

# Food marketing to children in Canada: a settings-based scoping review on exposure, power and impact

Rachel Prowse, BSc, RD

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## Abstract

**Introduction:** Food marketing impacts children’s food knowledge, behaviours and health. Current regulations in Canada focus on restricting promotional aspects of food marketing with little-to-no consideration of the places where children experience food. Understanding food marketing in children’s everyday settings is necessary to protect children. This scoping review describes the current literature on food marketing to children in Canada by setting.

**Methods:** The author searched databases for Canadian research on children’s exposure to food marketing, and the power and impact of food marketing to children (2-17 years) across settings, and on how current regulations may mediate the effect of food marketing on children. Peer-reviewed studies in English, published between 2000 and 2016, were included.

**Results:** Twenty-five studies documented children’s exposure to food marketing and its power and/or impact on them in homes (via television, or online) (n = 12), public schools (n = 1), grocery stores (n = 8), fast food restaurants (n = 2), and in general (n = 2). Research trends suggest that unhealthy foods are targeted at children using multiple promotional techniques that overlap across settings. Several research gaps exist in this area, leading to an incomplete, and potentially underestimated, picture of food marketing to children in Canada. Available evidence suggests that current Canadian approaches have not reduced children’s exposure to or the power of food marketing in these settings, with the exception of some positive influences from Quebec’s statutory regulations.

**Conclusion:** The settings where children eat, buy or learn about food expose them to powerful, often unhealthy food marketing. The current evidence suggests that “place” may be an important marketing component to be included in public policy in order to broadly protect children from unhealthy food marketing. Organizations and communities can engage in settings-based health promotion interventions by developing their own marketing policies that address the promotion and place of unhealthy food and beverages.

**Keywords:** *food marketing, childhood obesity, public health*

## Introduction

Children’s development takes place in their everyday settings.<sup>1</sup> The places where children live, learn and play are critical factors in determining their current and future health.<sup>2</sup> In fact, the Ottawa Charter for Health Promotion emphasizes the importance of everyday settings in preventing disease.<sup>3</sup> To this end, the World

Health Organization recommends that the places where children gather be free from unhealthy food and beverage marketing.<sup>4</sup> “Place” is also a critical factor for marketers, as it is one of the four components of marketing known as the “four Ps” (4Ps): product, promotion, place and price. Corporations strategically mix the 4Ps to reach their target audience effectively and influence attitudes and behaviours.<sup>5</sup>

## Highlights

- Children’s everyday settings are important places to restrict unhealthy food marketing.
- Research in Canada shows that children (2-17 years) are exposed to food marketing in homes, schools and supermarkets; however, overall exposure is likely underestimated.
- Powerful marketing techniques are often used in promoting less healthy foods to children.
- Multiple exposures to the marketing of unhealthy foods in various settings may adversely shape children’s food culture.
- Current evidence suggests that actions by governments and communities that address all components of marketing (product, place, promotion and price) will more effectively protect children from powerful, unhealthy food marketing in their everyday settings, however more research is needed.

Food marketing impacts children’s food knowledge, preferences, behaviours and health.<sup>6</sup> Factors that promote a poor diet are of concern since, according to Statistics Canada, one-quarter of the calories eaten by Canadians aged 4 to 18 years are from “other foods” (e.g. foods to be limited according to Canada’s Food Guide), including soft drinks, fruit drinks, chocolate and chips.<sup>7</sup> More than half of children in Canada consume fewer than five servings of vegetables and fruit per day.<sup>8</sup> The impact of food marketing on children’s food preferences and behaviours depends on their exposure to and the power of the marketing messages, where exposure is defined as “the reach

## Author reference:

School of Public Health, University of Alberta, Edmonton, Alberta, Canada

**Correspondence:** Rachel Prowse, School of Public Health, University of Alberta, 4-347 Edmonton Clinic Health Academy, 11405 – 87 Avenue NW, Edmonton, AB T6G 1C9; Email: [prowse@ualberta.ca](mailto:prowse@ualberta.ca)

and frequency of the marketing message,” and power is “the creative content, design and execution of the marketing message.”<sup>9,p.11</sup>

There are three main mechanisms by which food marketing to children is currently “controlled” in Canada (Table 1): (1) Quebec statutory regulation [Quebec’s *Consumer Protection Act* (QCPA)<sup>10</sup>]; (2) food industry voluntary self-regulation [Canadian Children’s Food and Beverage Advertising Initiative (CAI)<sup>11</sup>]; and (3) broadcast industry self-regulation (*The Broadcast Code for Advertising to Children*<sup>12</sup>). Additionally, in 2016, the Canadian Health Minister announced forthcoming federal statutory regulations on food marketing.<sup>13</sup> School food policies may also regulate food marketing to children; however, current provincial and territorial policies tend to focus on food provision and are limited and inconsistent in their address of food marketing (Table 1).

Current and proposed regulations may control both exposure to and power of

food marketing to children by restricting the amount and the use of persuasive promotional techniques (discussed in the Results section of this article). Unfortunately, place, a key component of marketers’ strategies<sup>5</sup> and of health promotion interventions,<sup>14</sup> is poorly considered in current approaches, with the exception of the CAI restricting some marketing in elementary schools.<sup>15,\*</sup> It is reasonable to expect that regulations that ignore this key component of marketing will not generate maximal impact on children’s exposure to or the power of food marketing. Place is often misinterpreted as the location of marketing messages, which is in fact a component of promotion.<sup>16</sup> A more accurate definition of place, from a marketing perspective, is the location where behaviours are performed or related goods and services are acquired.<sup>5</sup> In the context of food marketing, place may represent where we eat, purchase or learn about food.

Notably, the settings in which children are marketed to are a policy consideration of proposed regulations in Canada;<sup>17</sup> however, no research has explored what these settings are. It is critical to understand food marketing in the context in which children experience it in order to form effective policies. Using a settings-based approach,<sup>18</sup> this review aims to explore the places where children may be exposed to food marketing by reviewing (1) the extent of their exposure to and the power of food marketing by setting; (2) the influence of statutory (QCPA) and voluntary (CAI) regulations on exposure and power;<sup>†</sup> and (3) the impact of food marketing on the attitudes, perceptions and behaviours of Canadian children.

## Methods

The author systematically searched eight health, psychology and business databases (Table 2) identified by a research librarian for research on the exposure to and power of food marketing to children

**TABLE 1**  
Types of regulatory control of food marketing to children in Canada

Regulatory control	Year introduced	Location	Type	Restriction on food marketing (product)	Marketing channels and techniques covered (promotion)
Quebec <i>Consumer Protection Act</i> (QCPA) <sup>10</sup>	1980	Quebec	Statutory	No commercial marketing to children under 13 years. <sup>‡</sup>	Television Radio Print media Internet Mobile phones Signs Other promotional items
Canadian Children’s Food and Beverage Advertising Initiative (CAI) <sup>15</sup>	2007	All of Canada (except Quebec)	Voluntary self-regulation of food industry	Committed companies agree not to advertise to children under 12 years at all, or only to advertise “better-for-you” foods, as defined by a uniform nutrition criteria developed by the food industry. <sup>19</sup>	Television Radio Print media Internet Mobile phones Video games Movies Elementary schools Select marketing techniques (licensed characters, movie cross-promotions, celebrities, product placement)

Continued on the following page

\* Price, another component of the 4Ps, is also not targeted in marketing regulations; however, discussion of that component is beyond the scope of this review.

† *The Broadcast Code for Advertising to Children* has not been evaluated by researchers; therefore, this review includes only the influence of the QCPA and the CAI.

TABLE 1 (continued)  
Types of regulatory control of food marketing to children in Canada

Regulatory control	Year introduced	Location	Type	Restriction on food marketing (product)	Marketing channels and techniques covered (promotion)
<i>The Broadcast Code for Advertising to Children</i> <sup>12</sup> of the <i>Canadian Code of Advertising Standards</i> <sup>20</sup>	2004; 2007	All of Canada (except Quebec)	Self-regulation of broadcast media	Advertising to children under 12 years should not discourage a healthy lifestyle or adherence to Canada's Food Guide; advertising should not show excessive amounts of food being consumed or in general.	Television Radio Print media Internet Billboards
Proposed regulations on food marketing to children <sup>17</sup>	Forthcoming	Not disclosed	Statutory	Possible restrictions of unhealthy food marketing for select age groups (to be determined).	Possible restriction of select marketing channels, techniques, and settings (to be determined).
Provincial/territorial school food policies <sup>b</sup>	2008	British Columbia <sup>21,22</sup>	Mandatory adoption of nutrition guidelines in public schools	Discourages unhealthy food marketing.	Posters Coupons Branded equipment
	2010	Ontario <sup>23</sup>	Mandatory adoption of nutrition guidelines in public schools	Does not restrict food marketing.	Not applicable
	2005	New Brunswick <sup>24,25</sup>	Mandatory adoption of nutrition guidelines in public schools	Recommends healthy food marketing and discourages unhealthy food marketing. <sup>c</sup>	Rewards Incentives Vending machine promotions Fundraising
	2006	Nova Scotia <sup>26</sup>	Mandatory adoption of nutrition guidelines in public schools	Recommends healthy food marketing. <sup>c,d</sup>	Advertising (non-specific) Fundraising Rewards
	2011	Prince Edward Island <sup>27</sup>	Mandatory adoption of nutrition guidelines in public schools	Restricts unhealthy food marketing. <sup>c,d</sup>	Advertising (non-specific)
	2009	Saskatchewan <sup>28,29</sup>	Voluntary nutrition guidelines for mandatory school board food policies	Recommends healthy food marketing.	Rewards Fundraising
	2009	Manitoba <sup>30,31</sup>	Voluntary nutrition guidelines for mandatory public school food policies	Recommends healthy food marketing. <sup>c,d</sup>	"Daily special" promotions
	2008	Alberta <sup>25</sup>	Voluntary nutrition guidelines	Recommends healthy food marketing.	Posters
	2007	Quebec <sup>79</sup>	Voluntary nutrition guidelines	Recommends healthy food marketing.	Fundraising
	2009	Newfoundland & Labrador <sup>32</sup>	Voluntary nutrition guidelines	Does not restrict food marketing.	Not applicable
2008	Yukon <sup>33</sup>	Voluntary nutrition guidelines	Discourages unhealthy food marketing.	Rewards Incentives Fundraising	

