

**Privatized School Food Service and Student Performance in Michigan:  
A Preliminary Report**

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**Abstract:** I analyze Michigan school district data for the 2005-2006 school year to assess the association between private school food service management and the cost of meals, the level of classroom resources, and student performance on standardized tests. Results indicate no substantive decrease in the cost of student lunches and a modest increase in the cost of breakfasts with private food management. Private food service management is associated with higher student-to-teacher and student-to-instructor ratios. Finally, private food service management is associated with an estimated 1 to 3 percent reduction in MEAP scores. This effect appears to be strongest in grades 3 to 5 and with the English, reading and writing tests. **Exploration of Centers for Disease Control data suggests that the cause for the lower test scores is greater availability of high fat and high sugar foods under private food service management.**

## Introduction and Research Questions

A robust democracy, responsive civil society, and competitive economy depend on the health, well-being, and cognitive development of children. This is why quality public education is considered an important social goal.

Research on education quality has largely focused on the interaction between student and teacher, looking at factors such as pedagogy and resource inputs. For instance, the best available research indicates that smaller classes improve education outcomes—especially for younger children—because teachers are better able to provide individualized attention to students.<sup>1</sup>

In this report, we consider another aspect of school administrative policy that may affect the learning environment: the use of private contractors to manage school food programs. Specifically, we first test whether private food service reduces meal cost. Then, we test for an association between school food service privatization and student performance. Our inquiry is limited to Michigan’s public school districts that submitted results for the 2005 Michigan Education Assessment Program (MEAP) tests.

The tests might show that the privatization of school food services has no relationship to student performance. Industry regulation and careful oversight by school boards may standardize school food offerings, thus yielding no difference between privately delivered and publicly delivered food. On the other hand, we may find that privatization is associated with lower student performance. If this is the case, we speculate that the causal mechanism is the change in dietary offerings to students, and would urge further research in this direction. On the other hand, it might be that private food services are associated with higher student performance. This could happen if by privatizing food services, a district realizes substantial economic savings, thus allowing the district to redirect resources toward more “core” educational priorities, such as reducing class sizes, expanding district libraries, and so forth.

Indeed, the Midland-based Mackinac Center for Public Policy, which regularly posts commentary and reports that market privatization, hypothesize the latter. Their most recent survey of Michigan school districts shows modest growth (3.6 percent) for the private contracting of school food services during the 2006–2007 fiscal year. Further, their results indicate that the majority of respondents are satisfied with private contracting and that privatization has resulted in economic savings.<sup>2</sup> From this, the authors conclude that by privatizing school support services, districts potentially “liberate resources for

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<sup>1</sup> See: Blatchford, Peter, Viv Moriarty, Suzanne Edwards, and Clare Martin. 2002. Relationships Between Class Size and Teaching: A Multimethod Analysis of English Infant Schools. *American Education Research Journal*, 39 (1):101–32. Finn, Jeremy D., Gina M. Pannozzo, and Charles M. Achilles. 2003. The “Why’s of Class Size: Student Behavior in Small Classes. *Review of Educational Research*, 73 (3): 321–68. Krueger, Alan B. 1999. Experimental Estimates of Education Production Functions. *The Quarterly Journal of Economics*, 114 (2):497–532.

<sup>2</sup> For a summary of results, see: Smith, Daniel J. and Michael D. LaFaive. 2007. Survey 2007: More Growth in School Support Service Privatization. Online at: <http://www.mackinac.org/archives/2007/s2007-10.pdf>

academic pursuits” and enable officials to concentrate on helping teachers with “the difficult but central job of academic improvement and discovery.”<sup>3</sup> These statements inform our empirical tests.

We begin by testing whether privatizing school food services yields economic savings. Even if we set aside the ideological charter of the Mackinac Center, there are reasons to suspect that their research overstates the economic value of private contracting. The most serious limitation to the Mackinac Center approach is that they never measure economic savings. Instead, they report on perceptions or official predictions of economic savings. Coupled with this limitation is their reliance on data collected through survey methods, which are notorious for social desirability bias. Social desirability bias is the tendency for a respondent to provide answers to an interviewer that casts the respondent in a favorable light. Thus, when asking decision-makers whether their program to privatize a service was a success, one should expect many “yes” replies, regardless of the facts. To state otherwise would be an admission by the decision-makers that the policy they championed failed, reflecting negatively on their competence.

Researchers who use survey methods to probe into questions that might challenge the candor of respondents should seek multiple data sources to verify results. Moreover, our trust in the validity of the findings increases when the data comes from authorities that are independent of the respondent. In this report, we analyze public data provided by the Michigan Department of Education (MDE), the U.S. Census, and the Centers for Disease Control (CDC).

In addition to testing for a financial gain, we test the theory that by privatizing school food services, districts are able to shift resources to the classroom and improve academic performance. Student academic achievement has become a national priority. With the No Child Left Behind Act of 2001 (Public Law 107–110), standardized testing became mandatory for all public schools. In compliance, the MDE compiles MEAP scores for four tests—English, mathematics, reading, and writing—for grades 3 through 8. These data are used in this study to test for an association between private food service management and student performance.

