reimbursable and nonreimbursable meals in four steps:

Step 1: Allocate Meal Production Labor Costs for Breakfast and Lunch Between Reimbursable and Nonreimbursable Meals. In each school, the study team allocated meal production labor costs for breakfast and lunch between reimbursable and nonreimbursable meals based on the percentages of food costs for these meals. These computations yielded labor costs for NSLP lunches, SBP breakfasts, and nonreimbursable meals. As noted above, meal production labor costs for a receiving kitchen included a share of labor costs for the associated production kitchen, while a production kitchen's labor costs for meals served onsite excluded labor costs for supplying its associated receiving kitchens.

Step 2: Allocate Meal Production Labor Costs for Snacks. Similarly, the study team allocated meal production labor costs for snacks between NSLP afterschool snacks, CACFP snacks and suppers, and FFVP snacks based on the percentages of food costs for these snacks. All of the food served for these snacks was for reimbursable snacks.

Step 3: Allocate Nonproduction Labor Costs. Nonproduction labor costs for each school were allocated to NSLP lunches, SBP breakfasts, NSLP afterschool snacks, CACFP snacks and suppers, FFVP snacks, and nonreimbursable meals based on the percentages of production labor costs for these meals.

Step 4: Compute Total Labor Costs for Reimbursable and Nonreimbursable Meals. Combining production and nonproduction labor costs yielded each school's total labor costs for each type of reimbursable meal and for nonreimbursable meals.

The four steps in Part 3 were completed for both reported and full costs. For the full costs, unreported labor costs were allocated to reimbursable and nonreimbursable meals and then combined with reported labor costs. Reported and full labor costs were divided by meal counts to compute raw labor costs per NSLP lunch, SBP breakfast, NSLP afterschool snack, and CACFP snack/supper based on the target week in sampled schools. The raw annual FFVP labor cost per student was also computed.

Part 4: Estimate SFA-Level Costs

The estimation of SFA-level costs included separate steps for reported labor costs, unreported labor costs, and other direct and indirect costs.

Step 1: Estimate Reported SFA-Level Labor Costs by Function. To estimate reported labor costs for the SFA's central personnel (including central kitchens and other non-school

based staff), the study team combined time-use and salary data from the SFA Director and Business Manager Cost Interview. The interview differentiated between personnel whose time was charged to the school foodservice account and staff paid out of other accounts (that is, staff whose labor costs were unreported). The time-use data provided the breakdown of effort to estimate reported labor costs for the SFA's central personnel by function: lunch, breakfast, other meals, and nonproduction activities. As discussed below, labor costs for SFA central personnel were included in the total labor cost for SFA-level cost estimates and a portion of these costs was included in the total labor cost for the sample schools.

Step 2: Estimate Unreported SFA-Level Labor Costs by Function. Likewise, the study team used time-use and salary data for central personnel whose time on school foodservice was not charged to the school foodservice account to estimate unreported labor costs by function. These data also came from the SFA Director and Business Manager Cost Interview, which included a module to verify that unreported labor costs were not captured by the SFA's indirect cost rate.

Step 3: Estimate Other Direct and Indirect Cost Totals. The SFA's expense statement provided annual totals for other direct costs (such as supplies, equipment and purchased services) and indirect costs charged to the school foodservice account. In addition, the SFA Director and Business Manager Cost Interview provided data to estimate unreported costs for foodservice staff fringe benefits, equipment and utility costs, and indirect costs.

Part 5: Allocate SFA-Level Costs to Meals

The allocation of SFA-level costs to meals included the following steps:

Step 1: Allocate SFA-Level Labor Costs to Meals. SFA-level meal production labor costs, including central kitchens, were allocated directly to NSLP, SBP, NSLP afterschool snacks, CACFP, FFVP, and nonreimbursable meals based on SFA-level interview data and food cost percentages. SFA-level nonproduction labor costs were allocated to NSLP, SBP, NSLP afterschool snacks, CACFP, FFVP, and nonreimbursable meals based on weighted mean percentages of school-level production labor.

Step 2: Adjust School and SFA Reported Labor Costs. The reported labor costs for school foodservice and SFA personnel were adjusted so that SFA totals for NSLP, SBP, NSLP afterschool snacks, CACFP, FFVP, and nonreimbursable meals summed to the reported total labor costs for salaries, wages, and fringe benefits. This adjustment was applied at the SFA and school levels.

Step 3: Allocate Other Direct and Indirect Costs. Other direct costs, and indirect costs (as reported on the SFA's expense statement) were allocated to NSLP, SBP. NSLP afterschool snacks, CACFP, FVVP and nonreimbursable meals based on the weighted means of the percentages of production costs (labor plus food) in the sampled schools, using the sampled schools' within-SFA weights.

Step 4: Compute Components and Total Costs per Meal. For the SFA-level estimates, reported labor, food, other direct, and indirect costs were combined to compute the components and total of the reported cost per meal for NSLP, SBP, NSLP afterschool snacks, and CACFP, as

well as the reported FFVP cost per student, the total reported cost of all reimbursable meals, and the total reported cost of nonreimbursable meals. These computations used SFA-wide meal counts.

Part 6: Allocate SFA-Level Reimbursable Meal Costs to Schools

The reported and full SFA-level costs per NSLP lunch and SBP breakfast (including labor, other direct costs, and indirect costs) were used for computing school-level meal costs. This approach effectively allocated SFA-level costs for NSLP lunch and SBP breakfast to each school in proportion to the number of NSLP lunches and SBP breakfasts served. The costs of NSLP afterschool snacks, CACFP snacks/suppers, FFVP, and nonreimbursable meals were not estimated at the school level.

Part 7: Total Costs per Reimbursable Meal for Schools

The team added the SFA-level components of the reported per NSLP lunch and SBP breakfast to the adjusted reported school-level labor and food costs per meal in each sampled school to compute the total reported cost per NSLP lunch and SBP breakfast for each sampled school.

For the full cost estimates, Parts 5, 6 and 7 were repeated, adding each component of unreported costs at the school and SFA levels.

As discussed in the SNMCS methodology report (Zeidman et al. 2019), the study used a complex sampling design that weights observations to form national and subgroup estimates. For the cost analysis, the study used use three types of weighting. One set of estimates were weighted at the SFA level, so that the estimates are for the average SFA (overall or in the specified subgroup). Due to the substantial variation in the size of SFAs (as measured by meals served) a second set of estimates weighted at the meal level was computed to represent the cost of the average meal. The SFA and meal-level estimates appear in Chapters 2 and 3. A third set of estimates, presented in Appendix C, was weighted at the school level and used in multivariate analyses presented in Chapter 6. Revenue estimates were weighted at the SFA level.

B. Methods for Estimating Revenue Components

Key topics for the study included the sources of SFA revenues and the relationship of revenues to costs for reimbursable and nonreimbursable meals, as presented in Chapter 4. To support the analysis for these topics, the study required data on SFAs revenues broken down by source of funds and by type of meal. However, in many cases SFAs' financial statements did not provide the desired details about sources of revenues. For this reason, the study team used several procedures to separate components of revenue that were combined in some SFAs' data. For example, estimating total SFA revenues for NSLP lunches required data for all of the components of NSLP revenue including revenue from: (1) USDA reimbursements, (2) the value of USDA Foods, (3) State funds, (4) student payments, and (5) local funds. No SFA provided separate values for all of these components. However, the revenue statement completed during the follow-up phase of the SFA Director and Business Manager Cost Interview documented what components of revenues were combined in the subtotals of revenues reported by the SFAs. The following text describes the key challenges encountered in the revenue data and the solutions used to address them.

All USDA reimbursements were combined. SFAs' revenue statements often reported a single total for all USDA reimbursements, including reimbursements for NSLP lunches, SBP breakfasts, and (in some cases) other reimbursable meals and snacks, such as NSLP afterschool snacks or CACFP snacks and suppers. These totals were decomposed by imputing total revenues for NSLP lunches and SBP breakfasts based on annual counts of reimbursable meals provided by State Child Nutrition Agencies. Separate counts for NSLP lunches and SBP breakfasts were broken down by reimbursement rate. As discussed in Chapter 1, reimbursement rates varied by (a) free, reduced-price, and paid (full-price) status; (b) higher versus lower reimbursement rates based on the percentage of lunches served free or at reduced-price, and (c) for the NSLP, with or without eligibility for the additional 6 cents performance-based reimbursement. These meal counts were multiplied by the applicable reimbursement rates to impute the total revenue for NSLP reimbursements and SBP reimbursements. If the reported total for all USDA reimbursements also included NSLP afterschool snacks or CACFP snacks or suppers, the USDA reimbursements for these meals and snacks were imputed by subtracting the imputed NSLP and SBP revenue from the reported combined total for all USDA reimbursements. The imputed totals for these additional programs were adjusted, as necessary, to ensure that the imputed values for all USDA programs summed to the reported total for all USDA reimbursements combined.

State funds for multiple meal programs were combined. As with USDA reimbursements, SFAs' revenue statements often reported a single total for State funds in support of NSLP and SBP. In these cases, the reported or imputed percentages of USDA reimbursements for NSLP lunches and SBP breakfasts were used to impute the breakdown of State funds. This approach was necessary because State funding formulas were not available. As indicated in Table 4.1, State funds represented 2.5 percent of the average SFA's revenues, so alternative methods for allocating these funds would not materially affect the estimated total revenues for the NSLP and SBP.[4]

[4] If the revenue statement indicated that State funds for NSLP, SBP and other reimbursable meals were combined, the SFA was excluded from the analysis of the composition of SFA revenues.

Student payments for NSLP and SBP meals were combined. SFAs' revenue statements often included a single total for student payments for NSLP lunches and SBP breakfasts. In these cases, student payments for each meal were imputed using the SFA's meal counts and the mean prices for reduced-price and paid meals (as reported in the SFA Director Survey). As with USDA reimbursements, the imputed totals for NSLP and SBP payments were adjusted to sum to the reported total student payments for all reimbursable meals. This adjustment provided a correction for the potential overstatement of revenues based on meal counts and prices. The actual revenues from student payments for NSLP or SBP meals may be less than the product of meal counts and prices because some students do not pay for meals that are counted at the paid level (for example, when students accumulate debt in their payment accounts).

Student payments for NSLP and SBP meals were combined with nonreimbursable food sales. When reporting and tracking sales data, SFAs often combined student payments for reimbursable meals (NSLP, SBP or both) with a la carte sales or other revenues from nonreimbursable food sales (such as adult meals, vending machines and snack bars). In this situation, two methods were used to separate payments for reimbursable meals from nonreimbursable food sales.

Under the first method, the imputed student payments for reimbursable meals (as described above) were subtracted from the combined total. If the remaining amount was positive, it was used as the estimate of the nonreimbursable foods sales component.

If the first method did not produce a positive estimate of the nonreimbursable food sales component, or if the SFA combined student payments for reimbursable snack sales with payments for NSLP or SBP, the study used the second method to separate student payments for reimbursable meals and nonreimbursable food sales[5]. Under the second method, the following mean ratio was calculated among SFAs that had separately reported nonreimbursable foods sales and student payments for reimbursable meals:

$$\text{Mean ratio}=\text{Mean}\left(\frac{\text{nonreimbursable food sales}}{\text{student payments for reimbursable meals}+\text{nonreimbursable food sales}}\right)$$

When the second method was used, the mean ratio was multiplied by the SFA's reported total of student payments for reimbursable meals plus nonreimbursable food sales to impute the nonreimbursable food sales revenue. The difference between the reported total of student payments for reimbursable meals plus nonreimbursable food sales and the imputed total of nonreimbursable food sales provided an imputed total of student payments for reimbursable meals. If the SFA reported receiving student payments for NSLP lunches and SBP breakfasts, the imputed total of these payments was decomposed in proportion to the imputed student payments for NSLP and SBP based on meal counts and prices.

Different source of local funds were combined in a single total. Local funds in support of school meals were often reported in SFAs' revenue statements as a single total (if reported at all). These funds were assumed to be used only in support of reimbursable meals. They were

[5] The second (ratio) method was used in the School Lunch and Breakfast Cost Study-II (Glantz et al. 2008).

allocated to NSLP, SBP and other reimbursable meals in proportion to all other revenues, including USDA, State and student payments.

Sample Limitations. In the process of conducting the revenue analysis, it was determined that:

11 SFAs had unreliable data on USDA reimbursements (based on a comparison of reported values with imputed values using cleaned meal counts data).

1 SFA provided no revenue data.

54 SFAs did not provide sufficient detail to determine the composition of all revenues (that is, categories of revenue were combined in ways that could not be reliably decomposed).

Thus, there was a sample of 218 SFAs with complete revenue breakdowns; ten of these SFAs that did not offer the SBP were excluded from tabulations of SBP revenue. Each table in Chapter 4 indicates the sample used and the numbers and types of SFAs excluded.

The weighted counts of SFAs for subgroups (particularly for low-poverty versus high-poverty SFAs) differ between tables that use the cost analysis sample of 284 SFAs and those that use the revenue composition sample of 218 SFAs. The nonresponse adjustments were designed to reduce the risk of nonresponse bias. They do not guarantee that the weighted tabulation of group memberships are identical for every alternate definition of response. This is common in nonresponse adjustments for samples with small numbers in some subgroups. As noted throughout the text, the numbers of small and urban SFAs were particularly small.

C. Regression Analysis of Revenue from Nonreimbursable Meal Revenue Against Nonreimbursable Meal Cost

This section describes the problem encountered in analyzing revenue and cost for nonreimbursable meals, the regression analysis conducted to address this problem, and the results of the regression. The preferred specification of the regression model is the basis for the discussion of the relationship of revenue to cost for nonreimbursable meals in Chapter 4.

1. Data Problem

For the analysis of the relationship between SFAs' revenue from sales of nonreimbursable meals and their cost of producing nonreimbursable meals, the analysis team constructed a variable for the ratio of nonreimbursable meal revenue to nonreimbursable meal cost. The category of "nonreimbursable meals" includes all food (single items or full meals) sold on a nonreimbursable basis through a la carte cafeteria servings, vending machines, adult meals, and catering.

The numerator of this ratio comes from the SFA's revenue data and, in some cases, is imputed by decomposing a reported total that combines nonreimbursable meals revenue with revenue for reimbursable meals, such as student payments. As shown in Table 4.1, nonreimbursable meals revenue accounts for 10.9 percent of SFA revenues, on average. Thus, errors in reporting or imputation that were small in absolute terms would be large relative to the

amount of nonreimbursable meals revenue (2-3 percent of total SFA revenues would represent roughly 20 to 30 percent error relative to the estimate of nonreimbursable meals revenue).

The denominator of the ratio (nonreimbursable meals cost) comes from the cost allocation analysis. As described in the section on cost allocation methods, the estimated cost of nonreimbursable meals for each SFA (including food, labor, other direct costs, and indirect costs) relied on school-level data on the costs of nonreimbursable foods and the nonreimbursable percentage of total food costs for the target week. For schools with missing or implausible values for the cost of nonreimbursable foods, the analysis used imputed values for the cost of nonreimbursable foods during the target week. (This imputation used the nonreimbursable meals revenue for the week from the Daily Meal Counts Form and the median ratio of nonreimbursable meals revenue to food cost from schools with data considered sufficiently accurate.) However, there may have been measurement error in the values for the cost of nonreimbursable foods, either from the individual school data or from the imputation of these costs. As shown in Table 2.5, nonreimbursable food costs represent only 5.0 percent of total food costs, on average. Thus, a very small amount of error in estimating the food cost for reimbursable meals would result in a large relative error in the food cost for nonreimbursable meals and, therefore, in the total cost of nonreimbursable meals. In sum, both the revenue and cost estimates for nonreimbursable meals are highly sensitive to relatively modest errors in estimates for reimbursable meals.

As a more robust alternative to using the simple ratio of nonreimbursable meals revenue to nonreimbursable meals cost, the study team estimated the relationship between revenue and cost from nonreimbursable meals through a regression analysis of nonreimbursable meals revenue against cost. This analysis provides more credible estimates of the mean amount of nonreimbursable meals revenue generated for every dollar in nonreimbursable meals cost by investigating the complete distribution of nonreimbursable meals revenue and cost, taking into account the influence of extreme values of revenue and cost on the estimates. The regression approach is described in the next section, followed by the results, which are the basis for the discussion in Chapter 4.

2. Regression Approach

The regression model was a weighted OLS model of nonreimbursable meals revenue against nonreimbursable meals cost, without an intercept term,

$$y_i = \beta x_i + \varepsilon_i \ ,$$

where, for SFA i, y_i is total nonreimbursable meals revenue, x_i is total nonreimbursable meals cost, and ε_i is the error term or residual. In this equation, β is the parameter estimate, or the estimate of the mean marginal change in nonreimbursable meals revenue for every dollar in nonreimbursable meals cost. The base sample size is 209 SFAs, which includes all SFAs in the revenue analysis sample (N=218) except 9 SFAs for which nonreimbursable meals revenue or nonreimbursable meals cost is missing. (The rest of the revenue analysis included SFAs that had no nonreimbursable meals revenue and SFAs that had nonreimbursable meals revenue but were missing NR meals cost, as well as SFAs with both NR meals revenue and cost.)

To investigate the influence of extreme nonreimbursable meals revenue and cost values on the parameter estimates, the analysis team calculated influence statistics, specifically the Cook's D and leverage statistics. These statistics are measures proposed by Cook[6] (1977) and Belsley, Kuh, and Welsch[7] (1980), respectively, to identify observations that are extreme outliers and have a strong impact on the parameter estimates. Exclusion of observations with high Cook's D or leverage statistics from the regression sample result in notable changes in parameter estimates. The threshold for exclusion proposed by Belsey et al is a leverage value greater than 2k/N, where k is the number of regressors in the model, and N is the sample size.

To test the influence of observations with substantial impact on β, the analysis team ran six regressions with varying samples excluding one or more SFAs that were identified to have strong influence on the parameter estimate using the Belsey et al. threshold noted above, or were extreme outliers based on their Cook's D value or studentized residual.[8] Some of the strongest influencers may not appear to be outliers, precisely because of their influence on the fitted regression line which tends to pivot towards them. Therefore, strong influencers may have small residuals relative to the fitted regression line. A total of 17 SFAs had leverage values above the Belsey et al. threshold. Of these 17 SFAs, 7 SFAs were extreme outliers with studentized residuals greater than 2. Observations with high studentized residuals generally had high Cook's D values. The following section describes the different regression models that exclude SFAs based on these statistics, and presents the modeling results.

3. Results

Table A.1 presents the results for the six regressions. The first regression included all SFAs in the revenue analysis sample, except 9 SFAs with missing values for nonreimbursable meals revenue or nonreimbursable meals cost. This sample of 209 SFAs was the base sample from which different groups of SFAs were excluded from the following regressions. The second regression excluded the 17 SFAs identified to be strong influencers (based on leverage value as defined above). The third excluded only the SFA with the highest leverage value from the base sample and the fourth, in addition, also excluded the SFA with the second highest leverage value. These two SFAs were considered the top influencers. The fifth regression excluded the 7 extreme outliers (based on their studentized residuals) among the 17 strong influencers. The sixth, which is the preferred model, excluded the top two influencers plus the most extreme outlier (based on its studentized residual).

[6] Cook, R. Dennis (1977). "Detection of Influential Observations in Linear Regression". Technometrics. American Statistical Association. 19 (1): pp. 15–18.

[7] Belsley, D.A., Kuh, E., and Welsch, R.E (1980). "Regression Diagnostics: Identifying Influential Data and Sources of Collinearity". John Wiley and Sons, Hoboken, NJ.

[8] The studentized residual is a measure of the difference between the actual y_i and the predicted, $\hat{y}_i$ if the study team deleted that observation from the regression model, standardized by dividing the residual by the standard error of the residuals.

Table A.1. Regression Results of Nonreimbursable Revenue Against Nonreimbursable Cost

Regression Sample	Parameter Estimate (β)	Standard Error	t-value	N	R-squared	CI-low	CI-high
1. All observations with nonreimbursable meals revenue and cost	1.48	0.14	10.91***	209	0.70	1.21	1.74
2. Excludes all 17 influencers (based on leverage value above threshold)	1.85	0.20	9.04***	192	0.47	1.45	2.25
3. Excludes 1 top influencer (highest leverage value)	1.38	0.17	8.22***	208	0.59	1.05	1.70
4. Excludes top 2 influencers (based on leverage value)	1.54	0.10	14.93***	207	0.64	1.34	1.75
5. Excludes 7 outliers (based on studentized residual)	1.56	0.10	15.4***	202	0.60	1.36	1.76
6. Excludes top 2 influencers and most extreme outlier (based on studentized residual)	1.52	0.10	14.93***	206	0.74	1.32	1.72

The first regression, which included all SFAs in the base sample for this analysis, yielded a parameter estimate (β in the equation above) of $1.48 in nonreimbursable meals revenue per $1 of nonreimbursable meals cost. This estimate is 25 percent less than the estimate from the second regression that excluded all 17 influencers. While this may seem like a substantial change in the results, the 95 percent confidence interval of the parameter estimate from the second regression includes $1.48. Therefore, statistically, the results are not significantly different. Moreover, the parameter estimates of the third to sixth regressions are not statistically different. All six models yield similar results for the amount of nonreimbursable meals revenue per dollar of nonreimbursable meals cost, with a range of $1.38 to $1.85.

Chapter 4 presents the results from the sixth regression with a parameter estimate of $1.52. This is the preferred regression because it did not exclude as many SFAs as in the second regression, but it did exclude the most extreme observations: the top two influencers (base on leverage value) and the observation with the highest studentized residual. Also, the R-squared for the sixth model is the greatest among all regressions. Therefore, this model presents the most credible estimate of the relationship between revenue and cost while minimizing the exclusions from the revenue analysis sample. However, it is important to bear in mind the range of estimates when applying the results of this analysis in the broader context of the study.

