

Evaluation of the Free School Breakfast Program in St. Joseph, Missouri

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Please note that this study was published before the implementation of Healthy, Hunger-Free Kids Act of 2010, which went into effect during the 2012-13 school year, and its provision for Smart Snacks Nutrition Standards for Competitive Food in Schools, implemented during the 2014-15 school year. As such, certain research may not be relevant today.

ABSTRACT

Objectives

The purpose of this study is to evaluate the efficacy of the free school breakfast program implemented in the St. Joseph, MO school district and identify ways to facilitate the success of the program.

Methods

The study sample was comprised of three experimental and three control schools. Quantitative and qualitative data were obtained to evaluate the effectiveness of the program. Participation and attendance data were obtained for all students in six schools for the pre-implementation (2001-02) and post-implementation (2002-03) phases. Math and science scores from 345 matched student samples were assessed to investigate academic performance. Breakfast consumption data were obtained from a random sample of 450 students. Qualitative information included exploring perceptions of principals, teachers, the superintendent, and school foodservice managers about the free school breakfast program. In-depth interviews and a survey with open-ended questions were administered.

Results

The participation percentage almost doubled in the experimental schools after implementing the free school breakfast program. The location where breakfast was served also influenced participation. In the experimental schools, the student attendance percentage increased from 91% during the pre-intervention period to 94.3% during the post-intervention phase. Attendance for students in the free eligibility group increased the most. Academic performance showed no significant increase after providing free school breakfast for one academic year. Results of the breakfast consumption behavior survey provided the foodservice director with useful information concerning the foods students eat most often for breakfast. Qualitative data revealed that principals and teachers were most concerned about food variety and the menu items served. More healthy alternatives and less concentrated sweet items were suggested.

Application to Child Nutrition Professionals

Serving breakfast in the classroom and obtaining support from both principals and teachers were identified as significant factors influencing the success of the program. School nutrition directors can use the results of this study to identify benefits, as well as challenges they may need to address when assessing the feasibility of implementing a free school breakfast program.

INTRODUCTION

Research has demonstrated that the availability of school breakfast has been associated with both dietary and educational benefits (Kleinman et al., 2002; Murphy et al., 1998; Pollitt, 1995). Evidence from existing studies suggests that eating breakfast can enhance student school performance and overall nutritional well-being (Position of the American Dietetic Association, 1999). Nicklas, et al. (1993) found that children who skipped breakfast had lower nutrient intakes than children who ate breakfast at school or home.

The School Breakfast Program (SBP) was established under the Child Nutrition Act of 1966 to ensure that all children have access to a healthy breakfast at school to promote learning readiness and healthy eating behaviors (Food and Nutrition Service, U.S. Department of Agriculture [USDA], 2002a). While the number of schools offering the SBP has increased, the percentage of low-income students eating school breakfast has remained lower than those eating school lunches (Food Research and Action Center, 2006). Only 44 children eat reduced or free price school breakfasts for every 100 who receive reduced or free price school lunches. One approach to encourage participation is to provide breakfast free to all students.

Universal free school breakfast programs provide breakfast to all children in a school, regardless of family income, without charge. The Food Research and Action Center (FRAC) (2004) noted that offering a free breakfast to all students decreases the stigma of school breakfast being for "poor kids" only. Although the stigma associated with eating school breakfast decreases participation in the SBP (FRAC, 2004), providing free breakfasts to all students would substantially increase the government's cost of subsidizing school breakfast. It is critical to know the value of this investment. Results from the first year of implementation of USDA's pilot study of universal free school breakfast and other free school breakfast studies indicated that participation almost doubles in the treatment schools (Murphy et al., 2000; Murphy & Pagano, 2001; Peterson et al., 2004; USDA, 2002b).

The city of St. Joseph, MO, is located 50 miles north of Kansas City, with a population of approximately 72,000. The St. Joseph School District implemented its own free school breakfast program during the 2002-03 academic year. The program was initiated because of administrators' concerns about student academic success in schools with high free- and reduced-meal eligibility rates. The program is funded by the district and federal reimbursement based on participation and is not part of USDA's pilot study. The purpose of this research is to provide practical information to evaluate the effects of the free school breakfast program implemented in the St. Joseph School District and to identify ways to facilitate the success of this program here and in other communities. Suggestions to other school nutrition directors who are interested in implementing a free school breakfast program in their districts also are provided.

