

ORIGINAL ARTICLE

Self-regulation by industry of food marketing is having little impact during children's preferred television

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Abstract

Objective. To examine the efficacy of self-regulation of food marketing to children by comparing, during children's preferred viewing on television, the differences in food/beverage marketing between two groups of corporations: 17 corporations participating in the Canadian Children's Food and Beverage Advertising Initiative (CAI) and 35 corporations not participating (non-CAI) in this initiative. **Methods.** The food/beverage marketing activities of CAI and non-CAI corporations during 99.5 hours of children's preferred viewing on television were compared. First, the preferred television viewing of 272 children aged 10–12 years from Ontario and Quebec who completed TV viewing journals for a seven-day period was determined. A total of 32 television stations were simultaneously recorded, and a content analysis of children's preferred viewing was conducted and included coding all food/beverage promotions and their nutritional content. Each food/beverage promotion was classified by corporation type (i.e., CAI or non-CAI). **Results.** The CAI was responsible for significantly more food/beverage promotions, and used media characters and repetition more frequently in their food/beverage promotions than the non-CAI group. Nutritionally, the CAI food/beverage promotions were higher in fats, sugar, sodium and energy per 100 grams. A significantly greater proportion of the CAI food/beverage promotions were considered 'less healthy' compared to the non-CAI promotions. **Conclusion.** With the exception of the four corporations that did not market to children at all, the commitments that have been made in the CAI are not having a significant impact on the food and beverage marketing environment on television which is viewed by 10–12-year-olds.

Key words: Child, obesity, policy, television, prevention, marketing, food

Introduction

It has been estimated that 10% of the world's school-aged children are overweight and at increased risk for the development of chronic disease (1). Childhood obesity has recently been declared a 'national health crisis' in the USA (2). Currently, in the 9–13-year-old age group in Canada, 31% of boys and 28% of girls meet the criteria for either overweight or obesity, and it is estimated that three of every 10 adolescents aged 9 through 18 has an energy intake that exceeds their caloric needs (3).

Childhood obesity has been shown to be associated with the marketing of food and beverages (4). The World Health Assembly recently endorsed the draft WHO recommendations which state that there is a clear rationale for member states to develop policy that will reduce the impact of the marketing of foods

and beverages that are high in fats, sugars and salt on children (5).

The majority of governments, (including Canada, the USA, Australia and Spain) are, for the most part, currently relying on the food, beverage and restaurant industry to self-regulate in the area of food/beverage marketing directed towards children (6). However, there is no scientifically-based evidence that such a policy model is reducing children's exposure to food marketing or stemming childhood obesity rates (7). Since the introduction of increased self-regulatory marketing measures in the USA, television food advertising, overall, has declined for children aged 2–11 years and increased for children aged 12–17 years from 2002/2003 levels (8,9). Decreases of non-core food advertising on television by companies participating in a self regulatory initiative have

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also been reported in Australia between 2006 and 2009 (10). However in the USA increases have been observed in specific sub-categories of television food advertising directed at children such as fast food and full service restaurants (8,9).

In Canada, the self-regulatory marketing initiative entitled the Children's Food and Beverage Advertising Initiative (CAI) was announced in April 2007 and was fully implemented by December 2008 (11). Within this initiative, 17 large food and beverage manufacturers, including Burger King Restaurants of Canada Inc., Campbell Company of Canada, General Mills Canada Corporation, Kellogg Canada Inc., Kraft Canada Inc., McDonald's Restaurants of Canada Ltd, Nestle Canada Inc., Parmalat Canada Inc., and Weston Bakeries Limited pledged to devote 50% of their child-directed advertising on television, radio, print and the Internet to 'healthier dietary choices'. Cadbury Adams Canada Inc., Coca-Cola Canada, Hershey Canada Inc., Janes Family Foods Ltd, Mars Canada Inc., McCain Foods Canada, PepsiCo Canada, and Unilever Canada Inc., for their part, pledged to not direct any advertising to children under age 12. The CAI corporations also pledged to reduce their use of third party licensed characters. Each corporation independently developed its own definition of 'advertising directed primarily to children under 12 years of age', nutrition criteria, and audience thresholds (11).

