Television Food Advertising to Children: A Global Perspective

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Excess weight in children is a significant global public health issue: 10% of school-aged children,¹ and a further 22 million children younger than 5 years,² are estimated to be overweight or obese. Although the absolute prevalence of childhood obesity varies between and within countries,³ obesity levels are rising across the globe.⁴

Food marketing to children has been recognized as 1 factor contributing to the obesitypromoting environment, and it is considered an important arena for action in the prevention of obesity.⁵ Systematic reviews have found that marketing generates positive beliefs about advertised foods and influences children's food preferences, purchase requests, and consumption.^{6–8} These findings are a concern because advertised foods are typically the antithesis of dietary recommendations.⁹

Evidence from psychological research indicates that children, particularly those younger than 8 years, are not fully aware of the persuasive intent of food marketing and tend to accept advertising as truthful, accurate, and unbiased.^{8,10} Older children, although they may understand that advertising is intended to sell a product, may not be able to interpret these messages critically.¹⁰

Only a few studies have compared international patterns of television food advertising to children. One of these found that food and beverages were the most highly advertised products and that confectionery, presugared breakfast cereals and fast-food restaurants accounted for over half of all food advertisements.¹¹

Analyses of persuasive marketing techniques, such as the use of promotional characters and premiums in television advertising from individual countries, have found them to be concentrated in advertisements for unhealthy food products and during the broadcast periods most popular with children. An Australian study found that the rate of *Objectives.* We compared television food advertising to children in several countries.

Methods. We undertook a collaboration among 13 research groups in Australia, Asia, Western Europe, and North and South America. Each group recorded programming for 2 weekdays and 2 weekend days between 6:00 and 22:00, for the 3 channels most watched by children, between October 2007 and March 2008. We classified food advertisements as core (nutrient dense, low in energy), noncore (high in undesirable nutrients or energy, as defined by dietary standards), or miscellaneous. We also categorized thematic content (promotional characters and premiums).

Results. Food advertisements composed 11% to 29% of advertisements. Noncore foods were featured in 53% to 87% of food advertisements, and the rate of noncore food advertising was higher during children's peak viewing times. Most food advertisements containing persuasive marketing were for noncore products.

Conclusions. Across all sampled countries, children were exposed to high volumes of television advertising for unhealthy foods, featuring child-oriented persuasive techniques. Because of the proven connections between food advertising, preferences, and consumption, our findings lend support to calls for regulation of food advertising during children's peak viewing times. (*Am J Public Health.* 2010;100:1730–1736. doi:10.2105/AJPH.2009. 179267)

unhealthy food advertisements containing premiums was 18 times as high and the rate of advertisements containing promotional characters was twice as high during the most popular children's programs as during adults' popular programs.¹²

We determined and compared the frequency and nature of television food advertising to children in a range of countries. We also assessed food advertising during children's peak viewing periods and the use of persuasive marketing techniques.

METHODS

We undertook a collaboration among 13 independent research groups in 11 countries. The groups were based in Sydney, Australia; Brasilía, Brazil; Edmonton, Alberta; Toronto, Ontario; Hong Kong, China; Hamburg, Germany; Athens, Greece; Brindisi, Italy; Las Palmas de Gran Canaria, Spain; Gothenburg, Sweden; Liverpool and Durham, United Kingdom; and New York City.

Sampling

Each research group recorded television data for 2 weekdays and 2 weekend days between 6:00 and 22:00, for the 3 channels most popular with children younger than 13 years. Each group analyzed 192 hours of television broadcasting from an overall sample of 2496 hours.

For countries with a high penetration of cable or pay TV (\geq 50%), these channels were considered for inclusion. Where cable or pay TV penetration was less than 50% of households, only free-to-air channels were considered. Channels were selected according to audience measurement data. Where these data were not available, we consulted with experts in the field and searched recognized sources of children's television viewing to ensure that we selected the most appropriate channels.

Television data were recorded onto DVDs or hard disks. Where possible, we recorded data for all channels simultaneously. Otherwise, we recorded over successive weeks, with each channel recorded on the same days of the week to avoid any differences in advertising patterns between weekdays.

