

Local Acts

Policy development is an important and powerful tool to promote health and welfare in society, yet the process of adopting policies is rarely evaluated for compliance, and studies examining policy impact sometimes neglect to verify the extent to which the policy interventions are faithful to the policy's original intent. Evaluations can lead to critical improvements and improve success in achieving intended goals. In this article, Polacsek et al. present a simple yet elegant evaluation of Maine's law to limit the marketing of foods of minimal nutritional value in public school settings. Their findings underscore the need to perform such evaluations to inform enforcement efforts and assess impact.

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EXAMINING COMPLIANCE WITH A STATEWIDE LAW BANNING JUNK FOOD AND BEVERAGE MARKETING IN MAINE SCHOOLS

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Consumption of non-nutritious foods and beverages has been shown to be a key determinant of the current obesity epidemic among young people aged <18 years.¹ These non-nutritious foods and beverages include sugar-sweetened beverages (SSBs), which have been directly associated with the incidence of obesity in children and young people in the U.S.^{2,3} High school students now consume, on average, more than 300 kilocalories (kcal) of SSBs per day.⁴ Other examples of non-nutritious foods include candy and snacks that are high in fat, such as high-fat cookies, cakes, or pastries. Changes in intake of these non-nutritious foods and beverages can help to close the "excess energy gap" (i.e., the calories consumed that exceed the calories burned—currently estimated to be 110–165 kcal/day) that has led to recent trends in average excess weight gain among children and young people in the U.S.⁵

Food advertising has been shown to influence children's food purchase requests, the nutritional quality of their food selections, and their health.^{6–8} Food and beverage marketing affects students' food selections at school,⁹ and many foods and beverages of poor nutritional quality are marketed across the nation. Children may be uniquely vulnerable to marketing of poor nutritional quality foods because they lack decision-making

skills and maturity to make healthier choices.¹⁰ Young children may not understand the persuasive intent of marketing, while older children, who have not yet fully developed their logical, evaluative skills, may have considerable spending money and opportunities to make food choices in the absence of parental guidance. School-based marketing undermines parents' and schools' health promotion efforts. And studies have shown that parents, school administrators, and the general public all support limits on in-school marketing of low-nutrition foods.¹¹

In 2007, Maine became the first state to pass legislation limiting the marketing of foods of minimal nutritional value (FMNV) on public kindergarten through 12th-grade school campuses. Maine's legislation using the FMNV standard implies that foods falling below that standard are considered to be inappropriate for promotion in the school setting. The U.S. Department of Agriculture developed the concept of FMNV and defined those foods as follows: (1) in the case of artificially sweetened foods, a food that provides <5% of the Reference Daily Intake (RDI) for each of eight specified nutrients per serving; and (2) in the case of all other foods, a food that provides <5% of the RDI for each of eight specified nutrients per 100 calories and <5% of the RDI for each of eight specified nutrients per serving. The eight nutrients to be assessed for this purpose include protein, vitamin A, vitamin C, niacin, riboflavin, thiamine, calcium, and iron.¹²

The current language of Maine's marketing law (commonly referred to as Chapter 156),¹³ which went into effect in September 2007, states that brand-specific advertising of food or beverages is prohibited in school buildings or on school grounds except for food and beverages meeting state standards for sale or distribution on school grounds. Specifically, the law states that advertising does not include advertising on

broadcast media or in print media (e.g., newspapers and magazines), clothing with brand images worn on school grounds, or advertising on product packaging.

School food and beverage promotion activities and materials can be broadly classified into three groups: product sales, direct advertising, and indirect advertising. Direct advertising includes the use of a brand name or logo on a sign or banner or otherwise visible to a target audience to promote the product. Indirect advertising is advertising used to promote a product using brand names or logos on or in conjunction with educational or other activities, corporate sponsorship, commercial food-based reward or incentive programs, scholarships, and textbooks and/or curricula. Product sales marketing is advertising of the product on the product's label and/or packaging itself. The term "marketing" is used broadly to describe these various types of product promotion.¹⁴

Maine requires schools to meet the federal FMNV standard for foods that are sold or distributed on school

grounds 24 hours a day, seven days a week, with possible exemptions only for teachers' lounges and community events. However, Maine's marketing ban does not allow for exemptions. Therefore, the marketing of food or beverages not meeting the FMNV standard is prohibited everywhere within the school and on school grounds, including teachers' lounges, unless the marketing is on the product packaging itself (Figure 1).