To date, no independent research in Canada has evaluated the CAI. The purpose of the current study is to compare the marketing practices on television of food/beverage corporations that are participating in the Canadian CAI to those corporations not participating in terms of the frequency and repetition of promotions, the use of media characters, and the nutritional quality of the foods/beverages featured in these promotions. It was expected that, as a group, those corporations participating in the CAI would be advertising less frequently, use licensed characters less regularly and that their promotions would feature fewer foods and beverages classified as 'less healthy' by the UK Nutrient Profile Model compared to food/beverage promotions in the non-CAI group.

Methods

In order to compare the marketing activities of CAI and non-CAI corporations, we (a) determined children's preferred television viewing, (b) conducted a content analysis of this viewing, (c) classified each food/beverage promotion by corporation type (i.e., CAI or non-CAI), and (d) conducted a nutritional analysis of the foods/beverages featured in every promotion.

Determination of children's preferred viewing

A total of 272 English-speaking subjects between the ages of 10 and 12 years were recruited from 14 schools in two large metropolitan centers in Ontario and Quebec; 62% of the sample was female and 38% was male. Ethics approval was received for this study from The Ottawa Hospital Research Ethics Board; all subjects gave oral assent, their parents gave informed consent, and each school and school board with participating students approved the study. Each school received \$350 for their participation. From March 26 through April 1 2009, a week selected because it did not include school or statutory holidays, each participant completed a television viewing diary as previously described (12). During this same week, a third party-contractor recorded 32 television stations of potential appeal to participants from 06:00 h to midnight on a multi-media recording server.

Children's preferred television viewing was defined as all television programs viewed by at least five children in the sample. Given that the subjects' television viewing was extremely dispersed, this cut-off was chosen to maximize both the number of hours of television analyzed and the number of stations included in the content analysis. This cut-off resulted in a sample of 99.5 hours (h) of television viewing drawn from 11 television stations including three children's specialty stations (87.5 h) and eight generalist stations (12 h).

Content analysis of children's preferred viewing

A content analysis of all the non-programming content in the total 99.5 h was conducted and included the systematic documentation of type and length of promotion, the station on which it aired, the type of food or beverage being promoted, and the presence of media characters. The content analysis was conducted by a research assistant who had completed two days of training. All food and beverage promotions were coded twice by the research assistant and the main researcher reviewed a random sample of 15% of these promotions to ensure reliability. Inter-coder agreement was 97%.

Food/beverage promotions included advertisements, contests and sponsorship announcements that featured a food, beverage or restaurant. These varied in length between 5 and 45 seconds ($\chi = 20.3$ seconds). Media characters included the presence of licensed characters, movie or sports celebrities, and spokescharacters (i.e., company-created mascots like Tony the Tiger) in the advertisement. Each of these types of media characters was coded and analyzed separately as the CAI commitments only limit licensed character use. Media characters

were coded as promoting a food/beverage product if they endorsed the product/restaurant verbally (i.e., 'They're great!') or non-verbally.

Classification of promotions by corporation type

Once the content analysis was complete, we determined which corporation was responsible for every promotion by researching product names online. Next, corporations were either classified as CAI or non-CAI. CAI corporations were those corporations participating in the Children's Food and Beverage Advertising Initiative at the time that data was collected in March/April 2009 ($n = 17$). Non-CAI corporations were those not participating in this initiative at this time. Size comparisons between CAI and non-CAI corporations were not possible due to inconsistent financial reporting between corporations and lack of public information available regarding private corporations. Instead, company size rankings (top 50 quick-serve restaurants in North-America, top 100 food processing in North America, top 100 candy manufacturing worldwide) were obtained through trade journal articles published online and used to compare company size (14–16).