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APPENDIX B

MULTIVARIATE ANALYSIS METHODS

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TABLES

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This appendix describes the methods used for the multivariate analyses presented in Chapter 6 and Appendix D. These analyses cover research questions about the relationships between the costs of NSLP lunches and SBP breakfasts at the SFA and school levels and key characteristics in five domains:

- Institutional and demographic characteristics of schools and SFAs
- Characteristics of NSLP lunches and SBP breakfasts (school level)
- Characteristics of the school food environment (school level)
- Characteristics of school foodservice operations (school and SFA levels)
- Other SFA operating characteristics (SFA level).

The tables in Chapter 6 identify the characteristics in all five domains. The text box below identifies the institutional and demographic characteristics. Except as noted, the characteristics listed below are the same for SFAs and their member schools.

Institutional Characteristics	Demographic Characteristics
SFA size	FNS Region
SFA type (single or multi-district)	SFA urbanicity
School size (school level only)	Share of minority students in SFA
School type (school level only	District child poverty rate
	Share of students approved for free or reduced-price meals (separate school and SFA level variables)

A. General Modeling Approach

The study team used multiple linear regression estimation to produce estimates of the relationships between the costs of school meals and key characteristics in the five domains listed above. The cost measures included six outcome variables: reported and full costs per NSLP lunch; reported and full costs per SBP breakfast; and revenues as a percentage of reported costs for NSLP lunches and for SBP breakfasts. All six outcomes were analyzed at the SFA level; only the four outcomes of reported and full costs were analyzed at the school level. The discussion in Chapter 6 focuses primarily on the school-level analysis but includes SFA-level results as well. All of the cost outcomes were trimmed to eliminate outliers, with values below the 3rd or above the 97th percentile set to the values at those percentiles. The outcomes for revenue as a percentage of reported costs used trimmed costs in the denominator.

At the SFA level, single-equation regression models were used to estimate these relationships, taking the general form of:

$$(1) \quad Y_s = X'_s \beta + Z'_s \gamma + Q'_s \delta + \varepsilon_s ,$$

where Y_s is one of the six outcome variables available at the SFA level for SFA s, X_s is a vector of institutional characteristics of SFA s with coefficient β, Z_s is a vector of the SFA's institutional and demographic characteristics with coefficient γ, Q_s is a vector of key

characteristics and factors within the domain of interest with δ as the corresponding coefficient, and ε_s is a random error term.

At the school level, single-equation regression models were used to estimate these relationships, taking the general form of:

(2) $Y_{sch} = X'_{sch}\beta + Z'_{sch}\gamma + Q'_{sch}\delta + \varepsilon_{sch}$,

where Y_{sch} is one of the four cost variables available at the school level for school *sch*, X_{sch} is a vector of institutional characteristics of school *sch* and the SFA of which it is a member with coefficient β, Z_{sch} is a vector of SFA and school institutional and demographic characteristics with coefficient γ, Q_{sch} is a vector of key characteristics and factors within the domain of interest with δ as the corresponding coefficient, and ε_{sch} is a random error term.

When estimating the relationships between the cost outcomes and key characteristics of school meals, the school food environment, school foodservice operations at the SFA and school levels, and other SFA operating characteristics, it is important to control for other factors that may influence costs and also be correlated with various meal, school, or SFA characteristics. For example, food purchasing behaviors, such as use of food purchasing cooperatives, may vary by FNS region, but regional differences in food prices may partially explain differences between schools and between SFAs in costs. In this case, not controlling for regional differences would overestimate the strength of the relationship between use of food purchasing cooperatives and the cost outcomes. For this reason, multivariate models that explored relationships between the cost outcomes and characteristics of the meals, the school food environment, school and SFA foodservice operations, and other SFA operations included institutional and demographic characteristics not controlled by SFAs and schools. Note that when estimating the relationships between cost outcomes and the institutional and demographic characteristics, the vector Q_s or, Q_{sch} above is omitted.

All multivariate estimates are nationally representative of all public, non-charter schools offering the NSLP. Sample strata, clustering, and weighting were used to account for the complex sampling design of the study in producing estimates, calculating standard errors, and testing for statistical significance. (Clustering was only used for the school models, not the SFA-level models.) Although key variables of interest were drawn from multiple instruments, the primary sample used for multivariate analyses included the schools and SFAs that completed the Menu Survey and provided cost data at the school and SFA levels. These data were available for 876 schools and 284 SFAs, which constituted the sample for the cost models presented in Chapter 6. SFAs and schools without the SBP were excluded from analyses of SBP costs. In addition, 66 SFAs were excluded from the analysis of revenues as a percentage of costs due to limitations of data on the composition of revenue, as discussed in the notes to affected tables in Chapter 4 and Appendix A.

Main results reported in Chapter 6 are presented as regression-adjusted mean values of cost outcomes at the school and SFA levels that control for the institutional and demographic characteristics of each school and their SFA, as well as key characteristics within the domain of

interest. The regression-adjusted mean for a particular level of a particular covariate is computed by taking all of the observations that participated in that regression, artificially setting that covariate to that particular level in all of the observations while leaving everything else alone, using the fitted model to predict the outcome using each of these modified observations, and then taking the mean of these predictions. This amounts to seeing what the mean value of the outcome would be if all of the observations took on that particular value for that particular covariate, based on the model.

For each key characteristic, regression-adjusted mean outcomes are presented separately by subcategories of the characteristic. Statistical significance reported is for the difference between the regression-adjusted mean cost reported for that particular category of the characteristic and the regression-adjusted mean for the characteristic's reference category. In Chapter 6, symbols in the tables indicate differences that were significant at the 0.05 level using two-tailed tests, consistent with the practice for significance testing in the descriptive tables in Chapters 2 through 5. For each variable, the reference category is listed first. Symbols for statistical significance are not reported for reference categories.

The study team separately estimated models for each of the five domains so that each model had sufficient degrees of freedom to detect significant relationships between costs and the characteristics in the model. Tables of regression adjusted means are provided in Chapter 6 for all five domains.

In Chapter 6, relationships are discussed only when a characteristic is associated with more than one outcome of the same type (i.e., cost per meal or revenue as a percentage of cost) in the same direction. This rule is intended to reduce the risk of highlighting results that may be occurring by chance. Current practice in rigorous policy analysis calls for attention to multiple comparison bias—the fact that when multiple hypotheses about associations between program features and outcomes are tested, the probability of finding significant associations by chance (known as false discovery) increases, which can lead to incorrect conclusions.

Given the many relationships between costs and key characteristics examined in Chapter 6, the findings from multivariate analyses should be considered exploratory and interpreted with caution. There is one exception to this rule: the multivariate analysis for this report tested the confirmatory hypothesis that healthier NSLP lunches cost more. This hypothesis was designated in advance as confirmatory so that results of statistical tests of this relationship could be considered without adjustment for the many other statistical tests conducted on an exploratory basis. In addition, it is important to understand that significant associations do not imply causality. Given the cross-sectional design of this study, it is not possible to conclusively attribute associations observed between key characteristics in the five domains and the cost outcome of interest to the characteristic's influence on the outcome.

Appendix D presents the regression coefficient estimates and their standard errors for all outcomes and domains of covariates used in the analysis, corresponding with the regression-adjusted means presented in Chapter 6. The coefficient estimates and standard errors for all models include the institutional and demographic control variables, for which regression-adjusted means are not reported in tables for other domains.

B. Variable Selection and Exclusion

For each of the five domains identified above, the initial set of characteristics considered for inclusion in multivariate analyses consisted of relevant variables gathered from the Menu Survey, Principal Survey, School Nutrition Manager Survey, Cafeteria Observation Guide, A la Carte Checklist, Vending Machine and Other Sources of Foods and Beverages Checklist, School Food Authority Director Survey, School Nutrition Manager Cost Interview, School Principal Cost Interview, and SFA Director and Business Manager Cost Interviews (Onsite and Follow-Up) (see Chapter 1), as well as SFA and school characteristics from Common Core of Data (CCD) 2011–2012, the U.S. Census Bureau's 2011 Small Area Income and Poverty Estimates school district file, and the Food and Nutrition Service's SFA Verification Summary Report 2012–2013.

To facilitate comparisons and syntheses across analyses, the definitions of domains and the selection of the characteristics within these domains for the school-level models were based on the domains and characteristics used in the models of NSLP and SBP meal quality reported in Volume 2 of the SNMCS final report (Gearan et al. 2019), as discussed in Chapter 6. Potential characteristics related to the school food environment, school foodservice operations and other SFA operations were selected if they had the potential to affect the costs of operating the NSLP and SBP and the associated revenues, and to assure that the analysis addressed all research questions for the cost analysis.

Continuous and categorical variables were then transformed to exhibit appropriate variation given the distribution of values across sample schools. For example, in 75 percent of sampled schools, all daily menus met the relaxed requirement that at least half of all grains must be whole grain-rich. For such cases, categorical variables were created to compare the large proportion of schools taking on one value (in this case, 100 percent of daily menus) with observations taking on lower or higher values. This produced categorical-specific samples large enough to detect meaningful differences in outcome variables between schools in different categories of independent variables.

Among the list of variables considered for the multivariate analyses, a subset were excluded from each analysis for exhibiting (1) a high proportion of missing values, (2) low within-sample variation, or (3) high correlation with another variable that better explained variation in the outcome of interest. The details of how the study team determined variable exclusion criteria is presented in the following three subsections.

1. High Proportions of Missing Values

Multivariate analyses excluded variables originally missing values for at least 30 percent of the estimation sample. This includes both missing values stemming from non-response to a particular survey item and missing values reflecting partial overlap between schools in the Menu Survey sample and schools sampled for other instruments from which variables were drawn. Missing values were replaced with a value of zero and an indicator specific to the particular variable was constructed to flag observations with originally missing values. These indicators were included as variables in relevant multivariate analyses to control for unobservable factors associated with missing values that may also be correlated with the nutritional quality of school meals. This approach was used to minimize any influence of imputed values on results, while

retaining schools in the estimation sample if they were missing values for only a subset of variables. While none of the variables considered for the multivariate analysis of school meal costs were excluded due to missing values, the variable selection for this analysis began with the set of variables developed for other analyses, which had already applied this exclusion criterion.

2. No or Little Variation between Observations

Final models excluded dichotomous variables for which 95 percent or more of the sample was contained in one category. Similarly, categorical variables were excluded when 95 percent or more of the sample belonged to one category. When one or more categories contained 5 percent or less of the sample, the study team attempted to logically combine adjacent or similar categories to group more than 5 percent in each redefined category.

3. Highly Correlated Variables

Simultaneously including characteristics that are highly correlated in a linear regression can lead to issues of multicollinearity, resulting in models that cannot properly identify how these characteristics are related to the nutritional quality of school meals. To address this potential issue, the study team analyzed correlations for all pairwise combinations of independent variables originally considered for multivariate models. Beginning with pairs exhibiting the strongest correlations, the study team excluded the one variable from each having the weakest correlation with the reported cost per NSLP lunch (the focal outcome for this volume). This pairwise exclusion continued until no correlations greater than an absolute value of 0.7 remained among variables simultaneously included in a multivariate model. This method resulted in a number of indicators for missing values being dropped especially at the SFA level where missing SFA Director Surveys were the primary source of missing values.

Table B.1 lists the variables excluded from the models due to insufficient variation or high correlations with other variables.

Table B.1. Exclusions from NSLP and SBP Regression Analyses

		Outcome		
	Meal Type	Reported Cost per Meal	Full Cost per Meal	Revenue as a Percentage of Reported Cost
Key Characteristics of NSLP Lunches and SBP Breakfasts (School Level)				
Met Relaxed Requirement that at Least Half of Weekly Grains Are Whole Grain-Rich	SBP (*only*)	HC	HC	†
At Least One Daily Menu Offered Meat or Meat Alternate (as Separate Choice or as Part of an Entrée)	SBP (*only*)	LV	LV	†
Key Characteristics of School Foodservice Operations (School Level)				
School Participates in School Breakfast Program	SBP (*only*)	LV	LV	†
School Uses Offer-Versus-Serve at Lunch	NSLP (*only*)	HC	HC	†
Key Characteristics of School Foodservice Operations (SFA Level)				
SFA Uses Cycle Menus	*both*	HC	HC	HC
Other Operating Characteristics (SFA Level)				
Methods Used to Certify Students for Free and Reduced-Price Meals	*both*	LV	LV	LV

Note: Table presents variables that were initially considered for inclusion in each multivariate analysis, but were excluded due to low within-sample variation (LV), or because they were highly correlated (HC) with another included variable that better explained variation in the outcome of interest.

† = Revenue as a percentage of reported cost was available only at the SFA level and therefore not included in school-level analyses.

NSLP = National School Lunch Program. SBP = School Breakfast Program; SFA = school food authority.

APPENDIX C

SUPPLEMENTAL TABLES

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TABLES

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Table C.1. Mean Reported Cost per NSLP Lunch: School Level, SY 2014–2015

	Unit of Analysis is School			SFA Sample Size	
	Mean ($)	Median ($)	SE($)	Weighted	Unweighted
All Schools	**3.84**	**3.56**	**0.07**	**93,780**	**877**
School Type					
Elementary	3.72	3.46	0.08	56,889	326
Middle	3.90	3.59	0.10	16,828	286
High	4.13#	3.86	0.12	20,063	265
School Size					
Small (fewer than 500 students)	3.96*	3.63	0.11	46,205	339
Medium (500 to 999 students)	3.65†	3.41	0.09	36,798	354
Large (1,000 or more students)	3.99	3.90	0.10	10,777	184
Urbanicity					
Urban	3.79	3.38	0.17	20,508	161
Suburban	3.91	3.66	0.09	40,717	433
Rural	3.78	3.53	0.11	32,555	283

Source: School Nutrition and Meal Cost Study, Menu Survey, School Nutrition Manager Cost Interview, and SFA Director and Business Manager Cost Interviews (Onsite and Follow-Up), school year 2014–2015. Tabulations are weighted to be representative of all public, non-charter schools offering the NSLP.

Notes: Outliers were trimmed to avoid excessive influence on means. Reported cost per NSLP lunch was set to the 3rd percentile for 27 schools with cost per lunch at or below the 3rd percentile. Likewise, reported cost per NSLP lunch was set to the 97th percentile for 27 schools with cost per NSLP lunch at or above the 97th percentile.

Differences in medians were not tested for statistical significance.

* Difference between first and second subgroups is significantly different from zero at 0.05 level.

† Difference between second and third subgroups is significantly different from zero at the 0.05 level.

Difference between first and third subgroups is significantly different from zero at the 0.01 level.

NSLP = National School Lunch Program; SE = standard error of the mean; SFA = school food authority; SY = school year.

Table C.2. Mean Reported Cost per SBP Breakfast: School Level, SY 2014–2015

	Unit of Analysis is School			SFA Sample Size	
	Mean ($)	Median ($)	SE ($)	Weighted	Unweighted
All Schools	**2.65**	**2.30**	**0.08**	**88,704**	**815**
School Type					
Elementary	2.58*	2.24	0.09	54,265	301
Middle	2.85	2.50	0.11	15,789	266
High	2.71	2.31	0.11	18,650	248
School Size					
Small (fewer than 500 students)	2.80	2.38	0.11	43,093	307
Medium (500 to 999 students)	2.51	2.21	0.11	35,231	332
Large (1,000 or more students)	2.57	2.34	0.12	10,380	176
Urbanicity					
Urban	2.54	2.06	0.19	19,883	156
Suburban	2.67	2.33	0.10	38,366	397
Rural	2.71	2.38	0.11	30,455	262

Source: School Nutrition and Meal Cost Study, Menu Survey, School Nutrition Manager Cost Interview, and SFA Director and Business Manager Cost Interviews (Onsite and Follow-Up), school year 2014–2015. Tabulations are weighted to be representative of all public, non-charter schools offering the NSLP.

Notes: Estimates exclude 62 schools with no SBP. Outliers were trimmed to avoid excessive influence on means. Reported cost per SBP breakfast was set to the 3rd percentile for 25 schools with cost per SBP breakfast at or below the 3rd percentile. Likewise, reported cost per SBP breakfast was set to the 97th percentile for 25 schools with cost per SBP breakfast at or above the 97th percentile.

Differences in medians were not tested for statistical significance.

* Difference between first and second subgroups is significantly different from zero at the 0.05 level.

SBP = School Breakfast Program; SE = standard error of the mean; SFA = school food authority.

Table C.3. Mean Full Cost per NSLP Lunch: School Level, SY 2014–2015

	Unit of Analysis is School			SFA Sample Size	
	Mean ($)	Median ($)	SE ($)	Weighted	Unweighted
All Schools	**5.79**	**5.14**	**0.13**	**93,780**	**877**
School Type					
Elementary	5.65	5.05	0.15	56,889	326
Middle	5.83	5.04	0.17	16,828	286
High	6.18#	5.53	0.21	20,063	265
School Size					
Small (fewer than 500 students)	6.07*	5.45	0.19	46,205	339
Medium (500 to 999 students)	5.43	4.84	0.18	36,798	354
Large (1,000 or more students)	5.88	5.28	0.20	10,777	184
Urbanicity					
Urban	5.53	4.65	0.31	20,508	161
Suburban	5.84	5.28	0.17	40,717	433
Rural	5.89	5.18	0.20	32,555	283

Source: School Nutrition and Meal Cost Study, Menu Survey, School Nutrition Manager Cost Interview, School Principal Cost Interview, and SFA Director and Business Manager Cost Interviews (Onsite and Follow-Up), school year 2014–2015. Tabulations are weighted to be representative of all public, non-charter schools offering the NSLP.

Notes: Outliers were trimmed to avoid excessive influence on means. Full cost per NSLP lunch was set to the 3rd percentile for 24 schools with cost per lunch at or below the 3rd percentile. Likewise, full cost per NSLP lunch was set to the 97th percentile for 27 schools with cost per NSLP lunch at or above the 97th percentile.

Differences in medians were not tested for statistical significance.

* Difference between first and second subgroups is significantly different from zero at the 0.05 level.

Difference between first and third subgroups is significantly different from zero at the 0.05 level.

NSLP = National School Lunch Program; SE = standard error of the mean; SFA = school food authority.

Table C.4. Mean Full Cost per SBP Breakfast: School Level, SY 2014–2015

	Unit of Analysis is School			SFA Sample Size	
	Mean ($)	Median ($)	SE ($)	Weighted	Unweighted
All Schools	**3.93**	**3.35**	**0.13**	**88,704**	**815**
School Type					
Elementary	3.85	3.25	0.15	54,265	301
Middle	4.18	3.50	0.18	15,789	266
High	3.97	3.37	0.21	18,650	248
School Size					
Small (fewer than 500 students)	4.19	3.60	0.18	43,093	307
Medium (500 to 999 students)	3.67	2.92	0.20	35,231	332
Large (1,000 or more students)	3.74	3.22	0.19	10,380	176
Urbanicity					
Urban	3.70	2.72	0.32	19,883	156
Suburban	3.92	3.32	0.18	38,366	397
Rural	4.11	3.64	0.18	30,455	262

Source: School Nutrition and Meal Cost Study, Menu Survey, School Nutrition Manager Cost Interview, School Principal Cost Interview, and SFA Director and Business Manager Cost Interviews (Onsite and Follow-Up). school year 2014–2015. Tabulations are weighted to be representative of all public, non-charter schools offering the NSLP.

Notes: Estimates exclude 62 schools with no SBP. Outliers were trimmed to avoid excessive influence on means. Full cost per SBP breakfast was set to the 3rd percentile for 25 schools with cost per SBP breakfast at or below the 3rd percentile. Likewise, full cost per SBP breakfast was set to the 97th percentile for 25 schools with cost per SBP breakfast at or above the 97th percentile.

Differences in medians were not tested for statistical significance.

None of the differences in subgroup means was statistically significant.

SBP = School Breakfast Program; SE = standard error of the mean; SFA = school food authority.

Table C.5. Distribution of SFAs by Reported Cost per NSLP Lunch, SY 2014–2015

	Percentage of SFAs (Weighted)	Percentage of Lunches (Weighted)	Number of SFAs	
			Weighted	Unweighted
Reported Cost per NSLP Lunch ($)				
0.00 to 2.74	6.6 ^	<3	891	12
2.75 to 2.99	10.1	8.4 ^	1,376	21
3.00 to 3.24	11.7	19.9	1,585	39
3.25 to 3.49	15.0	19.0	2,044	50
3.50 to 3.74	14.2	16.2	1,927	47
3.75 to 3.99	13.1	12.0	1,778	33
4.00 to 4.24	8.6	8.4	1,166	31
4.25 to 4.49	7.4 ^	6.0 ^	1,006	15
4.50 to 4.74	<3	<3	231	5
4.75 or more	11.7	6.6	1,596	31
All SFAs	100.0	100.0	13,601	284
Reported Cost per NSLP Lunch Compared to Reimbursement Rate				
Below applicable reimbursement rate[a]	18.4	17.0	2,498	39
Below lower reimbursement rate[b]	18.3	16.0	2,487	38
Below higher reimbursement rate[c]	18.6	17.8	2,528	40

	Reported Cost per NSLP Lunch ($) Unit of Analysis is SFA	Reported Cost per NSLP Lunch ($) Unit of Analysis is NSLP Lunch
Mean	3.81	3.66
Standard error of mean	0.08	0.06
25th percentile	3.16	3.16
Median	3.63	3.49
75th percentile	4.12	3.92
Minimum	2.53	2.53
Maximum	7.02	7.02

Notes: Outliers were trimmed to avoid excessive influence on means. Reported cost per NSLP lunch was set to the 3rd percentile for nine SFAs with cost per lunch at or below the 3rd percentile. Likewise, reported cost per NSLP lunch was set to the 97th percentile for nine SFAs with cost per NSLP lunch at or above the 97th percentile.