We find a small, negative association between private school food service management and student performance. To explore a possible cause, we examine CDC data to test for differences in food nutritional quality across privately and publicly managed food services. This national dataset does not identify the schools in their sample, which unfortunately prevents us from linking school food policy to student performance. However, it does provide rich information on food offerings and food preparation techniques, and enables us to develop hypotheses.

To summarize, the questions we address in this report are as follows:

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<sup>3</sup> For a comprehensive review of the Mackinac Center position on school service privatization, see: LaFaive, Michael D. 2007. A School Privatization Primer for Michigan School Officials, Media and Residents. Online at: <http://www.mackinac.org/archives/2007/s2007-07.pdf>

1. For Michigan, how does the privatization of school food services relate to the finances of school food programs?
2. For Michigan, how does the privatization of school food services relate to student performance on the MEAP tests?
3. Nationally, are there differences in food offerings and preparation between privately and publicly managed school food programs?

As the subtitle to this report indicates, these analyses are preliminary. Critical limitations in the data prevent us from drawing a confident causal connection between private food services and student performance. Using readily available public data, we present a first look at the association between private food services and student performance. In the concluding section, we summarize the main findings, outline the limitations, and point the direction toward future research.

### **Data and Methodology**

The MDE annually posts data on school district performance, and as such is the primary source for the data used in this report. Information on the food service is contained in a report titled “Food Service Year End Report Compilation.”<sup>4</sup> This source includes the main independent variable for this study, private food service management, as well as financial variables such as the cost per lunch and breakfast meals, and the proportionate cost for labor, contract, transport, supplies, and food expenses.

Since the food service data was for fiscal year 2005–2006, all other data was compiled for that year, including student MEAP scores.<sup>5</sup> English, mathematics, reading, and writing scores for the MEAP are categorized and reported by MDE as either: exceeded standards (level 1), met standards (level 2), basic (level 3), and apprentice (level 4). With this data, we created a grade-test score for each district, and we use this score as a primary measure of student achievement.

Student test scores correlate with family and community affluence. To control for district-level economic conditions, we include a measure for the percentage of students in the district enrolled in the free and reduced-cost meal program. The National School Lunch Program provides free or reduced school meals for needy families. Each family must apply, and eligibility is based on family size and income. MDE files on the free and reduced lunch program were available from the Center for Educational Performance and Information (CEPI).<sup>6</sup> Further, we include the proportion of adults in the district with a bachelor’s degree to control for regional educational attainment.<sup>7</sup>

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<sup>4</sup> The MDE food service data is available at: [http://www.michigan.gov/documents/public\\_15080\\_7.PDF](http://www.michigan.gov/documents/public_15080_7.PDF); for definitions, see: [http://www.michigan.gov/documents/compilation\\_overview\\_2003\\_81818\\_7.pdf](http://www.michigan.gov/documents/compilation_overview_2003_81818_7.pdf)

<sup>5</sup> MEAP data is at: [http://www.michigan.gov/mde/0,1607,7-140-22709\\_31168\\_40135---,00.html](http://www.michigan.gov/mde/0,1607,7-140-22709_31168_40135---,00.html)

<sup>6</sup> The National School Lunch data is at: [http://www.michigan.gov/cepi/0,1607,7-113-21423\\_30451\\_36965-146259--,00.html](http://www.michigan.gov/cepi/0,1607,7-113-21423_30451_36965-146259--,00.html)

<sup>7</sup> Wealth, income, and education are three commonly used measures of socio-economic status. For the education variable, we relied on census compilations available through School Data Direct at: <http://www.schooldatadirect.org/>

Student performance is also correlated with classroom resources and family structure. To control for classroom resources we include the student-instructor ratio for each district.<sup>8</sup> Our family structure variable is the percentage of single-parent households in the district, defined as households occupied by one adult and one or more children.<sup>9</sup>

We also include control variables for the students. The proportion of students in the district who are classified as special needs learners is included.<sup>10</sup> In our full analyses, we also include race and gender proportions for each grade.<sup>11</sup> A table of the variables is in the appendix.

To standardize all comparisons, analyses include only Michigan public school districts. Thus, excluded are private schools and public school academies (charter schools). Of the 552 local education agencies (public school districts) in FY 2005–2006, the MDE reports information on 527 school lunch programs, or slightly more than 95 percent of districts. For the student performance analyses, full data was available for 510 to 514 districts, depending on the grade level, which represents approximately 93 percent of districts.<sup>12</sup>

We use cross-section regression analyses to test first for an association between private food services and school meal cost. Second, we test for whether privatizing food services lowers student-to-teacher ratios. Third, we test for an association between private school food services and student performance. Here, in addition to producing estimates using cross-section methods, we test for a change in the cohort score between the 2005 and 2006 MEAP tests.<sup>13</sup> The student performance regressions are weighted by the number of grade-tests taken and reported by MDE.

