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Competitive foods in schools: Availability and purchasing in predominately rural small and large high schools

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Abstract

OBJECTIVES—Schools have an important role to play in obesity prevention, but little is known about the food environment in small, predominately rural schools. The primary purpose of this study was to compare the availability and student purchasing of foods sold outside of the reimbursable meals program through a la carte (ALC) or vending (i.e., competitive foods) in small (n = 7) and large (n = 6) Kansas high schools.

METHODS—A cross-sectional observational study design was used to capture the number of ALC and vending items available and purchased, and the fat and caloric content of all available and purchased items on a single school day between January and May 2005.

RESULTS—Small schools had significantly fewer vending machines than large schools [median=3.0 (range=2.0–5.0) versus 6.5 (range=4.0–8.0), $p<0.01$]. Vending and ALC items at small schools contained a median of 2.3 fewer fat grams per item ($p\leq0.05$), while vending products contained a median of 25.0 fewer calories per item ($p\leq0.05$) than at large schools. Significantly less fat (median= −15.4 grams/student) and fewer calories (median= −306.8 kcal/student) were purchased per student from all competitive food sources and from ALC (median= −12.9 fat grams and −323.3 kcal/student) by students in small schools compared to students in large schools ($p\leq0.05$).

CONCLUSIONS—The findings, which highlight less availability and lower energy content from competitive foods at small compared to large schools, have implications for understanding how small schools support their food service programs with limited dependence on competitive foods

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DISCLOSURE

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and the impact that food and nutrition professionals can have on the school environment by providing more oversight into the nutritional quality of foods available.

Keywords

Competitive foods; availability; purchasing; high schools; rural

Over one-third (35.7%) of United States (U.S.) children and adolescents, 6–19 years of age, are overweight or obese (body mass index ≥ 85th percentile), making the prevention and treatment of childhood obesity a national health priority (1). Because more than 95% of American youth attend school and consume as much as 35%–40% of their daily caloric intake there (2), schools have been regarded as an ideal setting for prevention efforts. In particular, much attention has been placed on the wide availability of competitive foods, defined as foods and beverages available or sold outside of the U.S. Department of Agriculture's (USDA) national school lunch program (NSLP) and school breakfast program (3). The results from the 2006 School Health Polices and Programs Study found that 89% of high schools had vending machines, school stores, canteens or snack bars where students could purchase competitive foods and beverages (4). The majority of items offered through these venues are low in nutrients and high in fat, calories, and sugar (5–8), raising concern about student's consumption of excess calories and fat at school and the contribution of the school environment to childhood obesity (9).

While numerous studies provide a snapshot of the food environment in large, urban and suburban schools (5–7, 10), little descriptive data is available on the food environment in smaller, predominately rural schools. Obesity rates are as much as 50% higher among rural children and adolescents than their urban counterparts (11–18) and small communities face unique contributing factors to childhood obesity, including geographic isolation, lack of nutrition education resources, limited exercise equipment and facilities, limited prevention and treatment options, and a shortage of health care professionals (19). Small schools located in these communities face similar challenges, including limited financial resources and smaller food service programs (20, 21), although it is unknown how these factors impact competitive food and beverage availability and purchasing. Given the lack of data on the food environment in smaller, predominately rural schools, the primary purpose of this study was to compare the availability and purchasing of competitive foods in small and large high schools. Based on data suggesting lower product volume in food service programs in small, predominately rural schools (20, 21), it was hypothesized that small schools would offer fewer ALC and vending items. Given the exploratory nature of this study and the lack of data on the food environment in small, predominately rural schools, no hypotheses were made about differences in the nutritional quality of available and purchased items by school size.

METHODS

Software, developed to draw systematic random samples of schools with probability proportional to enrollment size for the Center for Disease Control and Prevention's (CDC) Youth Risk Behavior Survey (PCSample, 2000, Westat and CDC, Atlanta, GA), was used to randomly select 50 high schools, stratified by enrollment to ensure adequate representation of both rural and urban schools in the state, from all available public and private high schools in Kansas. All 50 schools were invited to participate. Nineteen (38%) agreed, and 14 completed both the school-environment assessments between January and May 2005. All methods and procedures were approved by the Institutional Review Board at the University of Kansas Medical Center. One private high school was excluded because all items were sold as ALC, leaving a final sample of 13 schools. From these 13, a median split categorized

schools as small (< 350 students, n=7) or large (≥ 350 students, n=6). All 7 small schools and 3 large schools were considered rural according to National Center for Education Statistics criteria (22). The remaining 3 large schools were considered suburban/urban fringe. Schools declining participation cited interference with the school day and burden on staff as the primary reasons for refusal. These 31 schools were significantly larger ($p<0.01$) than the participating schools but did not differ on race/ethnicity, gender, free or reduced lunch participation, or rural/urban status.

