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Demographic and Financial Characteristics of School Districts with Low and High À La Carte Sales in Rural Kansas Public Schools

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Abstract

Reducing à la carte (ALC) items in schools – i.e., foods and beverages sold outside the reimbursable meals program -- may have important implications for childhood obesity. However, schools are reluctant to reduce ALC offerings because of the impact these changes could have on revenue. Some food service programs operate with limited ALC sales, but little is known about these programs. This secondary data analysis compared rural and urban/suburban school districts with low and high ALC sales. Food service financial records (2007–2008) were obtained from the Kansas State Department of Education (KSDE) for all public K-12 school districts (n=302). Chi-square and t-tests were used to examine the independent association of variables to ALC sales. A multivariate model was then constructed of the factors most strongly associated with low ALC sales. In rural districts with low ALC sales, lunch prices and participation were higher; lunch costs and ALC quality were lower; and fewer free/reduced price lunches were served compared to rural districts with high ALC sales. Lunch price (OR=1.2, 95% CI = 1.1–1.4) and free/reduced price lunch participation (OR=3.0, 95% CI=1.0–9.8) remained in the multivariate model predicting low ALC sales. No differences were found between urban/suburban districts with low and high ALC sales. Findings highlight important factors to maintaining low ALC sales. Schools should consider raising lunch prices and increasing meal participation rates as two potential strategies for reducing the sale of ALC items without compromising food service revenue.

Keywords

À la carte; competitive foods; schools; childhood obesity

Food service programs in the majority of US schools are expected to be financially self-sufficient and cover food, labor, facilities, and equipment costs (1). While financial support is provided through the National School Lunch Program and the School Breakfast Program, these sources do not cover all of the operating costs (2). To operate within a balanced budget, food service programs must generate revenue from additional sources. For the majority of schools, the revenue gap is covered by the sale of ALC items – i.e., foods and

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beverages sold outside the reimbursable meals program through an ALC line, snack bar, or school store (3).

Items offered through the school meals program must meet federally mandated nutrition guidelines. By comparison, nutrition guidelines for ALC items often are weak or not enforced. As a result, students have access to a wide variety of nutrient poor/energy dense items (e.g., chips, desserts, soda) (4–7). One-third of elementary, 71% of middle, and 89% of high schools nationwide offer competitive foods (8). In Kansas, once public school students reach high school, more than 90% have access to vended foods and beverages (9).

Efforts to eliminate or decrease the sale of ALC items may have important implications for childhood obesity prevention (1, 10–14). However, schools remain reluctant to modify their competitive food offerings because of the impact these changes could have on food service revenues (15). There are food service programs that operate with limited ALC sales (9, 16), but little is known about these programs. Understanding these programs could improve children's diets by encouraging schools to eliminate or improve the nutritional quality of ALC without adversely impacting food service revenue. Therefore, the purpose of this study was to examine how Kansas school districts with low ALC sales differed from districts with moderate to high ALC sales on important demographic (rurality, enrollment, race/ethnicity, ALC nutritional quality) and financial factors (meal price, meal cost, lunch participation rates, and district funding of school meals). It was hypothesized that districts with low ALC sales would have higher lunch prices and participation rates, lower per lunch costs, and would receive more district funding than those with moderate and high ALC sales.

METHODS

A secondary data analysis was conducted of food service financial records provided to KSDE by all public K-12 school districts (n=302). Data came from two existing sources. The 2007–2008 *Kansas Report Card* provides district-level demographic information including district size/enrollment, race/ethnicity of the student population, and the percent of students eligible for free/reduced price lunch (17). The 2007–2008 *Annual Financial Report for School Nutrition Programs* is submitted annually to KSDE for districts to maintain funding for their school meals program (18). This report is accessible only to authorized users and provides yearly summaries of revenue from reimbursable (National School Lunch and Breakfast Programs), non-reimbursable (ALC), and district-level sources, expenditures for food, labor and benefits, equipment, and overhead costs, and meal eligibility and participation rates by income status. All methods were approved by the University of Kansas Medical Center Institutional Review Board.