<sup>a</sup> The QCPA uses three criteria to identify child-directed marketing: (1) purpose of advertised product, (2) advertisement presentation, and (3) time and place of advertisement. Advertising in schools or at point-of-purchase is not explicitly restricted by the QCPA but may be prohibited depending on these criteria.<sup>10</sup>

<sup>b</sup> There were no publicly available policies in Northwest Territories and Nunavut.

<sup>c</sup> Includes food pricing statements.

<sup>d</sup> Includes food placement statements.

**TABLE 2**  
**Scoping review of food marketing to children in Canada:**  
**systematic search criteria and process**

Inclusion criteria	English language Canadian data Published between January 2000 and September 2016 Original research Evidence on exposure to, power of and/or impact of food marketing to children (aged 2–17 years), or the influence of Canadian food marketing regulations Evidence on exposure, power and regulation must identify the setting Evidence on impact must clearly identify the setting, or study the collective impact of food marketing across settings
Exclusion criteria	Grey literature Evidence on infants and toddlers (less than age 2 years) Evidence on parents only Commentaries on policy interventions
Search string	(food OR beverage OR diet OR nutrition [TIAB]), AND (marketing OR advertis*[TIAB]), AND (child* OR youth OR teen OR adolescen*[TIAB]), AND (Canad*[TIAB]).
Databases searched	ABI/INFORM Complete, CBCA Complete, CINAHL, MEDLINE, ProQuest Dissertation and Theses, PsycINFO, Scopus, Web of Science Core

in Canada, its impact and the influence of regulations in July 2015 and updated the search in September 2016. All references were imported into an online reference manager. The author selected articles based on a priori inclusion criteria (Table 2) through systematic title, abstract and full-text screening (Figure 1). After title and abstract reviewing, three Canadian researchers with expertise in the topic area were consulted to identify missing research and confirm comprehensiveness of search results. The researchers provided 21 new items, but only four<sup>34-37</sup> met the inclusion criteria (Figure 1). This scoping review was limited to peer-reviewed, English-language studies using Canadian data. Two French-language articles<sup>38,39</sup> were excluded, as no expert fluent in French was able to review them. The author reviewed all studies and extracted the data.

## Results

Twenty-five articles met the inclusion criteria (Figure 1). The literature available examined the exposure to, power of or impact of food marketing to children in Canada in general,<sup>36,40</sup> on television,<sup>34,41-48</sup> online,<sup>49-51</sup> in public schools,<sup>52</sup> on product packaging in grocery stores<sup>35,37,53-58</sup> and in fast food restaurants<sup>59,60</sup> (Table 3). The

majority of articles were based on cross-sectional studies (n = 14).<sup>34,37,42-45,49-56</sup> Two articles reviewed the impact of the QCPA<sup>43,44</sup> and four reviewed that of the CAI<sup>45-47,56</sup> on exposure to and power of food marketing. Table 4 provides a summary of the influence of regulations on exposure and power by setting. Nine studies explored how food marketing impacted food attitudes, preferences and behaviours—three using experimental,<sup>48,59,60</sup> one using cross-sectional<sup>49</sup> and five using qualitative methods.<sup>35,36,40,57,58</sup>

### *Exposure to and power of food marketing to children in Canada*

#### **Exposure to food marketing in the home: television**

Six articles reviewed exposure to television food marketing.<sup>34,41-45</sup> In these studies, exposure was measured by the proportion of all television advertisements that were for food (overall and unhealthy) and the rate of food advertisements per hour per channel.

One-fifth of advertisements recorded on three popular children's channels in Canada between 2007 and 2008 were for food (unpublished data by Kelly et al.<sup>34</sup>). Potvin Kent et al. studied the top 30 hours of television watched by ten to 12 year old

children in Ontario and Quebec in 2009, which included general and children's channels, and found that 24% to 27% of the advertisements children watched were for food.<sup>43</sup>

The studies reported varying rates of food advertising, from three to seven advertisements per hour per channel<sup>34,41,47</sup> (unpublished data by Kelly et al.<sup>34</sup>). This variability may be related to differences in study methods, including heterogeneity in the number and type of channels recorded, times and number of days recorded and location and dates of data collection.

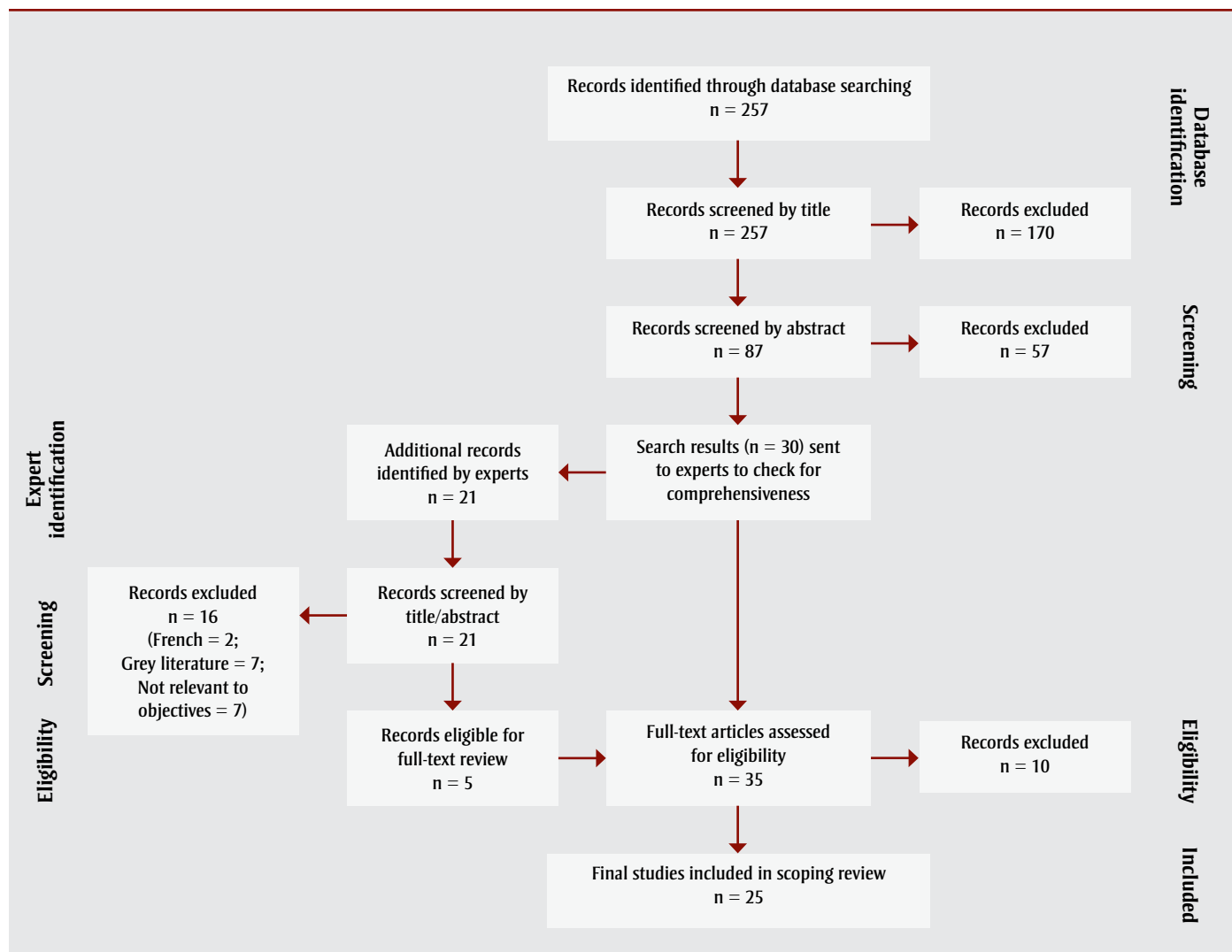
Exposure to unhealthy food television advertisements was evaluated by determining the proportion of advertised foods that were high in energy, fat, sugar or salt.<sup>34,42,44</sup> According to Kelly et al., 80% of food advertisements on children's channels were for "noncore foods" that were high in fat, sodium or energy.<sup>34</sup> Using the UK's Nutrient Profiling system, Adams et al.<sup>42</sup> found that 66% of all food advertisements on general television in Canada were "less healthy." Potvin Kent et al.<sup>44</sup> found that 88% of food advertisements watched by children in Canada were "less healthy" using the same nutrient profiling system.