Study Design

A cross-sectional observational study design was used to capture the number of ALC and vending items (i.e., competitive foods) available and purchased, and the fat and caloric content of all available and purchased items on a single school day between January and May 2005. Cross-sectional survey methods were also used to obtain relevant school demographic information (e.g., enrollment) from personnel at each school.

School Demographic Information

Basic demographic information, including school enrollment, racial/ethnic and gender makeup of the student body, number of students eligible for free or reduced lunch, and presence of an open campus lunch policy, were collected via a brief survey administered to the principal or assistant principal by trained research staff.

School Food Environment Assessment

School environment data on ALC and vending machine foods and beverages was collected by trained research staff through observation on a single school day between January and May 2005 using a standardized protocol that was pilot tested by the study team prior to implementation (6).

Vending machines—Vending machine data was collected from all machines in locations accessible to students within the school building (e.g., cafeteria, hallway, and gymnasium). Machines in faculty areas and those located outside the school but on school grounds (e.g., at the stadium) were not included. Study staff recorded the location, hours of operation, and machine type (i.e., soda, snack, other) for each machine. Study staff completed an initial walk through to identify machines and then queried the principal/assistant principal about hours of operation and the location of additional machines during the demographic information survey. *Snack machines* were defined as those where ≥ 50% of items were snack items, such as candy, candy bars, chips, crackers, or pretzels. *Soda machines* were defined as those where ≥ 50% of items were soft drinks. *Other machines* were defined as those where ≥ 50% of items was something other than snacks or soft drinks. Machines in this category primarily sold milk/dairy, sport or fruit drinks, and bottled water.

Information collected on foods/beverages from vending included brand name, package size, serving size, fat grams, and kilocalories. Information on the quantity sold was obtained from either school personnel or vendors. For machines stocked by school personnel, product availability was tabulated by study staff at the beginning and end of the school day. For vendor-operated machines, vendors supplied the study team with a log detailing the quantity of each product available at the beginning and end of one refill cycle. Logs were standardized to obtain a per day estimate. Six schools (4 small) stocked some or all of the vending machines at their school. Vending machines at the remaining 7 schools (3 small) were stocked by an outside vendor. Items were grouped into larger categories (e.g., desserts/sweet snacks; chips/crackers/salty snacks; entrées) based on food categories used in similar studies of the school food environment (5–7). The number of vending machines, number of products offered, and fat grams and kilocalories of offered and purchased items were also

derived. Fat grams and kilocalories were derived for each package size rather then serving size because it was assumed that the entire package was consumed during lunch or at some point during the day.

ALC lunch program—A la carte was defined as any food or beverage available for sale during the lunch period at designated ALC areas. Extra portions of the NSLP entrée are an additional source of revenue for schools and exceed USDA regulations for the amount of calories, fat, protein, calcium, iron, and Vitamins A and C allowable per school meal and, for these reasons, are considered ALC (23). The ALC at two small schools was comprised solely of extra portions of entrees from the federally reimbursed line. Items from salad bars were not included because the nutritional content of these items could not be appropriately monitored.

Research staff physically counted all available items and determined their nutrition information as described below. Purchased items were determined through direct observation of student trays as they proceeded through the checkout lines and completing before and after lunch counts of items located on self-service carts. Information collected on foods/beverages for sale through ALC included brand name, package size, serving size, fat grams, kilocalories, and quantity sold. Nutrition information for school-prepared items, e.g., school-prepared entrée, cakes, cookies, and other dessert items, was extracted from recipes obtained from the food service manager or head cook and entered in Food Works nutritional analysis software (FoodWorks Nutrition Assessment Software version 7.0, 2004, The Nutrition Company, Long Valley, NJ). Items were grouped into larger categories using the same categories used for vending. The number of food/beverage items offered, as well as the fat grams and kilocalories of all offered and purchased items were also derived. As with vending, fat grams and kilocalories were derived for the entire item, as opposed to a single serving.

