

# Evaluation of the School Breakfast Program Pilot Project:

Summary of Findings from the  
First Year of Implementation

October 2002



Food and  
Nutrition Service

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## Summary of Findings from the First Year of Implementation



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## Executive Summary

### Background

Participation in the School Breakfast Program (SBP) by children from low-income households continues to be less than their participation in the National School Lunch Program (NSLP). There is concern that children might be coming to school without eating breakfast and still not be participating in the SBP for a variety of reasons, including a perceived stigma associating school breakfast participation with poverty. Breakfast is an important meal and several studies appear to link the consumption of nutritious breakfasts to improved dietary status and school performance. One approach to increasing participation in the SBP is to offer free breakfast to all students, regardless of their household's ability to pay for the meal. It is believed that a universal-free breakfast program would result in more children consuming a nutritious breakfast and beginning the school day ready to learn. This approach to increasing breakfast participation, however, would substantially increase the cost to the federal government as a result of subsidizing school breakfasts at the free-rate for all students. Thus it is critical to know if such expenditures are warranted. Specifically, would the increase in SBP participation result in improved dietary intake and/or academic performance?

Toward this end, Congress enacted Section 109 of the William F. Goodling Child Nutrition Act of 1998 (Public Law 105–336), authorizing implementation of a three-year pilot in elementary schools in six school districts representing a range of economic and demographic characteristics. The Food and Nutrition Service was also directed to evaluate this pilot. The three-year pilot began in school year (SY) 2000–2001 in the following school districts, which were chosen from among the 386 school districts that applied to participate:

- Shelby County Board of Education, Columbiana, Alabama;
- Washington Elementary School District, Phoenix, Arizona;
- Santa Rosa City Schools, Santa Rosa, California;

- Independent School District of Boise City, Boise, Idaho;
- Wichita Public Schools, Wichita, Kansas; and
- Harrison County School District, Gulfport, Mississippi.

The aim of this pilot is to study the impact of the availability of universal-free school breakfast on breakfast participation and measures related to students' nutritional status and academic performance. *This pilot is not intended to evaluate the current SBP or the value of consuming breakfast.*

### Objectives

The two main objectives of the evaluation are to: (1) assess the effects of the availability of universal-free school breakfast on breakfast participation and selected student outcome measures, including dietary intake, cognitive and social/emotional functioning, academic achievement tests, school attendance, tardiness, classroom behavior and discipline, food insecurity, and health; and (2) document the methods used by schools to implement universal-free school breakfast and determine the effect of participation in this program on administrative requirements and costs.

### Study Design and Methodology

The evaluation is based on an experimental design in which schools within each district were randomly assigned to implement the universal-free school breakfast (treatment schools) or to continue to operate the regular SBP (control schools). There are 79 treatment and 74 control schools in the pilot. In Spring 2001, about 4,300 students across the treatment and control schools were measured on dietary intake, cognitive function, and height and weight. Other data were also collected from parents and teachers. An analysis of these measures, data extracted from school records for SY 1999–2000 (pre-implementation) and SY 2000–2001, and information collected during interviews with school district staff in Spring 2001 are presented in this interim report.

## Findings

Key findings from the first year of the pilot include:

### Breakfast Participation and Dietary Intake

- Participation in the SBP nearly doubled in the treatment schools (from 19 to 36 percent). Greater increases were seen among the paid-eligible participants than the free and reduced-price participants.
- Few elementary school students, less than 4 percent in both treatment and control schools, skipped breakfast altogether.
- Students in treatment schools (80 percent) were more likely than control school students (76 percent) to consume a nutritionally substantive breakfast.
- Given that most students in this study consumed breakfast, universal-free school breakfast seems to have shifted the source of breakfast from home (or elsewhere) to school.
- Students in treatment schools (7 percent) were more likely than control school students (4 percent) to consume two or more substantive breakfasts.
- There was almost no difference in the food and nutrient intake of treatment and control school students at breakfast or over the course of a day. Food energy, protein, and vitamin and mineral intakes of most students in both groups met the standards for dietary adequacy.
- Few students, teachers, or principals in either treatment or control schools reported a stigma that associated breakfast participation with students from low-income households.

### Cognitive Functioning and Academic Achievement Test Scores

- Treatment and control school students had similar scores on a cognitive test battery that assessed a range of cognitive functions including attention, short-term and long-term memory.
- There were no differences in math and reading score gains across all grades between treatment and control school students.

### Other Measures

- School attendance, tardiness, social/emotional functioning, food insecurity, and health status were not different for treatment and control school students.

- The prevalence of overweight was similar, but high, in both treatment (17 percent) and control (18 percent) school students.
- There was one significant difference on a behavior rating between the treatment and control school students. Treatment schools students had a slightly more negative rating. In addition, a significantly higher number of disciplinary incidents were recorded in treatment schools.

### Implementation-Related Findings

- School breakfast participation was much higher in treatment schools in which students ate breakfast in classrooms (65 percent) than when they ate in a cafeteria or other non-classroom setting (28 percent).
- Treatment school breakfasts were just as likely as control school breakfasts to meet SBP nutrition standards for food energy, target nutrients, and total and saturated fat.
- Increased breakfast participation resulted in lower per-meal labor costs in treatment schools.

## Conclusion

During the first year of implementation, the availability of universal-free school breakfast nearly doubled school breakfast participation (from 19 to 36 percent). Since most elementary school students in this study were consuming breakfast, the availability of free breakfast seems to have primarily shifted the source of breakfast from home to school. Given the low rate (less than 4 percent) of breakfast skipping, it is not surprising that the availability of universal-free school breakfast did not have a significant impact on measures of dietary intake or school performance. Whether two additional years of exposure to the availability of universal-free school breakfast will have an impact on student outcomes will be determined after data collection and analyses for all three years are completed. A report of the findings on the impact of the availability of universal-free school breakfast on elementary school students over the three-year period will be available in 2004.

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## Summary of Findings

The School Breakfast Program (SBP) was established more than 30 years ago, largely in response to concerns about hunger among low-income children. The SBP was modeled after the National School Lunch Program (NSLP), which had been in existence for some 20 years when the SBP was established. The combination of the NSLP and SBP was intended to provide “a coordinated and comprehensive child food service [program] in schools” (Public Law 89–842).

Recent research has indicated that there is a need for the SBP among low-income children. Sampson and her colleagues (1995) found that about one quarter of low-income children in their study arrived at school without having had breakfast. Yet, a relatively small proportion of children take advantage of the availability of free and reduced-price breakfasts in their schools (Rossi, 1998). Offering a free breakfast to all school children, regardless of family income, is viewed as a promising vehicle for removing what some believe to be a barrier to increasing participation (e.g., Food Research and Action Center, 2001), a stigma associating poverty status with the SBP. In 1998, Congress established the School Breakfast Program Pilot Project (SBPP) as a demonstration of universal-free school breakfast to provide information on this alternative approach to school breakfast (Public Law 105–336). The SBPP was implemented in school year (SY) 2000–2001 in six school districts across the country.

An evaluation was included as part of the Congressional mandate for the SBPP, to assess the implementation and impact of this three-year, universal-free school breakfast demonstration in the six school districts. The objectives of the evaluation are to document how universal-free school breakfast is implemented, its costs, and administrative requirements it places on schools, and to examine the effects of universal-

free school breakfast on participation and a range of student outcomes, including dietary intake, cognitive and social/emotional functioning, classroom behavior and discipline, academic achievement, attendance and tardiness, food insecurity, and health. The evaluation is based on a randomized design, where schools within each district were randomly assigned to offer either universal-free school breakfast (treatment) or the regular SBP (control). A randomized experimental design constitutes the most effective way of demonstrating impact by being able to rule out the possibility that other factors might have led to differences between the treatment and control groups.

This summary presents highlights from the interim report, based on data collected for the year before the SBPP was initiated, SY 1999–2000, and the first year of implementation, SY 2000–2001. The summary begins with a brief overview of the findings for each evaluation objective. The remainder of the summary presents the key findings in more detail.