[a]For each SFA, the applicable free NSLP lunch reimbursement rate was determined by one of two procedures. Where possible, the mean free lunch reimbursement rate for the SFA was computed as the weighted mean of the lower and higher reimbursement rates for free lunches, using counts of lunches claimed at the two rates. (See Table 1.1 for the reimbursement rates and the associated criteria.) Otherwise, if the SFA served 60 percent of NSLP lunches or more at free or reduced price, the SFA was assigned the higher rate, and SFAs with fewer than 60 percent of NSLP lunches served at free or reduced price were assigned the lower rate. The $.06 per meal performance-based reimbursement was added to the NSLP free lunch rate for SFAs certified to receive this additional reimbursement.

[b]The lower reimbursement rate is the regular free lunch rate without the $0.06 per meal performance-based reimbursement.

[c]The higher reimbursement rate is the high-need free lunch rate with the $0.06 per meal performance-based reimbursement.

^ Point estimate is considered less precise than estimates that are not flagged because the sample size is small or the coefficient of variation is large. The rules used in flagging estimates are described in Chapter 1. When these rules are applied, percentages close to 0 or 100 are often flagged. In this table, flagged percentages between 0 percent and 3 percent are displayed as <3.

NSLP = National School Lunch Program; SFA = school food authority.

Table C.6. Distribution of Schools by Reported Cost per NSLP Lunch, SY 2014–2015

	Percentage of Schools (Weighted)	Number of Schools	
		Weighted	Unweighted
Reported Cost per NSLP Lunch ($)			
0.00 to 2.74	10.2	9,581	80
2.75 to 2.99	9.3	8,724	70
3.00 to 3.24	13.3	12,449	93
3.25 to 3.49	13.7	12,868	116
3.50 to 3.74	13.5	12,647	116
3.75 to 3.99	10.9	10,211	94
4.00 to 4.24	6.6	6,184	70
4.25 to 4.49	4.2	3,937	58
4.50 to 4.74	4.7	4,383	46
4.75 or more	13.6	12,795	134
All Schools	100.0	93,780	877
Reported Cost per NSLP Lunch Compared to Reimbursement Rate			
Below applicable reimbursement rate[a]	22.1	20,709	166
Below lower reimbursement rate[b]	21.3	19,947	160
Below higher reimbursement rate[c]	22.4	21,037	167

	Reported Cost per NSLP Lunch ($)
Mean	3.84
Standard error of mean	0.07
25th percentile	3.12
Median	3.56
75th percentile	4.12
Minimum	2.38
Maximum	7.88

Notes: Outliers were trimmed to avoid excessive influence on means. Reported cost per NSLP lunch was set to the 3rd percentile for 27 schools with cost per NSLP lunch at or below the 3rd percentile. Likewise, reported cost per lunch was set to the 97th percentile for 27 schools with cost per NSLP lunch at or above the 97th percentile.

[a]For each SFA, the applicable free NSLP lunch reimbursement rate was determined by one of two procedures. Where possible, the mean free lunch reimbursement rate for the SFA was computed as the weighted mean of the lower and higher reimbursement rates for free lunches, using counts of lunches claimed at the two rates. (See Table 1.1 for the reimbursement rates and the associated criteria.) Otherwise, if the SFA served 60 percent of NSLP lunches or more at free or reduced price, the SFA was assigned the higher rate, and SFAs with fewer than 60 percent of NSLP lunches served at free or reduced price were assigned the lower rate. The $.06 per meal performance-based reimbursement was added to the NSLP free lunch rate for SFAs certified to receive this additional reimbursement.

[b]The lower reimbursement rate is the regular free lunch rate without the $0.06 per meal performance-based reimbursement.

[c]The higher reimbursement rate is the high-need free lunch rate with the $0.06 per meal performance-based reimbursement.

NSLP = National School Lunch Program; SFA = school food authority.

Table C.7. Distribution of SFAs by Reported Cost per SBP Breakfast, SY 2014–2015

	Percentage of SFAs (Weighted)	Percentage of Breakfasts (Weighted)	Number of SFAs	
			Weighted	Unweighted
Reported Cost per SBP Breakfast ($)				
0.00 to 1.99	25.2	36.6	3,226	69
2.00 to 2.24	17.2	19.9	2,200	49
2.25 to 2.49	8.8	11.2	1,130	32
2.50 to 2.74	14.8	10.5 ^	1,899	33
2.75 to 2.99	8.8	3.9 ^	1,124	21
3.00 to 3.24	5.9 ^	<3	761	13
3.25 to 3.49	3.0 ^	8.6 ^	386	10
3.50 to 3.74	<3	<3	220	6
3.75 to 3.99	3.4 ^	<3	432	10
4.00 or more	11.2	4.6 ^	1,428	27
All SFAs	100.0	100.0	12,805	270
Reported Cost per SBP Breakfast Compared to Reimbursement Rate				
Below applicable reimbursement rate[a]	22.8	34.2	2,919	63
Below regular reimbursement rate	7.7	15.2	987	23
Below severe-need reimbursement rate	22.8	34.2	2,919	63

	Reported Cost per SBP Breakfast ($) Unit of Analysis is SFA	Reported Cost per SBP Breakfast ($) Unit of Analysis is SBP Breakfast
Mean	2.72	2.34
Standard error of mean	0.10	0.08
25th percentile	1.98	1.74
Median	2.43	2.10
75th percentile	3.01	2.70
Minimum	1.41	1.41
Maximum	6.57	6.57

Notes: Estimates exclude 14 SFAs with no SBP. Outliers were trimmed to avoid excessive influence on means. Reported cost per SBP breakfast was set to the 3rd percentile for nine SFAs with cost per SBP breakfast at or below the 3rd percentile. Likewise, reported cost per breakfast was set to the 97th percentile for nine SFAs with cost per SBP breakfast at or above the 97th percentile.

[a]For each SFA, the applicable free SBP breakfast reimbursement rate was determined by one of two procedures. Where possible, the mean free reimbursement rate for the SFA was computed as the weighted mean of the rates for severe-need and regular free breakfasts, using counts of breakfasts claimed at the severe-need and regular rates. Otherwise, if the SFA served 40 percent of NSLP lunches or more at free or reduced price, the SFA was assigned the severe-need rate, and SFAs with fewer than 40 percent of NSLP lunches served at free or reduced price were assigned the regular rate.

^ Point estimate is considered less precise than estimates that are not flagged because the sample size is small or the coefficient of variation is large. The rules used in flagging estimates are described in Chapter 1. When these rules are applied, percentages close to 0 or 100 are often flagged. In this table, flagged percentages between 0 percent and 3 percent are displayed as <3.

SBP = School Breakfast Program; SFA = school food authority.

Table C.8. Distribution of Schools by Reported Cost per SBP Breakfast, SY 2014–2015

	Percentage of Schools (Weighted)	Number of Schools	
		Weighted	Unweighted
Reported Cost per SBP Breakfast ($)			
0.00 to 1.99	33.8	29,956	277
2.00 to 2.24	13.6	12,083	108
2.25 to 2.49	12.3	10,889	90
2.50 to 2.74	7.1	6,337	68
2.75 to 2.99	6.3	5,577	55
3.00 to 3.24	4.7	4,167	39
3.25 to 3.49	5.3	4,691	39
3.50 to 3.74	<3	2,561	24
3.75 to 3.99	<3	1,983	24
4.00 or more	11.8	10,460	91
All Schools	100.0	88,704	815
Reported Cost per SBP Breakfast Compared to Reimbursement Rate			
Below applicable reimbursement rate[a]	27.5	24,395	234
Below regular reimbursement rate	12.6	11,193	109
Below severe-need reimbursement rate	28.8	25,517	242

	Reported Cost per SBP Breakfast ($) Unit of Analysis is School
Mean	2.65
Standard error of mean	0.08
25th percentile	1.87
Median	2.30
75th percentile	3.11
Minimum	1.31
Maximum	6.89

Notes: Estimates exclude 62 schools with no SBP. Outliers were trimmed to avoid excessive influence on means. Reported cost per SBP breakfast was set to the 3rd percentile for 25 schools with cost per SBP breakfast at or below the 3rd percentile. Likewise, reported cost per SBP breakfast was set to the 97th percentile for 25 schools with cost per SBP breakfast at or above the 97th percentile.

[a]For each SFA, the applicable free SBP breakfast reimbursement rate was determined by one of two procedures. Where possible, the mean free reimbursement rate for the SFA was computed as the weighted mean of the rates for severe-need and regular free breakfasts, using counts of breakfasts claimed at the severe-need and regular rates. Otherwise, if the SFA served 40 percent of NSLP lunches or more at free or reduced price, the SFA was assigned the severe-need rate, and SFAs with fewer than 40 percent of NSLP lunches served at free or reduced price were assigned the regular rate.

<3 = Point estimate is considered less precise than estimates that are not flagged because the sample size is small or the coefficient of variation is large. The rules used in flagging estimates are described in Chapter 1. When these rules are applied, percentages close to 0 or 100 are often flagged. In this table, flagged percentages between 0 percent and 3 percent are displayed as <3.

SBP = School Breakfast Program; SFA = school food authority.

Table C.9. Distribution of SFAs by Full Cost per NSLP Lunch, SY 2014–2015

	Percentage of SFAs (Weighted)	Percentage of Lunches (Weighted)	Number of SFAs	
			Weighted	Unweighted
Full Cost per NSLP Lunch ($)				
0.00 to 3.99	6.5	7.9	885	21
4.00 to 4.49	12.6	15.6	1,715	37
4.50 to 4.99	17.8	16.1	2,415	48
5.00 to 5.49	13.0	20.6	1,766	49
5.50 to 5.99	8.6	11.6 ^	1,165	27
6.00 to 6.49	8.8	8.6	1,203	23
6.50 to 6.99	9.9	6.4	1,350	22
7.00 to 7.49	4.4 ^	<3	596	10
7.50 to 7.99	6.4 ^	3.7 ^	868	16
8.00 or more	12.0	7.0	1,639	31
All SFAs	100.0	100.0	13,601	284
Full Cost per NSLP Lunch Compared to Reimbursement Rate				
Below applicable reimbursement rate[a]	<3	<3	0	0
Below lower reimbursement rate[b]	<3	<3	0	0
Below higher reimbursement rate[c]	<3	<3	0	0

	Full Cost per NSLP Lunch ($) Unit of Analysis is SFA	Full Cost per NSLP Lunch ($) Unit of Analysis is NSLP Lunch
Mean	6.02	5.55
Standard error of mean	0.15	0.11
25th percentile	4.62	4.53
Median	5.50	5.27
75th percentile	6.83	6.05
Minimum	3.51	3.51
Maximum	11.84	11.84

Notes: Outliers were trimmed to avoid excessive influence on means. Full cost per NSLP lunch was set to the 3rd percentile for nine SFAs with cost per NSLP lunch at or below the 3rd percentile. Likewise, full cost per NSLP lunch was set to the 97th percentile for nine SFAs with cost per NSLP lunch at or above the 97th percentile.

[a]For each SFA, the applicable free NSLP lunch reimbursement rate was determined by one of two procedures. Where possible, the mean free lunch reimbursement rate for the SFA was computed as the weighted mean of the lower and higher reimbursement rates for free lunches, using counts of lunches claimed at the two rates. (See Table 1.1 for the reimbursement rates and the associated criteria.) Otherwise, if the SFA served 60 percent of NSLP lunches or more at free or reduced price, the SFA was assigned the higher rate, and SFAs with fewer than 60 percent of NSLP lunches served at free or reduced price were assigned the lower rate. The $.06 per meal performance-based reimbursement was added to the NSLP free lunch rate for SFAs certified to receive this additional reimbursement.

[b]The lower reimbursement rate is the regular free lunch rate without the $0.06 per meal performance-based reimbursement.

[c]The higher reimbursement rate is the high-need free lunch rate with the $0.06 per meal performance-based reimbursement.

^ Point estimate is considered less precise than estimates that are not flagged because the sample size is small or the coefficient of variation is large. The rules used in flagging estimates are described in Chapter 1. When these rules are applied, percentages close to 0 or 100 are often flagged. In this table, flagged percentages between 0 percent and 3 percent are displayed as <3.

NSLP = National School Lunch Program; SFA = school food authority.

Table C.10. Distribution of Schools by Full Cost per NSLP Lunch, SY 2014–2015

	Percentage of Schools (Weighted)	Number of Schools	
		Weighted	Unweighted
Full Cost per NSLP Lunch ($)			
0.00 to 3.99	14.9	13,991	123
4.00 to 4.49	15.2	14,227	128
4.50 to 4.99	15.9	14,935	140
5.00 to 5.49	11.4	10,714	115
5.50 to 5.99	10.7	10,012	83
6.00 to 6.49	6.4	5,984	65
6.50 to 6.99	5.1	4,773	48
7.00 to 7.49	5.0	4,720	39
7.50 to 7.99	3.6	3,397	29
8.00 or more	11.8	11,026	107
All SFAs	100.0	93,780	877
Full Cost per NSLP Lunch Compared to Reimbursement Rate			
Below applicable reimbursement rate[a]	<3	0	0
Below lower reimbursement rate[b]	<3	0	0
Below higher reimbursement rate[c]	<3	0	0

	Full Cost per NSLP Lunch ($) Unit of Analysis is School
Mean	5.79
Standard error of mean	0.13
25th percentile	4.38
Median	5.14
75th percentile	6.61
Minimum	3.24
Maximum	13.06

Notes: Outliers were trimmed to avoid excessive influence on means. Full cost per NSLP lunch was set to the 3rd percentile for 24 schools with cost per NSLP lunch at or below the 3rd percentile. Likewise, full cost per NSLP lunch was set to the 97th percentile for 27 schools with cost per NSLP lunch at or above the 97th percentile.

[a]For each SFA, the applicable free NSLP lunch reimbursement rate was determined by one of two procedures. Where possible, the mean free lunch reimbursement rate for the SFA was computed as the weighted mean of the lower and higher reimbursement rates for free lunches, using counts of lunches claimed at the two rates. (See Table 1.1 for the reimbursement rates and the associated criteria.) Otherwise, if the SFA served 60 percent of NSLP lunches or more at free or reduced price, the SFA was assigned the higher rate, and SFAs with fewer than 60 percent of NSLP lunches served at free or reduced price were assigned the lower rate. The $.06 per meal performance-based reimbursement was added to the NSLP free lunch rate for SFAs certified to receive this additional reimbursement.

[b]The lower reimbursement rate is the regular free lunch rate without the $0.06 per meal performance-based reimbursement.

[c]The higher reimbursement rate is the high-need free lunch rate with the $0.06 per meal performance-based reimbursement.

<3 = Point estimate is considered less precise than estimates that are not flagged because the sample size is small or the coefficient of variation is large. The rules used in flagging estimates are described in Chapter 1. When these rules are applied, percentages close to 0 or 100 are often flagged. In this table, flagged percentages between 0 percent and 3 percent are displayed as <3.

NSLP = National School Lunch Program; SFA = school food authority.

Table C.11. Unreported Cost as a Percentage of Full Cost per NSLP Lunch: SFA Level, SY 2014–2015

	Percentage of SFAs (Weighted)	Number of SFAs	
		Weighted	Unweighted
Unreported Cost as a Percentage of Full Cost (%)			
Less than 10	<3	28	3
10 to less than 20	12.5	1,707	34
20 to less than 30	26.5	3,600	86
30 to less than 40	33.1	4,502	93
40 to less than 50	16.1	2,194	47
50 more	11.5	1,570	21
All SFAs	100.0	13,601	284

	Unreported Cost as a Percentage of Full Cost (%)
Mean	34.4
Standard error of mean	1.1
25th percentile	26.3
Median	32.9
75th percentile	40.7
Minimum	8.2
Maximum	75.5

Source: School Nutrition and Meal Cost Study, Menu Survey, School Nutrition Manager Cost Interview, School Principal Cost Interview, and SFA Director and Business Manager Cost Interviews (Onsite and Follow-Up), school year 2014–2015. Tabulations are weighted to be representative of all public SFAs offering the National School Lunch Program.

Notes: Outliers were trimmed to avoid excessive influence on means. Unreported cost per NSLP lunch was calculated using trimmed values of reported and full cost per NSLP lunch. Full cost per NSLP lunch was set to the 3rd percentile for nine SFAs with cost per NSLP lunch at or below the 3rd percentile. Likewise, full cost per NSLP lunch was set to the 97th percentile for nine SFAs with cost per NSLP lunch at or above the 97th percentile.

<3 = Point estimate is considered less precise than estimates that are not flagged because the sample size is small or the coefficient of variation is large. The rules used in flagging estimates are described in Chapter 1. When these rules are applied, percentages close to 0 or 100 are often flagged. In this table, flagged percentages between 0 percent and 3 percent are displayed as <3.

NSLP = National School Lunch Program; SFA = school food authority.

Table C.12. Distribution of SFAs by Full Cost per SBP Breakfast, SY 2014–2015

	Percentage of SFAs (Weighted)	Percentage of Breakfasts (Weighted)	Number of SFAs	
			Weighted	Unweighted
Full Cost per SBP Breakfast ($)				
0.00 to 1.99	4.3 ^	9.3 ^	546	14
2.00 to 2.49	11.2	14.4	1,429	31
2.50 to 2.99	13.9	27.0	1,774	53
3.00 to 3.49	15.7	11.6	2,014	42
3.50 to 3.99	7.7	5.2	990	22
4.00 to 4.49	15.4	15.3	1,978	35
4.50 to 4.99	9.2	3.7 ^	1,184	18
5.00 to 5.49	6.5 ^	<3	835	12
5.50 to 5.99	3.8 ^	6.4 ^	486	8
6.00 or more	12.3	5.7 ^	1,570	35
All SFAs	100.0	100.0	12,805	270
Full Cost per SBP Breakfast Compared to Reimbursement Rate				
Below applicable reimbursement rate[a]	4.0 ^	8.8 ^	513	13
Below regular reimbursement rate	<3	<3	0	0
Below severe-need reimbursement rate	4.0 ^	8.8 ^	513	13

	Full Cost per SBP Breakfast ($) Unit of Analysis is SFA	Full Cost per SBP Breakfast ($) Unit of Analysis is SBP Breakfast
Mean	4.19	3.50
Standard error of mean	0.15	0.17
25th percentile	2.90	2.52
Median	3.76	2.99
75th percentile	4.89	4.18
Minimum	1.83	1.83
Maximum	11.39	11.39

Notes: SBP estimates exclude 14 SFAs with no SBP. Outliers were trimmed to avoid excessive influence on means. Full cost per SBP breakfast was set to the 3rd percentile for 9 SFAs with cost per SBP breakfast at or below the 3rd percentile. Likewise, full cost per SBP breakfast was set to the 97th percentile for 9 SFAs with cost per SBP breakfast at or above the 97th percentile.

[a]For each SFA, the applicable free SBP breakfast reimbursement rate was determined by one of two procedures. Where possible, the mean free reimbursement rate for the SFA was computed as the weighted mean of the rates for severe-need and regular free breakfasts, using counts of breakfasts claimed at the severe-need and regular rates. Otherwise, if the SFA served 40 percent of NSLP lunches or more at free or reduced price, the SFA was assigned the severe-need rate, and SFAs with fewer than 40 percent of NSLP lunches served at free or reduced price were assigned the regular rate.

^ Point estimate is considered less precise than estimates that are not flagged because the sample size is small or the coefficient of variation is large. The rules used in flagging estimates are described in Chapter 1. When these rules are applied, percentages close to 0 or 100 are often flagged. In this table, flagged percentages between 0 percent and 3 percent are displayed as <3.

SBP = School Breakfast Program; SFA = school food authority.

Table C.13. Distribution of Schools by Full Cost per SBP Breakfast, SY 2014–2015

	Percentage of Schools (Weighted)	Number of Schools	
		Weighted	Unweighted
Full Cost per SBP Breakfast ($)			
0.00 to 1.99	8.0	7,097	72
2.00 to 2.49	15.7	13,938	140
2.50 to 2.99	18.2	16,179	132
3.00 to 3.49	11.3	10,034	102
3.50 to 3.99	13.0	11,513	102
4.00 to 4.49	8.4	7,436	64
4.50 to 4.99	4.7	4,187	48
5.00 to 5.49	4.4	3,916	33
5.50 to 5.99	3.6 ^	3,154	27
6.00 or more	12.7	11,249	95
All Schools	100.0	88,704	815
Full Cost per SBP Breakfast Compared to Reimbursement Rate			
Below applicable reimbursement rate[a]	6.6	5,870	55
Below regular reimbursement rate	<3	0	0
Below severe-need reimbursement rate	6.6	5,870	55

	Full Cost per SBP Breakfast ($) Unit of Analysis is School
Mean	3.93
Standard error of mean	0.13
25th percentile	2.52
Median	3.35
75th percentile	4.52
Minimum	1.72
Maximum	10.60

Notes: Estimates exclude 62 schools with no SBP. Outliers were trimmed to avoid excessive influence on means. Full cost per SBP breakfast was set to the 3rd percentile for 25 schools with cost per SBP breakfast at or below the 3rd percentile. Likewise, full cost per SBP breakfast was set to the 97th percentile for 25 schools with cost per SBP breakfast at or above the 97th percentile.

[a]For each SFA, the applicable free SBP breakfast reimbursement rate was determined by one of two procedures. Where possible, the mean free reimbursement rate for the SFA was computed as the weighted mean of the rates for severe-need and regular free breakfasts, using counts of breakfasts claimed at the severe-need and regular rates. Otherwise, if the SFA served 40 percent of NSLP lunches or more at free or reduced price, the SFA was assigned the severe-need rate, and SFAs with fewer than 40 percent of NSLP lunches served at free or reduced price were assigned the regular rate.