Finally, in a separate, national analysis, we evaluate CDC data to explore differences in food service offerings and operations across privately and publicly managed food service programs.<sup>14</sup> For these results, we relied on various statistical tests for mean differences or proportion differences, such as t-tests or chi-square tests. There were approximately 710 responses to the CDC questionnaire.

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<sup>8</sup> The ratio was developed by dividing pupil headcount by the number of teachers and instructional aids. Pupil headcount data are available from CEPI at: [http://www.michigan.gov/cepi/0,1607,7-113-21423\\_30451\\_30460-153640--,00.html](http://www.michigan.gov/cepi/0,1607,7-113-21423_30451_30460-153640--,00.html); data on staff (teachers and instructional aids) are at: [http://www.michigan.gov/cepi/0,1607,7-113-21423\\_30446-151489--,00.html](http://www.michigan.gov/cepi/0,1607,7-113-21423_30446-151489--,00.html)

<sup>9</sup> Available at School Data Direct, at: <http://www.schooldatadirect.org/>

<sup>10</sup> The MDE data was compiled by CEPI and available at: [http://www.michigan.gov/cepi/0,1607,7-113-21423\\_30451\\_39662---,00.html](http://www.michigan.gov/cepi/0,1607,7-113-21423_30451_39662---,00.html)

<sup>11</sup> Grade-level student demographic data is available through CEPI, at: [http://www.michigan.gov/cepi/0,1607,7-113-21423\\_30451\\_30460-153640--,00.html](http://www.michigan.gov/cepi/0,1607,7-113-21423_30451_30460-153640--,00.html)

<sup>12</sup> One unfortunate consequence of using data from numerous sources is that not all files have complete data. As we add files, there is a tendency for an increase in missing data. For these analyses, we omitted observations with missing data.

<sup>13</sup> The MEAP tests are given in the first half of the fall semester. By exploring the effect of private food service on the 2006 MEAP scores, controlling for the cohort performance in 2005, we test for an effect on the change over a one-year period.

<sup>14</sup> The CDC data is at: <http://www.cdc.gov/HealthyYouth/shpps/2006/data/district.htm>

## Food Service Privatization and Food Service Finances

A standard measure of economic performance for food services is the cost per meal. The MDE provides statistics on the cost per lunch and breakfast by school district. Below are the averages for these measures across Michigan public schools:

Table 1. Private versus Public Meal Costs

	Private (N)	Public (N)
Cost per lunch	\$2.78 (160)	\$2.88 (367)
Cost per breakfast	<b>\$2.15</b> (152)	\$1.90 (345)

Number of observations in parentheses. Differences in **bold** are significant at  $p < 0.05$ .

Every public school district has a lunch program. As table 1 shows, the estimated average cost of a lunch from a privately managed service is \$0.10 lower than a publicly managed service. Due to variation in the cost of lunches, statistically this cost difference does not breach standard levels of statistical significance. Still, if we assume that the difference is genuine and multiply the average number of lunches in the sample (241,617) by the estimated savings of \$0.10, we arrive at an average annual savings of \$24,162.

Not all schools provide breakfasts. For the public school districts that do offer breakfast, the average cost per meal is \$1.90 for food services managed by the districts, and \$2.15 for meals provided through private management. The difference of \$0.25 is statistically significant ( $p < 0.01$ ) at conventional levels. When we multiply the average number of breakfast meals in the sample (71,047) by the estimated cost premium of \$0.25, we arrive at a higher private cost of \$17,762.

In sum, we find substantively small differences in the cost per meal. The modest \$0.10 cost premium from a public lunch is canceled out by the modest \$0.25 cost premium for a private breakfast. Combined, there is no evidence that private food services yield savings for districts.

To illustrate why there is so little difference in the cost of meals across publicly and privately managed food services, table 2 presents five cost categories as a proportion of total revenue, as compiled by the MDE.

Table 2. Cost Categories as a Percentage of Revenue

	Private	Public
Labor costs	<b>39.3</b>	54.0
Contract costs	<b>13.2</b>	2.2
Food costs	<b>37.9</b>	41.7
Supplies cost	<b>8.3</b>	4.5
Transportation costs	0.2	0.3

Differences in **bold** are significant at  $p < 0.05$ .

What the results suggest is that there is considerable cost shifting within a food service program when a district adopts private management. Labor costs as a proportion of total revenue declines significantly (difference of 14.8 percentage points). This reduction, however, is nearly matched by the increase in the fees paid to the contractor (difference of 10.9 percentage points). Food costs decline modestly with the use of private management (difference of 3.8 percentage points), hinting perhaps at some savings due to economies of scale.<sup>15</sup> This reduction in turn is offset by the rise in the relative cost of supplies (difference of 3.9 percentage points). Private firms evidently use more disposable cutlery, plates, and so forth, perhaps as a method of reducing labor costs. Finally, there is basically no difference in transportation costs.

In general, we detect significant cost shifting: less spent on labor and food; more spent on contractor fees and supplies. It is important to keep in mind that these results may reflect the accounting practices of districts, rather than operational changes in a food service system. For instance, contract costs probably finance, in part, private management employees, thus representing a form of labor cost. Nonetheless, the evidence does suggest that cost shifting partially explains why there are no net savings associated with private food service management.