### OBJECTIVE 1:

**Document the various ways in which schools choose to implement universal-free school breakfast.**

The six school districts in this evaluation were chosen to represent a range of economic and demographic characteristics, urbanicity, and regional location. They were given wide latitude in how to implement universal-free school breakfast in their treatment schools. The decision to apply to be a part of the SBPP was made at the district level, but once the districts were chosen, most of the key program decisions were made at the school level. Determining whether breakfast should be eaten in the classroom or some other location (e.g., cafeteria, multi-purpose room) turned out to be a key

decision, as participation was much higher for students with the classroom breakfast option (65 percent participation in classroom breakfast schools versus 28 percent in non-classroom schools). Of the 79 treatment schools, 18 (23 percent) served breakfasts that were eaten in the classroom.

Despite the fact that the timeline for introducing the SBPP was relatively short, most schools geared up to serve free breakfasts in a matter of weeks. Overall, the implementation went smoothly. Administrators, school staff, parents, and students generally were pleased with the adoption of universal-free school breakfast.

There was also little evidence found of a stigma associating school breakfast participation with low-income status. Eighty-nine percent of the 152 principals and 91 percent of the 54 teachers interviewed reported no evidence of stigma associating breakfast participation with students from low-income households. Despite extensive probing in the focus groups with fourth, fifth, and sixth grade students, moderators reported little evidence of stigma gleaned from these elementary school children.

Schools that implemented universal-free school breakfast had to develop new procedures for delivering and serving food, collecting trash, and keeping records. In general, however, these issues did not cause major problems for implementation. While a concern for classroom implementation was the possible loss of teacher preparation or instruction time, interviews with principals and teachers in schools with classroom breakfast revealed that it had relatively little effect.

## OBJECTIVE 2:

### **Assess the effect that universal-free school breakfast has on paperwork, costs, and other administrative requirements.**

The effect of universal-free school breakfast on paperwork and reporting cannot be definitively addressed at this time. Principals did report an increase in reporting requirements, which involved some additional staff time. However, since all additional reporting requirements resulting from the SBPP were associated with gathering data for the evaluation, it is not clear whether the changes identified by the principals were due to the program itself, the evaluation, or both. This will be clarified in a follow-up survey planned for SY 2002–2003.

There was no evidence from the review of breakfast menus that the implementation of universal-free school breakfast had an effect on schools' compliance with the SBP nutrition standards or the degree to which breakfasts met other dietary recommendations. Treatment schools were as likely as control schools to meet the SBP standards for food energy, target nutrients, total fat, and saturated fat. They were also as likely to meet National Research Council-based recommendations for carbohydrates, cholesterol, and sodium.

The evaluation found that increased participation led to lower per-meal labor costs in treatment schools. The combined food and labor costs per breakfast were about 11 percent lower in treatment than control schools (\$0.80 and \$0.90, respectively). The combined food and labor costs per breakfast were 18 percent lower in treatment schools where breakfast was eaten in the classroom than in control schools (\$0.74 compared with \$0.90). Overall, treatment schools, which were reimbursed at the free meal rate for all breakfasts served, had revenues that

were about 40 percent higher than food and labor costs, while control schools had revenues that were about 28 percent higher than these costs.<sup>1</sup>

Treatment schools experienced an increased workload and some need for additional staff. The workload of cafeteria staff increased, and additional assistance was needed to supervise the larger number of breakfast participants.

### OBJECTIVE 3:

#### Assess the effects of universal-free school breakfast on student participation.

There was a significant<sup>2</sup> increase in school breakfast participation as a result of offering universal-free school breakfast. Overall, participation increased by about 16 percentage points for treatment school students over and above the negligible increase (1 percentage point) for control school students. The participation increase varied considerably, ranging from 7 percentage points in one district to 34 percentage points in the school district where students in all treatment schools ate breakfast in the classroom.

### OBJECTIVE 4:

#### Assess the effects of universal-free school breakfast on student outcomes.

Despite the increase in participation, there was no consistent pattern of positive effects on student outcomes associated with the availability of universal-free school breakfast. The rate of breakfast skipping was low overall—less than 4 percent for students in both treatment and control schools. The likelihood

of consuming a substantive breakfast, defined as food from at least two food groups and more than 10 percent of the Recommended Dietary Allowance (RDA) for food energy, was slightly but significantly higher among students attending treatment schools (80 percent) versus those attending control schools (76 percent). This study does not dispel the concern of some that universal-free school breakfast could lead children to consume more than one breakfast in a given day, one at home and one at school. Using the same definition of a substantive breakfast as above, treatment school students were significantly more likely to consume more than one substantive breakfast as their controls. However, the incidence of consumption of more than one nutritionally substantive breakfast for both groups was low (7 percent for treatment school students, 4 percent for controls). Nonetheless, students who consumed the additional breakfasts had higher food energy intakes at both breakfast and over a 24-hour period than those who did not.

The great majority (93 to 100 percent) of students in both treatment schools and control schools had 24-hour dietary intakes that were adequate for vitamins and minerals and exceeded 80 percent of the RDA for food energy and protein. On the other hand, few students in either group met dietary recommendations for total fat, saturated fat, or sodium. The availability of universal-free school breakfast was thus not related to students' likelihood of meeting daily dietary requirements and other recommendations.

For most of the other student outcomes measured—cognitive and social/emotional functioning, academic achievement, attendance, tardiness, food insecurity, body mass index, and health status—there were essentially no differences between treatment and control school students. The few differences found on the behavior ratings (e.g., opposi-

<sup>1</sup> Control schools continued to be reimbursed based on the school meal eligibility status of participating students.

<sup>2</sup> Throughout this summary, "significant" refers to any statistically significant difference with  $p < .05$ .

tional behavior, school disciplinary incidents) were in the negative direction, indicating worse outcomes for students with access to universal-free school breakfast. While these differences were statistically significant, they were substantively small.

## Conclusion

The message from this evaluation of the first year of the SBPP is that universal-free school breakfast can be administered in a variety of settings in economically mixed, geographically diverse schools across the country. It can be implemented fairly smoothly and quickly, with the support of school district and school administrators. In-classroom breakfast service is associated with the biggest jumps in participation. The participation increase in treatment schools supports a per-meal cost benefit without sacrificing the nutritional quality of the meals. The increases in participation did not, however, translate into any substantial effect on student outcomes, either positive or negative, in these six school districts.

## The School Breakfast Program

The SBP is currently available in approximately 70,000 schools and serves about 7.6 million breakfasts per day (Food and Nutrition Service, 2002). The U.S. Department of Agriculture's Food and Nutrition Service (FNS), which administers the SBP, provides cash subsidies for school breakfasts served to children at all income levels. Eligible institutions include public schools, private non-profit schools, and public or non-profit private licensed residential childcare institutions. Schools and institutions that participate in the SBP must serve breakfasts that meet federal nutrition standards and must provide free and reduced-price meals for those that are determined eligible. Children from households with income at or below 130 percent of the federal poverty level are eligible to receive breakfast at no charge (free-eligible); those from households with income between 131 and 185 percent of the poverty level pay no more than 30 cents for breakfast (reduced-price eligible); and children from households with income above 185 percent of poverty must pay the price established by the SFA for a school breakfast (paid-eligible). In SY 2000–2001, the maximum free-eligible income for a family of four was \$22,165; the maximum reduced-price eligible income for a family of four was \$31,543. In fiscal year 2001, 85 percent of all SBP meals nationwide were served free or reduced-price.

Schools that participate in the SBP must serve breakfasts that are consistent with the federal *Dietary Guidelines for Americans*: eat a variety of foods; choose a diet with plenty of vegetables, fruits and grain products; use sugars only in moderation; use salt and sodium only in moderation; and choose a diet low in fat (30 percent or less of calories), saturated fat (less than 10 percent of calories), and cholesterol. In addition, school breakfasts must provide,

on average over the course of each school week, at least 25 percent of the RDA for food energy (calories), protein, iron, calcium, and vitamins A and C for age/grade-specific categories.