Statistical Analysis

All data are at the level of the school, not at the level of the individual student. School level measures were generated based on demographic information collected via interview with the principal or assistant principal and the school food environment assessment. Fat and caloric content of available and purchased items were standardized per item and per student, respectively, to account for variations in school size. Distributional characteristics for all measures were described using the median and range. Comparison of these measures between small schools and large schools was done using the Wilcoxon rank sum test. As this was an exploratory study, p-values are presented without adjustment for multiplicity. Data were entered, managed, and analyzed using SAS (SAS version 9.1, 2002, SAS Institute Inc., Cary, NC).

RESULTS

Demographic and Food Environmental Characteristics

Demographic and food environmental characteristics are displayed in Table 1. All 13 schools had soda machines and 69.2% had snack machines [four small (57.1%) and five large schools (83.3%)]. Eighty-five percent had ‘other’ machines [five small (71.4%) and all large schools] (not displayed in table). The majority [57.1% (4/7)] of small schools stocked some or all of their vending machines compared to 33.3% (2/6) of large schools. Overall, small schools had significantly fewer vending machines than large schools [median=3.0 (range=2.0–5.0) versus 6.5 (range=4.0–8.0), $p<0.01$], with the primary difference being in the number of ‘other’ machines selling products such as bottled water, milk, sports or fruit drinks [median=1.0 (range=0.0–2.0) versus 2.5 (range=1.0–4.0), $p\leq0.05$].

Sixty-nine percent of schools offered ALC lunch items [Four small (57.1%) and five large schools (83.3%)]. Of the four small schools offering ALC, the menu at two of these schools was comprised solely of extra entrée portions from the NSLP. One large school had an open campus during lunch where students were permitted to leave school grounds during their scheduled lunch period. All other school campuses remained closed during the lunch period.

Types of Vending Items Available and Purchased at Small and Large Schools

Desserts/sweet snacks, sugar-sweetened beverages, and chips/crackers/salty snacks comprised the largest proportion of vending items available at both small and large schools, respectively (Table 2). These items were also the most frequently purchased at both small and large schools. In contrast, water, fruits/vegetables/100% fruit juice, and dairy comprised a much smaller portion of vending items available and purchased across schools.

Types of ALC Items Available and Purchased at Small and Large Schools

Desserts/sweet snacks comprised the majority of ALC items available at large schools (median 40.5%, range=0.0–43.8), with the remaining available items distributed across entrées (median 10.2%, range=0.0–50.0), chips/crackers/salty snacks (median 8.2%, range=0.0–36.4), sugar-sweetened beverages (median 6.5%, range=0.0–16.7), non-frozen dairy (median 6.4%, range=0.0–25.0), fruits/vegetables/fruit juice (median 5.0%, range=0.0–25.0), and water (median 3.5%, range=0.0–6.6). Although entrées comprised 10.2% of items available, they accounted for the largest proportion of ALC items purchased (median 27.4%, range=0.0–97.6). Combined, desserts/sweet snacks and entrées comprised the majority of ALC purchases at large schools. A much smaller proportion of purchases were for water, fruits/vegetables/fruit juice, and dairy.

In contrast, ALC was limited at small schools, with a median of only 1.0 (range=0.0–2.0) entrée item available. The median number of items available and purchased in each ALC category was zero, however variability between schools was observed. For example, the maximum number of ALC items offered in small schools was as many as 19.0 dessert/sweet snack items, 11.0 sugar-sweetened beverages, 5.0 non-frozen dairy items, 4.0 chips/crackers/salty snacks, 3.0 fruits/vegetables/100% fruit juice, 2.0 cereals/breads, entrées or miscellaneous, and 1.0 water.

Comparison of Fat and Calories Available by School Size

Combined, ALC and vending products available at small schools contained significantly less fat ($p \leq 0.05$), with a median of 5.5 fat grams per item (range=0.0–9.1) compared to 7.8 fat grams per item (range=6-4-9.8) at large schools (see Table 3). Vending products at small schools also contained fewer calories than at large schools ($p \leq 0.05$). Specifically, small school's vending products had a median of 229.5 kilocalories per item (range=218.7–251.4) compared to 254.5 kilocalories per item (range=160.5–263.2) in large schools ($p \leq 0.05$).