If economic savings fail to materialize, then we would expect that districts with private food services would not gain additional classroom resources. One standard measure for classroom resources is class size. Using Michigan data, we estimate the number of students per teacher, and the number of students per instructor,<sup>16</sup> across districts with private and public food services. The results are in table 3.

Table 3. Food Service Management and Classroom Size

	<u>Service Management</u>	
	<u>Private</u>	<u>Public</u>
Students per teacher	<b>21.2</b>	20.2
Students per instructor	<b>16.4</b>	15.7

Differences in **bold** are significant at  $p < 0.05$ .

Results indicate that districts with private food service management have an average of 1.1 more children per teacher, and 0.72 more children per instructor. While we hesitate to conclude that private food services increases class sizes,<sup>17</sup> the results do not indicate that privatizing food services liberates resources for the classroom.

### **Food Service Privatization and Student Test Scores**

The No Child Left Behind Act requires all states receiving federal support for K-12 education to test students annually. In Michigan, students in grades 3 through 8 take the

<sup>15</sup> Alternatively, this might indicate that private firms supply lower quality food.

<sup>16</sup> Number of instructors = number of teachers + number of instructional aids.

<sup>17</sup> The causal problem is that districts under financial stress with large classrooms may turn to private food service in the belief that economic savings will occur.

MEAP tests to assess their progress and evaluate school effectiveness. The policy of standardized testing is hotly debated, and here we avoid that controversy. Suffice it to say that standard tests are a narrow and potentially problematic measure of how well students learn. Despite these reservations, standardized testing is the norm and the test scores are readily available, so we use them as a proxy for student performance.

For each school district, the MDE provides data on the proportion of students that fall into four categories for each grade-test: (1) exceeded expectations, (2) met expectations, (3) basic, and (4) apprentice. We created a grade-test score by summing the products of the proportion of children in each classification with the assigned number (1 to 4) for that classification. For example, suppose a third-grade class had the following proportions on their English test: 10 percent exceeded expectations, 50 percent met expectations, 30 percent basic, and 10 percent apprentice. The grade-test score for this class would be 240 ( $1(10) + 2(50) + 3(30) + 4(10) = 240$ ). A third-grade class that performed better on the English test would have a lower score; a third-grade class with lower performance would have a higher score. The average grade-test scores for Michigan's public school districts in 2005 are as follows:

Table 4. Mean Grade-Test Scores for Michigan Public School Districts

<u>Grade</u>	<u>English</u>	<u>Math</u>	<u>Reading</u>	<u>Writing</u>	<u>N</u>
3	206.17	158.04	178.76	248.63	515
4	214.23	176.25	192.10	243.14	512
5	215.62	193.70	196.77	235.51	512
6	209.71	205.72	196.96	216.95	513
7	222.21	214.35	210.22	229.98	511
8	225.38	211.38	213.28	231.88	513

Each cell in table 4 gives the average score for each grade-test combination. To test whether student performance is related to private food service management, we regress the grade-test scores on the variable for private food service management, controlling for other factors such as affluence, school and family resources, and child traits. For these first analyses we include all the controls described above except student race and gender. The results, expressed in terms of percentage deviation from the average state-wide scores, are in table 5 below:

Table 5. Deviations from Mean Grade-Test Scores Associated with Private Food Service Management

<u>Grade</u>	<u>English</u>	<u>Math</u>	<u>Reading</u>	<u>Writing</u>
3	<b>2.57</b>	1.41	<b>2.29</b>	<b>2.89</b>
4	1.33	2.13	1.40	1.59
5	<b>1.96</b>	0.57	<b>2.75</b>	<b>2.22</b>
6	<b>2.10</b>	0.86	1.35	1.35
7	0.27	1.25	0.74	-0.40

8	-0.88	3.13	-1.36	0.47
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Values are in percentages. Differences in **bold** are significant at  $p < 0.05$ .

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The first cell in table 5, grade 3 English, tells us that third-grade students in school districts with private food service had MEAP scores that were, on average, 2.57 percent lower than third-grade students in districts with a public food program. Looking across the remaining cells, note that private food service management is usually associated with lower MEAP scores, especially for younger grades. Of the 24 tests, 7 are statistically significant at conventional levels.

To place this in perspective, consider that at our chosen level of statistical significance ( $p < 0.05$ ) chance alone dictates that we should expect 1, at most 2, of the 24 findings to be statistically different from zero. With 7—all in the same direction—we are reasonably confident of a negative association between MEAP scores and private food service.

We use the term “association” to emphasize that confirmatory tests are needed to claim a causal link between privatized food service and student performance. One inherent limitation to this research is the fact that privatizing food services is not a random policy. Nationally, food service privatization is more likely in areas where it is profitable for private firms: districts that are mid-sized, non-poor, and non-urban. In Michigan, for reasons that are not evident, food service privatization occurs more often in districts with higher proportions of children with special needs, single-parent households, and African-American students. As we control for these variables in the analyses, the measured association between MEAP grade-test scores and private food management declines. To illustrate, table 6 presents the same analysis as in table 5, with the exception that we include demographic controls for race and gender.

