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Nutrition Standards for Competitive Foods in Schools

Implications for Foodservice Revenues

Joanne F. Guthrie, Constance Newman, Katherine Ralston, Mark Prell, and Michael Ollinger

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Abstract

USDA's National School Lunch and School Breakfast Programs supply most of the foods and beverages obtained by children in U.S. schools. Many schools also sell supplemental items, often called "competitive foods." The Healthy, Hunger-Free Kids Act of 2010 required USDA to set nutritional requirements for competitive foods served by schools that also offer USDA school meals, and this could diminish revenue to local school foodservices. This report uses data from two national surveys of schools and School Food Authorities to examine competitive food selections and their contribution to school foodservice revenues. Most competitive foods selected by students in 2005 were of low nutritional value. The amount of revenue obtained from these foods varied widely, but most foodservices earned less than 12 percent of revenues from competitive foods. School foodservices with high competitive food revenues typically were located in more affluent districts and served fewer students receiving free and reduced-price lunches. Secondary (middle and high) schools received much more revenue from competitive foods than did elementary schools.

Keywords: National School Lunch Program, competitive foods, child nutrition, diet quality, school foodservice revenues

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Nutrition Standards for Competitive Foods in Schools: Implications for Foodservice Revenues

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Across America, meals provided through USDA's National School Lunch Program (NSLP) and School Breakfast Program (SBP) supply most of the foods and beverages obtained by children at school. Most schools also sell competitive foods, or "à la carte" items, alongside USDA school meals, in vending machines, or in school stores and snack bars, with proceeds going to the school foodservice or fundraising school groups. These foods have been widely criticized as being of low nutritional value, undercutting public efforts to improve children's diets and prevent obesity. The Healthy, Hunger-Free Kids Act of 2010 requires schools that offer USDA school meals to limit competitive foods to those that meet updated nutrition standards, under development by USDA's Food and Nutrition Service (FNS).

What Is the Issue?

Limiting the types of competitive foods available for sale may result in lost revenue for school foodservices, which depend to varying degrees on this revenue stream. Because USDA school meal programs are a part of the Nation's nutrition safety net, the contribution that competitive food revenues make to foodservices serving economically vulnerable student populations is of particular interest. This report examines how updated nutrition standards for competitive foods might affect competitive food availability, and the implications for foodservice revenues.

What Are the Findings?

Desserts, sweetened beverages, salty snacks, and candy made up more than half of competitive items selected by elementary and secondary school students in 2005. Most (80-90 percent) of the competitive food and beverage items selected by students would not fully meet updated nutrition standards, which would shift purchases from items high in fat, saturated fat, sugars, and sodium to foods featuring whole grains, low-fat dairy, fruits, and vegetables.

One-third of elementary students consumed at least one competitive food on a typical school day in 2005, whereas 53 percent of secondary students did. Secondary students also consumed more competitive items than did elementary students. Average annual competitive revenues for elementary schools were about one-sixth those of middle schools and one-ninth those of high schools. At both the elementary and secondary school levels, school foodservices in more affluent districts obtained more revenues from competitive foods on a per-student basis.

School Food Authorities (SFAs), the foodservice management units for school districts, reported obtaining, on average, 12 percent of revenues from competitive foods in 2002-2003, a period in which there were few nutritional restrictions on competitive foods. Ten percent of SFAs received 36 percent or more of their revenues from competitive foods, which was attributable both to higher competitive food revenues and lower revenues from USDA school meals. SFAs with higher shares of competitive food revenue typically were located in more affluent districts and served fewer low-income students receiving free and reduced-price meals than did schools with low competitive food revenues. They also were more common in suburban, rather than urban or rural, districts and in the Northeast, Mid-Atlantic, and Midwest.

Establishing nutrition standards for foods sold at school in competition with the USDA meals should provide nutritional benefits, especially to secondary-school students and in the typically suburban, more affluent SFAs that obtain large shares of revenue from competitive foods and have low school meal participation. There may be additional benefits to lowering the profile of competitive foods in schools. Eliminating less nutritious competitive foods may also support efforts to improve the quality of USDA school meals. One study found NSLP lunches to be lower in fat in schools with no à la carte and vending. In the competition for student food spending, the absence of unhealthy alternatives may leave school foodservices more free to offer healthier meals that meet Federal nutrition standards.

For school foodservices concerned about covering their expenses, the challenge will be to adapt to new standards and develop new strategies for maintaining revenues in a healthier school nutrition environment. The challenge is most pronounced in SFAs receiving a large proportion of revenues from competitive foods. Higher school foodservice revenues from competitive foods were associated with lower USDA lunch participation, suggesting that competitive food revenues may displace meal participation and associated revenue. In SFAs where competitive food revenues make up a larger share of overall revenues, foodservice managers may be apprehensive about nutrition-mandated changes in offerings. Such SFAs will be especially interested in strategies for maintaining revenues when nutrition standards for competitive foods are implemented.

To offset revenue losses from removal of competitive foods that fail to meet nutrition standards, school foodservices can (1) seek out healthier competitive food options to replace those currently sold, or (2) re-emphasize their "core business" by expanding participation in school meals. For both strategies, appropriate pricing is key. The Healthy, Hunger-Free Kids Act of 2010 addressed pricing of meals and competitive foods, and new regulations based on this act may have important effects on revenues obtained both from USDA school meals and from healthier competitive foods.

How Was the Study Conducted?

This study made use of two national surveys conducted on behalf of FNS. Nationally representative school- and student-level data collected in 2004-05 were obtained from the School Nutrition Dietary Assessment III (SNDA-III), whereas the School Food Authority Characteristics Study (SFACS) provided school foodservice revenue and other data at the school district level from 2002-03. The SFACS sample was designed to generate national and regionally representative estimates, and although now a decade old, is still the most recent source for such data. At both the school and the SFA level, we examine the association of school foodservice competitive revenues with (1) the socioeconomic environment in which schools and SFAs operate; (2) school meal program characteristics like the average price charged for a full-price lunch; and (3) State and local characteristics that influence the school environment in which the foodservice operates.

Nutrition Standards for Competitive Foods in Schools

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Congress Mandates Update of Nutrition Standards for Competitive Foods

Across America, lunches and breakfasts provided through USDA's National School Lunch Program (NSLP) and School Breakfast Program (SBP) supply most of the foods and beverages obtained by children at school. The majority of schools also sell "competitive foods," a general term for foods and beverages sold in schools and that are not part of USDA school meals. They are most commonly sold in the cafeteria alongside USDA school meals, where they are known as "à la carte" items. They are also frequently sold in vending machines and less frequently in other locations such as school stores and snack bars, with profits sometimes going to the school foodservice or more often to other school groups. Competitive foods are consumed by 40 percent of public school students on a typical day (Fox et al., 2009).

USDA school meals are required to meet nutrition standards. These standards were recently updated, as part of the Healthy, Hunger-Free Kids Act of 2010 (USDA, 2011), to conform to the most up-to-date nutrition guidance and to address concerns about childhood obesity. Meals now include more whole fruit, dark green and red/orange vegetables, and whole grains.

While USDA meals are held to nutrition standards, the nutritional content of competitive foods is minimally regulated. As concerns about child nutrition and obesity have risen, the nutritional content of competitive foods has become an issue (Kids Safe & Healthful Foods Project, 2012a). Most of the competitive foods and beverages favored by children are "low-nutrient, energy-dense" (LNED) foods, which are high in fat, sugars, or sodium, and deficient in the fruits, vegetables, whole grains, fiber, and nutrients that are underconsumed by U.S. children (USDHHS and USDA, 2011).

Section 208 of the Healthy, Hunger-Free Kids Act of 2010 requires USDA to align nutrition standards for competitive foods with the *Dietary Guidelines for Americans*. These standards must be met by all competitive foods sold at school at any time during the school day (with special exemptions for occasional school-sponsored fundraisers such as bake sales). USDA's Food and Nutrition Service (FNS) published in February 2013 a proposed rule (USDA, FNS, 2013) of nutrition standards based on those developed by the Institute of Medicine (IOM, 2007), allowing 60 days for comment. After the final rule is published, schools will be given 1 year to implement the regulations.

Updated nutrition standards for competitive foods would shift schoolchildren's purchases from foods and beverages high in overconsumed food components such as fat, saturated fat, sugars, and sodium

to foods lower in these components and featuring whole grains, lowfat dairy, fruits, and vegetables. Implementing these standards may affect the revenues and costs of school foodservices.

Views on the financial effects of competitive food standards differ. Some maintain that more stringent standards for competitive food could jeopardize the financial viability of school foodservices (Rinaldi, 2008; Greves and Rivara, 2006). School foodservices that participate in USDA meal programs are required to be nonprofit; however, many localities expect them to cover their operational costs. This requires a delicate balancing of revenues and costs, and for a large share of schools, revenues fall short of costs (USDA, FNS, 2008). School foodservices must balance nutrition, student participation, and meal cost to achieve nutrition and food security goals while covering operational costs (Ralston et al., 2008). Some school foodservices contend that the sale of competitive foods is necessary to maintain financial solvency (U.S. GAO, 2005). Poppendieck (2010) quotes one school foodservice director as saying, "We need to sell à la carte to be financially sound."

In contrast, others question whether competitive food revenues actually improve the net financial status of school foodservices because competitive foods entail their own expenses and can reduce NSLP meal participation and the associated revenues (Peterson, 2011). Several school foodservices have reduced or discontinued competitive foods while simultaneously promoting NSLP meal participation, with one director saying "I recommend elimination of à la carte for anyone who wants to see their program grow—both in participation and revenue" (Kavanaugh, 2010).

The effect of competitive food standards on a school foodservice's finances can depend, in part, on what steps the school foodservice takes to adapt to healthier competitive offerings and/or promote the NSLP meal. Student responses to healthier competitive foods—that is, whether they continue to buy competitive items, shift to the NSLP meal, or bring food from home or other outside sources—may vary depending on age, their household economic conditions, or other factors.

This report examines how updated nutrition standards for competitive foods might affect competitive food availability, and the implications for foodservice revenues. It uses nationally representative data on school food offerings, student selections, and foodservice revenues to estimate the percentage of competitive food items that would or would not meet nutrition standards. It examines student and school characteristics associated with higher school foodservice revenues from competitive foods.

School-level foodservices are part of a School Food Authority (SFA), usually a district-level unit that oversees foodservice operations and manages the overall foodservice budget, consolidating revenues and submitting claims for meal reimbursements to USDA. Using a national survey of SFAs, this report examines the contribution of competitive food revenues to the SFA as a share of SFA total revenues and how those shares relate to SFA characteristics. Results should be useful to program and policy officials at Federal, State, and local levels as they implement nutrition standards governing competitive foods, allowing them to target and guide school foodservices that are likely to be most in need of assistance.

Background

Growth of Competitive Foods in U.S. Schools

Since the beginning of the National School Lunch Program (NSLP) in 1946, snacks and other food items have been sold in many schools (Poppendieck, 2010). At first, the nutritional content of these foods was viewed as purely a local issue. Concern about their nutritional quality and detrimental effects on school meal consumption led to efforts to regulate sales of competitive foods at the Federal level (Poppendieck, 2010; USDA, 2001; U.S. GAO, 2005).

In 1977, the Child Nutrition Act was amended to empower USDA to limit sales of foods that competed with USDA school meals. From 1980 to 1983, USDA regulated the sale of foods sold anywhere in school until after the last meal period. This blanket prohibition was challenged, and in *National Soft Drink Association vs. Block* (1983), the Court of Appeals for the District of Columbia ruled that USDA's power should be limited to regulation of competitive foods sold in the area where USDA meals were being served during mealtimes (U.S. GAO, 2005). Current USDA regulations prohibit sale of "foods of minimal nutritional value" in the foodservice area during meal periods. These prohibited items are narrowly defined (CFR, 2011) and include sugary items such as soft drinks, chewing gum, sugary candies like marshmallows, and popsicles. Under this regulation, many high-energy-density snacks and sweets such as fried chips, cakes, and chocolate candy are still allowed.

In 2005, à la carte items were offered in the cafeteria at lunch in 92 percent of secondary schools, compared to 76 percent of elementary schools.[1] When excluding the schools that offered only milk as an à la carte item, the share of elementary schools with à la carte offerings fell to 32 percent. Competitive food offerings were more varied in secondary schools. More than half of secondary schools offered à la carte entrees, making it easy to substitute competitive foods for the NSLP meal. Vending was relatively uncommon in elementary schools (27 percent of schools) and ubiquitous in secondary schools (87 percent of middle schools; 98 percent of high schools (USDA, 2007a)).

Availability of specific competitive food items varied from school to school. In 2005, about as many schools offered juice and water as sugary or caffeine-containing beverages (USDA, 2007a). Fresh fruit was the most widely available healthy choice among à la carte items, obtainable in approximately 40 percent of secondary schools, whereas cookies and chips were available in more than half of them. Ice cream and cake-type desserts were also obtainable in one-third or more of secondary schools (USDA, 2007a).

Nutritional Impacts of Competitive Foods

Competitive foods could have negative effects on children's diets either by substituting for a healthier lunch, reducing diet quality, or contributing excess calories above the standard lunch. Using nationally representative data from the 2004-05 school year, collected as part of USDA's School Nutrition Dietary Assessment III (SNDA-III), Fox et al. (2009) report that students who ate competitive foods

[1]USDA recently released findings from its School Nutrition Dietary Assessment IV (SNDA-IV), including updated information on competitive food offerings in school year 2009-10. Because SNDA-IV did not have data on student food selections, we did not update our analysis. However, we consider how findings from SNDA-IV add to the interpretation of our findings.

obtained an average of 277 calories per day from those foods. Low-nutrient, energy-dense (LNED) foods and beverages contributed 177—or 64 percent—of those calories.

Among children who did not eat the NSLP lunch, 45 percent ate competitive foods. Of those who ate the NSLP lunch, 36 percent also ate competitive foods, which may crowd out some lunch items if, for example, children eat chips or candy instead of the vegetables or fruit provided as side items with the meal. Marlette et al. (2005) found that students who purchased competitive foods along with the school lunch ate significantly less of their fruit and several other foods, compared to students who only bought lunch. If children do eat the complete lunch, the extra calories from LNED competitive foods may contribute to obesity, although the link is not definitive (Taber et al., 2012; Van Hook and Altman, 2012: Datar and Nicosia, 2012; Anderson and Butcher, 2006).

Policy Actions To Improve Competitive Foods

As part of the Child Nutrition and WIC Reauthorization Act of 2004 (P.L. 108-265), Congress required that school districts participating in the NSLP develop wellness policies that addressed the nutritional quality of all foods available in schools, not just USDA meals (USDA, 2005). However, the content of the wellness policies was left to local discretion—schools could restrict less nutritious competitive foods or not. Similarly, there were no requirements to assess compliance with any policies established.[2]

Competitive Food Revenues

On average across the country, revenues from competitive foods are far smaller than those from USDA-funded school meals. Nationwide, approximately 75 percent of school foodservice revenues were obtained from USDA subsidies and student payments for USDA meals in 2005 and 9 percent came from State and local funding, according to USDA's School Lunch and Breakfast Cost Study II (USDA, 2008). The remaining 16 percent came from miscellaneous revenue, which included à la carte sales in the cafeteria, any vending machines revenues, and all other miscellaneous revenues, such as meals sold to adults, catering, etc.

Competitive food sales vary considerably among schools. Approximately one-quarter of elementary schools sold no competitive foods in 2005 (Fox et al., 2009). Only 3 percent of middle schools had no competitive foods, and virtually all high schools offered them. Competitive foods have been reported to be a large portion of foodservice sales and revenues in some schools. Responding to a small study conducted by the U.S. General Accountability Office, one school foodservice director said that his district generated nearly half its revenue through competitive food sales (U.S. GAO, 2005).

[2]The Healthy, Hunger-Free Kids Act of 2010 added requirements for monitoring compliance with local wellness policies and making findings publicly available.

Data

USDA's School Nutrition Dietary Assessment Study (SNDA)-III

For student and school-level analyses, we use data from the School Nutrition Dietary Assessment Study III (SNDA-III). SNDA-III was conducted by Mathematica Policy Research, Inc. (Mathematica), under contract with USDA's Food and Nutrition Service (FNS). It provides nationally representative data on public schools that participate in the National School Lunch Program and the students in grades 1-12 who attend those schools (USDA, 2007c).

