Tennessee General Assembly

Joint Working Group on Federal Education Funding
INTERIM REPORT

NASHVILLE

House Members

Rep. Debra Moody, Co-Chair
House District 81

Rep. John Ragan
House District 33

Rep. Timothy Hill
House District 3

Rep. William Slater
House District 35

Rep. Ronnie Glynn
House District 6

January 19, 2024

Chairmen,

The Joint Working Group on Federal Education Funding was created by the Speakers of the 113th General Assembly to study, evaluate, analyze, and undertake a comprehensive review of federal education funding. When reviewing federal education funding, the working group shall: (1) identify the amount of federal funding the state and political subdivisions of the state receive for educational programs and purposes and the laws associated with accepting such funds; (2) examine how the state and the political subdivisions of the state use or intend to use the federal education funding and whether there are conditions or requirements to accepting such funds; (3) report on the feasibility of the state rejecting the federal education funding; and (4) recommend a strategy on how to reject certain federal funding or how to eliminate unwanted restrictions placed on the state due to the receipt of such federal funds.

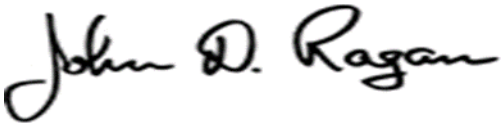
Pursuant to the establishing document of the Joint Working Group, the group shall submit its report and recommendations to the chairs of the following committees: Senate Education; Senate Finance, Ways and Means; House Education Administration; House Education Instruction; and House Finance, Ways and Means.

At this time, the House and the Senate have not agreed to mutual recommendations. Enclosed you will find a copy of the House's fulfilment of the requested report. This in an interim report, preliminary in nature, with further discussions pending.

Sincerely,

Rep. Debra Moody, Co-Chair

Rep. John Ragan



Rep. Timothy Hill

Rep. William Slater

Rep. Ronnie Glynn

Breakdown of Education Funding in Tennessee

Contribution	FY24 Budget	Percentage
Local	$ 4,819,142,703	**36.93%**
State	$ 6,935,683,500	**53.14%**
Federal*	$1,296,076,681	**9.93%**
Total	**$13,050,902,884**	

*The federal contribution is the total of FY24 ESEA, IDEA, and Perkins V allocations added to FY23 Child Nutrition reimbursements.

*Source: Tennessee Department of Education

Federal Funding Received

All 148 LEAs, including DCS and DOC, receive one or more federal grants. Out of 1,907 Tennessee public schools, 1,198 schools implement a Title I schoolwide program and 9 schools implement a Title I targeted assistance program. Additionally, federal grants support 47 community-based organizations through 21st Century Community Learning Centers, and 215 non-public schools opt into ESEA equitable services.

The two most significant federal programs for elementary and secondary education are the Elementary and Secondary Education Act (ESEA), most recently reauthorized by Congress as the Every Student Succeeds Act in 2015, and the Individuals with Disabilities Education Act (IDEA), last reauthorized in 2004.

Other federal programs that provide support to states for elementary and secondary education include the Carl D. Perkins Act, which provides federal support for career and technical education; The McKinney-Vento Education for Homeless Children and Youth Program, which provides federal support for homeless children and youths; and the Education Sciences Reform Act, which, among other purposes, provides federal support for statewide longitudinal data systems.

The Elementary and Secondary Education Act, known as ESEA, contains multiple programs offering federal aid for education including:

- Title I: Programs for disadvantaged students in order "to provide all children significant opportunity to receive a fair, equitable, and high-quality education, and to close educational achievement gaps."
- Title II: Programs for teachers, principals, and school leaders. Supports for literacy; and American history and civics education are also included.
- Title III: Programs to support English language acquisition for English learners.
- Title IV: Programs to support a well-rounded education, safe and healthy students, and technology; after-school instruction and care; charter schools; magnet schools; family engagement in education; and various national activities.
- Title V: Programs to support rural education.
- Title VII: Impact Aid programs

Tennessee also receives Child Nutrition grants, which are provided by the U.S. Department of Agriculture. Federal 2023 formula grant allocations to the state for these programs are as provided below. The first five grants listed account for 95% of all 2023 Tennessee formula fund allocations.

Federal formula grant	2023 allocation
Title I (A-D): Disadvantaged Students	$359 Million
Child Nutrition: Meals and snacks, admin	$487 Million
IDEA (birth – Age 21): Students with Disabilities	$292 Million
Title II: Supporting effective instruction	$45 Million
Perkins: Career and Technical Education	$30 Million
Title III-A: English Learners	$8 Million
Title IV-A: Student supports and academic enrichment	$24 Million
Title IV-B: 21st Century – before and after school programs	$25 Million
Title V-B: Rural and low-income students	$4 Million
Title IX-A: Homeless Youth	$2 Million
Other Programs	$16 Million
Total	**1.29 Billion**

Source: Tennessee Comptroller of the Treasury, Office of Research & Education Accountability

The bulk of federal funds are passed through Local Education Agencies (LEAs). Data from TDOE's 2021-2022 Annual Statistical Report (the most current available) shows that on average 19.54% of district revenues come from federal funds.

Percentage of district revenues from federal funds FY 2021-22

Top Ten	Federal Revenues	Bottom Ten	Federal Revenues
Hancock	31.37%	Williamson*	6.63%
Campbell	30.58%	Johnson	12.94%
Benton	29.87%	Sumner	13.59%
Morgan	28.79%	Rutherford*	14.34%
Haywood	28.38%	Robertson	14.48%
Wayne	28.19%	Wilson*	14.94%
Warren	28.13%	Davidson	14.95%
Lauderdale	27.69%	Knox	15.08%
Fayette	27.52%	Moore	15.57%
Shelby*	26.89%	Sevier	15.60%

*County that contains more than one LEA

Source: Tennessee Comptroller of the Treasury, Office of Research & Education Accountability

TDOE's 2021-2022 Annual Statistical Report also shows that local districts received a total of **$108,687,940** in direct federal grants, of which an estimated **$48 million** were non-recurring COVID relief grants. These grants are federal funds that do not flow through the Tennessee Department of Education or the Tennessee Department of Intellectual and Developmental Disabilities, which receives IDEA Part C grants for early intervention services.

Not all districts receive direct federal funds. In 2021-22, 71 districts received some amount of federal funds. Districts receiving more than $2 million in direct federal funds were:

- Memphis-Shelby County Schools - $47.2 million
- Metro Nashville Public Schools – $33.5 million
- Anderson County - $4.7 million
- Montgomery Co. - $2.7 million
- Murfreesboro City - $2.5 million
- Bedford County - $2.2 million
- Bartlett City - $2.1 million

Direct federal grants include:

- Impact Aid (ESEA Title VII): Federal funds to aid the provision of education services to federally connected children. These funds are paid to LEAs that lose property taxes due to federal acquisition of property utilized to educate children who live on federal property and whose parents are employed on federal property (for example, military bases), children whose parents are in uniformed services or employed on federal properties and do not live on federal property, and other situations.

- Junior Reserve Officers' Training Corps (JROTC) reimbursement via the Department of Defense
- Energy grants via the Department of Energy
- COVID relief grants (non-recurring)

Breakdown of Federal Grant Fund Serving Students:

ESEA
- **62.95%** of the ESEA FY24 budget is for instructional staff supporting students in the classroom.
- Examples of other uses of funds include social workers, school psychologists, and guidance personnel.

IDEA
- **62.47%** of the IDEA FY24 budget is for instructional staff supporting students in the classroom.
- Examples of other uses of funds include social workers, school psychologists, nurses, speech pathologists, and transportation personnel.

Perkins V
- **57.11%** of the Perkins V FY24 budget is for vocational, instructional, and industry credential-related equipment and supplies.

*Source: Tennessee Department of Education

Laws and Requirements Associated with Federal Funds

There are numerous federal laws and programs that promulgate requirements for how state and local authorities manage and govern their elementary and secondary system and schools.

These requirements are rooted in two main sources:

A. As conditions for receiving funding through federal education grant programs; and
B. As requirements of education-related and broader civil rights laws, such as Title IX, that apply to programs and activities that receive any form of federal financial assistance.

Conditions and Requirements of Federal Education Grants

In order to receive funding from each of the aforementioned federal education grant programs, states must apply to the U.S. Department of Education and agree to the policy and reporting requirements included for each program.

Rather than apply for each program individually, states are offered the ability to submit a consolidated application for all title programs to the U.S. Department of Education. All states have submitted a consolidated application and have been approved by the U.S. Department of Education.

Detailed protocols and timelines guide the submission of waiver requests pertaining to child nutrition programs to the United States Department of Education (USEd). Entities may tender their waiver requests to the USEd at any juncture, following which a stipulated timeline for the review and revisions process is initiated.

> The timeline proceeds as follows:
>
> *Review Phase:* From the point of submission, USEd allocates a period of 120 days for a comprehensive evaluation of the request. This period facilitates a thorough scrutiny of the waiver's potential impact, ensuring that the integrity of the nutrition program remains uncompromised.
>
> *Revision Phase:* Should the USEd deem it necessary for amendments or corrections to be made to the waiver request, they provide a 60-day window for the submitting entity to make appropriate changes and resubmit the revised request. Under ESSA statute, state plans can be "periodically reviewed and revised" by the state education agency "to reflect changes in the State's strategies and programs under this part"
>
> (Title I, Part A, Sec. 1005(6)(A)).

ESSA statute does not specify a date by which states must submit amendments to their state plans. However, the Department of Education has released memos in previous years that set deadlines for amendments related to accountability determinations for the following next school year. The letters remind states that proposed amendments must be submitted to the Department of Education for review before implementation and list the information and documents states must

submit with their plan amendments. The most recent such memo was published on December 14, 2022, and set a deadline of February 1, 2023 for state plan changes to be implemented in accountability determinations for fall 2023.[1]

Brief Overview of Federal Requirements in Education Law

ESEA: Title I-A & Title II

The most notable and broad federal requirements for states come through participation in the Title I-A program in the ESEA. In order to receive Title I-A funding, states must set their own education-related goals and hold schools accountable for student outcomes, especially related to academic achievement. States are required to select academic standards of their choosing and administer annual academic assessments in reading, mathematics, and science that are aligned to those selected standards.

Reading and mathematics assessments must be administered in each of grades 3-8 and once during high school. The science assessment must be administered once in grades 3-5, grades 6-9, and grades 10-12. In total, states must administer 17 assessments each school year, although no individual student will take more than 3 of these tests in one year.

States must implement an accountability system with weighted indicators that allows for meaningful differentiation to identify schools that need additional support to improve student achievement. Based on the accountability system, states must identify at least the lowest-performing 5% of schools, among other improvement designations, to receive additional support and state-selected school improvement interventions.

Keeping within the Title I-A program, other requirements include:

- State participation in the National Assessment of Educational Progress (NAEP).
- Allocation of additional funds to improve education outcomes for students from low income families. In FY2022, Tennessee allocated **$349,633,715** of state dollars for this purpose.
- Creation of a plan to ensure that low-income and minority children enrolled in Title I-A schools are not served at disproportionate rates by "ineffective, out-of-field, or inexperienced teachers."
- Ensuring any teacher or paraprofessional working in a program supported with Title I-A funds meets applicable state certification and licensure requirements.
- Equitable services for non-public schools
- Evaluation of effectiveness of grant activities

There are also a number of fiscal requirements that are required of local education agencies. This includes:

- A maintenance of effort (MOE) provision, which requires school districts to ensure that education funding from state and local sources does not decrease by more than 10% from year to year.
- A Supplement, Not Supplant provision, which requires that Title I-A funds be used so as to supplement and not supplant state and local funds that would otherwise be provided to Title I-A schools.
- A comparability provision, which requires that a comparable level of services be provided with state and local funds in Title I-A schools compared with non-Title I-A schools prior to the receipt of Title I-A funds.
- A requirement that all funds are to be distributed to LEAs except the following set asides: up to 1% for Title I-A state administration, 7% set aside for designated school improvement of which 95% must go to districts, and up to 3% is allowed for direct student service grants of which 1% can be withheld for administration.

ESSA statute provides four types of poverty measures LEAs can use in determining Title I-A grants for schools. States may also use a combination of any of the allowed measures.

- Census data on children ages 5-17 in poverty
- Eligibility for free or reduced-price lunch
- Eligibility for TANF
- Eligibility for Medicaid

[1] https://oese.ed.gov/files/2022/12/State-Plan-Memo-for-2022-2023-School-Year-to-post.pdf

Most federal guidance on calculating Title I-A allocations is based on schools or districts that adopt the Community Eligibility Provision for school meals, which allows eligible schools and districts to directly certify students and provide free meals to all without collecting individual applications with household data.[2] These schools may use direct certification data and/or any of the other three measurement options that are statutorily allowed.

Title II grants allocated to states to improve teacher and principal quality share similar requirements. The Department of Education requires states to:

- Conduct a needs assessment to inform the use of funds
- Establish program and financial reporting
- Supplement not supplant as explained under Title I-A
- Provide equitable services to non-public schools
- Evaluate the effectiveness of grant activities (e.g. surveys; completion, retention, teacher quality data)
- Monitor and manage districts' spending of grant funds
- Ensure at least 95% of the grant is passed through to districts, although the state can reserve 3% of district funds for principal support

States accepting Title II grant funds may set aside up to 5% of the grant for state-level activities, of which 1% can be for state administration and 2% can be for preparation academies (for teachers, principals, other school leaders).

In 2020-21, almost all Tennessee LEAs (96%) used Title II-A Funds for professional development. Other uses of the funds included recruiting, hiring, and retaining effective educators (42% of LEAs); class size reduction (7% of LEAs); and evaluation systems (8% of LEAs).

Broader requirements that apply to all programs under ESEA include a requirement that LEAs receiving ESEA funds certify to their state education agency that they do not limit the exercise of "constitutionally protected prayer" in public schools.

In FY24, 7.75% of the ESEA grants received (Title I-Title VII) were allocated towards administration, resulting in 349 full-time administration personnel. 62.95% went towards instructional staff supporting students in the classroom. Examples of other uses of funds include social workers, school psychologists, and guidance personnel.

IDEA

Beyond the Elementary and Secondary Education Act, the Individuals with Disabilities Education Act is the third largest education-related source of federal funding for Tennessee. In exchange for receiving funding through IDEA, states must agree to provide a "free appropriate public education" (FAPE) to each qualified child with a disability who is in a school district's jurisdiction, regardless of the nature or severity of the child's disability.

Both IDEA and state law require:

- An individualized education program (IEP) be prepared for each student with disabilities, setting academic goals and special education services and accommodations the school will provide.
- Schools to educate students in the least restrictive environment, e.g., keeping students in regular classrooms whenever possible.
- State and local maintenance of effort.
- Identification and screening of all children who may be eligible for special assistance.
- Sharing of funds with private schools.

[2] https://www.fns.usda.gov/cn/updated-title-i-guidance-making-within-district-allocations

Providing a "free appropriate public education" is also required by Section 504 of the Rehabilitation Act of 1973. While IDEA is an education-specific grant program that contains more detailed requirements for providing FAPE, Section 504 applies to any program or activity receiving federal financial assistance.[3]

In FY24, 15.44% of the IDEA grant was allocated towards administration, resulting in 110 full-time administration personnel. 62.47% was allocated for instructional staff supporting students in the classroom. Examples of other uses of funds include social workers, school psychologists, nurses, speech pathologists, and transportation personnel.

IDEA is comprised of Part B (ages 3 – 21) and Part C (ages birth – 2). Part C is administered by the TN Department of Intellectual and Developmental Disabilities. It is required that certain home-based and community-based services are provided to children from birth to age two. The office of Research and Education Accountability (OREA) estimates that federal funds cover about one-fifth of the total spending for students receiving IDEA funds. In 2022, Tennessee joined a handful of states that expanded services to children up to age three. In 2023, Tennessee became first in the nation to expand these services up until a child turns five or starts kindergarten.

USDA Child Nutrition

Child nutrition programs play a pivotal role in promoting healthy eating habits among children. These initiatives are substantially funded through various federal, state and local sources. In 2023, such programs accounted for over a third of the federal formula funding allocated for this sector. During the working group's discussions, questions regarding the severability of this program were discussed.

Types of Funds

The grant funds are typically separated into two key categories:

- Child Nutrition
- Child Nutrition State Expense funds

Program Administration- The Tennessee Department of Education (TDOE) uses State Expense funds to hire 21-full time staff responsible for administering these child nutrition programs. Among these, 10 operate regionally, providing localized support to school food authorities.

Reimbursement Method- School districts are reimbursed based on the number of meals served. The rate of reimbursement is determined by whether a child paid the full meal price or was eligible for free or discounted meals by federal guidelines related to household income.

Participation Benefits- School districts and independent schools electing to participate in child nutrition programs receive cash subsidies and donated commodities from the United States Department of Agriculture (USDA) for each eligible meal served.

The meals served in the school lunch program must comply with certain federal nutritional requirements (e.g., ½ cup fruit, ¾ cup vegetables, etc.) and eligible children should be offered free or reduced-price meals.

Measurement and Looking Forward- Efforts to measure waste have been inconclusive at this time. Collecting this type of data could be a future pursuit to assess the efficiency and effectiveness of this program meticulously. A targeted inquiry to evaluate potential waste is recommended to identity any necessary adjustments to improve program outcomes. Roughly 31% of food served in schools nationwide is wasted according to study quoted by Dept of Education from 2010. Currently USDA does not collect data on food waste. However, several districts in Tennessee are collecting food waste data to save costs. Oversight of programs designed to combat waste are maintained at a district level. If food waste could be decreased or eliminated, there may be a pathway via waivers for use of those savings to serve other nutrition needs of TN students.

Impact- In the school year 2022-23, Tennessee served approximately 161,613,688 meals under this program, showing its considerable reach. Amid scrutiny and ongoing performance evaluations, these child nutrition programs remain integral to meeting the dietary needs of children.

[3] https://www2.ed.gov/about/offices/list/ocr/docs/edlite-FAPE504.html

*See Appendix A for additional data pertaining to USDA Child Nutrition programs.

Perkins V

Perkins V funds provide supplemental resources to support the academic, career, and technical skills of secondary students who elect to enroll in career and technical education programs. In FY 2021-22, 122 school districts received a portion of $20.67 million in federal funds that were distributed throughout the state. The state may use Perkins V funds to cover administrative costs, including developing its state plan, reviewing local applications, and monitoring and evaluating program effectiveness. School districts may use Perkins funds to improve career and technical education programs, including modernizing, revising, expanding, or upgrading CTE programs.

In FY24, 3.08% of the Perkins V grant was allocated towards administration. 57.11% was allocated for vocational, instructional, and industry credential-related equipment and supplies. The remainder of funds are utilized for program supports such as placement exams and student career technical organizations.

Requirements of Education-Related Civil Rights Laws

The distinction between IDEA and Section 504 serves as an important transition to the other federal laws that place requirements on elementary and secondary education. There are a number of education-related civil rights laws that would apply to this category, including:

- Section 504 of the Rehabilitation Act of 1973, which prohibits discrimination based on disability.
- Title VI of the Civil Rights Act of 1964, which prohibits discrimination based on race, color, or national origin.
- Title IX of the Education Amendments of 1972, which prohibits discrimination based on sex.

Requirements under these laws are generally not conditions of discrete federal education grant programs, but rather are required for any activity or program, including in an education setting, that receives federal financial assistance. Federal financial assistance consists of a much more expansive set of funding streams than just those administered by the U.S. Department of Education.[4]

Other federal education requirements are settled in case law. For instance, the Supreme Court guaranteed the equal right to public education regardless of citizenship status in the Plyler v. Doe decision in 1982.