Collection of nutritional information

The nutritional information for the featured food during the promotion was collected from, in order of priority, company websites, direct contact with the corporation, product labels, the Canadian Nutrient File and the USDA National Nutrient Database. The nutritional information gathered included total fat, saturated fat, trans fat, protein, carbohydrate, sugar, fibre, sodium, and energy per 100 g of each advertised food. Liquids were first converted to 100 ml servings and then to 100 g servings by multiplying by the specific density of foods (17). Each food/beverage was also categorized using the three-step UK Nutrient Profile Model developed by the Food Standards Agency in the UK (18). This model allocates points to foods based on the energy, saturated fat, total sugar, sodium, fruit, vegetable, nut, fibre and protein content of 100 g of a food/beverage. Foods that score 4 points or more and beverages that score 1 point or more are categorized as 'less healthy' (19). In this study, foods that did not fall into this category were defined as 'healthier'. The UK Nutrient Profile Model has been shown to classify foods in a manner that is consistent with the decisions made by dietitians (20). It has also shown good construct, convergent, and discriminate validity (21) and has been successfully applied to classify television food advertisements outside of the UK in New Zealand (22).

When many food or many beverage items were featured in a promotion together, the nutritional information of all food products or all beverage products was averaged. When combination meals that included both food and beverage components that are sold and intended to be eaten together were highlighted (such as chicken tenders, apple slices and a drink), the nutritional information for the two main food items (i.e., chicken and apple) were added together (i.e., the energy for the chicken plus the energy for the apple). This method of examining foods and beverages separately was undertaken as the UK Nutrient Profile Model has different cut-off scores for foods and beverages as noted above.

Analysis

All data was inputted and analyzed using PASW Statistics 17.0 (SPSS, 2009). Non-parametric Chi square analyses were undertaken in order to compare CAI and non-CAI expected promotion frequencies to actual promotion frequencies, to compare the use of media characters and to compare the frequencies of foods classified according to the UK Nutrient Profile Model. *T*-tests were calculated to determine group differences in average nutrient content.

Analyses were conducted on the total 99.5 h of television viewing and on two sub-samples of preferred viewing: the 87.5-h sample of viewing from children's specialty channels and the 12-h sample that only included children's preferred viewing from generalist stations. These three separate analyses were conducted in order to assess how the CAI and non-CAI were performing on children's specialty channels compared to on generalist stations viewed by children.

Results

Comparison of CAI and non-CAI corporations

Thirteen CAI corporations and 35 non-CAI corporations were responsible for all the food/beverage promotions during the 99.5 h of preferred viewing while in the 87.5-h sample, nine CAI corporations and 16 non-CAI corporations were responsible for these promotions. The CAI corporations that advertised during children's total preferred viewing (99.5 h) consisted of 13 multinational corporations whereas the non-CAI corporations consisted of six Canadian, one American, and 28 multinational corporations. The CAI corporations that advertised included one restaurant chain, seven food-related corporations, one beverage-related corporation, and four corporations that manufacture both food and

beverages. The non-CAI corporations were more diverse and included 12 restaurant chains, 10 food manufacturers, one beverage manufacturer, four corporations that manufacture both food and beverages, five corporations that exclusively manufacture/bottle alcoholic beverages and three industry associations. All CAI corporations were ranked in 2009 trade articles as being in the top 100 food/beverage processors or top 50 quick serve restaurants or confectionary manufacturers. Only 43% ($n = 15$) of non-CAI corporations were ranked in the top of their categories, 20% did not meet these rankings and 37% were not ranked (10 private companies and three industry groups).

Length of food/beverage promotions

CAI promotions ranged in length from 5–45 sec and were longer at an average 21.3 sec ($SD = 9.2$) compared to non-CAI promotions ($\chi = 18.6$, $SD = 9.7$; $t = 3.028$, $p = 0.003$) which ranged in length from 5–30 sec.

Frequency of food/beverage promotions

In the 99.5 h of children's preferred television programming, there were 2017 total promotions and 24% of these were food/beverage promotions ($n = 481$). The frequency of CAI and non-CAI advertisements, contests, sponsorship announcements and total food and beverage promotions are provided in Table I.

Table I. Frequency of food and beverage promotions during children's preferred viewing.