Data were collected from 397 schools and 2,314 students in the spring of 2005. Students identified each food/beverage item they selected and where it was obtained (e.g., cafeteria line, vending machine, etc.). Mathematica identified foods and beverages as being from USDA school meals or competitive sources (see Fox et al., 2009, for details of the methodology). Data on foodservice revenues, meal participation, and related variables were obtained from questionnaires administered to school foodservice managers. Information on vending by non-school foodservice entities was obtained from questionnaires administered to school principals.

School Food Authority Characteristics Survey (SFACS)

For the SFA-level analysis, we use data from the School Food Authority Characteristics Survey (SFACS), a nationally representative survey of SFAs that collected information on SFA revenues and costs for school year 2002-03. The survey was conducted by Abt Associates and Mathematica on behalf of USDA's FNS. It provides the most recent SFA financial data from a sample that can generate estimates for each of the seven regions defined by FNS (Northeast, Mid-Atlantic, Midwest, Mountain, Southeast, Southwest, and West). A subset of 1,432 SFAs participated in the SNDA-III, providing information on student enrollment, SFA revenues, and their sources (such as USDA reimbursements for NSLP/SBP meals, student payments for USDA meals, and student payments for competitive foods). The SFACS also contains information on school district enrollment and demographic/wealth characteristics drawn from the National Center for Education Statistics Common Core of Data and the U.S. Census Bureau.

Methods

To illustrate how implementation of nutrition standards for competitive foods might affect school foodservice revenues, we assessed the types of competitive foods and beverages most often selected by students in 2005 versus those that would be allowed under more stringent nutrition standards. Because updated standards have not been finalized, we examined several options, based on the IOM report *Nutrition Standards for Foods in School: Leading the Way to Healthier Youth* (2007) (see box, "Foods and Beverages That Meet IOM 'Tier 1' Nutrition Standards"). That report is the most widely accepted source of expert guidance on the appropriate nutritional content of competitive foods and underlies the nutrition standards proposed by FNS.

One "competitive foods" option estimated foods eligible for sale applying the IOM Tier 1 standards as closely as possible, and the other two were less restrictive, incorporating some alternative options proposed for consideration (USDA, FNS, 2013). One allows sale of à la carte items also sold as part of the reimbursable meal if they meet IOM-based criteria limiting fat and sugars, and the second option allows à la carte sales of any foods that are part of the reimbursable meal. Both options allow larger sizes of beverages and a wider range of permissible beverages for sale in high schools, including flavored waters, caffeinated beverages and low-calorie beverages such as diet sodas (see Appendix B). SNDA-III does not provide the purchase price for each selection; however, by examining the share of selected items that would be purchasable versus disallowed, we can estimate the potential effects of competitive food standards on student selections and, ultimately, on revenues.

Using SNDA-III data, we estimate annual school foodservice competitive food revenues on a per-school basis, and on a per-student, per-school basis to adjust for differences in school size. We include à la carte revenues and any income the foodservice authority received from vending machines (in most schools, vending revenues go to the school or other non-SFA groups, but there are some in which the school foodservice obtained revenue from vending).[3] À la carte and vending revenues are converted to annual revenues based on a 180-day school year. This annual value is divided by the school's average daily attendance to arrive at per-student estimates.

We examine competitive food revenues from elementary and secondary (middle and high) schools separately because of differences in student and school characteristics (USDA, 2007a). Older students are expected to have more discretionary funds and freedom with which to purchase foods and beverages. For each subgroup of schools, we compare school foodservice competitive food revenues on the basis of (a) the socioeconomic environment in which the school foodservice operates, since revenue losses could be of particular concern for school foodservices located in low-income districts and/or serving primarily low-income children (Kids Safe & Healthful Foods Project, 2012a), (b) school meal program characteristics like average price for full-price lunch, and (c) State and local (district or school-level) characteristics (e.g., reimbursements to SFAs) that influence the school environment (see Appendix A). We categorize schools by revenue quartile in order to create profiles of schools with lower and higher revenues from competitive foods. The data are weighted using school-level sampling weights to obtain nationally representative estimates (StataCorp., 2011).

[3]A small number of school foodservices may also have received revenues from school stores and snack bars but these revenues were not included because of problems identifying either (a) what share of revenues were received by school foodservices; (b) for stores, what share of revenues was attributable to food; or (c) for snack bars, whether school foodservice revenues were not already included in à la carte totals. Revenue attributable to snack bars and school stores was quite small compared to à la carte and vending.

The SFA-level analysis investigates competitive food revenues as a share of SFA revenues. This measure is based on annual foodservice revenues for school year 2002-03, as reported by the SFA director. Revenues are categorized according to source: "student à la carte" and "other food sales, e.g. vending" are combined and used as our measure of SFA competitive food revenues. We categorize SFAs by percentage of revenue obtained from competitive foods and examine associated socioeconomic and demographic characteristics, meal program characteristics, and State characteristics (see Appendix A).

Foods and Beverages That Meet Institute of Medicine "Tier 1" Nutrition Standards[1]

Foods	**Beverages**
Tier 1 foods are fruits, vegetables, whole grains, and related combination products[2] and nonfat/low-fat dairy that are limited to 200 calories or less per portion as packaged and contain: • No more than 35 percent of total calories from fat. • Less than 10 percent of total calories from saturated fats. • Zero trans fat (< 0.5 g per serving). • 35 percent or less of calories from total sugars, except for yogurt with no more than 30 g of total sugars, per 8-oz portion as packaged. • Sodium content of 200 mg or less per portion as packaged. Á la carte entrée items that meet fat and sugar limits as listed above and: • Are National School Lunch Program (NSLP) menu items. • Have a sodium content of 480 mg or less. • Do not exceed calorie content of comparable NSLP entrée items (200-calorie limit does not apply to entrees).	Tier 1 beverages are: • Water without flavoring, additives, or carbonation. • Low-fat (1-percent milk fat) and nonfat milk (in 8-oz portions): ◊ Lactose-free and soy beverages are included ◊ Flavored milk with no more than 22 g of total sugars per 8-oz portion. • 100-percent fruit juice in 4-oz portion as packaged for elementary/middle school and 8-oz (2 portions) for high school. • Caffeine-free, with the exception of trace amounts of naturally occurring caffeine substances.

[1]The Institute of Medicine Committee also developed a list of "Tier 2" foods and beverages that could be made available to high school students after the end of the school day. This list is not considered in this study because the Healthy, Hunger-Free Kids Act addresses foods and beverages available during the school day only.

[2]Combination products must contain a total of one or more servings as packaged of fruit, vegetables, or whole-grain products per portion.

Findings

Most Competitive Foods and Beverages Selected by Students Would Not Meet Nutrition Standards

Our analysis of School Nutrition Dietary Assessment III (SNDA-III) data found that students' choices were even more skewed toward the less healthy options than were product offerings. The overwhelming majority—80-90 percent—of competitive foods and beverages selected by students in SY 2004-05 would not meet criteria based on Institute of Medicine (IOM) Tier 1 standards, depending on the option examined (table 1). The top five competitive food purchases and their respective shares were: (1) desserts (20.3 percent), (2) sodas and fruit drinks/drinkades (19.5 percent), (3) salty snacks (12.1 percent), (4) pizza and other entrees (11 percent), and (5) candy (11.1 percent).

The majority of items did not meet the basic criterion of being primarily one of the major food groups such as fruit, vegetables, whole grains, or low-fat/nonfat dairy. A larger share of beverages than foods met standards; low-fat milks and bottled waters made up the majority of these beverages. In the case of some healthier choices, such as fruit juice, overly large portion sizes were frequently a problem. Some generally healthy foods, such as yogurts, did not meet a specific standard such as the standard for sugars. More detailed information on how competitive foods and beverages compared to criteria based on IOM recommended standards is provided in Appendix B.

Secondary-Level Students Consumed More Competitive Foods

One-third (33 percent) of elementary-level students consumed competitive foods on a typical day, whereas more than half (53 percent) of secondary-level students did. Secondary-level students also consumed twice as many competitive food items as did elementary-level students—on average, 1.2 items daily compared to 0.6 item. Both differences were statistically significant ($p < 0.001$). Thus, older students likely will benefit most from improvements in dietary intakes at schools that are associated with establishing nutrition standards for competitive foods.

Competitive Food Revenues Vary Across and Within School Grade Levels

Given that most of the competitive items selected by students are low-nutrient, energy-dense foods, final nutrition standards are likely to exclude most of the items heavily purchased by students in 2005. What are the implications for school foodservice revenues?

We expected to see wide variance in revenues obtained from competitive foods based on students' selection patterns. À la carte items make up the bulk of school foodservice competitive food revenues. Although competitive food sales from vending are common in schools, those revenues are more likely to go to non-school foodservice sources, with only 20 percent of school foodservices reporting vending revenues, based on SNDA-III data. Non-foodservice revenues from competitive foods can go to a range of school-related groups (see box, p. 10). However, these revenues are not the focus of this study, except as a local characteristic that may influence the competitive food revenues of school foodservices, either by competing for student food dollars or by creating an environment wherein foodservices feel obliged to sell more competitive foods.

Table 1

Competitive food/beverage items selected by students, school year 2004-05

BEVERAGES		Total number of items selected, SY 2005 (million)	Percent of items meeting Option 1 standards[1]	Percent of items meeting Option 2 standards[2]	Percent of items meeting Option 3 standards[3]
Dairy	Whole or 2% milk—flavored	23	-0-	-0-	-0-
	Whole or 2% milk—unflavored	77	-0-	-0-	-0-
	1% of fat free milk—flavored	126	12.6	12.6	12.6
	1% of fat free milk—unflavored	121	98.3	98.3	98.3
	Milkshakes and other milk drinks	7	-0-	-0-	-0-
Fruit juice	100% fruit juice	164	38.5	55.5	55.5
Sodas, fruit drinks	Carbonated soda (sweetened)	452	-0-	-0-	-0-
	Non-caloric soda (diet)	26	-0-	69.2	69.2
	Fruit drinks, fruitades	864	-0-	-0-	-0-
Bottled water	Bottled water	403	93.5	98.0	98.0
Coffee or tea	Coffee or tea—unsweetened	42	-0-	50.0	50.0
	Coffee or tea—sweetened	152	-0-	-0-	-0-
	Beverage total	2,457			
	Percent of all beverages meeting standard		23.4	26.9	26.9
FOODS					
Fruit		143	47	47	47
Vegetables	French fries and similar products	148	-0-	-0-	7.4
	All other vegetables	128	31.4	31.4	31.4
Salty snacks	Potato chips	225	0.7	0.7	46.2
	Popcorn	95	-0-	-0-	9.5
	Corn, tortilla chips	254	-0-	-0-	7.9
	Crackers and hard pretzels	257	-0-	0.8	0.8
Breads/Grains	All except grain-based salty snacks	243	-0-	2.1	7.8
Entrees	Pizza or pizza pockets	217	-0-	-0-	7.8
	All other entrees	540	1.5	4.1	14.8
Desserts	Ice cream, baked items, all others	1,399	-0-	0.1	21.5
Candy	Candy	763	-0-	-0-	6.7
Other	Soup, not a veg or entree item	16	-0-	18.8	18.8
	Food total	4,428			
	Percent of all foods meeting standard		2.6	3.2	16.5
Total competitive food/beverage selections		6,885			
Percent of total selections meeting IOM standards			10.0	11.6	20.2

[1]Standards matched to Institute of Medicine (IOM) standards (see box, p. 7) as closely as possible.
[2]IOM standards adapted to allow à la carte offerings that were also sold as part of the reimbursable USDA meal and met IOM fat and total sugar standards, and to allow a wider range of beverages, i.e. (i) up to 8-oz portion sizes of juice in elementary schools and 12-oz portion sizes in middle and high schools; and (ii) in high schools up to 20-oz portion sizes of calorie-free beverages and flavored water; and (iii) no restrictions on caffeine.
[3]IOM standards adapted to allow all à la carte offerings that were also sold as part of the reimbursable USDA meal and allow a wider range of beverages, i.e., (i) up to 8-oz portion sizes of juice in elementary schools and 12-oz portion sizes in middle and high schools; and (ii) in high schools up to 20-oz portion sizes of calorie-free beverages and flavored water; and (iii) no restrictions on caffeine.
Total number of items selected on sample school day, weighted to generate an annual, national estimate, assuming 180-day school year.

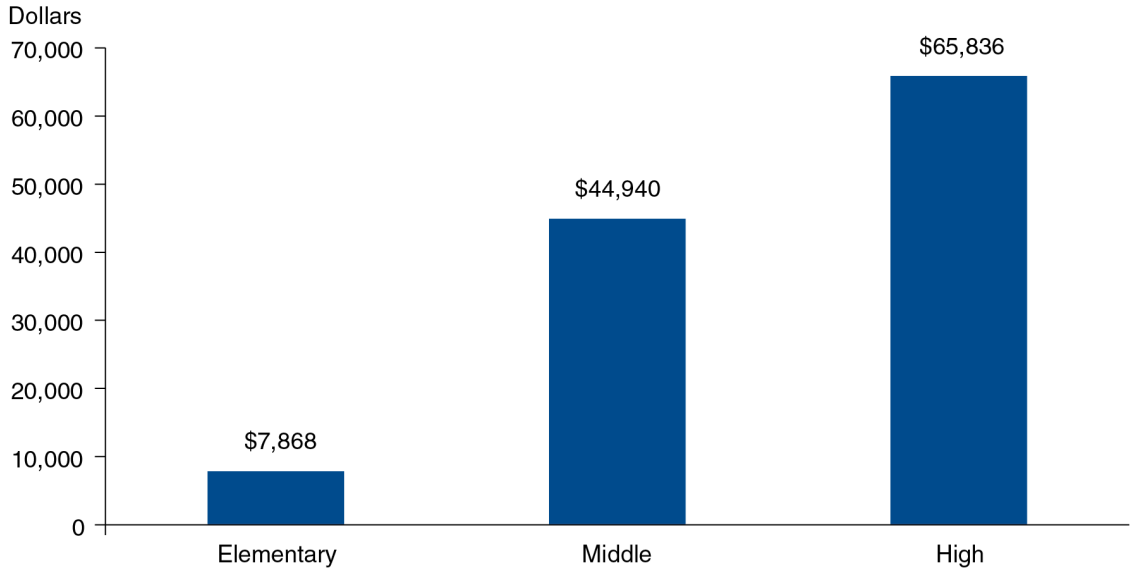
Source: USDA, Economic Research Service analysis, using data from the School Nutrition Dietary Assessment Study III (SNDA-III), collected in 2004-05.

Non-Foodservice Revenues From Competitive Foods

In many schools, principals, booster clubs, and other non-school foodservice entities sell competitive foods in vending machines, as fundraisers, etc. They use revenues to augment school funding, purchase sports uniforms, fund school trips, or meet other wants and needs. Revenues obtained from competitive food sales by school entities other than school foodservices account for only about 5 percent of competitive food revenues (USDA, FNS, 2013). The legislative requirement for competitive foods to meet nutrition standards will apply to these groups, in general, although it does allow for school groups to sell foods that do not meet standards on a limited number of occasions. This should help affected school groups to maintain revenues. They may also substitute nonfood sales and fundraising activities for sales of less healthy foods. Case studies provide many examples of schools that have used these alternative strategies to raise funds previously obtained from vending and other competitive food sales (USDA et al., 2005).

Revenues obtained from competitive food sales differ greatly between elementary and secondary (middle and high school) levels. Average annual competitive revenues for elementary schools were about one-sixth those of middle schools in 2005 and approximately one-ninth those of high schools (fig. 1). These differences are consistent with the greater purchasing power and latitude of older students. At the middle and high school levels, the difference in revenues appears to be attributable to the larger enrollments of high schools. On a per-student basis, elementary school revenues averaged $16 per student per year in 2005, versus $82 for middle school students and $64 for high school students. This supports our decision to separate elementary and secondary schools in our analyses.

Figure 1
Mean annual school foodservice competitive food revenues



Source: USDA, Economic Research Service analysis, using data from the School Nutrition Dietary Assessment Study III (SNDA-III), collected in 2004-2005.