Feasibility of Tennessee Replacing Federal Funds

In FY2024, federal dollars amounted for roughly 10% of the Tennessee Department of Education's operating budget. Their total budget contributions are broken down below:

CONTRIBUTION	FY24 BUDGET	PERCENTAGE
LOCAL	$4,819,142,703	36.93%
STATE	$6,935,683,500	53.14%
FEDERAL*	$1,296,076,681	9.93%
TOTAL	**$13,050,902,884**	

*the federal contribution is the total of FY24 ESEA, IDEA, and Perkins V allocations added to the FY23 Child Nutrition reimbursements.
Source: Tennessee Department of Education

In evaluating the feasibility of TN replacing federal education funds, determination of whether the federal funds are severable or bundled should be considered. Grant funds that are currently bundled (like ESEA for example) are like to continue being bundled due to the funding formula that ties them together. The other titles that Tennessee receives are based on how ESEA Title I is calculated. The Perkins V grants would likely not be impacted if other grants were refused, as these grants are not bundled and are separate from ESEA and IDEA. Food Services Grants received from the USDA would likely not be impacted if other grants were refused. USDA nutrition accounts are required to be tracked and reported

Civil Rights Division | Title IX (justice.gov)

separately from all other federal funds. The USDA grants are only bundled with the commodities from US Departments of Agriculture and Department of Defense as an additive.

Comparison of Education Waivers versus Program Selection

Two major approaches for managing federal education funding are the use of education waivers and the cafeteria-style program selection.

Education Waivers - Education waivers from the Department of Education give states, districts, or other entities an exemption from specific statutory or regulatory requirements, providing the opportunity to use different measures to enhance student outcomes. The process to apply for these waivers can be complex, requiring detailed plans and specifications, as detailed on page 4.

Program Selection- Selection of individual programs allows states to choose from a variety of federal programs, only accepting grants or funds that align with their specific needs or objectives. It could offer states more control by choosing only the programs that best fit their needs. States could avoid engaging with programs that come with unsuitable or irrelevant constraints.

Other States and Exploration of Replacing Federal Funds

All states currently participate in the major federal grant programs for elementary and secondary education. No state has ever chosen to no longer participate in any of the federal education grant programs described. This is not to say that there have not been collective and specific conflicts between states and the U.S. Department of Education, however. Prior to the passage of the 2015 Every Student Succeeds Act, there were occasional instances of states refusing to comply with some aspect of federal law or courting the prospect of noncompliance.

Washington is the only state that we are aware of that has lost federal funds and temporary policy waivers due to their refusal to implement reforms regarding teacher evaluation, which is no longer a federal requirement. [5]

In 2005, the Utah State Legislature passed a bill that was signed into law that gave state officials the authority to ignore provisions of the previous iteration of the ESEA, No Child Left Behind, when they were found to be in conflict with state education laws and interests. However, the state ultimately continued to participate in ESEA programs.

More recently, legislation (SB 863) was introduced in Oklahoma to create a plan to phase out federal education funding over a 10-year period. [6]

In cases of noncompliance, the federal General Education Provisions Act (GEPA) describes the authorities the U.S. Secretary of Education has to administer federal education laws and regulations.[7] Part D of the GEPA outlines the enforcement authorities afforded to the Secretary, which include recovery of funds in instances of noncompliance.[8] Specific consequences and the cadence of escalation in instances of noncompliance vary on a case-by-case basis and are typically outlined in official letters from the Secretary.

Additional Presentations & Commentary

The following is a synopsis of comments delivered to House Members of the Joint Working Group by the James Madison Institute and the Center for Practical Federalism on November 8, 2023.

- Initially, Sal Nuzzo, Senior Vice President of the James Madison Institute, spoke on the blueprint Florida initiative, which facilitates policy discussions among states, with the intent of reducing federal overreach and promoting state and individual autonomy. He discussed the continually changing conditions related to receiving federal educational funding, and the need to consider this volatility in policy considerations, regardless of whether or not they serve our students best interests. Nuzzo pointed out how Kentucky and Illinois faced challenges from the Federal Department of Education when they started implementing new Every Student Succeeds Act (ESSA) requirements, replacing the No Child Left Behind Act. These states tried enhancing testing quality and standards but federal funding remained at risk despite these attempts. To illustrate, he mentioned a circumstance from 2016 in Kentucky. The state almost lost federal funding for disadvantaged and special education students as their revised science test did not adhere to federal requirements. A lack of alignment between the state's old test and their newly adopted

[5] https://www.nytimes.com/2014/04/25/us/washington-state-loses-control-of-some-school-funds.html
[6] https://oksenate.gov/press-releases/bullard-plan-would-phase-out-and-replace-federal-funding-and-control-over-k-12?back=/press-releases
[7] https://www.govinfo.gov/content/pkg/COMPS-732/pdf/COMPS-732.pdf
[8] https://crsreports.congress.gov/product/pdf/R/R41119/3

standards posed further difficulties. Illinois faced similar issues when introducing a new assessment system, which potentially jeopardized federal funding due to an imposed "high-risk status" by the Federal Department of Education. The state's flexibility to let districts choose various high school tests did not meet federal expectations, despite the seeming allowance under ESSA. This scenario underscored the persisting "strings attached" with state education initiatives.

- Steve Johnson, a Senior Fellow with the Center for Practical Federalism emphasized the importance of state lawmakers guarding their authority and resisting federal overreach.
  In his comments, three kinds of costs were outlined that related to decision-making for states: monetary costs, opportunity costs and independence costs. Mr. Johnson warned that the apparent financial benefit from federal programs could be deceptive, as administrative costs may decrease the net gain. Mr. Johnson also noted that the administrative burden of programs could detract from teachers' time with their students, while also hampering the capacity to innovate at the state level. Mr. Johnson cautioned that federal guidelines might stifle the '50 laboratories of democracy' phenomenon, where states learn from each other's successes and failures by innovating different approaches to problems. Mr. Johnson highlighted the importance of states' ability to innovate, considering whether replacing federal funds might provide space for innovation due to the saved money. Lastly, Mr. Johnson criticized the federal government's tendency to issue "guidance letters" to state agencies with directives. He noted that these directives aren't law, despite what many assume.

How to Eliminate Unwanted Restrictions

Overview of Current Prohibitions on Federal Authority

While there are many requirements for states included in federal education programs, there are also numerous prohibitions on federal authority that are included in federal statute. A key understanding that emerges from these provisions is that the federal government is expressly prohibited from determining what is taught in schools.

ESEA Title I-A Sec. 1604 and 1605 contains two key prohibitions, which are echoed at other points in statute:

- "Nothing in this title shall be construed to authorize an officer or employee of the Federal Government to mandate, direct, or control a State, local educational agency, or school's specific instructional content, academic achievement standards and assessments."

- "Nothing in this title shall be construed to mandate equalized spending per pupil for a State, local educational agency, or school."

ESEA Title II Sec. 2302 echoes Title I-A's prohibitions and includes additional prohibitions related to educators. It states the federal government cannot "mandate, direct, or control a State, local educational agency, or school's":

- instructional content or materials, curriculum, program of instruction, academic standards, or academic assessments;

- teacher, principal, or other school leader evaluation system;

- specific definition of teacher, principal, or other school leader effectiveness; or

- teacher, principal, or other school leader professional standards, certification, or licensing.

ESEA Title VIII, the "General Provisions" section, also outlines a series of prohibitions on federal authority in states that accept any funds under the ESEA, including:

- a prohibition on the use of ESEA funds to "promote or encourage sexual activity."

- a prohibition on federal control of educational curricula, content or achievement standards, building standards, or allocation of resources.

- a prohibition related to the aiding and abetting of sex abuse

Options for Consideration

Exercise flexibilities afforded in federal law

Depending on the specific issue, the ESEA provides a number of flexibilities that states and local schools can enjoy upon request. For instance, with regard to federal assessment requirements, states are afforded the flexibility in law to reduce testing time, implement locally selected, nationally recognized high school academic assessments, and offer statewide interim assessments in lieu of a single summative assessment score.

Request a waiver from specific requirements

Under the ESEA, the U.S. Secretary of Education is authorized to waive most statutory and regulatory requirements associated with any program authorized by the ESEA if specifically requested by a state educational agency.[9] A state requesting a waiver must submit a waiver request with a plan that, among other requirements, identifies the federal program affected by the requested waiver, describes which federal statutory and regulatory requirements are to be waived, and describes how the waiving of such requirements will advance student achievement.

Districts may apply for waivers of federal ESSA program requirements by applying through their state. The Tennessee Department of Education has numerous processes built out for districts to apply for ESSA waivers.

The waiver request must include:

- a description of the federal statutory or regulatory requirements to be waived,
- how waiving the requirements will advance student academic achievement,
- the methods the state, district, or school will use to monitor and regularly evaluate effectiveness,
- the notice and comment process and how the state addressed the comments and input, and
- (if the waiver relates to assessments), a description of how the state, district, or school will maintain or improve transparency in reporting to parents and the public on student achievement and school performance.

Upon receiving a waiver request, the Secretary has 120 days to review and issue a decision on the request. If the waiver is not approved, a state has 60 days to revise and re-submit the waiver.

In 2012, Tennessee's application for a waiver from specific requirements of the No Child Left Behind Act was approved by the United States Department of Education. The waiver's terms include significant changes to the state's accountability system and to the allocation of Title I funds.[10]

Seek changes through a reauthorization of federal law

The legislature could work through a reauthorization of one or more of the education laws described above. The ESEA was last reauthorized in 2015 as the Every Student Succeeds Act. U.S. Senator from Tennessee Lamar Alexander was considered the chief architect of this last major reauthorization. The Individuals with Disabilities Education Act (IDEA) was last reauthorized in 2004.

Create legislative involvement in the grant processes

The legislature, in collaboration with the Tennessee Department of Education, can implement safeguards to protect the state from unwanted federal overreach. Many changes to the federal grant requirements are done through policy changes and not law. These policy changes are usually communicated to the state by letter to the state administering agency, in most cases TDOE. The legislature can require that any time these policy guidance documents are received, they are immediately provided to the appropriate legislative committees and/or members for review.

The legislature could also implement a process for legislative authorization of grants, such as requiring grant applications to go before a legislative committee before an agency can submit an application. Like legislative measures, these applications

[9] https://crsreports.congress.gov/product/pdf/IF/IF11517

[10] https://comptroller.tn.gov/content/dam/cot/orea/advanced-search/2014/2014_OREA_TNNCLBwaiver.pdf

would come with state created Fiscal Notes that detail the funding and its requirements. This process is currently done in Oregon, where a committee is appointed both in and out of session to approve federal grant applications.

Further Questions and Considerations

There are more questions than definitive answers about what replacing federal K-12 dollars could mean for Tennessee's obligations because no state has ever done so. If the legislature, for example, chooses to go replace select federal education programs in the ESEA, there are number of questions that would need to be resolved with the U.S. Department of Education. In particular, there are a number of uncertainties about the consequences of non-participation in Title I-A, where many of the most significant requirements of federal education law are contained.

Letters from a previous administration indicated that non-participation in ESEA Title I-A could have serious consequences for participating in other ESEA title programs, especially for programs with statutory formulas for allocating funds that are based, in part, on the amount of funding received under Title I-A.

Many federal requirements could still apply to Tennessee schools even if the state replace federal K-12 dollars, creating questions that would likely be resolved in court. Because of its broad application, the requirements associated with that broad definition of federal financial assistance could still apply depending on the scope of the state's efforts to replace any federal dollars. There may be other, less obvious ways that schools receive or benefit from federal assistance, for example TennCare reimbursement for certain services provided in school, that could continue to trigger federal funding assistance associated mandates.

It is also important to consider that many of the requirements attached to federal dollars align with state policymakers' goals and/or are integrated into the state's own requirements. Therefore, many federal grants provide the state with monetary support for policies that the state would likely implement on its own.

Examples of other questions that policymakers may want to consider or answer include:

- How much federal funding would Tennessee replace with its own dollars?
- Could districts still apply for direct-to-district grant funding?
- Would replacing Department of Education grant dollars with state funds affect grants from the Department of Agriculture, Department of Defense, or Department of Energy?
- Would the funding used to replace any federal dollars be allocated in the same way as done currently using federal funds? Or would they flow through the state's existing school funding formula?
- Would state replacement dollars affect local funding requirements?
- What federal requirements would Tennessee maintain for school districts?
- How would state law and regulation need to change to accommodate those maintained or modified requirements?
- How would using state dollars affect the redistribution of taxpayer dollars across the state?
- Will Tennessee still get federal education aid to weather recessions? During and after the Great Recession, for example, TDOE's federal revenues grew to $1.5 billion (or 30% of the department's budget).

Most federal dollars for educational programs are distributed to states based on a formula. If Tennessee replaced some or all of the money it receives from these programs, those funds would not result in federal taxpayer savings unless Congress reduced its funding amounts by the same amount. While possible, it seems more likely that those funds would instead be redistributed to other states.

Reflection on Report Mandate Adherence and Future Investigative Direction

As we reflect on the progress made so far, we are guided by our original mandate. This commission was charged with the following objectives:

- Identify the amount of federal funding the state and political subdivisions receive for educational programs and purposes, and the laws associated with accepting such funds.
  -Collaborated with the Tennessee Department of Education, Tennessee Comptroller's Office of Research & Education Accountability and the Tennessee Legislature's Fiscal Review Department in understanding the financial landscape of education funding.

- Examine how the state and political subdivisions use or intend to use the federal education funding and whether there are conditions or requirements to accepting such funds.
  -We've heard from the Tennessee Department of Education, Comptroller's Office of Research & Education Accountability and the Tennessee Legislature's Fiscal Review Department on how federal funds are utilized and the accompanying requirements of such acceptances.

- Report on the feasibility of the state replacing the federal education funding.
  - The aspect of feasibility around replacing federal funding in education is still under active examination.

- Recommend a strategy on how to replace certain federal funding or how to eliminate unwanted restrictions placed on the state due to the receipt of such federal funds.
  - Formulating a strategy for navigating unwanted restrictions due to federal funding acceptance is a work in progress. Further to the adherence to our initial charge, our pursuit of comprehensive findings necessitates further exploration with the following:
    -U.S. Department of Agriculture (USDA)
    -U.S. Department of Education
    -U.S. Department of Defense
    -U.S. Department of Energy

Tennessee House of Representatives Recommendations:

1. New federal rules and directives pertaining to the Tennessee Department of Education shall be presented before the House Government Operations Committee. As new federal rules and directives arise, hearings shall be included in the routine House Government Operations review hearings.

2. Letters or other communications providing interpretations or directives concerning implementation of rules from the U.S. Department of Education providing guidance to states relative to regulations and compliance shall be promptly made available to the House Government Operations Committee, House Education Instruction Committee, House Education Administration Committee, Speaker of the House of Representatives, and Speaker of the Senate. Review of the letters shall occur in the routine House Government Operations review hearings.

3. Direct Fiscal Review to implement evaluation of federal funds in their fiscal impact analysis. As part of the analysis, indication of the probability of grant approval and sustainability of continued federal funding as it pertains to federal grants, federal funding agency, cooperative or competitive grants should be included.

4. Direct the House Education Instruction Committee and Education Administration Committees to implement an annual hearings to review federal education testing requirements. Any consideration of change to federal education testing requirements shall occur during session.

5. Direct the Tennessee Department of Agriculture and the Tennessee Department of Education to undertake a comprehensive evaluation of food waste in Tennessee public school systems. A report detailing the outcomes of the study is to be prepared and submitted to the House Government Operations Committee, House Education Instruction Committee, House Education Administration Committee, Speaker of the House of Representatives, and Speaker of the Senate. Determine the feasibility and desirability of contracting with an outside agency for a statistically based process improvement effort to reduce identified waste along with potential cost bracket estimates and execution time requirements for such. Review of letters or other communications providing interpretations or directives concerning implementation of rules shall occur in routine House Government Operations review hearings.

Upon receipt of requested data, the House of Representatives members of the Joint Working Group on Federal Education Funding will continue deliberations on the important topic of education funding in Tennessee. Members of the House of Representatives will continue to evaluate options on how to replace certain federal funding or eliminate unwanted restrictions placed on the state due to the receipt of such federal funds. Through these continued efforts, the Representatives aspire to achieve a less restrictive environment for fostering success of all students in Tennessee schools.

Appendix

Updates to the appendix will be implemented under the guidance of the Chair and are intended to supplement any forthcoming reports from the House component of the Joint Working Group on Federal Education Funding. The first identified data set for consideration is detailed below.

A. **In terms of school nutrition, the USDA "School Nutrition and Meal Cost Study Summary of Findings" provided important insights into the management of federal funding and meal costs. Other states have also experienced issues with federal nutrition stipulations, as illustrated in the USDA's comprehensive report found on the following pages.**

United States Department of Agriculture

Food and Nutrition Service

School Nutrition and Meal Cost Study

Summary of Findings

Mathematica Policy Research

In partnership with:
Abt Associates Inc.

April 2019

United States Department of Agriculture
Food and Nutrition Service

School Nutrition and Meal Cost Study

Summary of Findings

Mary Kay Fox and Elizabeth Gearan
Mathematica Policy Research

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April 2019

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OVERVIEW OF THE SCHOOL NUTRITION AND MEAL COST STUDY

The U.S. Department of Agriculture's (USDA) Food and Nutrition Service (FNS) administers the National School Lunch Program (NSLP) and the School Breakfast Program (SBP) to ensure that school-age children have access to nutritious meals and snacks that support normal growth and development. In school year (SY) 2012–2013, the school meal programs began to undergo widespread changes, including new requirements that affect the food and nutrient content of school meals; the types of foods students need to select in order for their meal to be eligible for Federal reimbursement; pricing for full-price (also called "paid") meals; and the types of foods and beverages that can be sold in schools during the school day ("competitive foods").

This report presents findings from the School Nutrition and Meal Cost Study (SNMCS), the first comprehensive, nationally representative study of the school meal programs since these program reforms were implemented. The SNMCS continues FNS's long-standing commitment to periodically assess the school meal programs. Compared to prior studies, the SNMCS is unique in three important ways.

No previous national study of the school meal programs has (1) simultaneously examined the nutritional quality of school meals and the cost of producing those meals;

(2) assessed 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.

Key findings from the SNMCS are summarized below. The rest of this report describes the design and implementation of the SNMCS and provides detailed summaries of other important findings.

Nutritional Quality of School Meals

NSLP Lunches

- Based on mean total scores on the Healthy Eating Index (HEI)-2010, the nutritional quality of NSLP lunches increased significantly between SY 2009–2010 and SY 2014–2015. Over this period, the mean total HEI-2010 score for NSLP lunches increased 41 percent—from 57.9 to 81.5 out of a possible 100. This finding suggests that updated nutrition standards for school meals have had a positive and significant influence on nutritional quality.

- For NSLP lunches, mean scores increased for 10 of the 12 components included in the HEI-2010.
- For the nine adequacy components, which focus on meeting food group and nutrient needs without exceeding calorie requirements, the largest increases were observed for the whole grains and greens and beans components. Between SY 2009–2010 and SY 2014–2015, the score for whole grains increased from 25 to 95 percent of the maximum score, and the score for greens and beans increased from 21 to 72 percent of the maximum score.
- Mean scores for the three moderation components also increased significantly between SY 2009–2010 and SY 2014–2015. This indicates that concentrations of refined grains, empty calories, and sodium in NSLP lunches *decreased* over time.

SBP Breakfasts

- The nutritional quality of SBP breakfasts also increased significantly between SY 2009–2010 and SY 2014–2015. The mean total HEI-2010 score for SBP breakfasts increased 44 percent—from 49.6 to 71.3 out of a possible 100.
- For SBP breakfasts, mean scores increased for 7 of the 12 components of the HEI-2010.
- For the nine adequacy components, the largest increases were observed for whole grains and whole fruit. Between SY 2009–2010 and SY 2014–2015, the score for whole grains increased from 38 to 96 percent of the maximum score, and the score for whole fruit increased from 50 to 89 percent of the maximum score.
- Mean scores for the three moderation components also increased significantly between SY 2009–2010 and SY 2014–2015. This indicates that concentrations of refined grains, empty calories, and sodium in SBP breakfasts *decreased* over time.