^ Point estimate is considered less precise than estimates that are not flagged because the sample size is small or the coefficient of variation is large. The rules used in flagging estimates are described in Chapter 1. When these rules are applied, percentages close to 0 or 100 are often flagged. In this table, flagged percentages between 0 percent and 3 percent are displayed as <3.

SBP = School Breakfast Program; SFA = school food authority.

Table C.14. Unreported Cost as a Percentage of Full Cost of SBP Breakfasts: SFA Level, SY 2014–2015

	Percentage of SFAs (Weighted)	Number of SFAs	
		Weighted	Unweighted
Unreported Cost as a Percentage of Full Cost (%)			
Less than 10	<3	68	5
10 to less than 20	11.9	1,520	29
20 to less than 30	32.7	4,185	107
30 to less than 40	26.8	3,428	69
40 to less than 50	18.2	2,330	38
50 more	10.0	1,275	22
All SFAs	100.0	12,805	270

	Unreported Cost as a Percentage of Full Cost (%)
Mean	33.1
Standard error of mean	1.0
25th percentile	23.5
Median	32.2
75th percentile	42.0
Minimum	7.3
Maximum	64.9

Notes: Outliers were trimmed to avoid excessive influence on means. Reported cost per NSLP lunch was set to the 3rd percentile for nine SFAs with cost per lunch at or below the 3rd percentile. Likewise, reported cost per NSLP lunch was set to the 97th percentile for nine SFAs with cost per NSLP lunch at or above the 97th percentile.

<3 = Point estimate is considered less precise than estimates that are not flagged because the sample size is small or the coefficient of variation is large. The rules used in flagging estimates are described in Chapter 1. When these rules are applied, percentages close to 0 or 100 are often flagged. In this table, flagged percentages between 0 percent and 3 percent are displayed as <3.

SBP = School Breakfast Program; SFA = school food authority.

Table C.15. Percentage of SFAs by Percentage of Schools Eligible for Severe Need Rates for SBP and Schools Eligible for Higher Payment Rates for NSLP, SY 2014–2015

	Percentage of SFAs (Weighted)	Number of SFAs	
		Weighted	Unweighted
SBP Breakfast			
Percentage of SFAs with no schools eligible for severe need rates for SBP Breakfast	12.1	1,549	26
Percentage of SFAs with some but not all schools eligible for severe need rates for SBP Breakfast	17.6	2,255	82
Percentage of SFAs with all schools eligible for severe need rates for SBP Breakfast	70.3	9,001	162
NSLP Lunch			
Percentage of SFAs with no schools eligible for higher payment rates for NSLP Lunch	46.7	6,354	121
Percentage of SFAs with some but not all schools eligible for higher payment rates for NSLP Lunch	<3	115	3
Percentage of SFAs with all schools eligible for higher payment rates for NSLP Lunch	52.4	7,131	160

Source: Meal claims data for SY 2014–2015 provided by the Food and Nutrition Service, USDA.

<3 = Point estimate is considered less precise than estimates that are not flagged because the sample size is small or the coefficient of variation is large. The rules used in flagging estimates are described in Chapter 1. When these rules are applied, percentages close to 0 or 100 are often flagged. In this table, flagged percentages between 0 percent and 3 percent are displayed as <3.

NSLP = National School Lunch Program; SBP = School Breakfast Program; SFA = school food authority.

Table C.16. Distribution of SFAs by Total Revenues as a Percentage of Total Reported Costs

	Percentage of SFAs	Number of SFAs	
		Weighted	Unweighted
Total Revenues as a Percentage of Total Reported Cost (%)			
0 to less than 80	9.9 ^	1,348	14
80 to less than 85	<3	349	6
85 to less than 90	4.5 ^	614	13
90 to less than 95	14.3	1,943	30
95 to less than 100	24.3	3,303	52
100 to less than 105	22.5	3,067	54
105 to less than 110	10.2	1,383	27
110 percent or more	11.7	1,594	22
All SFAs	100.0	13,601	218

	Total Revenues as a Percentage of Total Reported Cost (%)
Mean	97.1
Standard error of mean	1.7
25th percentile	93.5
Median	99.3
75th percentile	104.4
Minimum	39.7
Maximum	154.7

Source: School Nutrition and Meal Cost Study, SFA Director and Business Manager Cost Interviews (Onsite and Follow-Up), SY 2014–2015. Tabulations are weighted to be representative of all public SFAs offering the National School Lunch Program.

Note: The revenue analysis sample includes the SFAs in the cost analysis sample with the following exceptions: excludes 11 SFAs with unreliable USDA reimbursements data, 1 SFA that did not provide any revenue data, and 54 SFAs that did not provide sufficient detail to determine the composition of revenues.

^ Point estimate is considered less precise than estimates that are not flagged because the sample size is small or the coefficient of variation is large. The rules used in flagging estimates are described in Chapter 1. When these rules are applied, percentages close to 0 or 100 are often flagged. In this table, flagged percentages between 0 percent and 3 percent are displayed as <3.

SFA = school food authority.

Table C.17. Total SFA Revenues Compared with Total Full Cost, SY 2014–2015

	Revenues as a Percentage of Total Full Cost			SFA Sample Size	
	Mean	Median	SE	Weighted	Unweighted
All SFAs	**64.2**	**65.5**	**1.4**	**13,601**	**218**
District Child Poverty Rate					
Lower (less than 20 percent)	63.9	65.5	1.8	7,269	122
Higher (20 percent or more)	64.5	64.1	2.2	6,332	96
SFA Size					
Fewer than 1,000 students	61.3	60.2	2.6	5,924	39[a]
1,000 to 5,000 students	65.9	67.4	1.7	5,660	96
More than 5,000 students	68.2[#]	68.9	1.4	2,017	83
SFA Urbanicity					
Urban	68.9	70.9	2.6	717	31[a]
Suburban	67.4[†]	68.4	1.4	5,421	116
Rural	61.5[#]	61.1	2.1	7,463	71

Source: School Nutrition and Meal Cost Study, Menu Survey, Principal Cost Interview, School Nutrition Manager Cost Interview, and SFA Director and Business Manager Cost Interviews (Onsite and Follow-Up), SY 2014–2015. Tabulations are weighted to be representative of all public SFAs offering the National School Lunch Program.

Notes: The revenue analysis sample includes the SFAs in the cost analysis sample with the following exceptions: Excludes 11 SFAs with unreliable USDA reimbursements data, one SFA that did not provide any revenue data, and 54 SFAs that did not provide sufficient detail to determine the composition of revenues.

Differences in medians were not tested for statistical significance.

[a]Estimates for small SFAs (n = 39) and urban SFAs (n = 31) may be unreliable due to the small sample for these groups (see discussion of statistical reporting standards for details).

† Difference between second and third subgroups is significantly different from zero at the 0.05 level.

[#] Difference between first and third subgroups is significantly different from zero at the 0.05 level.

SE = standard error of the mean; SFA = school food authority.

Table C.18. Comparison of Total Revenues as a Percentage of Total Reported Costs: SY 2005–2006, SY 2014–2015

	SY 2005–2006 Percentage of SFAs (Weighted)	SY 2014-15 Percentage of SFAs (Weighted)
Total Revenues as a Percentage of Total Reported Costs (%)		
0 to less than 80		9.9
80 to less than 85	9.7[a]	<3
85 to less than 90		4.5
90 to less than 95	11.1	14.3
95 to less than 100	20.0	24.3
100 to less than 105	37.9	22.5
105 to less than 110	13.0	10.2
110 percent or more	8.4	11.7
All SFAs	100.0	100.0
	Total Revenues as a Percentage of Total Reported Costs (%)	**Total Revenues as a Percentage of Total Reported Costs (%)**
Mean	100.8	97.1
Standard error of mean	1.1	1.7
25th percentile	n.a.	93.5
Median	101.5	99.3
75th percentile	n.a.	104.4
Minimum	n.a.	39.7
Maximum	n.a.	154.7

Source: School Nutrition and Meal Cost Study, SFA Director and Business Manager Cost Interviews (Onsite and Follow-Up), SY 2014–2015. Tabulations are weighted to be representative of all public SFAs offering the National School Lunch Program.

Note: The revenue analysis sample includes the SFAs in the cost analysis sample with the following exceptions: excludes 11 SFAs with unreliable USDA reimbursements data, 1 SFA that did not provide any revenue data, and 54 SFAs that did not provide sufficient detail to determine the composition of revenues.

[a] For SY 2005–2006, the lowest category reported was 0 percent to less than 90 percent.

<3 = Point estimate is considered less precise than estimates that are not flagged because the sample size is small or the coefficient of variation is large. The rules used in flagging estimates are described in Chapter 1. When these rules are applied, percentages close to 0 or 100 are often flagged. In this table, flagged percentages between 0 percent and 3 percent are displayed as <3.

n.a. = not available from published report; SFA = school food authority.

APPENDIX D

MULTIVARIATE ANALYSIS TABLES

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TABLES

Table D.1. Relationships between NSLP Meal Costs and Key Institutional and Demographic Characteristics of Schools and SFAs: Regression Coefficient Estimates for Reported and Full Cost per NSLP Lunch for Schools

	Regression Coefficient (Standard Error)	
	Unit of Analysis Is School	
	Reported Cost per NSLP Lunch ($)	Full Cost per NSLP Lunch ($)
SFA Size		
Fewer than 1,000 students (*reference category*)	-0-	-0-
More than 1,000 students	0.17	0.02
	(0.22)	(0.40)
SFA Type		
Single district (*reference category*)	-0-	-0-
Multi-district	-0.23	0.06
	(0.17)	(0.33)
School Size		
Fewer than 500 students (*reference category*)	-0-	-0-
500 to 999 students	-0.45**	-0.68**
	(0.15)	(0.26)
1,000 or more students	-0.34	-0.61
	(0.18)	(0.33)
School Type		
Elementary (reference category)	-0-	-0-
Middle	0.22*	0.25
	(0.10)	(0.17)
High	0.47**	0.56*
	(0.14)	(0.27)
FNS Region		
Mid-Atlantic (reference category)	-0-	-0-
Northeast	0.01	0.31
	(0.24)	(0.48)
Southeast	0.34	0.07
	(0.31)	(0.55)
Midwest	-0.32	-0.85*
	(0.22)	(0.41)
Southwest	-0.01	-0.19
	(0.33)	(0.58)
Mountain Plains	-0.09	-0.74
	(0.27)	(0.47)
Western	-0.29	-1.42***
	(0.18)	(0.34)

	Regression Coefficient (Standard Error)	
	Unit of Analysis Is School	
	Reported Cost per NSLP Lunch ($)	Full Cost per NSLP Lunch ($)
SFA Urbanicity		
Urban (reference category)	-0-	-0-
Suburban	0.14	0.28
	(0.18)	(0.33)
Rural	-0.07	0.23
	(0.20)	(0.37)
Share of Minority Students in SFA		
Less than 20 percent (*reference category*)	-0-	-0-
20 to 39 percent	0.38	0.47
	(0.20)	(0.34)
40 to 59 percent	0.10	0.56
	(0.17)	(0.31)
60 to 79 percent	-0.16	-0.26
	(0.20)	(0.33)
80 percent or more	0.40	0.85
	(0.35)	(0.61)
District Child Poverty Rate		
Lower (less than 20 percent) (*reference category)*	-0-	-0-
Higher (20 percent or more)	-0.09	-0.12
	(0.15)	(0.27)
Share of Students in School Approved for Free or Reduced-Price Meals		
Less than 40 percent (*reference category*)	-0-	-0-
40 percent or more	-0.42	-0.48
	(0.31)	(0.57)
Number of Schools	**876**	**876**

Source: School Nutrition and Meal Cost Study, School Nutrition Manager Cost Interview, School Principal Cost Interview, and SFA Director and Business Manager Cost Interviews (Onsite and Follow-Up), Menu Survey, School Food Authority Director Survey, Common Core of Data (CCD) 2011-2012, 2011 U.S. Census Bureau's Small Area Income and Poverty Estimates school district file, and Food and Nutrition Service's SFA Verification Summary Report 2012-2013, school year 2014–2015. Coefficient estimates are weighted to be representative of all public, non-charter schools offering the NSLP.

Notes: Outliers on cost measures were trimmed to avoid excessive influence on means. Cost measures at or below the 3rd percentile were set to the 3rd percentile, and measures at or above the 97th percentile were set to the 97th percentile,

Regression analysis was conducted at the school level. Standard errors are adjusted to account for clustering of schools within SFAs. Estimates are based on regression models that control for institutional and demographic characteristics of each school and their SFA. See Appendix B for more details on characteristic descriptions and selection methods.

Relationship between characteristic and the outcome listed in the column is significantly different from zero at the ***0.001 level, ** 0.01 level, or * 0.05 level.

-0- denotes omitted reference categories, for which coefficient estimates are not produced.

FNS = Food and Nutrition Service; NSLP = National School Lunch Program; SFA = school food authority.

Table D.2. Relationships between SBP Meal Costs and Institutional and Demographic Characteristics of Schools and SFAs: Regression Coefficient Estimates for Reported and Full Cost per SBP Breakfast for Schools

	Regression Coefficient (Standard Error)	
	Unit of Analysis Is School	
	Reported Cost per SBP Breakfast ($)	Full Cost per SBP Breakfast ($)
SFA Size		
Fewer than 1,000 students (*reference category*)	-0-	-0-
More than 1,000 students	0.23	-0.03
	(0.23)	(0.36)
SFA Type		
Single district (*reference category*)	-0-	-0-
Multi-district	-0.16	0.17
	(0.15)	(0.27)
School Size		
Fewer than 500 students (*reference category*)	-0-	-0-
500 to 999 students	-0.44**	-0.58*
	(0.15)	(0.26)
1,000 or more students	-0.49**	-0.70*
	(0.17)	(0.29)
School Type		
Elementary (reference category)	-0-	-0-
Middle	0.31***	0.39*
	(0.09)	(0.17)
High	0.22	0.19
	(0.12)	(0.23)
FNS Region		
Mid-Atlantic (reference category)	-0-	-0-
Northeast	-0.06	-0.06
	(0.35)	(0.59)
Southeast	0.21	0.30
	(0.36)	(0.61)
Midwest	-0.42	-0.64
	(0.28)	(0.54)
Southwest	-0.07	-0.36
	(0.35)	(0.57)
Mountain Plains	-0.22	-0.51
	(0.30)	(0.54)
Western	-0.27	-1.05*
	(0.23)	(0.45)
SFA Urbanicity		
Urban (reference category)	-0-	-0-

	Regression Coefficient (Standard Error)	
	Unit of Analysis Is School	
	Reported Cost per SBP Breakfast ($)	Full Cost per SBP Breakfast ($)
Suburban	-0.04	-0.20
	(0.19)	(0.32)
Rural	0.00	-0.05
	(0.22)	(0.36)
Share of Minority Students in SFA		
Less than 20 percent (*reference category*)	-0-	-0-
20 to 39 percent	0.28	0.52
	(0.23)	(0.38)
40 to 59 percent	-0.01	0.34
	(0.22)	(0.43)
60 to 79 percent	-0.23	-0.28
	(0.24)	(0.37)
80 percent or more	0.34	0.64
	(0.36)	(0.56)
District Child Poverty Rate		
Lower (less than 20 percent) (*reference category)*	-0-	-0-
Higher (20 percent or more)	-0.49**	-1.00***
	(0.17)	(0.27)
Share of Students in School Approved for Free or Reduced-Price Meals		
Less than 40 percent (*reference category*)	-0-	-0-
40 percent or more	-0.44	-0.22
	(0.29)	(0.47)
Number of Schools	**814**	**814**

Source: School Nutrition and Meal Cost Study, School Nutrition Manager Cost Interview, School Principal Cost Interview, and SFA Director and Business Manager Cost Interviews (Onsite and Follow-Up), Menu Survey, School Food Authority Director Survey, Common Core of Data (CCD) 2011-2012, 2011 U.S. Census Bureau's Small Area Income and Poverty Estimates school district file, and Food and Nutrition Service's SFA Verification Summary Report 2012-2013, school year 2014–2015. Coefficient estimates are weighted to be representative of all public, non-charter schools offering the NSLP.

Notes: Outliers on cost measures were trimmed to avoid excessive influence on means. Cost measures at or below the 3rd percentile were set to the 3rd percentile, and measures at or above the 97th percentile were set to the 97th percentile,

Regression analysis was conducted at the school level. Standard errors are adjusted to account for clustering of schools within SFAs. Estimates are based on regression models that control for institutional and demographic characteristics of each school and their SFA. See Appendix B for more details on characteristic descriptions and selection methods.

Relationship between characteristic and the outcome listed in the column is significantly different from zero at the ***0.001 level, ** 0.01 level, or * 0.05 level.

-0- denotes omitted reference categories, for which coefficient estimates are not produced.

FNS = Food and Nutrition Service; SBP = School Breakfast Program; SFA = school food authority.

Table D.3. Relationships between NSLP Meal Costs and Revenues and Key Institutional and Demographic Characteristics of SFAs: Regression Coefficient Estimates for Reported and Full Cost per NSLP Lunch

	Regression Coefficient (Standard Error)	
	Unit of Analysis Is SFA	
	Reported Cost per NSLP Lunch ($)	Full Cost per NSLP Lunch ($)
SFA Size		
Fewer than 1,000 students (*reference category*)	-0-	-0-
More than 1,000 students	-0.01	0.05
	(0.18)	(0.36)
SFA Type		
Single district (*reference category*)	-0-	-0-
Multi-district	-0.38	0.03
	(0.20)	(0.38)
FNS Region		
Mid-Atlantic (reference category)	-0-	-0-
Northeast	-0.36	-0.42
	(0.33)	(0.83)
Southeast	-0.05	-0.85
	(0.39)	(0.79)
Midwest	-0.74*	-1.56*
	(0.35)	(0.71)
Southwest	-0.47	-1.60*
	(0.34)	(0.68)
Mountain Plains	-0.57	-1.68*
	(0.37)	(0.76)
Western	-0.93**	-2.75***
	(0.29)	(0.61)
SFA Urbanicity		
Urban/suburban (reference category)	-0-	-0-
Rural	-0.09	0.38
	(0.15)	(0.31)
Share of Minority Students in SFA		
Less than 20 percent (*reference category*)	-0-	-0-
20 to 39 percent	0.28	0.31
	(0.21)	(0.38)
40 to 59 percent	0.40	0.62
	(0.25)	(0.38)
60 to 79 percent	-0.34	-0.01
	(0.21)	(0.48)

	Regression Coefficient (Standard Error)	
	Unit of Analysis Is SFA	
	Reported Cost per NSLP Lunch ($)	Full Cost per NSLP Lunch ($)
80 percent or more	0.40	0.81
	(0.31)	(0.61)
District Child Poverty Rate		
Lower (less than 20 percent) (*reference category)*	-0-	-0-
Higher (20 percent or more)	-0.23	-0.07
	(0.17)	(0.37)
Share of Students in SFA Approved for Free or Reduced-Price Meals		
Less than 40 percent (*reference category*)	-0-	-0-
40 percent or more	0.09	-0.02
	(0.15)	(0.31)
Number of SFAs	**284**	**284**

Source: School Nutrition and Meal Cost Study, School Nutrition Manager Cost Interview, School Principal Cost Interview, and SFA Director and Business Manager Cost Interviews (Onsite and Follow-Up), Menu Survey, School Food Authority Director Survey, Common Core of Data (CCD) 2011-2012, 2011 U.S. Census Bureau's Small Area Income and Poverty Estimates school district file, and Food and Nutrition Service's SFA Verification Summary Report 2012-2013, school year 2014–2015. Coefficient estimates are weighted to be representative of all public SFAs offering the National School Lunch Program.

Notes: Outliers on cost measures were trimmed to avoid excessive influence on means. Cost measures at or below the 3rd percentile were set to the 3rd percentile, and measures at or above the 97th percentile were set to the 97th percentile,

Regression analysis was conducted at the SFA level. Estimates are based on regression models that control for institutional and demographic characteristics of each school and their SFA. See Appendix B for more details on characteristic descriptions and selection methods.

Relationship between characteristic and the outcome listed in the column is significantly different from zero at the ***0.001 level, ** 0.01 level, or * 0.05 level.

-0- denotes omitted reference categories, for which coefficient estimates are not produced.

FNS = Food and Nutrition Service; NSLP = National School Lunch Program; SFA = school food authority.

Table D.4. Relationships between SBP Meal Costs and Revenues and Key Institutional and Demographic Characteristics of SFAs: Regression Coefficient Estimates for Reported and Full Cost per SBP Breakfast

	Regression Coefficient (Standard Error)	
	Unit of Analysis Is SFA	
	Reported Cost per SBP Breakfast ($)	Full Cost per SBP Breakfast ($)
SFA Size		
Fewer than 1,000 students (*reference category*)	-0-	-0-
More than 1,000 students	-0.06	-0.26
	(0.26)	(0.41)
SFA Type		
Single district (*reference category*)	-0-	-0-
Multi-district	-0.30	-0.02
	(0.26)	(0.35)
FNS Region		
Mid-Atlantic (reference category)	-0-	-0-
Northeast	0.09	0.46
	(0.34)	(0.63)
Southeast	0.24	0.28
	(0.33)	(0.54)
Midwest	-0.27	-0.26
	(0.24)	(0.45)
Southwest	0.01	-0.20
	(0.28)	(0.45)
Mountain Plains	0.15	0.37
	(0.34)	(0.62)
Western	-0.21	-0.76
	(0.23)	(0.41)
SFA Urbanicity		
Urban/suburban (reference category)	-0-	-0-
Rural	0.06	0.19
	(0.19)	(0.31)
Share of Minority Students in SFA		
Less than 20 percent (*reference category*)	-0-	-0-
20 to 39 percent	0.33	0.60
	(0.23)	(0.36)
40 to 59 percent	0.17	0.38
	(0.28)	(0.48)
60 to 79 percent	-0.29	-0.15
	(0.24)	(0.38)

	Regression Coefficient (Standard Error)	
	Unit of Analysis Is SFA	
	Reported Cost per SBP Breakfast ($)	Full Cost per SBP Breakfast ($)
80 percent or more	0.22	0.43
	(0.27)	(0.42)
District Child Poverty Rate		
Lower (less than 20 percent) (*reference category*)	-0-	-0-
Higher (20 percent or more)	-0.31*	-0.43
	(0.15)	(0.26)
Share of Students Approved for Free or Reduced-Price Meals		
Less than 40 percent (*reference category*)	-0-	-0-
40 percent or more	-0.76***	-1.52***
	(0.20)	(0.35)
Number of SFAs	**270**	**270**

Source: School Nutrition and Meal Cost Study, School Nutrition Manager Cost Interview, School Principal Cost Interview, and SFA Director and Business Manager Cost Interviews (Onsite and Follow-Up), Menu Survey, School Food Authority Director Survey, Common Core of Data (CCD) 2011-2012, 2011 U.S. Census Bureau's Small Area Income and Poverty Estimates school district file, and Food and Nutrition Service's SFA Verification Summary Report 2012-2013, school year 2014–2015. Coefficient estimates are weighted to be representative of all public SFAs offering the National School Lunch Program.