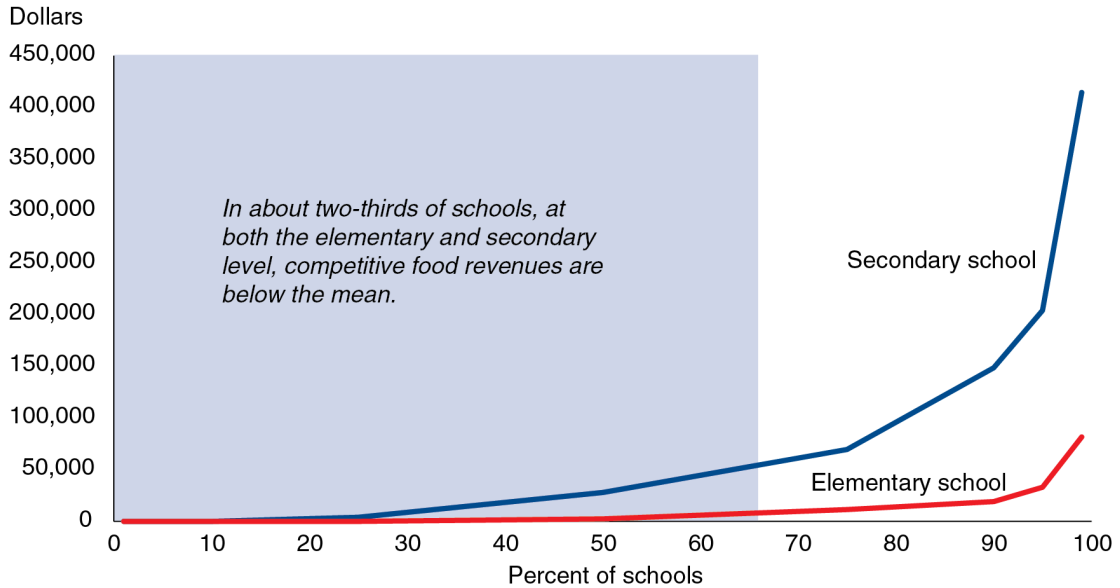
School foodservice revenues range widely across elementary and secondary levels. Foodservices in most elementary schools obtain negligible revenue from competitive foods and beverages. At the median, they received approximately $2,400 annually (fig. 2). This translates to less than $5 per student per year. The average foodservice revenue in elementary schools is dramatically skewed by a minority of schools. At the 75th percentile, school foodservices obtained almost five times as much revenue as at the median, and at the 90th percentile they obtained eight times as much as median revenues.

At the secondary level, almost all school foodservices have some competitive food revenues, but again, the amounts vary considerably. At the 75th percentile, foodservices obtain 2.5 times as much revenue as at the median, and at the 90th percentile they obtain more than 5 times as much (fig. 2). To some extent, this may be a function of school size, as at the secondary level enrollments vary considerably. On a per-student basis, the pattern is less extreme: per-student revenues at the 75th percentile are 2 times as high as at the median, while revenues at the 90th percentile are 3.7 times as high.

School Profiles: Characteristics by Food Revenue Quartile

We divided elementary and secondary schools into quartiles based on per-student foodservice revenues from competitive foods. Within each quartile, we calculated mean values for each of the characteristics examined (socioeconomic, geographic, demographic, meal program, nutrition environment; see Appendix A). The patterns of characteristics associated with each elementary-school quartile are shown in figures 3A and 4A, and secondary-level findings are shown in figures 3B and 4B.[4] These patterns allow us to create profiles of schools in which foodservices receive more revenues from competitive foods.

Figure 2
Distribution of annual school foodservice competitive food revenues, elementary and secondary levels

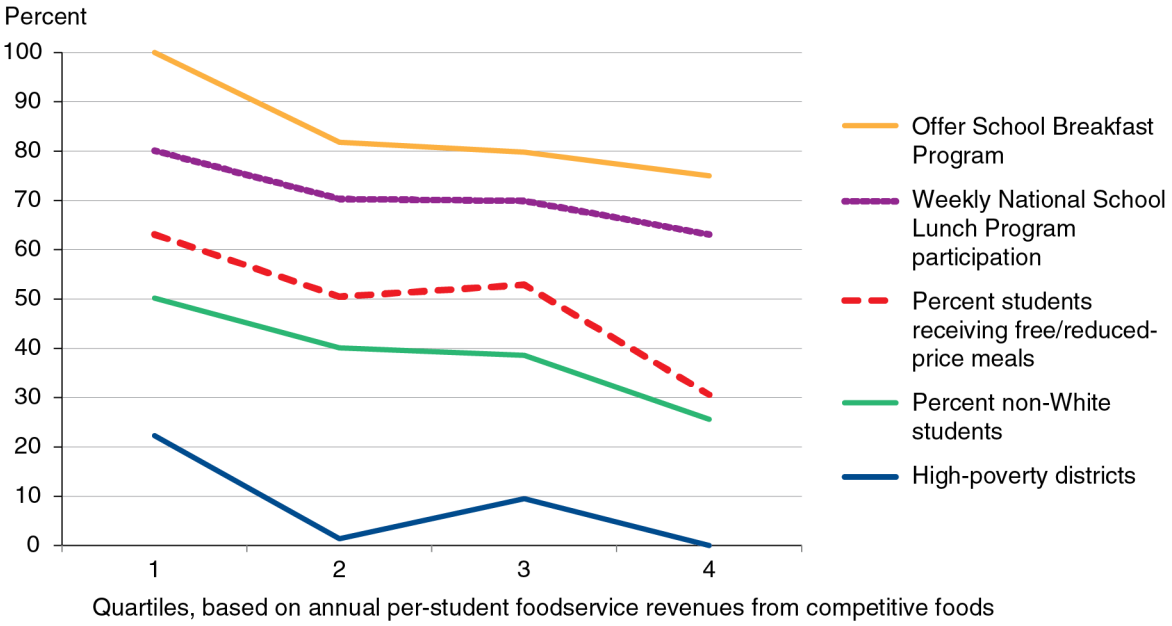


Source: USDA, Economic Research Service analysis, using data from the School Nutrition Dietary Assessment Study III (SNDA-III), collected in 2004-2005.

[4]Complete data for all elementary and secondary quartiles can be found in Appendix C.

Figure 3A

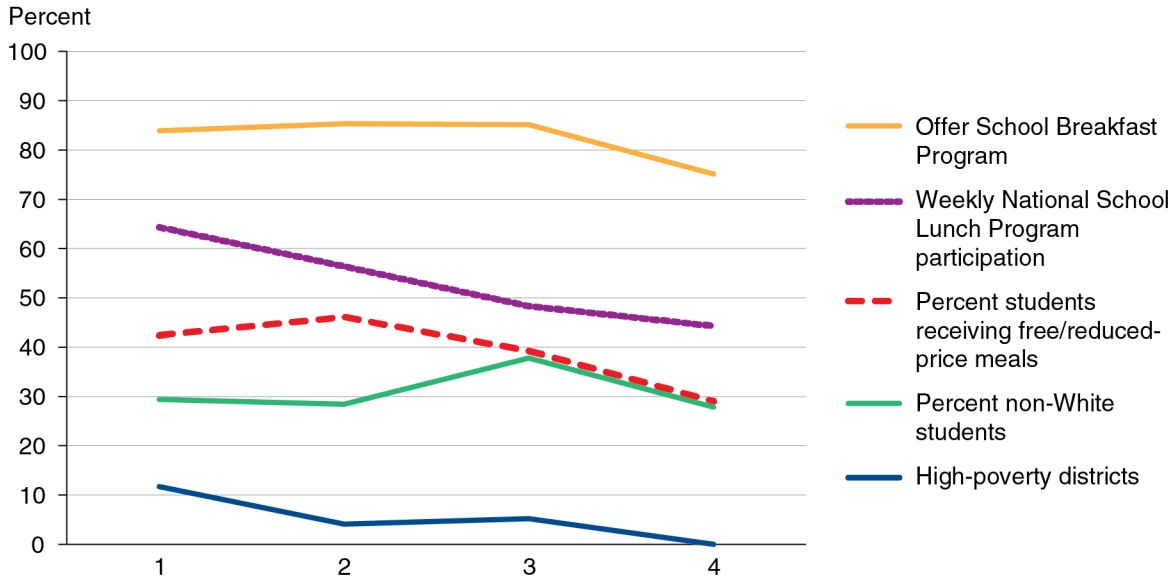
Socioeconomic and meal program characteristics of elementary schools in differing foodservice competitive revenue quartiles



Source: USDA, Economic Research Service analysis, using data from the School Nutrition Dietary Assessment Study III (SNDA-III), collected in 2004-2005. For complete data table, see Appendix C.

Figure 3B

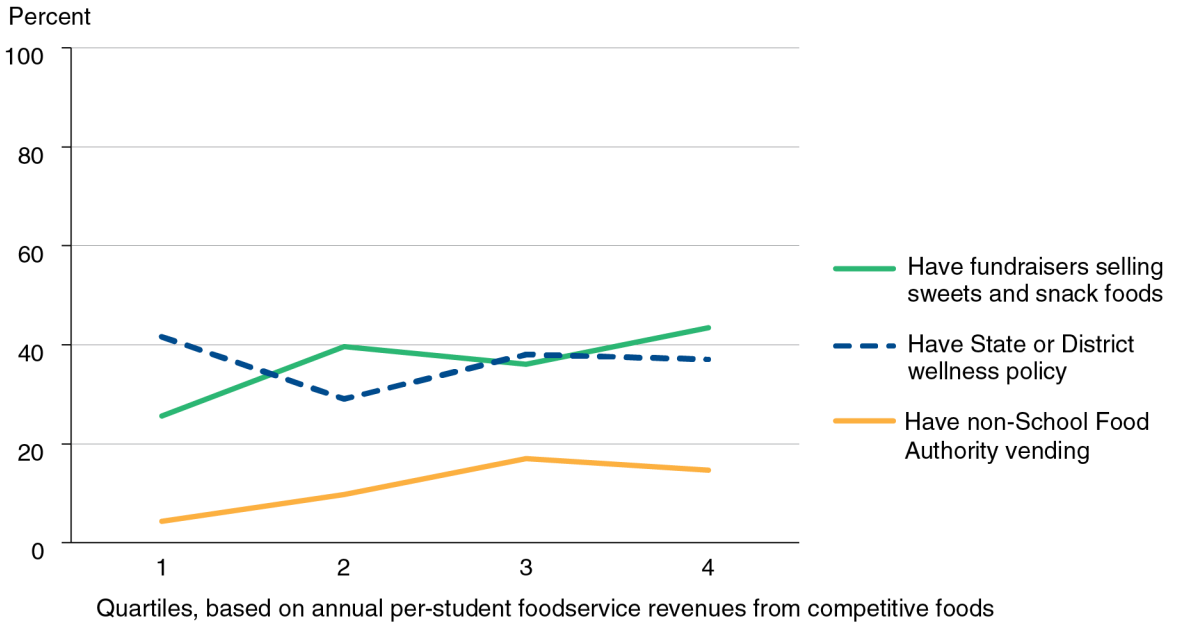
Socioeconomic and meal program characteristics of secondary schools in differing foodservice competitive revenue quartiles



Source: USDA, Economic Research Service analysis, using data from the School Nutrition Dietary Assessment Study III (SNDA-III), collected in 2004-2005.

Figure 4A

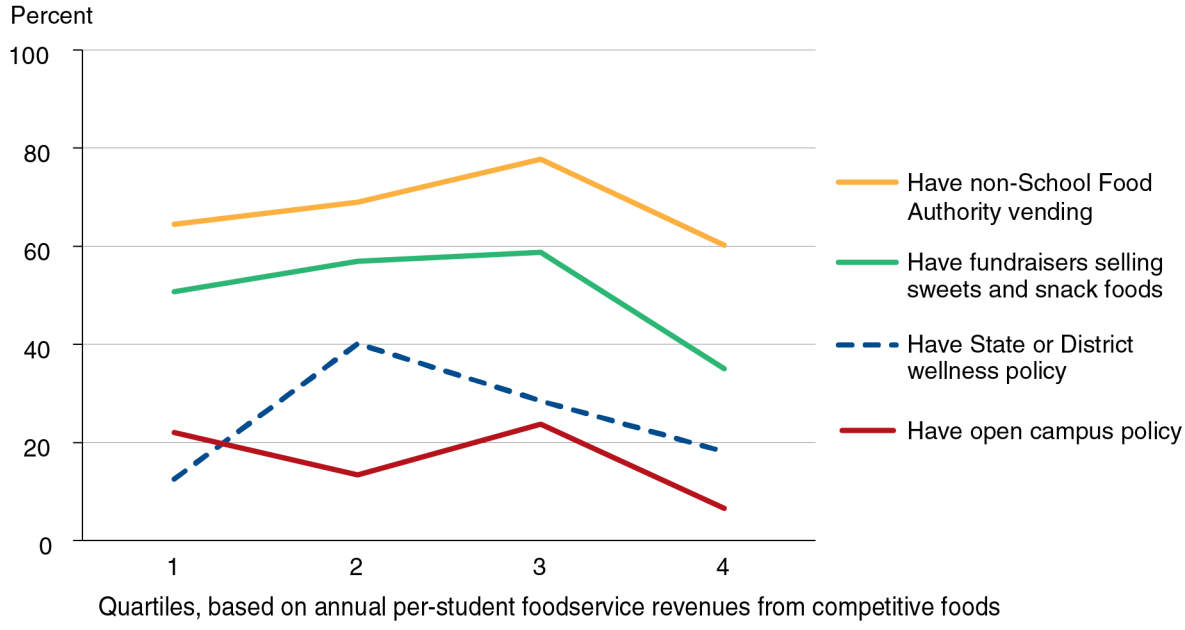
Nutrition environment characteristics of elementary schools in differing foodservice competitive revenue quartiles



Source: USDA, Economic Research Service analysis, using data from the School Nutrition Dietary Assessment Study III (SNDA-III), collected in 2004-2005. For complete data table, see Appendix C.

Figure 4B

Nutrition environment characteristics of secondary schools in differing foodservice competitive revenue quartiles



Source: USDA, Economic Research Service analysis, using data from the School Nutrition Dietary Assessment Study III (SNDA-III), collected in 2004-2005. For complete data table, see Appendix C.

Whether elementary or secondary, high competitive-revenue schools shared similar socioeconomic and meal program characteristics. Specifically, the high-revenue (4th quartile) elementary and secondary schools were:

- More affluent, with none of the high-revenue elementary and secondary schools located in high-poverty districts. The overwhelming majority—84 percent of elementary and 81 percent of secondary schools—were located in low-poverty districts, with the remainder in medium-poverty districts.

- Serving far fewer students that received free or reduced-price meals. In the high-revenue quartile elementary schools, 31 percent of students received free or reduced-price lunch, compared to 63 percent of students in the lowest revenue quartile. At the secondary level, high-revenue quartile schools averaged 29 percent of students receiving free or reduced-price lunch, compared to 42 percent in the lowest revenue quartile.

- Serving the fewest NSLP meals, with elementary schools in the high-revenue quartile averaging 63 percent participation, compared to 80 percent in the low-revenue (first) quartile. At the secondary level, where participation is lower, schools in the high-revenue quartile averaged 44 percent participation, compared to 64 percent participation in the lowest revenue quartile.

- Least likely to offer the School Breakfast Program (SBP), with 75 percent of elementary schools in the high-revenue quartile offering the program compared to 100 percent of the schools in the lowest revenue quartile. At the secondary level, 75 percent of schools in the high-revenue quartile offered the SBP, compared to 84 percent of schools in the lowest revenue quartile.

Findings on ethnicity differed by school level. Elementary schools in the high-revenue quartile served a smaller percentage of non-White students—26 percent compared to 50 percent in the lowest revenue quartile. At the secondary level, however, competitive food revenues were unassociated with race/ethnicity.

High-revenue elementary and secondary schools both charged more for full-price meals to students. The average meal price for elementary schools in the high-revenue quartile was $1.56 in 2005, compared to $1.03 for the low-revenue quartile. For secondary schools in the high-revenue quartile, the average meal price was $1.89, compared to $1.32 for the low-revenue quartile. Yet, while they charged higher standard prices than other schools, the revenue obtained from such meals would still be lower than the free meal reimbursement. Full-price meals receive a small Federal reimbursement—$0.21 in the study year. So an elementary school foodservice that charged a full-price student $1.56 would have had a combined student and Federal payment of $1.77, and a secondary school charging $1.89 would have a combined payment of $2.10. Both amounts are lower than the Federal free meal reimbursement of $2.24 for that year.

Given that higher competitive-revenue schools serve a larger share of full-price students, they would tend to obtain less revenue from school meals, possibly leading them to seek additional revenues from competitive foods. SNDA-III data do not provide school-level information on meal revenues, but the relationship between competitive food revenues and meal revenues is explored further in the SFA-level analysis.