Compliance with Updated Nutrition Standards

NSLP Lunches

- At least 80 percent of daily lunch menus met each of the daily NSLP meal pattern quantity requirements. Over 90 percent of daily lunch menus met the daily quantity requirements for fruits (95 percent), meats/meat alternates (91 percent), and milk (100 percent). About 80 percent of daily lunch menus met the daily quantity requirements for vegetables (81 percent) and grains (80 percent).
- More than three-quarters (79 percent or more) of weekly lunch menus met weekly NSLP meal pattern requirements for milk, fruits, and vegetables. Fewer weekly lunch menus met the weekly quantity requirements for meats/meat alternates (58 percent) and grains (49 percent). Weekly menus in elementary schools were significantly more likely than weekly menus in middle or high schools to meet the weekly quantity requirements for meats/meat alternates and grains.
- Only about four in ten (41 percent) weekly lunch menus fell within the specified calorie range (that is, they met both the minimum and maximum calorie levels). Average weekly lunch menus in elementary and middle schools were more likely to exceed the maximum calorie level, while weekly high school lunch menus were more likely to fall below the minimum calorie level.
- More than one-third of weekly lunch menus did not meet the specified calorie range but came close to doing so. The average calorie content of weekly menus in 33 percent of elementary schools, 35 percent of middle schools, and 38 percent of high schools was within 10 percent of the calorie range. Thus, overall, more than three-quarters of weekly lunch menus (76 percent) met both the minimum and maximum calorie levels or came close to meeting these specifications.

SBP Breakfasts

- More than eight of ten daily breakfast menus met each of the daily SBP meal pattern quantity requirements. More than three-quarters (79 percent or more) of weekly SBP menus met each of the weekly quantity requirements. A slightly smaller percentage (69 percent) complied

with the requirement that no more than half of the fruits offered be in the form of juice.

- More than half (56 percent) of average weekly breakfast menus fell within the specified calorie range (that is, they met both the minimum and maximum calorie levels). It was more common for average weekly breakfast menus to exceed the maximum calorie level (36 percent) than to fall below the minimum calorie level (8 percent).
- Twenty-two percent of weekly breakfast menus did not meet the specified calorie range but came within 10 percent of the calorie range. Thus, overall, more than three-quarters (78 percent) of weekly breakfast menus met both the minimum and maximum calorie levels or came close to meeting these specifications.

Plate Waste in NSLP Lunches

- Plate waste is a measure of the amount of available food that is discarded (or not consumed). Overall, plate waste in NSLP lunches was highest for vegetables—an average of 31 percent of the vegetables on observed lunch trays was wasted—followed by milk (29 percent), fruits and 100% fruit juice (26 percent), and separate or side grains/breads (23 percent). Mean levels of waste were lower for desserts and other menu items (20 percent), and lowest for entrées and meats/meat alternates (16 and 14 percent, respectively).
- For each type of food, the mean proportion wasted was higher in elementary schools than in middle or high schools and was higher in middle schools than in high schools (though not all differences between middle and high schools were statistically significant).
- One factor that may, in part, explain the differences in plate waste observed across school types is differences in the use of the offer-versus-serve (OVS) option, which allows students to decline some components of a reimbursable meal as a way of providing choice and reducing waste. OVS is mandatory for high schools, but optional for middle schools and elementary schools (81 percent of all elementary and middle schools used OVS at lunch). Multivariate analyses found that, among elementary schools, use of OVS was associated with significantly lower levels of plate waste.

Dietary Intakes of NSLP Participants and Nonparticipants

- Lunches consumed by NSLP participants achieved a higher mean total score on the HEI-2010 than lunches consumed by a matched comparison group of nonparticipants (80.1 versus 65.1 out of a possible 100). As a point of reference, the average total HEI-2010 score for the diets consumed by the U.S. population as a whole in 2011–2012 was 59.0 and the average score for children was 55.1.[1]
- Mean scores for HEI-2010 components showed that lunches consumed by NSLP participants had higher concentrations of vegetables, whole grains, and dairy and lower concentrations of refined grains and empty calories than lunches consumed by matched nonparticipants. Lunches consumed by NSLP participants achieved perfect scores for whole grains and dairy and a near-perfect score for empty calories.
- The significant difference in mean total HEI-2010 scores observed between NSLP participants and matched nonparticipants at lunch persisted over 24 hours (65.2 versus 60.6), although the magnitude of the difference was smaller.

- The positive and significant differences observed between NSLP participants and matched nonparticipants at lunch for HEI-2010 scores for whole grains, dairy, and refined grains also persisted over 24 hours, but significant differences for total vegetables and empty calories did not.

School Meal Costs and Revenues

- In SY 2014–2015, reported costs of producing a reimbursable meal in most school food authorities (SFAs) exceeded the Federal subsidies for free meals. For the average SFA, the mean reported cost to produce a reimbursable lunch was $3.81, compared to the average Federal free lunch subsidy of $3.32; the mean reported cost to produce a reimbursable breakfast was $2.72, compared to the average Federal subsidy of $1.88.
- Food and labor accounted for 90 percent of the average SFA's reported costs. Food costs (including USDA Foods) and labor costs each accounted for approximately 45 percent of reported costs. All other costs (for example, supplies, contract services, and capital expenditures) accounted for the remaining 10 percent.
- USDA subsidies, including cash reimbursements and USDA Foods, represented the largest single source of SFA revenues, accounting for an average of 63 percent of total revenues. Student payments for reimbursable meals represented about 20 percent of total SFA revenues. A la carte and other nonreimbursable food sales accounted for 11 percent of total revenues.
- On average, across all SFAs, revenues from reimbursable lunches covered only an average of 93 percent of reported costs of producing those meals, and revenues from SBP breakfasts covered an average of 82 percent of reported costs. Net revenues from nonreimbursable food sales (a la carte, adult meals, and other nonreimbursable meals) supported school foodservice operations by partially offsetting the gap between costs and revenues for reimbursable meals.
- For the average SFA, total revenues covered 97 percent of total reported costs, indicating that the average SFA operated at a small deficit.

Relationships Between the Nutritional Quality of NSLP Lunches and Other Key Outcomes

Student Participation

- There was a positive and statistically significant association between student participation in the NSLP and the nutritional quality of NSLP lunches, as measured by the HEI-2010. Rates of student participation were significantly higher in schools with HEI-2010 scores in the third and highest quartiles (that is, the top half) of the distribution compared to the lowest quartile.
- Specifically, the average NSLP participation rates for schools with lunches in the two highest quartiles of the HEI-2010 distribution were 61 and 60 percent, compared to 50 percent for schools with lunches in the lowest quartile of the distribution.

Diets of NSLP Participants

- There was no significant positive association between the nutritional quality of NSLP lunches and the nutritional quality of the overall diets of students who consumed the lunches.

Reported Meal Costs and Revenues

- There was no significant association between reported cost per NSLP lunch and the nutritional quality of the meals. That is, mean reported costs per NSLP lunch 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.
- There was no significant association between revenue as a percentage of reported cost and compliance with updated nutrition standards for NSLP lunches.

SECTION I

BACKGROUND

The National School Lunch Program (NSLP) and School Breakfast Program (SBP), 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.[2] For children who qualify for free or reduced-price meals, the NSLP and SBP provide an important nutrition safety net at school. 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 a variety of factors, primarily whether the child is or is not approved for free or reduced-price meals. Federal reimbursements supplement State and local resources (including student payments) to help ensure children receive nutritious school meals. FNS also provides foods that USDA purchases (called "USDA Foods") as additional support to schools participating in the 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 (1) more fruits, vegetables, and whole grains in the school menu;

(2) updated nutrition standards to improve the nutritional quality of school meals and students' diets to reduce children's risk of developing chronic diseases; (3) a new requirement that students select at least a half cup of fruits or vegetables for their meal to be eligible for Federal reimbursement; (4) equitable price setting for full-price (also called "paid") meals; and (5) the introduction of nutrition standards for all foods and beverages sold in competition with reimbursable meals in schools during the school day ("competitive foods").

All 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, as well as new menu options that schools develop, may not be as acceptable to students as some of the former choices. If student acceptability is not taken into account, this could lead to changes in student participation. The requirement to take at least a half cup of fruits or vegetables or the prices charged for paid meals also may affect students' decisions to eat school meals. The new nutrition standards

for competitive foods may affect students' consumption of these foods, as well as 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 (1) how school food authorities (SFAs) and schools are doing in implementing the changes made in response to the HHFKA; and (2) whether and how these 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. 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 and is the first nationally representative, comprehensive assessment of these programs since major reforms began in SY 2012–2013.

Compared 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 nutritional quality of school meals and the cost of producing 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.

Research Questions

The SNMCS addressed research questions of interest to stakeholders at the national, State, and local levels. These questions were grouped under four broad domains, as shown in Box 1.

To address these 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. Most data collection took place in the spring of SY 2014–2015. Study findings are presented in four report volumes, plus this summary report that highlights key findings across the volumes.[3]

Box 1. The School Nutrition and Meal Cost Study Addressed Research Questions in Four Broad Domains:

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

Data

The SNMCS collected data from SFAs, schools in those SFAs, and students in sampled schools. SFA-level data are representative of all public SFAs that offer the NSLP in the 48 contiguous States and the District of Columbia. School- and student-level data are representative of all public, non-charter schools offering the NSLP and students attending those schools.

To describe **SFA and school characteristics, foodservice operations, and school nutrition environments,** SFA and school-level staff participated in the following data collection activities:

- SFA directors and school nutrition managers (SNMs) completed separate web-based surveys. Topics included 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.

- 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 identified during school recruitment) completed two forms known collectively as the Competitive Foods Checklists. These forms captured information on 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.[4] The Menu Survey collected detailed information on the foods offered, prepared, 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,** 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. As part of their interview, SFA directors and business managers also answered questions on SFA staffing and operations and indirect costs. 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 the following activities:

- Sampled students in participating schools completed a 24-hour dietary recall and the Child/Youth Interview, and trained field interviewers measured their height and weight.
- 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.

- 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 did not consume (wasted).

Most data were collected from January through June 2015. Data were collected from 518 SFAs, more than 1,200 schools (completed sample sizes vary by data collection instrument), 2,165 students, and 1,850 parents. In addition, plate waste observations were completed for 6,253 lunch trays (in 165 schools) and 3,601 breakfast trays (in 154 schools).

PROGRAM OPERATIONS

The NSLP and SBP are administered at the State level by State child nutrition (CN) agencies and at the local level by SFAs. SFAs and schools have discretion in how they administer the programs within Federal and State guidelines. For example, SFAs and schools do not have to participate in both the NSLP and SBP and may elect to participate in other FNS-sponsored programs that provide meals and snacks to students. In addition, SFAs and schools have options in how they set meal prices—including potentially offering all meals free of charge—and whether they offer competitive foods. These and other decisions about program operations may influence student participation rates.

Meals and Snacks Offered

- Most public, non-charter schools that participated in the NSLP in SY 2014–2015 (94 percent) also participated in the SBP.
- Twenty-five percent of NSLP schools offered reimbursable afterschool snacks, suppers, or both. Of these schools, 80 percent offered snacks through the NSLP, 11 percent offered snacks through the Child and Adult Care Food Program (CACFP), and 22 percent provided suppers through the CACFP.

- Among schools that operated their own afterschool program (with or without USDA support), 61 percent
  offered only afterschool snacks, 12 percent offered only suppers, 7 percent offered both snacks and suppers, and 20 percent provided neither.

Universal Free Meals

- About one in five schools (19 percent) offered free lunch to all students, and 29 percent of SBP-participating
  schools offered free breakfast to all students. Universal free meals were somewhat more common in elementary schools than in middle or high schools.

- The Community Eligibility Provision (CEP), which allows school districts with 40 percent or more students
  directly certified for free meals to provide free breakfast and lunch to all students, was the most common means by which schools offered universal free meals—80 percent of schools that offered free lunch to all students and 56 percent of schools that offered free breakfast to all students did so under the CEP.

- Use of Provisions 2 and 3, which also allow schools to serve universal free meals, was much less common. Only 19 percent of schools that offered free lunch to all students and 20 percent of schools that offered free breakfast to all students did so under Provision 2 or 3.

Prices Charged for Paid Meals

- Excluding schools that provided universal free lunch, the most commonly charged price for a paid lunch in SY 2014–2015 was $2.50, and the mean was $2.42. On average, large schools charged higher prices for paid lunches than small and medium-sized schools ($2.59 versus $2.37 and $2.42, respectively), and suburban schools charged somewhat higher prices than urban or rural schools ($2.46 versus $2.43 and $2.36, respectively).

- The average price of a paid lunch increased by 25 percent between SY 2009–2010 and SY 2014–2015 (from $1.93 to $2.42). 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).[5]

- 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 in the NSLP. For the SBP, the association between paid meal price and participation was not statistically significant.

- Excluding schools that provided universal free breakfast, the most commonly charged price for a paid breakfast in SY 2014–2015 was $1.25, and the mean was $1.43.

Perceived Challenges in Implementing the Updated Nutrition Standards

SFA directors were asked to provide feedback on the challenges they faced in fully implementing or maintaining compliance with the updated nutrition standards that were implemented starting in SY 2012–2013.[6] SFA directors rated eight potential challenges on a scale from 1 (not a challenge) to 5 (a significant challenge). Figure 1 presents the mean rating for each potential challenge (across all SFAs).

- The greatest challenge SFAs faced in implementing or maintaining compliance with the updated nutrition standards was the cost of foods that need to be incorporated into menus in order to meet the standards (mean rating of 3.8).

- With mean ratings of 3.0 to 3.1, SFA directors rated the availability of appropriate foods, staff training, the need for additional labor, and the need to offer different portion sizes to different grade groups as more moderate challenges (mid-way between "not a challenge" and "a significant challenge").

- Two of the remaining challenges—need for additional equipment and need for kitchen remodels or upgrades—

had lower mean scores of 2.7, which suggest that, relative to the other challenges, more SFA directors found these issues to be less of a challenge and assigned them a rating of 1 or 2.

- Of the potential challenges included in the survey, SFA directors found understanding the updated nutrition standards to be the least challenging (mean rating of 2.5).

Competitive Foods

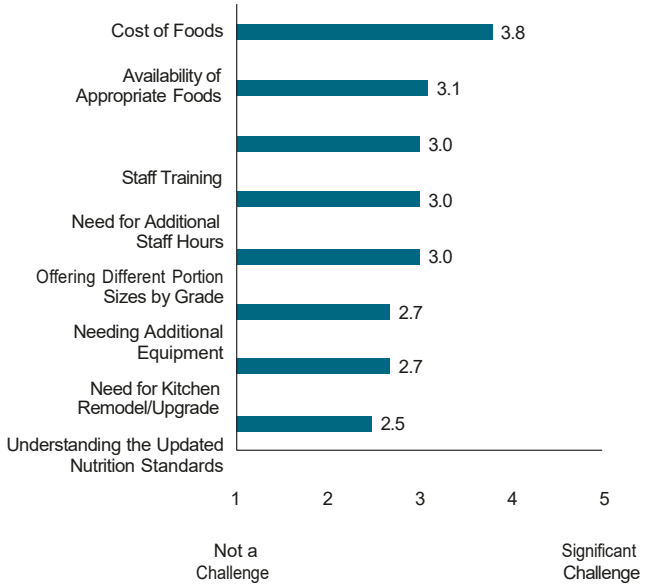
- Most schools had at least one source of competitive foods available to students. Foods available for a la carte purchase during meal times were the most common source of competitive foods (87 percent of schools for lunch and 56 percent for breakfast).
- Vending machines were available in 30 percent of all schools, with wide variation across school types. Seventy-one percent of high schools had vending machines, compared with 44 percent of middle schools and just 10 percent of elementary schools.
- Nearly one-fourth (24 percent) of schools had competitive foods available through alternative sources such as school stores, snack bars, food carts, kiosks, bake sales, or fundraisers.
- The items most commonly offered on an a la carte basis at lunch included milk (73 percent of all schools); water and 100% juices (48 percent); fresh, canned, or dried fruit (42 percent); and baked goods or desserts (30 percent). Low-fat baked goods and desserts were more prevalent than their regular-fat counterparts.

Student Participation in the NSLP and SBP

- Overall, an average of 56 percent of students participated in the NSLP on a typical school day in SY 2014–2015. Participation among students who received meals free or at a reduced price (including students who attended schools that offered free meals to all students) was more than double the rate for students who were participating at the paid rate (that is, students who were not certified to receive meal benefits) (78 percent versus 35 percent; Figure 2). In both groups, NSLP participation was highest among elementary school students and lowest among high school students.
- Participation rates in the SBP were notably lower overall, compared to the NSLP. Also, the difference in participation among students who were certified to receive free or reduced-price meals and students who were not certified was more pronounced (37 percent versus 5 percent; Figure 2).
- Multivariate analyses showed that use of HealthierUS School Challenge Smarter Lunchroom Techniques was associated with significantly higher NSLP participation rates.[7] Mean NSLP participation rates ranged from 57 to 59 percent among schools that used one or more Smarter Lunchroom Techniques, compared to 47 percent among schools that did not use any of these techniques.

Figure 1.

Challenges faced in fully implementing or maintaining compliance with the updated nutrition standards (mean rating)

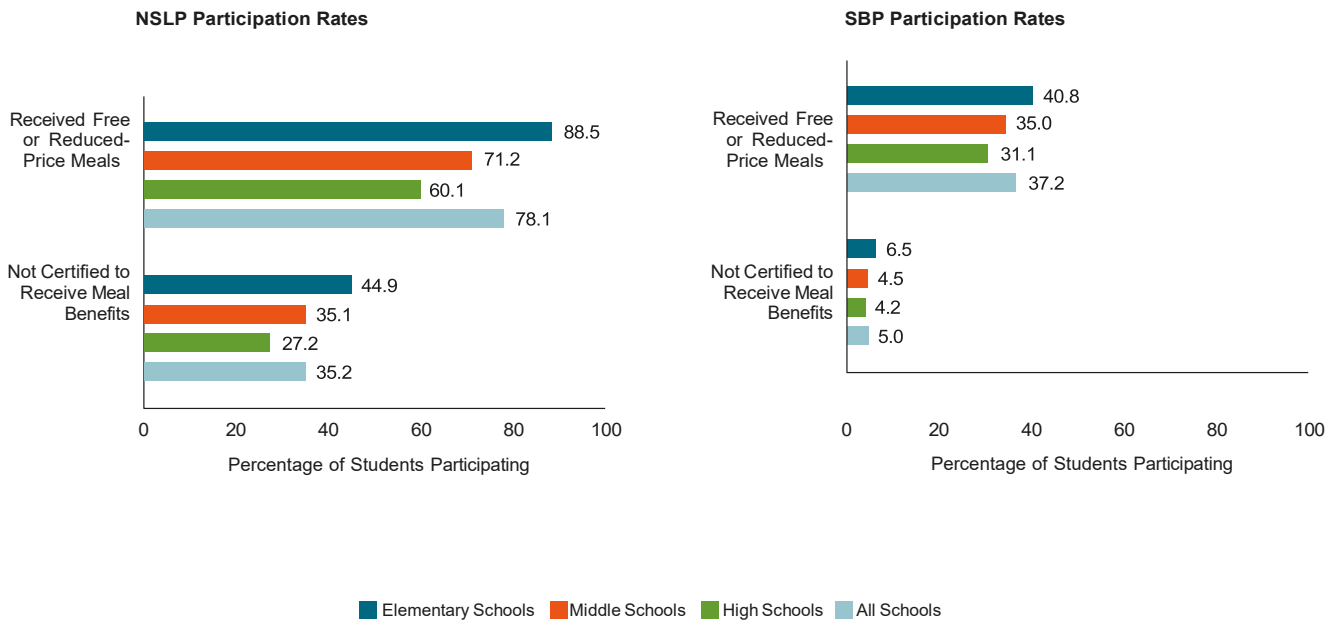


Source: School Nutrition and Meal Cost Study, School Food Authority Director Survey, SY 2014-2015. See Volume 1 of the SNMCS final report, Figure 2.7.