Although the legislative intent of the SBP was to provide a nutritious breakfast to low-income children who might not otherwise receive one, many students are not taking advantage of the availability of free and reduced-price breakfasts in their schools. Using data from the first School Nutrition Dietary Assessment Study (SNDA-1), Rossi (1998) reported that in schools where the program is available, only 78 percent of children who qualify for free or reduced-price meals are certified to receive meal subsidies, and of those certified, only 37 percent participate in the SBP.<sup>3</sup> The combined effect is that only 29 percent of children eligible for free and reduced-price meals are receiving school breakfasts.

## ***The School Breakfast Pilot Project***

The William F. Goodling Child Nutrition Act of 1998 (Public Law 105–336, section 109) authorized the Secretary of Agriculture, through the FNS, to conduct a pilot study that provides free school breakfasts to all students regardless of family income. The SBPP demonstration that resulted is a three-year commitment by the six school districts that applied and were selected for the program. Half of the participating elementary schools in each district continue to provide the regular School Breakfast Program (control schools), while the other half offer universal-free school breakfast (treatment schools). FNS, through State Child Nutrition Agencies, reimburses the districts for all breakfasts served to students in the treatment schools at the federal reimbursement rate for free breakfast. School districts are given wide latitude to implement the SBPP in a way that best suits their local context.

Thus, while the federal nutrition standards for breakfast have to be maintained, the districts and/or treatment schools determine what is served, how it is served to students (e.g., brown bags picked up in the cafeteria, buffet style, etc.), and when and where breakfast is served and eaten. The school districts are required to maintain the integrity of the school assignment to either treatment or control status over the course of the three-year project.

The school districts included in the pilot project are:

- Independent School District of Boise City, Boise, Idaho;
- Shelby County Board of Education, Columbiana, Alabama;
- Harrison County School District, Gulfport, Mississippi;
- Washington Elementary School District, Phoenix, Arizona;
- Santa Rosa City Schools, Santa Rosa, California; and
- Wichita Public Schools, Wichita, Kansas.

## ***Overview of the SBPP Evaluation***

The legislation authorizing the SBPP requires that the evaluation:

- Document the various ways in which schools choose to implement universal-free school breakfast;
- Assess the effect that universal-free school breakfast has on paperwork, costs, and other administrative requirements;
- Assess the effects of universal-free school breakfast on student participation; and
- Assess the effects of universal-free school breakfast on student outcomes.

To address these objectives, the evaluation employs a randomized experimental design, first pairing participating schools within each of the six participating school districts and then randomly assigning each school in the pair to either a treatment (universal-

<sup>3</sup> A child's eligibility for free or reduced-price meal benefits in the NSLP/SBP can be established (certified) either through documentation from the state or local government that the child is a member of a qualifying household or on the basis of an application submitted by an adult member of the child's household.



free school breakfast) or control (regular SBP) group.<sup>4</sup> A total of six classrooms in grades two through six were randomly selected from each school; a stratified random sample of students was then drawn from each of these classes (for a total of about 30 students per school). Overall, there were 153 schools and 4,358 children included in the evaluation.

Baseline data for SY 1999–2000 came entirely from school administrative records. Data for the first year of SBPP Implementation and the Impact Study were collected during Spring 2001. Data for the Implementation Study component of the evaluation were collected primarily from interviews with school district administrators, school food authority (SFA) directors, school principals, teachers, cafeteria staff, custodians, and students. School breakfast menus were also collected over the course of a target week. School climate, reflecting the learning environment of the school and student behavior, was assessed through a teacher survey. Response rates for all implementation instruments ranged from 95 to 100 percent.

The Impact Study component of the evaluation employed a broad range of measures to assess both short- and long-term student outcomes. Respondents included students, parents, and teachers. School records were also collected to study school- and student-level impacts. Key outcomes measured included school breakfast participation, breakfast consumption patterns, dietary intake at breakfast and over 24 hours, cognitive and social/emotional functioning, student behavior, academic achievement, school attendance and tardiness, household food security status, and health. Response rates for the Impact Study were quite high, ranging from 80 percent for parent interviews to 100 percent for student measures.

## Implementation Study Findings

### Characteristics of the School Districts

Exhibit 1 provides a brief summary of selected characteristics of the six participating school districts.

### Implementing the Universal-Free School Breakfast Program

The timeline for implementing the School Breakfast Pilot Project was very compressed, leaving the six school districts little time to plan for the SBPP before the start of the school year. Despite this short timeframe and a few early misunderstandings and miscommunications within the districts, issues were resolved quickly and the SBPP rolled out fairly smoothly. Issues discussed in the interviews with district and school administrators and school staff included training and orientation, program promotion, breakfast setting, and cafeteria operations. Results for each are described below.

#### Training and Orientation

A significantly higher proportion of treatment schools conducted orientation/training sessions for their staff regarding the school breakfast program than did control schools (81 percent versus 53 percent). There was also a need in both treatment and control schools for school principals and teachers to be made aware of the demonstration and its implications for their schools, especially the evaluation activities that would be occurring as part of the demonstration. There were no significant differences between treatment and control schools on training of foodservice workers. Training related to specific aspects of preparing and serving breakfast in schools that offered universal-free school breakfasts was not needed.

<sup>4</sup> The use of random assignment in this evaluation ensures that the two groups of schools are statistically comparable on any characteristic, either measured or unmeasured. As a result, any observed differences in outcomes provide unbiased estimates of the impact of the availability of universal-free school breakfast, and therefore can be attributed to the treatment within known confidence intervals.

### EXHIBIT 1 Selected Characteristics of Elementary Schools Participating in the School Breakfast Pilot Project, by District, SY 1999–2000

Characteristic	Boise	Shelby County <sup>1</sup>	Harrison County	Phoenix	Santa Rosa	Wichita
Number of schools in the evaluation						
Treatment	17	8	5	12	5	32
Control	17	8	5	12	5	27
Total	34	16	10	24	10	59
Total enrollment	14,362	9,739	7,899	15,586	4,364	24,508
Percent of elementary school students approved for free and reduced-price meals <sup>2</sup>	34%	24%	62%	48%	70%	59%
Range in free and reduced-price eligibility among elementary schools in the district	2–83%	3–65%	34–84%	10–94%	21–98%	18–100%
Percent of schools qualifying as “severe need” <sup>3</sup>	50%	25%	90%	58%	100%	80%
SBP participation rate (SY 1999–2000) <sup>2</sup>	9%	21%	33%	21%	25%	24%
District area (square miles)	46	795	581	44	34	136

<sup>1</sup>Two schools were new and did not have data in school district files; school-level data for SY 1999–2000 were used.

<sup>2</sup>Percent is weighted for enrollment in each school.

<sup>3</sup>Severe need data were collected from school district files for SY 2000–2001.

Sources: *Impact Study—School District Files, SY 1999–2000* and U.S. Census Bureau: *County and City Data Book, 1990* and *State and County Quick Facts, 2000* (district area data)

### Program Promotion

Fewer than half of the treatment school principals made a special effort to publicize the breakfast program in SY 2000–2001, although this is a much higher proportion than among control school principals (44 percent versus 12 percent). This lack of promotional effort could have been influenced by the concern raised by some administrators of possible adverse reactions from some parents related to serving breakfast in the school.

### Breakfast Setting

Of the 79 treatment schools, 18 schools (23 percent) chose to have breakfast eaten only in the classroom. Another two schools adopted a combination of approaches with some classes eating breakfast in the classroom and some in the cafeteria. In the remaining 59 treatment schools, breakfast continued

to be eaten in the same locations as before, usually the cafeteria or a multi-purpose room. The 73 control schools continued to use the same locations they had used prior to the pilot study, which included two schools that provided breakfast in the classroom because of special circumstances.