#### **Influence of regulation on exposure**

Potvin Kent et al. researched the impact of statutory regulation in 2009<sup>43</sup> and voluntary industry regulation in 2011<sup>46</sup> in Canada and found that neither were associated with reduced children's exposure to television food marketing. Specifically, French-speaking children in Quebec and English-speaking children in Quebec and Ontario were found to be exposed to the same rate of food advertisements per hour per channel.<sup>43</sup> Potvin Kent and Wanless<sup>47</sup> estimated that children's overall exposure to television food advertising increased by 6% in Vancouver and 17% in Toronto between 2006 and 2011, since the introduction of the CAI. Although food advertisements on children's television from CAI companies decreased by 24% between 2006 and 2011, the same kind of advertisements by non-CAI companies increased by 76%.<sup>46</sup>

Small improvements in the nutritional quality of the advertised foods were associated with the QCPA<sup>43</sup> but not the CAI.<sup>46</sup> Significantly fewer advertisements watched by children were found on French-language

**FIGURE 1**  
Flow chart of systematic search strategy



television in Quebec for “less healthy” foods than on English-language television in Ontario;<sup>44</sup> however, 81% of the former were still “less healthy.” On the other hand, there was no significant change in the proportion of “less healthy” foods advertised by CAI companies between 2006 and 2011.<sup>46</sup>

### Power of food marketing in the home: television

The power of food marketing is evaluated by the prevalence of child targeting in food advertisements and the use of powerful promotional techniques. On general television (from 7:00 p.m.–11:00 p.m.), 7% of food advertisements were of particular appeal to children (aged 2–17 years) in 2006.<sup>42</sup> On television watched by French-speaking children (10–12 years) in Quebec in 2009, only 30% of food advertisements were targeted at children,

compared to 76% and 65% of advertisements watched by English-speaking children (10–12 years) in Quebec and Ontario, respectively.<sup>43</sup> In 2011, approximately one-quarter of food advertisements by CAI and non-CAI companies on children’s specialty channels targeted children and teens.<sup>46</sup>

A variety of marketing techniques were used in television food advertisements, including premiums (such as giveaways, vouchers), promotional characters, fun and health appeals.<sup>34,46</sup> Foods advertised with these powerful techniques were often unhealthy.<sup>34,46</sup> For example, Kelly et al.<sup>34</sup> found that almost 100% of televised food advertisements that used promotional characters on children’s channels in 2007 and 2008 in Canada were for “non-core” foods, compared to only 80% overall.

### Influence of regulation on power

Small improvements in the power of food advertisements were found to be associated with the QCPA<sup>43</sup> but not the CAI.<sup>46</sup> In 2009, the QCPA was associated with fewer food advertisements targeted at French-speaking children in Quebec, but did not prove to fully protect all children in Quebec since English-speaking children view television originating outside Quebec, which is not restricted by Quebec’s law.<sup>43</sup> Overall, there was no change in the prevalence of targeting children in food advertisements by CAI or non-CAI companies between 2006 and 2011.<sup>46</sup> In fact, there is some evidence that it has worsened, since more unhealthy food advertisements targeted children in 2011 than 2006.<sup>46</sup> For example, between 2006 and 2011 the use of fun and licensed characters to advertise “less healthy” products increased by 38% and 234% by CAI companies, respectively.<sup>46</sup>



**TABLE 3** Synthesis of Canadian, English-language literature on exposure to and the power and impact of food marketing to children in Canada, and the influence of the QCPA and the CAI

Author	Setting	Population; location	Design	Purpose	Data Collection Period	Overview of methods	Key outcome measures	Key results
Kelly et al., 2010 <sup>34</sup>	Home: TV	Children's TV; Alberta, Ontario	Cross-sectional	Identify frequency, nutritional quality and persuasive techniques used in food advertising on children's TV channels in 11 countries	Oct. 2007–Mar. 2008	Recorded all ads on 3 most popular children's TV channels for 2 weekdays and 2 weekend days from 6:00–22:00. Food ads were coded for promotional techniques and nutritional quality (core, noncore or miscellaneous). X <sup>2</sup> tests compared country-level differences.	Number and rate of food advertising; proportion of food ads by program type, product type and nutritional quality; proportion of food ads with persuasive techniques	In Canada, one-fifth of ads were for food, the second-most advertised product. (E) Overall, food advertising was 4–7 ads/hr/channel and was higher on weekends. 80% of ads were for noncore foods. Fast food most commonly advertised. (E) Canada had one of the lowest proportions of food ads with premium offers (0–4%) but had the second-highest proportion of food ads with promotional characters (33–36%), of which almost all were for noncore foods. (P)
Adams et al., 2009 <sup>32</sup>	Home: TV	General TV; Ontario, Quebec	Cross-sectional	Compare frequency, nutritional quality of food advertising on children's TV in Canada and the UK prior to introduction of UK regulations	30 Oct. 2006–5 Nov., 2006	Recorded all ads on 4 free viewing channels (24h/d). Ads were coded as "of particular appeal to (OPAT) children" <sup>32,36,58</sup> if >20% of viewing population were children. UK Food Standards Agency definition used to identify "less healthy" food ads. Fisher exact tests used to compare OPAT children and non-OPAT children groups.	Number and rate of food ads; proportion of food ads OPAT children; nutritional quality of food ads	In Canada, 2315 food ads were identified from 4 channels over 7 days. (E) 7% of ads were OPAT children (defined as 2–17 years in Canada). (P) 66% of food ads were for "less healthy" foods. (E) No significant differences between proportion of "less healthy" food ads that were OPAT children compared to ads not OPAT children in Canada ( $p = .15$ ). (P) No significant differences in product type advertised between OPAT-children ads and non-OPAT-children ads were found in Canada, except for sweets and candy, which were advertised less often to children. (P)
Adams et al., 2009 <sup>31</sup>	Home: TV	General TV; Ontario, Quebec	Longitudinal	Compare frequency, nutritional quality of food ads on prime time TV from 1991–2006 in Canada and the UK	26 Oct. 1991–1 Nov. 1991; 30 Oct. 2006–5 Nov. 2006	Recorded ads on 5 and 4 free channels in 1991 and 2006, respectively, from 19:00–22:59. Food ads were coded for food type and promotional technique. "TV diets" were generated by summing one serving of each food advertised and were compared to reported diets from national surveys. X <sup>2</sup> tests compared outcomes within and across countries.	Number and rate of food ads; product type and nutritional quality of food ads	No change in rate of TV food advertising from 1991–2006 (5/h) in Canada. (E) Fast food product and restaurant ads significantly increased five-fold in Canada and were the most commonly advertised items at 29.5% and 15.6% of food ads. Fruits, vegetables and juices significantly decreased from 8% of ads to 2% in Canada. (E) TV diets from 1991 and 2006 were similar, but 2006 had less energy from alcohol. The 1991 and 2006 TV diets contained less fibre and energy from protein than reported intakes. The 2006 TV diet had greater levels of energy from sugar and higher sodium levels than reported intakes in 2006. (E)
Potvin Kent et al., 2011 <sup>43</sup>	Home: TV	TV viewed by English-speaking children aged 10–12 yrs; Ontario, Quebec	Cross-sectional	Compare frequency of food marketing on children's preferred TV in two Canadian provinces	26 Mar. 2009–1 Apr. 2009	Recorded 90 hours of TV watched from 6:00–0:00 by 428 children over one week. Ads were coded by day/time, program type, station, ad type/length, food type and target audience. X <sup>2</sup> tests compared differences between French-speaking children in Quebec, English-speaking children in Quebec and English-speaking children in Ontario.	Number and rate of food ads; characteristics of ads by station, channel and time; type of food advertised; type of promotion used	Neither the number of food ads nor the rate of TV food advertising (3–5/h) differed significantly between groups ( $p < .06$ ). (IR-E) More food ads targeted preschoolers ( $p < .001$ ), children ( $p < .001$ ) and teenagers ( $p < .03$ ) in the English-speaking groups compared to the French-speaking group. (IR-P) More ads were for snacks/candy and grain products in English-speaking groups compared to the French-speaking group. (IR-E) Significantly more persuasive marketing techniques (fun appeal, characters/celebrities, contests) were seen by English-speaking groups compared to French-speaking group. (IR-P)

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**TABLE 3 (continued)**  
**Synthesis of Canadian, English-language literature on exposure to and the power and impact of food marketing to children in Canada, and the influence of the QCPA and the CAI**