Comparison of Fat and Calories Purchased by School Size

Significant differences were also found in the fat and calorie content of competitive food purchases between small and large schools (see Table 4). For vending and ALC combined, a median of 1.9 fat grams (range=0.0–8.5) and 211.4 kilocalories (range=61.3–435.1) were purchased per student in small schools compared to 17.3 fat grams per student (range=1.5–25.8) and 518.2 kilocalories per student (range=95.8–824.5) in large schools ($p \leq 0.05$). Differences equate to 15.4 fewer fat grams and 306.8 fewer kilocalories purchased per student from ALC and vending, respectively, by students at small schools. Differences in competitive food purchasing were driven by ALC. Specifically, students from small schools

purchased 12.9 fewer fat grams and 323.3 kilocalories from ALC compared to students from large schools ($p \leq 0.05$).

DISCUSSION

The findings of this study highlight differences in competitive food availability and purchasing between small and large high schools. Previous literature has consistently documented the wide spread availability of ALC in large, predominately urban and suburban high schools (5–8, 10). In contrast and consistent with what was hypothesized, this study found surprisingly limited ALC lunch offerings in small, rural schools. Of the 7 small schools, 3 offered *no* ALC and 2 had ALC lunch programs comprised solely of extra portions of the NSLP entrée. A median of only 2.0 ALC products were available at small schools compared to a median of 42.0 products in large schools. Also consistent with what was hypothesized, small schools had fewer vending machines (median=3.0 versus 6.5) and fewer vending products available to students (median=31.0 versus 68.0).

With the exception of limited ALC, the types of competitive products offered were similar to what has been documented in the literature (6–8, 24, 25). Desserts and sweet snacks, sugar-sweetened beverages, and chips, crackers, and salty snacks were common, while healthier options such as fruits and vegetables, water, and dairy were limited. The widespread availability of competitive foods among the schools in this sample is concerning and contributes to a growing body of literature documenting student access to foods high in calories, fat, and sugar through competitive sources at school (6–8, 24–26). There is strong scientific evidence to suggest that the availability of competitive foods decreases student participation in the NSLP (2) and negatively impacts the quality of children's diets (10, 27, 28). In addition, the availability of competitive foods compromises food services' mission of providing healthy meals to students and may reduce the federal funds schools receive to support their food service program (29).

Interestingly, while the types of competitive food items were similar between small and large schools, food items at small schools contained significantly fewer fat grams (median = −2.3 grams/item) and kilocalories (median = −25.0 kcal/item) indicating that within each food type, smaller schools were choosing lower fat and calorie options. This may be partially explained by the larger percentage of small schools (57.1% versus 33.3% of large schools) that stocked their vending machines, and therefore, exercised more control over the nutritional quality of the items offered. The availability of fewer fat grams at small schools may also be driven by the fact that extra entrée servings were sold as the primary ALC item at small schools. These entrée items are regulated by NSLP standards that limit fat.

While causal relationships between the availability of competitive foods and purchasing cannot be determined from this cross-sectional study, students from small schools had fewer products available to them and purchased significantly less fat and fewer calories from all competitive food sources, and from ALC, than students in large schools. Although the implications of these findings are difficult to determine at this time, a better understanding of the food service programs at small, predominately rural schools may provide insight into efforts to decrease the availability and improve the quality of competitive foods at schools. Many schools depend on the sale of competitive foods to support their food service programs (9). Between 1992 and 2006, district-level financial support for food service programs fell dramatically (31). No longer supported through local budgets, almost all large districts and an increasing number of smaller ones now expect their food service programs to be self-supporting and to cover all their meal, labor, facilities, and equipment costs from the revenue generated through food sales (9). While financial support is provided through the NSLP, federal reimbursements cover less than half of the operating expenses (31). As a

result, food service directors turn to offering popular and appealing competitive foods. While school food service personnel acknowledge that the majority of the popular items are nutritionally poor and that the availability of these items decreases the likelihood of students selecting healthier options, decisions about what to offer come down to practical issues of what will sell and how much revenue must be generated to support the food service program (32). Despite the financial crisis of school food service, small schools in this study offered fewer competitive items and chose lower fat and calorie options, perhaps because of unique barriers, including access to fewer products through vendors and fewer personnel to support a large ALC program, yet they operated successful and self-supporting food service programs on limited ALC sales.