### Cafeteria Operations

#### *Offer Versus Serve at Breakfast*

To avoid unnecessary waste, schools may allow students to refuse a limited number of foods offered from among those required to qualify as a reimbursable meal. The approach, called “offer versus serve,” is adopted at the discretion of the school food authority for the SBP. A majority of both control schools (82 percent) and treatment schools (68 percent) allowed their students to exercise this option. The difference is attributable to the limited

use of this option in treatment schools in which breakfast is eaten in the classroom. Only 6 of the 18 treatment schools where breakfast was eaten in the classroom provided offer versus serve.

#### ***Availability of à La Carte Items at Breakfast***

Another option that some schools offer their students is the opportunity to buy individual food items à la carte. When offered, these items may be purchased in addition to, or instead of, the reimbursable meal. While relatively few schools offer à la carte items at breakfast, significantly fewer treatment schools (33 percent) offered à la carte items at breakfast than control schools (50 percent). Again, the difference is almost entirely due to the fact that only 2 of the 18 treatment schools where breakfast is eaten in the classroom have à la carte items available.

#### ***Availability of Hot Meals at Breakfast***

Nearly all of the participating schools, whether control or treatment, reported that they served the same items for breakfast to all the students in their school. Most schools (60 percent) served hot breakfast (from one to two times a week only during cold weather to every day), with no significant differences between treatment and control schools.

## **The Impact of Implementing the SBPP on School Operations and Costs**

### **District Operations**

At the school district level, there was little administrative burden due to the SBPP implementation. Five of the six school district administrators said that the implementation had no effect on district administration while one said there had been a small increase in cost. Concerns had been voiced in some districts during start-up that some parents might object to the program because they saw universal-free school breakfasts as an intrusion on parental responsibility, or that control school parents might object to their children having to pay for the break-

fasts while children in treatment schools did not. Despite these concerns, there were no major parental or community problems as the SBPP got underway. On the contrary, most of the administrators expressed surprise and pleasure at just how smoothly implementation had progressed.

### **School Operations**

There were few noteworthy changes in school operations that resulted from the implementation of universal-free school breakfast (Exhibit 2). One major impact was on staffing, with over one third of treatment school principals (37 percent) reporting an increase in staffing between SY 1999–2000 and SY 2000–2001. By contrast, only 6 percent of control school principals reported such an increase.

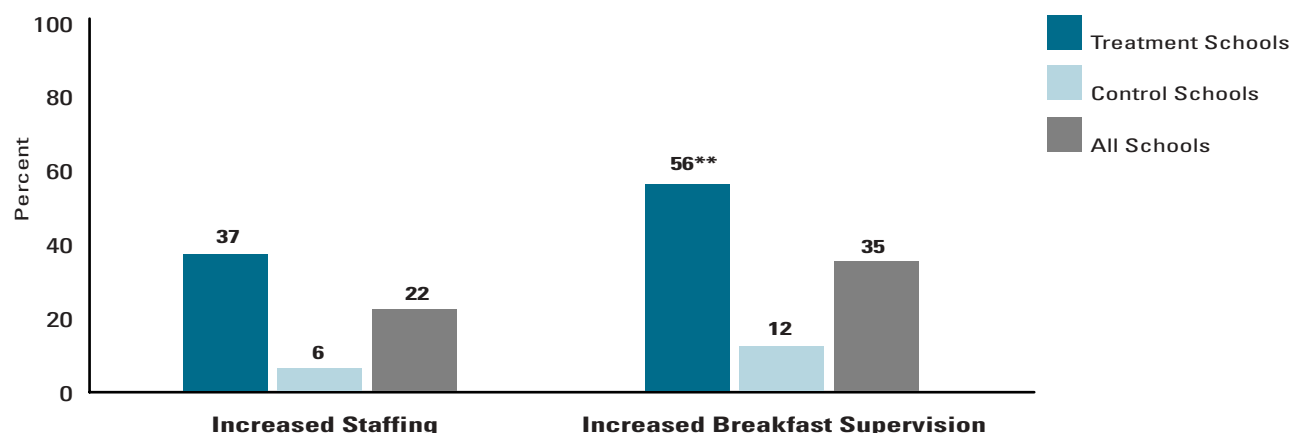
Cafeteria workers and custodial staff were most affected by the implementation of universal-free school breakfast, but office staff and teachers (notably in the schools where breakfast was served in the classroom) also reported an increase in workload.

More than half of treatment school principals (56 percent) indicated that breakfast supervision had increased, compared to only 12 percent of control school principals. The increase in breakfast supervision stems from a combination of increased breakfast participation and a shift of breakfast from the cafeteria to the classroom in some treatment schools.

Sixty percent of treatment school principals indicated that there had been an increase in reporting requirements as a result of the new program. Forty-two percent indicated that there was an increase in the workload of their office staff. Since virtually all additional reporting requirements resulting from universal-free school breakfast were associated with gathering data for the evaluation, it is not clear whether the changes identified by respondents were due to the program itself or to the evaluation or both. This issue will be examined in more detail in the follow-up survey that will be conducted late in SY 2002–2003.



## EXHIBIT 2 Share of School Principals Reporting Changes in School Operations in SY 2000–2001 Due to the SBPP



N=152

\*\*Difference between treatment and control schools is statistically significant at the .01 level.

Source: Implementation Study—School Principal Interview, Spring 2001

Sixteen of the teachers in schools that serve breakfast in the classroom were interviewed as part of the study. All 16 teachers indicated that “breakfast time” was used for more than eating breakfast. Over two thirds of these teachers (69 percent) indicated that having breakfast in the classroom had little or no effect on the amount of time available for classroom preparation or instruction.

### Foodservice Operations

In addition to the increase in cafeteria staff workload and in the need for breakfast supervision reported above, there were changes in foodservice preparation practices associated with the SBPP implementation. Control schools experienced few operational changes in SY 2000–2001, the first year of the pilot. About one in ten cafeteria managers in these schools indicated that there had been a change in preparation practices. By contrast, nearly one out of three treatment school cafeteria managers (30 percent) indicated that preparation practices in their school had

changed. Among the treatment schools, preparation practices changed more often in the schools where breakfast was eaten in the classroom (12 of the 18). Treatment schools indicated that their cafeterias had incurred additional expenditures as a result of implementing universal-free school breakfast, for such things as carts and coolers used to transport food to the classroom, carpet cleaners, trash containers, and additional trash pick-up. However, as noted below, the revenues to these schools increased as well.

### Food and Nutrient Composition of School Breakfasts

Increased student participation and changes in the location of breakfast service in the treatment schools led to changes in breakfast menus among schools offering the program. These changes, in turn, could hold implications for the types, variety, and number of food items offered; the nutritional quality of the meals; and compliance with established nutrition standards for the SBP. Data used to explore these

changes were obtained from the Breakfast Menu Survey, a self-administered instrument completed by the cafeteria manager in each school. Information was collected on all of the foods and beverages served as part of the USDA reimbursable breakfasts for a specified five-day period (the “target week”) that coincided with the Impact Study data collection.

### ***Number of Foods Offered in School Breakfasts***

Universal-free school breakfast was not associated with changes in the variety of foods offered. There were no significant differences in the average number of different foods offered in daily breakfast menus or over the course of a week.

### ***Types of Foods and Beverages Offered in School Breakfasts***

Except for breads and grains, breakfasts in treatment schools were as likely as those in control schools to include foods from five food groups: milk; fruits, vegetables and juices; grains and breads; meats and meat alternates; and combination entrees. Treatment schools offered significantly fewer grain/bread items overall than did control schools (97 versus 100 percent of breakfasts, respectively), but this difference was not large enough to be of importance to the implementation of the SBP.

### ***Food Energy and Nutrient Content of School Breakfasts Served to Students***

There were no significant differences associated with the implementation of universal-free school breakfast in the mean percent of RDA for food energy, protein, iron, calcium, vitamin A, or vitamin C served. Treatment school breakfasts contained similar amounts of these dietary components and were, on average, as likely to meet the SBP standard of one fourth of the RDA as control schools. With the exception of food energy, the average breakfast in all schools exceeded the one fourth of RDA standard for all key nutrients. Among treatment schools results were similar regardless of the location of breakfast service.