	CAI No. (%)	Non-CAI No. (%)	<i>P</i>
99.5 hours preferred TV			
Ads	216 (71)	165 (93)	$p = 0.009$
Contests	32 (11)	7 (4)	$p = 0.001$
Sponsorships	55 (18)	6 (3)	$p = 0.001$
Total promotions	303 (100)	178 (100)	$p = 0.001$
Rate of promotions	3.0/hr	1.8/hr	
87.5 hours preferred children's TV			
Ads	181 (69)	120 (93)	$p = 0.001$
Contests	28 (11)	7 (5)	$p = 0.001$
Sponsorships	53 (20)	2 (2)	
Total promotions	262 (100)	129 (100)	$p = 0.001$
Rate of promotions	3.0/hr	1.5/hr	
12 hours preferred generalist TV			
Ads	35 (85)	45 (92)	$p = 0.264$
Contests	4 (10)	0 (0)	
Sponsorships	2 (5)	4 (8)	
Total promotions	41 (100)	49 (100)	$p = 0.399$
Rate of promotions	3.4/hr	4.1/hr	

Most frequent advertisers

Overall, in the 99.5 h of viewing, the CAI was responsible for 63%, and the non-CAI was responsible for 37% of the promotions, while in the 87.5-h sample of viewing on children's specialty channels, the CAI was responsible for 67% of the promotions and the non-CAI was responsible for 33% of the promotions. The same three CAI corporations (General Mills Canada Corporation, Kraft Canada Inc., Kellogg Canada Inc.) were responsible for 35% and 39% of the total food and beverage promotions during the 99.5-h and 87.5-h samples.

The five most frequent CAI advertisers (General Mills Canada Corporation, Kraft Canada Inc., Kellogg Canada Inc., Mars Canada and McDonald's Restaurants of Canada Ltd) were responsible for 80% of the CAI promotions in the total sample of 99.5 h and 85% of the CAI promotions in the 87.5-h sample. The five most frequent non-CAI advertisers (Dairy Farmers of Canada, Topps Company Inc., Post Foods Canada Corp., CEC Entertainment Inc., and Ultima Foods) were responsible for 57% of the non-CAI food/beverage promotions in the total sample of 99.5 h and 74% of the non-CAI food/beverage promotions in the 87.5-h sample.

Number of products and repetition of advertisements

In the total sample of 99.5 h, the CAI advertised 46 different food/beverage/restaurant products, and the non-CAI advertised 51 different products. Nine (20%) of the CAI products and five (10%) of the non-CAI products were repeated more than 10 times in this sample. In the 87.5-h sample of preferred programming on children's specialty channels, the CAI advertised 27 different food/beverage products and the non-CAI advertised 20 different products. Table II provides a list of the products repeated more than 10 times in the 87.5-h sample.

Use of media and licensed characters

Table III summarizes the use of media characters during food and beverage promotions in the 99.5-, 87.5-, and 12-h preferred programming. In the 99.5 preferred children's hours, 82 (90%) of 91 CAI promotions with media characters promoted 'less healthy' foods or beverages (as defined by the UK Nutrient Profile Model) while 13 (48%) of 27 of the non-CAI promotions with media characters promoted these foods. In the 87.5-h sample, 72 (92%) of 78 CAI promotions with media characters promoted 'less healthy' foods or beverages while nine (45%) of 20 of the non-CAI promotions with media characters promoted these foods. In both the 99.5-h

Table II. Foods and beverages advertised more than 10 times during 87.5 hours of children's specialty station programming.

	CAI		Non-CAI	
	Product/ brand	No. of repeats	Product/ brand	No. of repeats
Candy and snacks	Oreo	12	Baby Bottle Pop	13
	Cookies			
	Gushers	11	Ring Pop	13
	Fruit Snacks			
	Hubba	15		
	Bubba products			
	Hubba	18		
	Bubba Glop			
	Rice Krispies	18		
	Squares			
	Bars			
	Sponge Bob	28		
	Fruit Snacks			
Beverages			Yoplait Yop	10
Restaurants	McDonald's:	32	Chuck E Cheese	11
	Happy Meal			
	Cheestrings	17	Milk	36
Prepared foods	Kraft Dinner Original	33		

($\chi^2 = 23.4, p < 0.001$) and 87.5-h samples ($\chi^2 = 24.8, p < 0.001$), the CAI advertisements with media characters were significantly more likely to promote 'less healthy' foods than the non-CAI group.