We collected data between October 2007 and March 2008. The data collection period excluded national holidays, large sporting competitions, special events, and holiday periods, to ensure that data represented typical broadcasting.

Coding

Overall advertisements. Each group scanned, logged, and classified recorded programming for advertisements according to predefined criteria. Criteria included the program category in which the advertisement was shown, the advertised product type, and the period when the advertisement was broadcast, as either children's peak or nonpeak viewing times. Children's peak viewing times were defined as periods when the number of children watching television (all channels combined) was greater than a quarter of the maximum child audience rating for the day. Data on children's peak viewing times were derived from the average child audience viewing pattern over the previous year, given separately for weekdays and weekend days. This definition was used previously to classify children's peak viewing times.¹² Where these data were not available, we tried to obtain representative data.

Food and beverage advertisements. Food and beverage advertisements were categorized as either core, for items that were nutrient dense and low in discretionary energy; noncore, for products that were relatively high in undesirable nutrients, including fat and sodium, or energy (according to the Australian Dietary Guidelines,¹³ which are similar to those of many of the countries in the study); or miscellaneous. We further subdivided the advertised products into 28 categories according to a food classification system used in previous research on food advertising to children (Table 1).^{12,14–16}

For food-coding ambiguities, we developed standard coding procedures. Where multiple food products were shown in an advertisement, we coded the most dominant product. Where equal weight was given to 2 or more products, we used the first product shown. If the advertisement was for a brand name only, we considered the nature of the products promoted by the advertised company (e.g., an advertisement for a fast-food brand was coded as a fast-food restaurant meal).

We screened food advertisements for 2 persuasive marketing techniques: premiums, including competitions, giveaways, rebates, and vouchers, and promotional characters, including celebrities, sports figures, cartoon characters, and spokesperson or branded characters.

Reliability. We assessed reliability of coding with a random 1-hour test sample of television recording. To determine within-group reliability, where more than 1 person performed the data coding, each person coded the test sample and the correlation between individuals' results (person 1 divided by person 2) was calculated. Agreement between coders ranged from 87% to 100% for food versus nonfood classification and 94% to 100% for food category classification.

For between-group reliability, the Australian group recoded the test sample from each group (Australian group's coding/other group's coding). Cohen's κ statistic assessed the correlation between groups' coding. The κ statistic for the classification of advertisements as for either food or nonfood products between groups was between 0.81 and 1.00, indicating almost per-fect agreement.^{17}

For a comparison of food category coding, we derived a κ statistic of 0.33 for Germany, indicating fair agreement.¹⁷ The lower correlation between Germany and the reference group was attributable to differences in coding of only 1 advertisement, for a probiotic drink, which was repeated during the test recording period (coded as sugar-sweetened drink by the German group and as low-fat dairy by the reference group). For all other groups, the κ statistic for food category coding ranged between 0.74 (substantial agreement) and 1.0 (almost perfect agreement).

Analysis

We analyzed data descriptively overall and for individual groups with SPSS version 14.0 for Windows (SPSS Inc, Chicago, IL). Data for the 2 groups from Canada and from the United Kingdom were merged so that results could be presented for each country overall. Pearson χ^2 tests were applied to determine significant differences in the proportion of food advertisements for different viewing periods and the use of persuasive marketing. We considered results significant at the α =.05 level.

RESULTS

We recorded a total of 2448.5 hours of programming. Because of recording errors, we omitted 2 hours from Alberta, 21.5 hours from Ontario, and 24 hours from New York City.

Overall Food Advertising

Across countries, 68 462 advertisements were identified, of which 18% were for food. Overall, food was the second most frequently advertised product, after channel promotions (23%); in each country, food products were in the top 3 advertised products, contributing between 11% (Brazil, n=454) and 29% (Greece, n=1816, and Italy, n=732) of advertisements.

The overall rate of food advertising across the sample was 5 food advertisements per hour per channel. Greece had the highest rate of food advertising: 9 food advertisements per hour per channel. Brazil had the lowest: 2 food advertisements per hour per channel.