METHODOLOGY

Study Samples and Data Collection

The study sample was comprised of three experimental and three control schools. The three experimental schools (E1, E2, and E3) were selected based on the number of students eligible for free or reduced-price meals. The three control schools (C1, C2, and C3), which provided a

traditional school breakfast program, were selected on the basis of school size and student socioeconomic status (free or reduced-price meal eligibility) to ensure comparability.

Research Instruments and Data Collection

Both quantitative and qualitative approaches were used to evaluate the free school breakfast program in St. Joseph. Quantitative information included the breakfast participation rate; student attendance rate; student academic performance, which encompassed math and science scores; and student breakfast consumption behavior. A summary of study variables is presented in Table 1. Both school level and matched student sample data for participation and attendance rates were obtained to evaluate the effectiveness of the free school breakfast program. School level data were obtained from the official school foodservice claim forms for reimbursement for the pre-intervention (2001-02) and post-intervention (2002-03) phases. The original data on enrollment, number of school days, daily attendance, and number of meals served per day were used to calculate breakfast participation and student attendance percentages. The following formulae were used:

$$\text{Breakfast Participation (\%)} = \frac{\text{Number of Breakfast Meals Served Per Day}}{\text{Average Daily Attendance}}$$

$$\text{Student Attendance (\%)} = \frac{\text{Average Daily Attendance}}{\text{School Enrollment}}$$

The matched student sample data were obtained from Troester Media Center (TMC), the technology hub of the St. Joseph School District; the University of Kansas data form available in the Nutrition Service Department; and the Student Period Attendance Report for student attendance and breakfast participation for pre-intervention and post-intervention phases. The formulae used to calculate individual student's breakfast participation and attendance percentages were:

$$\text{Breakfast Participation (\%)} = \frac{\text{Number of Days Students Participated in Breakfast during a Month}}{\text{Number of Days Students Attended School in the Same Month}}$$

$$\text{Attendance (\%)} = \frac{\text{Number of Days Students Attended School during a Month}}{\text{Number of School Days in the Same Month}}$$

The local assessment test scores for math and science for the matched student samples were used to evaluate the influence of the free school breakfast program on student academic performance. Math scores for kindergarten students for 2001-02 and students in First Grade for 2002-03, and sciences scores for students in Fourth Grade for 2001-02 and Fifth Grade for 2002-03 were selected to evaluate student academic performance. Data for the 345 students in the matched sample were analyzed (Table 1).

A survey of a random sample of students in Third through Sixth Grade was conducted to explore students' breakfast consumption behaviors and patterns. Breakfast at home and school, reasons for eating or not eating breakfast at home and school, most commonly eaten breakfast items at home, and demographic information were obtained using a self-administered questionnaire. A total of 450 students from six schools completed the survey.

Qualitative information included perceptions of principals, teachers, the superintendent, and school foodservice managers about the free school breakfast program. A survey with open-ended questions was administered to principals and teachers to assess their perceptions about the program. Information regarding the overall impression of the program, perceived benefits, challenges, and suggestions was obtained. A total of four principals and 45 teachers from the six schools completed questionnaires. In-depth interviews were conducted with the superintendent and foodservice managers from the three experimental schools. Information regarding operations, overall impressions, benefits, challenges, and comments was obtained. Each interview took approximately 30-40 minutes.

Data Analysis

The SPSS for Windows (version 11.0, Chicago, IL) was used to perform statistical analyses in the study. Descriptive statistics were used to examine school data, including school breakfast participation and student attendance in the three experimental and three control schools. An independent samples t-test was used to compare differences in participation and attendance between experimental and control schools from the matched student data. A paired-samples t-test was used to assess the influence of the free school breakfast program on participation and attendance by comparing the pre- and post-intervention periods in the experimental schools for the matched student data. Academic performance between the experimental and control groups after implementing the free school breakfast program was evaluated using an analysis of covariance (ANCOVA). Since students' previous experiences and/or their socioeconomic status might bias their academic performance, the pre-intervention period's scores (2001-02) were used as a covariate to control for bias.

RESULTS AND DISCUSSION

Participants

School nutrition directors from four school districts provided usable data. Two districts each had an intervention and a control high school while the others had only one high school in their respective districts. The total number of schools in the study was six. The high schools were varied in regard to the background of students and school nutrition program characteristics (Conklin et al., 2005).

Manipulation Check

A manipulation check was run on the study intervention by comparing ratings before and after the introduction of nutrition information. The three items included in the nutrition category survey instrument pertained to whether the information for nutrition, calories, and fat contained in the food products were posted (Meyer et al., 1997). In all of the intervention schools, significantly higher scores ($p < .001$) were found in all three measures for the intervention period

than for the baseline period at the beginning of the school year. In contrast, the control (non-intervention) schools did not show higher scores. This would indicate that the nutrition information supplied was observed by the students and may explain the effects discussed below.