Nutrition analysis

Compared to the non-CAI group, the CAI food and beverage promotions were significantly higher in fats, sugar, sodium and energy per 100 g as shown in Table IV. When the CAI and non-CAI food and beverage promotions were classified according to the UK Nutrient Profile Model, a significantly greater number of CAI promotions were classified as 'less healthy'. More precisely, 243 (80%) of the CAI food/beverage promotions were considered 'less healthy' compared to 97 (55%) of the non-CAI promotions ($\chi^2 = 34.0, p = 0.001$).

Discussion

The results of this study indicate that self-regulation by industry in food and beverage marketing to children is having little impact on children's food marketing environment. Compared to the non-CAI group, the CAI group was responsible for significantly more food/beverage promotions during children's total preferred viewing and during their preferred viewing on children's specialty channels (including significantly more food/beverage advertisements, contests and sponsorship announcements in both instances). Contests and sponsorship announcements, in fact, accounted for 29% of CAI promotions during children's total preferred viewing. It is unclear as to whether such forms of promotion on television are covered in CAI definitions of 'advertisements directed primarily to children under 12' however, it

Table III. Presence of media characters in food and beverage promotions during children's preferred viewing.

	CAI No. (%)	Non-CAI No. (%)	P
99.5 hours preferred TV			
Media character appearance	91 (30)	27 (15)	$p < 0.001$
Licensed characters	15	0	
Celebrities	9	0	
Spokescharacters	67	27	
Media character promotion	38 (13)	12 (7)	$p = 0.029$
Total food/beverage promotions	303 (100)	178 (100)	
87.5 hours preferred children's TV			
Media character appearance	78 (30)	20 (16)	$p = 0.002$
Licensed characters	15	0	
Celebrities	3	0	
Spokescharacters	60	20	
Media character promotion	37 (14)	11 (9)	$p = 0.075$
Total food/beverage promotions	262 (100)	129 (100)	
12 hours preferred generalist TV			
Media character appearance	13 (32)	7 (14)	
Licensed characters	0 (0)	0 (0)	
Celebrities	6 (15)	0 (0)	
Spokescharacters	7 (17)	7 (14)	
Media character promotion	1 (2)	1 (2)	
Total food/beverage promotions	41 (100)	49 (100)	

Table IV. Nutrients per 100 g of foods and beverages advertised during 99.5 hours of children's preferred programming.

	CAI \bar{x} (SD)	Non-CAI \bar{x} (SD)	Total sample \bar{x} (SD)	t	P
Total fat (g)	8.2 (8.6)	5.2 (8.0)	7.1 (8.5)	3.9	$p < 0.001$
Saturated fat (g)	3.5 (5.3)	2.3 (4.5)	3.1 (5.0)	2.7	$p = 0.007$
Trans fat (g)	0.3 (0.7)	0.1 (0.2)	0.2 (0.6)	4.2	$p < 0.001$
Protein (g)	6.0 (6.5)	5.5 (5.2)	5.8 (6.0)	0.951	$p = 0.342$
Carbohydrate (g)	50.6 (32.1)	32.0 (32.9)	43.8 (33.6)	6.1	$p < 0.001$
Sugar (g)	28.3 (23.4)	19.5 (26.8)	25.1 (25.0)	3.7	$p < 0.001$
Fibre (g)	1.6 (3.5)	1.5 (2.9)	1.6 (3.3)	0.3	$p = 0.744$
Sodium (mg)	348.2 (276.5)	232.6 (228.4)	305.7 (265.6)	4.7	$p < 0.001$
Energy (kcal)	323.7 (101.5)	210.3 (164.6)	282.0 (139.4)	8.3	$p < 0.001$
No. (%)	303 (100.0)	176 (100.0)	479 (100.0)		

is likely that advertising is being defined in a very narrow sense by many of the CAI corporations and excluding such forms of marketing.