Author	Setting	Population; location	Design	Purpose	Data Collection Period	Overview of methods	Key outcome measures	Key results
Potvin Kent et al., 2012 <sup>44</sup>	Home: TV	TV viewed by English- and French-speaking children aged 10–12 yrs; Ontario, Quebec	Cross-sectional	Compare nutritional quality of foods advertised on children's preferred TV in two Canadian provinces	26 Mar. 2009–1 Apr. 2009	Recorded 90 hours of TV watched from 6:00–0:00 by 428 children over 1 week. Nutritional quality of foods advertised was assessed by a 100 g reference size and classified as high in fats, sugar or sodium and/or low in fibre, and identified as “less healthy” using the UK Food Standards Agency definition. One-way ANOVA with post hoc tests compared group differences. <sup>45</sup>	Mean nutrients per 100 g advertised; percentage energy from energy, fats, carbohydrates; proportion of high-sugar/fat/salt, low-fibre food ads; proportion of “less healthy” food ads	English- and French-language food ads significantly differed in macronutrient content: French higher in total fat, saturated fat, trans fat; lower in carbohydrates, sugar, energy than English groups ( $p < .001$ ). (IR-E) Statistically significantly more English ads were for “less healthy” (68.3–68.9%) foods than French ads (60.6%) ( $p < .001$ ). (IR-E)
Potvin Kent et al., 2011 <sup>45</sup>	Home: TV	TV viewed by English- and French-speaking children aged 10–12 yrs; Ontario, Quebec	Cross-sectional	Compare presence of food marketing to children on children's preferred TV by companies committed and not committed to CAI	26 Mar. 2009–1 Apr. 2009	Recorded 99.5 hours of TV watched from 6:00–0:00 by 272 children over 1 week. Ads were coded by food type, use of media characters and whether the ad was from a CAI or non-CAI company. Nutritional quality was assessed by 100 g reference size, and using the UK Food Standards Agency definition for “less healthy” foods. X <sup>2</sup> tests and <i>t</i> tests compared differences between CAI and non-CAI ads.	Number of food promotions; type of food products promoted; proportion of use of media characters; proportion of “less healthy” products	24% (n = 418) of all ads recorded were for foods or beverages. (E) Food companies committed to CAI provided 63% of all ads recorded. (IR-E) Ads by CAI companies had significantly more energy, fats, sugar and sodium ( $p < .001$ ). (E) Significantly more ads by CAI companies were considered “less healthy” than non-CAI companies ( $p = .001$ ). (IR-E) CAI ads used media characters more often ( $p < .001$ ) and were significantly more likely to promote “less healthy” products with media characters ( $p < .001$ ) than non-CAI. (IR-P)
Potvin Kent et al., 2014 <sup>46</sup>	Home: TV	Children's specialty TV; British Columbia, Ontario	Longitudinal	Compare frequency, nutritional quality of food marketing on children's TV from 2006–2011 by companies committed and not committed to voluntary industry regulation (CAI)	May 2006; May 2011	4 weeks of food ads for 11 food categories aired from 6:00–0:00 on two children's specialty channels were purchased from Nielsen Media Research for two time periods. Ads were coded for target audience, use of persuasive marketing techniques and food company commitment to the CAI in 2011. Nutritional content was assessed by 100 g reference size, and using the UK Food Standards Agency definition for “less healthy” foods. <i>t</i> tests compared mean group differences.	Mean nutrient content; proportion “less healthy”; proportion targeting children, teens and adults; proportion using persuasive marketing techniques	Proportion of food ads by CAI companies decreased by 24% and that of non-CAI companies increased by 76% from 2006 to 2011. (IR-E) No change in proportion of CAI ads considered “less healthy” ( $p = .235$ ). (IR-E) Significant decrease in proportion of non-CAI ads considered “less healthy” ( $p < .001$ ). (IR-E) Increased targeting of “less healthy” ads to children and teens by CAI companies in 2011 over 2006. (IR-P) Increased use of fun appeals and characters by CIA companies in 2011 over 2006. (IR-P)
Potvin Kent & Wanless, 2014 <sup>47</sup>	Home: TV	Children's specialty TV and general TV viewed by children aged 2–11 yrs; British Columbia, Ontario	Longitudinal	Compare changes in children's exposure to food marketing on TV between 2006 and 2011	May 2006; May 2009; May 2011	4 weeks of food ads for 11 food categories aired between 6:00–0:00 on 27 channels (2 children specialty channels and 25 general channels) were purchased from Nielsen Media Research for three time periods. Children's exposure levels to food ads were estimated and compared across time periods.	Number and rate of food ads; children's overall average exposure to food advertising	Number and rate of food ads increased between 2006 and 2011. (IR-E) There was a decrease in food ads on children's channels (5%) but a 44%–45% increase on general channels between 2006 and 2011. (IR-E) Overall exposure increased by 6%–17% between 2006 and 2009. (IR-E) Children's exposure to candy and cereal ads was mostly from children's specialty channels but ads for chocolate, juice, diet soft drinks and fast food came from general TV. (IR-E)

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**TABLE 3 (continued)**  
**Synthesis of Canadian, English-language literature on exposure to and the power and impact of food marketing to children in Canada, and the influence of the QCPA and the CAI**

Author	Setting	Population; location	Design	Purpose	Data Collection Period	Overview of methods	Key outcome measures	Key results
Hudson & Elliott, 2013 <sup>48</sup>	Home: TV	Children aged 7–12 yrs; Canada	Experimental	Assess the impact of TV product placement on snack behaviour in children	Not stated	225 children were randomly assigned to view a 20-min children's TV program with healthy, unhealthy, or no product placement. After viewing, children recalled brands, sponsors or advertising messages in the program, and chose a food and beverage from a set selection. Questionnaires were used to record children's experiences of the show. Logistic regression tested the predictive ability of multiple variables, including recall of product placement, on snack behaviour.	Recall of product placement; immediate choice of food and beverage; impact of other variables on relationship between product placement and behaviour (TV viewing habits, how much children liked the TV program and products)	Children were unaware of product placement as a marketing technique. (I) Children (especially aged 10–12 yrs) who viewed an unhealthy product placement in a TV program had better recall of products. (I) There was a modest but mixed impact on snack choice immediately after viewing Pepsi or Coke and Fruit Gushers were most popular regardless of the experimental group, which may be due to children selecting "treats" during the experiment. (I) Strongest predictors of snack choice were whether the child liked the product packaging, and whether the product looked fun or "yummy." <sup>48(p.175)</sup> (I)
Brady et al., 2010 <sup>50</sup>	Home: online	Websites of CAI companies with marketing targeted at children aged 6–12 yrs; Canada	Cross-sectional	Compare marketing to children on the websites of CAI companies	Not stated	24 websites of CAI companies were identified and evaluated for 379 items related to the presence and type of online marketing techniques. Five marketing objectives were evaluated: target market appeal, increased engagement, increased awareness of the brand and websites, increased brand engagement, and influencing children's brand preferences and consumption norms.	Proportion of websites targeting children; number of marketing objectives, techniques and strategies observed on websites	83% of websites targeted children under age 12 yrs. (P) Websites commonly encouraged prolonged engagement through free memberships (63%), high-score leader boards (50%) and game rewards (46%). Interaction with product/brand was promoted through "advergaming," music, sounds, animation and buttons (88%). (P) Half encouraged sharing brand or website with friends. The majority of websites had material that could be downloaded by children for use in their everyday lives, such as screensavers, wallpaper, placemats and growth charts. (P) Foods advertised were similar to those advertised on TV and were inconsistent with Canada's Food Guide. (E) One-third provided nutrient information, 21% claimed health benefits and 42% promoted physical activity. (P)
Potvin Kent et al., 2013 <sup>51</sup>	Home: online	Restaurant websites; Canada	Cross-sectional	Compare content of English-Canadian and French-Canadian food company websites, and websites by CAI and non-CAI companies	Spring 2010	77 English-Canadian and 70 French-Canadian restaurant websites, identified from food ads on children's preferred TV, <sup>44</sup> were analyzed for child-directed content. Websites with child content were coded for marketing features, child protection features and health promotion messages. X <sup>2</sup> and <i>t</i> tests compared group differences between English and French websites, and between CAI and non-CAI websites.	Frequency of marketing techniques, child protection features, and healthy living messages	Frequency of child-directed content was not statistically different between French and English sites ( $p < .640$ ), nor between CAI and non-CAI websites ( $p < .877$ ). (IR-P) No significant difference in the proportion of marketing to children or online marketing techniques between English- and French-Canadian food company websites, nor between CAI and non-CAI company websites. (IR-P) French websites had more healthy living messages but this was not statistically significant. (IR-P) Non-CAI companies used no child-protective features while 14.3%–28.6% of CAI companies did. CAI companies were also more likely to promote healthy living. (IR-P)

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**TABLE 3 (continued)**  
**Synthesis of Canadian, English-language literature on exposure to and the power and impact of food marketing to children in Canada, and the influence of the QCPA and the CAI**

