Changes in the Volume, Power and Nutritional Quality of Foods Marketed to Children on Television in Canada

Monique Potvin Kent¹, Cherie L. Martin² and Emily A. Kent³

Objective: To evaluate the self-regulatory Children’s Food and Beverage Advertising Initiative pre- and post-implementation in terms of volume of marketing, marketing techniques, and nutritional quality of foods marketed to children on television.

Methods: Data for 11 food categories for May 2006 and 2011 were purchased from Nielsen Media Research for two children’s specialty channels in Toronto. A content analysis of food advertisements examining the volume and marketing techniques was undertaken. Nutritional information on each advertisement was collected and comparisons were made between 2006 and 2011.

Results: The volume of ads aired by Canadian Children’s Food and Beverage Advertising Initiative (CAI) companies on children’s specialty channels decreased by 24% between 2006 and 2011; however, children and teens were targeted significantly more, and spokes-characters and licensed characters were used more frequently in 2011 compared to 2006. The overall nutritional quality of CAI advertisements remains unchanged between 2006 and 2011.

Conclusion: There are clear weaknesses in the self-regulatory system in Canada. Food advertising needs to be regulated to protect the health of Canadian children.

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Introduction

Food and beverage marketing to children has been associated with obesity, short-term food intake, food requests, and food preferences (1,2). These associations have elicited interest given that childhood obesity rates have increased significantly in many developed countries including Spain, France, the United Kingdom, Japan, and the United States (3). In Canada, the prevalence of childhood obesity has tripled since 1981 increasing from <2 to 9% in 2013 (4,5). Food marketing to children is extensive, and, in the United States totaled US $1.79 billion in 2009. Television advertising remains the predominant medium to market food/beverages to children and represents 35% of these expenditures (6).

Marketing to children in Canada (with the exception of the province of Quebec), is mostly self-regulated by industry. In 2007, 16 large food/beverage manufacturers and fast food restaurants initiated the voluntary Canadian Children’s Food and Beverage Advertising Initiative (CAI) to reduce the amount of unhealthy food advertising seen by children under 12 years (7). By 2011, 18 companies had joined this initiative. As identified in Table 1, half of the companies pledged to completely refrain from advertising to children under 12 years while the remainder pledged to only advertise “healthier dietary choices” in print media, on television, radio, and the Internet. Each company participating in the CAI independently defined the scope of marketing to children, the child audience thresholds (ranging between 25 and 35%), and nutritional criteria. Companies also pledged to reduce their use of third party licensed characters for products that did not meet their nutritional standards (7).

To date, most evaluations of voluntary self-regulatory policies that exist in countries such as the United States and Australia have shown that, despite modest improvements in children’s exposure to food marketing over time (8-11), the improvement in the nutritional quality of foods and beverages advertised to children have been insignificant overall (11,12). Each self-regulatory initiative needs to be evaluated as they differ, sometimes significantly, from country to country despite participation from similar companies (13).

Very little research has examined the influence of the CAI on television marketing directed at children over time. The current study aimed to fill this void by examining whether the companies participating in

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TABLE 1 Companies participating in the Canadian Children’s Food and Beverage Advertising Initiative and their respective pledges in 2011

| Pledge to advertise only “healthier dietary choice” to children under 12 years | Company |
|---|---|
| Burger King Restaurants of Canada Inc. | Campbell Company of Canada |
| 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. | Post Foods Canada Corp. |
| Weston Bakeries Limited | Unilever Canada Inc. |

Methods

Data were purchased for May 2006 (May 1-28) and May 2011 (May 2-29) for Toronto and Vancouver for the two primary children’s specialty channels from Nielsen Media Research, a marketing research company that analyzes television viewing data and provides advertising information services. These two specialty channels were selected as they are the only specialty stations recorded by Nielsen Media Research that specifically target children and/or teens and they are heavily viewed by children and teens in Canada. The month of May was selected because of its distance from major holidays that could potentially inflate advertising budgets. As food advertising for Toronto and Vancouver was almost identical on these two stations between 6 AM and 12 AM for May 2006 and May 2011 for the 11 food categories listed above.