School nutrition environment characteristics

Schools in higher and lower competitive revenue quartiles did not differ as much in nutrition environment characteristics (figs. 4A-4B) as in socioeconomic and meal program characteristics. Nor did elementary and secondary levels vary in similar ways. The high-revenue elementary quartile, compared to the lowest revenue quartile, had higher percentages of schools that had non-foodservice vending (15 percent versus 4 percent) and fundraisers selling sweet or salty snacks (43 percent versus 26 percent).

At the secondary level, however, foodservices with the highest competitive revenues least often co-existed with non-foodservice vending and fundraisers selling sweet or salty snacks. This lack of internal competition may have allowed school foodservices to capture student food spending that would otherwise have gone to these outlets. Vulnerability to outside competition, as measured by having an open campus, did not seem to follow a consistent pattern of association with revenue levels. This may be because relatively few schools allowed students to leave and return during the school day. The pattern of association between State wellness policies and competitive food revenues was inconsistent—the low-revenue category had the lowest percentage of schools covered by a State or district wellness policy, followed by the high-revenue category (fig. 4B).

In summary, the prototypical high competitive-revenue elementary school foodservice can be found in a school located in a low-poverty district, serving primarily nonpoor, White children. It tends to have lower NSLP participation and is less likely to offer the SBP. It charged higher full prices for NSLP meals than other districts, but prices were still well below what the foodservice would have received for a free meal. Competitive foods were more likely to be available from non-foodservice vendors, perhaps pressuring foodservices to offer similar items.

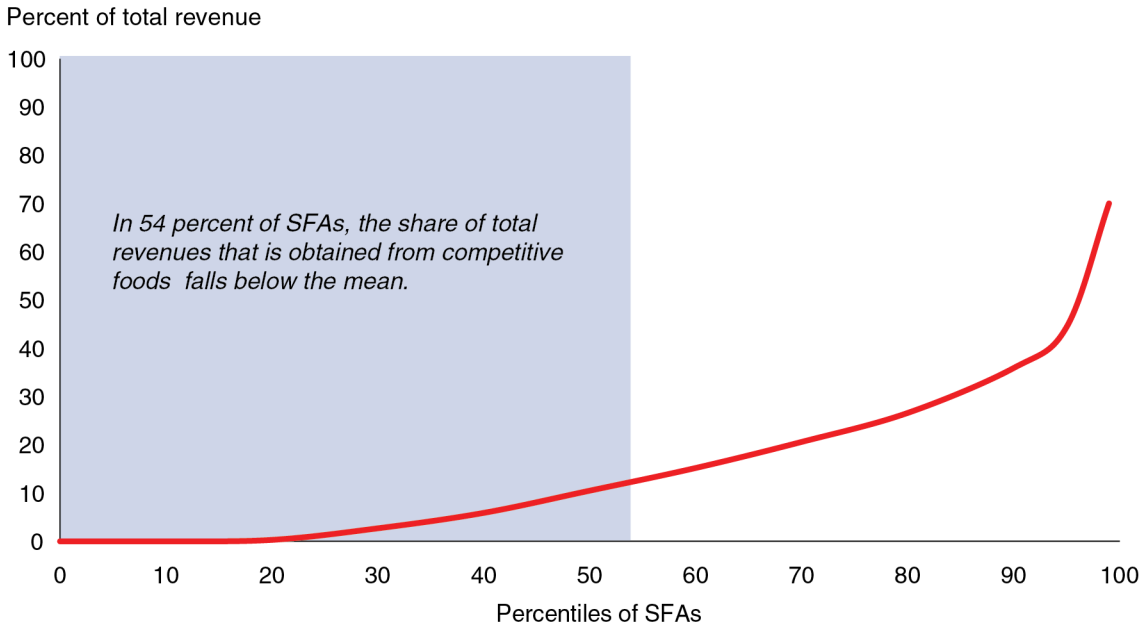
At the secondary level, the prototypical high competitive-revenue foodservice was also found in more affluent districts serving primarily nonpoor students, had lower NSLP participation, was less likely to offer the SBP, and charged a higher standard price for a full-price NSLP lunch. Unlike high-revenue elementary school foodservices, they were less likely to face competition from non-foodservice vending, although in all revenue quartiles, the majority of secondary schools included non-foodservice vending.

School Food Authorities (SFAs) With Higher Shares of Revenue From Competitive Foods

Using SFA-level data from the School Food Authority Characteristics Survey (SFACS), we examine competitive food revenues as a share of overall revenues. At the national level, SFAs averaged 12 percent of revenues from competitive foods in 2002-03. This is lower than the 16-percent figure reported in the 2005 School Lunch and Breakfast Cost Study (SLBCS) II. The difference may be attributable to measure—the SLBCS II included "miscellaneous" revenues that may have added to the estimate; to sampling differences; or to a trend to higher competitive revenues across the 2002-05 period. Our analysis found the distribution of competitive food revenue shares at the SFA level to be less skewed than at the school level. Nevertheless, 54 percent of SFAs had revenues below the mean in 2005 (fig. 5).

The differences in the competitive food share of revenues across SFAs could be attributed to either higher competitive food revenues, lower USDA meal revenues, or—as turned out to be the case—both. SFAs with higher shares of revenues from competitive foods received larger amounts of competitive food revenues in absolute terms, $1.25 per student per day at the highest percentile

Figure 5
School Foodservice Authority (SFA) competitive food revenue as percent of total revenue



Source: USDA, Economic Research Service analysis, using data from the School Food Authority Characteristics Study (SFACS), 2002-03. For complete data table, see Appendix C.

(fig. 6). They also had lower revenues from USDA meals, both from USDA reimbursements for meals served and from meal payments made by students.

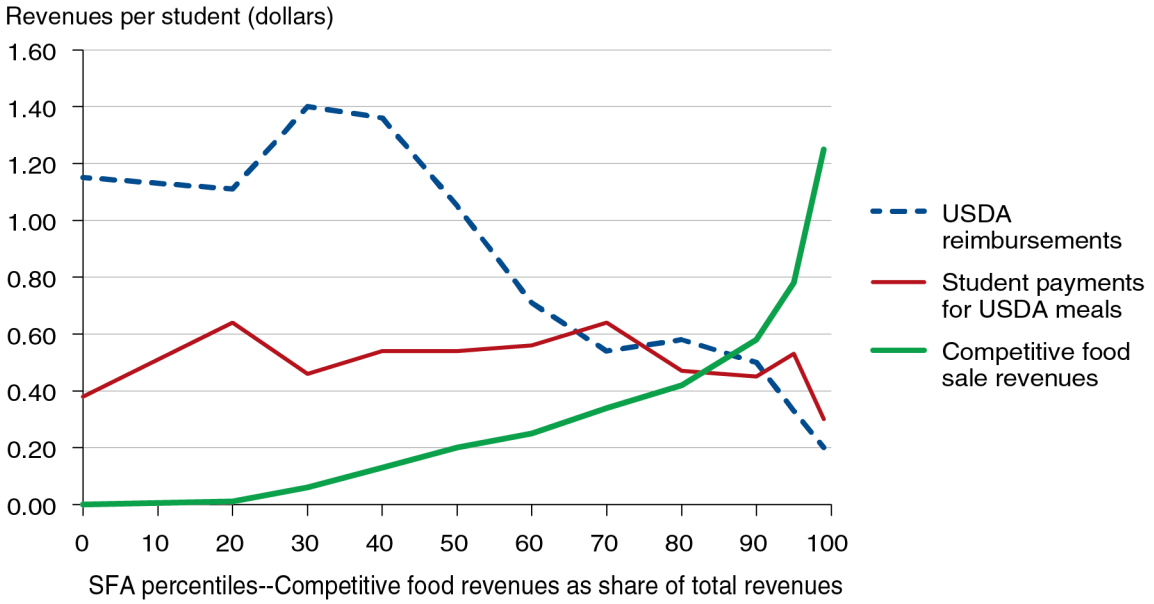
SFA Profiles: Characteristics Associated With Higher Shares of Revenue From Competitive Foods

To better understand what types of SFAs derived more revenue from competitive foods, we grouped SFAs into quartiles based on share of revenue from competitive foods. Analysis of SFA-level socio-economic characteristics revealed associations consistent with our school-level analysis. SFAs in the higher competitive food revenue quartiles were in more affluent districts, with below-average poverty levels and fewer students receiving free and reduced-price meals (fig. 7A).

Consistent with meal revenue patterns shown in figure 6, USDA meal participation was lower in the high-competitive food revenue SFAs (fig. 7B). Breakfast participation was especially low in the highest competitive revenue quartile, where breakfasts made up only 13 percent of all USDA meals served in 2005, compared to 24 percent in the lowest quartile. SFAs in the highest competitive revenue quartile charged higher average lunch and breakfast prices to full-price students than did other SFAs, with breakfast charges averaging $1.01 per meal compared to the national average of $0.94 per meal, and lunch prices averaging $1.73 per meal compared to a national average of $1.56. Nevertheless, meal revenues from student payments dropped off as the share of competitive food revenue increased (fig. 6), probably because of very low participation.

Figure 6

Composition of School Foodservice Authority (SFA) revenues in SFAs with higher shares of revenue from competitive foods



Source: USDA, Economic Research Service analysis, using data from the School Food Authority Characteristics Study (SFACS), 2002-03. For complete data table, see Appendix C.

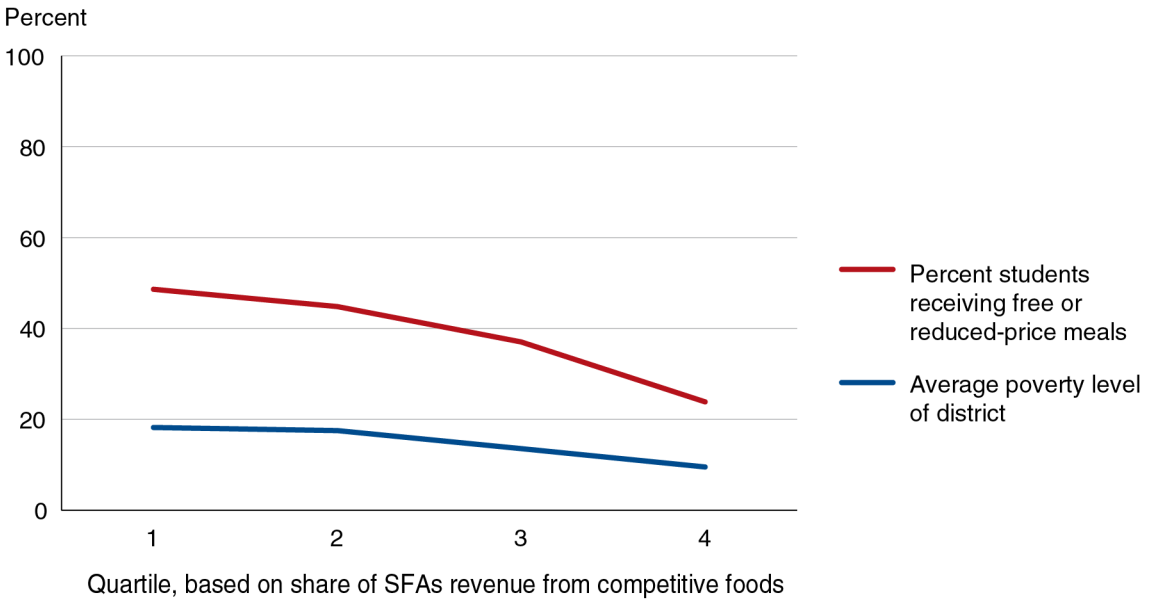
The SFACS was designed to be representative of FNS regions, allowing examination of geographic differences. SFAs with higher competitive food revenues as a share of total revenues were more heavily concentrated in suburban districts (fig. 8A). They were also much more commonly found in the Midwest, Northeast, and Mid-Atlantic regions (fig. 8B).

The SFACS data lack information on school-level factors such as presence of non-foodservice competitive food sales or existence of wellness policies. The survey does have information on the extent of State financial support to the school meal programs. SFAs in the highest competitive food revenue quartile had the lowest level of State support as a percent of revenue—2 percent, compared to 2.7 percent in the lowest quartile and the overall average of 2.4 percent. State support may be tied to either meal participation or the financial status of the district. However, these differences are small, and may be associated with other State differences.

In summary, we find that SFAs with high shares of revenues coming from competitive food sales tend to serve more affluent, suburban districts; are most common in the Midwest, Northeast, and Mid-Atlantic regions; and typically serve more nonpoor students. They serve fewer USDA meals per student (consistent with the lower participation found at schools with high competitive food revenues), serve fewer breakfasts as a share of meals, and charge higher meal prices to full-price students.

Figure 7A

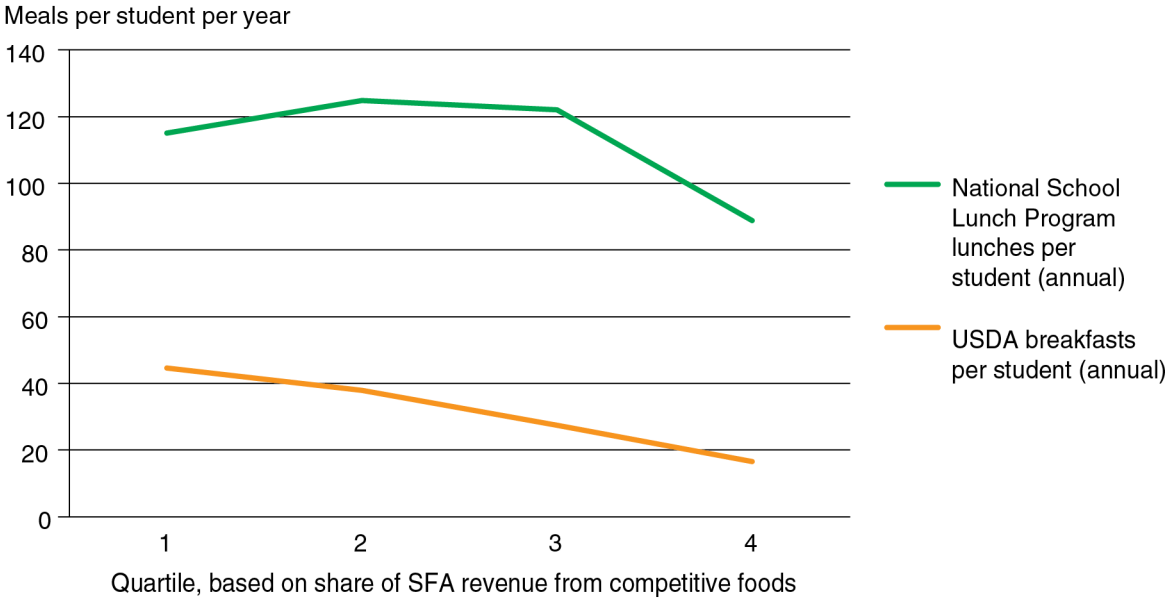
Socioeconomic characteristics of School Foodservice Authorities (SFAs) in different competitive revenue share quartiles



Source: USDA, Economic Research Service analysis, using data from the School Nutrition Dietary Assessment Study III (SNDA-III), collected in 2004-2005. For complete data table, see Appendix C.