Table 6. Deviations from Mean Grade-Test Scores Associated with Private Food Service Management, Models Including Demographics

<u>Grade</u>	<u>English</u>	<u>Math</u>	<u>Reading</u>	<u>Writing</u>
3	<b>2.64</b>	1.32	<b>2.31</b>	<b>2.97</b>
4	1.34	1.55	1.37	1.78
5	<b>1.88</b>	-0.07	<b>2.51</b>	<b>2.37</b>
6	1.76	-0.50	1.00	1.02
7	-0.26	-0.39	0.12	-0.66
8	-1.17	2.14	-1.61	0.19

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Values are in percentages. Differences in **bold** are significant at  $p < 0.05$ .

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As expected, when we add new variables the estimated association changes slightly for each grade-test analysis. Hence, the inherent limitation to cross-section research of this type is that the research cannot resolve whether the measured association is due to causal relationships or some other exogenous factor. The estimates for any association depend critically on the inclusion or exclusion of appropriate control variables. Indeed, in

analyses with fewer controls the estimated association between private food service management and MEAP grade-test scores is significant for nearly all 24 tests.<sup>18</sup>

An alternative approach is to examine the change in grade-test scores between 2005 and 2006 for student cohorts.<sup>19</sup> Table 7 reports the results for the tests for an association between private food service and 2006 MEAP scores, controlling for cohort performance on the same tests in 2005. Since the composition of any class of children changes only slightly over a one-year period, the 2005 cohort grade-test scores indirectly control for affluence, school and family resources, and child traits.

Table 7. Change in Grade-Test Scores, 2005-2006 Cohort Analysis

<u>Grade</u>	<u>English</u>	<u>Math</u>	<u>Reading</u>	<u>Writing</u>
4	-0.44	0.29	-0.36	0.68
5	1.40	-1.72	<b>2.82</b>	<b>2.10</b>
6	1.50	<b>3.06</b>	0.70	<b>3.94</b>
7	-1.13	0.71	-0.24	-0.06
8	-1.42	-0.22	-0.79	1.04

Values are in grade-test points. Differences in **bold** are significant at  $p < 0.05$ .

Each cell represents the association between private food service management and the change in the grade-test score over 2005–2006. Taking sixth-grade math as an example, the average change in the MEAP tests in districts with private food service was a decrease of 3.06 points below districts with public food services. As before, probability theory would allow one of these tests to be statistically significant through chance alone. Of the 20 tests, 4 deviate significantly from zero.<sup>20</sup>

We can conclude with reasonable certainty that privatizing food services does not enhance student performance, although we cannot say with certainty that private food services are deleterious to student achievement, at least as measured by the MEAP. The evidence does suggest, however, that there is a small but negative relationship between private food services and student performance. Our best estimate is that private food service is related to a reduction of 1 to 3 percent in MEAP performance. This effect appears to be concentrated in younger grades, and in the areas of English, reading and writing.

<sup>18</sup> In models that include measures of district affluence and class size, 19 of 24 equations indicate a negative relationship between private food service and MEAP test scores. These analyses are available from the author.

<sup>19</sup> The MEAP tests are administered early in the fall semester, and thus are testing students on what they learned in the prior year.

<sup>20</sup> Grade 3 could not be used because there are no grade 2 scores.

## Explaining the Michigan Results: A Closer Look at Private Food Services

What can explain the Michigan results? Developing hypotheses requires investigating the differences between public versus privatized school food service. Fortunately, data are available for this purpose.

Out of concern for the dietary habits of children, the CDC has in recent years investigated food service operations within schools nationwide. In 2006, the CDC surveyed a random sample of schools about their food service and posted the data for public use.<sup>21</sup> The data include information on food management, operations, dietary offerings, and so forth. This section analyzes that data to examine differences between private and public school food services.

To be consistent with the Michigan analyses, we examined only the results from public school districts. We begin with a question in the survey that asks about the use of private food service management.

Question: Currently, does an outside food service management company operate the food service program at this school?

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	<u>Response</u>	
	<u>Yes</u>	<u>No</u>
Frequencies (percentages)	146 (20.1)	581 (79.9)

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Note: Responses are limited to schools in public school districts.

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Taking this variable, we then test for differences between privately and publicly managed food service operations. Unfortunately, the data do not include identifiers that permit us to match this variable with school test scores. Instead, we use information the survey contains on the food and food preparation. The first issue we examine is whether the food is prepared on-site versus off-site.

Question: Is any food actually prepared at this school for students' breakfasts or lunches?

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	<u>Service Management</u>	
	<u>Private</u>	<u>Public</u>
Percentage of "Yes" responses	<b>77.3</b>	86.1

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Differences in **bold** are significant at  $p < 0.05$ .

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A private food service company is more likely to offer pre-prepared breakfast and lunch meals that are reheated on site. The efficiencies when food is mass prepared in a remote location and then trucked into cafeterias for heating and consumption may help explain why food expenses in Michigan are lower for privately managed services.