The findings also have important implications for food and nutrition professionals. Small scale changes, like providing more oversight into the type of items available through vending and ALC may go a long way toward facilitating healthier school environments. Food and nutrition professionals can play an important role by educating school food service personnel on the relationship between competitive food availability and the nutritional quality of student's food choices. Encouraging school food service personnel to take a more active role in product selection may help ensure that important wellness policy initiatives, like establishing nutrition guidelines for competitive foods, positively impact the school environment (8, 33). Additionally, schools must feel confident that providing healthful food choices will not adversely impact revenue, lunch participation rates, or school meal costs. Unfortunately, research in this area is limited and more work is needed before collaborative efforts addressing the school food environment can be successfully undertaken.

The current study has a number of limitations. Data were collected on a single school day and may not adequately represent the typical competitive food items available or purchased at participating schools. There was a low response rate (14/50), although analyses indicated no demographic differences between participating and non-participating schools except that non-participating schools were significantly larger. Larger schools offer more competitive items (21), therefore greater inclusion of larger schools in this sample may have led to different, and likely more distinct differences in competitive food availability and purchasing between small and large schools. Schools may not be representative of small and large high schools throughout the state or nationally, therefore caution should be used in generalizing the findings beyond the current sample of high schools. In addition, the current study was limited to examining vending and ALC and did not examine the availability of competitive foods through fundraising, student run clubs, or as a classroom reward. Finally, the analyses were limited to the examination of the fat and content of available and purchased items and did not include other factors, including sugar content, which are known to adversely impact the quality of children's diets (5–8).

CONCLUSIONS

This study describes the school environment in small, rural schools and examines differences in competitive food availability and purchasing by school size. The findings, which highlight less availability and lower energy content from competitive food sources at small compared to large schools, have implications for understanding how small schools support their food service programs with limited dependence on competitive foods. Findings also have implications for understanding the role that food and nutrition professionals can play in improving the school environment by guiding school food service personnel and providing more oversight into product selection and the nutritional quality of available foods. Although more research is needed to understand how food service programs are funded at the local level, including the extent to which schools rely on competitive food sales to support their food service programs and how the sale of competitive foods impacts

federal funding for the NSLP, small schools may provide a model for how self-supported food service programs can be run with limited dependence on competitive food sales.

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Table 1

Demographic and environmental characteristics of predominately rural large and small schools

	School Size, *median (range)*[a]		
	Large (n=6)	**Small (n=7)**	**p**
Student Demographics			
Enrollment	544.5 (387.0–1153.0)	194.0 (69.0–341.0)	--
Race, % White students	83.4 (58.7–95.1)	93.3 (62.3–99.6)	0.10
Gender, % male	50.6 (47.2–55.5)	49.8 (41.8–58.2)	0.84
Free/reduced lunch status, %	15.8 (3.3–32.4)	22.2 (11.7–61.2)	0.10
Food Environmental Characteristics			
Vending machines[b]	6.5 (4.0–8.0)	3.0 (2.0–5.0)	<0.01
Soda	2.5 (1.0–3.0)	1.0 (1.0–3.0)	0.36
Snack	1.5 (0.0–2.0)	1.0 (0.0–1.0)	0.14
Other	2.5 (1.0–4.0)	1.0 (0.0–2.0)	≤0.05
Products offered			
Vending	68.0 (14.0–111.0)	31.0 (15.0–50.0)	0.07
A la carte	41.5 (0.0–121.0)	2.0 (0.0–45.0)	0.11

[a] Large schools ≥ 350 students; Small schools < 350 students

[b] Vending categorized as: *Soda*=contains ≥50% soft drinks; *Snack*=contains ≥50% snack products; *Other*=contains ≥50% products other than snacks or soft drinks (e.g., sports drinks, milk, bottled water)

Table 2

Categories of items available and purchased through a la carte and vending by school size