Student Satisfaction

ANOVA and two sample means testing showed that when nutrition information was supplied, student satisfaction increased for food quality and service quality. In all intervention schools, means for most of six measures for food quality increased. Students consistently rated appearance and quality of food higher ($p < .05$). All significant differences for the intervention period are shown in Table 1.

Table 1. Summary of Study Samples and Variables			
Variables	Sample	Sample Size	Data Sources
Quantitative Data			
Breakfast Participation	Schools	6	Reimbursement claim forms
	Matched student sample	264	Participation Data
Attendance	Schools	6	Reimbursement claim forms
	Matched student sample	341	Student period attendance report
Academic Performance	Matched student sample		Student test score reports
Math	Kindergarten (2001-02) & First Grade (2002-03)	169	
Sciences	Fourth Grade (2001-02) & Fifth Grade (2002-03)	176	
Student Breakfast Consumption Behavior	Students in grades 3 to 6	450	Survey
Qualitative Data			
Insights of Principals	Principals	4	Survey with open-ended
Insights of Teachers	Teachers	45	Survey with open-ended
Insights of the Superintendent	The Superintendent	1	Structured interview
Insights of the School Foodservice Managers	School Foodservice Managers	3	Structured interview

In all intervention schools, ratings for almost all mean scores increased. Interestingly, when nutrition information was supplied, not only did student satisfaction with the quality of the food chosen increase, but this intervention also seemed to spread to increased satisfaction with the service of the food. Students in the intervention schools rated several measures of service quality significantly higher than the control schools. The item that was rated higher in all four schools concerned the friendliness of the foodservice staff even though researchers specifically asked employees to "carry on as usual and not make comments to students about the nutrition labels" during the intervention period.

Student satisfaction did not increase for food quality, service quality, or any other category in the two control schools (Table 1). In control schools, the trend was a decreasing means for most measures of student satisfaction ($p < .05$). It may suggest that students became bored with menu offerings and cafeteria settings over time, which resulted in lower satisfaction with most aspects of the school nutrition program. This would indicate that supplying nutrition information not only halts such a waning trend in satisfaction, but increases student satisfaction from baseline measures.

Supplying nutrition information is not a panacea that creates a halo effect over the entire school nutrition program. In intervention schools, nutrition information had no effect on student ratings of pricing, dining room ambiance, or perceptions of menu variety. This would add evidence to the validity of the study. One would not expect nutrition information at the POS to increase student satisfaction with room temperature, noise levels, or the cleanliness of tables. Surprisingly, however, even though students did not rate the "time given for meal periods is adequate" category any higher after the introduction of nutrition information, students *did* rate the "time available to eat once seated is adequate" category as higher. At first this might seem contradictory, but the ratings of the "number of servings lines is adequate" category also increased after nutrition information was introduced. This finding might suggest that students knew that the time they were given for meal periods did not change, but when the nutrition information was introduced, selection of food items became easier and faster, giving the impression of more adequate serving lines and eating time. This phenomenon did not occur in the control schools.

The authors also tested to see if gender, grade, or frequency of participation would explain some of the results found in satisfaction levels. Results indicated that gender ($p > .26$), grade ($p > .34$), and frequency of participation ($p > .46$) did not have a significant effect on any satisfaction score for any of the schools. For both overall foodservice and food quality, satisfaction ratings dropped as grade level increased. Ninth Grade ratings were higher than Tenth Grade, Tenth Grade was higher than Eleventh Grade, and Eleventh Grade was higher than Twelfth Grade. Similar results have been found in other research (Meyer, 2000).

The opposite held true for service personnel ratings. Ninth Grade gave the lowest ratings, while Twelfth Grade gave the highest ratings for satisfaction with service personnel. Tenth and Eleventh Grades ranked in increasing order. These results are intuitively appealing, as one would expect students to become more disinterested with the overall foodservice and food quality the more exposure they have to them. Conversely, the ratings for familiar and friendly (and possibly more satisfied) service personnel would increase as students have more exposure to the staff.