OUTCOME VARIABLE

ALC Sales—The primary outcome was ALC sales, represented as the percent of revenue generated from ALC as a function of total food service revenue. Revenue from the sale of ALC items – i.e., foods and beverages sold outside the reimbursable meals program through an ALC line, snack bar, or school store – is reported as a separate line item on the *Annual Financial Report for School Nutrition Programs*. Based on natural cut-points in the data, districts were classified as having low, moderate, or high ALC sales if 0%–13%, 14%–24%, or > 24% of their food service revenue was generated from ALC sales, respectively.

INDEPENDENT VARIABLES

Demographic Factors

Rurality: Districts were classified as rural if they were located outside an urban area or cluster as defined by their National Center for Education Statistics locale code (19). All other districts were classified as urban/suburban.

Enrollment: Enrollment was represented as the total number of students in the district.

Race/ethnicity: Due to low levels of diversity, race/ethnicity was dichotomized into the percent of students identified as White and non-White.

ALC nutritional quality: Districts rate the nutritional quality of their ALC items according to KSDE guidelines (20). Higher scores indicate healthier ALC. Notably, actual ALC products are not reported, although previous work in Kansas schools indicates that the most common items are desserts/sweet snacks, entrées, sugar-sweetened beverages, and chips/crackers/salty snacks (9, 16).

Financial Factors

Per lunch cost: Per lunch cost represents the cost to produce each lunch tray and was calculated by dividing yearly lunch expenditures by the total number of lunches sold.

Lunch price: Lunch price was represented as the amount charged for each *paid* lunch. The highest price was used if lunch price varied by school level.

Total student lunch participation: Student lunch participation was represented as a percentage, calculated by dividing the number of total student lunches sold by enrollment.

Free/reduced price lunch participation: Free/reduced lunch participation was represented as a percentage, calculated by dividing the number of free/reduced price lunches by total lunches sold.

District support: District support was represented as the sum of money transferred into the food service budget.

Statistical Analysis—The distribution of district-level ALC sales variable was examined to find natural cut points that would yield approximately equal numbers of schools in each category of sales. Chi-square tests for categorical variables and t-tests for continuous variables were used to examine the independent association of each independent variable to ALC sales. Multiple logistic regression analysis was then used to construct reduced multivariate models of factors most strongly associated with low ALC sales. Only variables found to be significantly related to ALC sales at $p < 0.10$ in univariate analyses were entered into the multiple logistic regression analysis. Only variables significant at $p = 0.05$ were retained in the final multivariate model. Data were managed, and analyzed using SAS V 9.2 (2002–2008 by SAS Institute Inc., Cary, NC, USA).

RESULTS AND DISCUSSION

Of the 302 Kansas public K-12 school districts, 20 were excluded due to incomplete or missing data, leaving a final sample of 282 (93.4%) districts. Preliminary analyses revealed that rural districts were 2.4 times more likely than urban/suburban districts to have low to moderate ALC sales (OR=2.4, 95% CI=1.2–4.8, $p < 0.01$). All remaining analyses were

conducted separately for rural and urban/suburban districts to characterize the unique set of factors associated with ALC sales by rurality.

Rural Districts

Of the 206 rural districts, 68 (33.0%) had low ALC sales and 138 (67.0%) had moderate and high ALC sales.

Independent association of factors to ALC sales—Independent associations of demographic, financial, and ALC nutritional quality characteristics with ALC sales in rural districts are presented in Table 1. Districts with low ALC sales had higher lunch prices and lunch participation; lower per lunch costs and ALC quality; and served fewer free/reduced price lunches compared to districts with high ALC sales ($p < 0.05$ for all comparisons).