Only a few school food and beverage marketing assessments have been conducted to date,^{15,16} and none of these reviewed compliance with a policy or law. This study aimed to assess compliance with Maine's legislation and the nature and extent of junk food marketing in a representative statewide sample of high schools in Maine.

METHODS

This was a cross-sectional study conducted in spring 2010 that was designed to collect observational and

Figure 1. School food and beverage marketing categories and activities covered under Chapter 156,^a limiting the marketing of foods of minimal nutritional value in schools in Maine

Category	Activities/techniques	Covered under Chapter 156?
Direct advertising	Posters, signs, or advertisements, specifically a food or beverage brand logo or name on a poster, scoreboard, sign, banner, vending machine exterior, equipment (e.g., sports equipment, cafeteria equipment, or school message board), or supplies; or in school media, including television, newsletter, newspaper, calendar, sports schedule, yearbook, and website	Yes
	Product promotions and giveaways, including food or beverage samples, coupons, and taste tests	Yes, unless advertising is only on the product packaging
Indirect advertising	Corporate sponsorship, including financial, product, or equipment donations by food or beverage companies to support school events or activities and corporate scholarship programs	Yes, unless there is no associated direct advertising or the advertising is only on the product packaging
	Corporate-sponsored educational materials, including food or beverage company-developed curricula, educational activities, and teacher training	Yes
	(Commercial) food-based reward programs that provide students with products or coupons to incentivize academic activity	Yes, unless advertising is only on the product packaging
	(Commercial) food-based incentive programs in which companies donate supplies or money to schools or school groups when certain food or beverage products are purchased; examples include brand rewards programs such as General Mills' Box Tops for Education and Foodservice Rewards and restaurant events where a percentage of proceeds from the event is donated back to the school group	No
	Incidental advertising, such as advertising banners on school websites	Yes
Product sales	Food-based fundraising in which the products sold are brand-specific foods/beverages	Yes, unless brand logo or name is only on the product packaging
Product sales	Beverage contracts that offer sponsorship payments in the form of direct cash or non-cash items and commissions on product sales in exchange for exclusive sales and distribution rights and marketing access	No

^aChapter 156: an act to protect children's health on school grounds. S.P. 67, L.D. 184 (2007).

interview data on food and beverage marketing from a representative random sample of 20 high schools representing approximately 16% of all eligible public high schools ($n=120$) in Maine. Schools were classified as either urban or rural and were chosen from a listing supplied by Maine's Department of Education. The urban/rural classification was assigned using the schools' location type supplied by the National Center for Education Statistics. Urban schools were defined as any school in an urban center or within 10 miles of an urban center. All schools farther than 10 miles from an urban center were classified as rural. Schools described as entirely devoted to special education were excluded ($n=2$). A stratified random sample of the 20 schools was obtained by selecting 10 schools at random from the urban list and 10 from the rural list, separately. The sample was assessed for demographic, socioeconomic, and ethnic representativeness of all high schools in Maine.

Superintendents and principals of selected schools were informed about the project via an official memo. The research team then contacted each selected school to ask for permission to complete the observation and interviews using the Food and Beverage Marketing in Schools Assessment Tool (FBMS) and to set up a date and time for a visit to the school. Two schools declined to participate and another did not respond. Three other schools were randomly selected and agreed to participate. Participating schools received a \$300 stipend. The school was the unit of analysis, and each school was assigned a unique identifier. Research assistants were trained in two pilot schools.

The research assistants spent approximately two hours (depending on the school size) completing the observational assessment and taking pictures. One research assistant conducted in-person interviews with the principal and the food service director or another key administrator if the food service director was unavailable. Data collection was accomplished within a two-month period.

