



# Marketing techniques in television advertisements of food and drinks directed at children in Spain, 2012

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## Abstract

**Objectives** To analyse marketing techniques used in television advertisements of food and drinks (AFDs) directed to children, and their nutritional quality.

**Methods** This is a cross-sectional study of television AFDs directed to children in Spain over 7 days in 2012. Primary appeal, persuasive and nutritional marketing techniques, and links to Internet were registered. The foods were classified according to their nutritional quality using an international codification system and the UK nutrient profile model. Frequency of AFDs using marketing techniques and percentages for unhealthy products were calculated.

**Results** Taste and fun were the main primary appeals used. Persuasive and nutritional marketing techniques and links to Internet were used in 61%, 68.5% and 65.2% of AFDs, respectively. These techniques were more common during weekdays, enhanced protection time slots and on channels with particular appeal to children. More than two-thirds of AFDs using these techniques were for unhealthy products, reaching 96.2% of AFDs with premium offers and gifts.

**Conclusions** There is an extensive use of marketing techniques in television AFDs directed to children in Spain. Most products advertised were unhealthy, so stronger governmental regulations are required.

**Keywords** Children · Food advertising · Food marketing · Marketing techniques · Television

## Introduction

### Food advertising in an obesogenic environment

Considered as one of the main public health problems of this century, childhood obesity continues to increase at alarming rates with adverse health effects in the short and long term (Roberto et al. 2015). In Southwestern European countries (Spain included), the estimated prevalence of

excess weight (overweight and obesity combined) in children was around 30% for boys and 25% for girls, and of obesity was 7.8% and 5.6%, respectively, in 2016 (NCD Risk Factor Collaboration 2017).

Currently, children are growing up in an obesogenic environment that promotes energy intake, sedentary leisure activities and less physical activity. Moreover, there is extensive evidence suggesting that food marketing influences children's food preferences, nutritional knowledge, diet, and purchasing requests (McDermott et al. 2004; Hastings et al. 2006; McGinnis et al. 2006; Cairns et al. 2013). Food advertising is mainly for unhealthy foods (high in fat, salt and sugar—HFSS) (King et al. 2011; Cairns et al. 2013; Romero-Fernández et al. 2013; Ramos and Navas 2015), largely through TV, the medium most frequently used for advertising food and beverages to children (WHO 2012). In Spain, children aged 7–12 years watch a mean of over 25 food and drink advertisements per day (Royo-Bordonada et al. 2016).

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## Food marketing techniques

Multinational companies have targeted children as a naive audience, and marketing approaches them both as consumers and as an access point to wider markets (Hastings et al. 2006). Marketing strategies employ multi-faceted and integrated techniques, which are highly engaging and attractive to children (Cairns et al. 2013). Persuasive marketing techniques such as the use of popular characters (cartoons, sports persons, celebrities), attractive product packaging, toys, and emotional appeals forge long-lasting relationships with children and create brand loyalty in the short and long run (Sonntag et al. 2015). Such strategies appeal more to children because they attract children's attention, improve product recognition and create positive brand attitudes from early ages (Hebden et al. 2011). Nutritional marketing targets children and their parents through the use of nutritional and health appeals (Hastings et al. 2006; Ho and Len 2008; Lobstein et al. 2008). Internet marketing uses the same product, emotional and health appeals to persuade children by exploiting their exposition to advertising with less parental control (Boylard et al. 2012). Linking television and Internet marketing is extremely effective at strengthening brand awareness and encouraging product purchases (Boylard and Whalen 2015). Indeed, new integrated marketing techniques facilitate peer endorsement of, and personal relationships with food and beverage brands.

Children are vulnerable to marketing techniques because of their undeveloped cognitive skills. Developmental studies have shown that children cannot identify (i.e., to distinguish what is from what is not advertising) an advertisement on TV until 6 years of age (Levin et al. 1982) and are unable to understand commercial objectives and persuasive intents of advertising until 12 years of age (Graff et al. 2012). Moreover, advertising on TV penetrates the mind of children more easily than other types of media, as they are more likely to develop a receptive memory with visual simulation generated by TV (Nassar and Al-Zien 2012). The ability to identify Internet advertising is acquired much later. Children aged 10–12 years continue to experience difficulty in recognising something like 1 out of every 4 Internet advertisements (Blades et al. 2013).