Nutritional assessment

Nutrient information for each advertised product was drawn from June through July 2012 from, in order of priority, the relevant Canadian company website, the American company website and product labels. Nutrient information collected included energy (kcal), total fat, saturated fat, trans-fat, sodium, carbohydrates, fiber, sugar, and protein per 100 g of the product. Liquids were converted to 100 mL servings and then converted to 100 g servings by multiplying by the appropriate specific gravity of commonly consumed foods (14). When combination meals featuring multiple items designed to be eaten together were advertised (i.e., chicken nuggets, apple slices, and drink), an average of the two main food items in the meal was calculated. When many food/beverage items were featured equally in the same advertisement, the nutritional information of all the products was collected and then averaged. Nutrient information for 13 products was not available as these products had been discontinued. In these cases, nutrient information for a similar product, by the same company was substituted. The nutrient information for 10 advertisements was not collected as there...
was no specific food/beverage featured in these advertisements. These included company endorsements such as charity fundraisers and gift card advertisements.

Each food ad was categorized as “less healthy” or “healthier” using the U.K. Ofcom Nutrient Profiling Model (15). This categorization model, developed by the Food Standards Agency in the United Kingdom, allocates points based on the nutritional content of 100 g of food or beverage based on energy, saturated fat, total sugar, sodium, fruit, vegetable, nut, fiber, and protein content. Beverages that score 1 point or more and foods that score 4 points or more are classified as “less healthy.” Those foods/beverages that fell below these scores were classified as “healthier” in the current study. The U.K. Ofcom Nutrient Profiling Model has shown good construct, convergent, and discriminate validity (16,17) and has been used effectively in multiple research studies to classify the nutritional quality of foods (18,19).

Content analysis
A content analysis was conducted on each food/beverage advertisement to determine the power of each advertisement. As per the definition used by the WHO, the power of the advertisement refers to the content, design, and execution of the marketing message (20). The power was assessed by determining who was being targeted in the advertisements and by an assessment of the marketing techniques used. Advertisements were classified as child targeted, teen targeted, adult targeted, child and teen targeted, or child and adult targeted. An advertisement was targeted at children if the product featured was designed for children aged 2-11 years, and the overall presentation was designed to appeal to children including the use of at least one of the following: (1) themes related to fantasy, magic, mystery, suspense, or adventure; (2) people, heroes, magical creatures, animals that the child can identify with; (3) child-like voices; (4) animation; (5) music that appeals to children; or (6) bright color, repetition or fast-cutting. An advertisement was targeted at teens (youth aged 12-17 years) if the product featured was designed for teens and the overall presentation was designed to appeal to teens including at least one of the following: (1) the use of characters that teens could identify with; (2) the use of activities tied to adolescence (i.e., school dances, video games); (3) the use of music that appeals to teens; (4) the use of themes related to adolescence (i.e., popularity, freedom); or (5) the use of humor directed at teens. Products were classified as targeting both children and teens if the product and presentation was determined to be appealing to both children and teens and met the criteria for each age group described above. Products defined as targeting both children and adults featured products designed for children aged 2-11 years; however, the themes, message, voices, and music were aimed at adults. For example, an advertisement for a children’s fruit yogurt accompanied by a free toy that is advertised as a healthy and easy to pack snack for school lunches.

Power was also assessed by examining the marketing techniques used in each advertisement. Fun was coded if the word “fun” was explicitly stated or if fun was implied through association with a fun reward such as toys, games, or fun activities. An advertisement was coded as using health as a persuasive appeal if the advertisement explicitly mentioned the health benefit of the product (i.e., “it’s part of a healthy breakfast”), the nutritional content of the food/beverage (i.e., “it’s high in fiber”), or if natural ingredients were explicitly emphasized. An advertisement was also coded as using health as a persuasive appeal if the product in the advertisement was featured with other healthy items (i.e., a bowl of cereal with fruit and orange juice) implying that it was part of a healthy meal. In addition, each food/beverage advertisement was assessed for the presence of spokes-characters (characters created and owned by the company; i.e., SNAP, CRACKLE, and POP), and of licensed characters (characters licensed by the company; i.e., Dora the Explorer used in a pasta advertisement). The presence of television or movie celebrities and music or athletic celebrities was also coded.