The Food and Beverage Marketing in Schools Assessment Tool (FBMS)

The FBMS, originally developed by Samuels and Associates¹⁶ and used recently by the Center for Science in the Public Interest in a study of food marketing in public schools,^{15,17} was adapted for use in Maine. The tool is divided into two parts. The first part is an observational assessment of the school food marketing environment, including food and beverage advertising on posters and signs, on vending machine exteriors, and on vending products themselves (i.e., product marketing). Data collected included location of food

and beverage marketing, total number of posters/signs and/or product logos, the product name or logo, whether it was compliant with Chapter 156, and whether it was used for counter-marketing. In this study, we defined counter-marketing as any food or beverage product name or logo that either discouraged the consumption or purchase of a food or beverage that was deemed unhealthy, or encouraged the consumption or purchase of one that was deemed healthy. The FBMS also provides a process for cataloguing vending offerings that are used for the purpose of assessing product marketing (on product packaging).

The second part of the FBMS is a face-to-face interview designed to gather information on school practices and policies regarding food and beverage marketing. Administrators were asked about food and beverage marketing in conjunction with media outlets at school (e.g., yearbook, television, radio station, public announcement system, newsletter, and newspaper); equipment and supplies (e.g., athletic uniforms); and activities, sponsorships, scholarships, and fundraising. We also collected information about administrators' policy knowledge, attitudes toward school food marketing, changes made since Chapter 156 went into effect, and resource needs for implementing changes to comply with the ban.

We defined "noncompliant" as "any brand-specific food or beverage advertisement (e.g., a product picture, name, logo, spokesperson, or character) observed on the school campus on a poster or sign, scoreboard, or vending machine exterior panel for a food or beverage product that did not meet the nutrition criteria referenced in Chapter 156." Figure 1 further defines the marketing activities and techniques covered under Chapter 156.

Observational data were recorded and double-entered into a Microsoft® Excel database. Notes taken during the interviews were recorded and transcribed, and pictures were taken of marketing examples.

To assess the interrater reliability of the FBMS observational data, we calculated Spearman correlations for questions related to the total number of posters and signs, the number of violations, and the number of counter-marketing instances to assess the agreement between the two research assistants. Spearman correlations were used to determine the level of agreement in how the research assistants ranked the schools. A value of 1 indicated perfect agreement in how each research assistant ranked the schools from least to most, while a value of 0 indicated no agreement. We also calculated intraclass correlations to determine not only how similar the research assistants ranked the schools, but also how closely the actual numerical counts agreed.

RESULTS

The Spearman correlations ranged from 0.56 to 0.72, indicating moderately strong agreement between the two research assistants' assessments of the relative rankings of the schools. However, intraclass correlations between the two research assistants were not consistently strong. We compared the FBMS data with evidence obtained from the members of the research team that visited the schools. From this we determined that one of the research assistants had highly accurate data and used those records for analysis.

Observational results

Overall marketing of food and beverages. We found an average of 49 food or beverage posters and signs per school, including on vending machine exteriors. Overall, the majority of food and beverage posters and signs were in cafeterias (52%), athletic areas (16%), entrances/hallways (15%), and teachers' lounges (12%). The distribution of marketing on posters and signs differed from that of vending machine exteriors. Marketing on wall posters and signs was found mostly in the cafeterias and athletic areas, while marketing on vending machine exteriors was found mostly in entrances/hallways, cafeterias, and teachers' lounges (Table 1).

We found 197 different food and beverage products marketed in the schools. The most frequently marketed products on posters, signs, and vending machine exteriors were Dasani® (10%), Coke® (9%), Gatorade® (8%), Aquafina® (7%), and Vitamin Water® (5%) (Figure 2). Products owned by Coca-Cola® (e.g., Dasani, Coke,

Vitamin Water, and Odwalla®) and PepsiCo® (e.g., Gatorade®, Aquafina®, and Pepsi®) comprised 45% of all food and beverage marketing observed on posters, signs, and vending machine exteriors.

Vending content product marketing. We found an average of 5.6 vending machines per school (111 machines in 20 schools, with a range of 2–15 machines per school). Vending machine offerings were dominated by plain water, flavored water, sports drinks, and iced teas, while snack offerings were dominated by granola bars, Chex Mix®, chips, and cookies. All schools offered plain and flavored water, while the vast majority offered sports drinks, granola bars, Chex Mix, and chips (Figure 3). Advertising on product packaging (i.e., product marketing) is excluded from the marketing ban; as such, the vending products themselves were not classified as compliant or noncompliant.