Note: The survey did not assign meanings to the other points on the scale.

Figure 2.

Students who received free or reduced-price meals and elementary school students participated in the NSLP and SBP at higher rates than other students



Source: School Nutrition and Meal Cost Study, Reimbursable Meal Sales Form, 24-Hour Dietary Recall, and Child/Youth Interview, SY 2014–2015. See Volume 4 of the SNMCS final report, Tables 2.1 and 2.3.

NSLP = National School Lunch Program; SBP = School Breakfast Program; SNMCS = School Nutrition and Meal Cost Study; SY = school year.

SECTION III

NUTRITIONAL CHARACTERISTICS OF SCHOOL MEALS

To be eligible for Federal reimbursement, school meals must meet defined nutrition standards. Updated nutrition standards for NSLP lunches and SBP breakfasts were phased in over several years, beginning in SY 2012–2013 (USDA, FNS 2012). The updated standards, which were based on recommendations from the Institute of Medicine (IOM),[8] were designed to better reflect the *Dietary Guidelines for Americans* and improve the nutritional quality of school meals (IOM 2010; USDA and DHHS 2010).

The SNMCS collected data in SY 2014–2015, the first year school meals had to meet all the updated requirements for both NSLP lunches and SBP breakfasts. The study examined the overall nutritional quality of school meals using the Healthy Eating Index (HEI)-2010 (Guenther et al. 2013), and also examined the extent to which daily and weekly menus complied with the updated nutrition standards.

Overall Nutritional Quality of School Meals

The HEI-2010 assesses conformance to key recommendations of the 2010 *Dietary Guidelines for Americans* (Guenther et al. 2013).[9] The index consists

of 12 component scores, each reflecting a key aspect of nutritional quality, and a total score that measures overall nutritional quality. Nine of the 12 components are adequacy components, which focus on meeting food group and nutrient needs without exceeding calorie requirements. The three remaining components, referred to as moderation components, measure dietary components that people are encouraged to limit. Maximum scores for the components range from 5 to 20, and the total score, computed by summing scores for each of the 12 components, has a maximum of 100. For both total and component scores, higher scores reflect better conformance with *Dietary Guidelines for Americans* recommendations and higher nutritional quality. To assess differences in the nutritional quality of meals before and after implementation of the updated nutrition standards, HEI-2010 scores for meals served in SY 2014–2015 were compared with scores for meals served in SY 2009–2010. Because maximum scores for the components vary, findings for component scores are expressed as a percentage of the maximum possible score.

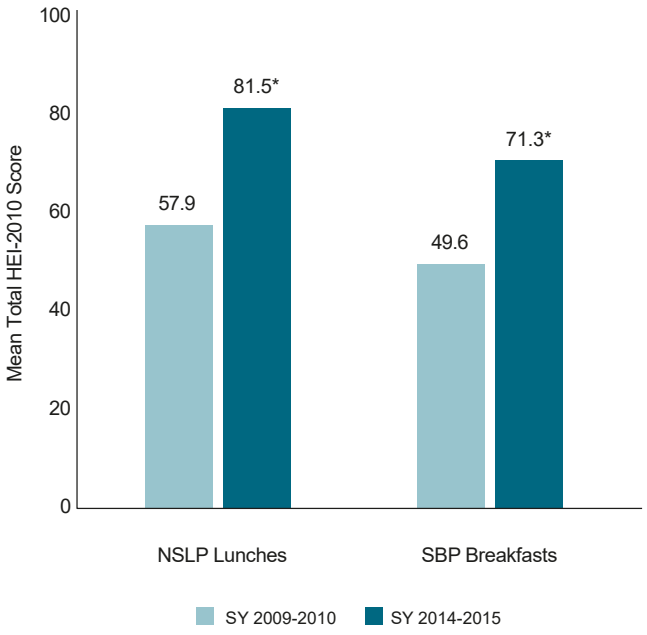
Total HEI-2010 Scores

- Between SY 2009–2010 and SY 2014–2015, the mean total HEI-2010 scores for NSLP lunches and SBP breakfasts increased significantly, suggesting that the updated nutrition standards have significantly improved the nutritional quality of school meals (Figure 3). Over this period, the mean total HEI-2010 score for NSLP lunches increased from 57.9 to 81.5—and the mean total HEI-2010 score for SBP breakfasts increased from 49.6 to 71.3.

- As a point of reference, the average total HEI-2010 score for the overall diets consumed by the U.S. population as a whole in 2011–2012 was 59.0 and the average score for children was 55.1.[10]

Figure 3.

The nutritional quality of NSLP lunches and SBP breakfasts increased significantly from SY 2009–2010 to SY 2014–2015



Source: School Nutrition and Meal Cost Study, Menu Survey, SY 2014–2015. Data for SY 2009–2010 are from SNDA-IV (Fox et al. 2012). See Volume 2 of the SNMCS final report, Figures 9.1 and 9.7.

Note: Higher total scores reflect higher nutritional quality.

*Difference between SY 2009–2010 and SY 2014–2015 is significantly different from zero at the 0.05 level.

HEI = Healthy Eating Index; NSLP = National School Lunch Program; SBP = School Breakfast Program; SNDA = School Nutrition Dietary Assessment Study; SNMCS = School Nutrition and Meal Cost Study; SY = school year.

HEI-2010 Component Scores for NSLP Lunches

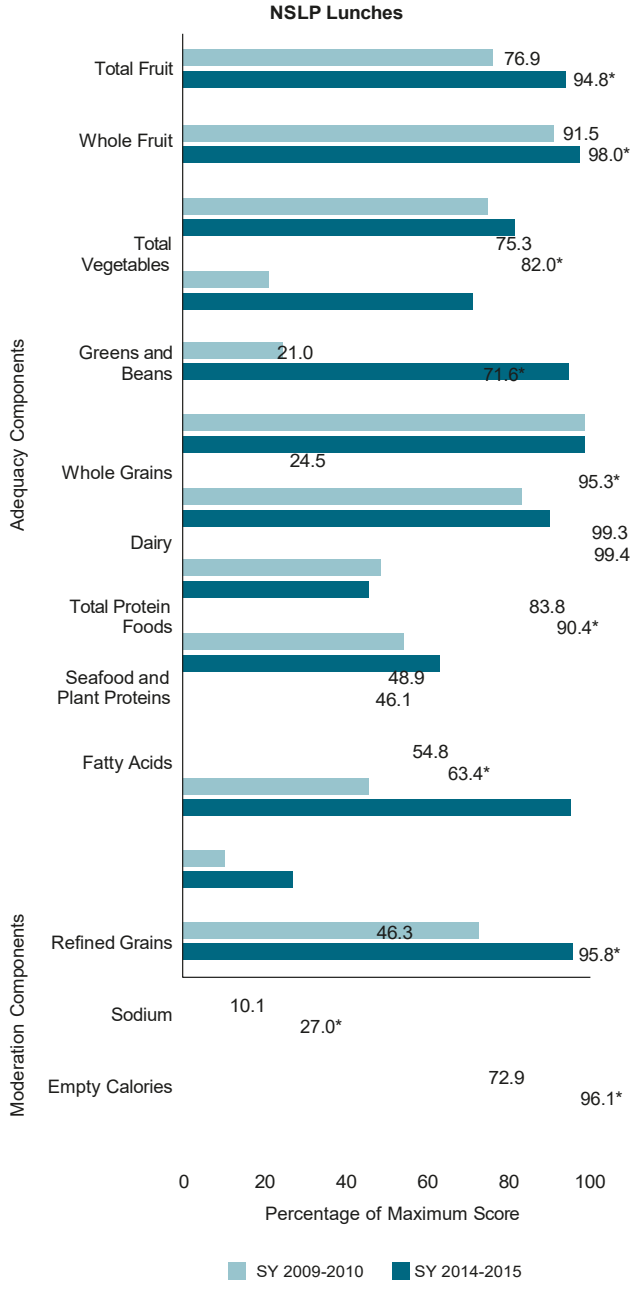
- For NSLP lunches, scores for seven of the nine adequacy components in the HEI-2010 increased significantly between SY 2009–2010 and SY 2014–2015 (Figure 4).
  - The largest increases were observed for greens and beans and whole grains. Between SY 2009–2010 and SY 2014–2015, the score for greens and beans increased from 21 to 72 percent of the maximum score, and the score for whole grains increased from 25 to 95 percent of the maximum score.
- Scores for the three moderation components also increased significantly between SY 2009–2010 and SY 2014–2015, indicating that the concentrations of refined grains, sodium, and empty calories in NSLP lunches decreased over time (Figure 4). For refined grains and empty calories, the scores for SY 2014–2015 were close to the maximum possible scores.
  - The score for refined grains more than doubled (from 46 to 96 percent of the maximum score), indicating a dramatic decrease in the concentration of refined grains in NSLP lunches over time.
  - The score for sodium almost tripled, from 10 to 27 percent of the maximum score. The increased score indicates that progress has been made in decreasing the sodium content of NSLP lunches. However, the fact that the SY 2014–2015 score was only 27 percent of the possible maximum indicates that more progress is needed to meet *Dietary Guidelines* recommendations for sodium.
  - The score for empty calories increased from 73 to 96 percent of the maximum score, indicating that the number of empty calories in NSLP lunches decreased over time.

HEI-2010 Component Scores for SBP Breakfasts

- For SBP breakfasts, scores for four of the nine adequacy components in the HEI-2010 increased significantly between SY 2009–2010 and SY 2014–2015 (Figure 5).

Figure 4.

For NSLP lunches, mean scores for most HEI-2010 components increased significantly from SY 2009–2010 to SY 2014–2015



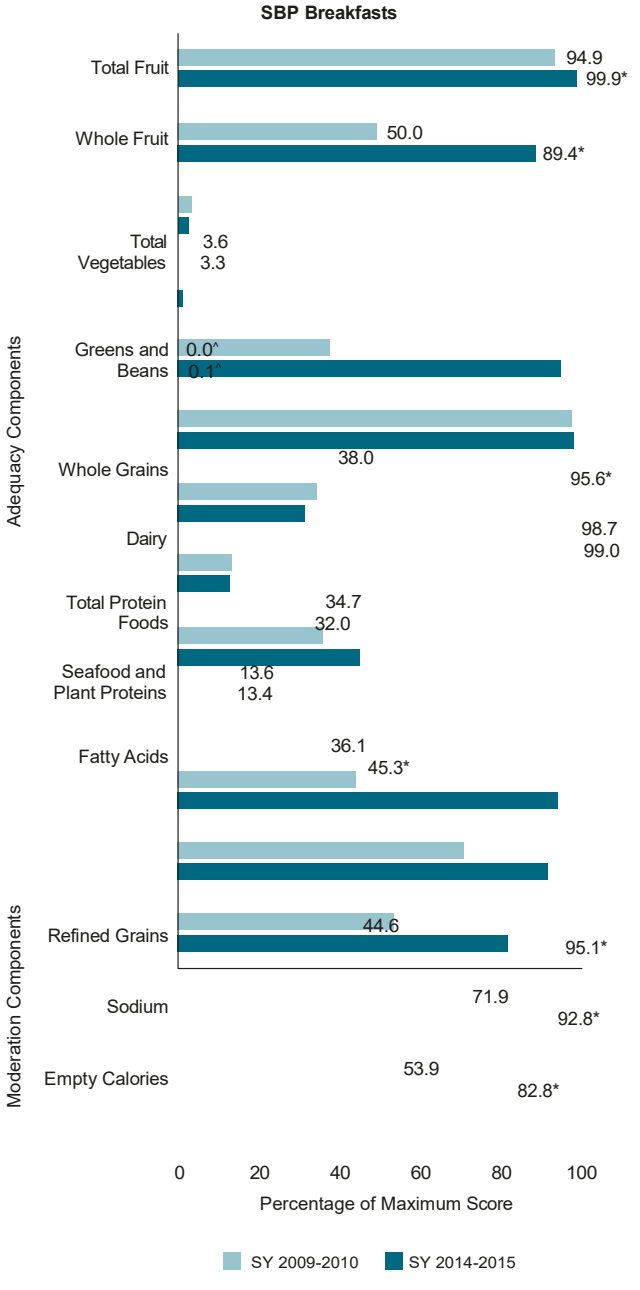
Source: School Nutrition and Meal Cost Study, Menu Survey, SY 2014–2015. Data for SY 2009–2010 are from SNDA-IV (Fox et al. 2012). See Volume 2 of the SNMCS final report, Figures 9.2 and 9.3.

Note: Higher scores for adequacy components indicate higher concentrations in NSLP lunches; whereas, higher scores for moderation components indicate lower concentrations in NSLP lunches.

*Difference between SY 2009–2010 and SY 2014–2015 is significantly different from zero at the 0.05 level.

Figure 5.

Mean HEI-2010 component scores for SBP breakfasts also increased significantly from SY 2009–2010 to SY 2014–2015



HEI = Healthy Eating Index; NSLP = National School Lunch Program; SNDA = School Nutrition Dietary Assessment Study; SNMCS = School Nutrition and Meal Cost Study; SY = school year.

Source: School Nutrition and Meal Cost Study, Menu Survey, SY 2014–2015. Data for SY 2009–2010 are from SNDA-IV (Fox et al. 2012). See Volume 2 of the SNMCS final report, Figures 9.8 and 9.9.

Note: Higher scores for adequacy components indicate higher concentrations in SBP breakfasts; whereas, higher scores for moderation components indicate lower concentrations in SBP breakfasts.

*Difference between SY 2014-2015 and SY 2009-2010 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.

HEI = Healthy Eating Index; SBP = School Breakfast Program; SNDA = School Nutrition Dietary Assessment Study; SNMCS = School Nutrition and Meal Cost Study; SY = school year.

  - The largest increases were observed for whole fruit and whole grains. Between SY 2009–2010 and SY 2014–2015, the score for whole fruit increased from 50 to 89 percent of the maximum score, and the score for whole grains increased from 38 to 96 percent of the maximum score.

- Scores for the three moderation components also increased significantly between SY 2009–2010 and SY 2014–2015, indicating that the concentrations of refined grains, sodium, and empty calories in SBP breakfasts decreased over time (Figure 5).
  - Similar to NSLP lunches, the score for refined grains for SBP breakfasts more than doubled (from 45 to 95 percent of the maximum score), indicating a marked decrease in the concentration of refined grains in SBP breakfasts.
  - There were also substantial increases in the scores for sodium (from 72 to 93 percent of the maximum score) and empty calories (from 54 to 83 percent of the maximum score), indicating that the concentrations of sodium and empty calories in SBP breakfasts decreased over time.

Compliance with Daily and Weekly Meal Pattern Requirements

Nutrition standards for NSLP lunches and SBP breakfasts include four types of requirements, shown in Box 2. The general approach used in assessing compliance with the nutrition standards was based on the approach FNS uses in determining whether an SFA is eligible to receive an additional 6-cent reimbursement per lunch. However, because the data collected in the Menu Survey were used to address many research questions not related to compliance, there were some differences in how the data were collected and analyzed. Therefore, results of this analysis are not directly comparable to the 6-cent reimbursement assessment.

Box 2. Nutrition Standards for NSLP Lunches and SBP Breakfasts

- Daily and weekly meal pattern requirements specify minimum amounts of foods to be offered each day and over the course of a week. Depending on the ages of students served, schools may have to offer more than the daily minimum amounts required for grains and meats/meat alternates on some menus in order to meet the associated weekly requirements.
- Weekly meal pattern requirements for NSLP lunches also specify weekly minimum amounts for five vegetable subgroups (dark green, red and orange, legumes, starchy, and other).
- Dietary specifications that (1) set average weekly minimum and maximum calorie levels; (2) set limits on saturated fat; (3) require foods to contain zero grams (less than 0.5 grams) of synthetic trans fat per serving; and (4) set limits on sodium to be phased in over several years. In SY 2014–2015, schools were expected not to exceed Target 1 levels for sodium.
- For some meal components, restrictions on the types of foods include the following:
  - Milk must be fat-free (flavored or unflavored) or low-fat (1% or less) unflavored, and at least two choices must be offered daily.
  - No more than 50 percent of fruit and vegetable offerings over the course of a week can be in the form of juice.
  - All grains must be whole grain-rich (contain at least 50 percent whole grains).
  - For NSLP lunches, no more than two ounce-equivalents of grains can be provided by grain-based desserts over the course of a week.

Daily Meal Pattern Requirements

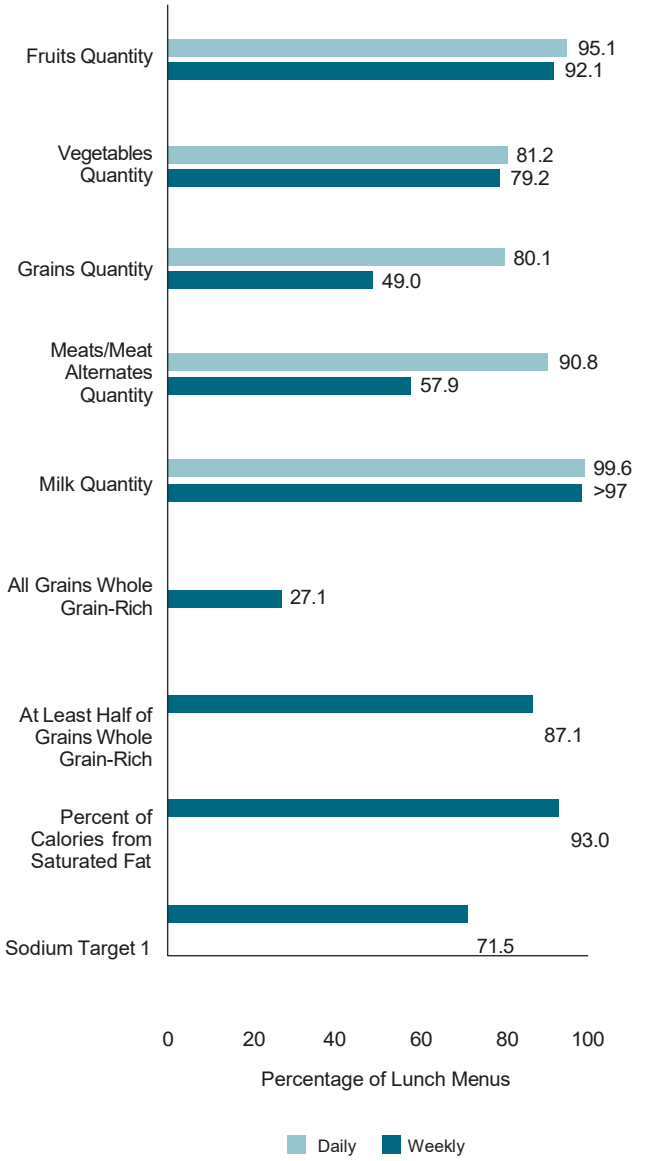
- Virtually all daily lunch menus met the daily quantity requirement for milk (Figure 6). Nearly all daily lunch menus met the daily quantity requirements for fruits (95 percent) and meats/meat alternates (91 percent). Roughly 8 in 10 daily lunch menus met the daily quantity requirements for vegetables and grains (81 and 80 percent, respectively).
- Almost all daily lunch menus (91 percent) offered only allowed types of milk.[11]

Weekly Meal Pattern Requirements

- Virtually all weekly lunch menus met the weekly quantity requirement for milk (Figure 6). Nearly all weekly lunch menus (92 percent) met the weekly quantity requirement for fruits, and nearly four out of five (79 percent) met the weekly quantity requirement for vegetables.
- Fewer weekly lunch menus met the weekly quantity requirements for meats/meat alternates (58 percent) and grains (49 percent) (Figure 6). Weekly menus in elementary schools were significantly more likely than weekly menus in middle or high schools to meet these weekly quantity requirements.
- Slightly more than one-quarter (27 percent) of weekly lunch menus offered only whole grain-rich grain items (Figure 6). In SY 2014–2015, SFAs that demonstrated a hardship in meeting this requirement could seek an exemption that allowed them to meet a relaxed requirement that at least half of all grains must be whole grain-rich. Most weekly lunch menus (87 percent) met this relaxed requirement for whole grain-rich items.
- Almost all weekly lunch menus (97 percent) complied with the requirement that no more than half of the fruits offered be in the form of juice.
- Between 92 and 95 percent of weekly lunch menus met weekly quantity requirements for vegetable subgroups (dark green vegetables, red and orange vegetables, starchy vegetables, and other vegetables). A smaller proportion (79 percent) of weekly lunch menus met the weekly quantity requirement for legumes.
- Nearly all weekly lunch menus (96 percent) met the grain-based dessert restriction, which sets a limit on the maxi-

Figure 6.