A master’s level research assistant trained over a 2-week period conducted the content analysis by watching each advertisement provided by Nielsen Media Research and recording the year it was broadcast, the product name, and the company name, and assessing the target of each advertisement, and the marketing techniques used. A second master’s level research assistant, similarly trained, evaluated the target of each food/beverage advertisement and the marketing techniques used and inter-rater reliability was 98%. Each food/beverage advertisement was classified by participation in the CAI. The advertisements from companies that belonged to the CAI as of May 2011 were classified as CAI companies while all other companies advertising food/beverage products were classified as non-CAI companies.

Data analysis
The total number of advertisements by food category according to company membership and by specific company was first determined using Nielsen Media Research Spot Watch Software and percentage change between 2006 and 2011 was calculated. All data regarding the power and nutritional content and quality of the advertisements were inputted and analyzed using PASW Statistics 17.0 (SPSS, 2009). T-tests were calculated to assess nutrient group mean differences between 2006 and 2011.

Results
Volume of food/beverage advertisements
Results that show changes in the total number of advertisements are described in a previously published article and are not repeated here (21). Overall, the CAI companies were responsible for 80.6% of the food/beverage advertising on children’s specialty channels in 2006 and 64.3% in 2011 (a 24% decrease as shown in Table 3). The non-CAI companies were responsible for 19.4% of this advertising in 2006 and 35.7% in 2011 (a 76% increase). The percentage change in the number of advertisements by specific food/beverage categories and by CAI membership is shown in Table 3. Most CAI companies reduced their volume of advertising on children’s specialty channels as per Table 4. However, Burger King, Parmalat, and General Mills increased their volume of advertising between 2006 and 2011 on the stations examined. Four companies (Campbell, Jans Family Foods, Unilever, and Weston Bakeries) refrained from advertising on these stations both before and after the implementation of the CAI.

Nutritional content and quality
As shown in Table 5, between 2006 and 2011 the CAI food/beverage advertisements, on average, decreased significantly in energy, carbohydrates, sugar, and fiber per 100 g while increasing significantly in total fat, trans-fat, sodium, and protein per 100 g. For the non-CAI advertisements, energy, carbohydrates, and sugar per 100 g
TABLE 3 Total advertisements and percentage change per food category on children’s specialty channels in 2006 and 2011 in Toronto by CAI membership

| Food category   | CAI 2006 (%) | CAI 2011 (%) | Percentage change | Non-CAI 2006 (%) | Non-CAI 2011 (%) | Percentage change |
|-----------------|--------------|--------------|-------------------|------------------|------------------|-------------------|
| Candy           | 0.0 (0.0)    | 18 (0.7)     | ∞                 | 258 (29.8)       | 196 (12.9)       | −24               |
| Chocolate bars  | 298 (8.3)    | 83 (3.0)     | −72               | 0.0 (0.0)        | 36 (2.4)         | ∞                 |
| Cookies         | 180 (5.0)    | 95 (3.5)     | −47               | 0.0 (0.0)        | 132 (8.7)        | ∞                 |
| Portable snacks | 175 (4.9)    | 449 (16.4)   | 157               | 0.0 (0.0)        | 0.0 (0.0)        | 0                 |
| Cheese          | 371 (5.5)    | 386 (14.1)   | 42                | 67 (7.7)         | 167 (11.0)       | 149               |
| Yogurt          | 0.0 (0.0)    | 92 (3.4)     | ∞                 | 0.0 (0.0)        | 337 (22.1)       | ∞                 |
| Cereals         | 1,286 (35.8) | 796 (29.1)   | −38               | 0.0 (0.0)        | 0.0 (0.0)        | 0                 |
| Juices          | 306 (8.5)    | 100 (3.7)    | −67               | 62 (7.2)         | 23 (1.5)         | −63               |
| Soft drinks     | 90 (2.5)     | 0.0 (0.0)    | −100              | 0.0 (0.0)        | 45 (3.0)         | ∞                 |
| Diet soft drinks| 121 (3.4)    | 0.0 (0.0)    | −100              | 0.0 (0.0)        | 0.0 (0.0)        | 0                 |
| Fast food       | 864 (24.1)   | 718 (26.2)   | −17               | 478 (55.3)       | 584 (38.4)       | 22                |
| Total number of advertisements | 3,591 | 2,737 | −24 | 865 | 1,520 | 76 |

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decreased significantly and total fat increased significantly between 2006 and 2011 as per the CAI companies; however, saturated fat and fiber increased significantly and trans-fat decreased significantly for these companies.