The majority of schools had vending machines that sold products that did not meet the FMNV standard but were not banned under Chapter 156 because the marketing was found on the product packaging. Examples included soda (sold in 75% of schools), candy (sold in 30% of schools), regular chips (sold in 5% of schools), cookies (sold in 1% of schools), other snacks (sold in 5% of schools), fruit drinks (sold in 5% of schools), other sweetened drinks (sold in 5% of schools), and iced tea (sold in 1% of schools). More than half (53%) of the products not meeting the FMNV standard in school vending were soda products; 20% were candy; 7% were cookies and iced tea; and 3% were regular chips, other snacks, fruit drinks, and other sweetened drinks.

Table 1. Location of compliant and noncompliant food and beverage marketing on posters/signs and vending exteriors in a random selection of Maine high schools, spring 2010

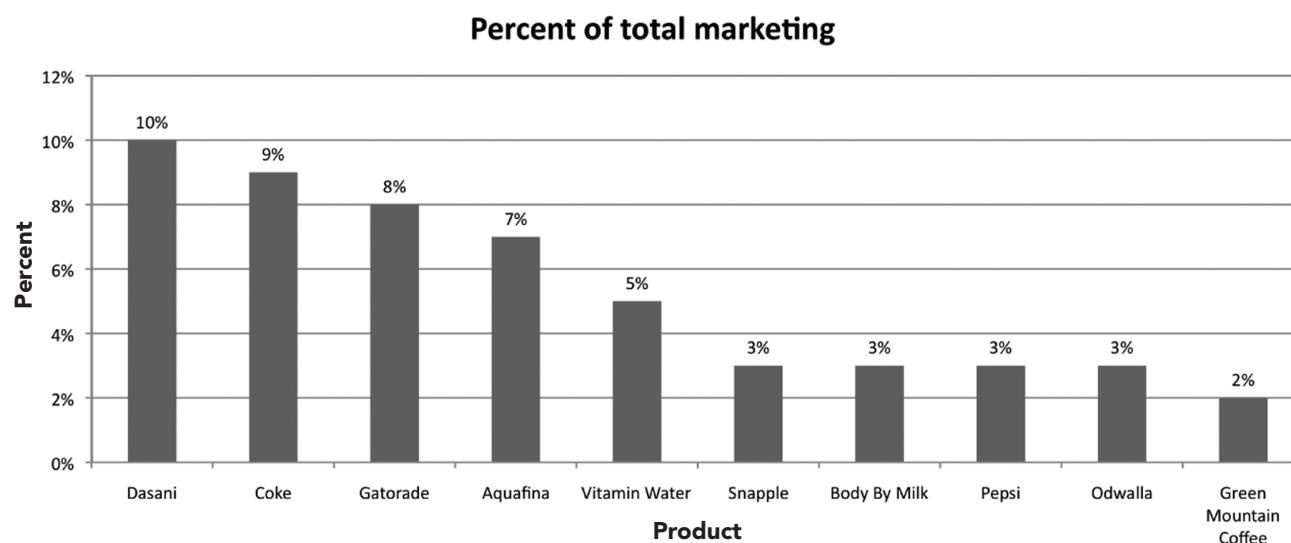
Location	Posters/signs N ^a (column percent)		Vending exteriors N ^a (column percent)		N ^a (row percent)
	Compliant	Noncompliant	Compliant	Noncompliant	Total
Cafeteria	21.0 (71)	1.6 (22)	2.5 (30)	0.6 (12)	25.6 (52)
Athletics	3.7 (12)	2.7 (38)	1.0 (12)	9.7 (15)	8.0 (16)
Entrance/hallways	2.0 (7)	0.7 (9)	3.4 (42)	91.4 (30)	7.4 (15)
Teachers' lounges	1.3 (4)	1.2 (17)	1.3 (16)	2.0 (43)	5.7 (12)
Snack bars	0.7 (2)	0.4 (5)	NA ^b	NA ^b	1.1 (2)
Main office	0.3 (1)	0.3 (4)	NA ^b	NA ^b	0.6 (1)
Guidance office	0.2 (1)	0.3 (4)	NA ^b	NA ^b	0.5 (1)
Other	0.7 (2)	0.1 (1)	NA ^b	NA ^b	0.8 (1)
Total	29.8 (60)	7.0 (14)	8.1 (17)	4.6 (9)	49.5 (100)

^aN = mean instances

^bEither no vending machines were found, or no such location was found.