Multivariate model of factors associated with low ALC sales—Results of the multiple logistic regression analysis for rural districts are presented in Table 2. Lunch price and free/ reduced price lunch participation were retained in the final reduced model. For each \$0.10 increase in lunch price, districts were 1.2 times more likely to have low ALC sales (95% CI = 1.1–1.4). In addition, districts where free/reduced priced lunches comprised 33% or less of total lunches sold were three times more likely to have low ALC sales than districts where free/reduced priced lunches represented nearly 60% or more of lunches sold (95% CI=1.0–9.8).

Urban/Suburban Districts

Of the 76 urban/suburban districts, 16 (21.1%) had low ALC sales and 60 (78.9%) had moderate and high ALC sales.

Independent association of factors to ALC sales—Districts with low ALC sales had lower ALC nutritional quality (79.8 ± 37.5) and served fewer free/reduced price lunches (40%) compared to districts with high ALC sales (ALC nutritional quality = 108.9 ± 44.3 , $p < 0.10$; free/reduced price lunches=50%, $p < 0.05$).

Multivariate model of factors associated with low ALC sales—No factors were retained in a final reduced model predicting low ALC sales among urban/suburban schools.

The salience of rurality to ALC sales is consistent with other studies in Kansas that have documented limited availability and purchasing of ALC in rural districts (9, 16). Conversely, the lack of findings for urban/suburban districts may be related to the small number of urban/suburban districts ($n=76$) in this sample or the fact few urban/suburban districts in this study (21.1%), and in the literature, have been able to maintain low levels of dependence on ALC revenue (4–7, 13).

Reimbursement for school meals makes up the majority of food service revenue, therefore maintaining high participation rates is critical (2). Many districts are hesitant to increase lunch prices for fear that higher prices will drive down participation rates (21). However, an important finding of this study is the association between lunch price and ALC sales – for each \$0.10 increase in lunch price districts were 1.2 times more likely to have low ALC sales – suggesting that strategies to increase lunch price may be important in reducing ALC and creating healthier school environments. While seemingly paradoxical, this finding suggests that as prices come closer to lunch costs, the reliance on ALC sales to fill this gap is diminished. As suggested elsewhere, schools should consider increasing the lunch price for paid students to equal the federal and state reimbursement for free/reduced lunches, at a minimum, and, optimally, to match meal costs (21). Concern over raising lunch price must

be balanced against the alternative of continuing to offer nutrient poor/energy dense ALC items to students and with data showing that meal price fluctuations ($\pm$ \$0.50) do not compromise participation by children just qualifying for paid meals (22).

An encouraging finding of this study was the relationship between ALC nutritional quality and ALC sales. Districts with nutritionally poor ALC items had *lower* ALC sales, which is contrary to the opinion that offering popular but nutritionally poor items (e.g., chips, soda, dessert) increases ALC sales because of their appeal to students. This finding suggests that students may be interested in purchasing healthier ALC items and is consistent with literature showing that restricting ALC to healthy items improves food service revenue through increased participation in school meals (15, 23–26).

One final finding is worth noting. This study found that districts selling *fewer* free/reduced price lunches had lower ALC sales. This finding is opposite what is expected given that reimbursement for free/reduced price lunches comes closer to covering per lunch costs. It also contradicts other studies, which have found that free/reduced price eligible students are more likely to purchase a school lunch than paid students and may be less likely to consume competitive foods (12, 22, 27). The relationship between free/reduced price lunch participation and ALC sales found in this study should be interpreted with caution, but more research is needed to examine the direct association of student purchasing of ALC by income status.

This study adds to existing literature on competitive foods in schools by addressing ALC availability from a financial perspective. It is the first known study to examine demographic and financial factors associated with ALC sales and is a first step toward identifying factors that could be modified to allow for reducing or eliminating the sale of ALC items without compromising food service revenue.

There are limitations. All financial information was self-reported. Although KSDE reviews each district's financial information, there is still potential for misreporting. Findings of this study mostly pertain to rural districts, a reflection of the demographic landscape of Kansas, so we know little about the factors associated with ALC sales in urban/suburban areas. Finally, this study did not examine how other factors in the school environment (e.g., access to vending machines, open-campus lunch policies) impact the financial structure of food service programs.