In terms of the overall nutritional quality of the foods/beverages advertised on children’s specialty channels, in 2006, 53.9% of CAI foods/beverages advertised were classified as “less healthy,” and this percentage remained virtually unchanged in 2011 (52.3%; \(X^2 = 1.41\) (df = 1); \(P = 0.235\)). In contrast, the percentage of “less healthy” non-CAI food/beverage products decreased significantly between 2006 and 2011 from 66 to 47% (\(X^2 = 75.8\) (df = 1); \(P < 0.001\)).

Power of food/beverage advertisements

There was no change between 2006 and 2011 in the number of CAI food advertisements targeting children on the examined specialty channels; however, food/beverage advertisements targeting teens and targeting both children and teens were much more frequent in 2011 compared to 2006 (Table 6). Teen targeting and child and teen targeting also increased markedly for non-CAI companies. Although the CAI company use of fun and health as marketing techniques stayed fairly flat between May 2011 and May 2006 (Table 7), large increases were seen in the use of spokes-characters (+27%) and licensed characters (+151%) in food/beverage advertisements. The non-CAI companies for their part used fun and health as marketing techniques more frequently in 2011 compared to 2006, while their use of spokes-characters and licensed characters declined.

A significantly higher proportion of CAI advertisements that were classified as “less healthy,” (see Table 8) were targeted at children (+47%), teens (+161%), children and teens (+264%), and children and adults (+130%) in 2011 compared to 2006. The use of fun by CAI companies in food advertisements was also used more

TABLE 4 Total advertisements and percentage change on children’s specialty channels in May 2006 and 2011 in Toronto by CAI company

| Company                  | May 2006 (%) | May 2011 % change |
|--------------------------|--------------|-------------------|
| Burger King Restaurants of Canada, Inc. | 0 (0.0) | 209 (7.6) | ∞ |
| Campbell Company of Canada | 0 (0.0) | 0 (0.0) | 0 |
| Coca-Cola Ltd | 65 (1.8) | 0 (0.0) | −100 |
| Ferrero Canada Ltd. | 38 (1.1) | 0 (0.0) | −100 |
| General Mills Canada Corporation | 362 (10.1) | 795 (29.0) | 120 |
| Hershey Canada Inc. | 143 (4.0) | 53 (1.9) | −63 |
| Jans Family Foods Ltd. | 0 (0.0) | 0 (0.0) | 0 |
| Kellogg Canada Inc. | 915 (25.5) | 437 (16.0) | −52 |
| Kraft Canada Inc. | 445 (12.4) | 340 (12.4) | −24 |
| Mars Canada Inc. | 0 (0.0) | 6 (0.2) | ∞ |
| McCain Foods (Canada) | 44 (1.2) | 0 (0.0) | −100 |
| McDonald’s Restaurants of Canada Ltd. | 864 (24.1) | 509 (18.6) | −41 |
| Nestlé Canada Inc. | 117 (3.3) | 42 (1.5) | −64 |
| Parmalat Canada | 126 (3.5) | 327 (11.9) | 160 |
| PepsiCo Canada ULC | 322 (9.0) | 0 (0.0) | −100 |
| Post Foods Canada Corp. | 150 (4.2) | 19 (0.7) | −87 |
| Unilever Canada Inc. | 0 (0.0) | 0 (0.0) | 0 |
| Weston Bakeries Limited | 0 (0.0) | 0 (0.0) | 0 |
| Total | 3,591 | 2,737 | −24 |

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extensively in 2011 in “less healthy” products compared to in 2006 (+38%). Finally, licensed characters were used by the CAI much more frequently in “less healthy” advertisements in 2011 compared to 2006 (+234%).