NA = not applicable

Figure 2. The 10 most frequently marketed products on posters/signs and vending machines in a random selection of Maine high schools, spring 2010



Interview results

Media. In the majority of schools (85%), at least one school administrator reported food and beverage marketing in conjunction with yearbooks. Other marketing on school media reported by administrators included marketing on scoreboards (55%), Channel One or other television channels (25%), radio station or public announcement system (10%), and newsletters or newspapers (5%) (data not shown).

Equipment and supplies. At least one school administrator reported food and beverage marketing on food or beverage coolers or display cases in 70% of schools, on paper products in 30% of schools, on physical education or gym equipment in 10% of schools, on school supplies in 10% of schools, on athletic uniforms or clothing in 5% of schools, and on other school equipment and supplies in 5% of schools (data not shown).

Activities, sponsorships, and scholarships. At least one school administrator reported fundraising activities in conjunction with food and beverages in 70% of the schools, discount nights at restaurants in 70% of the schools, receipt or proof-of-purchase rebate programs in 55% of schools, sponsorship of school events in 45% of schools, educational activities or incentives in 25% of schools, and scholarships in 20% of schools (data not shown).

Knowledge of Chapter 156. In 65% of schools, at least one administrator reported knowing about Chapter 156. In three schools (15%), both administrators interviewed

reported this knowledge. In 95% of schools, at least one administrator agreed that banning food and beverage marketing in schools was important. In 45% of schools, at least one administrator agreed it was a high priority to reduce junk food and beverage marketing in their school (data not shown).

Changes made since the ban went into effect. In 45% of schools, at least one administrator reported that changes to school food and beverage marketing had been made since Chapter 156 went into effect. The most common changes were a review of marketing present on school grounds (completed by 25% of schools) and identification of alternatives to existing marketing (completed by 20% of schools). Other changes included the development of new rules around marketing (15% of schools), reduction of marketing (10% of schools), and changes to products sold (10% of schools). In three schools (15%), at least one administrator reported lower revenues because of the ban (data not shown).

Perceived resources needed to better implement the ban. Administrators in nearly all of the schools (80%, $n=16$) reported wanting more resources to help implement the law. Perceived assistance needs included information about Chapter 156 (e.g., a definition of what is banned), requested by administrators in 70% of schools; technical assistance on how to better implement the law, requested by 55% of schools; funding to help implement the law, requested by 30% of schools; and cooperation from vendors, including the ability to

change contracts, requested by 20% of schools. A clear enforcement process and an assessment tool to help identify noncompliant marketing in schools were also noted as resource needs (data not shown).

Compliance with the statewide marketing ban

Posters and signs, including vending machine exteriors. Non-compliant marketing of products was found in 85% of schools, including on vending machine exteriors and scoreboards. An average of 12 instances of noncompliant marketing was found per school. Noncompliant food and beverage marketing on posters and signs was most often found in athletic areas and teachers' lounges. The distribution of noncompliant marketing on wall posters and signs differed from noncompliant marketing on vending machine exteriors. Most of the noncompliant marketing on vending machine exteriors was found in teachers' lounges (43%), while noncompliant posters and signs were most often found in athletic areas (38%) (Table 1).

We found 28 different noncompliant food or beverage products marketed in the schools. The most frequent noncompliant products marketed on posters and

signs were Coke, Pepsi, Dr. Pepper, and Mountain Dew. The types of products marketed differed between wall posters/signs and vending machine exteriors (Table 2).

Scoreboards. Eighty-nine percent of schools with scoreboards ($n=19$) had food and beverage marketing on them. Sixty-three percent of the scoreboards had non-compliant marketing ($n=32$). Products marketed on scoreboards included Aquafina (30%), Coke (26%), Pepsi (19%), Dasani (11%), Mountain Dew (5%), Diet Coke (4%), Diet Pepsi (2%), Powerade® (2%), and Allsport® (1%) (data not shown).