Most daily and weekly lunch menus met daily and weekly quantity requirements for fruits, vegetables, and milk, but fewer menus met weekly quantity requirements for grains and meats/meat alternates



Source: School Nutrition and Meal Cost Study, Menu Survey, SY 2014–2015. See Volume 2 of the SNMCS final report, Figures 3.1, 3.2, 3.4, and 3.7.

NSLP = National School Lunch Program; SNMCS = School Nutrition and Meal Cost Study; SY = school year.

>97 = 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.

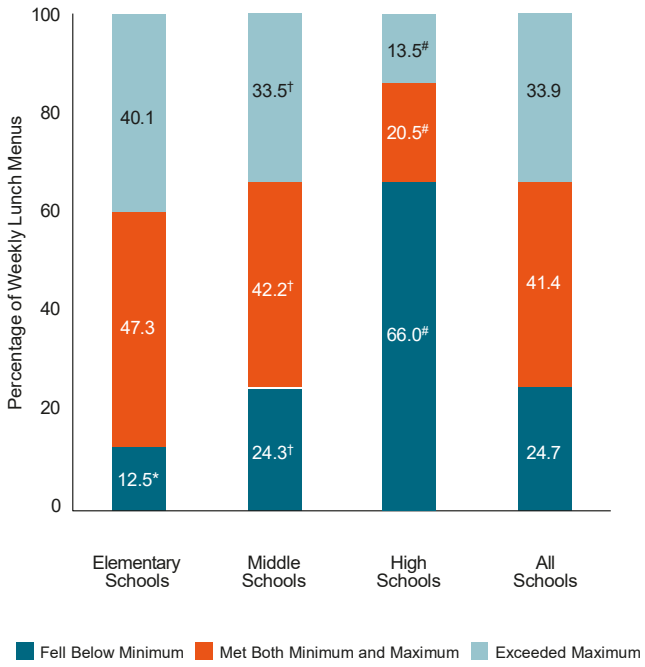
mum amount of grains allowed as grain-based desserts.

Dietary Specifications

- Almost all average weekly lunch menus (93 percent) met the limit on the percentage of calories from saturated fat (Figure 6).
- Roughly 7 in 10 average weekly lunch menus (72 percent) met the Target 1 sodium limit that was in place in SY 2014–2015 (Figure 6), and another 13 percent of weekly menus were within 10 percent of the limit. Average weekly menus in middle schools were significantly more likely than those in high schools to meet the Target 1 sodium limit.
- Overall, 41 percent of average weekly lunch menus fell within the specified calorie range—that is, the weekly menus met both the minimum and maximum calorie levels (Figure 7). Average weekly lunch menus in elementary and middle schools were significantly more likely than those in high schools to fall within the specified calorie range (47 percent and 42 percent, respectively, versus 21 percent).
- It was more common for average weekly lunch menus in elementary and middle schools to exceed the maximum calorie level (40 percent and 34 percent, respectively) than to fall below the minimum calorie level (13 percent and 24 percent, respectively) (Figure 7). Among high schools, however, it was more common for average weekly lunch menus to fall below the minimum calorie level than to exceed the maximum calorie level (66 percent versus 14 percent).
- More than one-third of weekly lunch menus did not meet the specified calorie range but came within 10 percent of doing so. The average calorie content of weekly menus in 33 percent of elementary schools, 35 percent of middle schools, and 38 percent of high schools was within 10 percent of the calorie range. Thus, overall, more than three-quarters of weekly lunch menus (76 percent) met both the minimum and maximum calorie levels or came close to meeting these specifications.

Figure 7.

Average weekly lunch menus in elementary and middle schools were more likely than those in high schools to meet NSLP dietary specifications for minimum and maximum calorie levels



Source: School Nutrition and Meal Cost Study, Menu Survey, SY 2014–2015. See Volume 2 of the SNMCS final report, Figure 3.5.

* Difference between elementary and middle schools is significantly different from zero at the 0.05 level.

† Difference between middle and high schools is significantly different from zero at the 0.05 level.

Difference between elementary and high schools is significantly different from zero at the 0.05 level.

NSLP = National School Lunch Program; SNMCS = School Nutrition and Meal Cost Study; SY = school year.

All Nutrition Standards for NSLP Lunches

- Overall, just over half (56 percent) of daily lunch menus met all of the daily meal pattern requirements (Figure 8). To meet all of the daily requirements, a daily lunch menu must be compliant with each of the six daily meal pattern requirements. If a daily menu includes a choice of foods for students to select from (for example, two milk choices or four entrée choices), each choice must meet the relevant daily meal pattern requirement. This means that a daily menu could fail to meet all of the daily meal pattern requirements because of just one noncompliant food.
- To meet all the weekly meal pattern requirements, weekly lunch menus must meet each of the 14 weekly requirements. Overall, only 7 percent of weekly lunch menus met all of the weekly meal pattern requirements (Figure 8). The percentage increases to 18 percent if the relaxed requirement for whole grains is used (that is, that

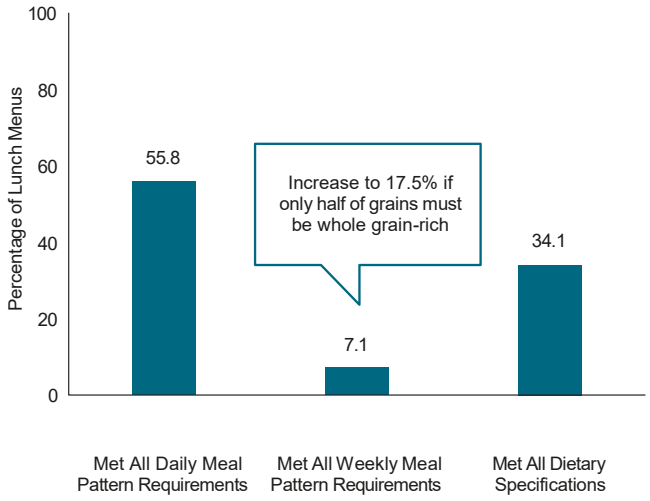
at least half of grains must be whole grain-rich rather than all grains).

  - Meeting all the weekly lunch requirements is challenging because there are so many requirements and because a single noncompliant food on one daily menu can cause a weekly menu to be noncompliant with all of the weekly requirements.
  - Another challenge for weekly lunch menus in elementary and middle schools is that, in order to meet the weekly requirements for grains and meats/meat alternates, at least some of the daily menus have to provide more than the daily minimum amount. For example, for grains, the daily requirement for elementary and middle schools is 1 ounce, but the weekly requirement is 8 ounces. To meet the weekly requirement, some of the daily menus must provide more than the 1 ounce minimum.

- About one-third (34 percent) of weekly lunch menus met all of the dietary specifications (Figure 8). Weekly menus that met all the dietary specifications had an average weekly calorie content that was within the specified range, and also met limits on saturated fat and sodium.

Figure 8.

More than half of lunch menus met all daily meal pattern requirements, but meeting all weekly meal pattern requirements and all dietary specifications was more challenging



Source: School Nutrition and Meal Cost Study, Menu Survey, SY 2014–2015. See Volume 2 of the SNMCS final report, Tables C.1, C.6, and C.10.

SNMCS = School Nutrition and Meal Cost Study; SY = school year.

SBP Breakfasts

Daily and Weekly Meal Pattern Requirements

- Virtually all daily and weekly breakfast menus met the quantity requirements for milk. Almost 9 in 10 (89 percent) daily breakfast menus offered only allowed types of milk.
- Most daily breakfast menus met the daily quantity requirements for grains (87 percent) and fruits (83 percent). Daily menus in elementary schools were significantly more likely than those in high schools to meet the daily quantity requirement for grains.
- More than three-quarters (79 percent) of weekly breakfast menus met the weekly quantity requirement for fruits. A slightly smaller percentage (69 percent) complied with the requirement that no more than half of the fruits offered be in the form of juice.
- Nearly 8 in 10 weekly breakfast menus (79 percent) met the weekly quantity requirement for grains. Weekly menus in elementary and middle schools were significantly more likely than those in high schools to meet this requirement.
- About half of all weekly breakfast menus (47 percent) offered only whole grain-rich grain items. However, 95 percent of all weekly breakfast menus met the relaxed requirement that at least half of the grains offered must be whole grain-rich.

Dietary Specifications

- More than half (56 percent) of average weekly breakfast menus fell within the specified calorie range (that is, they met both the minimum and maximum calorie levels). It was more common for average weekly breakfast menus to exceed the maximum calorie level (36 percent) than to fall below the minimum calorie level (8 percent).
- Twenty-two percent of weekly breakfast menus did not meet the specified calorie range but came within 10 percent of the calorie range. Thus, overall, more than three-quarters (78 percent) of weekly breakfast menus met both the minimum and maximum calorie levels or came close to meeting these specifications.

- Nearly all (97 percent) average weekly breakfast menus met the limit on the percentage of calories from saturated fat. Two-thirds (67 percent) of average weekly breakfast menus met the Target 1 sodium limit that was in place in SY 2014–2015 and another 10 percent were within 10 percent of the limit.

All Nutrition Standards for SBP Breakfasts

- Overall, almost two-thirds (64 percent) of daily breakfast menus met all four of the daily meal pattern requirements. Less than one-quarter (23 percent) of weekly breakfast menus met all five of the weekly meal pattern requirements; however, the percentage increases to 42 percent if the relaxed requirement for whole grains is used.

- Relative to lunch menus, larger proportions of breakfast menus met all of the daily and weekly meal pattern requirements. This is consistent with the fact that there are fewer daily and weekly meal pattern requirements for breakfasts than lunches.

- Almost half (47 percent) of weekly breakfast menus met all of the dietary specifications—that is, the menus had an average weekly calorie content that was within the specified range, and also met limits on saturated fat and sodium.

PLATE WASTE IN THE NATIONAL SCHOOL LUNCH PROGRAM

Plate waste is a measure of the amount of available food that is discarded (or not consumed). Some level of plate waste is inevitable in feeding programs like the school meal programs. Because required minimum portion sizes reflect average calorie and nutrient needs of specific grade groups, they may overestimate the needs of some students. However, the level of plate waste can be an important gauge of student satisfaction with meal offerings. It may also reflect menu planning that does not take students' food selection patterns or preferences into account. Plate waste varies because of individual student characteristics and preferences, but policy and environmental factors at the school and SFA levels may also influence it.

The SNMCS is the first national study in more than two decades to examine plate waste in school meals, and it is the first to examine the extent of plate waste since the updated nutrition standards went into effect.[12] For operational reasons, schools recruited for the plate waste observations had to serve a minimum number of lunches per day.[13] In addition, meals had to be served in cafeterias, and students had to consume the meals in the cafeteria. For these reasons,

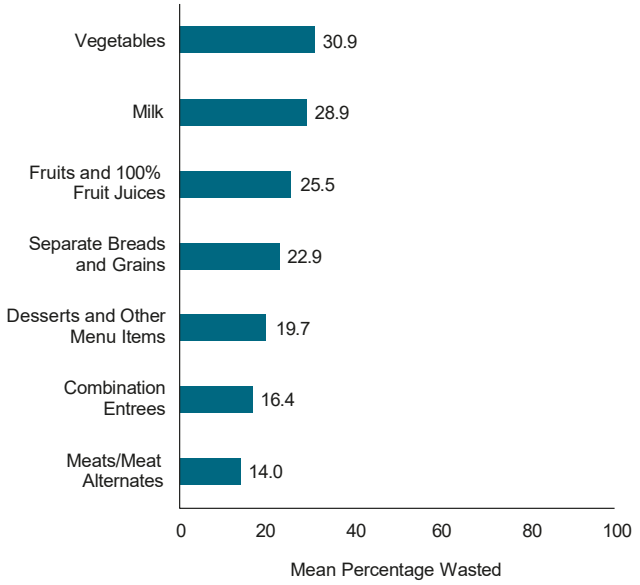
findings related to plate waste are representative of public, non-charter schools that offer the NSLP, serve a minimum number of lunches per day,[14] and serve meals in cafeteria-based settings.

Extent of Plate Waste for Specific Types of Food in NSLP Lunches

- Overall, plate waste in NSLP lunches was highest for vegetables—an average of 31 percent of the vegetables on observed trays was wasted—followed by milk (29 percent), fruits and 100% fruit juice (26 percent), and separate or side grains/breads (23 percent) (Figure 9). Mean levels of waste were lower for desserts and other menu items (20 percent), and lowest for entrees and meats/meat alternates (16 and 14 percent, respectively). These findings are generally comparable to findings from studies that examined plate waste prior to implementation of the updated nutrition standards.[15] Moreover, small, local studies that examined plate waste before and after implementation of the updated nutrition standards found that levels of plate waste were reduced or unchanged.[16]

Figure 9.

Mean levels of plate waste in the NSLP were highest for vegetables and lowest for meats/meat alternates and entrees



Source: School Nutrition and Meal Cost Study, Plate Waste Observations, SY 2014–2015. See Volume 4 of the SNMCS final report, Table 5.1.

NSLP = National School Lunch Program; SNMCS = School Nutrition and Meal Cost Study; SY = school year.

- For each type of food, the mean proportion wasted was higher in elementary schools than in middle or high schools and was higher in middle schools than in high schools (though not all differences between middle and high schools were statistically significant).

Calories and Nutrients Wasted in NSLP Lunches

- On average, about one-fifth (21 percent) of the calories available in NSLP lunches overall were wasted, as well as one-quarter or more of the available vitamin A, vitamin C, vitamin D, calcium, and potassium.
- In keeping with the variation observed across school types in levels of plate waste for specific types of food, the average proportion of calories and most nutrients wasted was significantly higher in elementary schools than in either middle or high schools, and was significantly higher in middle schools than in high schools. The only exceptions were total fat and saturated fat, where differences between middle and high schools were not statistically significant.

Factors Associated with Plate Waste

- One factor that may, in part, explain the differences in plate waste observed across school types is differences in the use of the offer-versus-serve (OVS) option, which allows students to decline some components of a reimbursable meal as a way of providing choice and reducing waste. OVS is mandatory for high schools, but optional for middle schools and elementary schools (81 percent of all elementary and middle schools used OVS at lunch). Multivariate analyses found that, among elementary schools, use of OVS was associated with significantly lower levels of plate waste.
- Multivariate analyses also found a significant association between the timing of lunch periods and plate waste. The mean percentage of calories wasted was significantly lower in lunch periods that started at 12:00 PM or later than in lunch periods that started before 11:30 AM (18 percent versus 20 percent).

SECTION V

DIETARY INTAKES OF NSLP PARTICIPANTS AND NONPARTICIPANTS

An important part of the SNMCS was comparing meal-specific and usual dietary intakes of school meal participants and nonparticipants. To support these analyses, 24-hour dietary recalls were completed with sampled students. These interviews collected detailed information on all foods and beverages consumed during a midnight-to-midnight recall period covering a school day. Data on the calorie and nutrient content of foods obtained from reimbursable school meals were taken from the detailed analysis of each school's reimbursable menus (see Section III). This ensured that the dietary intake data represented, as accurately as possible, the nutrient content of foods obtained in reimbursable meals.

Students identified in administrative records as having received a reimbursable breakfast or lunch on the day referenced in the 24-hour dietary recall (the target day) were considered SBP participants and NSLP participants, respectively.[17] Students not identified as having received a reimbursable meal on the target day were considered nonparticipants. In comparing the food and nutrient intakes of school meal participants and nonparticipants, the study team used inverse probability weighting to construct matched comparison groups of nonparticipants (for

example, NSLP nonparticipants in elementary schools). These matched comparison groups were weighted to more closely resemble participants on observable characteristics that are believed to influence participation, for example, age, gender, household income, and whether a student was a picky eater. Even with these controls, differences between participants and matched nonparticipants may exist for unmeasured characteristics. For this reason, findings from
these comparisons should not be interpreted as causal effects of school meal participation.

This summary focuses on the dietary intakes of NSLP participants and nonparticipants.[18] Findings are presented for dietary intakes at lunch as well as usual daily (24-hour) intakes on school days. For both NSLP participants and the matched comparison group of nonparticipants, the analysis of dietary intakes at lunch included all foods and beverages consumed as part of this meal. For NSLP participants, this may include, in addition to foods and beverages obtained as part of a reimbursable lunch, foods and beverages obtained from non-reimbursable sources at school, from home, and/or from other sources outside of school.

Lunch Intakes of NSLP Participants and Matched Nonparticipants

Foods Consumed at Lunch

- NSLP participants were more likely than matched nonparticipants to consume milk (66 percent versus 23 percent), fruit or 100% fruit juice (58 percent versus 47 percent), and vegetables (43 percent versus 21 percent) at lunch. The difference in vegetables was largely driven by higher percentages of NSLP participants consuming starchy vegetables (French fries, other potatoes, and corn) and side salads, relative to matched nonparticipants.
- NSLP participants were less likely than matched nonparticipants to consume desserts, snacks, or beverages other than milk or 100% juice (48 percent versus 75 percent) at lunch.

Mean Calorie and Nutrient Intakes at Lunch

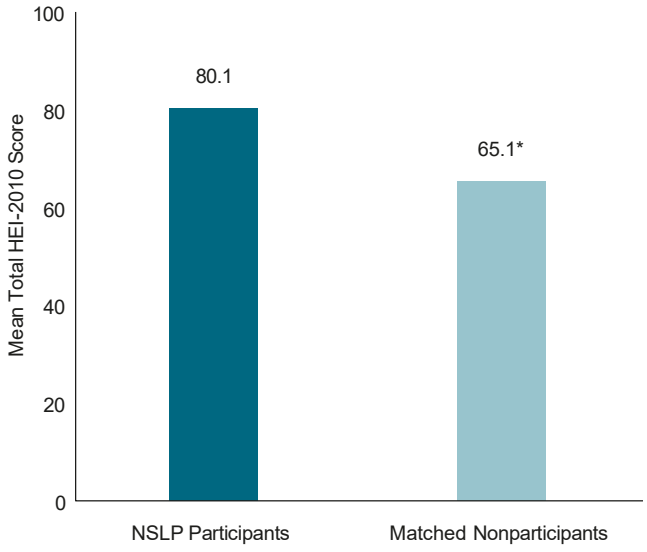
- NSLP participants consumed lunches that provided significantly fewer calories than lunches consumed by matched nonparticipants (515 calories versus 643 calories).
- Relative to lunches consumed by matched nonparticipants, lunches consumed by NSLP participants provided a smaller percentage of calories from total fat (28 percent versus 31 percent), a smaller percentage of calories from saturated fat (9 percent versus 10 percent), and a larger percentage of calories from protein (19 percent versus 15 percent).