Author	Setting	Population; location	Design	Purpose	Data Collection Period	Overview of methods	Key outcome measures	Key results
Brady et al., 2008 <sup>69</sup>	Home: online	Children aged 7–13 yrs; Canada	Cross-sectional	Explore children's awareness and use of online food marketing features and its impact on food requests	Jul. 2007–Aug. 2007	A convenience sample of 83 children at a summer day camp was recruited and completed an interview and questionnaire on the awareness and engagement with online marketing and relationships with requesting foods.	Prevalence of engagement with online marketing; prevalence of requests, purchases of food advertised online	Significantly fewer children (68%) believed there was food marketing on the internet compared to TV (99%) ( $p < .001$ ). (I) Over one-third visited food company websites advertised on TV or on product packaging (I) 13% shared these websites with friends. (I) 35% wanted to try a food advertised online and 21% requested or purchased the product. (I) Soft drinks, chocolate and candy were the top foods children wanted to try. (I)
Velazquez et al., 2015 <sup>52</sup>	School	Public schools; British Columbia	Cross-sectional	Identify frequency and type of food marketing in public schools in Vancouver	Nov. 2012–Apr. 2013	Observational audit of food promotions in common areas of 23 public schools. Promotions were coded by location, size, advertised product/brand, ad purpose, marketing techniques, and healthfulness as per provincial nutrition guidelines. X <sup>2</sup> and Fisher exact tests compared school group differences.	Number of food promotions; frequency of product type advertised, presence of marketing type, and provincial nutrition category	87% of schools contained food marketing (median 17/school, range 0–57/school), with more in secondary schools than elementary ( $p < .01$ ). (E) 60% of promotions were located in schools' hallways. (E) 55% of schools promoted "prohibited" foods and beverages according to the provincial guidelines. Only 13% of promotions were nutrition education. (E) Products and brands were promoted in 18% and 26% of promotions, respectively; characters and premium offers were rare (3% and 4% of promotions, respectively) (P)
Berry & McMillen, 2008 <sup>33</sup>	Grocery store	Breakfast cereals at eye level of children aged 8 yrs or younger in Canadian supermarkets; Ontario	Cross-sectional	Explore associations between marketing techniques and nutritional quality of breakfast cereals	Mar. 2005–Nov. 2005	Recorded breakfast cereals in a representative sample of 15 grocery stores that were 0–48 inches off ground. Product packaging was coded for marketing features. Nutritional content and ingredients were recorded. Multivariate regression using marketing features as predictors and nutritional content as outcomes was used to determine whether the cereal aisle is "health-protective" or "health-exploitive" <sup>35,39,333</sup>	Frequency of marketing features (spokes-characters, colours, child-orientation, reachable by child, oversized box); sugar, whole grain and trans fat content; relationship between features and nutrition	2755 cereal boxes identified at children's height. (E) Spokes-characters, colourful packaging, and child-oriented incentives were found on 34%, 48% and 35% breakfast cereal shelf space, respectively. (P) 17% of cereals were in child-themed colours and/or shapes (P) Cereals with these marketing techniques were also significantly higher in sugar, refined grain and/or trans fat. (P) Boxes that could be reached by children had mixed results on nutritional content (no difference in sugar, but more likely to have whole grain and less trans fat). (P)
Elliott, 2008 <sup>54</sup>	Grocery store	Regular (non-junk) foods targeted to children in Canadian supermarkets; location not provided	Cross-sectional	Assess the nutritional quality of foods marketed to children in Canadian grocery stores	Dec. 2005	367 foods targeted to children ("fun foods" <sup>54,39,389</sup> ) were purchased from Loblaws Superstore and coded for 36 variables related to the food type and packaging marketing features (graphics, nutrition claims). "Poor nutritional quality" products were identified using US Center for Science in the Public Interest benchmarks. X <sup>2</sup> , phi and Cramer's V tests assessed group differences.	Frequency of food types by nutritional quality; frequency of marketing techniques; differences by groups (food type, nutrient quality, presence of marketing technique)	Dry goods (cereal, crackers, cookies, granola bars, etc.) were the most common "fun foods" (61%). Vegetables and fruit were only 1% of the "fun foods". (E) 89% of "fun foods" were high in fat, sugar, or sodium. Acceptable cut-offs for sugar content were most frequently violated, at 70% of products. Total fat and sodium cut-offs were violated in 23% and 17% of products. (E,P) Products high in fat, sugar or sodium were significantly more likely to have a front-of-pack nutrition claim ( $p < .001$ ) (P)

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**TABLE 3 (continued)**  
**Synthesis of Canadian, English-language literature on exposure to and the power and impact of food marketing to children in Canada, and the influence of the QCPA and the CAI**

Author	Setting	Population; location	Design	Purpose	Data Collection Period	Overview of methods	Key outcome measures	Key results
Elliott, 2012 <sup>55</sup>	Grocery store	Regular (non-junk) foods targeted to children in Canadian supermarkets; Alberta	Cross-sectional	Identify regular grocery foods marketed to children in Canadian grocery stores	2009	354 foods targeted to children ("fun foods" <sup>55(p.385)</sup> ) were purchased from The Real Canadian Superstore and Safeway and coded for 37 variables related to food type, packaging marketing features, target audience and nutritional quality. X <sup>2</sup> , phi and Cramer's V tests assessed group differences.	Frequency of child-targeting product packaging and relationships between food types, packaging characteristics, target audience, nutritional quality	The majority of "fun foods" were dry goods (64%), only 1% were fruits or vegetables. (E) Parents were targeted on 55% of products. (P) Marketing techniques included: colours, shapes, cartoons, highlighting "fun food," <sup>55(p.386)</sup> nutrition claims, small portion sizes and convenient packaging. (P)
Elliott, 2012 <sup>57</sup>	Grocery store	Regular (non-junk) packaged foods targeted to children in Canadian supermarkets; Alberta	Cross-sectional	Compare nutritional quality of "regular" and "better-for-you" foods marketed to children in Canadian grocery stores	2009	354 foods targeted to children ("fun foods" <sup>57(p.387)</sup> ) were purchased from The Real Canadian Superstore and Safeway and coded for 37 variables related to food type and packaging marketing features, including claims that the product is healthier or "better-for-you." <sup>57(p.388)</sup> "Poor nutritional quality" products were identified using US Center for Science in the Public Interest benchmarks. X <sup>2</sup> and Fisher exact tests were used to assess group differences.	Frequency of healthier or "better-for-you" products; nutritional quality	23% of foods marketed to children ("fun foods") were considered "better-for-you" as per its packaging. (E,P) Overall, a lower proportion of "better-for-you" foods were high in fat, sugar or sodium than regular foods (65% vs. 91%, respectively). However, when considering the fixed effects of dry goods, there is no statistically significant difference in the proportion of regular and "better-for-you" foods that are of poor nutritional quality. (P) Almost all "better-for-you" foods that were high in fat, sugar or sodium had a front-of-pack nutrition claim. More "better-for-you" foods were marketed as "fun." (P)
Murray, 2014 <sup>56</sup>	Grocery store	Packaged foods and beverages; Canada; specific location not provided	Cross-sectional	Assess the presence of foods with product packaging marketed to children, and their nutritional quality	2010–2011	10 488 packaged food labels in Canadian grocers from Food Label Information Program 2010 were assessed for product packaging marketed to children aged 2–13 yrs from CAI and non-CAI companies. The UK Food Standards Agency definition was used to identify ads for "less healthy" foods. Wilcoxon rank sum test compared nutrient levels and X <sup>2</sup> or Fisher exact tests examined group differences.	Frequency and proportion of foods marketed to children; nutritional quality	415 packaged foods (4%) were marketed to children. (E) The products most frequently marketed to children were baked goods, desserts, cereals/ grain products, snacks and combination dishes. (E) Graphics, lettering, characters and unusual flavours, shapes and colours were most common marketing techniques used. (P) There were mixed results of nutrient content differences between foods marketed and not marketed to children. (E) 81% of the foods and beverages marketed to children were considered "less healthy". (E) There was no significant difference in the nutritional quality of foods marketed to children by CAI companies and by non-CAI companies ( $p = .090$ ). (IR-E)
Elliott & Brierley, 2012 <sup>58</sup>	Grocery store	Children aged 5–12 yrs; Alberta, Ontario, New Brunswick	Qualitative	Explore how children identify healthy products using packaging	2009	225 children participated in 52 focus groups divided by gender and age. Children were asked to evaluate the healthfulness of foods by looking at their packaging. Grounded theory approach was used for data analysis.	Identify the features of product packaging used by children to evaluate foods healthfulness	Ingredient lists and nutrition facts tables were used less frequently than front-of-pack claims. The children provided only vague explanations of how they used nutrition information to decide on a healthy product. (I) Colours, spokes-characters, language and pictures influenced perceptions of healthfulness. (I) Children believed products with bright, multiple colours were less healthy than muted colours; green was healthy. Pictures of foods not included in the package (i.e. strawberries in cereal) were often used in the analysis of products' healthfulness. (I) Spokes-characters were reported to be associated with both healthy and unhealthy products. (I)

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**TABLE 3 (continued)**  
**Synthesis of Canadian, English-language literature on exposure to and the power and impact of food marketing to children in Canada, and the influence of the QCQA and the CAI**