Notes: Outliers on cost measures were trimmed to avoid excessive influence on means. Cost measures at or below the 3rd percentile were set to the 3rd percentile, and measures at or above the 97th percentile were set to the 97th percentile,

Regression analysis was conducted at the SFA level. Estimates are based on regression models that control for institutional and demographic characteristics of each school and their SFA. See Appendix B for more details on characteristic descriptions and selection methods.

Relationship between characteristic and the outcome listed in the column is significantly different from zero at the ***0.001 level or * 0.05 level.

-0- denotes omitted reference categories, for which coefficient estimates are not produced.

FNS = Food and Nutrition Service; SBP = School Breakfast Program; SFA = school food authority.

Table D.5. Relationships between NSLP Meal Costs and Key Characteristics of NSLP School Lunches: Regression Coefficient Estimates for Reported and Full Cost per NSLP Lunch for Schools

	Regression Coefficient (Standard Error)	
	Unit of Analysis Is School	
	Reported Cost per NSLP Lunch ($)	Full Cost per NSLP Lunch ($)
Overall Nutritional Quality of NSLP Lunches Prepared		
Total HEI-2010 Score of Average Lunch Prepared		
Lowest Quartile—60.5 to 78.9 points (*reference category*)	-0-	-0-
Second Quartile—79.0 to 81.9 points	-0.07	-0.08
	(0.13)	(0.23)
Third Quartile—82.0 to 85.1 points	-0.02	-0.05
	(0.18)	(0.31)
Highest Quartile—85.2 to 97.9 points	0.06	-0.08
	(0.15)	(0.28)
Compliance of Daily and Weekly Lunch Menus with NSLP Nutrition Standards		
Met Daily Quantity Requirement for Meats/Meat Alternates	-0.17	-0.11
	(0.16)	(0.31)
Met Weekly Quantity Requirement for Meats/Meat Alternates	0.17	0.27
	(0.10)	(0.20)
Met Daily Quantity Requirement for Vegetables	-0.08	0.08
	(0.15)	(0.28)
Met Weekly Quantity Requirement for Vegetables	0.11	-0.17
	(0.17)	(0.32)
Met Daily Quantity Requirement for Grains	-0.06	-0.03
	(0.14)	(0.24)
Met Relaxed Requirement that at Least Half of Weekly Grains Are Whole Grain-Rich	0.30*	0.18
	(0.14)	(0.25)
Met Minimum Calorie Level	-0.16	-0.03
	(0.13)	(0.22)
Met Maximum Calorie Level	-0.50***	-0.33
	(0.13)	(0.20)
Met Target 1 Sodium Limit	-0.03	-0.11
	(0.14)	(0.21)

	Regression Coefficient (Standard Error)	
	Unit of Analysis Is School	
	Reported Cost per NSLP Lunch ($)	Full Cost per NSLP Lunch ($)
Types of Foods Offered in Lunch Menus		
All Daily Menus Offered Raw Vegetables	0.05 (0.15)	0.27 (0.27)
Median Number of Vegetable Choices Offered per Day		
Less than 2 (reference category)	-0-	-0-
2	0.16 (0.15)	-0.03 (0.30)
3 to 4	0.38 (0.21)	0.20 (0.41)
5 or more	0.30 (0.27)	-0.29 (0.51)
More than Half of Daily Menus Offered Dark Green Vegetables or Legumes	0.02 (0.15)	0.31 (0.26)
More than Half of Daily Menus Offered Red and Orange Vegetables	-0.23 (0.15)	-0.35 (0.27)
At Least One Daily Menu Offered Side Salad Bar or Entrée Salad Bar	0.23 (0.14)	0.52* (0.25)
More than Half of Daily Menus Offered Pizza or Pizza Products	-0.22 (0.14)	-0.29 (0.29)
At Least One Daily Menu Offered Breaded Meat (as Separate Choice or as Part of a Sandwich)	0.23 (0.14)	0.44 (0.25)
No Daily Menus Offered French Fries or Similar Potato Products	-0.06 (0.12)	-0.19 (0.21)
Institutional and Demographic Characteristics of Schools and SFAs		
SFA Size		
Fewer than 1,000 students (*reference category*)	-0-	-0-
More than 1,000 students	-0.12 (0.14)	-0.28 (0.25)
SFA Type		
Single district (*reference category*)	-0-	-0-
Multi-district	-0.15 (0.16)	0.10 (0.32)
School Size		
Fewer than 500 students (*reference category*)	-0-	-0-
500 to 999 students	-0.33* (0.15)	-0.56* (0.27)
1,000 or more students	-0.17 (0.17)	-0.32 (0.31)

	Regression Coefficient (Standard Error)	
	Unit of Analysis Is School	
	Reported Cost per NSLP Lunch ($)	Full Cost per NSLP Lunch ($)
School Type		
Elementary (reference category)	-0-	-0-
Middle	0.18	0.16
	(0.11)	(0.20)
High	0.28	0.20
	(0.18)	(0.31)
FNS Region		
Mid-Atlantic (reference category)	-0-	-0-
Northeast	-0.04	0.22
	(0.24)	(0.46)
Southeast	0.24	-0.14
	(0.26)	(0.47)
Midwest	-0.38	-1.01**
	(0.21)	(0.38)
Southwest	-0.04	-0.28
	(0.33)	(0.58)
Mountain Plains	-0.28	-1.07*
	(0.25)	(0.42)
Western	-0.29	-1.46***
	(0.18)	(0.35)
School Urbanicity		
Urban (reference category)	-0-	-0-
Suburban	0.06	0.16
	(0.18)	(0.33)
Rural	-0.24	0.01
	(0.19)	(0.36)
Share of Minority Students in SFA		
Less than 20 percent (*reference category*)	-0-	-0-
20 to 39 percent	0.35	0.44
	(0.18)	(0.31)
40 to 59 percent	0.26	0.73*
	(0.17)	(0.33)
60 to 79 percent	-0.01	0.02
	(0.19)	(0.31)
80 percent or more	0.51	0.93
	(0.33)	(0.56)

	Regression Coefficient (Standard Error)	
	Unit of Analysis Is School	
	Reported Cost per NSLP Lunch ($)	Full Cost per NSLP Lunch ($)
District Child Poverty Rate		
Lower (less than 20 percent) (*reference category*)	-0-	-0-
Higher (20 percent or more)	-0.10	-0.08
	(0.15)	(0.27)
Share of Students in School Approved for Free or Reduced-Price Meals		
Less than 40 percent (*reference category*)	-0-	-0-
40 percent or more	-0.34	-0.30
	(0.26)	(0.50)
Number of Schools	**876**	**876**

Source: School Nutrition and Meal Cost Study, School Nutrition Manager Cost Interview, School Principal Cost Interview, and SFA Director and Business Manager Cost Interviews (Onsite and Follow-Up), Menu Survey, school year 2014–2015. Coefficient estimates are weighted to be representative of all public, non-charter schools offering the NSLP.

Notes: Outliers on cost measures were trimmed to avoid excessive influence on means. Cost measures at or below the 3rd percentile were set to the 3rd percentile, and measures at or above the 97th percentile were set to the 97th percentile,

Regression analysis was conducted at the school level. Standard errors are adjusted to account for clustering of schools within SFAs. Estimates are based on regression models that control for institutional and demographic characteristics of each school and their SFA. See Appendix B for more details on characteristic descriptions and selection methods.

Relationship between characteristic and the outcome listed in the column is significantly different from zero at the ***0.001 level, ** 0.01 level, or * 0.05 level.

-0- denotes omitted reference categories, for which coefficient estimates are not produced.

FNS = Food and Nutrition Service; HEI = Healthy Eating Index; NSLP = National School Lunch Program; SFA = school food authority.

Table D.6. Relationships between SBP Meal Costs and Key Characteristics of SBP Breakfasts: Regression Coefficient Estimates for Reported and Full Cost per SBP Breakfast for Schools

	Regression Coefficient (Standard Error)	
	Unit of Analysis Is School	
	Reported Cost per SBP Breakfast ($)	Full Cost per SBP Breakfast ($)
Overall Nutritional Quality of SBP Breakfast Prepared		
Total HEI-2010 Score of Average Breakfast Prepared		
Lowest Quartile—50.5 to 67.7 points (*reference category*)	-0-	-0-
Second Quartile—67.8 to 71.3 points	-0.12	0.03
	(0.18)	(0.31)
Third Quartile—71.4 to 74.6 points	-0.23	-0.36
	(0.21)	(0.33)
Highest Quartile—74.7 to 87.2 points	-0.34	-0.57
	(0.19)	(0.31)
Compliance of Daily and Weekly Breakfast Menus with SBP Nutrition Standards		
Met Daily Quantity Requirement for Grains	-0.04	0.15
	(0.12)	(0.22)
Met Minimum Calorie Level	0.53***	0.91***
	(0.15)	(0.24)
Met Maximum Calorie Level	-0.60***	-0.73**
	(0.13)	(0.27)
Met Target 1 Sodium Limit	-0.09	-0.04
	(0.14)	(0.29)
Types of Foods Offered in Breakfast Menus		
All Daily Menus Offered Cold Cereal	-0.16	-0.24
	(0.13)	(0.22)
More than Half of Daily Menus Offered Breakfast Pastries or Muffins	-0.14	-0.48*
	(0.12)	(0.21)
At Least One Daily Menu Offered Pizza or Pizza Products	0.22	0.27
	(0.14)	(0.24)
No Daily Menus Offered French Fries or Similar Potato Products	0.05	0.04
	(0.14)	(0.24)
Institutional and Demographic Characteristics of Schools and SFAs		
SFA Size		
Fewer than 1,000 students (*reference category*)	-0-	-0-
More than 1,000 students	0.02	-0.03
	(0.16)	(0.28)

	Regression Coefficient (Standard Error)	
	Unit of Analysis Is School	
	Reported Cost per SBP Breakfast ($)	Full Cost per SBP Breakfast ($)
SFA Type		
Single district (*reference category*)	-0-	-0-
Multi-district	-0.13	0.16
	(0.15)	(0.26)
School Size		
Fewer than 500 students (*reference category*)	-0-	-0-
500 to 999 students	-0.34*	-0.50*
	(0.14)	(0.24)
1,000 or more students	-0.36*	-0.55*
	(0.16)	(0.28)
School Type		
Elementary (reference category)	-0-	-0-
Middle	0.37***	0.54***
	(0.09)	(0.16)
High	0.40***	0.53*
	(0.11)	(0.25)
FNS Region		
Mid-Atlantic (reference category)	-0-	-0-
Northeast	-0.05	-0.04
	(0.34)	(0.57)
Southeast	0.12	0.19
	(0.31)	(0.55)
Midwest	-0.27	-0.48
	(0.26)	(0.52)
Southwest	-0.08	-0.47
	(0.37)	(0.61)
Mountain Plains	-0.32	-0.62
	(0.28)	(0.54)
Western	-0.08	-0.72
	(0.24)	(0.48)
School Urbanicity		
Urban (reference category)	-0-	-0-
Suburban	-0.14	-0.35
	(0.20)	(0.35)
Rural	-0.12	-0.18
	(0.20)	(0.35)

	Regression Coefficient (Standard Error)	
	Unit of Analysis Is School	
	Reported Cost per SBP Breakfast ($)	Full Cost per SBP Breakfast ($)
Share of Minority Students in SFA		
Less than 20 percent (*reference category*)	-0-	-0-
20 to 39 percent	0.21	0.36
	(0.22)	(0.36)
40 to 59 percent	-0.04	0.24
	(0.22)	(0.42)
60 to 79 percent	-0.09	-0.16
	(0.24)	(0.38)
80 percent or more	0.36	0.58
	(0.35)	(0.54)
District Child Poverty Rate		
Lower (less than 20 percent) (*reference category*)	-0-	-0-
Higher (20 percent or more)	-0.48**	-1.00***
	(0.16)	(0.27)
Share of Students in School Approved for Free or Reduced-Price Meals		
Less than 40 percent (*reference category*)	-0-	-0-
40 percent or more	-0.36	-0.02
	(0.28)	(0.46)
Number of Schools	**814**	**814**

Source: School Nutrition and Meal Cost Study, School Nutrition Manager Cost Interview, School Principal Cost Interview, and SFA Director and Business Manager Cost Interviews (Onsite and Follow-Up), Menu Survey, school year 2014–2015. Coefficient estimates are weighted to be representative of all public, non-charter schools offering the NSLP.

Notes: Outliers on cost measures were trimmed to avoid excessive influence on means. Cost measures at or below the 3rd percentile were set to the 3rd percentile, and measures at or above the 97th percentile were set to the 97th percentile,

Regression analysis was conducted at the school level. Standard errors are adjusted to account for clustering of schools within SFAs. Estimates are based on regression models that control for institutional and demographic characteristics of each school and their SFA. See Appendix B for more details on characteristic descriptions and selection methods.

Relationship between characteristic and the outcome listed in the column is significantly different from zero at the ***0.001 level, ** 0.01 level, or * 0.05 level.

-0- denotes omitted reference categories, for which coefficient estimates are not produced.

FNS = Food and Nutrition Service; HEI = Healthy Eating Index; SBP = School Breakfast Program; SFA = school food authority.

Table D.7. Relationships between NSLP Meal Costs and Key Characteristics of the School Food Environment: Regression Coefficient Estimates for Reported and Full Cost per NSLP Lunch for Schools

	Regression Coefficient (Standard Error)	
	Unit of Analysis Is School	
	Reported Cost per NSLP Lunch ($)	Full Cost per NSLP Lunch ($)
Wellness Policies and Practices		
SFA Has Nutrition Standards for School Meals that Exceed Federal Standards	0.03	0.09
	(0.13)	(0.23)
SFA Has Plan for Informing Public About Wellness Policy Content and Implementation	-0.21	-0.06
	(0.15)	(0.25)
School Has School-Level Wellness Policy in Addition to District Wellness Policy	0.11	0.17
	(0.13)	(0.23)
SFA Wellness Policy Includes Nutrition Promotion	0.14	0.35
	(0.16)	(0.28)
School Conducted a Nutrition Education Activity in the Classroom or Foodservice Area	0.14	0.31
	(0.11)	(0.20)
School Operates a School Garden	0.10	-0.08
	(0.15)	(0.28)
Competitive Foods		
School Does Not Sell Competitive Foods during Mealtimes	0.71*	1.13*
	(0.29)	(0.50)
School Sells Foods Other than Milk on an A la Carte Basis	0.06	-0.06
	(0.15)	(0.26)
School Sells Foods and Beverages in Vending Machine	-0.13	-0.06
	(0.14)	(0.23)
School Sells Foods and Beverages in School Store and/or Snack Bar	0.29	0.35
	(0.16)	(0.26)
SFA Has Standards for Competitive Foods that Exceed Smart Snacks in Schools Standards	0.06	0.24
	(0.13)	(0.22)
Meal Schedules and Service		
Length of Lunch Period		
Less than 30 minutes (*reference category*)	-0-	-0-
30 to 44 minutes	0.08	-0.08
	(0.13)	(0.23)
45 minutes or more	-0.09	-0.21
	(0.16)	(0.29)
School Has Other Activities Scheduled during Lunch Period	-0.10	-0.36
	(0.11)	(0.18)

	Regression Coefficient (Standard Error)	
	Unit of Analysis Is School	
	Reported Cost per NSLP Lunch ($)	Full Cost per NSLP Lunch ($)
School Has More than One Line or Station that Offers Reimbursable Lunches or Components of Reimbursable Lunches	-0.07 (0.12)	0.04 (0.21)
Institutional and Demographic Characteristics of Schools and SFAs		
SFA Size		
Fewer than 1,000 students (*reference category*)	-0-	-0-
More than 1,000 students	-0.22 (0.13)	-0.40 (0.23)
SFA Type		
Single district (*reference category*)	-0-	-0-
Multi-district	-0.19 (0.16)	-0.01 (0.29)
School Size		
Fewer than 500 students (*reference category*)	-0-	-0-
500 to 999 students	-0.31* (0.13)	-0.57* (0.23)
1,000 or more students	-0.15 (0.16)	-0.48 (0.30)
School Type		
Elementary (reference category)	-0-	-0-
Middle	0.31** (0.12)	0.47* (0.20)
High	0.57** (0.17)	0.75* (0.34)
FNS Region		
Mid-Atlantic (reference category)	-0-	-0-
Northeast	0.08 (0.26)	0.35 (0.51)
Southeast	0.38 (0.29)	-0.02 (0.49)
Midwest	-0.32 (0.23)	-0.93* (0.41)
Southwest	-0.09 (0.30)	-0.37 (0.53)
Mountain Plains	-0.09 (0.28)	-0.82 (0.49)
Western	-0.28 (0.18)	-1.40*** (0.34)

	Regression Coefficient (Standard Error)	
	Unit of Analysis Is School	
	Reported Cost per NSLP Lunch ($)	Full Cost per NSLP Lunch ($)
SFA Urbanicity		
Urban (reference category)	-0-	-0-
Suburban	0.13	0.21
	(0.18)	(0.34)
Rural	-0.16	0.14
	(0.18)	(0.35)
Share of Minority Students in SFA		
Less than 20 percent (*reference category*)	-0-	-0-
20 to 39 percent	0.39	0.53
	(0.20)	(0.34)
40 to 59 percent	0.17	0.65*
	(0.17)	(0.32)
60 to 79 percent	-0.15	-0.23
	(0.21)	(0.35)
80 percent or more	0.34	0.80
	(0.30)	(0.53)
District Child Poverty Rate		
Lower (less than 20 percent) (*reference category*)	-0-	-0-
Higher (20 percent or more)	-0.10	-0.16
	(0.14)	(0.26)
Share of Students in School Approved for Free or Reduced-Price Meals		
Less than 40 percent (*reference category*)	-0-	-0-
40 percent or more	-0.57	-0.73
	(0.30)	(0.57)
Number of Schools	**876**	**876**

Source: School Nutrition and Meal Cost Study, School Nutrition Manager Cost Interview, School Principal Cost Interview, and SFA Director and Business Manager Cost Interviews (Onsite and Follow-Up), Menu Survey, School Food Authority Director Survey, School Nutrition Manager Survey, Principal Survey, Vending Machine and Other Sources of Foods and Beverages Checklist, A la Carte Checklist, and Cafeteria Observation Guide, school year 2014–2015. Coefficient estimates are weighted to be representative of all public, non-charter schools offering the NSLP.

Notes: Outliers on cost measures were trimmed to avoid excessive influence on means. Cost measures at or below the 3rd percentile were set to the 3rd percentile, and measures at or above the 97th percentile were set to the 97th percentile,

Regression analysis was conducted at the school level. Standard errors are adjusted to account for clustering of schools within SFAs. Estimates are based on regression models that control for institutional and demographic characteristics of each school and their SFA. See Appendix B for more details on characteristic descriptions and selection methods.

Relationship between characteristic and the outcome listed in the column is significantly different from zero at the ***0.001 level, ** 0.01 level, or * 0.05 level.

-0- denotes omitted reference categories, for which coefficient estimates are not produced.

FNS = Food and Nutrition Service; NSLP = National School Lunch Program; SFA = school food authority.