For all countries, the majority of food advertisements were for noncore foods (67%). Germany had the highest proportion of noncore food advertisements (87%; Figure 1).

The most frequently advertised food groups were fast-food restaurant meals (12% of food advertisements), chocolate and confectionery (12%), low-fat dairy products (9%), high-fat, high-sugar, or high-salt spreads and sauces (8%), and full-fat dairy products (8%; Table 1).

Fast-food restaurant meals were the most frequently advertised food products in the United States (32% of food advertisements), Canada (24%), Sweden (15%), and Australia (14%). Chocolate and confectionery was the most frequently advertised food product in Germany (26%), China (17%), and Italy (17%), and full-fat dairy products were the most advertised products in Greece (21%). Low-fat dairy foods were the most frequently advertised food products in Spain (30%) and the United Kingdom (14%); the most frequently advertised food or food-related item for Brazil was supermarkets (miscellaneous).

TABLE 1—Contribution of Each Food Category to Overall Food Advertisements Broadcast During Television Programs Most Watched by Children in 13 Countries, October 2007-March 2008.

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Food Advertising by Program Category and Time

The program category that contained the highest proportion of food advertisements overall was comedy (23% of advertisements). However, programs specifically targeting children with visuals, themes, and language of particular appeal to children—contained the highest proportion of advertisements for noncore foods (80% of food advertisements), followed by comedy (74%), sports (71%), and reality (71%).

The rate of food advertising was the same for children's peak and nonpeak viewing times: 5 food advertisements per hour per channel (Table 2). However, the rate of advertising of noncore food products was highest during children's peak viewing times, with 4 noncore food advertisements per hour per channel; only 3 per hour were broadcast during nonpeak viewing times. The rate of noncore food advertising was highest during children's peak viewing times in Australia, Brazil, China, Germany, Italy, Spain, and the United Kingdom.

Persuasive Marketing Techniques

Premiums. For all countries, 12% of food advertisements contained premiums, with



FIGURE 1—Proportion of major food groups advertised, by country.

a range of 2% (Greece) to 34% (United States). Significantly more food advertisements containing premiums were for noncore foods (75% vs 13% for core and 12% for miscellaneous foods; χ^2_1 =93.28; P<.001). We observed this tendency across all countries, with the exception of China, where 54% of all food advertisements featuring premiums

were for miscellaneous food products (Figure 2). Notably, all food advertisements containing premiums in Germany (n=338) and Sweden (n=48) were for noncore food products.

Overall, a significantly higher proportion of food advertisements containing premiums were aired during children's peak viewing

TABLE 2—Rate of Advertising of Food and Noncore Foods During Children's Peak and Nonpeak Viewing Times by Country

	Peak Viewing Times, Ads Per Hour Per Channel		Nonpeak Viewing Times, Ads Per Hour Per Channel	
Country	Food, Rate	Noncore Food, Rate	Food, Rate	Noncore Food, Rate
Greece	9	5	10	6
Germany	7	6	4	4
China	7	4	3	2
Spain	6	5	6	3
Sweden	6	4	6	4
United States	5	4	5	4
Australia	5	3	5	2
United Kingdom	5	3	3	2
Canada	4	3	6	5
Italy	4	3	3	2
Brazil	4	2	1	0
Overall	5	4	5	3

Note. Noncore foods include products relatively high in undesirable nutrients, including fat and sodium, or energy (as defined in dietary guidelines).

times than during nonpeak times (17% vs 8%; χ^2_1 =199.48; *P*<.001).

Promotional characters. In all countries, 23% of all food advertisements contained promotional characters, with a range of 9% (Italy) to 49% (United States). Significantly more advertisements featuring promotional characters were for noncore foods (79% vs 15% for core and 6% for miscellaneous; χ^2_1 =268.71; P<.001). In all countries, the highest proportion of all food advertisements containing promotional characters were for noncore foods, with the exception of China (49% for core foods) and Italy (36% for miscellaneous foods; Figure 2).

Overall, similar proportions of food advertisements containing promotional characters were aired during children's peak (23%) and nonpeak viewing times (22%; not significant).