DISCUSSION

Schools provide a captive audience for food sales and marketing. In schools, marketers compete for brand loyalty among our youngest, most vulnerable populations. We found a complex, pervasive food and beverage marketing environment in Maine high schools. Food and beverage marketing was observed throughout the school buildings on walls, school signs, scoreboards, and school equipment and supplies. Indirect forms of food and beverage marketing reported by

Figure 3. Percentage of Maine high schools offering specific products in vending machines and percentage of overall offerings of specific products, spring 2010

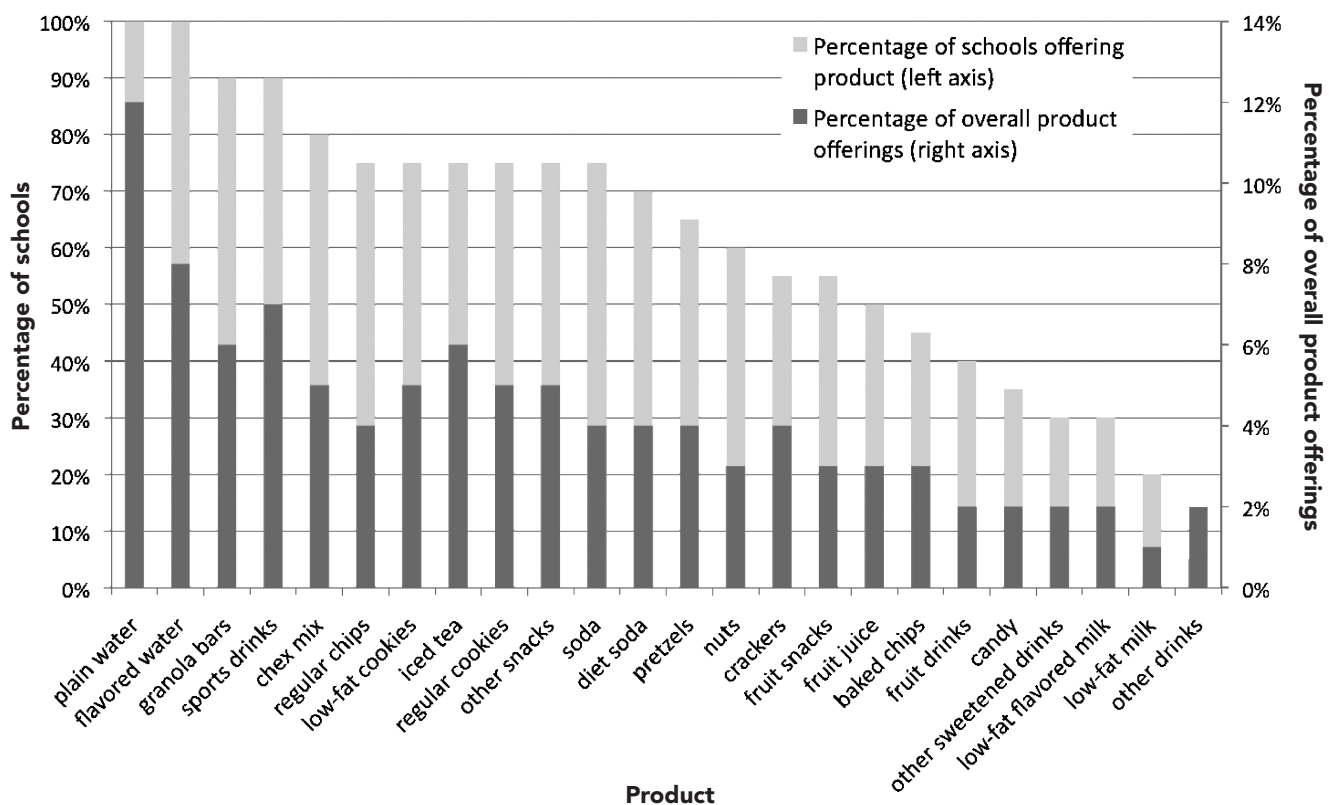


Table 2. Instances and percentages of the 10 most frequently marketed noncompliant food and beverage products on posters/signs and vending exteriors in a random selection of Maine high schools, spring 2010