	Vending					
	No. of Unique Items Offered Median (range)		**% of Total Vending Items[a] Median (range)**		**% sold/student/day Median (range)**	
Food Category	**Small school**	**Large school**	**Small school**	**Large school**	**Small school**	**Large school**
Desserts & sweet snacks[b]	12.0 (0.0–20.0)	29.0 (0.0–46.0)	34.3 (0.0–57.7)	38.3 (0.0–50.6)	14.0 (0.0–57.8)	20.3 (0.0–29.1)
Sugar-sweetened beverages	11.0 (8.0–25.0)	15.0 (12.0–34.0)	36.0 (25.7–80.7)	29.1 (16.5–92.9)	54.4 (0.0–94.4)	56.5 (41.4–83.3)
Chips, crackers, & salty snacks	1.0 (0.0–12.0)	15.0 (0.0–23.0)	3.9 (0.0–34.3)	21.5 (0.0–25.3)	7.2 (0.0–23.8)	7.5 (0.0–15.6)
Dairy, non-frozen	0.0 (0.0–16.0)	0.0 (0.0–4.0)	0.0 (0.0–55.2)	0.0 (0.0–4.4)	0.0 (0.0-0.0)	0.0 (0.0–14.5)
Entrees	0.0 (0.0-0.0)	0.0 (0.0-0.0)	0.0 (0.0-0.0)	0.0 (0.0-0.0)	0.0 (0.0-0.0)	0.0 (0.0-0.0)
Fruits, vegetables, & 100% fruit juice	0.0 (0.0–5.0)	2.0 (0.0–7.0)	0.0 (0.0–20.0)	3.6 (0.0–7.7)	0.0 (0.0–4.5)	4.7 (0.0–5.7)
Water	1.0 (1.0–2.0)	2.0 (1.0–3.0)	3.5 (2.9–6.7)	3.3 (1.1–7.3)	6.0 (0.0–8.8)	7.7 (0.0–16.7)

	A la carte					
	No. of Unique Items Offered Median (range)		**% of Total A La Carte Items[a] Median (range)**		**% sold/student/day Median (range)**	
Food Category	**Small school**	**Large school**	**Small school**	**Large school**	**Small school**	**Large school**
Desserts & sweet snacks [b]	0.0 (0.0–19.0)	17.0 (0.0–53.0)	0.0 (0.0–42.9)	40.5 (0.0–43.8)	0.0 (0.0–55.8)	24.5 (0.0–30.0)
Sugar-sweetened beverages [c]	0.0 (0.0–11.0)	3.0 (0.0–16.0)	0.0 (0.0–24.4)	6.5 (0.0–16.7)	0.0 (0.0–26.3)	10.5 (0.0–19.1)
Chips, crackers, & salty snacks	0.0 (0.0–4.0)	5.0 (0.0–16.0)	0.0 (0.0–25.0)	8.2 (0.0–36.4)	0.0 (0.0–17.7)	6.1 (0.0–22.1)
Dairy, non-frozen [d]	0.0 (0.0–5.0)	3.0 (0.0–8.0)	0.0 (0.0–50.0)	6.4 (0.0–25.0)	0.0 (0.0–56.7)	3.2 (0.0–7.7)
Entrees	1.0 (0.0–2.0)	4.5 (0.0–14.0)	2.2 (0.0–50.0)	10.2 (0.0–50.0)	7.5 (0.0–43.3)	27.4 (0.0–97.6)
Fruits, vegetables, & 100% fruit juice	0.0 (0.0–3.0)	2.0 (0.0–11.0)	0.0 (0.0–12.5)	5.0 (0.0–25.0)	0.0 (0.0–7.0)	5.1 (0.0–16.5)
Water	0.0 (0.0–1.0)	1.5 (0.0–8.0)	0.0 (0.0–6.3)	3.5 (0.0–6.6)	0.0 (0.0–9.9)	4.3 (0.0–7.6)
Cereal & bread	0.0 (0.0–2.0)	0.0 (0.0–10.0)	0.0 (0.0–14.3)	0.0 (0.0–8.3)	0.0 (0.0–9.3)	0.0 (0.0–0.7)
Miscellaneous [e]	0.0 (0.0–2.0)	0.0 (0.0–1.0)	0.0 (0.0–4.4)	0.0 (0.0–1.0)	0.0 (0.0–7.5)	0.0 (0.0–3.9)
French fries & onion rings	0.0 (0.0-0.0)	0.0 (0.0–1.0)	0.0 (0.0-0.0)	0.0 (0.0–2.0)	0.0 (0.0-0.0)	0.0 (0.0–3.9)

[a] Calculated as the % of total items available within each school

[b] e.g., cookies, bars, donuts, pastries, candy, candy bars, ice cream

[c] e.g., soft drinks, sports drinks, fruit drinks that are not 100% juice

[d] e.g., milk, yogurt, pudding, string cheese

[e] Salad dressing, cream cheese, condiments, beef jerky

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Table 3

Average fat and calories **available per item**[a] from a la carte (ALC) and vending (VM) by school size