### Discussion

Our results indicate that the CAI companies, as hypothesized, have decreased the volume of their food/beverage advertising on children’s specialty channels by 24%. However, this improvement is partially offset by the fact that non-CAI companies are now more heavily advertising on children’s specialty channels. There has also been a shift in the types of products advertised on children’s specialty channels. Most positively, the CAI companies completely eliminated regular and diet soft drink advertising and juice advertising has decreased by 67% since 2006. It is also positive that reductions in CAI company candy, chocolate bar, and cookie advertising on children’s specialty channels were seen. Fast food advertising, however, still predominates on these children’s channels in Canada. In 2011, fast food advertising was the second largest food category advertised by CAI companies (accounting for 26% of their advertising) while it was the biggest food category for non-CAI companies (accounting for 38% of their advertising). This predominance of fast food advertising has also been seen in the United States where a similar self-regulatory program exists. Here, they have found that fast food advertising accounts for the largest share of exposure for children 2-11 years and for teens 12-17 years (22). In Canada, only two fast food companies, McDonald’s and Burger King, currently participate in the CAI. Products from nine other fast food restaurants (including Harvey’s, Dairy Queen, Subway, Mr. Sub, Tim Hortons, Wendy’s, KFC, Pizza, and Taco Bell) comprised the non-CAI advertising in 2011. Clearly, this is one of the drawbacks of a voluntary self-regulatory system. Many companies that advertise to children have not chosen to participate and this is having a negative impact on the food marketing on children’s specialty channels in Canada.

With regard to nutrient content of food advertising seen on children’s specialty channels, the CAI companies that are advertising to children have made significant positive changes with regard to reducing the energy and sugar content of foods advertised on children’s specialty channels. Such decreases in sugar in food/beverage advertisements seen by children have also been described in the United States (11). However, in the current research study, when one considers that the overall nutritional quality of the foods/beverages advertised by CAI companies, no meaningful changes have been achieved since the implementation of the CAI contrary to what

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### TABLE 5 Average change in nutrients per 100 g of foods/beverages advertised in Toronto on children’s specialty channels between May 2006 and 2011 by CAI membership

| Nutrients       | CAI 2006 x (SD) | CAI 2011 x (SD) | T (df) | P     | NON-CAI 2006 x (SD) | NON-CAI 2011 x (SD) | T (df) | P     |
|-----------------|----------------|----------------|--------|-------|---------------------|---------------------|--------|-------|
| Energy          | 346.9 (124.9)  | 296.2 (135.1)  | 14.8 (5,605.3) | <0.001 | 267.8 (124.1)  | 237.6 (147.1)  | 5.2 (1,984.4) | <0.001 |
| Total fat (g)   | 9.2 (9.5)      | 10.5 (8.2)     | -5.2 (584.9)  | <0.001 | 7.4 (7.5)      | 8.7 (9.7)      | -3.5 (2,093.1) | <0.001 |
| Sat. fat (g)    | 3.7 (5.2)      | 3.8 (4.7)      | -0.5 (5,859.5) | 0.083  | 2.6 (3.6)      | 3.6 (5.0)      | -5.7 (2,090.8) | <0.001 |
| Trans-fat (g)   | 0.08 (0.2)     | 0.15 (0.4)     | -10.1 (3,823.3) | <0.001 | 0.8 (0.2)      | 0.2 (1.2)      | -3.7 (1,557.0) | <0.001 |
| Sodium (mg)     | 357.1 (245.9)  | 437.8 (291.0)  | -11.4 (5,371.6) | <0.001 | 312.2 (222.8)  | 303.0 (297.3)  | 0.8 (2,127.2) | =0.401 |
| Carb. (g)       | 58.9 (33.4)    | 36.6 (22.7)    | 25.8 (5,875)  | <0.001 | 39.7 (35.4)    | 29.2 (29.5)    | 7.2 (1,502.7) | <0.001 |
| Fiber (g)       | 3.3 (3.1)      | 2.8 (3.2)      | 6.0 (5,744.7)  | <0.001 | 0.5 (0.7)      | 0.8 (1.5)      | -6.8 (2,160.0) | <0.001 |
| Sugar (g)       | 31.3 (26.1)    | 17.6 (17.7)    | 24.0 (5,563.1) | <0.001 | 26.6 (31.2)    | 17.5 (23.9)    | 7.2 (1,408.2) | <0.001 |
| Protein (g)     | 7.2 (6.4)      | 8.2 (6.4)      | -5.2 (5,270.2) | <0.001 | 7.4 (6.6)      | 7.4 (6.8)      | -0.07 (1,782.9) | =0.945 |
| Total number of ads (n) | 3,146 | 2,731 | - | - | 835 | 1,428 | - | - |