Author	Setting	Population; location	Design	Purpose	Data Collection Period	Overview of methods	Key outcome measures	Key results
Elliott, 2009 <sup>27</sup>	Grocery store	Children aged 5–12 yrs; Ontario	Qualitative	Explore children's understanding, responses, and perceptions of packaged foods	Feb. 2007	36 children participated in 6 focus groups divided by gender and grade to explore children's preferences, perceptions of food and process of assessing nutrition and health of food. Children participated in several activities: drawing and rationalizing their favourite dinner meal; individually selecting most appealing foods from multiple standard selections of products; identifying and rationalizing healthy products. Grounded theory approach was used for data analysis.	Understanding of and response to child-targeted food packaging; understanding of how children identify healthy food products, differences by age and gender	Younger grades preferred foods with unusual shapes/colours and cross-merchandising, whereas older grades chose foods based on appealing or appetizing packages. (1) Fun was an important feature in food choice across all ages. (1) Boys appeared to select products that they could play with; girls appeared to select products that were "pretty" <sup>57, p.369</sup> or that they personally related to. (1) Ingredient lists, front-of-pack packaging (colours, package seriousness) and labelling were "clues" <sup>59, p.371</sup> used to decide if a product was healthy; however, their interpretation was not usually accurate. Many children were unaware of nutrition facts tables. (1)
Brierley & Elliott, 2015 <sup>35</sup>	Grocery store	Children aged 5–12 yrs; Alberta	Qualitative	Explore boys' interpretations of "healthy" and "less healthy" packaged foods	Not stated	58 children (27 boys) from a high socioeconomic school participated in 12 focus groups divided by age and gender to explore interpretations of "healthy" and "less healthy" foods. Children participated in two activities: individually identifying the "healthiest" and "less healthy" crackers, cookies, yogurt from a selection; sorting cereals into "healthy" and "less healthy" as a group. Descriptive and topic coding were used for data analysis.	Understanding of how boys classify packaged food as "healthy" and "less healthy"	Discussions in focus groups with boys revolved around using nutrition facts tables to decide whether a food was healthy. (1) Boys focussed more on the foods' content of calories, fat, sugar and salt than girls did in deciding whether a food was healthy, and often made reference in discussions to being healthy, having a healthy weight, or playing sports. (1) Boys felt that foods besides vegetables and fruit were healthy, as well as food that were "protein," "meaty," "seed," <sup>58, p.30</sup> (1) "Organic" was often used by both genders to identify a healthy food. <sup>58, p.31</sup> (1)
Hobin et al., 2012 <sup>29</sup>	Fast food outlet	Children aged 6–12 yrs; Ontario	Experimental	Compare impact of toy premiums on healthy fast food meal selection in children aged 6–12 yrs	Jul. 2011–Aug. 2011	A convenience sample of 337 children at a summer day camp was recruited and randomly allocated to choose their lunch from an intervention menu (2 healthy meals with toys and 2 less healthy meals without toys) or a control menu (all 4 meals, healthy and less healthy, with toys). X <sup>2</sup> tests compared group level differences. Logistic regression tested group differences controlling for age and gender.	Proportion of children who selected the healthy meal vs. the less healthy meal	Children who were offered a toy only with the healthy meal were significantly more likely to pick the healthy meal (OR = 3.19, 95% CI: 1.89–5.40). (1, P) Girls were more likely to select the healthy meal (OR = 1.19, 95% CI: 1.14–3.17; <i>p</i> = .01), but there was a significant two-way interaction between the intervention and gender (X <sup>2</sup> = 0.433, <i>p</i> = .038): "pairing toys with healthier meal options had a stronger effect on boys compared to girls," <sup>59, p.486</sup> Only 10.0% of boys in the control selected the healthy option, increasing to 37.3% in the intervention; 27.5% of girls in the control selected the healthy option, compared to 41.2% in the intervention. (1)

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**TABLE 3 (continued)**  
**Synthesis of Canadian, English-language literature on exposure to and the power and impact of food marketing to children in Canada, and the influence of the QCPA and the CAI**

Author	Setting	Population; location	Design	Purpose	Data Collection Period	Overview of methods	Key outcome measures	Key results
Elliott et al., 2013 <sup>60</sup>	Fast food outlet	Children aged 3–5 yrs; Alberta	Experimental	Compare impact of branding and packaging on taste preferences children aged 3–5 yrs	Not stated	77 children were randomly given identical foods in two different packages. Children selected their preferred food from their two options. Parents completed a questionnaire on child demographics, TV habits, eating habits and income. Wilcoxon signed rank, Mann-Whitney U and Kruskal-Wallis tests examined experimental impact and relationship with child characteristics.	Child preferred food; child characteristics; impact of packaging on food choice	Children preferred food that was presented in McDonald's packaging compared to plain packaging ( $p < .009$ ), but not compared to coloured ( $p < .240$ ) or Starbucks packaging ( $p < .404$ ). (I,P) Carrots in McDonald's packaging were believed to be tastier than those in plain packaging ( $p = .0497$ ) but not as tasty as carrots in coloured packaging ( $p = .033$ ). (I,P) Taste did not differ for any other product (burger, nuggets, dessert), except fries, which were reported as tastier in McDonald's than plain packaging ( $p = .048$ ). (I,P) Frequency of visiting McDonald's impacted taste preferences in the McDonald's vs. plain packaging group only ( $p < .044$ ). (I,P)
Elliott, 2011 <sup>60</sup>	n/a	Children aged 6–11 yrs; Alberta, Ontario, New Brunswick	Qualitative	Explore how children perceive food for them and food for adults	Not stated	225 children were recruited for focus groups to explore food preferences, food categories ("kids' food," "adult food" <sup>60(p.13)</sup> ), and nutrition. Focus groups contained 4–6 children and were separated by gender and grade level. Grounded theory approach was used for data analysis.	Perceptions of food types, preferences, and nutrition	Children's views were consistent across age, gender and location. (I) Children viewed "kids' food" as unhealthy junk food that might be presented in an unusual shape or colour or in a small serving, or that could be played with. (I) Adult food was perceived to be healthy, plain and responsible, such as salad or protein. (I) Children's beliefs about "kids' food" and "adult food" categories did not differ by age or gender. (I)
Elliott, 2014 <sup>36</sup>	n/a	Children aged 12–14 yrs; location not provided	Qualitative	Explore how adolescents perceive non-branded food items	Spring 2013	5 focus groups of 6 adolescents each, separated by gender and grade level, were used to explore the meaning of food to adolescents through the topic of "food as people." <sup>36(p.86)</sup> Grounded theory approach was used for data analysis.	Perceptions of personality traits of non-branded foods	Adolescents reported socially constructed perspectives on several food categories (broccoli, milk, meat, eggs, junk food, organic food) that do not have specific marketing campaigns. (I) For some food types, girls and boys had differing perspectives: girls believed milk to be healthy and athletic, while older boys believed it to be less desirable; girls assigned negative attributes to meat but boys assigned positive attributes to it. (I) Adolescents generate consistent "brand personalities" regardless of whether a food is commercially branded or promoted.(I)

**Abbreviations:** ad(s), advertisement(s); ANOVA, analysis of variance; CAI, Canadian Children's Food and Beverage Advertising Initiative; CI, confidence interval; d, day; E, exposure; h, hour; I, impact; IR-E, influence of regulation on exposure; IR-P, influence of regulation on power; min, minute; OPAT, of particular appeal to; P, power; QCPA, Quebec Consumer Protection Act; TV, television; X<sup>2</sup>, chi-square; yr(s), year(s).

**TABLE 4**  
**Summary of influence of current regulation in Canada on exposure to and power of food marketing to children by setting**

Setting	Influence of QCPA			Influence of CAI		
	Exposure <sup>a</sup> to food marketing overall	Exposure <sup>a</sup> to unhealthy food marketing	Power <sup>b</sup>	Exposure <sup>a</sup> to food marketing overall	Exposure <sup>a</sup> to unhealthy food marketing	Power <sup>b</sup>
Home (TV)	No influence	Positive influence	Positive influence	Negative influence	No influence	Negative influence
Home (online)	—	—	No influence	—	—	No influence
School	—	—	—	—	—	—
Supermarket	—	—	—	—	No influence	—

**Abbreviations:** CAI, Canadian Children's Food and Beverage Advertising Initiative; QCPA, *Quebec Consumer Protection Act*; "—", not documented.

<sup>a</sup> Exposure is defined as "the reach and frequency of the marketing message."<sup>9,p.11</sup>

<sup>b</sup> Power is defined as "the creative content, design and execution of the marketing message."<sup>9,p.11</sup>

### Exposure to food marketing in the home: online

Online food marketing in Canada was captured by two studies evaluating marketing to children on food company websites.<sup>50,51</sup> This evidence does not assess the multitude of emerging electronic marketing techniques used to target children, including viral marketing (online word-of-mouth by consumers), social networking and direct marketing by e-mail.<sup>4</sup> The author found no studies that assessed these techniques in Canada. Studies from other countries may be informative, since Canadians can access international websites; however, that was beyond the scope of this review. The two included studies focussed on documenting the powerful characteristics of food company websites and were not designed to measure exposure—for example, the proportion of websites visited by children with food marketing. Thus, the available evidence does not reveal children's exposure to food marketing online, or the impact of regulation on the degree of exposure.

### Power of food marketing in the home: online

In 2010, Potvin Kent et al.<sup>51</sup> reviewed websites tied to food or beverages advertised on television watched by ten to 12 year old children to evaluate the impact of the QCPA and the CAI. Of 148 websites, approximately one-third were child-directed, which was defined as having "child-oriented marketing features such as spokes-characters, cartoons, contests, activities, or games directed at children; and [using] simple vocabulary easily understood by children."<sup>51,p.801</sup> In a separate evaluation of only CAI company websites, 83% contained marketing directed at children under 12 years of age.<sup>50</sup>

Multiple techniques urged children to engage with the food marketing on CAI websites:<sup>50</sup>

- memberships, incentives and leaderboards for repeated and prolonged use of online media;
- "advergames," music, animation and e-buttons to interact with the product or brand;
- electronic word-of-mouth techniques to share brand or website information; and
- downloadable features (computer wallpaper, growth charts, shopping lists, board games) to embed brands into children's daily lives.