Advertisement repetition, which has been shown to affect child preferences and behaviours (23), and the use of media characters also figured significantly more frequently in the CAI advertisements compared with non-CAI advertisements. CAI pledges specify reduced use of licensed characters for products that do not meet their nutritional criteria and, while licensed characters were used on a limited basis in children's preferred viewing, spokescharacters are featured in 22% of all CAI food/beverage promotions. In addition, the CAI promotions with media characters were significantly more likely to promote 'less healthy' foods than the non-CAI group. Similar results have been described in Australia (24). Given that evidence shows that spokescharacters are effective at attracting children's attention, increasing product recognition and inducing favourable attitudes toward a product (25,26), an exclusive focus on licensed characters in self-regulatory commitments regarding marketing to children is not sufficient. Food and beverage corporations must extend their pledges to limit the use of spokescharacters in food and beverage marketing.

We expected the CAI food/beverage promotions to have a nutritional profile that was superior to the non-CAI food/beverage promotions although this was not the case. A total of 80% of CAI-featured foods/beverages fell into the 'less healthy' category compared to 55% of the non-CAI food promotions. Per 100 g, the CAI food and beverage promotions featured products that were significantly higher in fats, sugar, sodium and energy compared to non-CAI food/beverage advertisements. Overall, these results point to the need for more stringent consistent nutrition standards that are scientifically based. Currently the CAI nutrition criteria vary significantly between corporations and many of the products which fit these nutritional criteria seem to be of questionable nutritional value.

Despite the fact that the CAI corporations are fairly homogeneous, not all CAI corporations are behaving similarly. Food and beverage marketing during children's preferred viewing is highly concentrated in the hands of five large multi-nationals which are responsible for 80% of this type of marketing. Some other corporations are marketing at low levels, while others are not marketing at all. Four CAI corporations did not advertise during the 99.5 h of children's total preferred viewing (Burger King, Campbell's, Jane's and Unilever) and eight CAI corporations did not advertise foods or beverages during the sub-set of children's preferred viewing that only included children's specialty channels (Burger King, Cadbury Adams, Campbell's, Coca Cola, Hershey, Jane's, McCain's, and Unilever). Voluntary participation in self-regulations to curb marketing directed at children can place corporations who choose to participate at a competitive disadvantage (27). As such, given their fiduciary and legal responsibilities to shareholders, most corporations who choose to participate commit to weak marketing restrictions. However, our data shows that even within self-regulation schemes, the competitive playing field is not level amongst CAI corporations. Government regulation in this area would level the playing field for industry.

Strengths and weaknesses

It can be argued that the CAI and non-CAI groups represent different groups of corporations. Ideally, we would have compared the size of those corporations participating in the CAI and those in the non-CAI group. However, given the inconsistency of financial reporting and the lack of financial reporting in some cases, we compared the corporations on corporation type, and by their size rankings in trade journals. The CAI group is more homogeneous than the non-CAI particularly given that it is formed exclusively of large publically-traded multi-nationals.

Restaurants and beverage manufacturers, non-publically traded corporations and national corporations are sparsely represented or not represented at all in this group. While it is important to keep these differences in mind when examining the data, one would still expect to see contrasts between the marketing activities of the CAI and non-CAI particularly given that there were 13 large multinationals ranked at the top of their food categories in the CAI group and 15 large ranked multinationals in the non-CAI group.

The television viewing diaries and the television recording was conducted over a one-week period that may not have been representative of children's viewing habits or television programming at other points during the year. However, the week in our study was chosen for its distance from school holidays. Gantz et al. also argue that television programming is more likely to vary by day rather than by week (13). The sample of children that determined children's preferred viewing was self-selected. More girls participated than boys and overall, the participants' parents were more educated than the average in Canada. A representative group of children may have been watching different television programs; however, our group of participants was watching television from 11 stations at a variety of times across seven days and this gave us a clear picture of what children of this age are watching on television. In terms of generalizability, our viewing sample was based on what children aged 10–12 watch on television; therefore, our results may not be generalizable to what older or younger children in Canada are viewing.