Nutritional Quality of Lunches Consumed

- Overall, the lunches consumed by NSLP participants achieved a higher mean total score on the HEI-2010 than lunches consumed by matched nonparticipants (80.1 out of a possible 100 versus 65.1; Figure 10).[19] As noted previously, the average total HEI-2010 score for the overall diets consumed by the U.S. population as a whole in 2011–2012 was 59.0 and the average score for children was 55.1.[20]
- Mean scores for HEI-2010 components showed that lunches consumed by NSLP participants had higher concentrations of vegetables, whole grains, and dairy and lower concentrations of refined grains and empty calories than lunches consumed by matched nonparticipants (Figure 11). Lunches consumed by NSLP participants achieved perfect scores for whole grains and dairy and a near-perfect score for empty calories.

Figure 10.

Lunches consumed by NSLP participants were more nutritious than lunches consumed by matched nonparticipants



Source: School Nutrition and Meal Cost Study, 24-Hour Dietary Recalls: Day 1, SY 2014–2015. See Volume 4 of the SNMCS final report, Figure 9.1.

Note: Higher total scores reflect higher nutritional quality.

*Difference between participants and the matched comparison group of nonparticipants is significantly different from zero at the 0.05 level.

NSLP = National School Lunch Program; SNMCS = School Nutrition and Meal Cost Study; SY = school year.

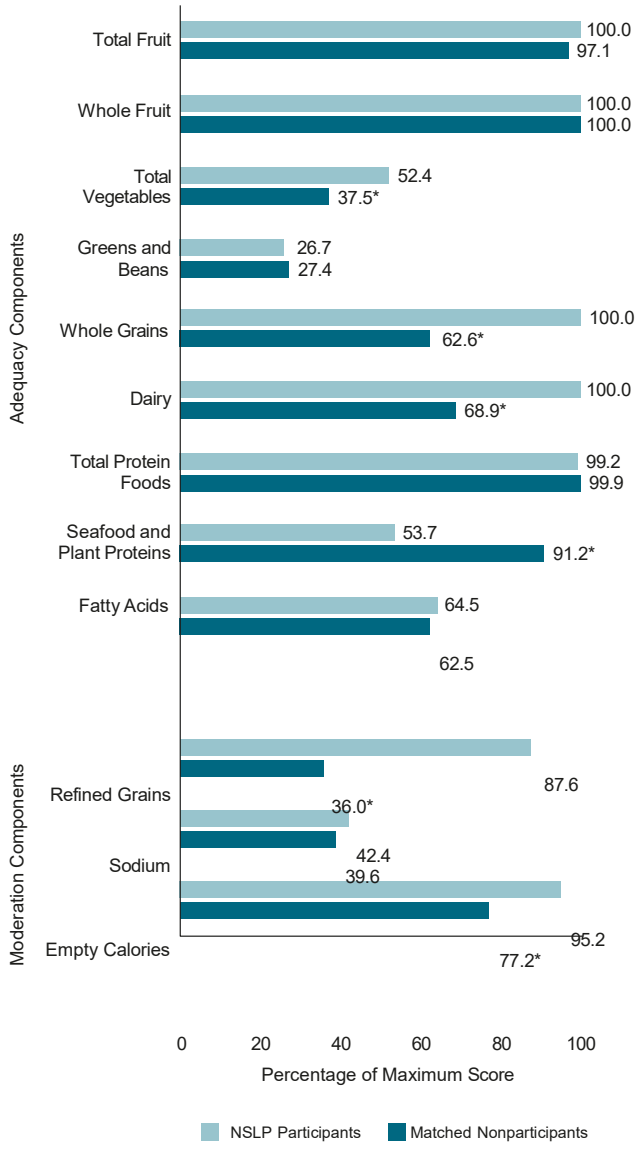
Usual Daily Intakes of NSLP Participants and Matched Nonparticipants on School Days

Overall Nutritional Quality

- The significant difference in mean total HEI-2010 scores observed among NSLP participants and matched nonparticipants at lunch persisted over 24 hours, although the magnitude of the difference was smaller (65.2 out of a possible 100 versus 60.6 for 24-hour intakes of NSLP participants and matched nonparticipants, respectively, compared to 80.1 versus 65.1 for lunch intakes; Figure 12).

Figure 11.

Lunches consumed by NSLP participants were more consistent with Dietary Guidelines recommendations than lunches consumed by matched nonparticipants



Source: School Nutrition and Meal Cost Study, 24-Hour Dietary Recalls: Day 1, SY 2014–2015. See Volume 4 of the SNMCS final report, Figures 9.2 and 9.3.

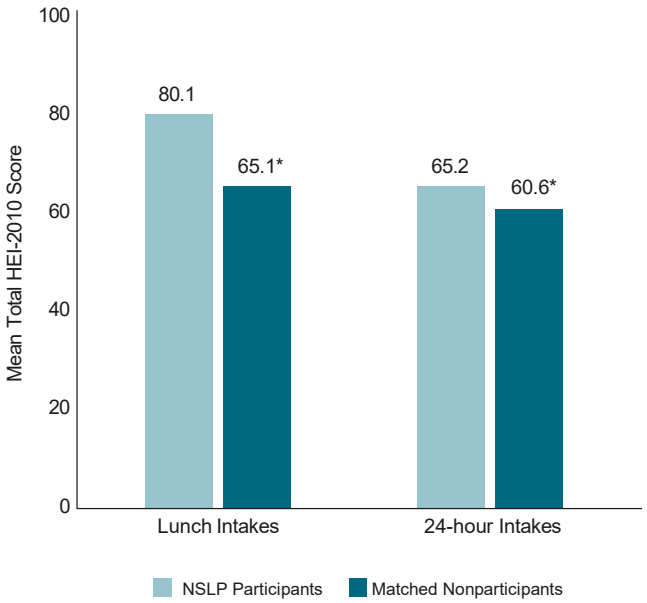
Note: Higher scores for adequacy components indicate higher concentrations in lunches consumed; whereas, higher scores for moderation components indicate lower concentrations in lunches consumed.

*Difference between participants and the matched comparison group of nonparticipants is significantly different from zero at the 0.05 level.

NSLP = National School Lunch Program; SNMCS = School Nutrition and Meal Cost Study; SY = school year.

Figure 12.

The positive difference between total HEI-2010 scores of NSLP participants and matched nonparticipants persisted over 24 hours, but the size of the difference was smaller



Source: School Nutrition and Meal Cost Study, 24-Hour Dietary Recalls: Day 1, SY 2014–2015. See Volume 4 of the SNMCS final report, Figures 9.1 and 9.4.

Note: Higher total scores reflect higher nutritional quality.

*Difference between participants and the matched comparison group of nonparticipants is significantly different from zero at the 0.05 level.

NSLP = National School Lunch Program; SNMCS = School Nutrition and Meal Cost Study; SY = school year.

- A similar pattern was observed for the positive and significant differences between NSLP participants and matched nonparticipants in HEI-2010 component scores for whole grains, dairy, and refined grains at lunch. The significant differences persisted over 24 hours (Figure 13), but the magnitude of the differences between NSLP participants and matched nonparticipants was smaller.
- The positive and significant difference observed at lunch for total vegetables did not persist over 24-hours (Figure 13). A comparison of mean scores for lunches and 24-hour intakes suggest that, relative to lunches, the concentrations of vegetables in other meals and snacks were lower for NSLP participants and higher for matched nonparticipants, resulting in comparable

concentrations of vegetables in 24-hour intakes.

- The positive and significant difference between NSLP participants and matched nonparticipants observed at lunch for empty calories also did not persist over 24-hours (Figure 13). A comparison of mean scores for lunches and 24-hour intakes suggests that, relative to lunches, the concentrations of empty calories in other meals and snacks were higher for both groups of students, particularly for NSLP participants.

Prevalence of Acceptable, Inadequate, and Excessive Nutrient Intakes

The study team used the 24-hour recalls collected from all students, as well as a second 24-hour recall collected from a representative subset (about 27 percent) of students, to estimate usual daily intake distributions of calories and nutrients on school days. Usual intake distributions were compared with standards defined in the Dietary Reference Intakes (DRIs) and 2010 *Dietary Guidelines for Americans* to estimate the percentages of students with acceptable, inadequate, or excessive usual nutrient intakes.[21] The DRIs provide standards for the amounts of nutrients healthy individuals should consume, based on age, gender, and life stage (IOM 2006).

Macronutrients

- Most NSLP participants and matched nonparticipants had acceptable usual intakes of macronutrients on school days (defined as intakes that fell within the Acceptable Macronutrient Distribution Ranges), and there were few significant differences between the two groups.

- Overall, about 60 percent of students had usual daily intakes of saturated fat that exceeded the 2010 *Dietary Guidelines for Americans* recommended limit. Findings were comparable for NSLP participants and matched nonparticipants.

Vitamins and Minerals

Nutrient requirements vary for students of different ages. Consequently, there were notable differences across school types in the prevalence of inadequate nutrient intakes (defined as intakes that were less than age-and-gender-specific Estimated Average Requirements).

- Among elementary school students, inadequate usual intakes of vitamins and minerals were relatively uncommon, except for vitamins A, D, and E[22], and calcium—which had rates of inadequacy above 10 percent for both NSLP participants and nonparticipants—and magnesium and phosphorus, with rates of inadequacy above 10 percent for matched nonparticipants only.

  – NSLP participants in elementary schools were significantly less likely than matched nonparticipants to have inadequate usual intakes of vitamin D (68 percent versus about 96 percent), calcium (28 percent versus 46 percent), and phosphorus (less than 3 percent versus 14 percent).

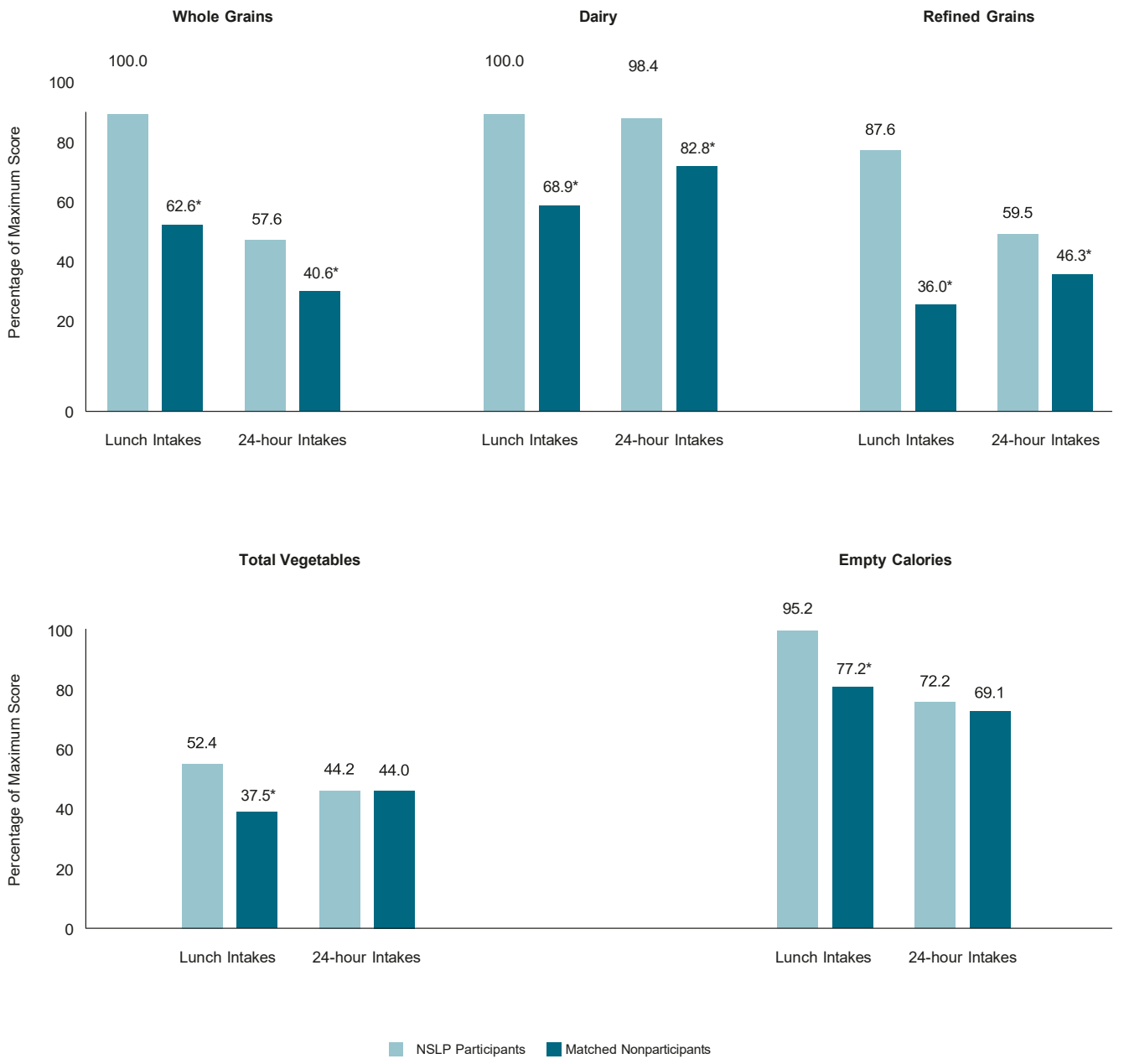
- Among middle school students, the prevalence of inadequate usual intakes exceeded 10 percent for both NSLP participants and matched nonparticipants for vitamins A, C, D, and E, and for calcium, magnesium, and phosphorus. In addition, among matched nonparticipants, the prevalence of inadequate usual intakes exceeded 10 percent for vitamin B_6, folate, and zinc.

  – NSLP participants in middle schools were significantly less likely than matched nonparticipants to have inadequate usual intakes of vitamin B_6 (less than 3 percent versus 10 percent) and zinc (about 4 percent versus 28 percent).

- High school students—who have the highest nutrient requirements relative to the other age groups considered in this study—had the greatest prevalence of inadequate usual intakes of vitamins and minerals. The prevalence of inadequacy exceeded 10 percent for both NSLP participants and matched nonparticipants for vitamins A, C, D, and E, and for calcium, magnesium, and phosphorus. In addition, for matched nonparticipants, the prevalence of inadequate usual intakes exceeded 10 percent for vitamins B_6 and B_{12}, folate, riboflavin, thiamin, and zinc.

Figure 13.

Differences between NSLP participants and matched nonparticipants in HEI-2010 scores at lunch persisted over 24 hours for some but not all components



Source: School Nutrition and Meal Cost Study, 24-Hour Dietary Recalls: Day 1, SY 2014–2015. See Volume 4 of the SNMCS final report, Figures 9.2, 9.3, 9.5, and 9.6.

Note: Higher scores for adequacy components (whole grains, dairy, and vegetables) indicate higher concentrations in lunches and 24-hour intakes; whereas, higher scores for moderation components (refined grains and empty calories) indicate lower concentrations.

*Difference between participants and the matched comparison group of nonparticipants is significantly different from zero at the 0.05 level.

NSLP = National School Lunch Program; SNMCS = School Nutrition and Meal Cost Study; SY = school year.

- NSLP participants in high schools were significantly less likely than matched nonparticipants to have inadequate usual intakes of several vitamins and minerals, including vitamins B_6 and B_{12}, niacin, riboflavin, thiamin, folate, calcium, phosphorus, and zinc.

Sodium and Fiber

- Overall, more than 81 percent of NSLP participants and matched nonparticipants had excessive usual intakes of sodium. Despite significantly lower sodium intakes among NSLP participants at lunch, there were no significant differences between NSLP participants and matched nonparticipants in the prevalence of excessive usual intakes of sodium.

- Mean usual dietary fiber intakes of both NSLP participants and matched nonparticipants were low, relative to the 14 grams of fiber per 1,000 calories benchmark on which the DRIs are based. Overall, there were no statistically significant differences between NSLP participants and matched nonparticipants in usual intakes of dietary fiber.

MEAL COSTS AND SCHOOL FOODSERVICE REVENUES

Under USDA regulations, SFAs must balance the costs and revenues of school foodservice to operate on a nonprofit basis. All revenues must be used solely to operate or improve meals and foodservice operations. SFAs 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 foods include competitive foods, adult meals, catering, and meals provided to schools, day care, or other programs outside the SFA.

The analysis of meal costs distinguished between reported, unreported, and full costs. *Reported costs* include only the costs charged to the school foodservice account. 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; pay and fringe benefits for foodservice personnel; supplies; and (less frequently) charges for facilities and other resources 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. This summary focuses on *reported costs*. Details about unreported costs and full costs are provided in Volume 3 of the SNMCS final report.

The study team examined mean costs of producing reimbursable meals in the NSLP and SBP using two different units of analysis, as outlined in Box 3.

In the discussion that follows, cost estimates reported "for the average SFA" used the SFA as the unit of analysis, and cost estimates reported "for the average NSLP lunch" or "for the average SBP breakfast" used the meal as the unit of analysis.

Box 3. Units of Analysis Used in Examining Meal Costs

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.

Reported Cost per NSLP Lunch

- In SY 2014–2015, the mean reported cost per NSLP lunch for the average SFA was $3.81 (Figure 14). As shown in Figure 14, 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.[23] In approximately three of five SFAs, the reported cost of producing a reimbursable lunch in SY 2014–2015 was greater than the mean Federal subsidy for a free lunch estimated for this study.
- Using the meal as the unit of analysis, the mean reported cost of the average NSLP lunch was $3.66. This was less than the mean reported cost for the average SFA ($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 per NSLP lunch reflects that the reported cost 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.[24]

Reported Cost per SBP Breakfast

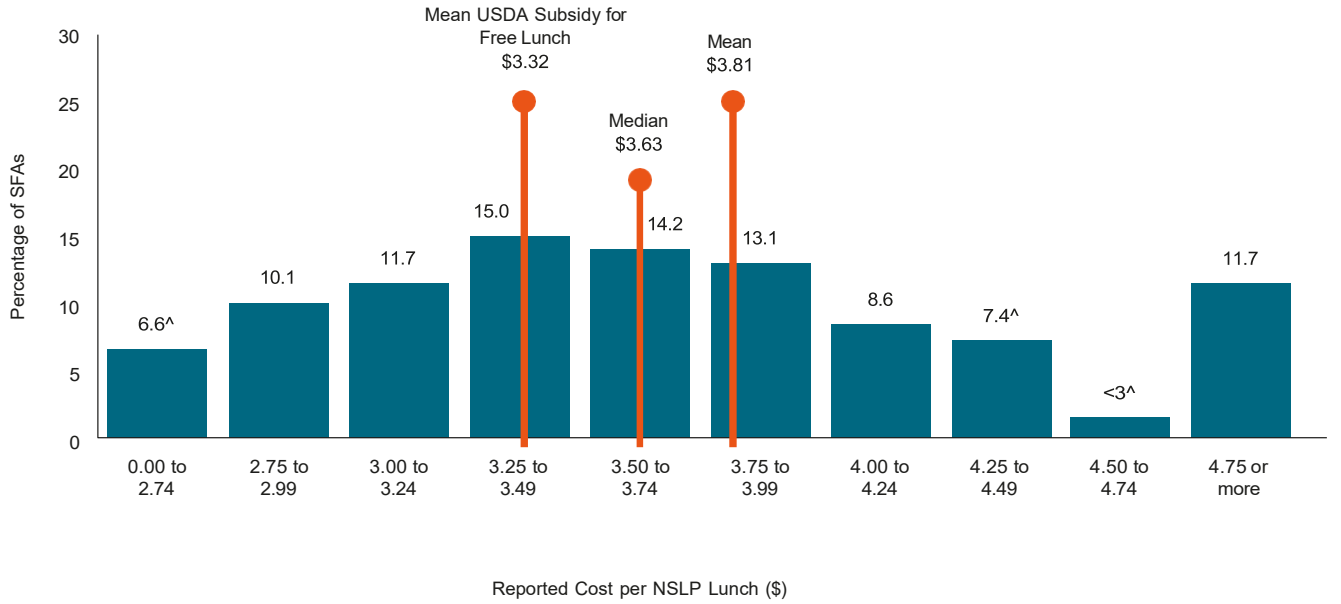
- In SY 2014–2015, the average SFA had a reported cost of $2.72 per SBP breakfast (Figure 15). The mean free breakfast reimbursement rate across SFAs as estimated for this study was $1.88.[25] One-quarter of the SFAs (25 percent) spent $3.00 or more per SBP breakfast.
- Using the meal as the unit of 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.