Figure 7B

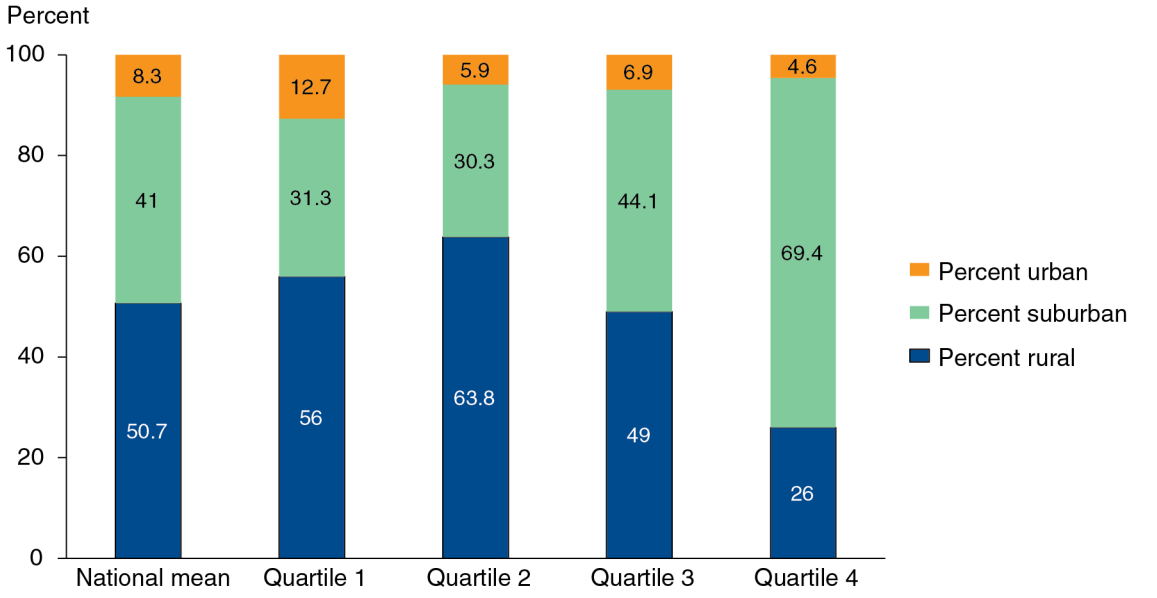
USDA meal program participation in School Foodservice Authorities (SFA) in different competitive revenue share quartiles



Source: USDA, Economic Research Service analysis, using data from the School Food Authority Characteristics Study (SFACS), 2002-03. For complete data table, see Appendix C.

Figure 8A

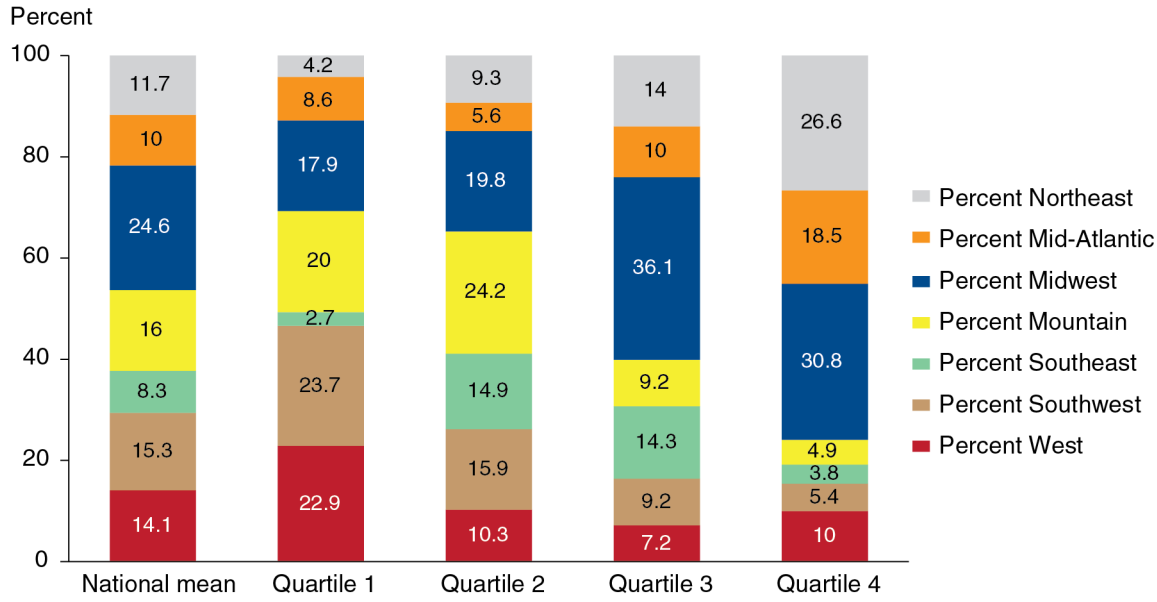
Distribution by urbanization of School Foodservice Authorities in different competitive revenue share quartiles



Source: USDA, Economic Research Service analysis, using data from the School Food Authorities Characteristics Study (SFACS), 2002-03. For complete data table, see Appendix C.

Figure 8B

Distribution by region of School Foodservice Authorities in different competitive revenue share quartiles



Source: USDA, Economic Research Service analysis, using data from the School Food Authorities Characteristics Study (SFACS), 2002-03. For complete data table, see Appendix C. For list of States in each FNS region, see Appendix B.

Limitations

School Environment Changes Since 2005

Foremost among this study's limitations is the fact that these data were collected some 8 years ago. Since then, State and local competitive food policies have changed considerably, potentially influencing offerings, selections, and revenues. By 2010, 39 States had policies concerning the nutritional quality of competitive foods, although policies varied considerably and they tended to be weaker in secondary schools. None fully met IOM standards (CDC, 2012). A recent, nationally representative survey of school district policies conducted through the Bridging the Gap Program found that a majority of school districts with policies limiting competitive foods and beverages were generally not as strict as ones based on the *Dietary Guidelines for Americans* would be (Schneider et al., 2012).

Still, these State policies appear to have had some effects on competitive food offerings. The Kids' Safe & Healthful Food Project (2012b) found that many secondary schools reduced availability of less healthy snack foods between 2002 and 2008, although the decline slowed between 2008 and 2010. Another study by the Bridging the Gap Program found that availability of some less healthy items, such as soft drinks, decreased significantly in secondary schools while healthier beverages like bottled water became ubiquitous (Johnston et al., 2012). USDA's SNDA-IV provides updated information on competitive food offerings for school year 2009-10, although it lacks the information on student behavior included in SNDA-III (USDA, FNS, 2012). As with SNDA-III, competitive foods and beverages were more limited at the elementary level. Many healthier items were more widely available in 2009-2010 than they had been in 2005—for example, fresh fruit was available à la carte in 66.5 percent of high schools in 2009-10, compared to 39 percent in 2005.

Taken together, these updated findings indicate that many schools have already expanded healthier offerings and limited at least some less healthy items. Although most students continue to have access to less healthy competitive options (Kids Safe & Healthful Foods Project, 2012b; Johnston et al., 2012, Turner et al., 2010), these changes likely have reduced the challenge schools face in adapting to updated Federal nutrition standards for competitive foods.

Other Limitations

The sample is limited to public schools. Private schools also participate in USDA school meal programs and will need to implement nutrition standards for competitive foods. However, no comparable data on these schools were available. Published findings from other sources suggest that private schools tend to sell a mix of competitive foods and beverages similar to that found in public schools (Turner et al., 2010). Therefore, the same changes in food offerings and purchase behavior have likely taken place in private schools that participate in USDA school meal programs, with similar effects on school foodservice revenues.

The financial data used in this study are based on questionnaire responses and may be less accurate than what would be obtained through a more detailed review of foodservice financial data. We do not have actual prices paid for specific competitive food and beverage items, requiring us to assume that competitive items meeting and not meeting proposed Federal standards contribute equally to revenues on a per-selection basis. It may be possible that healthier items are priced higher or lower than items not meeting the standards; if so, that will affect the extent to which implementation of nutrition standards would influence revenues.

Making the Transition to Healthier School Food Choices

Establishing nutrition standards for foods sold at school in competition with the USDA School Meal Programs should provide nutritional benefits, especially to secondary-school students who are the largest consumers of competitive foods. Those benefits should be especially pronounced in the typically suburban, more affluent SFAs that obtain large shares of revenue from competitive foods and have relatively low school meal participation. Nutritional benefits could be either better quality diets, fewer excess calories, or both.

There may be additional benefits to lowering the profile of competitive foods in schools. Eliminating less nutritious competitive foods may support efforts to improve the quality of USDA school meals. Newman et al. (2009) found NSLP lunches to be lower in fat in schools with no à la carte and vending. In the competition for student food spending, the absence of unhealthy alternatives may leave school foodservices more free to offer healthy meals that meet Federal nutrition standards.

Another potential benefit of restricting competitive foods may be reducing or eliminating any stigma associated with USDA school meal participation. Some argue that the presence of competitive foods creates a climate in which those purchasing competitive foods at lunchtime are perceived as being nonpoor, while those who eat the school lunch are more likely to be perceived as low-income, free-lunch recipients (Poppendieck, 2010; Kavanaugh, 2010). Some students who qualify for free lunch reportedly do not eat it because of the associated stigma.

For school foodservices concerned about covering their expenses, the challenge will be to adapt to new standards and develop new strategies for maintaining revenues in a healthier school nutrition environment. The challenge is most pronounced to the subset of SFAs receiving a large proportion of revenues from competitive foods. School foodservices serving low-income student populations are not at higher financial risk from pending introduction of nutrition standards. On the contrary, competitive food revenues are highest in more affluent districts and in schools serving nonpoor children, where many students are ineligible for free or reduced-price meals.

Higher school foodservice revenues from competitive foods were associated with lower USDA lunch participation, suggesting that competitive food revenues may displace meal participation and associated revenue. In SFAs where competitive food revenues make up a larger share of overall revenues, foodservice managers may be apprehensive about nutrition-mandated changes in offerings. Such SFAs will be especially interested in strategies for maintaining revenues when nutrition standards for competitive foods are implemented.

To offset revenue losses from removal of competitive foods that fail to meet nutrition standards, school foodservices can (1) seek out healthier competitive food options to replace those currently sold or (2) re-emphasize their "core business" by expanding participation in school meals. For both strategies, appropriate pricing is key. The Healthy, Hunger-Free Kids Act of 2010 addressed pricing of meals and competitive foods, and new regulations based on this act may have important effects on revenues obtained both from USDA school meals and from healthier competitive foods.

Offering Healthier Competitive Foods and Beverages

One strategy for offsetting revenue losses from removal of popular but unhealthy competitive foods would be to seek out healthier products that meet nutrition standards. Case studies at the State and

local level found that school foodservices respond to new standards by offering healthier competitive items, and student behavior adapts to the changed environment.

In Texas, establishment of State nutrition standards in 2004 resulted in considerable substitution of new or reformulated products for previously allowed products, and students increasingly bought these products (Cullen and Watson, 2009). Although this partially compensated for the loss of sales from less healthy options, overall school food purchases declined 6 percent. Because we do not have revenue information or specific pricing for each item, we cannot draw firm conclusions about revenue effects, but assuming each purchase contributes about the same, the substitution of offerings would suggest a 6-percent decline in foodservice revenue.

A study of several school districts in California found that, following the establishment of State nutrition standards in 2007, purchases of compliant products such as bottled water increased, partially offsetting the drop in purchases of soda, candy, and other foods not meeting standards. In addition, meal sales increased. Nevertheless, there was a decline in net revenue, apparently due to higher food costs (Woodward-Lopez et al., 2010).

Among early adopters of competitive food standards, limited availability and higher costs of healthier options have been cited as barriers to success (Woodward-Lopez et al., 2005b). Establishing nationwide standards is likely to reduce this problem by spurring product development and increasing demand. In some cases, changes are relatively simple. For example, to meet IOM standards, juices could be repackaged in smaller containers. In other cases, reformulation of products may be necessary, but advocacy groups such as Alliance for a Healthier Generation have already lobbied food manufacturers to develop new products for competitive food sales. Examples include such items as 4-ounce fruit bowls; nonfat, no-sugar- added frozen yogurt; 4-ounce frozen fruit bars; and reduced-fat/sodium pizza with whole-grain crust (Alliance for a Healthier Generation, 2010).

Other case studies report changes in competitive food offerings that did not have significant effects on revenues (Treviño et al., 2012; USDA et al., 2005). These typically combined changes in competitive food offerings with other health promotion activities, which may have contributed to their success. For example, school meal menus and competitive food offerings in 24 middle schools were modified as part of a health promotion project that also included physical activity, health education, and social marketing. After 3 years (2006-09), revenues and expenses of health project schools and matched control schools were not significantly different (Treviño et al., 2012).

Success in maintaining fiscal stability may hinge on appropriate pricing of competitive foods. Ironically, the competitive foods that school foodservices feel compelled to sell may not be helping their overall financial situation. The SLBCS-II (USDA, FNS, 2008) indicates that in school year 2005-06, school foodservice competitive food revenues covered, on average, only 71 percent of costs. Some of the costs associated with competitive food sales, such as labor, may not be fully considered by school foodservices, leading them to underestimate the appropriate price for covering costs. Supporting this possibility, in a study of 344 Minnesota public school districts, Peterson (2011) found a small but statistically significant negative relationship between competitive food sales and overall foodservice profit.

To address concerns about underpriced competitive foods, the Healthy, Hunger-Free Kids Act of 2010 (section 206) requires that beginning in the 2012 school year, competitive foods sold by the school foodservice must generate revenues appropriate to costs. More appropriate pricing of compet-

itive foods should result in higher revenues (USDA, 2011b)—and an improved net financial status of school foodservices.

Expanding School Meal Participation

Expanding meal participation is an especially appealing option for generating revenues to offset any losses from eliminating sales of less nutritious competitive foods. USDA meals are designed specifically to meet nutritional needs of children and reflect the most current nutrition guidance. Given the relatively low levels of school meal participation in high-competitive-food-revenue schools and SFAs, there is considerable opportunity for expanding meal participation. Previous research suggests that if the supply of competitive foods is removed or greatly reduced, school lunch participation is likely to increase. An analysis of SNDA-III (USDA, 2007b) found that the NSLP participation rate was 4.6 percentage points higher in schools that did not offer competitive food than in those that did. School foodservices with low initial participation rates—such as schools with higher competitive food revenues—may raise participation higher than the average rate. However, they tend to have more students who are not receiving free or reduced-price meals and may more easily opt to bring food from home. Therefore, expanding meal participation may be challenging, and may require school foodservices to intensify their efforts to promote USDA school meal purchases.

Some school foodservices that wanted to de-emphasize competitive foods as a part of the food environment have launched efforts to improve school meal participation that result in above-average increases. Kavanaugh (2010) reports that efforts such as adding new, attractive, healthy items; speeding service; and making the service area more appealing were successful in generating large increases in NSLP participation in several school districts that eliminated or dramatically reduced competitive foods. Given that school meal participation is particularly low in secondary schools, where competitive food revenues are highest, efforts to attract secondary students are especially important. More marketing-style research to identify approaches that appeal to older students could be useful. For example, a recent study highlighted the effectiveness of a "healthy express" line that could make a school meal as quick to pick up as a snack bar item (Hanks et al., 2012).

Breakfasts provided through USDA's SBP may offer another opportunity to increase foodservice revenue. However, this strategy can be problematic. USDA's School Lunch and Breakfast Cost Study II (SLBCS-II, 2008) reports that in school year 2005-06, the reported cost of producing reimbursable breakfasts exceeded reimbursement rates. Other studies have found that breakfast costs are strongly influenced by participation, which tends to be much lower than for lunches (Hilleren, 2007; Ollinger et al., 2011a; Ollinger et al., 2011b). Increasing participation may offer economies of scale, reducing costs in relationship to revenues. In a pilot study of nutrition improvements in California schools, offering the SBP in schools not currently participating and increasing participation where it was already offered were helpful in offsetting competitive food revenue losses in several schools (Woodward-Lopez et al., 2005a). This was most effective in schools with more free and reduced-price students, the group that most typically participates in SBP. In schools with more full-price students, this strategy may be less successful.

For schools with higher levels of nonpoor students, the success of strategies that rely on increasing meal participation hinges on the adequacy of the price charged to full-price students. The SLBC-II found that most schools underprice the full-price meal charged to their students by 32 percent (USDA, 2008; Kavanaugh, 2010). The Healthy, Hunger-Free Kids Act of 2010 addressed the issue, requiring school foodservices to gradually adjust the full price upward if the full price is less than the difference between the total Federal reimbursements for a free lunch and a full-price lunch (or

provide additional non-Federal support for these meals such as State or local funding). Affected school foodservices are allowed to gradually phase in higher prices, with meal price increases capped at $0.10 per year. As prices rise to meet costs, schools with larger percentages of nonpoor students should feel less pressure to sell competitive foods, assuming they are able to maintain or increase participation.

However, school foodservices may be unable to maintain or increase participation in the face of required price increases. Previous research indicates that higher meal prices are associated with lower participation (USDA, 2007b). School foodservices seeking to move from reliance on competitive food revenues to increased meal revenues may also need assistance with marketing efforts to increase the perceived value of the meal and to instill the willingness to pay a higher price. Alternatively, advocates may seek to gain State or local support for meals.