Table D.8. Relationships between SBP Meal Costs and Key Characteristics of the School Food Environment: Regression Coefficient Estimates for Reported and Full Cost per SBP Breakfast for Schools

	Regression Coefficient (Standard Error)	
	Unit of Analysis Is School	
	Reported Cost per SBP Breakfast ($)	Full Cost per SBP Breakfast ($)
Wellness Policies and Practices		
SFA Has Nutrition Standards for School Meals that Exceed Federal Standards	0.26 (0.14)	0.40 (0.23)
SFA Has Plan for Informing Public About Wellness Policy Content and Implementation	-0.29 (0.17)	-0.34 (0.30)
School Has School-Level Wellness Policy in Addition to District Wellness Policy	-0.09 (0.12)	-0.15 (0.23)
SFA Wellness Policy Includes Nutrition Promotion	0.11 (0.20)	0.17 (0.33)
School Conducted a Nutrition Education Activity in the Classroom or Foodservice Area	0.22 (0.13)	0.50* (0.21)
School Operates a School Garden	0.28 (0.38)	0.37 (0.63)
Competitive Foods		
School Sells Foods Other than Milk on an A la Carte Basis	-0.08 (0.14)	-0.29 (0.27)
School Sells Foods and Beverages in Vending Machine	-0.08 (0.12)	-0.20 (0.24)
School Sells Foods and Beverages in School Store and/or Snack Bar	-0.07 (0.14)	-0.08 (0.24)
Meal Schedules and Service		
Length of Breakfast Period		
Less than 25 minutes (*reference category*)	-0-	-0-
25 to 39 minutes	0.21 (0.15)	0.43 (0.24)
40 minutes or more	-0.13 (0.18)	-0.12 (0.27)
First Bus Arrives before or at Same Time as Breakfast	0.01 (0.15)	-0.15 (0.25)
Last Bus Arrives before or at Same Time as Breakfast	-0.11 (0.18)	-0.02 (0.30)

	Regression Coefficient (Standard Error)	
	Unit of Analysis Is School	
	Reported Cost per SBP Breakfast ($)	Full Cost per SBP Breakfast ($)
Institutional and Demographic Characteristics of Schools and SFAs		
SFA Size		
Fewer than 1,000 students (*reference category*)	-0-	-0-
More than 1,000 students	-0.00 (0.15)	-0.06 (0.25)
SFA Type		
Single district (*reference category*)	-0-	-0-
Multi-district	-0.11 (0.15)	0.18 (0.27)
School Size		
Fewer than 500 students (*reference category*)	-0-	-0-
500 to 999 students	-0.38** (0.14)	-0.53* (0.23)
1,000 or more students	-0.38* (0.17)	-0.58* (0.28)
School Type		
Elementary (reference category)	-0-	-0-
Middle	0.39*** (0.10)	0.58** (0.20)
High	0.33* (0.14)	0.47 (0.33)
FNS Region		
Mid-Atlantic (reference category)	-0-	-0-
Northeast	0.13 (0.33)	0.20 (0.54)
Southeast	0.32 (0.33)	0.41 (0.53)
Midwest	-0.31 (0.27)	-0.53 (0.48)
Southwest	-0.07 (0.32)	-0.40 (0.52)
Mountain Plains	-0.10 (0.29)	-0.36 (0.51)
Western	-0.22 (0.22)	-1.04* (0.40)

	Regression Coefficient (Standard Error)	
	Unit of Analysis Is School	
	Reported Cost per SBP Breakfast ($)	Full Cost per SBP Breakfast ($)
SFA Urbanicity		
Urban (reference category)	-0-	-0-
Suburban	0.02	-0.08
	(0.18)	(0.32)
Rural	0.03	0.11
	(0.19)	(0.33)
Share of Minority Students in SFA		
Less than 20 percent (*reference category*)	-0-	-0-
20 to 39 percent	0.33	0.59
	(0.24)	(0.38)
40 to 59 percent	0.12	0.54
	(0.22)	(0.43)
60 to 79 percent	-0.17	-0.21
	(0.25)	(0.39)
80 percent or more	0.32	0.61
	(0.33)	(0.52)
District Child Poverty Rate		
Lower (less than 20 percent) (*reference category*)	-0-	-0-
Higher (20 percent or more)	-0.50**	-0.99***
	(0.16)	(0.26)
Share of Students in School Approved for Free or Reduced-Price Meals		
Less than 40 percent (*reference category*)	-0-	-0-
40 percent or more	-0.39	-0.08
	(0.31)	(0.48)
Number of Schools	**814**	**814**

Source: School Nutrition and Meal Cost Study, School Nutrition Manager Cost Interview, School Principal Cost Interview, and SFA Director and Business Manager Cost Interviews (Onsite and Follow-Up), Menu Survey, School Food Authority Director Survey, School Nutrition Manager Survey, Principal Survey, Vending Machine and Other Sources of Foods and Beverages Checklist, A la Carte Checklist, and Cafeteria Observation Guide, school year 2014–2015. Coefficient estimates are weighted to be representative of all public, non-charter schools offering the NSLP.

Notes: Outliers on cost measures were trimmed to avoid excessive influence on means. Cost measures at or below the 3rd percentile were set to the 3rd percentile, and measures at or above the 97th percentile were set to the 97th percentile,

Regression analysis was conducted at the school level. Standard errors are adjusted to account for clustering of schools within SFAs. Estimates are based on regression models that control for institutional and demographic characteristics of each school and their SFA. See Appendix B for more details on characteristic descriptions and selection methods.

Relationship between characteristic and the outcome listed in the column is significantly different from zero at the ***0.001 level, ** 0.01 level, or * 0.05 level.

-0- denotes omitted reference categories, for which coefficient estimates are not produced.

FNS = Food and Nutrition Service; SBP = School Breakfast Program; SFA = school food authority.

Table D.9. Relationships between NSLP Meal Costs and Key Characteristics of School Foodservice Operations: Regression Coefficient Estimates for Reported and Full Cost per NSLP Lunch for Schools

	Regression Coefficient (Standard Error)	
	Unit of Analysis Is School	
	Reported Cost per NSLP Lunch ($)	Full Cost per NSLP Lunch ($)
Characteristics of the School Meal Programs		
School Participates in the Fresh Fruit and Vegetable Program	0.32 (0.19)	0.32 (0.33)
School Provides Afterschool Snacks or Suppers	-0.15 (0.16)	-0.21 (0.28)
School Participates in Farm to School Program	-0.06 (0.15)	0.09 (0.28)
Meal Service Characteristics		
School Receives Fully or Partially Prepared Meals from a Separate Production or Central Kitchen	0.05 (0.22)	0.43 (0.41)
School Has Policies and Procedures for Accommodating Students with Food Allergies or Special Dietary Needs	0.45* (0.19)	0.63 (0.35)
Number of Healthier US School Challenge Smarter Lunchroom Techniques Used		
Zero (reference category)	-0-	-0-
1	-0.05 (0.21)	0.02 (0.36)
2 to 3	-0.01 (0.21)	0.11 (0.36)
4 to 7	-0.13 (0.26)	-0.11 (0.44)
Price Charged for Paid Lunches		
School Offered Free Lunch to All Students	0.22 (0.25)	0.63 (0.44)
$2.25 or less (*reference category*)	-0-	-0-
$2.26 to $2.50	0.02 (0.17)	0.36 (0.31)
$2.51 to $2.75	-0.05 (0.16)	0.40 (0.30)
More than $2.75	0.16 (0.25)	0.89* (0.39)

	Regression Coefficient (Standard Error)	
	Unit of Analysis Is School	
	Reported Cost per NSLP Lunch ($)	Full Cost per NSLP Lunch ($)
Institutional and Demographic Characteristics of Schools and SFAs		
SFA Size		
Fewer than 1,000 students (*reference category*)	-0-	-0-
More than 1,000 students	-0.32*	-0.60*
	(0.14)	(0.26)
SFA Type		
Single district (*reference category*)	-0-	-0-
Multi-district	-0.22	0.04
	(0.17)	(0.32)
School Size		
Fewer than 500 students (*reference category*)	-0-	-0-
500 to 999 students	-0.34**	-0.52*
	(0.13)	(0.24)
1,000 or more students	-0.17	-0.34
	(0.16)	(0.30)
School Type		
Elementary (reference category)	-0-	-0-
Middle	0.25	0.17
	(0.13)	(0.22)
High	0.49***	0.42
	(0.14)	(0.25)
FNS Region		
Mid-Atlantic (reference category)	-0-	-0-
Northeast	-0.09	0.19
	(0.26)	(0.49)
Southeast	0.45	0.25
	(0.31)	(0.54)
Midwest	-0.40	-0.91*
	(0.22)	(0.39)
Southwest	-0.05	-0.14
	(0.31)	(0.55)
Mountain Plains	-0.21	-0.78
	(0.25)	(0.43)
Western	-0.24	-1.43***
	(0.20)	(0.38)

	Regression Coefficient (Standard Error)	
	Unit of Analysis Is School	
	Reported Cost per NSLP Lunch ($)	Full Cost per NSLP Lunch ($)
SFA Urbanicity		
Urban (reference category)	-0-	-0-
Suburban	0.10	0.22
	(0.18)	(0.32)
Rural	-0.21	0.09
	(0.18)	(0.34)
Share of Minority Students in SFA		
Less than 20 percent (*reference category*)	-0-	-0-
20 to 39 percent	0.38	0.43
	(0.21)	(0.36)
40 to 59 percent	0.16	0.56
	(0.19)	(0.35)
60 to 79 percent	-0.13	-0.28
	(0.22)	(0.37)
80 percent or more	0.54	1.01
	(0.32)	(0.56)
District Child Poverty Rate		
Lower (less than 20 percent) (*reference category)*	-0-	-0-
Higher (20 percent or more)	-0.23	-0.22
	(0.15)	(0.27)
Share of Students in School Approved for Free or Reduced-Price Meals		
Less than 40 percent (*reference category*)	-0-	-0-
40 percent or more	-0.35	-0.37
	(0.31)	(0.59)
Number of Schools	**876**	**876**

Source: School Nutrition and Meal Cost Study, School Nutrition Manager Cost Interview, School Principal Cost Interview, and SFA Director and Business Manager Cost Interviews (Onsite and Follow-Up), Menu Survey, School Food Authority Director Survey, School Nutrition Manager Survey, and Cafeteria Observation Guide, school year 2014–2015. Coefficient estimates are weighted to be representative of all public, non-charter schools offering the NSLP.

Notes: Outliers on cost measures were trimmed to avoid excessive influence on means. Cost measures at or below the 3rd percentile were set to the 3rd percentile, and measures at or above the 97th percentile were set to the 97th percentile,

Regression analysis was conducted at the school level. Standard errors are adjusted to account for clustering of schools within SFAs. Estimates are based on regression models that control for institutional and demographic characteristics of each school and their SFA. See Appendix B for more details on characteristic descriptions and selection methods.

Relationship between characteristic and the outcome listed in the column is significantly different from zero at the ***0.001 level, ** 0.01 level, or * 0.05 level.

-0- denotes omitted reference categories, for which coefficient estimates are not produced.

FNS = Food and Nutrition Service; NSLP = National School Lunch Program; SFA = school food authority.

Table D.10. Relationships between SBP Meal Costs and Key Characteristics of School Foodservice Operations: Regression Coefficient Estimates for Reported and Full Cost per SBP Breakfast for Schools

	Regression Coefficient (Standard Error)	
	Unit of Analysis Is School	
	Reported Cost per SBP Breakfast ($)	Full Cost per SBP Breakfast ($)
Characteristics of the School Meal Programs		
School Participates in the Fresh Fruit and Vegetable Program	0.11 (0.21)	-0.09 (0.34)
School Provides Afterschool Snacks or Suppers	-0.28 (0.17)	-0.53* (0.26)
School Participates in Farm to School Program	-0.21 (0.15)	-0.27 (0.26)
School Offers Grab-and-Go Option at Breakfast	-0.08 (0.14)	-0.23 (0.24)
Students Have Option of Eating Breakfast in the Classroom	-0.51** (0.16)	-0.72** (0.26)
Menu Service Characteristics		
School Receives Fully or Partially Prepared Meals from a Separate Production or Central Kitchen	0.19 (0.18)	0.57 (0.38)
School Uses Offer-Versus-Serve at Breakfast	0.01 (0.19)	0.16 (0.29)
School Has Policies and Procedures for Accommodating Students with Food Allergies or Special Dietary Needs	0.24 (0.18)	0.40 (0.29)
Number of Healthier US School Challenge Smarter Lunchroom Techniques Used		
Zero (reference category)	-0-	-0-
1	-0.19 (0.19)	-0.34 (0.29)
2 to 3	-0.15 (0.19)	-0.12 (0.31)
4 to 7	-0.10 (0.29)	-0.08 (0.44)
Price Charged for Paid Breakfasts		
School Offered Free Breakfast to All Students	-0.03 (0.21)	0.00 (0.34)
Less than $1.25 (*reference category*)	-0-	-0-
$1.25 or $1.49	0.11 (0.21)	0.12 (0.35)
$1.50 to $1.99	0.15 (0.19)	0.30 (0.32)

	Regression Coefficient (Standard Error)	
	Unit of Analysis Is School	
	Reported Cost per SBP Breakfast ($)	Full Cost per SBP Breakfast ($)
$2.00 or more	0.51	1.54*
	(0.31)	(0.75)
Institutional and Demographic Characteristics of Schools and SFAs		
SFA Size		
Fewer than 1,000 students (*reference category*)	-0-	-0-
More than 1,000 students	0.06	0.01
	(0.17)	(0.29)
SFA Type		
Single district (*reference category*)	-0-	-0-
Multi-district	-0.11	0.22
	(0.14)	(0.25)
School Size		
Fewer than 500 students (*reference category*)	-0-	-0-
500 to 999 students	-0.42**	-0.63**
	(0.13)	(0.23)
1,000 or more students	-0.54**	-0.86**
	(0.18)	(0.32)
School Type		
Elementary (reference category)	-0-	-0-
Middle	0.26*	0.19
	(0.12)	(0.21)
High	0.18	0.02
	(0.14)	(0.24)
FNS Region		
Mid-Atlantic (reference category)	-0-	-0-
Northeast	-0.01	0.04
	(0.33)	(0.53)
Southeast	0.28	0.38
	(0.37)	(0.60)
Midwest	-0.46	-0.67
	(0.27)	(0.48)
Southwest	-0.18	-0.49
	(0.34)	(0.54)
Mountain Plains	-0.36	-0.57
	(0.28)	(0.49)
Western	-0.37	-1.25**
	(0.22)	(0.40)

	Regression Coefficient (Standard Error)	
	Unit of Analysis Is School	
	Reported Cost per SBP Breakfast ($)	Full Cost per SBP Breakfast ($)
SFA Urbanicity		
Urban (reference category)	-0-	-0-
Suburban	-0.07	-0.26
	(0.19)	(0.31)
Rural	-0.10	-0.09
	(0.20)	(0.32)
Share of Minority Students in SFA		
Less than 20 percent (*reference category*)	-0-	-0-
20 to 39 percent	0.23	0.42
	(0.24)	(0.38)
40 to 59 percent	-0.06	0.21
	(0.22)	(0.39)
60 to 79 percent	-0.18	-0.21
	(0.24)	(0.39)
80 percent or more	0.46	0.83
	(0.37)	(0.58)
District Child Poverty Rate		
Lower (less than 20 percent) (*reference category)*	-0-	-0-
Higher (20 percent or more)	-0.41*	-0.78**
	(0.16)	(0.27)
Share of Students in School Approved for Free or Reduced-Price Meals		
Less than 40 percent (*reference category*)	-0-	-0-
40 percent or more	-0.46	-0.29
	(0.30)	(0.45)
Number of Schools	**814**	**814**

Source: School Nutrition and Meal Cost Study, School Nutrition Manager Cost Interview, School Principal Cost Interview, and SFA Director and Business Manager Cost Interviews (Onsite and Follow-Up), Menu Survey, School Food Authority Director Survey, School Nutrition Manager Survey, and Cafeteria Observation Guide, school year 2014–2015. Coefficient estimates are weighted to be representative of all public, non-charter schools offering the NSLP.

Notes: Outliers on cost measures were trimmed to avoid excessive influence on means. Cost measures at or below the 3rd percentile were set to the 3rd percentile, and measures at or above the 97th percentile were set to the 97th percentile,

Regression analysis was conducted at the school level. Standard errors are adjusted to account for clustering of schools within SFAs. Estimates are based on regression models that control for institutional and demographic characteristics of each school and their SFA. See Appendix B for more details on characteristic descriptions and selection methods.

Relationship between characteristic and the outcome listed in the column is significantly different from zero at the ** 0.01 level or * 0.05 level.

-0- denotes omitted reference categories, for which coefficient estimates are not produced.

FNS = Food and Nutrition Service; SBP = School Breakfast Program; SFA = school food authority.

Table D.11. Relationships between NSLP Meal Costs and Revenues and Key Characteristics of School Foodservice Operations of SFAs: Regression Coefficient Estimates for Reported and Full Cost per NSLP Lunch

	Regression Coefficient (Standard Error)	
	Unit of Analysis Is SFA	
	Reported Cost per NSLP Lunch ($)	Full Cost per NSLP Lunch ($)
Food Purchasing Characteristics		
SFA Uses Alliance for a Healthier Generation or Other Similar Tools for Selecting and Purchasing Healthy Foods	-0.15 (0.11)	-0.46 (0.27)
SFA Participates in a Food Purchasing Cooperative	-0.03 (0.14)	0.02 (0.28)
SFA Is Engaged in a Pouring Rights Contract	-0.13 (0.16)	-0.07 (0.31)
Schools in SFA Offer Brand-Name or Chain Restaurant Foods	0.15 (0.21)	-0.07 (0.35)
SFA Uses a Foodservice Management Company	-0.29 (0.24)	0.06 (0.39)
SFA Purchases Fruits and Vegetables through the Department of Defense Fresh Program	0.19 (0.15)	0.14 (0.28)
Menu Planning Characteristics		
All Menus Are Planned at the SFA Level	0.20 (0.37)	0.99* (0.48)
SFA Conducts Nutrient Analysis of Menus	0.02 (0.15)	0.20 (0.33)
Number of Challenges in Meeting the Updated Nutrition Standards that SFA Rated as 3 or Higher on a Scale of 1 (Not a Challenge) to 5 (Significant Challenge)		
4 or less (reference category)	-0-	-0-
5 to 7	-0.02 (0.16)	0.19 (0.29)
8	-0.10 (0.17)	0.02 (0.31)
SFA Perception of New Meal Requirements' Helpfulness in Improving the Nutritional Quality of Meals		
Not at all helpful (*reference category*)	-0-	-0-
Somewhat helpful	0.07 (0.18)	0.40 (0.47)
Very helpful	-0.03 (0.19)	0.12 (0.47)

	Regression Coefficient (Standard Error)	
	Unit of Analysis Is SFA	
	Reported Cost per NSLP Lunch ($)	Full Cost per NSLP Lunch ($)
SFA was already improving the nutritional quality of meals prior to the new meal requirements	0.11 (0.21)	0.04 (0.47)
Institutional and Demographic Characteristics of Schools and SFAs		
SFA Size		
Fewer than 1,000 students (*reference* category)	-0-	-0-
More than 1,000 students	-0.01 (0.19)	-0.08 (0.38)
SFA Type		
Single district (*reference category*)	-0-	-0-
Multi-district	-0.29 (0.18)	-0.01 (0.33)
FNS Region		
Mid-Atlantic (reference category)	-0-	-0-
Northeast	-0.44 (0.32)	-0.50 (0.76)
Southeast	-0.07 (0.40)	-0.65 (0.79)
Midwest	-0.71* (0.35)	-1.50* (0.68)
Southwest	-0.57 (0.37)	-1.69* (0.68)
Mountain Plains	-0.63 (0.39)	-1.79* (0.73)
Western	-1.06*** (0.28)	-2.89*** (0.56)
SFA Urbanicity		
Urban/suburban (reference category)	-0-	-0-
Rural	-0.09 (0.16)	0.32 (0.31)

	Regression Coefficient (Standard Error)	
	Unit of Analysis Is SFA	
	Reported Cost per NSLP Lunch ($)	Full Cost per NSLP Lunch ($)
Share of Minority Students in SFA		
Less than 20 percent (*reference category*)	-0-	-0-
20 to 39 percent	0.29	0.36
	(0.21)	(0.40)
40 to 59 percent	0.37	0.55
	(0.22)	(0.36)
60 to 79 percent	-0.29	0.18
	(0.22)	(0.47)
80 percent or more	0.49	0.94
	(0.33)	(0.60)
District Child Poverty Rate		
Lower (less than 20 percent) (*reference category)*	-0-	-0-
Higher (20 percent or more)	-0.27	-0.14
	(0.17)	(0.36)
Share of Students in SFA Approved for Free or Reduced-Price Meals		
Less than 40 percent (*reference category*)	-0-	-0-
40 percent or more	0.10	-0.06
	(0.15)	(0.30)
Number of SFAs	**284**	**284**

Source: School Nutrition and Meal Cost Study, School Nutrition Manager Cost Interview, School Principal Cost Interview, and SFA Director and Business Manager Cost Interviews (Onsite and Follow-Up), Menu Survey, School Food Authority Director Survey, School Nutrition Manager Survey, and Cafeteria Observation Guide, school year 2014–2015. Coefficient estimates are weighted to be representative of all public SFAs offering the National School Lunch Program.

Notes: Outliers on cost measures were trimmed to avoid excessive influence on means. Cost measures at or below the 3rd percentile were set to the 3rd percentile, and measures at or above the 97th percentile were set to the 97th percentile,

Regression analysis was conducted at the SFA level. Estimates are based on regression models that control for institutional and demographic characteristics of each school and their SFA. See Appendix B for more details on characteristic descriptions and selection methods.

Relationship between characteristic and the outcome listed in the column is significantly different from zero at the ***0.001 level or * 0.05 level.

-0- denotes omitted reference categories, for which coefficient estimates are not produced.

FNS = Food and Nutrition Service; NSLP = National School Lunch Program; SFA = school food authority.