One of the strengths of this study is our selection of the 10–12-year-old age segment. It has been suggested (8), that corporations participating in self-regulatory initiatives may be focusing their advertising on programs which fall slightly above their cut-offs for child viewing. Currently the corporations participating in the CAI have inconsistent definitions of 'programming directed primarily at those under-12 years'. Child audience thresholds vary from 30–50% of the audience. These definitions appear to simply limit the time to which the marketing restrictions apply. Here again, consistency across corporations and more stringent audience thresholds, such as 15% in the province of Quebec, would improve children's food/beverage marketing environments on television. Other strengths include our direct measure of children's preferred viewing, the simultaneous taping of 32 television stations over a seven-day period and a definition of promotions which included all advertisements, contests and sponsorship announcements that were 5 sec or more in duration.

Conclusion

This study only addresses some of the commitments made by CAI corporations. Future research needs to independently evaluate commitments that have been made by CAI corporations in other areas such as the use of product placement in television and movies and in-school marketing activities. To date, two annual compliance reports have been published by an industry supported advertising self-regulatory body that demonstrate that CAI participants, with few exceptions, are meeting their own commitments (11,28). As Wilde (29) indicates, what these evaluations fail to show is whether these corporate pledges are stringent enough to actually change the children's food and beverage marketing environment. To accomplish this goal, specific and measurable indicators would need to be developed that are clearly linked to self-regulatory objectives (6).

Since our data collection, two new corporations (Ferrero Canada Ltd and Post Foods Canada Corp.) have joined the CAI. In 2010, the CAI enhanced its pledges, and corporations committed to devote 100% of their child-directed advertising to 'better for you' products (11). While commendable, it is unlikely that such changes will have a measureable influence on children when participation remains voluntary and when commitments are heterogeneous and not necessarily based on sound scientific principles of nutritional research.

Wansink and Huckabee have stated that "... food companies are not focused on making people fat, they are focused on making money" (p. 159) (29). Neither are food companies focused on keeping people thin. The Children's Food and Beverage Initiative is not likely having a positive influence on children's food and beverage intake and their obesity rates. The food and beverage industry can, if it chooses, play a significant role in curbing childhood obesity rates. While some food and beverage corporations have stepped up to the plate in this regard, others are simply paying lip service to the childhood obesity crisis and are "... not yet fully engaged with the seriousness and urgency" of the current childhood obesity epidemic (p. 330) (30). Future research should examine the progress of those corporations participating in the CAI. In the meantime, in order to protect the health of our children, governments must consider regulatory approaches in marketing to children.