DISCUSSION

We compared television food advertising patterns in 13 countries across 5 continents. We observed wide variability in the rate of food advertising in each country—between 2 and 9 food advertisements per hour per channel. We also found variation in the rate of food advertising during children's peak viewing times, with between 3 and 9 food advertisements per hour per channel.

Our findings suggest that if children watch television only 2 hours per day (a conservative figure) and if this viewing takes place during the most popular broadcast periods for children, they are exposed to between 56 and 126 food advertisements per week (median=70), including 28 to 84 noncore food advertisements (median=56). Greece has the highest rate of food to noncore food advertising, approximately 3 times that of Brazil, with the lowest rate. Previous research has identified associative effects between the frequency of unhealthy food advertising on television and the prevalence of children's excess weight.¹⁸ The variability in food advertising patterns that we found may contribute to differences in children's weight status between countries, although this question requires further study.

Across our sample, the majority of advertised food products were noncore, with fastfood restaurant meals and chocolate and confectionery the most frequently advertised



FIGURE 2-Proportion of major food groups advertised with persuasive marketing, by country.

food groups. Although the high frequency of advertisements for low-fat dairy products and the presence of advertisements for core food products in some countries were positive factors, the frequency of noncore foods far outweighed these healthy food advertisements.

Analyses from individual countries also support the finding that unhealthy foods dominate television advertising to children. For example, Australian research from 2006 to 2007 showed that noncore food advertising was consistently highest during programs most popular with children.^{19,20} Similarly, research from the United Kingdom in 2005 found that the most frequently advertised products on television were sugary breakfast cereals, confectionery, and soft drinks.²¹ Longitudinal research on food advertising during Saturday morning programs for the previous 3 decades in the United States indicated an increasing frequency of fast-food restaurant advertisements and a consistently high rate of advertising for other highfat, high-sugar foods.²² In Brazil, a 2006 analysis of 1040 hours of broadcasting from cable and pay-TV channels directed to children found that 72% of food advertisements were for unhealthy foods.²³ Finally, an analysis of 31290 hours of

television broadcasting in Greece in 2007 and 2008 showed that 65% of food advertisements promoted foods high in fat or sugar.²⁴

The use of persuasive marketing techniques in food advertising also varied between countries. Notably, these techniques were used most often in advertisements for noncore food products in all countries except China (for both premiums and promotional characters) and Italy (for promotional characters).

The endorsement of food products by promotional characters and offers of premiums are used to attract children's attention and persuade them to request or buy an advertised product. Evidence suggests that young children lack the cognitive development to discriminate between a premium and an advertised food.²⁵ Behavioral outcomes, such as purchasing requests, have been shown to be modified by premiums.⁸ Research also indicates that the use of characters in television advertisements, particularly cartoons, attracts children's attention, creates positive attitudes toward products, and improves children's product recall.²⁶

The many perspectives from which we analyzed our data (e.g., peak viewing times, overall advertising, program types) provide an opportunity to explore possible policy implications for different countries. Previous research suggests that regulation of television advertising directed toward children could focus on the type of programs in which advertisements are broadcast (such as dedicated children's programs), the type of product (restricting all food and beverage advertising or only unhealthy foods), the target audience (restricting food advertising directed at children), the time of day (when a high number of children are watching), and the content of advertisements (persuasive marketing techniques).²⁷

Our study, which identified a higher rate of noncore food advertising during children's peak viewing times, highlights the need for television food advertising regulations specifically during these times. Although our definition of children's peak viewing times represented the broadcast periods when the highest numbers of children were watching for most countries, some country-specific adjustment of this definition may be required. For example, in Germany children watch television equally across the day, until 18:00 to 22:00, when the children's audience doubles.²⁸ Recalculating the proportion of noncore food advertisements during this restricted peak viewing time yields

a slightly higher proportion of noncore food advertising during this viewing period than at other times (88% vs 86%).

In Australia, Canada, China, Greece, Spain, and the United States, children's programs were among the programs with the highest frequency of food advertising. It may be prudent for these countries to consider foodadvertising restrictions during such programs. However, television audience data indicate that children also watch programs that are not created primarily for them. Finally, restricting the content of food advertisements may be especially effective in countries with a high level of persuasive marketing.