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### TABLE 6 Percentage of different groups targeted in food advertisements in Toronto on children’s specialty channels in May 2006 and 2011 by CAI membership

| Target          | CAI 2006 (%) | CAI 2011 (%) | % change | Non-CAI 2006 (%) | Non-CAI 2011 (%) | % change |
|-----------------|--------------|--------------|----------|------------------|------------------|----------|
| Children        | 2,210 (68.8) | 2,217 (81.0) | 0.3      | 623 (72.0)       | 568 (37.4)       | -9       |
| Teens           | 497 (15.5)   | 831 (30.4)   | 67       | 574 (66.4)       | 918 (60.4)       | 60       |
| Adults          | 1,718 (53.5) | 979 (35.8)   | -43      | 523 (60.5)       | 1,052 (69.2)     | 101      |
| Children and teens | 304 (9.6)   | 585 (21.4)   | 92       | 416 (48.1)       | 511 (33.6)       | 23       |
| Children and adults | 718 (22.4)  | 459 (16.8)   | -36      | 281 (32.5)       | 100 (6.6)        | -64      |
| Number of advertisements | 3,210 | 2,737 | -15 | 865 | 1,520 | 76 |
we originally predicted. Over 50% of CAI foods advertised was classified as “less healthy” in both 2006 and 2011. Interestingly, in our research study, there was improvement in the nutritional quality of foods/beverages advertised by the non-CAI group. In 2006, 66% of their food advertisements were classified as “less healthy” and in 2011, this figure dropped significantly to 47%. The poor nutritional quality of foods advertised by the CAI also makes one question the strength of the nutritional criteria set by individual CAI members. Advertising Standards Canada, the nonprofit organization that administers the CAI, has alluded that common nutritional criteria for all participating companies will be developed shortly (Feasby, 2011; personal communication). While such a move may improve the nutritional standards of advertised products, ideally such a development would best be placed in the hands of an independent body of nutrition experts without industry ties so that change to these standards can be unbiased and meaningful.

The power of food/beverage advertisements seems to have increased on children’s specialty channels between 2006 and 2011 for both CAI and non-CAI advertisements. Compared to 2006, CAI companies increasingly targeted children and teens (+92%) aged 2-17 years in 2011 in their food/beverage advertisements and the number of CAI child targeted, teen targeted and child, and teen targeted advertisements that were classified as “less healthy” grew by 47, 161, and 264%, respectively, between 2006 and 2011. The CAI also markedly increased their use of spokes-characters (+27%) and licensed characters (+151%) in 2011 compared to 2006, and in 2011, more than one-third of CAI advertisements used spokes-characters while 20% used licensed characters on children’s specialty channels despite pledges to reduce their use of third party licensed characters for products that do not meet their nutritional criteria. While we did not examine license character use using company-specific nutritional criteria, we did find that a significantly greater percentage (+234%) of “less healthy” CAI advertisements featured licensed characters in 2011 (n = 214) compared to 2006 (n = 64).

Although the use of health as an appeal remained fairly flat between 2006 and 2011, it is problematic that this marketing technique was used in 41% of “less healthy” CAI advertisements in 2011. Such marketing techniques are misleading and arguably unethical, re-emphasizing the need for child and teen protection. The use of health as an appeal is perhaps not surprising given evidence that between 2007 and 2011, “better for you foods” generated more than

### TABLE 7 Marketing features in food and beverage advertisements on children’s specialty channels in Toronto in May 2006 and 2011 by CAI membership

| Feature                        | CAI          | Non-CAI       | % change |
|--------------------------------|--------------|---------------|----------|
| Fun as persuasive appeal       | 1,663 (51.8) | 1,825 (66.7)  | 9.3      |
| Health as persuasive appeal    | 954 (29.7)   | 1,014 (37.0)  | 6.3      |
| Spokes-characters              | 719 (22.4)   | 913 (33.4)    | 27       |
| Licensed characters            | 215 (6.7)    | 539 (19.7)    | 151      |
| TV/movie celebrity             | 134 (4.2)    | 0 (0.0)       | -100     |
| Musical/athletic celebrity     | 0 (0.0)      | 0 (0.0)       | 0        |
| Number of advertisements       | 3,210        | 2,737         | -15      |