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<sup>21</sup> The data can be accessed at: <http://www.cdc.gov/HealthyYouth/shpps/2006/data/>

The CDC data also reveal that the variety of food offerings for children increase when the food service is privately managed. Menu choices expand along several dimensions. For instance:

Question: Each day for lunch, are **students at this school offered a choice** between...

	Service Management	
	Private	Public
a. 2 or more different entrees or main courses?	<b>93.6</b>	76.0
b. 2 or more different non-fried vegetables?	78.7	74.3
c. 2 or more different fruits or types of 100% fruit juice?	<b>85.1</b>	74.1

Values are probabilities of “Yes” responses. Differences in **bold** are significant at  $p < 0.05$ .

Children tend to have more than one entree option and more than one variety of juice to choose from when ordering lunch. They also have greater liberty to substitute a la carte items for a standard breakfast or lunch. For those schools offering breakfast or lunch:

Question: Does this school ...

	Service Management	
	Private	Public
Offer a la carte breakfast items to students?	<b>73.6</b>	49.7
Offer a la carte lunch items to students?	<b>81.9</b>	66.2

Values are probabilities of “Yes” responses. Differences in **bold** are significant at  $p < 0.05$ .

Thus, it appears that the privatization of school food service liberalizes menu choices for children by **providing greater lunch entrée options** and the ability to select a la carte. On its face, this is a positive, since it is reasonable to assume that when children have options they will choose the most appealing food and likely eat during mealtimes. This **positive assumes, however, that the choices are among healthy foods.**

To explore whether choice equates with healthy nutrition options, we test for a difference across privately and publicly managed operations with respect to food characteristics. For lunch, most positive food characteristics (e.g., fruit, non-fried vegetable, low-fat or non-fat dairy products, whole-grain foods) show no difference in availability across the two management types. **Access to low-fat foods, in particular, is statistically the same for privately and publicly managed food service.**

**Access to high-fat foods, on the other hand, is greater in privately managed food service operations.** Moreover, **the statistically significant difference between privately and publicly provided food service, shown in the table below, increases when the private management company is responsible for ordering the food. The following survey item asks about deep fried food:**

Question: Which of the following statements on this card best describes **the sale of deep fried foods** at this school? Would you say...

	Service Management	
	Private	Public
Deep fried foods are sold each day at lunch, either as part of a meal or as a la carte items.	<b>22.3</b>	<b>10.5</b>
Deep fried foods are sold at lunch, but fewer than five days per week.	15.1	17.8
Deep fried foods are not sold at lunch.	<b>62.6</b>	<b>71.7</b>

Values are in percentages. Differences in **bold** are significant at  $p < 0.05$ .

Moreover, there is **evidence that private food services are less likely to reduce the sugar content of recipes prepared on-site, or to use low-sugar recipes. Greater access to high-fat and high-sugar items in a privately managed food service applies to a la carte offerings as well:**

Question: I'd like to ask about the different **a la carte foods** that students are offered, not counting items available in a vending machine. During a typical week, are students at this school offered...

	Service Management	
	Private	Public
a. 100% fruit juice or 100% vegetable juice?	81.4	75.6
b. <b>Soda pop or fruit drinks that are not 100% juice?</b>	<b>35.5</b>	<b>18.9</b>
c. Sports drinks, such as Gatorade®?	36.9	33.2
d. <b>Sweetened iced tea?</b>	<b>35.7</b>	<b>20.0</b>
e. Fruit?	89.4	83.3
f. Bread sticks, rolls, bagels, pita bread, or other bread products?	78.0	74.6
g. Low-fat cookies, crackers, cakes, pastries, or other low-fat baked goods?	50.4	49.9
<b>h. Cookies, crackers, cakes, pastries, or other baked goods that are not low in fat?</b>	<b>63.8</b>	<b>54.7</b>
i. Low-fat or nonfat yogurt?	65.2	54.5
j. <b>Pizza, hamburgers, or sandwiches?</b>	<b>82.3</b>	<b>74.3</b>
k. Foods containing peanuts or peanut butter?	54.5	55.6
l. Lettuce, vegetable, or bean salads?	<b>85.1</b>	76.5
m. Vegetables with low-fat dip?	<b>65.7</b>	56.4
<b>n. Deep fried French fried potatoes?</b>	<b>32.6</b>	<b>22.1</b>
o. Oven baked French fried potatoes?	64.5	62.5
p. Other vegetables?	<b>83.7</b>	74.4
q. Chocolate candy?	5.7	5.6

r. Other kinds of candy?	7.1	5.8
s. Salty snacks that are low in fat, such as pretzels, baked chips, or other low-fat chips?	<b>68.8</b>	58.6
t. Salty snacks that are not low in fat, such as regular potato chips or cheese puffs?	38.3	32.8
u. Low-fat or fat-free ice cream, frozen yogurt, or sherbet?	<b>31.7</b>	<b>42.0</b>
v. Ice cream or frozen yogurt that is not low in fat?	34.3	33.8
w. Frozen water ices or slushes that do not contain juice?	<b>14.2</b>	<b>9.5</b>

Values are probabilities of “Yes” responses. Differences in **bold** are significant at  $p < 0.05$ .