Further analysis revealed a number of interaction effects. In each intervention school, there was a gender by intervention effect for overall foodservice [i.e. $F(1, 507) = 4.58, p < .03$], and for food quality [i.e. $F(1, 507) = 8.81, p < .003$]. Although there was no difference between male and female satisfaction rates with foodservice operations that provided no nutrition information at the POS [means: male = 3.8 and female = 3.9, $t(253) = 0.73, n.s.$], there was a gender difference when nutrition information *was* available [means: male = 4.1 and female = 4.4, $t(254) = 2.16, p < .03$]. Similar results were found for food quality. There was no difference between male and female satisfaction rates with food quality when nutrition information was not provided at the

POS [means male = 3.3 and female = 3.4, $t(253) = 0.29$, n.s.], however, a gender difference was present when nutrition information was available [means male = 3.6 and female = 4.0, $t(254) = 2.95$, $p < .003$]. This would suggest that when nutrition information was available, satisfaction with overall foodservice and food quality was greater for females than for males. Other research with young adults similarly has found that females are more influenced by nutrition information than males (Marietta et al., 1999).

Based on previous research on empowerment and self-determination (Cranage & Sujun, 2004; Cranage et al., 2004), these findings suggest that supplying nutrition information at the POS empowers students and enables a stronger sense of self-determination. This newfound sense of empowerment results in greater satisfaction with the quality of food and service. Additionally, total food selections were recorded at each school for a study focused on healthful selections and have been reported in a previous article; results showed there was a distinctive increase in more healthful food selections as an aggregate number for all Ninth through Twelfth Grade students (Conklin et al., 2005). If supplying nutrition information also influences students to make more healthful food choices, then an increased satisfaction could reinforce their choices and persuade them to make the more healthful selection repeatedly.

Variables	Pre-year (2001-02)	Post-year (2002-03)	t	p
Student Attendance	Mean ± SD	Mean ± SD		
Free (n=103)	89%±16%	94%±5%	-2.473	.007**
Reduced (n=27)	92%±16%	93%±9%	-0.343	0.362
Paid (n=21)	94%±8%	96%±2%	-1.232	0.11
Total (n=151)	91%±15%	94%±5%	-2.516	.006**
Breakfast	Mean ± SD	Mean ± SD		
Free (n=57)	53%±34%	95%±7%	-9.331	.000**
Reduced (n=15)	28%±35%	96%±5%	-7.135	.000**
Paid (n=13)	17%±22%	98%±2%	-12.352	.000**
Total (n=85)	43%±35%	95%±6%	-13.318	.000**
* P<0.05				
** P<0.01				
Note: Attendance (%) = Number of Days Students Attended School during a Month / Number of School Days in the Same Month * 100				
Participation (%) = Number of Days Students Participated in Breakfast during a Month / Number of Days Students Attended School in the Same Month * 100				

CONCLUSIONS AND APPLICATIONS

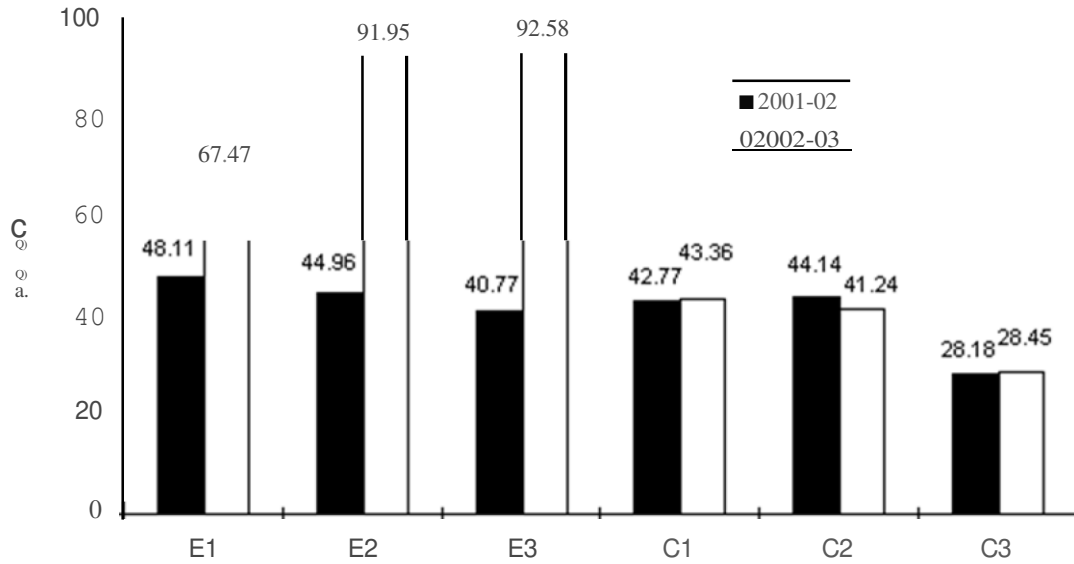
Overall, the free school breakfast program in St. Joseph, MO, was successful and benefited all students, especially those from low-income families. Providing free breakfast encourages all students to participate in the school breakfast program, regardless of family income. It also benefits students from low-income families by encouraging them to attend school more often. While an influence on students' academic performance was not observed after the first year of the free breakfast program, a future study with a longer period of evaluation is suggested.