There were also no differences overall in the percent of food energy from total fat or saturated fat in breakfasts served in treatment and control schools. On average, breakfasts in both treatment and control schools met the SBP standards for no more than 30 percent of food energy from total fat and less than 10 percent from saturated fat.

### ***Percent of Schools That Met SBP Nutrition Standards and NRC Recommendations***

The proportions of control and treatment schools whose average breakfast met nutrition standards for the SBP and dietary recommendations from the National Research Council (NRC) are shown in Exhibit 3. Results show that the implementation of universal-free school breakfast did not significantly affect schools’ compliance with these benchmarks.

### ***School District Costs and Revenues***

#### ***Costs***

During the visits to schools in April 2001, information on food and labor costs was collected from each of the SFA directors.<sup>5</sup> The food and labor costs of a reimbursable breakfast were calculated for each school for the five-day target week using this information. Exhibit 4 presents a comparison of the average food and labor costs per meal for treatment and control schools. During the target week, the average food and labor cost of a reimbursable breakfast was significantly lower in the treatment schools (\$0.80) than in the control schools (\$0.90). This difference is entirely due to the difference in average labor costs (\$0.25 versus \$0.35). There were no significant differences in average food costs.

The higher participation rates in the treatment schools translated into a substantially higher volume of breakfasts being served. During the target week, the average number of breakfasts served in treatment schools exceeded the average for control

<sup>5</sup> Food and labor account for approximately 90 percent of the reported costs of a reimbursable breakfast (Glantz et al., 1994).

### EXHIBIT 3 Proportion of Schools in Which the Average Breakfast Met SBP Nutrition Standards and NRC Recommendations

Dietary Component	Standard/ Recommendation	Percent of Schools	
		Treatment Schools	Control Schools
Food Energy	25% of 1989 RDA	9	18
Protein	25% of 1989 RDA	100	100
Vitamin A	25% of 1989 RDA	95	96
Vitamin C	25% of 1989 RDA	94	96
Calcium	25% of 1989 RDA	97	99
Iron	25% of 1989 RDA	91	95
Total fat	≤ 30% of food energy	92	88
Saturated fat	< 10% of food energy	83	86
Carbohydrate	> 55% of food energy <sup>1</sup>	94	92
Cholesterol	≤ 75 mg <sup>1</sup>	99	100
Sodium	≤ 600 mg <sup>1</sup>	83	75
Number of Schools		78	73

RDA = Recommended Dietary Allowance.

<sup>1</sup> National Research Council (NRC) recommendation, not SBP standard.

Note: None of these differences are statistically significant.

Source: Implementation Study—Breakfast Menu Survey, Spring 2001

### EXHIBIT 4 Comparison of Average Food and Labor Cost Per Reimbursable Breakfast for SBPP Treatment and Control Schools, One Week Period in SY 2000–2001

School Type	Number of Schools	Average Number of Meals/Day	Average Food Cost Per Meal	Average Labor Cost Per Meal	Average Food and Labor Cost Per Meal
Treatment	79	191 <sup>**a</sup>	\$ 0.55	\$ 0.25 <sup>**a</sup>	\$ 0.80 <sup>**a</sup>
Classroom	18	395	0.56	0.18	0.74
Non-classroom	61	130 <sup>**b</sup>	0.55	0.27 <sup>*b</sup>	0.82 <sup>*b</sup>
Control	71	110	\$ 0.56	\$ 0.35	\$ 0.90

\* Difference is statistically significant at the .05 level.

\*\* Difference is statistically significant at the .01 level.

<sup>a</sup> Comparison is between treatment and control schools.

<sup>b</sup> Comparison is between classroom and non-classroom treatment schools.

Sources: Implementation Study—Breakfast Menu Survey, Spring 2001, and district records

schools by 74 percent (191 versus 110).<sup>6</sup> For treatment schools serving breakfast in the classroom, the contrast was even greater. While treatment schools serving in the classroom averaged nearly 400 breakfasts per day, those serving breakfast in the cafeteria averaged 130 breakfasts per day. Because total breakfast labor costs are a relatively fixed cost, the labor cost per reimbursable breakfast declines as the number of breakfasts served increases.

### Revenues

School districts are reimbursed for each breakfast they serve that meets program requirements. Exhibit 5 compares average reimbursements and average food and labor costs for school breakfast in SY 2000–2001. Control schools were reimbursed for breakfasts in accordance with the reimbursement rate established for SY 2000–2001.<sup>7</sup>

Treatment schools were reimbursed at the “free” meal rate for all breakfasts. Treatment schools therefore benefited from a combination of: (1) being able to apply the highest reimbursement rate to all the breakfasts it served and (2) increased participation. As a result, in SY 2000–2001, the average value of reimbursements going to treatment schools was significantly higher than that of the control group (\$39,894 versus \$19,312). However, average food and labor costs for the treatment group were also significantly higher as a result of the substantially higher volume of breakfasts served (\$24,142 versus \$16,339). In addition to their federal reimbursements, control schools also collected revenue from reduced-price and paid breakfasts. While total revenue exceeded food and labor costs in both treatment and control schools, on average, the difference was much greater in treatment

**EXHIBIT 5 Comparison of Average Per School Federal Reimbursements and Estimated Food and Labor Costs for School Breakfast, SY 2000–2001**

Item	Treatment Schools	Control Schools
Estimated reimbursements	\$ 39,894	\$ 19,312
Estimated revenue from paid meals	na	3,445
Total breakfast revenue	39,894	22,757
Estimated food and labor cost	24,142	16,339
Difference	15,752	6,418
Percent of schools where total breakfast revenue equaled or exceeded food and labor cost <sup>1</sup>	94.9%	80.3%

N=150

na = not applicable

<sup>1</sup> If food and labor costs are inflated by 12.4 percent to account for “all other” costs, consistent with the findings of earlier research (Glantz et al., 1994), the share of schools where total breakfast revenue equaled or exceeded total cost falls to 92.4 percent for treatment schools and to 57.7 percent for control schools.

Sources: Implementation Study—Breakfast Menu Survey, Spring 2001, Impact Study—School-Level Data, SY 2000–2001, and district records

<sup>6</sup> The comparable margin for all of SY 2000–2001 was 68 percent.

<sup>7</sup> For SY 2000–2001, the reimbursement was \$1.12 for free meals; \$0.82 for reduced-price meals; and \$0.21 for paid meals. Reimbursement rates for severe need schools provide an additional \$0.21 for each free and reduced-price breakfast that was served.

schools (\$15,752 versus \$6,418). Another way to examine costs is to see whether revenues cover breakfast food and labor costs. This was the case in 95 percent of the treatment schools and only 80 percent of the control schools.<sup>8</sup>

### Stakeholder Perceptions and Attitudes

Interviews with district and school staff, parents, and students revealed that there is generally a high regard for school breakfast from all stakeholders. Changes that resulted from the SBPP were perceived differently, depending on the respondents and how they were affected by it. For example, in the small sample of teachers interviewed (54), their perceptions of in-classroom breakfast were based on whether their schools were utilizing this approach. Ten of the 16 teachers (63 percent) who taught in classrooms where breakfast was consumed had a positive opinion of the experience when interviewed. By contrast, only 7 of the 38 teachers (18 percent) who had not taught in classrooms where breakfast was served were supportive of the idea.

One perceived barrier to participation in the SBP, and the one that universal-free school breakfast is designed to overcome, is a “stigma” of being identified as a poor student simply by participating in the program. The issue of stigma was addressed in principal and teacher interviews and student focus groups. Overall, 89 percent of 152 principals interviewed responded that they had observed no evidence of stigma associated with breakfast in their schools. Similarly, 91 percent of the 54 teachers interviewed reported no evidence of a stigma associating poverty with school breakfast.