Composition of Reported Meal Costs

- Food and labor costs accounted for the vast majority (90 percent; 45 percent each) of the average SFA's reported cost per NSLP lunch in SY 2014–2015 (Figure 16).
- Other reported direct costs (which may include non-food supplies, equipment purchases, utilities, and any other costs not classified as food, labor, or indirect costs) constituted 10 percent of the reported cost per NSLP lunch.

Figure 14.

For the average SFA in SY 2014–2015, the cost of producing an NSLP lunch exceeded the average USDA subsidy for a free lunch



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. See Volume 3 of the SNMCS final report, Figure ES.2.

Note: SFA is the unit of analysis.

NSLP = National School Lunch Program; SFA= school food authority; SNMCS = School Nutrition and Meal Cost Study; SY = school year; USDA = U.S. Department of Agriculture.

^ 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. Percentages close to 0 or 100 are often flagged. In this figure, flagged percentages between 0 and 3 percent are displayed as <3 percent.

- The remaining 1 percent of the reported cost comprised indirect costs for facilities and other resources provided by the district to the school foodservice program.
- The composition of the reported cost was very similar for SBP breakfasts (Figure 16).
- 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).

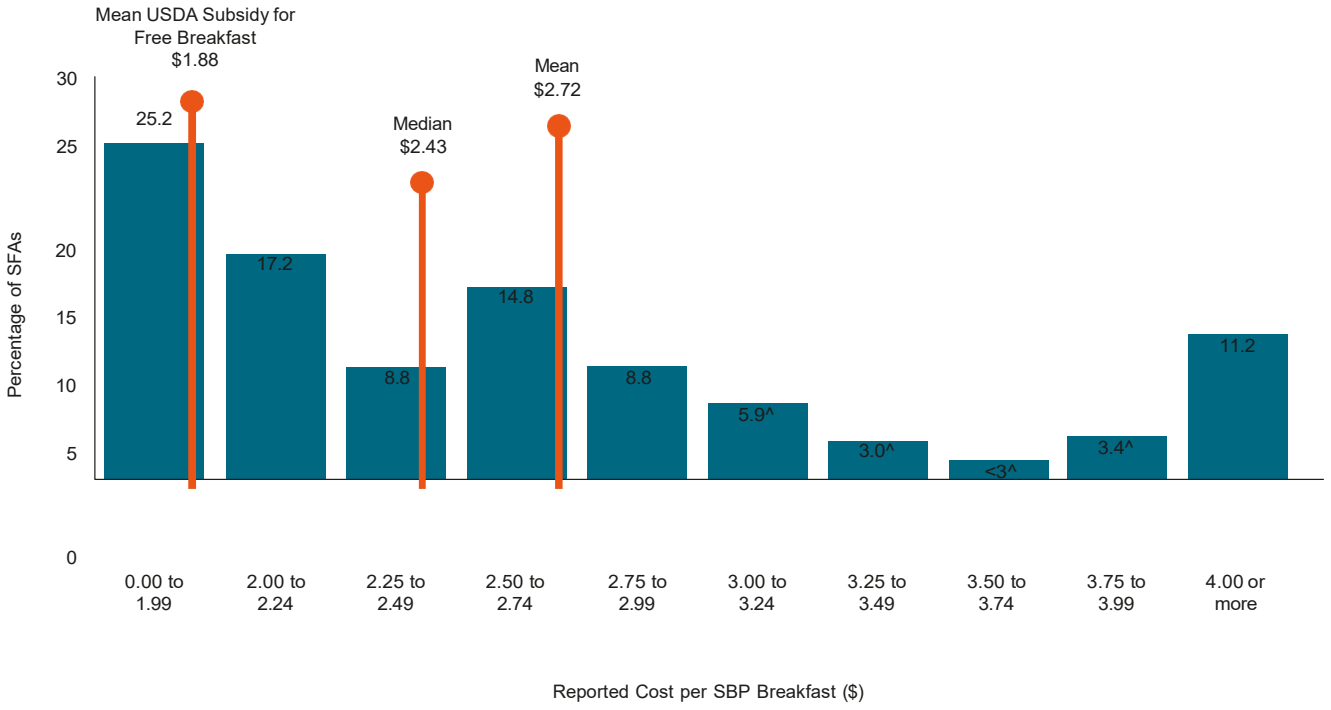
Composition of SFA Revenues and Comparison to Reported Costs

SFAs generate revenues through many sources, including: (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 an average of 63 percent of total SFA revenues, with 57 percent from meal reimbursements and 6 percent from USDA Foods (Figure 17).[26]
- Student payments for reimbursable meals accounted for an average of 20 percent of total SFA revenues (Figure 17). 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
- USDA meal reimbursements in SY 2014–2015 accounted for a significantly larger share of SFA revenues relative to SY 2005–2006 (57 percent versus 45 percent; Figure 17). Meanwhile, the shares of SFA revenues from student

Figure 15.

For the average SFA in SY 2014–2015, the cost of producing an SBP breakfast exceeded the average USDA subsidy for a free breakfast



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. See Volume 3 of the SNMCS final report, Figure ES.3.

Note: SFA is the unit of analysis.

SBP = School Breakfast Program; SFA = school food authority; SNMCS = School Nutrition and Meal Cost Study; SY = school year; USDA = U.S. Department of Agriculture.

^ 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. 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.

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.

- 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 18). In nearly 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

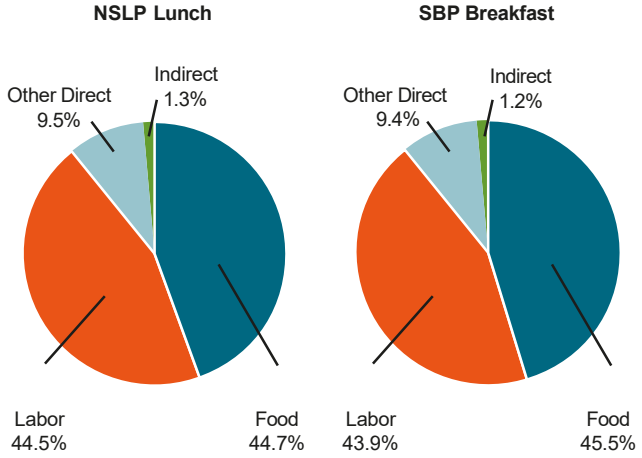
costs, and 12 percent had revenues that were equal to or greater than 110 percent of reported costs.

- 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 an average of 93 percent of reported costs. The gap between revenues and costs was even larger for SBP breakfasts, with revenues from SBP breakfasts covering only an average of 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

Figure 16.

For both NSLP lunches and SBP breakfasts, food and labor accounted for 90 percent of reported costs in SY 2014–2015

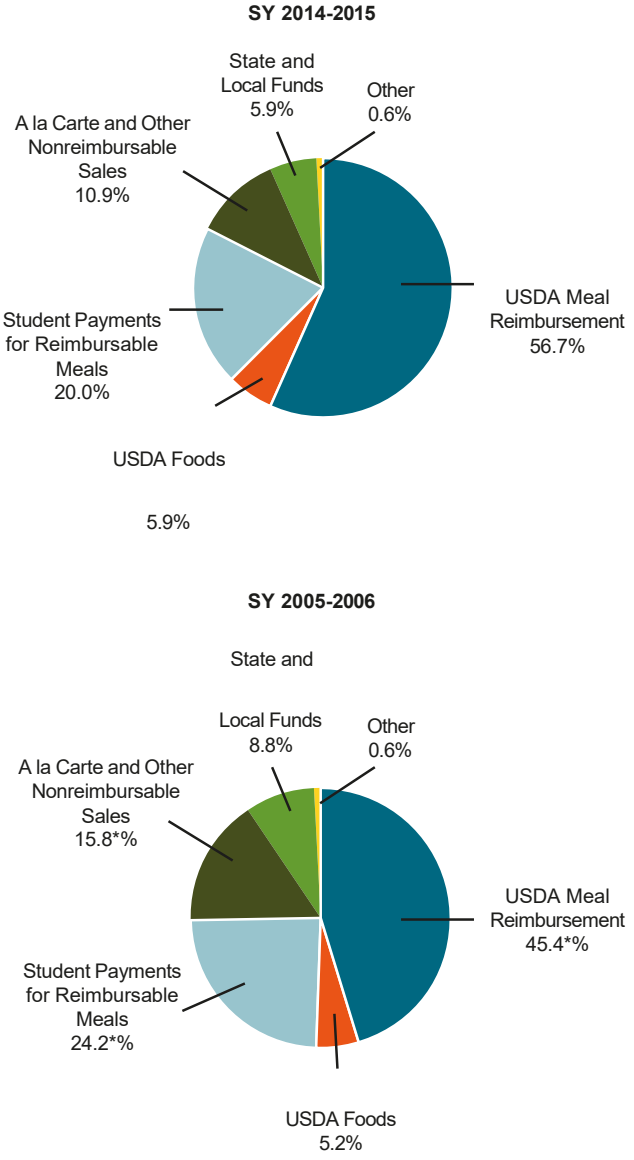


Source: School Nutrition and Meal Cost Study, Menu Survey, School Nutrition Manager Cost Interview, and SFA Director and Business Manager Onsite and Follow-Up Cost Interviews, SY 2014–2015. See Volume 3 of the SNMCS final report, Figure ES.4.

Note: SFA is the unit of analysis.
NSLP = National School Lunch Program; SBP = School Breakfast Program; SFA = school food authority; SNMCS = School Nutrition and Meal Cost Study; SY = school year.

Figure 17.

In SY 2014–2015, USDA meal reimbursements accounted for a significantly higher percentage of SFA revenues relative to SY 2005–2006



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. Data for SY 2005–2006 are from the School Lunch and Breakfast Cost Study-II (Bartlett et al. 2008).See Volume 3 of the SNMCS final report, Table 5.10.

Note: SFA is the unit of analysis.

*Difference between SY 2014–2015 and SY 2005–2006 is significantly different from zero at the 0.05 level.

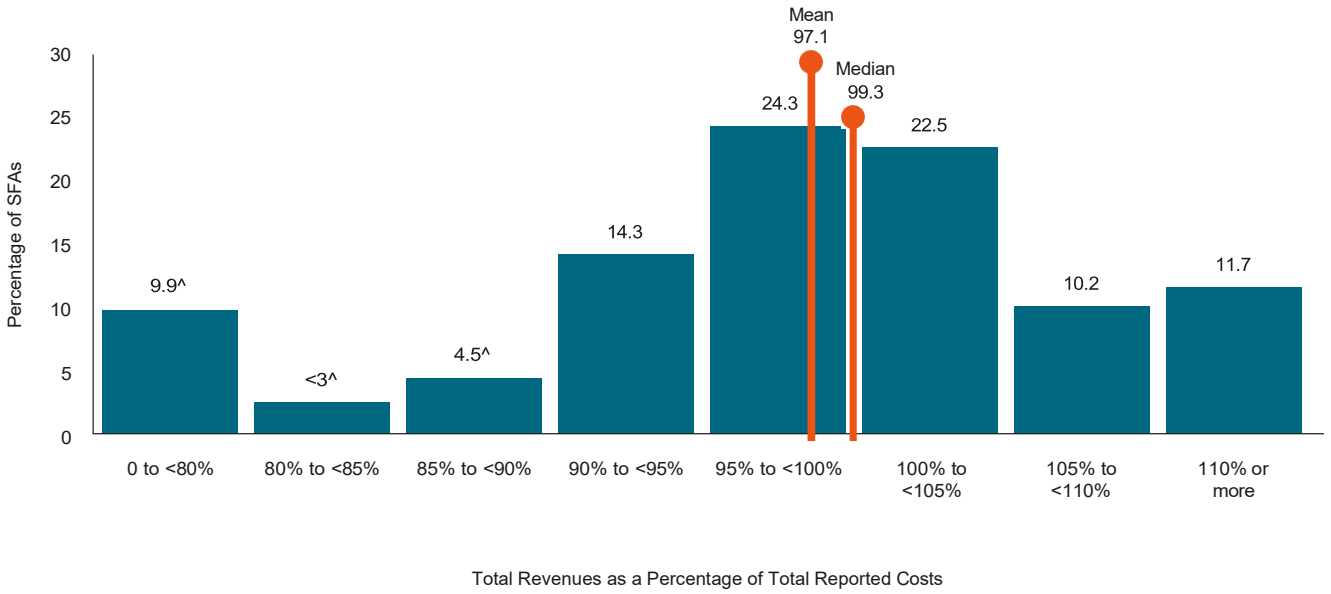
SFA = school food authority; SNMCS = School Nutrition and Meal Cost Study; SY = school year; USDA = U.S. Department of Agriculture.

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 previous studies of costs and revenues in the school meal programs, which found the opposite relationship—that revenues from reimbursable meals subsidized nonreimbursable sales.[27] To address this issue, USDA established a rule on pricing of nonreimbursable foods. The change in net revenues from nonreimbursable food sales suggest that the rule may have shifted the pattern of cross-subsidization between reimbursable meals and nonreimbursable sales in the desired direction.

Figure 18.

For the average SFA in SY 2014–2015, total revenues covered only 97 percent of total 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. See Volume 3 of the SNMCS final report, Figure ES.6.

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. Percentages close to 0 or 100 are often flagged. In this figure, flagged percentages between 0 and 3 percent are displayed as <3 percent.

SFA= school food authority; SNMCS = School Nutrition and Meal Cost Study; SY = school year.

Comparisons to SY 1992–1993 and SY 2005–2006

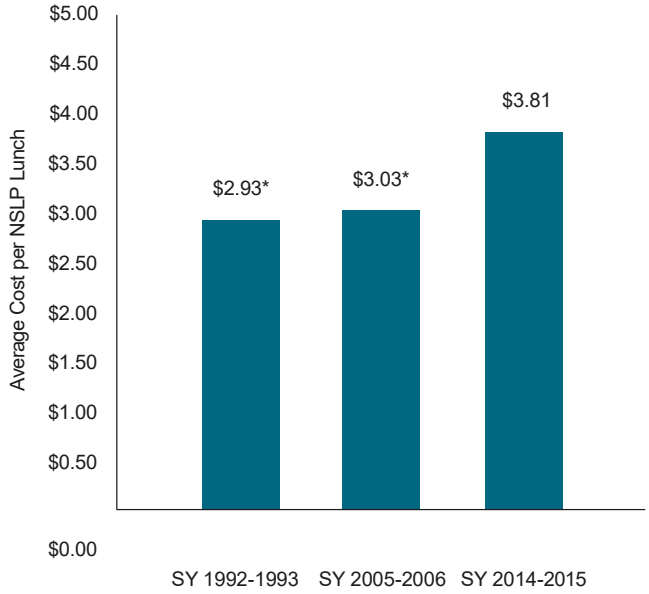
There were statistically significant differences in the real (inflation-adjusted) reported costs of producing reimbursable meals in SY 2014–2015, relative to reported costs in SY 1992–1993 (School Lunch and Breakfast Cost Study-I) and SY 2005–2006 (School Lunch and Breakfast Cost Study-II). At $3.81, 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 19). 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).

Similarly, for SBP breakfasts, the reported cost per SBP breakfast in 2015 dollars for the average SFA in SY 1992–1993 was $2.27, and in SY 2014–2015 it was 20 percent higher at $2.72 (Figure 20). 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. (The inflation-adjusted average 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 and/or labor costs. 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.[28] Increases in the pricing of paid lunches (mandated by the HHFKA) may have reduced NSLP participation rates in lower-poverty SFAs and thereby reduced economies of scale.[29] 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 19.

The reported cost of producing an NSLP lunch in SY 2014–2015 was significantly higher than the inflation-adjusted costs of producing NSLP lunches in SY 2005–2006 and SY 1992–1993



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). See Volume 3 of the SNMCS final report, Figure ES.7.

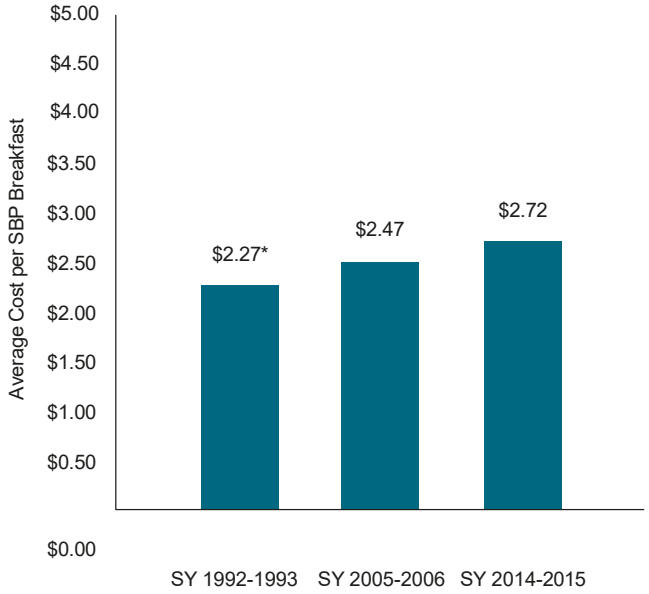
Note: SFA is the unit of analysis.

*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; SNMCS = School Nutrition and Meal Cost Study; SY = school year.

Figure 20.

The reported cost of producing an SBP breakfast in SY 2014–2015 was significantly higher than the inflation-adjusted cost of producing an SBP breakfast in SY 1992–1993, but not SY 2005–2006



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). See Volume 3 of the SNMCS final report, Figure ES.8.

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.

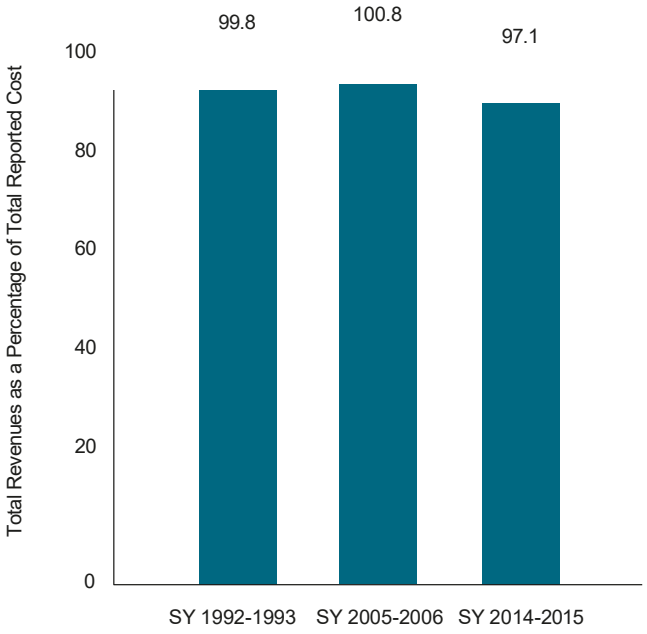
SBP = School Breakfast Program; SFA = school food authority; SNMCS = School Nutrition and Meal Cost Study; SY = school year.