Conclusions

Most competitive food and beverage items selected by students in 2005 would not meet nutrition standards based on Institute of Medicine guidelines. Implementation of nutrition standards for competitive foods promises benefits by improving dietary quality and reducing excess calories from low-nutrient foods. Although there has been concern that the loss of revenue would hurt poorer schools most, school foodservices with high competitive food revenues typically are located in more affluent districts and serve fewer low-income students receiving free and reduced-price lunch than do schools with low competitive food revenues.

These school foodservices may particularly benefit from guidance in making the transition to new competitive food standards. Typically, they tend to couple higher competitive food revenues with low school meal participation, so increasing meal participation is a plausible strategy to offset revenue losses. In addition, these school foodservices could be assisted in selecting new competitive food products that meet nutrition standards. Such products are becoming more widely available, and national nutrition standards for competitive foods will likely spur further product development. Changes in Federal regulations that should result in more appropriate pricing of full-price USDA meals and competitive foods could enhance the revenue-generating effects of these nutrition-based strategies.

References

Anderson. Patricia M., and Kristin F. Butcher. 2006. "Reading, Writing, and Refreshments: Are School Finances Contributing to Children's Obesity?" *Journal of Human Resources* 41(3):467-494.

Alliance for a Healthier Generation. 2010. "At School." https://schools.healthiergeneration.org/resources__tools/school_meals/product_navigator/

Briefel, R.B., M.K. Crepinsek, C. Cabili, A. Wilson and P.M. Gleason. 2009. "School food environments and practices affect dietary behaviors of U.S. public school children," *Journal of the American Dietetic Association* 109:S91-S107.

Centers for Disease Control and Prevention (CDC). 2012. *Competitive Foods and Beverages in U.S. Schools: A State Policy Analysis.* U.S. Department of Health and Human Services: Atlanta.

Chriqui J.F., L. Schneider, F.J. Chaloupka, K. Ide, and O. Pugach. 2009. *Local Wellness Policies: Assessing School District Strategies for Improving Children's Health. School Years 2006-07 and 2007-08.* Chicago, IL: Bridging the Gap Program, Health Policy Center, Institute for Health Research and Policy, University of Illinois at Chicago.

Code of Federal Regulations (2011) Subchapter A—Child Nutrition Programs Part 210—National School Lunch Program Appendix B To Part 210—Categories Of Foods Of Minimal Nutritional Value. http://www.gpo.gov/fdsys/pkg/CFR-2011-title7-vol4/pdf/CFR-2011-title7-vol4-part210.pdf Accessed November 29, 2011.

Cullen, K.W., K. Watson, I. Zakeri, and K. Ralston. (2005) "Exploring changes in middle-school student lunch consumption after local school food service policy modifications," *Public Health Nutrition*: 9(6):814-820.

Cullen, Karen W., and Kathleen Watson. 2009. "The Impact of the Texas Public School Nutrition Policy on Student Food Selection and Sales in Texas," *American Journal of Public Health* 99(4):706-12.

Datar, A, and N. Nicosia. 2012. "Junk Food in Schools and Childhood Obesity," *Journal of Policy Analysis and Management* 31:312-337.

Fox, Mary Kay, Anne Gordon, Renee Nogales, and Ander Wilson. 2009. "Availability and Consumption of Competitive Foods in US Public Schools," *Journal of the American Dietetic Association* 109:S57-S66.

Greves, H.M., and F.P Rivara. 2006. "Report card on school snack food policies among the United States' largest school districts in 2004-2005: Room for improvement," *International Journal of Behavioral Nutrition and Physical Activity* 3:1-10.

Hanks A.S., D.R. Just, L.E. Smith, and B. Wansink. 2012. "Healthy convenience: nudging students toward healthier choices in the lunchroom," *Journal of Public Health.* Advance Access doi:10.1093/pubmed/fds003.

Hilleren, Heather. 2007. S*chool Breakfast Program Cost/Benefit Analysis: Achieving a Profitable SBP.* University of Wisconsin Extension Family Living Program, Madison, WI.

Institute of Medicine, Food and Nutrition Board, Committee on Nutrition Standards for Foods in Schools. 2007. *Nutrition Standards for Foods in Schools: Leading the Way toward Healthier Youth.* National Academies Press.

Johnston, L.D., P.M. O'Malley, Y.M. Terry-McElrath, P. Freedman-Doan, and J.S. Brenner. 2011. *School policies and practices to improve health and prevent obesity: National secondary school survey results, school years 2006–07 and 2007 –08.* Volume 1. Ann Arbor, MI: Bridging the Gap Program, Survey Research Center, Institute for Social Research.

Johnston, L.D., P.M. O'Malley, Y.M. Terry-McElrath, and N. Colabianchi. 2012. *School policies and practices to improve health and prevent obesity: National secondary school survey results, school years 2006–07 through 2009 –10.* Volume 2. Ann Arbor, MI: Bridging the Gap Program, Survey Research Center, Institute for Social Research.

Kavanaugh, C. 2010. *Flunking Lunch: How segregated lunch lines and misused subsidies are undermining the National School Lunch Program.* Campaign for Better Nutrition.

Kids' Safe & Healthful Foods Project. (2012a). *Health Impact Assessment: National Nutrition Standards for Snack and a la Carte Foods and Beverages Sold in Schools.* Robert Wood Johnson Foundation and PEW Health Group.

Kids' Safe & Healthful Foods Project. 2012b. *Out of Balance: A Look at Snack Foods in Secondary Schools Across the States.* Robert Wood Johnson Foundation and PEW Health Group.

Kubik, Martha Y., M. Wall, L. Shen, M. Nanney, T. Nelson, M. Laska, and M. Story. 2010. "State but not District Nutrition Policies Are Associated with Less Junk Food in Vending Machines and School Stores in US Public Schools," *Journal of the American Dietetic Association* 110:1043-1048.

Long, Michael W., Kathryn E. Henderson, and Marlene B. Schwartz. 2010. "Evaluating the Impact of a Connecticut Program to Reduce Availability of Unhealthy Competitive Food in Schools," *Journal of School Health* 80(10), Oct., pp.478-486.

Marlette M.A., S.B. Templeton, and M. Panemangalore. 2005. "Food type, food preparation, and competitive food purchases impact school lunch plate waste by sixth-grade students," *Journal of the American Dietetic Association* 105(11):1779-1782.

Newman, Constance, Joanne Guthrie, Lisa Mancino, Katherine Ralston, and Melissa Musiker. 2009. *Meeting Total Fat Requirements for School Lunches: Influence of School Policies and Characteristics.* ERR-87, Economic Research Service, U.S. Department of Agriculture.

Ollinger, Michael, K. Ralston, and J. Guthrie. 2011a. *School Foodservice Costs: Location Matters.* ERR-117, Economic Research Service, U.S. Department of Agriculture.

Ollinger, Michael, K. Ralston, and J. Guthrie. 2011b. "School Breakfast and Lunch Costs: Are There Economies of Scale?" Agricultural & Applied Economics Association Annual Meeting, Pittsburgh, PA.

Peterson, C. 2011. "Competitive Foods Sales Are Associated with a Negative Effect on School Finances," *Journal of the American Dietetic Association* 111:851-857.

Poppendieck, J. 2010. *Free for All: Fixing School Food in America.* University of California Press.

Ralston, K, C. Newman, A. Clauson, J. Guthrie, and J. Buzby. 2008. *National School Lunch Program: Background, Trends, and Issues.* ERR-61, Economic Research Service, U.S. Department of Agriculture.

Rinaldi, F. 2008. "Tight Budgets & Snack Sales." http://slantconsultants.blogspot.com/search?updated-max=2008-10-28T04:37:00-07:00&max-results=7.

Schneider, L.M., R.M. Schermbeck, and J.F. Chriqui. 2012. "The Extent to Which School District Competitive Food and Beverage Policies Align with the 2010 Dietary Guidelines for Americans: Implications for Federal Regulations," *Journal of the Academy of Nutrition and Dietetics.* doi:1016/j.jand.2012.01.025

StataCorp. 2011. *Stata: Release 12. Statistical Software.* College Station, TX: StataCorp LP.

Taber, D.R., J.F. Chriqui, F.M. Perna, L.M. Powell, and F.J. Chaloupka. 2012. "Weight Status Among Adolescents in States that Govern Competitive Food Nutrition Content," *Pediatrics* www.pediatrics.org/cgi/doi/10.1542/peds.2011-3353.

Treviño, R.P., T. Pham, C. Mobley, J. Hartstein, L. El Ghormli, and T. Songer. 2012. "HEALTHY Study school food service revenue and expense report," *Journal of School Health* 82:417-423.

Turner L., F.J. Chaloupka, J.F. Chriqui, and A. Sandoval. 2010. *School Policies and Practices to Improve Health and Prevent Obesity: National Elementary School Survey Results: School Years 2006-07 and 2007-08.* Vol. 1. Chicago, IL: Bridging the Gap Program, Health Policy Center, Institute for Health Research and Policy, University of Illinois at Chicago.

U.S. Department of Agriculture, Food and Nutrition Service. 2001. *Foods sold in competition with USDA school meal programs: a report to Congress.* www.fns.usda.gov/cnd/Lunch/CompetitiveFoods/report_congress.htm.

U.S. Department of Agriculture, Food and Nutrition Service. 2005. Child and WIC Reauthorization Act of 2004. http://www.fns.usda.gov/cnd/governance/legislation/historical/pl_108-265.pdf

U.S. Department of Agriculture, Food and Nutrition Service; Centers for Disease Control and Prevention (CDC), U.S. Department of Health and Human Services; and U.S. Department of Education. 2005. *Making It Happen: School Nutrition Success Stories.* Alexandria, VA.

U.S. Department of Agriculture, Food and Nutrition Service, Office of Research, Nutrition and Analysis. 2007a. *School Nutrition Dietary Assessment Study-III: Vol. I: School Foodservice, School Food Environment, and Meals Offered and Served.* Anne Gordon, M.K. Crepinsek, R. Nogales and E. Condon. Project Officer: Patricia McKinney. Alexandria, VA.

U.S. Department of Agriculture, Food and Nutrition Service, Office of Research, Nutrition and Analysis. 2007b. *School Nutrition Dietary Assessment Study-III: Vol. II: Student Participation and Dietary Intakes.* Anne Gordon, M.K. Fox, M. Clark, R. Nogales, E. Condon, P. Gleason and A. Sarin. Project Officer: Patricia McKinney. Alexandria, VA:

U.S. Department of Agriculture, Food and Nutrition Service, Office of Research, Nutrition and Analysis. 2007c. *School Nutrition Dietary Assessment Study-III: Vol. III: Sampling and Data Collection*. Anne Gordon, J. Hall, E. Zeidman, M.K. Crepinsek, M. Clark, and E. Condon. Project Officer: Patricia McKinney. Alexandria, VA:

U.S. Department of Agriculture, Food and Nutrition Service, Office of Research, Nutrition and Analysis. 2008. *School Lunch and Breakfast Cost Study-II, Final Report.* Susan Bartlett, F. Glantz, and C. Logan. Project Officer: Patricia McKinney and John R. Endahl. Alexandria, VA.

U.S. Department of Agriculture, Food and Nutrition Service. 2011a. Healthy Hunger-Free Kids Act of 2010. http://www.fns.usda.gov/cnd/Governance/Legislation/CNR_2010.htm

U.S. Department of Agriculture, Food and Nutrition Service. 2011b. 7 CFR Part 210 RIN 0584–AE11; National School Lunch Program: School Food Service Account Revenue Amendments Related to the Healthy, Hunger-Free Kids Act of 2010, *Federal Register* 35301 Vol. 76, No. 117 Friday, June 17.

U.S. Department of Agriculture, Food and Nutrition Service, Office of Research, Nutrition and Analysis. 2012. *School Nutrition Dietary Assessment Study-IV, Vol. I: School Foodservice Operations, School Environments, and Meals Offered and Served*. Mary Kay Fox, Elizabeth Condon, Mary Kay Crepinsek, K. Niland, D. Mercury, S. Forrestal, C. Cabili, V. Oddo, A. Gordon, N. Wozny and A. Killewald. Project Officer, Fred Lesnett. Alexandria, VA.

U.S. Department of Agriculture, Food and Nutrition Service. 2013. "National School Lunch Program and School Breakfast Program: Nutrition Standards for All Foods Sold in School as Required by the Healthy, Hunger-Free Kids Act of 2010: Proposed Rules," *Federal Register.* Vol. 78, No. 27, Feb. 8, http://www.gpo.gov/fdsys/pkg/FR-2013-02-08/pdf/2013-02584.pdf

U.S. Department of Health and Human Services and U.S. Department of Agriculture. 2011. *Dietary Guidelines for Americans, 2010.* 7th Edition, http://www.dietaryguidelines.gov.

U.S. Government Accountability Office (GAO). 2005. *School Meal Programs: Competitive Foods Are Widely Available and Generate Substantial Revenues for Schools.* GAO-05-563.

Van Hook, J., and C.E. Altman. 2012. "Competitive Food Sales in Schools and Childhood Obesity: A Longitudinal Study," *Sociology of Education* 85(1):23-39.

Wang, Y.C., T. Orleans, and S. Gortmaker. 2012. "Reaching the Healthy People Goals for Reducing Childhood Obesity: Closing the Energy Gap," *American Journal of Preventive Medicine* 42:437-444.

Woodward-Lopez, G., A. Vargas, S. Kim, C. Proctor, L. Hiort-Lorenzen Diemoz, and P. Crawford. 2005a. *LEAF Cross-Site Evaluation: Fiscal Impact Report.* Center for Weight and Health, University of California, Berkeley. www.cnr.berkeley.edu/cwh/activities/LEAF.shtml

Woodward-Lopez, G., S. Kim, and P. Crawford. 2005b. *LEAF Cross-Site Evaluation: Report on Food and Beverage Industry Response to SB 19.* Center for Weight and Health, University of California, Berkeley.

Woodward-Lopez, Gail, Wendi Gosliner, Sarah E. Samuels, Lisa Craypo, Janice Kao, and Patricia B. Crawford. 2010. "Lessons Learned from Evaluations of California's Statewide School Nutrition Standards," *American Journal of Public Health* 100 (11), Nov., pp. 2137-2145.

Appendix A—Characteristics Examined in School-Level (SNDA) and SFA-Level (SFACS) Analyses

School-Level Analysis (SNDA III data)		
Categories	**Specific Items**	**Information sources**
School level	Elementary, middle, high	National Center for Educational Statistics (NCES) Common Core Database (CCD), 2004-05
Socioeconomic	Child poverty level of district reported on SNDA data file as falling into one of the following categories, based on the percentage of schoolchildren in families with incomes less than 100 percent of poverty: --low (<20 percent) --medium (20 to <30 percent) --high (30 percent or more)	U.S. Census, 2000
	Percentage of students receiving free or reduced-price meals	National Center for Educational Statistics (NCES) Common Core Database (CCD), 2004-05
Demographic	Percentage of non-White students	National Center for Educational Statistics (NCES) Common Core Database (CCD), 2004-05
Meal Program Characteristics	Weekly lunch (National School Lunch Program) participation	Calculated by Mathematica researchers using data collected during a target week in which school menus and meal participation were recorded by school foodservice managers following standardized protocols
	Average standard price for full-price lunch	Reported by school foodservice managers
	School offers USDA School Breakfast Program (SBP)	Schools coded as offering SBP if School Food Authority director reported that they did and menu survey reported serving breakfast menu
School Nutrition Environment	Has State, district, or school wellness policy	School principal's response to question asking whether there was a wellness policy addressing student nutrition and physical activity, with options of (1) school, (2) district, (3) State, or (0) no policy
	Has vending that is not operated by school foodservice (non-foodservice vending)	Computed from questionnaire response variables indicating that there are vending machines present at the school, but the foodservice does not receive revenues from them
	Has fundraisers selling sweet or salty snacks	Variable created by Mathematica on basis of questionnaire responses indicating whether the school had any fundraising activities selling sweet or salty snacks
	Open campus (for secondary schools)	Variable created by Mathematica on basis of questionnaire responses indicating whether the school had a policy allowing students to leave and return to school during the school day (open campus)

Characteristics Examined in SFA-Level (SFACS) Analysis		
Characteristics	**SFA-level (SFACS) analysis of competitive food revenue as a share of total foodservice revenue**	**Information sources**
School type	Elementary, middle, high	National Center for Educational Statistics (NCES) Common Core Database (CCD), 2002-03
Socioeconomic	Poverty level --Percent of school-age children in district in poverty	U.S. Census, 2000
	Shares of students receiving free or reduced-price meals	Calculated from questionnaire data
Geographic	USDA Food and Nutrition Service region --Mid-Atlantic (includes Delaware, District of Columbia, Maryland, New Jersey, Pennsylvania, Virginia, West Virginia) --Midwest (includes Illinois, Indiana, Michigan, Minnesota, Ohio, Wisconsin) --Mountain (includes Colorado, Iowa, Kansas, Missouri, Montana, Nebraska, North Dakota, South Dakota, Utah, Wyoming) --Northeast (includes Connecticut, Maine, Massachusetts, New Hampshire, New York, Rhode Island, Vermont) --Southeast (includes Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, Tennessee) --Southwest (includes Arkansas, Louisiana, New Mexico, Oklahoma, Texas) --West (includes Arizona, California, Idaho, Nevada, Oregon, Washington)	Regions defined by FNS for administrative purposes; some of these regions also included States or territories outside of the 48 coterminous States, but these were not included in the sampling frame of this study and are therefore not listed here.
	Urbanicity --Rural --Suburban --Urban	Defined on the basis of the Metropolitan Statistical Area (MSA) in which the SFA is located
Meal Program Characteristics	Lunch (NSLP) meals per student	Questionnaire response provided by SFA
	Average price for full-price lunch	Questionnaire response provided by SFA
	Breakfast as share of meals	Computed on the basis of questionnaire responses provided by SFA
State Characteristics	State reimbursement to SFA	National Center for Educational Statistics (NCES) Common Core (CCD), 2002-03

Appendix B—Categorizing Competitive Food Selections by Ability To Meet Criteria Based on Institute of Medicine Nutrition Standards

This analysis was first conducted as part of an effort to assess the possible effects on students and school foodservices of implementing national nutrition standards for competitive foods. The analysis examines the extent to which the mix of competitive foods and beverages selected by students in 2005 would meet national nutrition standards for competitive foods. In the absence of established national nutrition standards, we use criteria based on model nutrition standards developed by the Institute of Medicine (IOM, 2007) as our guideline (see box, p. 7). Given uncertainty about final standards, we examined how foods would be categorized under three different options:

(a) Standards that matched those described in the box as closely as possible.