### TABLE 8 Number of advertisements classified as “less healthy” using various marketing techniques on children’s specialty channels in Toronto between May 2006 and 2011 by CAI membership

| Feature                        | CAI          | Non-CAI       | % change |
|--------------------------------|--------------|---------------|----------|
| Children targeted              | 740 (49.7)   | 1,084 (75.9)  | 47       |
| Teens targeted                 | 290 (19.5)   | 756 (52.9)    | 161      |
| Adults targeted                | 923 (61.9)   | 741 (51.9)    | -20      |
| Children and teens targeted    | 140 (9.4)    | 510 (35.7)    | 264      |
| Children and adults targeted   | 173 (11.6)   | 397 (27.8)    | 130      |
| Fun as persuasive appeal       | 632 (42.4)   | 872 (61.1)    | 38       |
| Health as persuasive appeal    | 609 (40.9)   | 588 (41.2)    | -3.4     |
| Spokes-characters              | 364 (24.4)   | 391 (27.4)    | 7.4      |
| Licensed characters            | 64 (23.0)    | 214 (15.0)    | 234      |
| TV/movie celebrity             | 143 (9.0)    | 0 (0)         | -100     |
| Musical/athletic celebrity     | 0 (0)        | 0 (0)         | 0        |
| Total (“less healthy”)         | 1,490        | 1,428         | -4.2     |
70% of growth in sales for 15 of the largest food/beverage companies in the United States (23). References to health are likely seen by advertisers as an effective means to sell products to adults as well as to children.

Advertisements targeted at teens are another area for increasing concern. Sixteen percent (15.5%) of CAI ads targeted teens in 2006 and this increased to 30.4% by 2011, a 67% increase. In 2006, 19.5% of CAI advertisements classified as “less healthy” targeted teens and this statistic increased significantly to 52.9% in 2011. Advertising unhealthy foods/beverages to adolescents is equally as contentious as advertising to children given that obesity rates have tripled since the late 1970s for this age group (24) and given that teens have access to money, opportunities to purchase their own foods, and significant influence on household spending (25).

Strengths and limitations of the study
One of the main strengths of this study is that it is the first one of its kind to examine the volume, power, and nutritional content of CAI foods/beverages advertised to children on television before and after the implementation of the CAI. Children are exposed to food marketing on other television stations in Canada (21) as well as to television stations broadcast from the United States. However, our results cannot be generalized to these stations. Another limitation is that this study did not examine children’s exposure to food advertising using ratings data. Instead, the focus was on the volume of food advertising on children’s specialty channels which does not imply exposure. A third limitation to the study is that the researcher was not blind to the year that the advertisement was broadcast. This is because the data were provided on discs organized by year, and therefore the researcher was always aware of the year of the advertisement. As a result, there is potential for bias; however, it was minimized by following rigorous coding guidelines for each advertisement.

Finally, another key limitation to the study is that nutritional data for 2006 and 2011 for the advertised products were not available and instead, nutritional data from 2012 were substituted. Some companies may have reformulated some products between 2006 and 2011 and therefore, it is important to interpret nutritional findings with this in mind. There is little published data on recent food reformulations in Canada; however, a survey conducted by Agriculture and Agri-Food Canada has shown that between 2007 and 2011/2012, 25% of 40 food manufacturers decreased sodium levels in 25-75% of their foods (26). Evidence that trans-fat levels have decreased in some processed foods in Canada has also been documented (27).

Conclusions
Although the results in this study indicate that the CAI companies have decreased the overall volume of their food/beverage advertising on children’s specialty channels, approximately 50% of the products advertised that target children are still classified as “less healthy.” A variety of techniques to appeal to children, including the use of fun, spokes-characters, and licensed characters have all increased by CAI member companies. Given the increases in the power of CAI food/beverage advertisements on children’s specialty channels in Canada and given that their overall nutritional quality has not meaningfully changed since the implementation of the CAI, it is clear that the current self-regulation system in Canada is not effectively protecting children. It is recommended, as per a consensus statement that was developed by a group of Canadian researchers and health-related nongovernmental organizations (28), that a broad based-ban on all commercial marketing to children and youth aged 2-17 years across all media and in places where children gather be implemented in Canada.

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