Product	Noncompliant marketing on wall posters/signs N (percent)	Noncompliant marketing on vending exteriors N (percent)	Total noncompliant marketing N (percent)
Coke®	129 (58)	54 (41)	183 (51)
Pepsi®	41 (18)	21 (16)	62 (17)
Dr. Pepper®	14 (6)	4 (3)	18 (5)
Mountain Dew®	7 (3)	3 (2)	10 (3)
M&M's®	5 (2)	NA ^a	5 (1)
Crush® Soda	4 (2)	NA ^a	4 (1)
Starburst®	4 (2)	NA ^a	4 (1)
Lipton® Brisk®	NA ^a	11 (8)	11 (3)
Diet Pepsi®	3 (1)	8 (6)	8 (2)
Snickers®	3 (1)	NA ^a	3 (1)
Diet Coke®	2 (1)	8 (6)	6 (2)
Sprite®	NA ^a	6 (5)	6 (2)
Sunkist®	NA ^a	5 (4)	5 (1)
Diet Dr. Pepper®	NA ^a	2 (2)	2 (<1)
Total (10 most frequent)	212 (61)	122 (92)	334 (94)
Total (all noncompliant marketing)	224 (100)	132 (100)	356 (100)

^aProduct was not observed or advertised, or the instances of advertising were too few to be included.

NA = not applicable

school administrators included marketing in yearbooks and marketing associated with many school activities, such as fundraising, sponsorship of school events, and scholarships.

Although some efforts by industry and school administrators have been made to comply with state law, multiple instances of noncompliant marketing were found in nearly every school. Forty-five percent of all marketing found was for products owned by either Coca-Cola or PepsiCo. Coke and Pepsi dominated the noncompliant marketing landscape as well. These products, ironically, likely play a key role in the current obesity epidemic.¹⁻³

It is not surprising that we found food and beverages marketed where food and beverages are sold and consumed. More surprising was the disproportionate presence of such marketing in athletic areas and teachers' lounges. In athletics, products such as sports drinks are marketed as healthful and are often associated with greater vitality,¹⁸ taking advantage of the vulnerability of our young athletes. A disproportionate amount of marketing, including marketing of foods not meeting

the FMNV standard, was found in teachers' lounges, a location that is exempted from the state's nutritional standards for foods sold on school grounds, but not legally excused from the Chapter 156 restriction on marketing of non-nutritious products.

Whether industry is taking advantage of the potential confusion between these two policies or whether administrators are not aware of the legal difference is unknown. Stronger policies that do not allow exemptions and stronger nutrition standards—as evidenced by the quantity of lower nutritional quality vending machine foods sold (and marketed) that meet the FMNV standard—could improve the school nutrition environment.

Findings from our study indicate that administrators often do not know about the statewide ban or may have been confused by the difference between the marketing ban and the state nutrition standard for what is sold (Chapter 51) that was enacted in 2005.¹⁹ Administrators in a Montgomery County, Maryland, study¹⁵ were also largely unaware of government regulations affecting school marketing. However, our study indicates that administrators overwhelmingly support such a ban. Unfortunately, administrators may not have the tools they need to help implement this policy. School administrators face many competing priorities, and food and beverage sales and marketing provide needed revenue for school programs.

Before passage of the ban, Maine legislators were assured by industry advocates that soda marketing on school scoreboards and vending machines would be removed.²⁰ To date, this voluntary compliance has not been effective in Maine given this study's findings of noncompliant marketing on vending machine exteriors and scoreboards. Additionally, given the weak nutrition standard used in Maine's statewide policy for the sale or distribution of food and beverages on school grounds, foods high in sugar and/or fat and other poor nutritional quality foods will likely continue to dominate both the competitive food environment in Maine schools and the school-based marketing of these same foods and beverages.

Limitations

This study had several potential limitations. One limitation was the use of cross-sectional data collection, which allowed data collection at only one point in time. Therefore, food and beverage marketing that was present in the schools at other times may have been missed. Because of the complexity and pervasiveness of the food and beverage marketing environment, forms of marketing not presently on the FBMS may also have been overlooked. We were also unable to

objectively corroborate the interview portion of the FBMS. It is possible that the interview data underreported marketing in conjunction with school media, equipment, activities, sponsorships, and scholarships either due to social desirability or school administrators' potential lack of knowledge about marketing in these areas. Additionally, because our study included only high schools, conclusions about food and beverage marketing in Maine schools should be limited to that school population.

CONCLUSION

There is widespread marketing of non-nutritious foods and beverages in Maine high schools, despite a state-wide ban. We urgently need more effective policies, including stronger nutrition standards, better communication to administrators about policies, help for schools to implement policy, industry cooperation, and, finally, enforcement, to support improvements in the school nutrition environment.

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