(b) Standards that allowed all à la carte offerings that were also sold as part of the reimbursable USDA meal and met IOM fat and total sugar standards, and that allowed a wider range of beverages, i.e., (i) up to 8-oz portion sizes of juice in elementary schools and 12-oz portion sizes in middle and high schools; and (ii) in high schools, up to 20-oz portion sizes of calorie-free beverages and flavored water; and (iii) no restrictions on caffeine.

(c) Standards that allowed all à la carte offerings that were also sold as part of the reimbursable USDA meals, and also allowed the beverages described under option (b).

Data and Methods

Our data source is the School Nutrition Dietary Assessment Study III (SNDA-III), conducted in the 2004-05 school year. This provides the most recent nationally representative data on foods consumed at school, their sources, and their nutrient composition. SNDA-III was conducted for the Food and Nutrition Service of the U.S. Department of Agriculture by Mathematica Policy Research, Inc. (Mathematica). Its staff collected information on all foods selected and consumed by students within a given 24-hour period that included a school day. Mathematica researchers classified foods obtained at school as being part of the USDA school meal or as competitive items using methods described by Fox et al. (2009). Survey weights that could be used to generate nationally representative findings were developed by Mathematica and included in the public-access data file used in this analysis.

SNDA-III does not identify foods by purchase occasion, but rather by eating occasion. Therefore, we assessed frequency of item selection as a proxy for purchase frequency. For each item selected, we compared its nutritional composition to standards based on the three options described above. Each item was identified as meeting or not meeting standards on this basis of its specific composition. As a result, within a given type of food or beverage, some might meet nutrition standards, others not. For example, some low-fat flavored milks might not meet the standard for sugar content, while others made with less sugar might meet the sugar content.

After each item was classified as meeting or not meeting the standards, items were grouped by major beverage or food categories. The total number of selections of each item was generated using SNDA-III data, which were annualized assuming a 180-day school year. Results were weighted to provide nationally representative findings.

Findings

Tables B1-B6 provide detailed information on beverages and foods selected by students and the share of selections that met standards, as well as the specific standards not met. More beverage than food items met standards—23-27 percent, depending on the option examined. Low-fat milk, juice, and especially bottled water were the beverages that most often met standards. However, even within these categories, not all choices completely met the standards. The majority of flavored lowfat milks exceeded the sugars standard. Many fruit juice selections (our proxy for purchase size) were of over-large portion size, even under options that allowed larger sizes. Even some bottled waters did not meet criteria regarding flavors and sweeteners.

Under every option, a smaller proportion of foods than beverages selected by students met the Tier 1 standards. Fewer than 3 percent met all IOM standards, but allowing any NSLP item to be sold à la carte raised the share of saleable items to 16.5 percent. Generally, competitive foods are criticized as being high in fat, sodium, or sugars. Large numbers of food items failed to meet standards for those nutrients, but the biggest single reason for not meeting standards was the failure to provide meaningful amounts of healthful, underconsumed food groups like low-fat dairy, whole grains, vegetables, fruits. Again, there were some categories in which some items met standards, and others did not. For example, some potato chips met all standards, perhaps because they were baked rather than fried, made with less sodium, and/or sold in smaller packages. Because updated USDA school meal standards have likely resulted in items that are also sold as part of the NSLP being lower in fat, sodium, and sugars, the nutritional quality of à la carte items also sold as part of the NSLP has likely improved since 2005.

Limitations

The model IOM standards provided the guiding principles for our analysis. However, using them to classify food items required us to make some operational decisions, as described in the footnotes to our tables. For example, portion size was an important criterion for fruit juices, but we did not have direct information on purchase size. Instead we estimate purchase size based on amount consumed, and we also based our cutoffs on slightly larger amounts consumed (e.g., 4.5 oz. rather than 4 oz. of juice) to allow for reporting error.

Since these data were collected in 2005, some States and/or school districts have developed policies limiting sales of less nutritious competitive foods and beverages. Therefore, the composition of competitive foods may have changed since 2005. However, we lack more recent national data with the level of detail necessary for these estimates. Given changes in school policies, these should be considered upper-bound estimates of the shares of competitive food and beverage selections that would not meet IOM model standards.

Most importantly, these are model standards developed by an independent organization, not actual national nutrition standards. The Food and Nutrition Service (FNS) of USDA has not yet issued final standards; those standards may be quite different from any of the options examined here. Therefore, findings provide only a general guide to how food items might be affected by national nutrition standards. Nevertheless, these data provide insights into how products commonly selected by U.S. students compare to model nutrition standards and suggest potential areas for improvement, for example by decreasing portion sizes of some items, such as juice, or developing lower-sugar versions of some items, such as yogurts.

Table B1

Competitive beverage items selected by students - Option 1; Tier One Institute of Medicine (IOM) Standards

Competitive beverages		Total number of items selected "Baseline 2005"	Tier 1 IOM standards					
			Beverage standards					
			Meets all Tier 1 IOM standards	Meets lowfat or nonfat milk standard	Meets flavored milk sugar standard	Meets portion size standard of 4 oz (elem/mid) or 8 oz (high) for 100% fruit juice	Meets caffeine free standard	Meets non-carbonated, non-flavored, unsweetened standard for water
BEVERAGES								
Dairy	Whole or 2% milk--flavored	23	-	-	-	-	23	-
	Whole or 2% milk--unflavored	77	-	-	77	-	77	-
	1% of fat free milk--flavored	126	16	126	16	-	126	-
	1% of fat free milk--unflavored	121	119	121	119	-	121	-
	Milkshakes and other milk drinks	7	-	-	7	-	7	-
Fruit juice	100% fruit juice	164	63	-	-	63	164	-
Soda	Caloric soda (sweetened)	452	-	-	-	-	99	-
	Non-caloric soda (diet)	26	-	-	-	-	1	-
	Fruit drinks, fruitades	864	-	-	-	-	864	-
Bottled water	Bottled water	403	376	-	-	-	403	376
Coffee or tea	Coffee or tea--unsweetened	42	-	-	-	-	-	-
	Coffee or tea--sweetened	152	-	-	-	-	-	-
	Beverage baseline total	2,457	574	-	-	-	-	-
	Percent of 2005 beverage baseline total		23.4	-	-	-	-	-

Note: Total number of items selected on sample school day, weighted to generate an annual, national estimate.
Selections are considered proxies for purchases.
Source: Economic Research Service analysis of School Nutrition Dietary Assessment Study-III 2005 student recall dietary data.

Table B2

Competitive food items selected by students - Option 1; Tier 1 Institute of Medicine (IOM) Standards

Competitive food		Total number of items selected "Baseline 2005"	Food sub-standards							
			Meets all Tier 1 IOM stan-dards	Meets all Tier 1 IOM except Food Type Stan-dards	Meets IOM food type stan-dards	Meets total fat standard	Meets saturated fat stan-dard	Meets to-tal sugars standard	Meets 200 sodium standard	Meets calorie limits
FOOD										
Vegetables	French fries and similar products	148	-	1	33	1	79	148	124	123
	All vegetables other than french fries	128	40	81	83	114	118	120	85	118
Breads/ grains	Other bread (biscuits, croissants, bread)	17	-	7	-	11	17	17	7	9
	Breads, rolls, bagets, etc.	79	-	43	-	79	79	79	43	52
	Cold cereal	44	-	-	9	44	44	18	26	37
	Corn, tortilla chips	254	-	1	-	8	144	254	147	202
	Crackers and hard pretzels	257	-	42	4	132	168	257	106	209
	Pastries	63	-	-	-	4	35	36	28	8
	Rice	5	-	3	-	5	5	5	3	5
	Pasta	4	-	4	-	4	4	4	4	4
	Muffins, quickbreads, not english muffins	31	-	-	4	28	27	31	-	-
Fruit	Whole fruit, fresh, canned, or frozen	143	67	92	94	143	143	92	143	129
Entrees	Pizza or pizza pockets, etc.	217	-	-	114	34	-	217	39	94
	Beef, burgers, pork, lamb, veal, sandwich	31	-	-	23	5	-	31	18	23
	Sandwich with meat, poultry, fish, may	77	7	7	70	24	51	77	42	60
	Breakfast sandwich	20	-	-	20	8	-	20	-	4
	Other entree mix with meat, grain, vegetable	11	-	-	11	-	-	11	-	11
	Chicken and turkey	104	1	1	99	2	20	104	61	74
	Fish and shellfish	12	-	-	12	12	12	12	-	12
	Mexican-style entrees	119	-	-	79	16	12	119	42	91
	Hotdogs and sausage	32	-	2	31	2	2	32	2	29
	Yogurt	15	-	-	-	15	15	-	15	15
	Noodles or pasta mixture	7	-	-	4	6	3	7	-	3
	Peanut butter sandwich	18	-	-	18	-	18	18	-	-
	Nuts, nutbutters, sunflower seeds, trail mix	21	-	-	14	6	11	21	21	21

continued—

Table B2

Competitive food items selected by students - Option 1;Tier One Institute of Medicine (IOM) Standards—continued

Competitive food		Total number of items selected "Baseline 2005"	Food substandards							
			Meets all Tier 1 IOM standards	Meets all Tier 1 IOM except Food Type Standards	Meets IOM food type standards	Meets total fat standard	Meets saturated fat standard	Meets total sugars standard	Meets 200 sodium standard	Meets calorie limits
	Other protein-cheese, eggs	73	-	-	-	-	-	73	49	68
Desserts	Ice cream and other frozen dairy dessert	283	-	-	-	60	20	31	280	254
	Pudding and other non-frozen dairy dessert	22	-	-	1	22	10	-	19	21
	Fruit or fruit juice dessert	31	-	-	2	31	31	-	31	31
	Sweet baked desserts	246	-	-	-	133	220	49	142	138
	Cookies	550	-	25	-	60	131	514	522	481
	Granola or grain fruit bar	87	-	1	9	37	34	68	87	69
	Other dessert, non-fruit gelatin	180	-	-	-	180	180	-	180	149
Candy	Candy	763	-	-	21	475	458	27	753	525
Salty snacks	Popcorn	95	-	-	43	3	38	91	30	55
	Potato chips	225	1	1	164	4	61	225	161	193
	Soup that is not a veg or entree item	16	-	-	-	3	3	16	8	11
	Food baseline total	4,428	116	311	962	1,711	2,193	2,824	3,218	3,328
	Percent of 2005 food baseline total		2.6	7.0	-	-	-	-	-	-
	Total baseline	6,885	690	-	-	-	-	-	-	-
	Percent of 2005 total baseline		10.0	12.9	-	-	-	-	-	-

Note: Total number of items selected on sample school day, by commodity-based groups, weighted to generate an annual, national estimate.
Selections are considered proxies for purchases.
Source: Economic Research Service analysis of School Nutrition Dietary Assessment Study-III 2005 student recall dietary data.

Appendix table B3

Competitive beverage items selected by students - Option 2, modified Institute of Medicine (IOM) standards

Competitive beverages		Total number of items selected "Baseline 2005"	Estimates using Option 2 Modified IOM standards						
			Beverage standards						
			Meets all Option 2 beverage standards	Meets lowfat or nonfat milk standard	Meets flavored milk sugar standard	Meets portion size standard of 8 oz (elem/mid) or 12 oz (high) for 100% Fruit Juice	Meets caffeine free standard for elem/mid and up to 20 oz for high	Meets bottled water limits of unsweetened for elem/mid and up to 20 oz for high	Meets diet soda limit of up to 20 oz for high school students
BEVERAGES									
Dairy	Whole or 2% milk--flavored	23	-	-	-	-	23	-	-
	Whole or 2% milk--unflavored	77	-	-	77	-	77	-	-
	1% of fat free milk--flavored	126	16	126	16	-	126	-	-
	1% of fat free milk--unflavored	121	119	121	119	-	121	-	-
	Milkshakes and other milk drinks	7	-	-	7	-	7	-	-
Fruit juice	100% fruit juice	164	91	-	-	91	164	-	-
Soda	Caloric soda (sweetened)	452	-	-	-	-	35	-	-
	Non-caloric soda (diet)	26	18	-	-	-	1	-	18
	Fruit drinks, fruitades	864	-	-	-	-	437	-	-
Bottled water	Bottled water	403	395	-	-	-	89	395	-
Coffee or tea	Coffee or tea--unsweetened	42	21	-	-	-	21	-	-
	Coffee or tea--sweetened	152	-	-	-	-	-	-	-
	Beverage baseline total	2,457	660	-	-	-	-	-	-
	Percent of 2005 beverage baseline total		26.9	-	-	-	-	-	-

Note: Total number of items selected on sample school day, weighted to generate an annual, national estimate.
Selections are considered proxies for purchases.
Source: Economic Research Service analysis of School Nutrition Dietary Assessment-III 2005 student recall dietary data.