Despite extensive probing in the student focus groups, there was little reported evidence of a stigma

associating school breakfast participation with students from low-income households.

## Impact Study Findings

### Impact of the Availability of Universal-Free School Breakfast on Students

The results in this section are aimed at answering questions about whether students in schools where universal-free school breakfasts are available do better across a number of outcomes than students in the control schools. Key findings are presented by outcome measure below.

#### School Breakfast Participation

Implementation of universal-free school breakfast did lead to significant increases in participation among treatment school students (Exhibit 6). Overall, treatment school students increased participation by 17 percentage points (from about 19 to 36 percent). Students in the control group, however, only increased their participation by one percentage point (from about 19 to 20 percent).

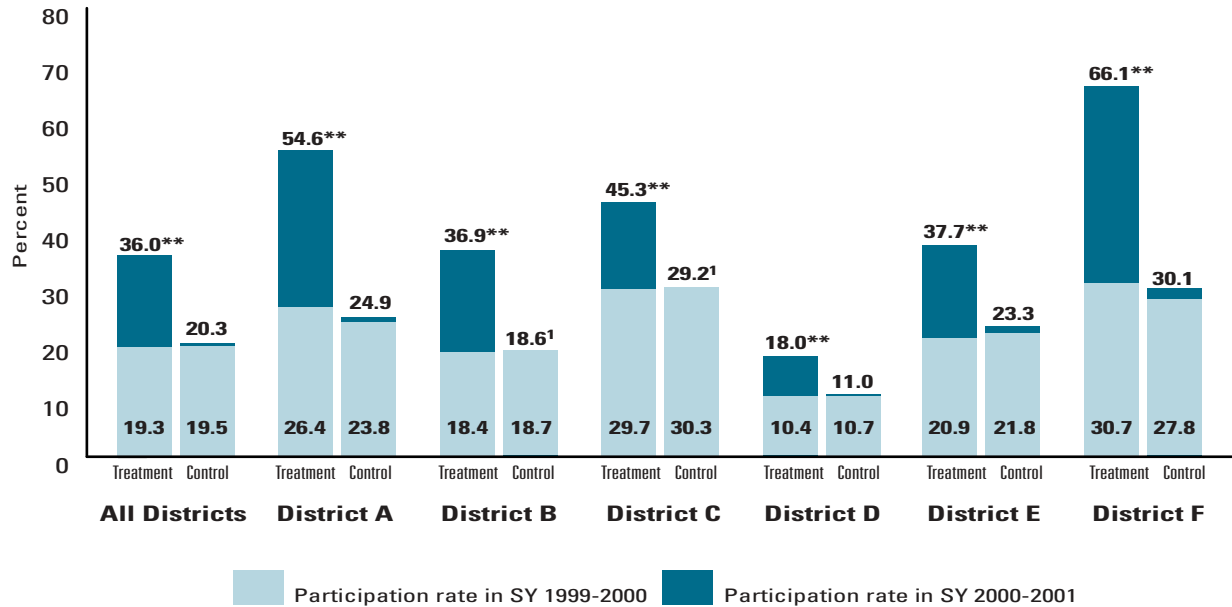
The overall net gain attributable to the implementation of universal-free school breakfast is thus 16 percentage points. Each district also had significant net increases in participation, ranging from 7 to 33 percentage points.<sup>9</sup>

When the data for the sampled students were analyzed, paid students in the treatment schools showed a greater jump in participation when compared to their control counterparts (21 percentage points) than free or reduced-price students (15 percentage points; Exhibit 7).

<sup>8</sup> Although food and labor are by far the largest cost components of a school breakfast, there are other costs not reflected in this analysis (e.g., custodial time, utilities, supplies) that might reduce or eliminate the average surpluses reported above and might increase the percent of schools where food and labor costs exceed total revenue.

<sup>9</sup> Participation gains for sampled students were quite similar to the school-level findings.

**EXHIBIT 6 School Breakfast Participation in School Years 1999–2000 and 2000–2001, Overall and by District**



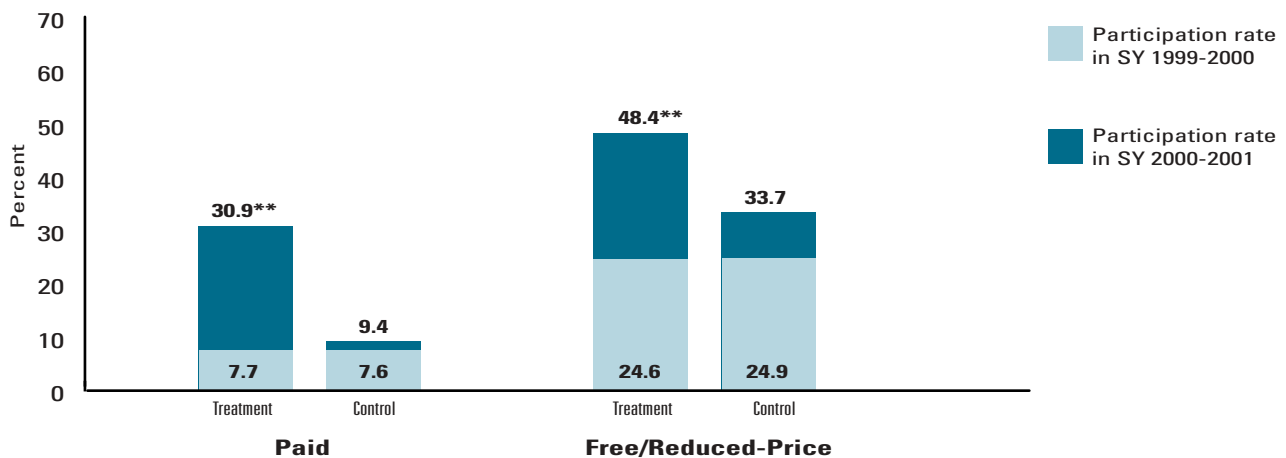
N=151

<sup>1</sup>Participation rate decreased from SY 1999–2000 to SY 2000–2001.

\*\*Difference in participation gain from SY 1999–2000 to SY 2000–2001 between treatment and control students is statistically significant at the .01 level.

Sources: Impact Study—School-Level School Breakfast Participation Data, 1999–2000 and 2000–2001

**EXHIBIT 7 Overall Gains in School Breakfast Participation of Sampled Students from School Year 1999–2000 to 2000–2001<sup>1</sup>, by School Meal Eligibility Status**



N=3,380

<sup>1</sup> District C could not provide student-level data for this analysis.

\*\* Difference between gains in participation for paid and free/reduced-price students is statistically significant at the .01 level.

Sources: Impact Study—Student-Level School Breakfast Participation Data, 1999–2000 and 2000–2001

## Breakfast Consumption Patterns

In this section findings are presented on: (1) the source of breakfast for students in the study; (2) the prevalence of consuming breakfast on the day children were interviewed (the “target day”); and (3) the prevalence of consuming more than one breakfast on that target day. The data reported here are based on dietary recall interviews with students and their parents.

### Sources of Breakfast

Exhibit 8 shows the sources of breakfast (defined here as any food or beverage except water) among students by treatment group. Students in the schools that offer universal-free school breakfast were more likely to consume food from the SBP and less likely to eat breakfast at home relative to

students in control schools. They were also twice as likely to eat something both at home and at school. However, since the vast majority of students in control schools (96 percent) also consumed breakfast, offering breakfast free of charge primarily affected where food was obtained, not whether any breakfast was eaten.