The most significant concern identified was the breakfast items served. Most teachers and principals reported that food choices should be improved and more healthy alternatives and less-sweet items were requested. The menu items served in the schools also were identified by students as reasons for choosing to eat breakfast in schools. These results indicate a critical need to include healthy breakfast choices that also can meet student preferences. Several suggestions were provided to improve and facilitate the success of this program and to serve as guidelines for implementing a free school breakfast program in other schools or districts. These included providing a greater variety of choices and including more nutritious items; involving teachers, principals, and students in new product testing; conducting a survey to explore students' preferences; and providing nutrition education regarding the nutrient content of menu items served to enhance principals', teachers', and students' knowledge about food choices.

Obtaining support from both principals and teachers was identified as a significant factor influencing the success of the program. Serving breakfast in the classroom showed a higher rate of student participation in the program than serving breakfast in the cafeteria. Input from teachers was one of the major factors determining where the breakfast was served. However, a few teachers disagreed about serving breakfast in the classroom, due to the higher incidence of littering, packaging waste, and sanitation problems. The benefits of eating school breakfast and serving breakfast in the classroom should be clearly articulated to principals and teachers. Developing a simple and effective plan to clean and sanitize the classroom also may help to obtain teacher support.

Food items eaten most often at home also were identified. A few teachers mentioned their preferences for hot breakfast. A survey to explore student preference was recommended before implementing the free school breakfast program. The foodservice director can use the information as a reference when planning breakfast menus and selecting food items that might encourage more students to eat breakfast in schools.

Figure 1. School breakfast participation rate in school years 2001-02 and 2002-03

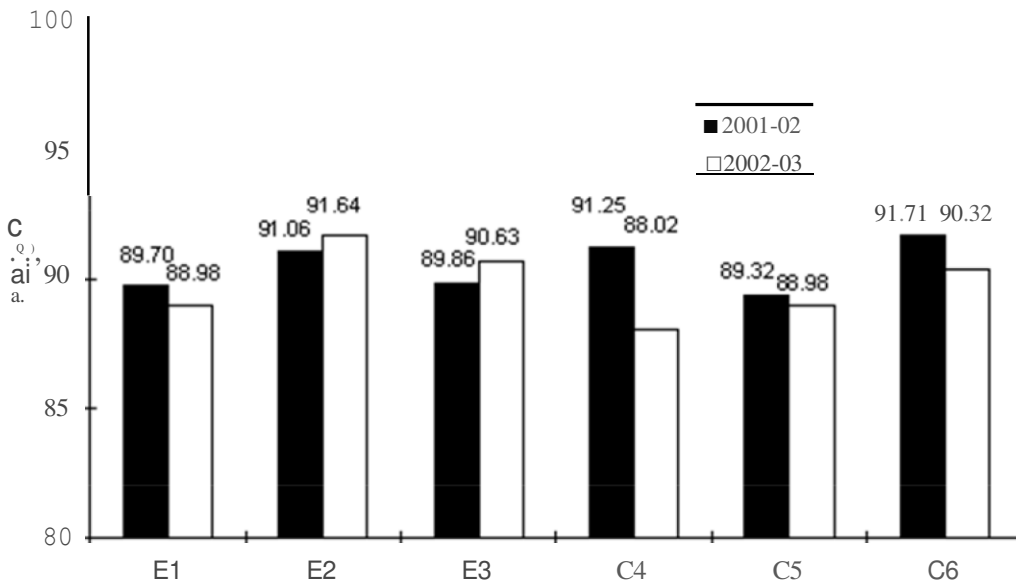


Note: Schools E1, E2, E3 are experimental schools; Schools C1, C2, C3 are control schools.

Free breakfast was implemented in the control schools in 2003-2004 academic year.

Participation rate(%)= Number of meals served /Average daily attendance 100

Figure 2. Attendance during pre-intervention (2001-2002) and post-Intervention periods (2002-2003)



Note: Schools E1, E2, E3 are experimental schools; Schools C1, C2, C3 are control schools.

Free breakfast was implemented in the control schools in 2003-2004 academic year.

Attendance(%)= Average daily attendance / Enrollment 100

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