The countries in our sample had a range of regulatory systems; many, such as Australia and Germany, had both (limited) government regulation and industry self-regulation, predominantly focusing on misleading and deceptive conduct in advertising. In Sweden and the United Kingdom, government regulation of television advertising limited the volume and nature of food advertising targeted toward children. In Sweden, the Radio and Television Act stipulated that commercial television advertising must not be designed to attract the attention of children younger than 12 years.²⁹ However, these regulations only applied to terrestrial channels broadcast from within Sweden: only 1 of the 3 channels that were the most popular with children during our study fell under this rule.

In the United Kingdom, the Office of Communications introduced restrictions to reduce television advertising of high-fat, high-sugar, and high-salt food and drink products to young people. Beginning in January 2008 (after our data collection period for the United Kingdom) this legislation prohibited advertisements for these products in or around programs specifically made for, or of particular appeal to, children younger than 16 years.³⁰ The nutrientprofiling system used in this legislation to define the restricted foods may provide a useful model for similar restrictions in other countries. However, consumer groups argue that the way the restrictions apply is flawed, because they are triggered by the proportion of children watching rather than the actual number. In 1 analysis, none of the 5 most popular programs watched by children were covered by the restrictions.31

Both Sweden and the United Kingdom had a higher rate of noncore food advertising during children's peak viewing times than most other countries in our sample and a comparable proportion of noncore food advertisements, suggesting that their regulations may not effectively limit children's exposure to television advertisements for unhealthy food.

Limitations

Because our study was designed to be simple in methodology and broad in scope, to generate a general picture of international food advertising patterns, we did not assess all facets of advertising. For example, we did not collect data on the duration of advertisements. However, research indicates that the frequency and duration of food advertising follow similar patterns: increased advertising frequency leads to increased advertising duration.³² The contribution of food advertisements to overall advertising was also lower than some other studies have found, because we included channel promotions, including advertisements for other programs, in our sample. The exclusion of these advertisements would result in an even higher contribution of food advertisements to overall advertising.

We defined children as younger than 13 years. Definitions of childhood in broadcasting regulatory frameworks vary considerably between countries, from ages 12 to 16 years.³³ Although our more narrow definition of childhood excluded the analysis of food advertisements broadcast during peak broadcast periods for adolescents, the overall rates of food advertising and persuasive marketing across the sample remain unchanged.

We tested intercoder reliability between groups and found a high level of coding agreement for all countries except Germany, which can be explained by a single advertisement.

The representativeness of our data and the statistical power in our study expand on findings from previous international comparisons of food advertising to children. Although the magnitude of our significance tests reflected the large sample size, differences between groups appeared to be real. The recording duration exceeded that used in previous international studies, which have collected between 20^{11} and 40^{34} hours of television data from each country.

Previous research by Dibb only analyzed advertisements in programs specifically aimed at children.¹¹ It is clear from audience viewing data that children's television viewing is not confined to designated children's programs.

Conclusions

Internationally, children are exposed to high volumes of food advertising on television. Although the absolute frequency of this advertising varies by country, its aim is consistent: the marketing of unhealthy products. The targeted broadcasting of unhealthy food advertisements when the highest numbers of children are watching and the use of childoriented persuasive marketing techniques define a media environment in which children are frequently and deliberately targeted with commercial messages that run counter to nutritional recommendations.

Considerable scientific evidence establishes a link between unhealthy food marketing and children's food choices, purchases, and consumption.⁶⁻⁸ Limiting this food marketing is an important preventive strategy against childhood obesity, and the development or extension of statutory regulations to prohibit unhealthy food advertising when a significant number of children are watching could be a useful first step.

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Contributors

B. Kelly helped originate the study, coordinate research groups, perform reliability testing, analyze data, and develop the article. J.C.E Halford, E.J Boyland, and K. Chapman helped conceptualize the research, recruit research groups, collect data, and interpret results. All other authors helped collect data for their own jurisdictions, interpret results, perform reliability testing, and develop the article.

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Human Participant Protection

No protocol approval was required because no human participants were involved in the study.

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