### Breakfast Consumption

Foods that counted as “breakfast” included all foods reported consumed between 5:00 a.m. and 45 minutes after the start of school, as well as foods consumed up to 10:30 a.m. that the student reported as being part of breakfast.<sup>10</sup> The following definitions of breakfast consumption were then used to categorize students who consumed versus skipped breakfast:

**EXHIBIT 8 Sources of Breakfast Among Students on the Target Day<sup>1</sup>**

	Treatment Schools	Control Schools	Difference
	Percent of Students		
Any SBP breakfast	49	27	22
School breakfast only	28	17	11
School and home or other breakfast <sup>2</sup>	21	11	10
Non-SBP breakfast	48	69	-21
Home breakfast only	44	64	-20
Other breakfast only	3	3	0
Home and other breakfast	1	2	-1
No breakfast eaten	3	4	-1
<b>Number of Students</b>	<b>2,212</b>	<b>2,066</b>	

<sup>1</sup> Tests for statistical significance were not conducted on these data.

<sup>2</sup> Only 1 percent of all students had something from school and from a source other than home (e.g., restaurant).

Source: *Impact Study—24-Hour Dietary Recall Interview, Spring 2001*

<sup>10</sup> The breakfast period was extended past 45 minutes after the start of school because some schools offered breakfast mid-morning rather than at the start of the school day.

1. Consumption of any food or beverage (except water);
2. Consumption of foods from at least two of five main food groups<sup>11</sup> and breakfast intake of food energy greater than 10 percent of the RDA; and
3. Consumption of foods from at least two of five main food groups<sup>11</sup> and breakfast intake of food energy greater than 15 percent of the RDA.

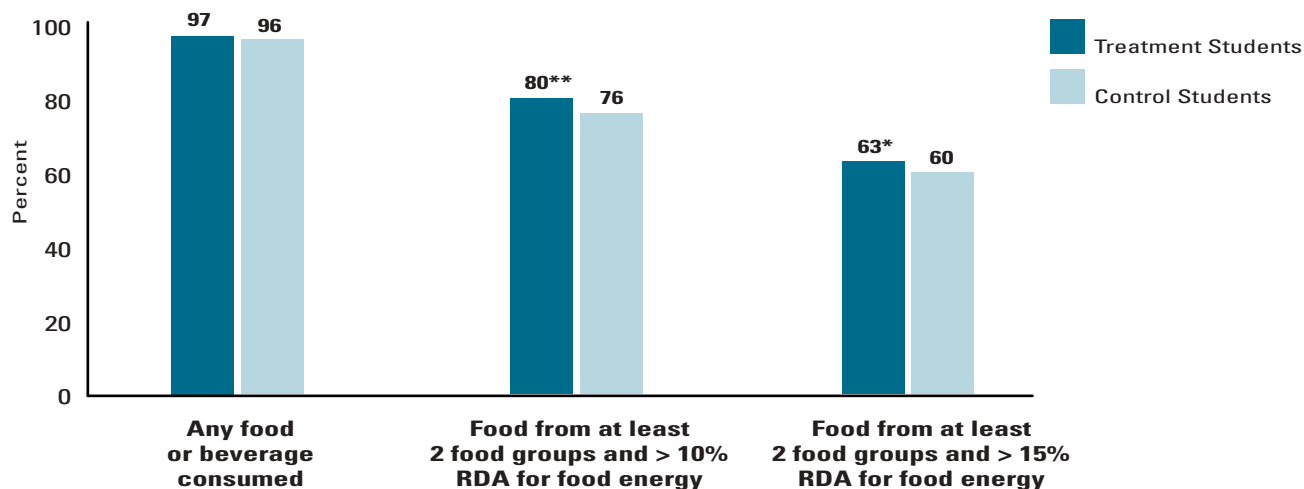
On a given day, when breakfast was defined as any food or beverage eaten (definition 1), there was no difference in the likelihood of consuming breakfast among students with access to universal-free school breakfast compared with their SBP counterparts (Exhibit 9). Breakfast skipping was low among both treatment and control students (3.4 and 3.6 percent, respectively). In response to questions about students' usual breakfast consumption, parents indicated that students in schools offering universal-free school breakfast were significantly more likely to eat

breakfast all five days of the school week than students in control schools. This difference was slightly more than 4 percentage points overall.

When breakfast was defined as providing foods from at least two food groups and more than 10 percent of the RDA for food energy (definition 2), treatment school students were significantly more likely than controls to consume breakfast. The increase, however, was only 4 percentage points for all districts combined.

Somewhat contrary to expectations, this difference was smaller when breakfast was defined with a higher minimum food energy criterion (definition 3). The impact of universal-free school breakfast on breakfast consumption was similar regardless of students' school meal eligibility status (i.e., whether students were eligible for free or reduced-price versus paid meals).

**EXHIBIT 9 Percent of Students Eating Breakfast on the Target Day, by Breakfast Definition**



N=4,278

\* Difference between treatment and control students is statistically significant at the .05 level.

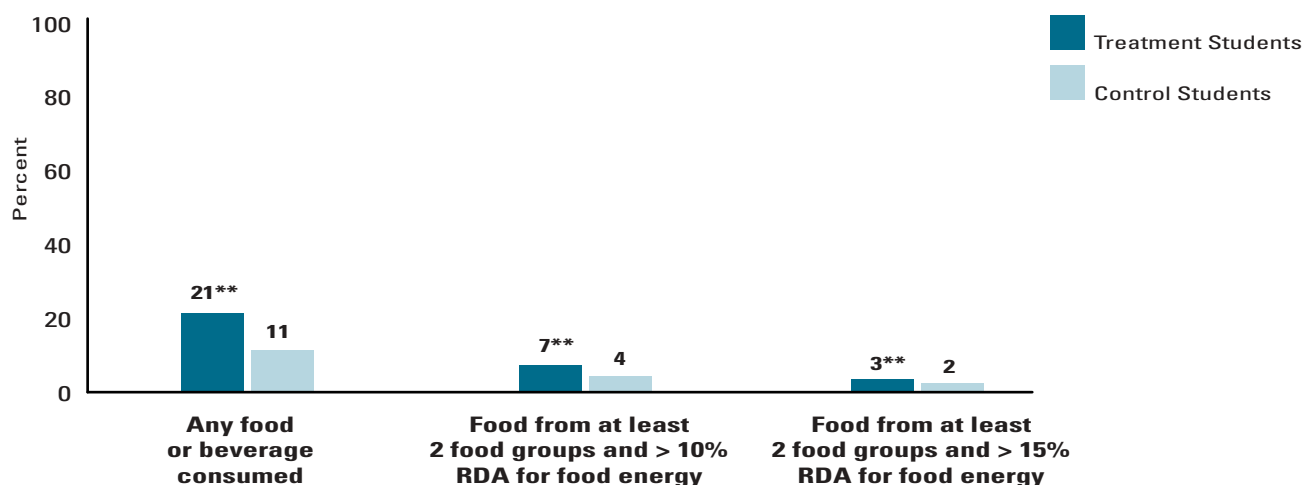
\*\* Difference between treatment and control students is statistically significant at the .01 level.

Source: *Impact Study—24-Hour Dietary Recall Interview, Spring 2001*

<sup>11</sup> The five food groups used are: (1) milk and milk products; (2) meat and meat equivalents; (3) grain products; (4) fruits and fruit juices; and (5) vegetables and vegetable juices.



### EXHIBIT 10 Percent of Students Eating More than One Breakfast, by Breakfast Definition<sup>1</sup>



N=4,278

<sup>1</sup> Percentages include only those students for whom one source of breakfast food was the school breakfast.

\*\* Difference between treatment and control students is statistically significant at the .01 level.

Source: Impact Study—24-Hour Dietary Recall Interview, Spring 2001

#### Consumption of More Than One Breakfast

The availability of universal-free school breakfast was associated with a greater likelihood of eating two or more substantive breakfasts, but few students overall followed this eating pattern (Exhibit 10). The proportion of students eating any food or beverage for breakfast from more than one source was significantly higher among students with access to universal-free school breakfast than among students in SBP schools. However, this finding does not necessarily mean that students who are offered school breakfast free of charge are overeating. Some children might rely on school breakfast to supplement what they eat or drink at home in the morning because they are still hungry.

When breakfast was defined as a nutritionally substantive meal (definition 2 or 3), the difference between students in treatment and control schools remained statistically significant, but the percent of

students eating more than one breakfast declined substantially. The net difference in the prevalence of eating two or more robust breakfasts was small, 1 to 3 percentage points overall.