Here it is evident that private management diversifies food options, which means that children have greater access to both healthy (e.g., vegetables) and unhealthy items (e.g., sweetened drinks). While we do not have data on the actual choices children make, it is reasonable to hypothesize that with more unhealthy options, children in a privatized food environment consume greater amounts of high-fat and high-sugar items.

In the next table, we apply the same questions to examine the more narrow case where the private management company not only runs the service, but also provides the a la carte items. Of the 146 cases where a private company was managing the district food service, 114 (78 percent) of the food management companies provided the a la carte items and 32 (22 percent) did not.

Question: I’d like to ask about the different a la carte foods that students are offered, not counting items available in a vending machine. During a typical week, are students at this school offered...

A la carte foods from private management	Service Management		
	Private Yes	Private No	Public No
a. 100% fruit juice or 100% vegetable juice?	<b>85.0</b>	67.7	75.6
b. Soda pop or fruit drinks that are not 100% juice?	<b>41.2</b>	12.9	18.9
c. Sports drinks, such as Gatorade®?	<b>43.9</b>	<b>9.7</b>	33.2
d. Sweetened iced tea?	<b>43.4</b>	<b>3.2</b>	20.0
e. Fruit?	<b>95.6</b>	<b>64.5</b>	83.3
f. Bread sticks, rolls, bagels, pita bread, or other bread products?	<b>84.2</b>	<b>54.8</b>	74.6
g. Low-fat cookies, crackers, cakes, pastries, or other low-fat baked goods?	55.4	35.5	49.9
h. Cookies, crackers, cakes, pastries, or other baked goods that are not low in fat?	<b>68.8</b>	46.7	54.7
i. Low-fat or nonfat yogurt?	<b>70.3</b>	48.4	58.5
j. Pizza, hamburgers, or sandwiches?	<b>88.6</b>	58.1	74.7
k. Foods containing peanuts or peanut butter?	61.4	45.2	55.6

l. Lettuce, vegetable, or bean salads?	<b>90.4</b>	64.5	76.5
m. Vegetables with low-fat dip?	<b>69.9</b>	51.6	56.4
n. Deep fried French fried potatoes?	<b>38.6</b>	<b>6.5</b>	22.1
o. Oven baked French fried potatoes?	65.8	61.3	62.5
p. Other vegetables?	<b>88.6</b>	61.3	74.4
q. Chocolate candy?	7.0	3.2	5.6
r. Other kinds of candy?	8.8	3.2	5.8
s. Salty snacks that are low in fat, such as pretzels, baked chips, or other low-fat chips?	<b>76.3</b>	<b>38.7</b>	58.6
t. Salty snacks that are not low in fat, such as regular potato chips or cheese puffs?	<b>43.9</b>	<b>12.9</b>	32.8
u. Low-fat or fat-free ice cream, frozen yogurt, or sherbet?	33.0	32.3	42.0
v. Ice cream or frozen yogurt that is not low in fat?	38.4	<b>6.5</b>	34.3
w. Frozen water ices or slushes that do not contain juice?	<b>17.5</b>	0.0	9.5

Values are probabilities of “Yes” responses. Differences in **bold** are significant at  $p < 0.05$ , with public provision the comparison group.

These results suggest that the level of control given to private management companies goes far in determining the availability of certain foods. As before, there is evidence that private management results in a wider diversity of food offerings. However, the diversity is contingent on whether the private contractor is supplying a la carte items. Absent this role, private management is more often associated with a less diverse food offering.<sup>22</sup>

As is evident from the tabulations and statistical results, **children have greater access to high-fat and high-sugar food when private management companies provide the a la carte items.** Note also that **several nutritional a la carte options, namely fruit and vegetables, expand with a private management model. Nonetheless, sweetened drinks (e.g., soda pop, sports drinks, ice tea) as well as high-fat snacks (e.g., deep fried potatoes, cookies, chips) become more readily available to children when private management supplies the a la carte items.**

### **Conclusion: Food Service Type, Student Performance and Nutrition**

In this final section, we list the main conclusions, offer hypothetical scenarios for the results, and describe ways to improve upon this research. First, the main conclusions:

- We find no substantive economic savings when districts hire private food service management firms.**

<sup>22</sup> We caution, however, that the low occurrence of this arrangement means that our results may suffer from small sample bias.

2. We detect evidence of cost shifting: less for labor and food, more for contract fees and supplies. The absence of a net cost improvement is in part due to expense shifting: decreases in labor and food expenses were offset by increases in contract and supplies expenses.
3. We find no evidence to support the theory that by privatizing food service, districts are able to redirect resources to the classroom. Rather, we found the opposite: private food service was associated with larger class sizes.
4. Controlling for affluence, school resources, and student traits, private food service is associated with 1 to 3 percent lower MEAP test scores. These cross-section estimates were stronger for younger students, and for the English, reading, and writing tests.
5. Controlling for 2005 MEAP test scores, private food service in the 2005–2006 school year is associated with lower 2006 MEAP scores. Results were uneven across the tests, yet nonetheless suggest that private food service retards student improvement on MEAP tests.
6. Nationally, private food service is associated with greater diversity in entrée offerings and greater access to a la carte items. Much of the diversity was in the direction of high-fat and high-sugar foods. Because the CDC data cannot be linked to test scores, we cannot test for whether food quality affects student achievement. Nonetheless, the analysis does provide *prima facie* evidence that dietary differences might be the underlying cause for the negative association between private food service management and lower student performance.