Table D.12. Relationships between SBP Meal Costs and Revenues and Key Characteristics of School Foodservice Operations of SFAs: Regression Coefficient Estimates for Reported and Full Cost per SBP Breakfast

	Regression Coefficient (Standard Error)	
	Unit of Analysis Is SFA	
	Reported Cost per SBP Breakfast ($)	Full Cost per SBP Breakfast ($)
Food Purchasing Characteristics		
SFA Uses Alliance for a Healthier Generation or Other Similar Tools for Selecting and Purchasing Healthy Foods	0.10 (0.16)	0.03 (0.30)
SFA Participates in a Food Purchasing Cooperative	0.01 (0.18)	0.10 (0.31)
SFA Is Engaged in a Pouring Rights Contract	-0.26 (0.16)	-0.27 (0.27)
Schools in SFA Offer Brand-Name or Chain Restaurant Foods	-0.05 (0.20)	-0.25 (0.28)
SFA Uses a Foodservice Management Company	-0.00 (0.28)	0.31 (0.43)
SFA Purchases Fruits and Vegetables through the Department of Defense Fresh Program	0.37* (0.17)	0.57* (0.27)
Menu Planning Characteristics		
All Menus Are Planned at the SFA Level	-0.56 (0.37)	-0.41 (0.37)
SFA Conducts Nutrient Analysis of Menus	0.02 (0.17)	0.08 (0.30)
Number of Challenges in Meeting the Updated Nutrition Standards that SFA Rated as 3 or Higher on a Scale of 1 (Not a Challenge) to 5 (Significant Challenge)		
4 or less (reference category)	-0-	-0-
5 to 7	-0.29 (0.20)	-0.49 (0.32)
8	-0.18 (0.26)	-0.17 (0.42)

	Regression Coefficient (Standard Error)	
	Unit of Analysis Is SFA	
	Reported Cost per SBP Breakfast ($)	Full Cost per SBP Breakfast ($)
SFA Perception of New Meal Requirements' Helpfulness in Improving the Nutritional Quality of Meals		
Not at all helpful (*reference category*)	-0-	-0-
Somewhat helpful	0.07	0.21
	(0.27)	(0.52)
Very helpful	-0.33	-0.57
	(0.29)	(0.54)
SFA was already improving the nutritional quality of meals prior to the new meal requirements	0.19	0.08
	(0.32)	(0.57)
Institutional and Demographic Characteristics of Schools and SFAs		
SFA Size		
Fewer than 1,000 students (*reference* category)	-0-	-0-
More than 1,000 students	0.05	-0.19
	(0.26)	(0.42)
SFA Type		
Single district (*reference category*)	-0-	-0-
Multi-district	-0.18	0.12
	(0.19)	(0.33)
FNS Region		
Mid-Atlantic (reference category)	-0-	-0-
Northeast	-0.07	0.16
	(0.37)	(0.67)
Southeast	0.07	0.17
	(0.32)	(0.51)
Midwest	-0.20	-0.21
	(0.26)	(0.45)
Southwest	-0.14	-0.43
	(0.29)	(0.45)
Mountain Plains	0.16	0.30
	(0.34)	(0.58)
Western	-0.26	-0.83
	(0.24)	(0.43)
SFA Urbanicity		
Urban/suburban (reference category)	-0-	-0-
Rural	0.17	0.30
	(0.20)	(0.32)

	Regression Coefficient (Standard Error)	
	Unit of Analysis Is SFA	
	Reported Cost per SBP Breakfast ($)	Full Cost per SBP Breakfast ($)
Share of Minority Students in SFA		
Less than 20 percent (*reference category*)	-0-	-0-
20 to 39 percent	0.37	0.65
	(0.24)	(0.39)
40 to 59 percent	0.14	0.30
	(0.28)	(0.44)
60 to 79 percent	-0.40	-0.26
	(0.25)	(0.40)
80 percent or more	0.26	0.53
	(0.27)	(0.45)
District Child Poverty Rate		
Lower (less than 20 percent) (*reference category*)	-0-	-0-
Higher (20 percent or more)	-0.27	-0.37
	(0.16)	(0.26)
Share of Students Approved for Free or Reduced-Price Meals		
Less than 40 percent (*reference category*)	-0-	-0-
40 percent or more	-0.73***	-1.50***
	(0.19)	(0.33)
Number of SFAs	**270**	**270**

Source: School Nutrition and Meal Cost Study, School Nutrition Manager Cost Interview, School Principal Cost Interview, and SFA Director and Business Manager Cost Interviews (Onsite and Follow-Up), Menu Survey, School Food Authority Director Survey, School Nutrition Manager Survey, and Cafeteria Observation Guide, school year 2014–2015. Coefficient estimates are weighted to be representative of all public SFAs offering the National School Lunch Program.

Notes: Outliers on cost measures were trimmed to avoid excessive influence on means. Cost measures at or below the 3rd percentile were set to the 3rd percentile, and measures at or above the 97th percentile were set to the 97th percentile,

Regression analysis was conducted at the SFA level. Estimates are based on regression models that control for institutional and demographic characteristics of each school and their SFA. See Appendix B for more details on characteristic descriptions and selection methods.

Relationship between characteristic and the outcome listed in the column is significantly different from zero at the ***0.001 level or * 0.05 level.

-0- denotes omitted reference categories, for which coefficient estimates are not produced.

FNS = Food and Nutrition Service; SBP = School Breakfast Program; SFA = school food authority.

Table D.13. Relationships between NSLP Meal Costs and Other Key Operating Characteristics of SFAs: Regression Coefficient Estimates for Reported and Full Cost per NSLP Lunch

	Regression Coefficient (Standard Error)	
	Unit of Analysis Is SFA	
	Reported Cost per NSLP Lunch ($)	Full Cost per NSLP Lunch ($)
Factors Considered in Pricing A la Carte Items		
Costs (food, labor, other direct or indirect)	0.07 (0.25)	1.00* (0.45)
Incentive for consumption of specific items or participation in reimbursable meal program	-0.02 (0.14)	0.05 (0.29)
Other factors (ease of payment, school principal, other, don't know)	0.32* (0.13)	0.36 (0.22)
No a la carte items sold in any school cafeteria	0.03 (0.33)	1.04* (0.52)
SFA Director Experience		
Fewer than 5 years (*reference category*)	-0-	-0-
5 to 9 years	0.28 (0.20)	0.33 (0.33)
10 to 16 years	0.12 (0.16)	0.33 (0.25)
17 years or more	-0.25 (0.17)	-0.14 (0.31)
Highest Level of Education Completed by SFA Director		
High school graduate or less than high school (*reference category*)	-0-	-0-
Some college, no degree	0.21 (0.16)	0.81* (0.38)
Associate's degree	-0.64** (0.22)	-1.03* (0.44)
Bachelor's degree	-0.39 (0.21)	-0.42 (0.39)
Master's degree	-0.16 (0.28)	-0.44 (0.54)
Graduate credits beyond a Master's degree or doctorate	0.19 (0.34)	0.01 (0.57)
SFA Director Has Degree in Field Related to Food and Nutrition or Public/School Administration	-0.02 (0.16)	0.42 (0.30)

	Regression Coefficient (Standard Error)	
	Unit of Analysis Is SFA	
	Reported Cost per NSLP Lunch ($)	Full Cost per NSLP Lunch ($)
SFA Director Credentials		
Licensed Nutritionist or Dietitian, or Registered Dietitian	0.10	0.30
	(0.20)	(0.40)
School Nutrition Association Certification Level 1, 2 or 3	-0.33*	-1.03***
	(0.13)	(0.26)
School Nutrition Specialist	0.44	0.08
	(0.27)	(0.49)
State foodservice certificate	0.03	-0.18
	(0.12)	(0.27)
Food safety certification	0.08	0.31
	(0.13)	(0.26)
Health department certification	0.00	0.18
	(0.15)	(0.36)
Other credentials	0.41*	-0.24
	(0.20)	(0.32)
None of the above	0.12	0.09
	(0.23)	(0.44)
Proportion of Full-Time SFA Employees Receiving Health Benefits		
None (reference category)	-0-	-0-
Some	-0.11	0.11
	(0.17)	(0.40)
Most	-0.33	-0.09
	(0.25)	(0.50)
All	0.13	0.63
	(0.17)	(0.42)
Sources of Funding for Capital Equipment Purchases and Repairs		
SFA budget	-0.28	-0.72
	(0.19)	(0.38)
USDA grant	-0.18	0.20
	(0.19)	(0.38)
State grant	-0.12	0.08
	(0.15)	(0.30)
Local education agency funds	-0.55**	-0.76*
	(0.20)	(0.35)
School funds	0.22	-0.21
	(0.15)	(0.29)
SFA Has Purchased New Equipment to Implement Updated Nutrition Standards for School Meals	0.27	0.11
	(0.15)	(0.24)

	Regression Coefficient (Standard Error)	
	Unit of Analysis Is SFA	
	Reported Cost per NSLP Lunch ($)	Full Cost per NSLP Lunch ($)
Institutional and Demographic Characteristics of Schools and SFAs		
SFA Size		
Fewer than 1,000 students (*reference category*)	-0-	-0-
More than 1,000 students	0.04	-0.03
	(0.24)	(0.48)
SFA Type		
Single district (*reference category*)	-0-	-0-
Multi-district	-0.14	-0.11
	(0.15)	(0.28)
FNS Region		
Mid-Atlantic (reference category)	-0-	-0-
Northeast	-0.09	-0.20
	(0.28)	(0.65)
Southeast	0.12	-0.76
	(0.35)	(0.71)
Midwest	-0.71**	-1.70**
	(0.26)	(0.59)
Southwest	-0.66*	-2.00***
	(0.26)	(0.58)
Mountain Plains	-0.58*	-1.63*
	(0.27)	(0.64)
Western	-0.85***	-2.61***
	(0.25)	(0.53)
SFA Urbanicity		
Urban/ suburban (*reference category*)	-0-	-0-
Rural	0.06	0.54
	(0.14)	(0.28)
Share of Minority Students in SFA		
Less than 20 percent (*reference category*)	-0-	-0-
20 to 39 percent	0.42*	0.50
	(0.19)	(0.37)
40 to 59 percent	0.49*	0.71*
	(0.23)	(0.36)
60 to 79 percent	-0.21	0.14
	(0.21)	(0.45)
80 percent or more	0.49	0.98
	(0.31)	(0.56)

	Regression Coefficient (Standard Error)	
	Unit of Analysis Is SFA	
	Reported Cost per NSLP Lunch ($)	Full Cost per NSLP Lunch ($)
District Child Poverty Rate		
Lower (less than 20 percent) (*reference category*)	-0-	-0-
Higher (20 percent or more)	-0.26	-0.00
	(0.15)	(0.30)
Share of Students in School Approved for Free or Reduced-Price Meals		
Less than 40 percent (*reference category*)	-0-	-0-
40 percent or more	0.03	-0.15
	(0.13)	(0.28)
Number of SFAs	**284**	**284**

Source: School Nutrition and Meal Cost Study, School Nutrition Manager Cost Interview, School Principal Cost Interview, and SFA Director and Business Manager Cost Interviews (Onsite and Follow-Up), School Food Authority Director Survey, school year 2014–2015. Coefficient estimates are weighted to be representative of all public SFAs offering the National School Lunch Program.

Notes: Outliers on cost measures were trimmed to avoid excessive influence on means. Cost measures at or below the 3rd percentile were set to the 3rd percentile, and measures at or above the 97th percentile were set to the 97th percentile,

Regression analysis was conducted at the SFA level. Estimates are based on regression models that control for institutional and demographic characteristics of each school and their SFA. See Appendix B for more details on characteristic descriptions and selection methods.

Relationship between characteristic and the outcome listed in the column is significantly different from zero at the ***0.001 level, ** 0.01 level, or * 0.05 level.

-0- denotes omitted reference categories, for which coefficient estimates are not produced.

FNS = Food and Nutrition Service; NSLP = National School Lunch Program; SFA = school food authority.

Table D.14. Relationships between SBP Meal Costs and Revenues and Other Key Operating Characteristics of SFAs: Regression Coefficient Estimates for Reported and Full Cost per SBP Breakfast

	Regression Coefficient (Standard Error)	
	Unit of Analysis Is SFA	
	Reported Cost per SBP Breakfast ($)	Full Cost per SBP Breakfast ($)
Factors Considered in Pricing A la Carte Items		
Costs (food, labor, other direct or indirect)	-0.43	-0.45
	(0.32)	(0.62)
Incentive for consumption of specific items or participation in reimbursable meal program	-0.11	0.12
	(0.17)	(0.31)
Other factors (ease of payment, school principal, other, don't know)	0.12	-0.12
	(0.19)	(0.34)
No a la carte items sold in any school cafeteria	0.29	0.75
	(0.44)	(0.80)
SFA Director Experience		
Fewer than 5 years (*reference category*)	-0-	-0-
5 to 9 years	-0.17	-0.17
	(0.17)	(0.30)
10 to 16 years	-0.14	-0.05
	(0.20)	(0.34)
17 years or more	0.22	0.66
	(0.25)	(0.42)
Highest Level of Education Completed by SFA Director		
High school graduate or less than high school (*reference category*)	-0-	-0-
Some college, no degree	-0.21	-0.07
	(0.23)	(0.43)
Associate's degree	-0.72**	-0.84
	(0.26)	(0.47)
Bachelor's degree	-0.62*	-0.62
	(0.25)	(0.48)
Master's degree	-0.13	-0.16
	(0.34)	(0.63)
Graduate credits beyond a Master's degree or doctorate	0.20	0.04
	(0.40)	(0.59)
SFA Director Has Degree in Field Related to Food and Nutrition or Public/School Administration	0.05	0.16
	(0.24)	(0.42)

	Regression Coefficient (Standard Error)	
	Unit of Analysis Is SFA	
	Reported Cost per SBP Breakfast ($)	Full Cost per SBP Breakfast ($)
SFA Director Credentials		
Licensed Nutritionist or Dietitian, or Registered Dietitian	-0.00	0.04
	(0.24)	(0.40)
School Nutrition Association Certification Level 1, 2 or 3	-0.31	-0.71*
	(0.17)	(0.29)
School Nutrition Specialist	0.36	-0.04
	(0.42)	(0.59)
State foodservice certificate	0.18	0.13
	(0.19)	(0.34)
Food safety certification	0.05	0.27
	(0.16)	(0.29)
Health department certification	0.19	0.40
	(0.23)	(0.44)
Other credentials	0.21	-0.23
	(0.18)	(0.30)
None of the above	0.47	0.89
	(0.27)	(0.48)
Proportion of Full-Time SFA Employees Receiving Health Benefits		
None (reference category)	-0-	-0-
Some	-0.08	-0.03
	(0.28)	(0.51)
Most	-0.04	0.43
	(0.33)	(0.58)
All	-0.09	0.13
	(0.31)	(0.57)
Sources of Funding for Capital Equipment Purchases and Repairs		
SFA budget	-0.22	-0.28
	(0.22)	(0.37)
USDA grant	-0.52*	-0.48
	(0.20)	(0.33)
State grant	-0.15	-0.18
	(0.21)	(0.36)
Local education agency funds	-0.72**	-0.93*
	(0.27)	(0.43)
School funds	0.49*	0.48
	(0.20)	(0.38)

	Regression Coefficient (Standard Error)	
	Unit of Analysis Is SFA	
	Reported Cost per SBP Breakfast ($)	Full Cost per SBP Breakfast ($)
SFA Has Purchased New Equipment to Implement Updated Nutrition Standards for School Meals	0.48**	0.63*
	(0.16)	(0.26)
Institutional and Demographic Characteristics of Schools and SFAs		
SFA Size		
Fewer than 1,000 students (*reference category*)	-0-	-0-
More than 1,000 students	0.47	0.39
	(0.24)	(0.43)
SFA Type		
Single district (*reference category*)	-0-	-0-
Multi-district	0.00	0.11
	(0.19)	(0.34)
FNS Region		
Mid-Atlantic (*reference category*)	-0-	-0-
Northeast	-0.05	0.10
	(0.35)	(0.63)
Southeast	0.34	0.31
	(0.33)	(0.53)
Midwest	-0.51	-0.52
	(0.30)	(0.56)
Southwest	-0.48	-0.90
	(0.32)	(0.55)
Mountain Plains	-0.26	-0.13
	(0.31)	(0.55)
Western	-0.29	-0.88*
	(0.25)	(0.42)
SFA Urbanicity		
Urban/ suburban (*reference category*)	-0-	-0-
Rural	0.08	0.14
	(0.19)	(0.30)

	Regression Coefficient (Standard Error)	
	Unit of Analysis Is SFA	
	Reported Cost per SBP Breakfast ($)	Full Cost per SBP Breakfast ($)
Share of Minority Students in SFA		
Less than 20 percent (*reference category*)	-0-	-0-
20 to 39 percent	0.30	0.56
	(0.21)	(0.36)
40 to 59 percent	0.11	0.38
	(0.22)	(0.39)
60 to 79 percent	-0.43	-0.40
	(0.28)	(0.45)
80 percent or more	0.01	0.25
	(0.27)	(0.44)
District Child Poverty Rate		
Lower (less than 20 percent) (*reference category*)	-0-	-0-
Higher (20 percent or more)	-0.48**	-0.65*
	(0.16)	(0.27)
Share of Students in School Approved for Free or Reduced-Price Meals		
Less than 40 percent (*reference category*)	-0-	-0-
40 percent or more	-0.62***	-1.34***
	(0.16)	(0.27)
Number of SFAs	**270**	**270**

Source: School Nutrition and Meal Cost Study, School Nutrition Manager Cost Interview, School Principal Cost Interview, and SFA Director and Business Manager Cost Interviews (Onsite and Follow-Up), School Food Authority Director Survey, school year 2014–2015. Coefficient estimates are weighted to be representative of all public SFAs offering the National School Lunch Program.

Notes: Outliers on cost measures were trimmed to avoid excessive influence on means. Cost measures at or below the 3rd percentile were set to the 3rd percentile, and measures at or above the 97th percentile were set to the 97th percentile,

Regression analysis was conducted at the SFA level. Estimates are based on regression models that control for institutional and demographic characteristics of each school and their SFA. See Appendix B for more details on characteristic descriptions and selection methods.

Relationship between characteristic and the outcome listed in the column is significantly different from zero at the ***0.001 level, ** 0.01 level, or * 0.05 level.

-0- denotes omitted reference categories, for which coefficient estimates are not produced.

FNS = Food and Nutrition Service; SBP = School Breakfast Program; SFA = school food authority.

Table D.15. Relationships between NSLP Meal Costs and Revenues and Key Institutional and Demographic Characteristics of SFAs: Regression Coefficient Estimates for Revenues as Percentage of Reported Costs

	Regression Coefficient (Standard Error)
	Unit of Analysis Is SFA
	Revenues as a Percentage of Reported Costs for NSLP Lunch (%)
SFA Size	
Fewer than 1,000 students (*reference category*)	-0-
More than 1,000 students	-8.64 (4.98)
SFA Type	
Single district (*reference category*)	-0-
Multi-district	13.15** (4.91)
FNS Region	
Mid-Atlantic (reference category)	-0-
Northeast	-7.00 (4.96)
Southeast	-0.73 (6.79)
Midwest	2.32 (5.26)
Southwest	-2.05 (6.56)
Mountain Plains	-2.10 (5.59)
Western	2.47 (4.57)
SFA Urbanicity	
Urban/suburban (reference category)	-0-
Rural	-2.10 (4.01)

	Regression Coefficient (Standard Error)
	Unit of Analysis Is SFA
	Revenues as a Percentage of Reported Costs for NSLP Lunch (%)
Share of Minority Students in SFA	
Less than 20 percent (*reference category*)	-0-
20 to 39 percent	1.53
	(4.48)
40 to 59 percent	-4.11
	(6.45)
60 to 79 percent	3.91
	(5.13)
80 percent or more	-5.20
	(6.15)
District Child Poverty Rate	
Lower (less than 20 percent) (*reference category)*	-0-
Higher (20 percent or more)	3.52
	(3.75)
Share of Students in SFA Approved for Free or Reduced-Price Meals	
Less than 40 percent (*reference category*)	-0-
40 percent or more	-1.55
	(3.40)
Number of SFAs	**218**

Source: School Nutrition and Meal Cost Study, School Nutrition Manager Cost Interview, School Principal Cost Interview, and SFA Director and Business Manager Cost Interviews (Onsite and Follow-Up), Menu Survey, School Food Authority Director Survey, Common Core of Data (CCD) 2011-2012, 2011 U.S. Census Bureau's Small Area Income and Poverty Estimates school district file, and Food and Nutrition Service's SFA Verification Summary Report 2012-2013, school year 2014–2015. Coefficient estimates are weighted to be representative of all public SFAs offering the National School Lunch Program.

Notes: Outliers on cost measures were trimmed to avoid excessive influence on means. Cost measures at or below the 3rd percentile were set to the 3rd percentile, and measures at or above the 97th percentile were set to the 97th percentile,

Regression analysis was conducted at the SFA level. Estimates are based on regression models that control for institutional and demographic characteristics of each school and their SFA. See Appendix B for more details on characteristic descriptions and selection methods.

The revenue analysis sample includes the SFAs in the cost analysis sample with the following exceptions: excludes 11 SFAs with unreliable USDA reimbursements data, 1 SFA that did not provide any revenue data, and 54 SFAs that did not provide sufficient detail to determine the composition of revenues.

Relationship between characteristic and the outcome listed in the column is significantly different from zero at the ** 0.01 level.

-0- denotes omitted reference categories, for which coefficient estimates are not produced.

FNS = Food and Nutrition Service; NSLP = National School Lunch Program; SFA = school food authority.

Table D.16. Relationships between SBP Meal Costs and Revenues and Key Institutional and Demographic Characteristics of SFAs: Regression Coefficient Estimates for Revenues as Percentage of Reported Costs

	Regression Coefficient (Standard Error)
	Unit of Analysis Is SFA
	Revenues as a Percentage of Costs for SBP Breakfast (%)
SFA Size	
Fewer than 1,000 students (*reference category*)	-0-
More than 1,000 students	3.19 (6.00)
SFA Type	
Single district (*reference category*)	-0-
Multi-district	-5.54 (4.68)
FNS Region	
Mid-Atlantic (reference category)	-0-
Northeast	-1.55 (9.83)
Southeast	-10.29 (7.97)
Midwest	-8.37 (9.45)
Southwest	-21.29* (10.36)
Mountain Plains	-8.53 (10.33)
Western	-12.19 (7.14)
SFA Urbanicity	
Urban/suburban (reference category)	-0-
Rural	5.75 (3.97)

	Regression Coefficient (Standard Error)
	Unit of Analysis Is SFA
	Revenues as a Percentage of Costs for SBP Breakfast (%)
Share of Minority Students in SFA	
Less than 20 percent (*reference category*)	-0-
20 to 39 percent	-4.87 (5.40)
40 to 59 percent	2.56 (12.20)
60 to 79 percent	15.19 (9.40)
80 percent or more	-2.51 (6.96)
District Child Poverty Rate	
Lower (less than 20 percent) (*reference category*)	-0-
Higher (20 percent or more)	14.15* (6.21)
Share of Students Approved for Free or Reduced-Price Meals	
Less than 40 percent (*reference category*)	-0-
40 percent or more	13.05** (4.91)
Number of SFAs	**208**

Source: School Nutrition and Meal Cost Study, School Nutrition Manager Cost Interview, School Principal Cost Interview, and SFA Director and Business Manager Cost Interviews (Onsite and Follow-Up), Menu Survey, School Food Authority Director Survey, Common Core of Data (CCD) 2011-2012, 2011 U.S. Census Bureau's Small Area Income and Poverty Estimates school district file, and Food and Nutrition Service's SFA Verification Summary Report 2012-2013, school year 2014–2015. Coefficient estimates are weighted to be representative of all public SFAs offering the National School Lunch Program.