		School Size			
Available	**Total Median (range)**	**Large (n=6) Median (range)**	**Small (n=7) Median (range)**	**Difference Med large-Med small**	**p**
Fat in grams					
Total, from ALC & VM	6.6 (0.0–9.8)	7.8 (6.4–9.8)	5.5 (0.0–9.1)	2.3	≤0.05
ALC	10.3 (5.9–13.4)	10.3 (8.5–11.2)	9.4 (5.9–13.4)	0.9	1.00
Vending, all	5.9 (0.0–8.9)	7.0 (0.0–8.9)	5.1 (0.0–7.6)	1.9	0.18
Soda	--	--	--	--	--
Snack	9.6 (6.4–11.7)	9.8 (9.4–11.7)	8.7 (6.4–11.6)	1.1	0.19
Other[b]	0.0 (0.0–6.7)	0.0 (0.0–4.4)	0.0 (0.0–6.7)	0.0	1.00
Calories in kcals					
Total, from ALC & VM	250.2 (202.7–275.5)	254.8 (223.9–275.5)	232.9 (202.7–255.5)	21.9	0.14
ALC	269.8 (178.5–291.5)	269.8 (227.2–291.5)	232.4 (178.5–271.7)	37.4	0.41
Vending, all	250.2 (160.5–263.2)	254.5 (160.5–236.2)	229.5 (218.7–251.4)	25.0	≤0.05
Soda	241.8 (162.8–284.4)	249.6 (162.8–284.4)	229.8 (201.5–248.7)	19.8	1.00
Snack	248.4 (214.8–264.5)	255.5 (242.2–263.0)	228.6 (214.8–264.5)	26.9	0.29
Other[b]	236.4 (125.0–280.4)	242.5 (159.4–280.4)	236.4 (125.0–241.7)	6.1	0.66

[a] Calculated by taking an average, within each school, of the fat and calories of each item and dividing by the number of items available

[b] Contains ≥50% products other than snacks or soft drinks (e.g., sports drinks, milk, bottled water)

Table 4

Average fat and calories **purchased per student**[a] from a la carte (ALC) and vending (VM) by school size

		School Size			
Purchased	**Total Median (range)**	**Large (n=6) Median (range)**	**Small (n=7) Median (range)**	**Difference Med large-Med small**	**p**
Fat in grams					
Total, from ALC & VM	8.5 (0.0–25.8)	17.3 (1.5–25.8)	1.9 (0.0–8.5)	15.4	≤0.05
ALC	5.7 (0.0–23.9)	13.8 (0.0–23.9)	0.9 (0.0–6.4)	12.9	≤0.05
Vending, all	1.5 (0.0–5.3)	1.7 (0.0–5.3)	1.3 (0.0–3.7)	0.4	0.63
Soda	--	--	--	--	--
Snack	1.3 (0.0–5.3)	1.7 (0.0–5.3)	1.2 (0.0–3.7)	.5	0.38
Other[b]	0.0 (0.0–0.5)	0.0 (0.0–0.1)	0.0 (0.0–0.5)	0.0	1.00
Calories in kcal					
Total, from ALC & VM	301.2 (61.3–824.5)	518.2 (95.8–824.5)	211.4 (61.3–435.1)	306.8	≤0.05
ALC	145.7 (0.0–570.1)	350.3 (0.0–570.1)	27.0 (0.0–157.6)	323.3	≤0.05
Vending, all	81.9 (23.5–435.1)	88.8 (23.5–406.0)	77.3 (53.7–435.1)	11.5	0.95
Soda	45.2 (11.0–319.3)	27.7 (11.0–204.8)	53.2 (11.5–319.3)	−25.5	0.45
Snack	40.2 (0.0–125.1)	42.2 (0.0–125.1)	31.1 (0.0–101.7)	11.1	0.38
Other[b]	16.0 (0.0–115.8)	27.9 (4.5–76.2)	9.9 (0.0–115.8)	18.0	0.28

[a] Calculated by taking an average, within each school, of the fat or calories in each item times the number of those items sold and dividing by the number of students enrolled in the school

[b] Contains ≥50% products other than snacks or soft drinks (e.g., sports drinks, milk, bottled water)