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 21). As shown in Figure 17, the share of SFA revenues from USDA reimbursements increased substantially. In summary, USDA reimbursements helped to offset both the increases in the costs of reimbursable meals and the decline in other sources of revenues, thereby sustaining the overall financial

status of school foodservice accounts.

Figure 21.

There was no significant difference between SY 1992–1993, SY 2005–2006, and SY 2014–2015 in total revenue as a percentage of total reported costs (in 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). See Volume 3 of the SNMCS final report, Figure ES.9.

Note: SFA is the unit of analysis.

SFA = school food authority; SNMCS = School Nutrition and Meal Cost Study; SY = school year.

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

SECTION VII

RELATIONSHIPS BETWEEN NUTRITIONAL CHARACTERISTICS OF NSLP LUNCHES AND OTHER KEY OUTCOMES

The research questions defined for the SNMCS included several questions about relationships between the key outcomes described in the preceding sections. The three most important questions addressed the relationships between the nutritional characteristics of school meals and (1) student participation, (2) the nutritional quality of school meal participants' overall diets, and (3) meal costs.[30] This summary focuses on key outcomes related to the NSLP, but the study also examined similar outcomes for the SBP.

To answer these questions, the study team used multivariate analyses. These analyses explored associations among the three outcomes identified above and three characteristics of school meals: (1) nutritional quality, as measured by total HEI-2010 scores, (2) compliance with the updated nutrition standards, and (3) types of foods offered. To characterize compliance with the nutrition standards, the study team collaborated with FNS to identify a parsimonious set of variables, focusing on standards that were more challenging for one or more school types to meet and had enough variation within the sample. Many characteristics related to the types of foods offered were considered. The final set of characteristics, shown in Table 1, was identified

by eliminating, from the pool of potential characteristics, those that (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.

Multivariate analyses were implemented using logistic or linear regression and weights that accounted for the study's complex sample design. All models controlled for demographic and institutional characteristics of SFAs and schools (including school size, school type, urbanicity, FNS region, and share of students approved
for free or reduced-price meals), and student-level models also controlled for students' demographic characteristics (including race and ethnicity, gender, and certified for free or reduced-price meals).

Because the probability of finding significant associations by chance increases with the number of associations tested, findings for the many associations explored in these analyses should be interpreted with caution. In addition, it is important to understand that significant

Table 1. Measures included in multivariate analyses that explored associations between nutritional characteristics of NSLP lunches and other key outcomes

Overall Nutritional Quality of NSLP Lunches
• Total HEI-2010 score of average lunch prepared
Compliance with Nutrition Standards
• Met daily quantity requirement for grains
• Met daily quantity requirement for meats/meat alternates
• Met daily quantity requirement for vegetables
• Met weekly requirement for meats/meat alternates
• Met weekly requirement for vegetables
• Met requirement that at least half of weekly grains are whole grain-rich
• Met minimum calorie level
• Met maximum calorie level
• Met Target 1 sodium level
Types of Foods Offered in NSLP Lunches
• All daily menus offered raw vegetables
• Median number of vegetable choices offered per day
• More than half of daily menus offered red or orange vegetables
• At least one daily menu offered side salad bar
• No daily menus offered French fries or similar products
• Percentage of daily menus that offered pizza or pizza products
• At least one daily menu offered breaded meat item

HEI = Healthy Eating Index; NSLP = National School Lunch Program.

associations do not imply causality. Because of the study's cross-sectional design, it is not possible to conclusively attribute associations observed between key nutritional characteristics of schools meals and the outcomes of interest to the characteristic's influence on the outcome.

Associations Between Nutritional Characteristics of NSLP Lunches and Student Participation

- There was a positive and statistically significant association between student participation in the NSLP and the nutritional quality of NSLP lunches, as measured by the HEI-2010. Rates of student participation were significantly higher in schools with HEI-2010 scores in the third and highest quartiles (that is, the top half) of the distribution compared to the lowest quartile (Figure 22).

- Specifically, the average NSLP participation rates for schools with lunches in the two highest quartiles of the HEI-2010 distribution were 61 and 60 percent, compared to 50 percent for schools with lunches in the lowest quartile of the distribution (Figure 22).

- Overall, there were significant associations between NSLP participation and compliance with two of the NSLP nutrition standards examined in this analysis. Specifically, compliance with the daily quantity requirement for meats/meat alternates was associated with a significantly higher NSLP participation rate (59 percent versus 49 percent). However, compliance with the Target 1 sodium limit was associated with a significantly lower NSLP participation rate (54 percent versus 64 percent).

- Offering red or orange vegetables on more than half of daily lunch menus was associated with a significantly higher NSLP participation rate (60 percent versus 53 percent).

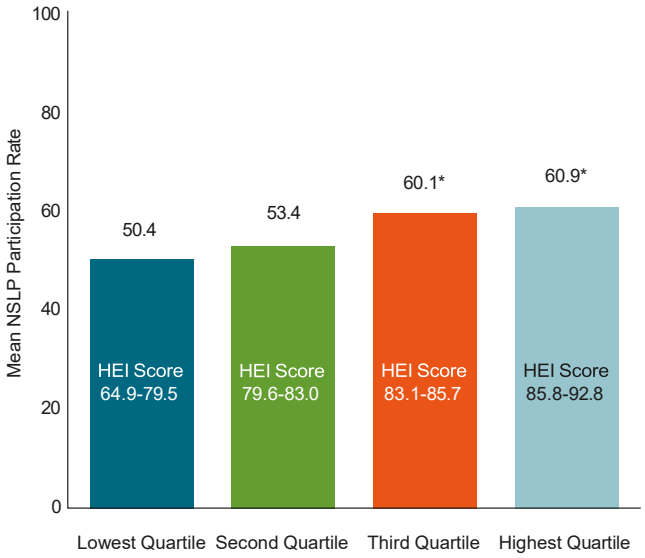
Associations Between Nutritional Characteristics of NSLP Lunches and the Nutritional Quality of NSLP Participants' Diets

This analysis estimated how the nutritional quality of NSLP participants' diets (measured by total scores on the HEI-2010) was associated with key characteristics of NSLP lunches. The sample included students who (1) had a completed 24-hour dietary recall, (2) were identified as school meal participants on the day covered in the dietary recall, and (3) attended schools where the SNM completed the SNM Survey and the Menu Survey.

- There was no significant positive association between the nutritional quality of NSLP lunches prepared and the nutritional quality of NSLP participants' diets. That is, the nutritional quality of students' overall diets was not significantly higher in schools that had higher scores on the HEI-2010 than in schools that scored the lowest on the HEI-2010. This is not necessarily surprising, given the influence of students' diets outside of school on the nutritional quality of their overall diets (see Section V).[31, 32]
- Of the nine measures of compliance with NSLP nutrition standards included in this analysis, only one—meeting the Target 1 sodium limit —was associated with a significantly higher average HEI-2010 score for NSLP participants (58.0 points versus 55.2 points).
- There were no significant associations between NSLP participants' HEI-2010 scores and the characteristics of NSLP menu offerings examined in this analysis.

Figure 22.

There was a positive and statistically significant association between student participation in the NSLP and the nutritional quality of NSLP lunches as measured by the HEI-2010



Source: School Nutrition and Meal Cost Study, Reimbursable Meal Sale Form, 24-Hour Dietary Recalls: Day 1, and Menu Survey, SY 2014–2015. See Volume 4 of the SNMCS final report, Figure 4.1.

Notes: Estimates are regression-adjusted mean NSLP participation rates (as percentages) that control for demographic characteristics of each student, institutional characteristics of schools and SFAs, and the price charged by each school for a paid lunch.

The maximum possible score for the HEI-2010 is 100. A higher total score indicates higher nutritional quality.

*Difference in participation rates between schools in this category and schools in the lowest quartile of the HEI-2010 distribution is statistically different from zero at the 0.05 level.

HEI = Healthy Eating Index; NSLP = National School Lunch Program; SFA = school food authority; SNMCS = School Nutrition and Meal Cost Study; SY = school year.

Associations Between Nutritional Characteristics of NSLP Lunches and Reported Meal Costs

This analysis examined relationships between the nutritional characteristics of NSLP lunches and the reported costs per meal.[33, 34] Because the nutritional characteristics of school meals were measured at the school level, regression models provided estimates of differences in mean costs between schools that differed on each characteristic while controlling for institutional and demographic characteristics.

- There was no significant association between reported cost per NSLP lunch in SY 2014–2015 and the nutritional quality of NSLP lunches, as measured by mean total scores on the HEI-2010. That is, mean reported costs per NSLP lunch 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.[35]
- There were no significant associations between reported cost per NSLP lunch and any of the variables used in these analyses to characterize compliance with updated nutrition standards for NSLP lunches or the types of foods offered in NSLP lunches.

References

Bartlett, S., F. Glantz, and C. Logan. "School Lunch and Breakfast Cost Study-II." Alexandria, VA: U.S. Department of Agriculture, Food and Nutrition Service, Office of Research, Nutrition and Analysis, April 2008.

Cullen, K.W., T. Chen, and J.M. Dave. "Changes in Foods Selected and Consumed After Implementation of the New National School Lunch Program Meal Patterns in Southeast Texas." Preventive Medicine Reports, vol. 2, 2015, pp. 440-443.

Devaney, B., M.K. Crepinsek, K. Fortson, and L. Quay. "Review of Dietary Reference Intakes for Selected Nutrients: Challenges and Implications for Federal Food and Nutrition Policy." Contractor and Cooperator Report No. 28 prepared for the USDA's Economic Research Service (ERS) Food and Nutrition Assistance Research Program (FANRP), February 2007.

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

General Accounting Office. "School Lunch Program: Cafeteria Managers' Views on Food Wasted by Students." Washington, DC: U.S. General Accounting Office, 1996.

Glantz, F., C. Logan, H. Weiner, M. Battaglia, and E. Gorowitz. "School Lunch and Breakfast Cost Study." Alexandria, VA: U.S. Department of Agriculture, Food and Nutrition Service, Office of Analysis and Evaluation, October 1994.

Guenther P.M., K.O. Casavale, J. Reedy, S.I. Kirkpatrick, H.A.B. Hiza, K.J. Kuczynski, L.L. Kahle, and S.M. Krebs-Smith. "Update of the Healthy Eating Index: HEI-2010." Journal of the Academy of Nutrition and Dietetics, vol. 113, no. 4, 2013, pp. 569–580.

Institute of Medicine. "Dietary Reference Intakes: The Essential Guide to Nutrient Requirements." Washington, DC: National Academies Press, 2006.

Institute of Medicine. "School Meals: Building Blocks for Healthy Children." Washington, DC: National Academies Press, 2010.

Schwartz, M.B., K.E. Henderson, M. Read., N. Danna., and J. Ickovics. "New School Meal Regulations Increase Fruit Consumption and Do Not Increase Total Plate Waste." Childhood Obesity, vol. 11, no. 3, June 2015, pp. 242-247.

St. Pierre, R., M.K. Fox, M. Puma, F. Glantz, and M. Moss. "Child Nutrition Program Operations Study: Second Year Report." Alexandria, VA: U.S. Department of Agriculture, Food and Nutrition Service, Office of Analysis and Evaluation, June 1992.

U.S. Department of Agriculture, Food and Nutrition Service. "Final Rule: Nutrition Standards in the National School Lunch and School Breakfast Programs " Federal Register, vol. 77, no. 17, Thursday, January 26, 2012, pp. 4088–4167. Available at https://www.gpo.gov/fdsys/pkg/FR-2012-01-26/pdf/2012-1010.pdf. Accessed August 28, 2018.

U.S. Department of Agriculture, Food and Nutrition Service. "National School Lunch, Special Milk, and School Breakfast Programs: National Average Payments/Maximum Reimbursement Rates" Federal Register. 2014. Available at https://www.Federalregister.gov/documents/2014/07/16/2014-16719/national-school-lunch-special-milk-and-school-breakfast-programs-national-average-paymentsmaximum. Accessed August 28, 2018.

U.S. Department of Agriculture and U.S. Department of Health and Human Services. "Dietary Guidelines for Americans 2010." 7th edition. Washington, DC: U.S. Government Printing Office, December 2010. Available at http://health.gov/dietaryguidelines/dga2010/DietaryGuidelines2010.pdf. Accessed August 28, 2018.

Endnotes

[1] See https://www.cnpp.usda.gov/sites/default/files/healthy_eating_index/HEI-2010TotalAndComponentScoresTable.pdf.

[2] 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.

[3] See "More Information" on page 44

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

[5] Internal analysis completed by FNS staff; data not shown.

[6] The updated nutrition standards and schools' compliance with the standards are described in detail in Section III.

[7] Smarter Lunchroom Techniques are intended to promote healthy food choices, and include strategies such as soliciting students' input on vegetable offerings and displaying dark green, red, and orange vegetables prominently among side dish offerings.

[8] The IOM is now referred to as the Health and Medicine Division of the National Academies of Science. Throughout this report, we refer to the IOM because that was the name of the organization when it developed recommendations for the updated nutrition standards for school meals.

[9] The 2010 *Dietary Guidelines for Americans* were in effect when the data for this study were collected.

[10] See https://www.cnpp.usda.gov/sites/default/files/healthy_eating_index/HEI-2010TotalAndComponentScoresTable.pdf.

[11] In SY 2014–2015, allowed milks included fat-free (flavored or unflavored) or low-fat (1% or less) unflavored. In November 2017, USDA published an interim final rule that provides flexibility in meeting the milk requirement by allowing schools to offer low-fat flavored milk.

[12] This summary focuses on plate waste in the NSLP, but the study also examined plate waste in the SBP. See Chapter 5 in Volume 4 of the SNMCS final report.

[13] The minimum number of lunches served per day in the final sample of schools included in the plate waste analysis were 157 lunches for elementary schools, 220 for middle schools, and 87 for high schools.

[14] Data for the full sample of schools that completed the SNMCS Menu Survey indicate that, in SY 2014-2015, more than three-quarters of all NSLP schools served the minimum number of lunches per day reflected in the plate waste sample (78 percent of elementary schools, 77 percent of middle schools, and 90 percent of high schools).

[15] See St. Pierre et al. 1992 and General Accounting Office 1996.

[16] See Cullen, Chen, and Dave 2015, and Schwartz et al. 2015.

[17] When administrative data were not available for a given student, the study team constructed measures of target-day participation based primarily on the lunch and breakfast foods that the student reported obtaining at school on the target day.

[18] The study also examined the dietary intakes of SBP participants and nonparticipants. The general pattern of findings for SBP participants and matched nonparticipants was comparable to findings for NSLP participants and matched nonparticipants because most SBP participants were also NSLP participants. See Volume 4 of the SNMCS final report.

[19] See Section III for a description of the HEI-2010.

[20] See https://www.cnpp.usda.gov/sites/default/files/healthy_eating_index/HEI-2010TotalAndComponentScoresTable.pdf.

[21] The 2010 *Dietary Guidelines for Americans* were in effect when data for this study were collected.

[22] Devaney et al. (2007) pointed out that the diets of most of the U.S. population are low in vitamin E, relative to recommended intakes, yet vitamin E deficiency is rare. They noted limitations of both the data used to establish recommendations and the data used to assess vitamin E intakes.

[23] In SY 2014–2015, the lowest 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 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.

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

[25] SFAs received higher Federal reimbursements for free and reduced-price breakfasts for schools classified as "severe need." Schools qualify for the "severe need" reimbursement if they served at least 40 percent of NSLP lunches at a free or reduced price in the second preceding school year. For the SNMCS analyses, the average free SBP breakfast reimbursement rate reflected the average SFA's proportions of free breakfasts claimed at the severe need and non-severe need rates.

[26] 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.

[27] Bartlett et al. 2008 and Glantz et al. 1994.

[28] 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 the differences were statistically significant.

[29] The average price of a paid lunch increased by $0.49 from SY 2009–2010 to 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 (see Volume

1 of the SNMCS final report, Table 2.8). 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 PLE rule.

[30] Additional analyses addressed the relationships between these outcomes and key characteristics of (1) school foodservice operations, (2) the school food environment, and (3) demographic characteristics of students and demographic and institutional characteristics of SFAs and schools. See Volumes 3 and 4 of the SNMCS final report.

[31] In addition, there was relatively little variation in total HEI-2010 scores for NSLP lunches prepared, relative to the variation in total HEI-2010 scores for usual (24-hour) dietary intakes of NSLP participants. Mean total HEI-2010 scores for NSLP lunches in the 10th and 90th percentiles of the sample were 77.0 and 87.9 points, respectively (data not shown). In comparison, mean total HEI-2010 scores for usual dietary intakes of NSLP participants in the 10th and 90th percentiles of the sample were 40.1 and 73.7 points, respectively.

[32] The analyses summarized in Section V included both NSLP participants and matched nonparticipants and used rigorous methods to estimate the relationship between NSLP participation and the nutritional quality of students' diets. These estimates better isolate the average difference in the quality of students' overall diets associated with participation in the NSLP.

[33] The study team also examined the associations between the nutritional characteristics of school meals and full costs. See Volume 3 of the SNMCS final report, Chapter 6.

[34] As a rule, relationships were discussed only when a characteristic was associated with more than one outcome 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.

[35] This finding is at least partially explained by the fact that there was relatively little variation in mean HEI-2010 scores of NSLP lunches in 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).

For More Information

For in-depth results, please consult the following technical reports available at https://www.fns.usda.gov/report-finder:

U.S. Department of Agriculture, Food and Nutrition Service, Office of Policy Support, *School Nutrition and Meal Cost Study, Final Report Volume 1: School Meal Program Operations and School Nutrition Environments* by Sarah Forrestal, Charlotte Cabili, Dallas Dotter, Christopher W. Logan, Patricia Connor, Maria Boyle, Ayesha Enver, and Hiren Nisar. Project Officer: John Endahl. Alexandria, VA: 2019.

U.S. Department of Agriculture, Food and Nutrition Service, Office of Policy Support, *School Nutrition and Meal Cost Study, Final Report Volume 2: Nutritional Characteristics of School Meals* by Elizabeth Gearan, Mary Kay Fox, Katherine Niland, Dallas Dotter, Liana Washburn, Patricia Connor, Lauren Olsho, and Tara Wommack. Project Officer: John Endahl. Alexandria, VA: 2019.

U.S. Department of Agriculture, Food and Nutrition Service, Office of Policy Support, *School Nutrition and Meal Cost Study, Final Report Volume 3: School Meal Costs and Revenues* by Christopher W. Logan, Vinh Tran, Maria Boyle, Ayesha Enver, Matthew Zeidenberg, and Michele Mendelson. Project Officer: John Endahl. Alexandria, VA: 2019.

U.S. Department of Agriculture, Food and Nutrition Service, Office of Policy Support, *School Nutrition and Meal Cost Study, Final Report Volume 4: Student Participation, Satisfaction, Plate Waste, and Dietary Intakes* by Mary Kay Fox, Elizabeth Gearan, Charlotte Cabili, Dallas Dotter, Katherine Niland, Liana Washburn, Nora Paxton, Lauren Olsho, Lindsay LeClair, and Vinh Tran. Project Officer: John Endahl. Alexandria, VA: 2019.

U.S. Department of Agriculture, Food and Nutrition Service, Office of Policy Support, *School Nutrition and Meal Cost Study: Study Design, Sampling, and Data Collection* by Eric Zeidman, Nicholas Beyler, Elizabeth Gearan, Nikkilyn Morrison, Katherine Niland, Liana Washburn, Barbara Carlson, David Judkins, Lindsay LeClair, Michele Mendelson, Tara Wommack, Justin Carnagey, Maureen Murphy, and Andre Williamson. Project Officer: John Endahl. Alexandria, VA: 2019.

Public-use data files can be obtained by writing or calling us at:

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