There are many plausible explanations for the results, but we will offer two. The first is that schools under stress, financially, but also due to below-average MEAP performance, are experimenting with privatization as a method of directing resources to the classroom. The more stressful the situation, the more likely that an elected body will explore and accept privatization as a partial solution to fiscal and performance concerns. Our private food service variable is therefore a proxy for financial and performance stress, and the measured association that we find in these analyses is spurious. In this scenario, the negative association between private food management and student performance is not due to food quality, but rather, reflecting the hunt for resources among stressed districts. As districts experiment with privatized food service, however, they discover little to no real financial gain, and therefore are unable to redirect resources to classroom activities. Consequently, districts fail to improve student performance.

A second explanation builds on the first, adding that districts under stress negotiate terms with private food service companies in an attempt to improve district finances, and the most viable way to achieve fiscal goals is to boost revenue through the sale of food. For instance, a district in need of cash and a private firm desiring sales might agree to a revenue sharing arrangement. With a common incentive to sell food, especially strong for contractors that supply the food, the districts liberalize food choices. Students are allowed to substitute a la carte for lunch, and private contractors gain latitude to market a wider variety of food items. For many students, especially younger children, the most

attractive food options are high in fat and sugar. This difference in dietary patterns has a small, negative effect on student performance.

The critical distinction between the two explanations is the role of the nutritional content of the food. As suggested by the national CDC data, does the nutritional content of food change when Michigan school districts privatize their food service operations? Then, is the consumption of food linked to a decline (or reduced gain) in test performance?

Additional data and analysis is needed to answer these questions. This preliminary report can be improved by gathering data and incorporating information into the analyses, including:

1. Data on the relationship between the private food management service and the school districts. Our indicator for private food management can be developed if we know whether the district purchases food through the private firm, if the private firm orders food, prepares meals on site, is in charge of meal planning, and so forth. In addition to the operational arrangement, it might be revealing to assess whether the financial relationship between the district and the private firm creates an incentive to sell food, and whether this in turn predicts food types and consumption patterns.
2. Data on the food served and consumed in each district. If our finding was due to the nutritional content of food, then we should see a pattern where healthier food equates with better student performance.
3. Data at the grade, class, or individual level. Our analysis was a comparison of aggregate measures across Michigan districts. We can improve the precision of the estimates if data can be collected by grade (i.e., align the student test scores with meal consumption), classroom, or individual.
4. Longitudinal data to capture changes in food service policy. With multiple years of data it is possible to investigate whether “switchers;” districts that change food policy, experience changes in student MEAP performance.

## Variables Used in the Analyses

<u>Variable</u>	<u>Definition</u>	<u>Level (Source)</u>
Private food service	Indicator variable for whether the district hires a private food service management company	D (M)
English score	Rating for MEAP English proficiency, aggregated by grade level.	G (M)
Math score	Rating for MEAP Math proficiency, aggregated by grade level.	G (M)
Reading score	Rating for MEAP Reading proficiency, aggregated by grade level.	G (M)
Writing score	Rating for MEAP Writing proficiency, aggregated by grade level.	G (M)
Cost per lunch	The total cost allocated to reimbursable lunch ÷ total lunches claimed for reimbursement.	D (M)
Cost per breakfast	The total cost allocated to reimbursable breakfast ÷ total breakfasts claimed for reimbursement.	D (M)
Labor costs	The percentage of labor cost to total revenue (Labor Cost ÷ Total Revenue).	D (M)
Contract costs	The percentage of contracted services cost to total revenue (Contracted Cost ÷ Total Revenue).	D (M)
Food costs	The percentage of food cost to total revenue (Food Cost ÷ Total Revenue).	D (M)
Supplies cost	The percentage of supplies cost to total revenue (Supplies Cost ÷ Total Revenue).	D (M)
Transportation costs	The percentage of transportation cost to total revenue (Transportation Cost ÷ Total Revenue).	D (M)
Percent of special needs students	Percentage of students in the district enrolled in special education program	D (M)
Percent free or reduced meals	Percentage of students enrolled in the federal National School Lunch Program	D (M)
Students per teacher	The ratio of students to teachers (students ÷ (teachers	D (M)
Students per instructor	The ratio of students to instructors (students ÷ (teachers + instructional aids))	D (M)
Percent of citizens with a BA	Percentage of citizens in the school district with a bachelors degree.	D (C)
Percent of one-parent households	Percentage of one-parent households in the school district.	D (C)

Key: D = district; G = grade; M = Michigan Department of Education; C = Census