Students who ate more than one nutritionally substantive breakfast had significantly higher average food energy intakes, both at breakfast and over 24 hours, compared to students who did not eat more than one breakfast.

#### Dietary Intake

The availability of universal-free school breakfast had the potential to affect at least three aspects of students' dietary intake: (1) food and nutrient intake at breakfast and over 24 hours (both on a given day and usual intake); (2) the degree to which dietary recommendations and standards are met; and (3) the extent of waste of school breakfast foods and associated nutrients.

### ***Food and Nutrient Intake at Breakfast***

**All Students.** For all students combined, breakfast provided approximately 21 percent of the 1989 RDA for food energy, from one third to over 100 percent of the RDA for protein and key vitamins and minerals, and almost 18 percent of the recommended intake of dietary fiber (based on the age-plus-five grams recommendation; Williams, 1995). Although meal-specific dietary recommendations are not available, students' breakfast intakes of total fat, saturated fat, carbohydrate, cholesterol, and sodium were not detracting from meeting recommendations for the full day.

Breakfast made little to no contribution to the recommended daily intake of foods from the vegetable or meat and meat substitutes groups of the Food Guide Pyramid. On average, breakfast provided slightly less than one third of the minimum recommended number of daily servings of grain products and about one half the minimum recommendations for dairy products and fruits. The mean breakfast intake of added sugar ranged from 42 to 83 percent of the guidelines for total added sugar per day for individuals seven years and older with energy requirements of 2,200 and 1,600 calories, respectively. Discretionary fat made up from 12 to 17 percent of the guideline for total fat intake at those calorie levels.

**Treatment versus Control Group Differences on Food Energy and Nutrient Intake.** Average intakes were very similar for students in treatment and control schools. The only statistically significant differences in breakfast nutrient intake were a 2 percentage point higher average percent of RDA and Adequate Intake, or AI, for calcium and phosphorous, and a 10 milligram (mg) lower dietary cholesterol intake among students in treatment schools compared with those in control schools.

**Treatment versus Control Group Differences on Food Group Intake.** The availability of universal-free school breakfast had little effect on students'

intake of foods from the Food Guide Pyramid food groups at breakfast. Statistically significant differences were found in the mean numbers of servings of fruits, dairy products, and meat and meat substitutes (red meat and eggs, in particular) consumed by students in treatment schools compared to their controls. The differences, however, were all extremely small in magnitude (one tenth of a serving or less).

### ***Food and Nutrient Intake Over 24 Hours***

**All Students.** Students in the SBPP had somewhat higher average food energy intake (as a percent of the 1989 RDA) over 24 hours than national estimates for this age group. Based on USDA's 1994–96, 1998 Continuing Survey of Food Intakes of Individuals (CSFII; USDA/ARS, 1999), mean food energy intake for males 6 to 11 years old was 101 percent of RDA, compared to 106 percent of the RDA for the SBPP sample of males (7 to 13 years old). For females in the same age range, mean food energy intake was 91 percent of the RDA in the CSFII sample, compared with 97 percent of the RDA in the SBPP. Intakes of most vitamins and minerals also exceed the national averages, but macronutrients as a percentage of food energy are quite similar.

Overall, students' 24-hour intake of grain and dairy products fell within the age- and gender-specific recommended number of servings per day from the Food Guide Pyramid. For all other major food groups, intakes fell short of recommendations. Students' mean intake of added sugars was double the guideline for total added sugar for individuals with energy requirements of 2,200 calories per day. Discretionary fat intake ranged from 82 to 113 percent of the guideline for total fat intake, depending on energy requirements.

**Treatment versus Control Group Differences on Food Energy and Nutrient Intake.** Average food energy intake over 24 hours did not differ significantly between treatment and control school students. There was essentially no effect of the avail-

ability of universal-free school breakfast on students' nutrient intake over 24 hours. The one dietary component for which there was a statistically significant difference was cholesterol. Students in treatment schools were consuming, on average, 12 mg less cholesterol per day than students in control schools. However, cholesterol intakes for students in both treatment and control schools were well below the recommended maximum of 300 mg of cholesterol per day (National Research Council, 1989a).

**Treatment versus Control Group Differences on Food Group Intake.** There was no discernable effect of the availability of universal-free school breakfast on students' food group intake over 24 hours. As was the case with breakfast, the only statistically significant differences between treatment and control school students were of the magnitude of one tenth of a serving or less.

#### ***Contribution of Breakfast to Food Energy and Nutrient Intake over 24 Hours***

Among all students, breakfast contributed approximately 21 percent of total food energy, 17 to 25 percent of the macronutrients, and 24 to 37 percent of vitamin and mineral intake for the day.

Comparing students in treatment schools to those in control schools, the contribution of breakfast to total daily intake was significantly greater for food energy, protein, carbohydrate, riboflavin, calcium, magnesium, phosphorous, and zinc. These differences, however, were small (1 to 2 percentage points of intake over 24 hours).

#### ***Proportion of Students Meeting Dietary Standards and Recommendations***

The availability of universal-free school breakfast was not associated with a higher likelihood of meeting daily dietary requirements and other health promotion recommendations. The vast majority of students

in both treatment and control schools (93 to 100 percent) were consuming a diet that provided more than 80 percent of RDA for food energy and protein and was adequate in vitamins and minerals.<sup>12</sup> Of general concern are the very low percentages of all students (28 percent or less across treatment and control groups) whose diets were in line with recommendations for fat, saturated fat, and sodium. The only dietary recommendation with which most students' intakes complied was for cholesterol (95 percent for treatment; 92 percent for controls).

#### ***Food and Nutrients Wasted in School Breakfasts***

The evaluation provided no evidence that the availability of universal-free school breakfast resulted in more wasted food or nutrients compared to the SBP. It is important to note, however, that the analysis of the effect of universal-free school breakfast on these particular outcomes was not based on an experimental comparison. Waste could only be measured on the group of students who opted to participate in school breakfast in the treatment and control schools. It is therefore possible that the results found are due to pre-existing differences between those who opted to participate in the school breakfast and not to the treatment per se.

#### ***Student Behavior***

Analyses of student behavior revealed some small but statistically significant results favoring control school students. On the Conners' Teachers Rating Scale, treatment school students had a significantly higher oppositional score (52.3) than controls (51.5), indicating that students who had access to universal-free school breakfast were more likely to engage in such behaviors as breaking rules, interacting negatively with persons in authority, and becoming more easily angered and annoyed than others their age. However, both sets of scores still fall within the average range (45 to 55) identified for this scale.

<sup>12</sup> Based on comparisons of usual intake with Dietary Reference Intakes, specifically, Estimated Average Requirements or EARs (Institute of Medicine, 1997, 1998, 2000a, 2000b, and 2001).

There was also a negative impact of universal-free school breakfast on disciplinary visits to the principal's office. In schools where universal-free school breakfasts were offered, the average number of daily disciplinary visits (per 100 students) was significantly higher than in control schools (1.13 and .86, respectively). When analyzed further, the data reveal that the impact was primarily due to a difference in disciplinary incidents occurring in the morning.

### Other Outcomes

There were no significant differences between treatment school students and controls on measures of cognitive or social/emotional functioning; academic achievement (reading and math for all grades combined); attendance; tardiness; food insecurity; body mass index; or student health, including parent reports of health and visits to the school nurse.

### Impact of Participation in School Breakfast

The analyses reported above contrasted outcomes between all students in the treatment school sample and all students in the control school sample to assess the impact of the availability of universal-free school breakfast, by relying on the strength of the randomized experimental design. The effect on those treatment school students who actually participated in universal-free school breakfast was also examined, by applying a statistical adjustment (based on Bloom, 1984) to the availability data described above. Based on this adjustment, the impacts on participants, though greater, generally followed those reported for the impact of the availability of universal-free school breakfast, for both positive and negative effects.

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