Appendix table B4

Competitive food items selected by students - Option 2, modified Institute of Medicine (IOM) standards

Competitive food		Estimates using Option 2 modified IOM standards								
			Food standards							
		Total number of items selected "Baseline 2005"	Meets all Option 2 standards	Meets reimbursable food standards subject to fat and sugar standards	Meets USDA food type standards	Meets total fat standard	Meets saturated fat standard	Meets total sugars standard	Meets 200 sodium standard	Meets calorie limits
FOOD										
Vegetables	French fries and similar products	148	-	-	44	1	79	148	124	123
	All vegetables other than french fries	128	40	-	83	114	118	120	85	118
Breads/Grains	Other bread (biscuits, croissants, bread)	17	-	-	-	11	17	17	7	9
	Breads, rolls, bagets, etc.	79	-	-	-	79	79	79	43	52
	Cold cereal	44	-	-	15	44	44	18	26	37
	Corn, tortilla chips	254	-	-	20	8	144	254	151	203
	Crackers and hard pretzels	257	2	2	6	132	168	257	107	209
	Pastries	63	-	-	14	4	35	36	30	22
	Rice	5	-	-	-	5	5	5	3	5
	Pasta	4	-	-	-	4	4	4	4	4
	Muffins, quickbreads, not english muffins	31	5	5	9	28	27	31	5	5
Fruit	Whole fruit, fresh, canned, or frozen	143	67	5	94	143	143	92	143	129
Entrees	Pizza or pizza pockets, etc.	217	-	-	125	34	-	217	54	109
	Beef, burgers, pork, lamb, veal, sandwich	31	-	-	23	5	-	31	19	25
	Sandwich with meat, poultry, fish, may	77	7	-	70	24	51	77	42	60
	Breakfast sandwich	20	-	-	20	8	-	20	-	4
	Other entree mix with meat, grain, vegs	11	-	-	11	-	-	11	-	11
	Chicken and turkey	104	1	-	99	2	20	104	73	86
	Fish and shellfish	12	-	-	12	12	12	12	-	12
	Mexican-style entrees	119	-	-	80	16	12	119	44	93
	Hot dogs and sausage	32	-	-	31	2	2	32	2	29

continued—

Appendix table B4

Competitive food items selected by students - Option 2, modified Institute of Medicine (IOM) standards—continued

Competitive food		Estimates using Option 2 modified IOM standards								
			Food standards							
		Total number of items selected "Baseline 2005"	Meets all Option 2 standards	Meets reimbursable food standards subject to fat and sugar standards	Meets USDA food type standards	Meets total fat standard	Meets saturated fat standard	Meets total sugars standard	Meets 200 sodium standard	Meets calorie limits
	Yogurt	15	-	-	-	15	15	-	15	15
	Noodles or pasta mixture	7	-	-	4	6	3	7	-	3
	Peanut butter sandwich	18	-	-	18	-	18	18	18	18
	Nuts, nutbutters, sunflower seeds, trail mix	21	14	-	14	6	11	21	21	21
	Other protein-cheese, eggs	73	-	-	25	-	-	73	61	68
Desserts	Ice cream/other frozen dairy desserts	283	-	-	130	60	20	31	283	270
	Pudding/other nonfrozen dairy desserts	22	-	-	20	22	10	-	20	22
	Fruit or fruit juice desserts	31	-	-	5	31	31	-	31	31
	Sweet baked desserts	246	-	-	-	133	220	49	142	138
	Cookies	550	-	-	-	60	131	514	522	481
	Granola or grain fruit bar	87	1	1	39	37	34	68	87	70
	Other dessert, non-fruit gelatin	180	-	-	115	180	180	-	180	171
Candy	Candy	763	-	-	68	475	458	27	753	547
Salty snacks	Popcorn	95	-	-	52	3	38	91	38	55
	Potato chips	225	1	-	189	4	61	225	190	206
	Soup that is not a veg or entree item	16	3	3	3	3	3	16	11	11
	Food baseline total	4,428	141	16	1,438	1,711	2,193	2,824	3,334	3,472
	Percent of 2005 food baseline total		3.2	-	-	-	-	-	-	-
	Total baseline	6,885	801	-	-	-	-	-	-	-
	Percent of 2005 total baseline		11.6	-	-	-	-	-	-	-

Source: Economic Research Service analysis of School Nutrition Dietary Assessment-III 2005 student recall dietary data.

Note: Total number of items selected on sample school day, by commodity-based groups, weighted to generate an annual, national estimate

Selections are considered proxies for purchases.

Table B5

Competitive beverage items selected by students - Option 3, Modified Institute of Medicine (IOM) standards

Competitive beverages		Total Number of Items Selected "Baseline 2005"	Estimates of USDA proposed standards						
			Beverage standards						
			Meets All USDA Proposed Beverage Standards	Meets lowfat or nonfat milk standard	Meets flavored milk sugar standard	Meets portion size standard of 8 oz (elem/mid) or 12 oz (high) for 100% Fruit Juice	Meets caffeine free standard for elem/mid and up to 20 oz for high	Meets bottled water limits of unsweetened for elem/mid and up to 20 oz for high	Meets diet soda limit of up to 20 oz for high school students
BEVERAGES									
Dairy	Whole or 2% milk--flavored	23	-	-	-	-	23	-	-
	Whole or 2% milk--unflavored	77	-	-	77	-	77	-	-
	1% of fat free milk--flavored	126	16	126	16	-	126	-	-
	1% of fat free milk--unflavored	121	119	121	119	-	121	-	-
	Milkshakes and other milk drinks	7	-	-	7	-	7	-	-
Fruit juice	100% fruit juice	164	91	-	-	91	164	-	-
Soda	Caloric soda (sweetened)	452	-	-	-	-	35	-	-
	Non-caloric soda (diet)	26	18	-	-	-	1	-	-
	Fruit drinks, fruitades	864	-	-	-	-	437	-	-
Bottled water	Bottled water	403	395	-	-	-	89	-	-
Coffee or tea	Coffee or tea--unsweetened	42	21	-	-	-	21	-	-
	Coffee or tea--sweetened	152	-	-	-	-	-	-	-
	Beverage baseline total	2,457	660	-	-	-	-	-	-
	Percent of 2005 beverage baseline total		26.9	-	-	-	-	-	-

Note: Total number of items selected on sample school day, by commodity-based groups, weighted to generate an annual, national estimate.
Selections are considered proxies for purchases.
Source: Economic Research Service analysis of School Nutrition Dietary Assessment-III 2005 student recall dietary data.

Table B6

Competitive food items selected bystudents - Option 3, Modified Institute of Medicine (IOM) standards

Competitive food		Total Number of Items Selected "Baseline 2005"	Food standards							
			Meets All USDA Proposed Standards - Alternative 2	Is a reimburseable food	Meets USDA Food Type Standards	Meets total fat standard	Meets saturated fat standard	Meets total sugars standard	Meets 200 sodium standard	Meets calorie limits
FOOD										
Vegetables	French fries and similar products	148	11	11	44	12	79	148	124	123
	All vegetables other than french fries	128	40	-	83	114	118	120	85	118
Breads/ Grains	Other bread (biscuits, croissants, brea	17	-	-	-	11	17	17	7	9
	Breads, rolls, bagets, etc.	79	-	-	-	79	79	79	43	52
	Cold cereal	44	6	6	15	44	44	24	26	37
	Corn, tortilla chips	254	20	20	20	28	155	254	151	203
	Crackers and hard pretzels	257	2	2	6	132	168	257	107	209
	Pastries	63	14	14	14	18	47	38	30	22
	Rice	5	-	-	-	5	5	5	3	5
	Pasta	4	-	-	-	4	4	4	4	4
	Muffins, quickbreads, not english muffi	31	5	5	9	28	27	31	5	5
Fruit	Whole fruit, fresh, canned, or frozen	143	67	5	94	143	143	92	143	129
Entrees	Pizza or pizza pockets, etc.	217	17	17	125	45	17	217	54	109
	Beef, burgers, pork, lamb, veal, sandwi	31	1	1	23	6	1	31	19	25
	Sandwich with meat, poultry, fish, may	77	7	-	70	24	51	77	42	60
	Breakfast sandwich	20	-	-	20	8	-	20	-	4
	Other entree mix with meat, grain, vege	11	-	-	11	-	-	11	-	11
	Chicken and turkey	104	13	12	99	14	32	104	73	86
	Fish and shellfish	12	-	-	12	12	12	12	-	12
	Mexican-style entrees	119	2	2	80	17	13	119	44	93

continued—

Table B6

Competitive food items selected bystudents - Option 3, Modified Institute of Medicine (IOM) standards—continued

Competitive food		Total Number of Items Selected "Baseline 2005"	Food standards							
			Meets All USDA Proposed Standards - Alternative 2	Is a reimburseable food	Meets USDA Food Type Standards	Meets total fat standard	Meets saturated fat standard	Meets total sugars standard	Meets 200 sodium standard	Meets calorie limits
	Hotdogs and sausage	32	-	-	31	2	2	32	2	29
	Yogurt	15	-	-	-	15	15	-	15	15
	Noodles or pasta mixture	7	-	-	4	6	3	7	-	3
	Peanut butter sandwich	18	18	18	18	18	18	18	18	18
	Nuts, nutbutters, sunflower seeds, trai	21	14	-	14	6	11	21	21	21
	Other protein-cheese, eggs	73	25	25	25	25	25	73	61	68
Desserts	Ice cream and other frozen dairy desser	283	130	130	130	160	140	144	283	270
	Pudding and other non-frozen dairy dess	22	20	20	20	22	22	20	20	22
	Fruit or fruit juice dessert	31	3	3	5	31	31	3	31	31
	Sweet baked desserts	246	-	-	-	133	220	49	142	138
	Cookies	550	-	-	-	60	131	514	522	481
	Granola or grain fruit bar	87	33	33	39	68	66	70	87	70
	Other dessert, non-fruit gelatin	180	115	115	115	180	180	115	180	171
Candy	Candy	763	51	51	68	493	476	71	753	547
Salty snacks	Popcorn	95	9	9	52	12	38	91	38	55
	Potato chips	225	104	102	189	106	140	225	190	206
	Soup that is not a veg or entree item	16	3	3	3	3	3	16	11	11
	Food baseline total	4,428	730	604	1,438	2,084	2,533	3,129	3,334	3,472
	Percent of 2005 food baseline total		16.5	-	-	-	-	-	-	-
	Total baseline	6,885	1,390	-	-	-	-	-	-	-
	Percent of 2005 total baseline		20.2	-	-	-	-	-	-	-

Note: Total number of items selected on sample school day, by commodity-based groups, weighted to generate an annual, national estimate
Selections are considered proxies for purchases.
Source: Economic Research Service analysis of School Nutrition Dietary Assessment-III 2005 student recall dietary data.

Appendix C—Data Tables for Figures 2-6

Table C.1

Distribution of annual school foodservice competitive food revenues, at elementary and secondary levels (data for Figure 2)

Percentile	Elementary school competitive food revenues	Secondary school competitive food revenues
1	$0	$0
10	$0	$0
25	$18	$3,928
50	$2,395	$27,803
75	$11,394	$69,339
90	$19,048	$148,275
95	$32,975	$203,812
99	$81,594	$414,317

Source: USDA, Economic Research Service analysis, using data from the School Nutrition Dietary Assessment Study III (SNDA-III), collected in 2004-2005.

Table C.2

Characteristics of elementary schools in differing school foodservice competitive food revenue quartiles (data for Figures 3A and 4A)

	Elementary schools				
	School foodservice competitive food revenue quartiles (school foodservice competitive food revenues per student per year)				
	Overall mean	<=25th %tile 0	>25th - <=50th %tile (>0 - <=$4.82)	>50th - <=75th %tile >$4.82 - <=23.41	>75th %tile >$23.34
% Low poverty (More affluent districts)	64.5%	37.8%	60.8%	60.9%	83.9%
% Medium poverty	28.6%	39.9%	37.8%	29.8%	16.1%
% High poverty	7.0%	22.3%	1.4%	9.5%	0.0%
% Students receiving free/reduced price meals	46.2%	63.1%	50.5%	52.9%	30.6%
% Non-white students	35.8%	50.2%	40.1%	38.7%	25.6%
Weekly lunch participation	69.8%	80.1%	70.3%	69.9%	63.1%
Average price of full-price meal	$1.44	$1.03	$1.50	$1.49	$1.56
Offer school breakfast program	79.3%	100.0%	67.2%	80.3%	75.0%
Have non-foodservice vending	11.3%	4.3%	9.7%	17.0%	14.7%
Have fundraisers selling sweet or salty snacks	36.9%	25.6%	39.6%	36.0%	43.4%
Have State or District level wellness policy	34.4%	41.6%	29.0%	38.0%	37.1%

Source: USDA, Economic Research Service analysis, using data from the School Nutrition Dietary Assessment Study III (SNDA-III), collected in 2004-2005

Table C.3

Characteristics of secondary schools in differing schoolfoodservice competitive food revenue quartiles (data for Figures 3B and 4B)

	Secondary schools				
	School foodservice competitive food revenue quartiles (school foodservice competitive food revenues per student per year)				
	Overall mean	<=25th %tile <=$5.79	>25th-<=50th % tile >$5.79-<=$46.91	>50th - <=75th %tile >$46.91-<=$99.21	>75th % >$99.21
% Low poverty (More affluent districts)	68.2%	56.2%	63.1%	70.5%	80.9%
% Medium poverty	26.0%	32.1%	32.8%	24.2%	19.1%
% High poverty	5.9%	11.7%	4.1%	5.2%	0.0%
% Students receiving free/reduced price meals	39.3%	42.4%	46.1%	39.2%	29.0%
% Non-white students	30.7%	29.4%	28.4%	37.8%	27.8%
Weekly lunch participation	53.5%	64.3%	56.4%	48.3%	44.3%
Average price of full-price meal	$1.62	$1.32	$1.66	$1.65	$1.89
Offer school breakfast program	83.0%	83.9%	85.3%	85.1%	75.1%
Have non-foodservice vending	69.4%	64.5%	69.0%	77.8%	60.2%
Have open campus	15.7%	22.0%	13.4%	23.7%	6.5%
Have fundraisers selling sweet or salty snacks	52.3%	50.7%	56.9%	58.8%	35.0%
Have State or District level wellness policy	24.1%	12.5%	40.1%	28.5%	18.1%

Source: USDA, Economic Research Service analysis, using data from the School Nutrition Dietary Assessment Study III (SNDA-III), collected in 2004-2005

Table C.4

School Foodservice Authority (SFA) competitive food revenue as percent of total revenue (data for Figure 5)

Percentile of SFAs	Competitive food revenue as a percent of total SFA revenue
0	0%
10	0%
20	0%
30	3%
40	6%
50	11%
60	15%
70	21%
80	27%
90	36%
95	44%
99	70%

Source: USDA, Economic Research Service analysis, using data from the School Food Authorities Characteristics Study (SFACS), 2002-03.

Table C.5

Composition of School Foodservice Authority revenues in SFAs with higher shares of revenue from competitive foods (data for Figure 6)

	Composition of SFA Revenues on a Per-Student, Per-Day Basis		
Percentiles of SFAs	USDA meal reimbursements	Student payments for USDA meals	Competitive food sale revenues
0	$1.15	$0.38	$0.00
20	$1.11	$0.64	$0.01
30	$1.40	$0.46	$0.06
40	$1.36	$0.54	$0.13
50	$1.05	$0.54	$0.20
60	$0.71	$0.56	$0.25
70	$0.54	$0.64	$0.34
80	$0.58	$0.47	$0.42
90	$0.50	$0.45	$0.58
95	$0.33	$0.53	$0.78
99	$0.20	$0.30	$1.25

Source: USDA, Economic Research Service analysis, using data from the School Food Authorities Characteristics Study (SFACS), 2002-03.

Table C.6

Characteristics of School Foodservice Authorities in differing quartiles defined by share of revenues from competitive foods

	School foodservice competitive food revenue quartiles				
	National mean	1	2	3	4
		<=25th %tile	>25th-<=50th % tile	>50th - <=75th %tile	>75th %
School Type					
Percent Elementary Schools	63.4	62.2	64.5	63.6	63.0
Percent Middle Schools	17.6	16.7	16.9	18.3	18.5
Percent High Schools	19.0	21.1	18.5	18.1	18.5
Socioeconomic					
Average Poverty Level of District	15.4	18.2	17.5	13.5	9.5
Percent Students Receiving Free Meals	31.2	38.1	34.8	27.8	17.4
Percent Students Receiving Reduced-Price Meals	9.3	10.5	10	9.2	6.4
Geographic					
Percent Rural	50.7	56	63.8	49.0	26.0
Percent Suburban	41	31.3	30.3	44.1	69.4
Percent Urban	8.3	12.7	5.9	6.9	4.6
Percent Mid-Atlantic	10.0	8.6	5.6	10.0	18.5
Percent Midwest	24.6	17.9	19.8	36.1	30.8
Percent Mountain	16.0	20.0	24.2	9.2	4.9
Percent Northeast	11.7	4.2	9.3	14	26.6
Percent Southeast	8.3	2.7	14.9	14.3	3.8
Percent Southwest	15.3	23.7	15.9	9.2	5.4
Percent West	14.1	22.9	10.3	7.2	10
State					
State reimbursement as percent of revenue	2.4	2.7	2.5	2.4	2.0
Meal Characteristics					
Average breakfast price	0.94	0.94	0.89	0.9	1.01
Breakfasts as percent of USDA meals	20.4	24.0	21.8	18.6	13.2
Average lunch price	1.56	1.56	1.43	1.55	1.73
National School Lunch Program lunches per student (annual)	113.9	115.0	124.9	122.1	88.9
USDA breakfasts per student (annual)	34.0	44.6	37.9	27.5	16.6

Source: USDA, Economic Research Service analysis, using data from the School Food Authorities Characteristics Study (SFACS), 2002-03.