### Influence of regulation on power

No statistical differences in the power of food marketing (e.g., whether or not they targeted children, the type or frequency of promotional techniques used) were found between French- and English-language websites, nor between CAI and non-CAI websites in 2010.<sup>51</sup>

### Exposure to food marketing in schools

With only one study on marketing in schools conducted in the last decade,<sup>52</sup> evidence is lacking in this setting. Velazquez et al.<sup>52</sup> examined the extent of commercial and non-commercial (made by the school or students) food promotions in a representative sample of 23 Vancouver public schools in the 2012/13 school year. Through observation, Velazquez et al.<sup>52</sup> found that 87% of schools displayed food promotions. Schools had a median of 17 promotions (range = 0–57). Secondary schools had more advertising than elementary schools.<sup>52</sup>

Velazquez et al.<sup>52</sup> used British Columbia's school nutrition guidelines<sup>21</sup> to assess the healthfulness of observed food and beverage promotions. Over half of schools promoted foods or beverages prohibited by the provincial guidelines.<sup>52</sup> Almost one-quarter of all promotions were for "Choose Least Often" or "Not Recommended" items.<sup>52</sup> On the other hand, 80% of the schools had promotions for "Choose Most Often" items, which made up 45% of all promotions.

### Influence of regulation on exposure

No studies have evaluated the impact of the QCPA or the CAI on exposure to food marketing in schools. The lower levels of food marketing in elementary schools documented by Velazquez et al.,<sup>52</sup> a setting partially covered by the CAI, may reflect the influence of the CAI; however, this finding more likely reflects the fact that secondary schools have more food services (vending machines and concessions) than elementary schools<sup>52</sup> and thus more food promotion.

### Power of food marketing in schools

Velazquez et al.<sup>52</sup> found that observable food promotions in schools often involved specific products or brands, and rarely used animated characters, celebrities or premium offers. The rare use of these powerful techniques may be related to the finding that half of promotions recorded were noncommercial promotions created by the students or the school.<sup>52</sup>

### Influence of regulation on power

Not documented.

### Exposure to food marketing in supermarkets

Two studies documented the proportion of products that targeted children through



product packaging. From 15 randomly audited grocery stores in Ontario, Berry and McMullen found 2755 cereal boxes at child height (defined as 48 inches from the ground, which takes into account the eye level of a child sitting in a shopping cart as well as standing or walking).<sup>53</sup> Up to half of breakfast cereal shelf space at child height contained cereal boxes with at least one child-directed feature (described in the “Power of food marketing in supermarkets” section of this article). From the University of Toronto’s Food Label Information Program database, which contains over 10 000 packaged food products collected between 2010 and 2011, Murray found that 415 (4%) targeted children, defined as depicting fun or play, or using cartoons or child-like fonts.<sup>56</sup> One other study<sup>55</sup> identified products that were targeted to children only, without collecting a total product denominator. In two supermarkets in Alberta, Elliott found over 350 everyday foods (not junk foods) that targeted children, defined as being designed for children, or displaying cartoons, cross-merchandising, unusual shapes, colours, tastes, or games on its packaging.<sup>55</sup> The estimates of exposure in these three studies are not complete; true exposure may be underestimated, since none of the studies explored food marketing in check-out areas, store display, or other features of grocery stores.

Overall, most foods marketed to children in supermarkets were high in sugar, fat or sodium<sup>54</sup> and/or low in desirable nutrients.<sup>56</sup> Almost one-quarter of foods marketed to children were labelled “better for you” according to the CAI definition; however, two-thirds of the “better for you” foods were still high in sugar, fat or sodium.<sup>37</sup> A significantly greater proportion of some food categories (snacks, beverages, cereals, crackers, pudding and combination dishes not measurable by a cup, such as pizza) were considered “less healthy” according to the UK’s Nutrient Profiling system when they were marketed to children compared to when they were not marketed to children.<sup>56</sup> Elliott<sup>55</sup> and Murray<sup>56</sup> both found that 1% or less of foods marketed to children were vegetables or fruits.

#### **Influence of regulation on exposure**

Neither the QCPA nor the CAI explicitly applies to product packaging. No research exists on the impact of the QCPA on product packaging. The impact of the CAI on

the overall exposure to product packaging targeted at children is not documented; however, Murray found that the CAI did not impact the nutritional quality of foods marketed to children through product packaging.<sup>56</sup>

#### **Power of food marketing in supermarkets**

The majority of grocery store products Elliott reviewed had “fun” features on product packaging, including cartoons and cartoonish fonts.<sup>54</sup> Murray found that unusual flavours, shapes and colours, characters and graphics or lettering were the most commonly used marketing techniques on products targeting children.<sup>56</sup> In an analysis of breakfast cereals boxes, 48% had child-oriented colours, 35% had incentives or premium offers and 34% had spokes-characters.<sup>53</sup>

Similar to research on television food advertisements, powerful marketing techniques on product packaging were associated with poor quality foods.<sup>53,54</sup> In particular, breakfast cereals were more likely to be higher in sugar if their packaging targeted children.<sup>53</sup> As well, over two-thirds of non-junk, high-sugar products had a nutrition claim, compared to only half of “healthier” products.<sup>54</sup> Berry and McMullen suggested that the marketing landscape in the cereal aisle in Canada is “health-exploitive,”<sup>53,p.334</sup> meaning that it uses child-directed marketing techniques on less healthy products, encouraging their consumption.

#### **Influence of regulation on power**

Not documented.

#### **Impact of food marketing on children in Canada**

The evidence of a causal impact of food marketing on children’s food attitudes, preferences and behaviours is compelling and has been discussed elsewhere.<sup>6,61,62</sup> Although limited, Canadian studies provide local insight into how children in Canada are impacted by food marketing. Experimental and qualitative studies in Canada have shown that television product placement,<sup>48</sup> online advertising,<sup>49</sup> product packaging,<sup>35,57,58,60</sup> and toy premiums<sup>59</sup> can impact Canadian children’s attitudes, preferences, and behaviours.

Hudson and Elliott<sup>48</sup> found that although only 17% of children (7-12 years) were aware of product placement, children who viewed a television program with unhealthy

product placements (vs. no product placement or healthy product placement) were most likely to recall the advertised products. Almost one-quarter of children aged 7 to 13 years said they purchased or requested a food advertised online (most commonly soft drinks, chocolate and candy).<sup>49</sup>

Researchers used focus groups of children aged 5 to 12 years to assess children’s preferences, perceptions and interpretations of packaged foods.<sup>35,57,58</sup> Preferences were commonly influenced by packaging that used themes of fun and was esthetically pleasing or interactive.<sup>57</sup> When asked to identify healthy products, children created their own, often inaccurate, rationales based on colours,<sup>57</sup> nutrition or organic claims,<sup>35,57</sup> ingredient lists<sup>35,57</sup> and sometimes nutrition facts tables.<sup>35,57</sup> Results from focus groups with 225 children across Canada revealed that marketing features (colours, words, pictures, spokes-characters and front-of-pack claims) were more regularly used than nutrition facts and ingredient lists in evaluating the healthfulness of packaged foods.<sup>58</sup>

Elliott et al.<sup>60</sup> investigated whether 6 to 11 year old children’s taste preferences differed based on food packaging design. When compared to food in plain packaging, children preferred the food in McDonald’s packaging; however, this preference was not maintained when food in McDonald’s packaging was compared to colourful or Starbucks packaging. Exploring a method of healthy food promotion, Hobin et al.<sup>59</sup> assessed the impact of toy premiums on meal choice. Children (aged 6–12 years) who were offered toy premiums with healthy options only (vs. healthy and unhealthy options) were over three times as likely to select the healthy meal.<sup>59</sup>

Finally, evidence from qualitative studies that were not setting-specific show that Canadian children have homogeneous attitudes towards food,<sup>36,40</sup> suggesting that cumulative exposures to food marketing may have a greater impact on children’s food culture than a single exposure in a study. Focus groups conducted in Alberta, Ontario and New Brunswick with children aged 6 to 11 years showed that children distinguished between food for themselves and for others.<sup>40</sup> They reported that “kids’ food” is junk food, sugary, associated with cartoons, comes in fun shapes or colours and is something you can play

with or eat with your hands.<sup>40,p.133</sup> These symbolic features identified by children mimic the powerful techniques listed in this review and used by the food industry to market to children. Conversely, children saw adult food as plain, unprocessed, healthy, responsible food, and not for them.<sup>40</sup> As well, adolescents (aged 12-14 years) personify food in a consistent manner across Canada:<sup>36</sup> broccoli is “shy, unpopular, and boring,”<sup>36,p.87</sup> and milk is “athletic”<sup>36,p.87</sup> (except for older boys). They see junk food, on the other hand, as a “party person” who is “funny and fun to hang around with.”<sup>36,p.87</sup> Children’s food attitudes may have been socially constructed by commercial food marketing, or the lack thereof, and may partly explain why the children’s diets do not align with Canada’s Food Guide.