Notes: Outliers on cost measures were trimmed to avoid excessive influence on means. Cost measures at or below the 3rd percentile were set to the 3rd percentile, and measures at or above the 97th percentile were set to the 97th percentile,

Regression analysis was conducted at the SFA level. Estimates are based on regression models that control for institutional and demographic characteristics of each school and their SFA. See Appendix B for more details on characteristic descriptions and selection methods.

The revenue analysis sample includes the SFAs in the cost analysis sample with the following exceptions: excludes 14 SFAs with no SBP, 11 SFAs with unreliable USDA reimbursements data, and 51 SFAs that did not provide sufficient detail to determine the composition of revenues.

Relationship between characteristic and the outcome listed in the column is significantly different from zero at the ** 0.01 level or * 0.05 level.

-0- denotes omitted reference categories, for which coefficient estimates are not produced.

FNS = Food and Nutrition Service; SBP = School Breakfast Program; SFA = school food authority.

Table D.17. Relationships between NSLP Meal Costs and Revenues and Key Characteristics of School Foodservice Operations of SFAs: Regression Coefficient Estimates for Revenues as Percentage of Reported Cost

	Regression Coefficient (Standard Error)
	Unit of Analysis Is SFA
	Revenues as a Percentage of Reported Cost for NSLP Lunch (%)
Food Purchasing Characteristics	
SFA Uses Alliance for a Healthier Generation or Other Similar Tools for Selecting and Purchasing Healthy Foods	7.69* (3.33)
SFA Participates in a Food Purchasing Cooperative	2.26 (3.89)
SFA Is Engaged in a Pouring Rights Contract	1.22 (3.67)
Schools in SFA Offer Brand-Name or Chain Restaurant Foods	-0.99 (4.19)
SFA Uses a Foodservice Management Company	-7.59 (5.11)
SFA Purchases Fruits and Vegetables through the Department of Defense Fresh Program	1.02 (3.05)
Menu Planning Characteristics	
All Menus Are Planned at the SFA Level	-5.00 (6.18)
SFA Conducts Nutrient Analysis of Menus	-3.85 (3.98)
Number of Challenges in Meeting the Updated Nutrition Standards that SFA Rated as 3 or Higher on a Scale of 1 (Not a Challenge) to 5 (Significant Challenge)	
4 or less (reference category)	-0-
5 to 7	-1.45 (3.80)
8	-2.20 (4.73)
SFA Perception of New Meal Requirements' Helpfulness in Improving the Nutritional Quality of Meals	
Not at all helpful (*reference category*)	-0-
Somewhat helpful	-5.12 (3.62)
Very helpful	-9.22 (5.45)
SFA was already improving the nutritional quality of meals prior to the new meal requirements	-4.48 (4.87)

	Regression Coefficient (Standard Error)
	Unit of Analysis Is SFA
	Revenues as a Percentage of Reported Cost for NSLP Lunch (%)
Institutional and Demographic Characteristics of Schools and SFAs	
SFA Size	
Fewer than 1,000 students (*reference category*)	-0-
More than 1,000 students	-9.37 (5.70)
SFA Type	
Single district (*reference category*)	-0-
Multi-district	12.41** (4.74)
FNS Region	
Mid-Atlantic (reference category)	-0-
Northeast	-8.07 (5.10)
Southeast	-3.73 (6.96)
Midwest	0.16 (5.17)
Southwest	-2.72 (5.67)
Mountain Plains	-0.92 (5.42)
Western	2.22 (4.57)
SFA Urbanicity	
Urban/suburban (reference category)	-0-
Rural	-4.29 (4.02)
Share of Minority Students in SFA	
Less than 20 percent (*reference category*)	-0-
20 to 39 percent	2.99 (4.22)
40 to 59 percent	-2.07 (5.40)
60 to 79 percent	3.68 (5.08)
80 percent or more	-5.16 (6.01)

	Regression Coefficient (Standard Error)
	Unit of Analysis Is SFA
	Revenues as a Percentage of Reported Cost for NSLP Lunch (%)
District Child Poverty Rate	
Lower (less than 20 percent) (*reference category)*	-0-
Higher (20 percent or more)	3.06 (3.81)
Share of Students in SFA Approved for Free or Reduced-Price Meals	
Less than 40 percent (*reference category*)	-0-
40 percent or more	-1.17 (3.37)
Number of SFAs	**218**

Source: School Nutrition and Meal Cost Study, School Nutrition Manager Cost Interview, School Principal Cost Interview, and SFA Director and Business Manager Cost Interviews (Onsite and Follow-Up), Menu Survey, School Food Authority Director Survey, School Nutrition Manager Survey, and Cafeteria Observation Guide, school year 2014–2015. Coefficient estimates are weighted to be representative of all public SFAs offering the National School Lunch Program.

Notes: Outliers on cost measures were trimmed to avoid excessive influence on means. Cost measures at or below the 3rd percentile were set to the 3rd percentile, and measures at or above the 97th percentile were set to the 97th percentile,

Regression analysis was conducted at the SFA level. Estimates are based on regression models that control for institutional and demographic characteristics of each school and their SFA. See Appendix B for more details on characteristic descriptions and selection methods.

Relationship between characteristic and the outcome listed in the column is significantly different from zero at the ** 0.01 level or * 0.05 level.

-0- denotes omitted reference categories, for which coefficient estimates are not produced.

FNS = Food and Nutrition Service; NSLP = National School Lunch Program; SFA = school food authority.

Table D.18. Relationships between SBP Meal Costs and Revenues and Key Characteristics of School Foodservice Operations of SFAs: Regression Coefficient Estimates for Revenues as Percentage of Reported Costs

	Regression Coefficient (Standard Error)
	Unit of Analysis Is SFA
	Revenues as a Percentage of Costs for SBP Breakfast (%)
Food Purchasing Characteristics	
SFA Uses Alliance for a Healthier Generation or Other Similar Tools for Selecting and Purchasing Healthy Foods	-8.06 (5.75)
SFA Participates in a Food Purchasing Cooperative	-0.61 (5.01)
SFA Is Engaged in a Pouring Rights Contract	-3.31 (6.00)
Schools in SFA Offer Brand-Name or Chain Restaurant Foods	2.59 (5.91)
SFA Uses a Foodservice Management Company	-4.20 (6.77)
SFA Purchases Fruits and Vegetables through the Department of Defense Fresh Program	0.15 (4.45)
Menu Planning Characteristics	
All Menus Are Planned at the SFA Level	14.61** (5.15)
SFA Conducts Nutrient Analysis of Menus	-7.46 (6.30)
Number of Challenges in Meeting the Updated Nutrition Standards that SFA Rated as 3 or Higher on a Scale of 1 (Not a Challenge) to 5 (Significant Challenge)	
4 or less (reference category)	-0-
5 to 7	-0.12 (5.33)
8	1.48 (7.35)
SFA Perception of New Meal Requirements' Helpfulness in Improving the Nutritional Quality of Meals	
Not at all helpful (*reference category*)	-0-
Somewhat helpful	-8.73 (6.12)
Very helpful	0.79 (8.85)
SFA was already improving the nutritional quality of meals prior to the new meal requirements	-2.52 (7.24)

	Regression Coefficient (Standard Error)
	Unit of Analysis Is SFA
	Revenues as a Percentage of Costs for SBP Breakfast (%)
Institutional and Demographic Characteristics of Schools and SFAs	
SFA Size	
Fewer than 1,000 students (*reference category*)	-0-
More than 1,000 students	4.01 (7.62)
SFA Type	
Single district (*reference category*)	-0-
Multi-district	-1.62 (4.26)
FNS Region	
Mid-Atlantic (reference category)	-0-
Northeast	-5.82 (10.26)
Southeast	-6.00 (7.50)
Midwest	-10.09 (9.45)
Southwest	-21.96* (10.32)
Mountain Plains	-9.26 (10.66)
Western	-14.65 (7.81)
SFA Urbanicity	
Urban/suburban (reference category)	-0-
Rural	4.06 (4.34)
Share of Minority Students in SFA	
Less than 20 percent (*reference category*)	-0-
20 to 39 percent	-8.30 (5.83)
40 to 59 percent	1.37 (11.20)
60 to 79 percent	14.42 (8.88)
80 percent or more	-5.76 (7.78)

	Regression Coefficient (Standard Error)
	Unit of Analysis Is SFA
	Revenues as a Percentage of Costs for SBP Breakfast (%)
District Child Poverty Rate	
Lower (less than 20 percent) (*reference category*)	-0-
Higher (20 percent or more)	12.83* (6.03)
Share of Students Approved for Free or Reduced-Price Meals	
Less than 40 percent (*reference category*)	-0-
40 percent or more	13.13* (5.34)
Number of SFAs	**208**

Source: School Nutrition and Meal Cost Study, School Nutrition Manager Cost Interview, School Principal Cost Interview, and SFA Director and Business Manager Cost Interviews (Onsite and Follow-Up), Menu Survey, School Food Authority Director Survey, School Nutrition Manager Survey, and Cafeteria Observation Guide, school year 2014–2015. Coefficient estimates are weighted to be representative of all public SFAs offering the National School Lunch Program.

Notes: Outliers on cost measures were trimmed to avoid excessive influence on means. Cost measures at or below the 3rd percentile were set to the 3rd percentile, and measures at or above the 97th percentile were set to the 97th percentile,

Regression analysis was conducted at the SFA level. Estimates are based on regression models that control for institutional and demographic characteristics of each school and their SFA. See Appendix B for more details on characteristic descriptions and selection methods.

The revenue analysis sample includes the SFAs in the cost analysis sample with the following exceptions: excludes 14 SFAs with no SBP, 11 SFAs with unreliable USDA reimbursements data, and 51 SFAs that did not provide sufficient detail to determine the composition of revenues.

Relationship between characteristic and the outcome listed in the column is significantly different from zero at the ** 0.01 level or * 0.05 level.

-0- denotes omitted reference categories, for which coefficient estimates are not produced.

FNS = Food and Nutrition Service; SBP = School Breakfast Program; SFA = school food authority.

Table D.19. Relationships between NSLP Meal Costs and Other Key Operating Characteristics of SFAs: Regression Coefficient Estimates for Revenues as a Percentage of Reported Cost

	Regression Coefficient (Standard Error)
	Unit of Analysis Is SFA
	Revenues as a Percentage of Reported Cost for NSLP Lunch (%)
Factors Considered in Pricing A la Carte Items	
Costs (food, labor, other direct or indirect)	5.15 (5.63)
Incentive for consumption of specific items or participation in reimbursable meal program	-0.49 (3.04)
Other factors (ease of payment, school principal, other, don't know)	-3.91 (3.06)
No a la carte items sold in any school cafeteria	-3.42 (8.24)
SFA Director Experience	
Fewer than 5 years (*reference category*)	-0-
5 to 9 years	-3.31 (4.51)
10 to 16 years	-3.21 (3.93)
17 years or more	7.14 (4.42)
Highest Level of Education Completed by SFA Director	
High school graduate or less than high school (*reference category*)	-0-
Some college, no degree	0.26 (4.52)
Associate's degree	6.93 (5.68)
Bachelor's degree	9.48 (4.97)
Master's degree	12.82* (6.38)
Graduate credits beyond a Master's degree or doctorate	-7.06 (10.02)
SFA Director Has Degree in Field Related to Food and Nutrition or Public/School Administration	-4.49 (4.47)

	Regression Coefficient (Standard Error)
	Unit of Analysis Is SFA
	Revenues as a Percentage of Reported Cost for NSLP Lunch (%)
SFA Director Credentials	
Licensed Nutritionist or Dietitian, or Registered Dietitian	-0.69
	(4.57)
School Nutrition Association Certification Level 1, 2 or 3	0.90
	(3.42)
School Nutrition Specialist	-5.94
	(6.74)
State foodservice certificate	5.14
	(4.04)
Food safety certification	-4.69
	(3.20)
Health department certification	-1.30
	(4.33)
Other credentials	-5.01
	(4.45)
None of the above	-8.08
	(6.01)
Proportion of Full-Time SFA Employees Receiving Health Benefits	
None (reference category)	-0-
Some	4.85
	(5.71)
Most	7.95
	(6.51)
All	-1.78
	(5.98)
Sources of Funding for Capital Equipment Purchases and Repairs	
SFA budget	2.22
	(5.55)
USDA grant	-6.24
	(3.91)
State grant	-0.99
	(4.64)
Local education agency funds	9.96
	(5.20)
School funds	-0.92
	(4.32)
SFA Has Purchased New Equipment to Implement Updated Nutrition Standards for School Meals	-0.51
	(3.25)

	Regression Coefficient (Standard Error)
	Unit of Analysis Is SFA
	Revenues as a Percentage of Reported Cost for NSLP Lunch (%)
Institutional and Demographic Characteristics of Schools and SFAs	
SFA Size	
Fewer than 1,000 students (*reference category*)	-0-
More than 1,000 students	-13.80*
	(5.65)
SFA Type	
Single district (*reference category*)	-0-
Multi-district	9.86*
	(3.95)
FNS Region	
Mid-Atlantic (reference category)	-0-
Northeast	-16.16**
	(5.90)
Southeast	-1.82
	(7.01)
Midwest	3.31
	(5.86)
Southwest	0.61
	(6.01)
Mountain Plains	-4.80
	(6.38)
Western	0.95
	(5.09)
SFA Urbanicity	
Urban/ suburban (*reference category*)	-0-
Rural	-3.51
	(4.00)
Share of Minority Students in SFA	
Less than 20 percent (*reference category*)	-0-
20 to 39 percent	-1.02
	(4.32)
40 to 59 percent	-5.51
	(5.70)
60 to 79 percent	0.14
	(5.22)
80 percent or more	-2.17
	(6.26)

	Regression Coefficient (Standard Error)
	Unit of Analysis Is SFA
	Revenues as a Percentage of Reported Cost for NSLP Lunch (%)
District Child Poverty Rate	
Lower (less than 20 percent) (*reference category*)	-0-
Higher (20 percent or more)	4.20 (3.65)
Share of Students in School Approved for Free or Reduced-Price Meals	
Less than 40 percent (*reference category*)	-0-
40 percent or more	0.07 (3.56)
Number of SFAs	**218**

Source: School Nutrition and Meal Cost Study, School Nutrition Manager Cost Interview, School Principal Cost Interview, and SFA Director and Business Manager Cost Interviews (Onsite and Follow-Up), School Food Authority Director Survey, school year 2014–2015. Coefficient estimates are weighted to be representative of all public SFAs offering the National School Lunch Program.

Notes: Outliers on cost measures were trimmed to avoid excessive influence on means. Cost measures at or below the 3rd percentile were set to the 3rd percentile, and measures at or above the 97th percentile were set to the 97th percentile,

Regression analysis was conducted at the SFA level. Estimates are based on regression models that control for institutional and demographic characteristics of each school and their SFA. See Appendix B for more details on characteristic descriptions and selection methods.

The revenue analysis sample includes the SFAs in the cost analysis sample with the following exceptions: excludes 11 SFAs with unreliable USDA reimbursements data, 1 SFA that did not provide any revenue data, and 54 SFAs that did not provide sufficient detail to determine the composition of revenues.

Relationship between characteristic and the outcome listed in the column is significantly different from zero at the ** 0.01 level or * 0.05 level.

-0- denotes omitted reference categories, for which coefficient estimates are not produced.

FNS = Food and Nutrition Service; NSLP = National School Lunch Program; SFA = school food authority.

Table D.20. Relationships between SBP Meal Costs and Revenues and Other Key Operating Characteristics of SFAs: Regression Coefficient Estimates for Revenues as Percentage of Reported Cost

	Regression Coefficient (Standard Error)
	Unit of Analysis Is SFA
	Revenues as a Percentage of Reported Cost for SBP Breakfast (%)
Factors Considered in Pricing A la Carte Items	
Costs (food, labor, other direct or indirect)	12.96
	(9.74)
Incentive for consumption of specific items or participation in reimbursable meal program	-4.24
	(4.90)
Other factors (ease of payment, school principal, other, don't know)	-9.13
	(5.19)
No a la carte items sold in any school cafeteria	6.14
	(13.25)
SFA Director Experience	
Fewer than 5 years (*reference category*)	-0-
5 to 9 years	11.18*
	(5.21)
10 to 16 years	8.74
	(5.69)
17 years or more	7.76
	(7.12)
Highest Level of Education Completed by SFA Director	
High school graduate or less than high school (*reference category*)	-0-
Some college, no degree	1.72
	(6.15)
Associate's degree	18.37**
	(6.88)
Bachelor's degree	23.16***
	(6.46)
Master's degree	35.38***
	(9.10)
Graduate credits beyond a Master's degree or doctorate	38.22**
	(11.95)
SFA Director Has Degree in Field Related to Food and Nutrition or Public/School Administration	-9.89
	(6.06)

	Regression Coefficient (Standard Error)
	Unit of Analysis Is SFA
	Revenues as a Percentage of Reported Cost for SBP Breakfast (%)
SFA Director Credentials	
Licensed Nutritionist or Dietitian, or Registered Dietitian	-5.00
	(6.93)
School Nutrition Association Certification Level 1, 2 or 3	10.98*
	(4.48)
School Nutrition Specialist	-4.93
	(9.56)
State foodservice certificate	9.58
	(6.57)
Food safety certification	-1.98
	(4.00)
Health department certification	-0.18
	(5.36)
Other credentials	8.95
	(5.31)
None of the above	-6.46
	(7.65)
Proportion of Full-Time SFA Employees Receiving Health Benefits	
None (reference category)	-0-
Some	8.28
	(7.57)
Most	11.98
	(7.50)
All	11.19
	(7.13)
Sources of Funding for Capital Equipment Purchases and Repairs	
SFA budget	9.38
	(5.77)
USDA grant	2.54
	(4.49)
State grant	-1.63
	(5.96)
Local education agency funds	6.25
	(7.47)
School funds	-2.64
	(5.38)
SFA Has Purchased New Equipment to Implement Updated Nutrition Standards for School Meals	-11.18**
	(4.17)

	Regression Coefficient (Standard Error)
	Unit of Analysis Is SFA
	Revenues as a Percentage of Reported Cost for SBP Breakfast (%)
Institutional and Demographic Characteristics of Schools and SFAs	
SFA Size	
Fewer than 1,000 students (*reference category*)	-0-
More than 1,000 students	-10.00 (6.78)
SFA Type	
Single district (*reference category*)	-0-
Multi-district	-3.78 (5.02)
FNS Region	
Mid-Atlantic (reference category)	-0-
Northeast	-1.70 (8.98)
Southeast	-17.37* (8.21)
Midwest	-3.55 (7.15)
Southwest	-9.72 (7.44)
Mountain Plains	-9.10 (7.52)
Western	-11.62 (6.84)
SFA Urbanicity	
Urban/ suburban (*reference category*)	-0-
Rural	7.55 (4.40)
Share of Minority Students in SFA	
Less than 20 percent (*reference category*)	-0-
20 to 39 percent	-6.47 (4.18)
40 to 59 percent	-1.32 (6.96)
60 to 79 percent	10.61 (9.49)
80 percent or more	-4.82 (6.91)

	Regression Coefficient (Standard Error)
	Unit of Analysis Is SFA
	Revenues as a Percentage of Reported Cost for SBP Breakfast (%)
District Child Poverty Rate	
Lower (less than 20 percent) (*reference category*)	-0-
Higher (20 percent or more)	10.70*
	(4.88)
Share of Students in School Approved for Free or Reduced-Price Meals	
Less than 40 percent (*reference category*)	-0-
40 percent or more	17.92***
	(4.23)
Number of SFAs	**208**

Source: School Nutrition and Meal Cost Study, School Nutrition Manager Cost Interview, School Principal Cost Interview, and SFA Director and Business Manager Cost Interviews (Onsite and Follow-Up), School Food Authority Director Survey, school year 2014–2015. Coefficient estimates are weighted to be representative of all public SFAs offering the National School Lunch Program.

Notes: Outliers on cost measures were trimmed to avoid excessive influence on means. Cost measures at or below the 3rd percentile were set to the 3rd percentile, and measures at or above the 97th percentile were set to the 97th percentile,

Regression analysis was conducted at the SFA level. Estimates are based on regression models that control for institutional and demographic characteristics of each school and their SFA. See Appendix B for more details on characteristic descriptions and selection methods.

The revenue analysis sample includes the SFAs in the cost analysis sample with the following exceptions: excludes 14 SFAs with no SBP, 11 SFAs with unreliable USDA reimbursements data, and 51 SFAs that did not provide sufficient detail to determine the composition of revenues.

Relationship between characteristic and the outcome listed in the column is significantly different from zero at the ***0.001 level, ** 0.01 level, or * 0.05 level.

-0- denotes omitted reference categories, for which coefficient estimates are not produced.

FNS = Food and Nutrition Service; SBP = School Breakfast Program; SFA = school food authority.

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United States Department of Agriculture
Food and Nutrition Service
3101 Park Center Drive
Alexandria, VA 22302

Visit us at www.fns.usda.gov