CONCLUSIONS

Findings highlight the importance of lunch price and lunch participation to maintaining low ALC sales. Districts should consider increasing school meal participation rates and raising the lunch price for paid students to at least match federal and state reimbursements for free/reduced price lunch as two potential strategies for reducing or eliminating the sale of ALC items without compromising overall food service revenue. But schools cannot address the precarious position of food service finance alone. Increases in federal and state reimbursement for schools meals are also necessary concurrent with increases in district support of food service. Advocacy efforts to increase the federal reimbursement for school meals are underway (28, 29). Findings also suggest that offering healthy ALC options may not have a detrimental effect on food service revenue. Schools should consider changing their product mix to healthy items as an alternative to eliminating ALC. This is consistent with a number of studies showing that healthy ALC offerings may improve food service revenue by increasing student participation in reimbursable meals (15, 23–26).

Future research is needed to understand the factors associated with ALC sales in urban/suburban districts. More research is also needed to examine acceptable strategies for increasing lunch price, including how lunch price increases impact lunch participation rates. Finally, research focusing on a healthy school environment, as opposed to one aspect of that environment is an important area for future study.

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Table 1

A Comparison of Demographic, Financial, and À La Carte Nutritional Characteristics in Rural Kansas School Districts (n=206) with Low, Moderate, and High À La Carte Sales

Variable	À La Carte Sales ^a	Mean (SD)	Pairwise p-value ^b
<i>Demographic Factors</i>			
Student Enrollment	Low	589.6 (468.5)	reference
	Moderate	620.2 (899.2)	ns
	High	718.6 (1046.4)	ns
% Non-White	Low	0.10 (0.10)	reference
	Moderate	0.11 (0.10)	ns
	High	0.12 (0.12)	ns
<i>Financial Factors</i>			
Per Lunch Cost	Low	\$3.05 (0.63)	reference
	Moderate	\$3.10 (0.49)	ns
	High	\$3.56 (0.91)	<0.001
Lunch Price	Low	\$1.95 (0.21)	reference
	Moderate	\$1.87 (0.22)	<0.05
	High	\$1.86 (0.21)	<0.05
% Total Lunch Participation	Low	0.78 (0.07)	reference
	Moderate	0.77 (0.09)	ns
	High	0.72 (0.15)	< 0.01
% Free/Reduced Price Lunch Participation	Low	0.38 (0.11)	reference
	Moderate	0.43 (0.11)	< 0.05
	High	0.45 (0.15)	<0.01
District Support	Low	\$58,266 (\$40,876)	reference
	Moderate	\$56,013 (\$30,899)	ns
	High	\$56,515 (\$48,785)	ns
<i>À La Carte Quality</i>			
À La Carte Nutritional Quality	Low	37.5 (56.5)	reference
	Moderate	33.5 (51.2)	ns
	High	59.4 (69.1)	<0.05

^aRepresented as percent of revenue generated from à la carte as a function of total food service revenue: *Low* = 0%–13% of revenue generated from à la carte sales; *Moderate* = 14%–24% of revenue generated from à la carte sales; *High* = 24% of revenue generated from à la carte sales

^bp-value compared to low à la carte sales

Table 2

Final Logistic Regression Model of the Factors Associated with Low À La Carte Sales in Rural Kansas School Districts^a

Variable	OR (95% CI)	p
Student Enrollment ^a	1.0 (0.9–1.0)	0.11
Free/Reduced Price Lunch Participation ^b		
<33% versus >58%	3.0 (1.0–9.8)	0.05
33%–58% versus >58%	1.8 (0.6–5.1)	0.97
Lunch Price ^c	1.2 (1.1–1.4)	0.007

^aRetained as a variable in the final model to control for variability in district size

^bFor ease of interpretation free/reduced price lunch participation was categorized into 3 groups: <33%, 33%–58%, and >58%

^cThe odds ratio shown is for a \$0.10 unit change (e.g., increase of lunch price from \$1.90 to \$2.00).