## Discussion

This scoping review found evidence of multiple exposures to food marketing to children in different settings—at home, at school and in supermarkets. With the exception of television and product packaging, the evidence base is limited. Fast food restaurants represent another setting where food marketing would be expected, but only the impact of promotional techniques used in fast food restaurants<sup>59,60</sup> has been studied in Canada. International research has documented food marketing in other settings (restaurants,<sup>63</sup> sports centres<sup>64</sup> and outside<sup>65</sup>) and thus, this review likely underestimates Canadian children’s exposure. Foods high in energy, fat, sugar and salt were commonly marketed in all settings, which is consistent with findings from other research.<sup>6</sup> Children were often targeted with powerful promotional techniques that were multiple and varied, and overlapped across settings; food marketers have an arsenal of marketing tools.

With the exception of limited positive influences of the statutory regulation in Quebec on television food advertising, current evidence suggests that statutory and self-regulations in Canada have not improved either children’s exposure to or the power of food marketing; however more research is needed to understand regulations’ impact across settings. Dhar and Baylis estimated that the QCPA has positively impacted population health by reducing weekly household fast food consumption in French-speaking, but not English-speaking, households with children in Quebec since English-speaking

households may view non-Quebec food marketing not covered under the QCPA.<sup>66</sup> Although the influence of regulation in schools has not been measured, a 2004 survey of all Canadian public schools found that prevalence of commercial (food and non-food) advertising was lower in Quebec than the rest of Canada.<sup>67</sup> Quebec’s statutory regulation, a rights-based approach to child health,<sup>4</sup> may better influence the settings and context in which children live, compared to industry self-regulation.

The evidence synthesis presented here shows that food attitudes, preferences and behaviours of Canadian children are impacted by exposures to food marketing in a single setting. More important, however, may be the uniformity of food attitudes among Canadian children, which is suggestive of a nonspecific, collective impact of food marketing exposure over time and across place. As children become increasingly immersed in marketing throughout their lives, and as promotional techniques and channels integrate and overlap more often,<sup>68</sup> it is reasonable to ask whether exposures to unhealthy food marketing have a greater cumulative impact<sup>61</sup> than when viewed separately by promotion type.

The body of evidence presented in this scoping review must be considered within the daily life of an average Canadian child, who watches two to three hours of television,<sup>69</sup> uses the computer or plays video games for one to two hours,<sup>69</sup> sits in school for five to six hours<sup>70</sup> and whose family shops for groceries almost every second day.<sup>71</sup> In that light, it becomes more obvious that children in Canada (with the exception of some in Quebec) are at risk of exposure to an astounding volume of powerful food marketing. Furthermore, the settings where food marketing occurs that the author has identified in this review are common places for children to eat, buy or learn about food.

The study of Vancouver schools may suggest that children’s exposure to unhealthy food marketing is less frequent and the marketing is less powerful in schools than in other settings, since only one-quarter of foods advertised were unhealthy and powerful promotional techniques were rare.<sup>52</sup> This finding may be noteworthy, as it may signify that settings-based policies, such as British Columbia’s mandatory school food policy with food

marketing recommendations,<sup>21,22</sup> are more comprehensive and efficient than traditional promotion-focussed regulations. The latter may not reach the extensive food-related commercialization in Canadian public schools previously reported,<sup>67</sup> including exclusive agreements with Coca-Cola and Pepsi, incentive programs (Campbell’s Labels for Education) and sponsored educational materials (Pizza Hut’s “Book it”, Mr. Christie’s “Smart Cookie”). Unfortunately, the limited research precludes conclusions about the state of marketing in schools, especially since variability in school food policies likely contributes to different food marketing environments in schools across Canada.

Experts have recommended strong, comprehensive statutory regulations with independent monitoring and compliance penalties to effectively reduce children’s exposure to powerful unhealthy food marketing.<sup>72,73</sup> Nevertheless, those planning interventions must consider how multiple exposures to food marketing interact and socially construct food attitudes and behaviours in children’s everyday settings. The tendency for regulations to focus on the promotional aspects of food marketing<sup>74</sup> without considering the settings where children eat, buy or learn about food may increase the risk of policies that inadequately intercept marketers’ plans to reach children. Settings as a component in the proposed Canadian food marketing regulations<sup>17</sup> is valuable if the regulations consider settings not as just promotional marketing channels, but as the places where behaviours are performed or related goods and services are acquired<sup>5</sup> – where children eat, buy and learn about food.

## Implications for policy and research

A comprehensive approach to restricting unhealthy food marketing to children that addresses product, promotion, place and price may require action by policy makers, industry and communities.

In the United States, Palaskhappa et al. found that lower childhood obesity prevalence was associated with strong laws regulating the sale of unhealthy foods (OR = 0.68, 95% CI:0.48–0.96) and food advertising in schools (OR = 0.63, 95% CI:0.46–0.86), compared to states with no laws.<sup>75</sup> Furthermore, states with multiple strong school food laws (two or more) compared to states with no laws had reduced risk of obesity in elementary

schools and of overweight in middle schools.<sup>75</sup> The success of this kind of regulation demonstrates that government policy regulating the food industry, if it follows research-based recommendations,<sup>73</sup> can be paired with local settings-based initiatives to prohibit unhealthy food marketing in the places where children live, learn and play, such as schools and recreation facilities. The places where we eat, buy and learn about food are critical points of intervention for health promotion, just as they are critical targets for the food industry.

The goal of marketing restrictions should be to improve children's everyday lives, not just limit the marketing channels used to reach them. Solely focussing on the promotional aspects of food marketing may allow marketers continued access to children by simply switching from one marketing technique to another. The increase in new media marketing techniques and decrease in television marketing observed in the United States after the introduction of industry self-regulation<sup>68</sup> may be evidence of such a consequence. The sectors that disseminate food marketing (schools, media, retailers, sports organizations, etc.) are key actors in supporting food marketing restrictions.<sup>9</sup>

Using the broadcast industry's code as an example of sector-based action,<sup>12</sup> organizations and communities can take the lead in place-based interventions by developing their own marketing or sponsorship policies that address the promotion, place and pricing of unhealthy food and beverages. Setting-based health promotion helps to shift the focus from an individualistic risk-factor approach to one that appreciates the complexity of interconnecting environmental and individual factors influencing health.<sup>14</sup> Whole-system approaches, a feature of settings-based interventions, with actions by government, industry and communities may impact culture more widely than traditional reductionist approaches that view issues linearly with single causes and outcomes.<sup>14</sup> For example, school food policies, which may include multiple aspects of marketing (see Table 1), can be expanded to comprehensively address all 4Ps. In addition to proposed marketing regulations, policy makers may also consider adopting additional supporting interventions that target broader aspects of marketers' 4Ps, such as product availability through industry reformulation, or food

pricing via taxes and subsidies, in a whole-system intervention to reduce the impact of food marketing. A 4Ps policy strategy may help address unhealthy food marketing in situations where it is not applicable or feasible to introduce a settings-based policy, such as in the business sector.

Further research is needed to fully examine children's exposure to and the power and impact of food marketing within the settings of children's everyday lives and consider the influence of all 4Ps. Specifically, more research is needed on how settings, such as schools, recreation centres, daycares, retailers and other spaces, can be targeted when creating policy to protect children from unhealthy food marketing. More research is also needed on children older than 12 years and population subgroups (e.g. by income or ethnicity) to completely understand the state of food marketing to children in Canada and its impact.

### **Strengths and limitations**

The settings-based approach<sup>18</sup> used to conduct this review diverges from the usual siloed media/promotion perspective and provides fresh insight into children's exposure to food marketing, its power and its impact on their lives. By critiquing the literature through the 4Ps marketing lens, this review bridges the population health and business disciplines and provides a novel perspective on population health interventions and research on food marketing to children.

Restricted to peer-reviewed, English-language research in Canada, however, the findings in this review may underestimate children's exposure to and the power of food marketing in Canada. The limited search strategy may have excluded studies that cursorily measured food marketing to children as a part of broader study objectives irrelevant to this review. With only 23 studies (mostly cross-sectional) published over the last decade, the temporal aspects of marketing are not well documented. Due to the mix of study designs, the quality of studies was not evaluated.

### **Conclusion**

Creating environments that support healthy diets for children is a priority in Canada as a strategy to reduce the prevalence of childhood obesity.<sup>76</sup> However, food marketing in the settings where

children eat, buy and learn about food encourages "fun" junk foods inconsistent with healthy diets. The findings from this scoping review suggests that statutory and voluntary regulations are not adequately protecting Canadian children from exposure to powerful unhealthy food marketing. Complementary actions from government, industry and communities, such as strong, enforced and monitored statutory regulations and broadened school food policies, may be needed to address the multifaceted nature of powerful food marketing. With almost seven million children under 18 years<sup>77</sup> in Canada and 400 000 new births every year,<sup>78</sup> protecting the places where children live, learn and play from unhealthy food marketing constitutes one of the strategies needed to help reverse the tide of childhood obesity in Canada.

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Rachel Prowse has no financial relationships that may pose a conflict of interest.

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