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References

- Lobstein T, Baur L, Uauy R. Obesity in children and young people: a crisis in public health. *Obes Rev.* 2004;5:4–85.
- Barnes M. Solving the Problem of Childhood Obesity within a Generation. White House Task Force on Childhood Obesity Report to the President. Washington, DC: Executive Office of the President of the United States; 2010.
- Health Canada. Do Canadian Adolescents Meet their Nutrient Requirements through Food Intake Alone? Ottawa: Health Canada; 2009. Available at: http://www.hc-sc.gc.ca/fn-an/alt_formats/pdf/surveill/nutrition/commun/art-nutr-adol-eng.pdf. Accessed August 2010.
- McGinnis JM, Appleton Gootman J, Kraak VI. Food Marketing to Children and Youth: Threat or Opportunity? Washington, DC: The National Academies Press; 2006.
- World Health Organization. Prevention and Control of Non-communicable Diseases: Implementation of the Global Strategy. Report by the Secretariat. Geneva: World Health Organization; 2010 April. Report No.: A63/12. Available at: http://apps.who.int/gb/ebwha/pdf_files/WHA63/A63_12-en.pdf. Accessed August 2010.
- Lobstein T. The PolMark Project. Policies on Marketing Food and Beverages to Children. Review of regulations in EU member states. London, England: International Association for the Study of Obesity; 2010. Available at: <http://polmarkproject.net/documents/CoordinatorsReportonActions.pdf>. Accessed September 2010.
- Hawkes C. Regulating food marketing to young people worldwide: Trends and policy drivers. *Am J Public Health.* 2007;97:1962–72.
- Powell LM, Szczytko G, Chaloupka FJ. Trends in exposure to television food advertisements among children and adolescents in the United States. *Arch Pediatr Adolesc Med.* 2010;164:794–802.
- Harris JL, Weinberg ME, Schwartz MB, Ross C, Ostroff J, Brownell KD. Trends in Television Food Advertising. Progress in Reducing Unhealthy Marketing to Young People? Yale University, Connecticut: Rudd Centre For Food Policy and Obesity; 2010.
- King L, Hebden L, Grunseit A, Kelly B, Chapman K, Venugopal K. Industry self-regulation of television food advertising: responsible or responsive. *Int J Pediatr Obes.* 2011;6(2-2):e390–8.
- Advertising Standards Canada. The Canadian Children's Food and Beverage Advertising Initiative: 2009 Compliance Report. Toronto, Canada: Advertising Standards Canada; 2010. Available at: <http://www.adstandards.com/en/childreinitiative/2009ComplianceReport.pdf>. Accessed August 2010.
- Potvin Kent M, Dubois L, Wanless A. Food marketing on children's television in two different policy environments. *Int J Pediatr Obes.* 2011;6(2-2):e433–41.
- Gantz W, Schwartz N, Angelini JR, Rideout V. Food for Thought: Television Food Advertising to Children in the United States. Menlo Park, CA: The Henry J. Kaiser Family Foundation; 2007.
- QSR Top 50 2010. Available at: http://www.qsrmagazine.com/reports/qsrtop50/2010/chart_rank.phtml. Accessed August 2010.
- Food Processing's Top 100 2010. Available at: <http://www.foodprocessing.com/top100/>. Accessed August 2010.
- The 8th Annual Candy Industry Top Global 100 List. Available at: http://www.candyindustry.com/Articles/Departments/BNP_GUID_9-5-2006_A_10000000000000506528. Accessed August 2010.
- Food Standards Agency. Food Portion Sizes. 3rd ed. London: TSO; 2002.
- FAO. Food energy – methods of analysis and conversion factors. Report of a Technical Workshop. Rome, Italy: Food and Agriculture Organization of the United Nations; 2003. Available at: <http://ftp.fao.org/docrep/fao/006/y5022e/y5022e00.pdf>. Accessed August 2010.
- Department of Health. Nutrient Profiling Technical Guidance. Accessed July 2010. London: Food Standards Agency; April 2009.
- Scarborough P, Boxer A, Rayner M, Stockley L. Testing nutrient profile models using data from a survey of nutrition professionals. *Public Health Nutr.* 2007;10:337–45.
- Arambepola C, Scarborough P, Rayner M. Validating a nutrient profile model. *Public Health Nutr.* 2008;11:371–8.
- Jenkin G, Wilson N, Hermanson N. Identifying 'unhealthy' food advertising on television: a case study applying the UK Nutrient Profile model. *Public Health Nutr.* 2008;12:614–23.
- Gorn GJ, Goldberg ME. Children's responses to repetitive television commercials. *J Consum Res.* 1980;6:421–4.
- Kelly B, Hattersley L, King L, Flood V. Persuasive food marketing to children: use of cartoons and competitions in Australian commercial television advertisements. *Health Promot Int.* 2008;23:337–44.
- Mizerski R. The relationship between cartoon trade character recognition and attitude toward product category in young children. *J Mark.* 1995;59:58–70.
- Neeley SM, Schumann DW. Using animated spokes-characters in advertising to young children. Does increasing attention to advertising necessarily lead to product preference? *J Advert.* 2004;33:7–23.
- Ludwig DS, Nestle M. Can the food industry play a constructive role in the obesity epidemic? *JAMA.* 2008;300:1808–11.
- Advertising Standards Canada. The Canadian Children's Food and Beverage Advertising Initiative: Year One Compliance Report. Toronto, Canada: Advertising Standards Canada; 2009. Available at: <http://www.adstandards.com/en/childreinitiative/yearOneComplianceReport.pdf>. Accessed August 2010.
- Wilde P. Self-regulation and the response to concerns about food and beverage marketing to children in the United States. *Nutr Rev.* 2009;67:155–66.
- Lewin A, Lindstrom L, Nestle M. Food industry promises to address childhood obesity: preliminary evaluation. *J Public Health Policy.* 2006;27:327–48.