## Food advertising regulation

One of the most cost-effective public health interventions for tackling childhood obesity is to restrict on food advertising directed at children (Magnus et al. 2009; Veerman et al. 2009). Countries worldwide have implemented three main regulatory systems, i.e., statutory regulation, self-regulation and co-regulation (Hawkes 2007).

Statutory regulation is usually implemented by an independent body, like the Ofcom in the UK (Ofcom 2012). Self-regulatory models are designed and led by the food industry, and applied on a voluntary basis. Co-regulatory models require periodic monitoring by a backstop body to ensure effectiveness and carry out enforcement activity when needed (Hawkes 2007).

In Spain, food and drink marketing and advertising directed at children under 12 years are regulated by the Code of self-regulation of the advertising of food products directed at children (known by its Spanish acronym as the PAOS Code) (AESAN 2005). This is a Code supervised by the Spanish Agency for Food Safety and Nutrition (AESAN for their acronym in Spanish), which lays down the ethical principles and standards for the design and dissemination of advertising messages (e.g., advertising should avoid exploiting children's credulity or using famous persons who are popular with them). Signatory companies agreed to observe a system of control monitored by a supervisory committee, whose members represent consumers, the public authorities (AESAN), and food industry (Davó-Blanes et al. 2013). The task of monitoring compliance falls to the Spanish Association for Self-Regulation of Commercial Communication, with fines for non-compliance ranging up to 180,000 euros (AESAN 2005).

Prevention efforts to combat the pernicious influence of food marketing on children with voluntary regimes have been unsuccessful (Hawkes and Harris 2011; King et al. 2011; Potvin et al. 2011; Ustjanauskas et al. 2014). In Spain, the PAOS Code has been found ineffective for controlling children's exposure to HFSS food advertising and to marketing techniques largely used by advertisers. Apart from the fact that the Code does not include some of the marketing techniques most frequently used, studies have shown a high level of non-compliance with its standards (Romero-Fernández et al. 2010, 2013; Ramos and Navas 2015).

## Objectives

As far as we know, studies in Spain have focused mainly on the frequency and nutritional quality of food advertising directed at children (Fernández and Díaz-Campo 2014; Romero-Fernández et al. 2013; Ramos and Navas 2015), as we did in a previous publication of this study (Royo-Bordonada et al. 2016), and in the evaluation of the PAOS Code (Romero-Fernández et al. 2010, 2013; Ramos and Navas 2015), but have not addressed specifically the marketing techniques used by food adverts, like premium offers and gifts, sponsorships, and support from health professionals or institutions, among others. Furthermore, international studies have not usually identified the existence of web links tagged on to TV adverts (Cairns et al.

2013; Jenkin et al. 2014). Considering this research gap, the main aim of the present study is to build on our prior study (Royo-Bordonada et al. 2016), to analyse persuasive and nutritional marketing techniques, and the existence of links to food-related web pages (Internet marketing) in TV advertisements directed at children in Spain. In addition, we will analyse the nutritional profile of the foods and drinks advertised using these techniques.

## Methods

### Study design and sample

We conducted a cross-sectional study of television advertisements of food and drinks (AFDs) directed at children in Spain from January to April 2012. For the purpose of this study, we consider children to those under the age of 12 years, according to the PAOS Code (AESAN 2005). The sample was obtained by recording AFDs for 7 days (Monday through Sunday) on five Spanish TV channels with the highest child-audience ratings (Moreno 2009). Excluding vacation periods, the broadcasts were recorded during a child-audience time slot (8 am–10 pm) plus the 10 pm–12 midnight time slot, which registered the last daily child-audience viewing peak in Spain (Busquet and Reinares 2009).

At the time of data collection, AFDs aimed at children in Spain were regulated by the PAOS Code. Hence, we identified AFDs directed at children using the PAOS Code criteria (AESAN 2005), according to the type of product advertised, design, and broadcasting characteristics of the advertisement (channels mainly targeting children under 12 years of age, or general interest channels during viewing time slots, programming blocks, or programs with audiences mostly in that age range).

### Data collection

Four trained research assistants collected the following characteristics for each AFDs: day of broadcast; TV network (general interest/children and teenage interest); enhanced protection time slot (yes/no); type of product (food/drink); persuasive and nutritional marketing techniques; the existence of web links in TV adverts; and primary persuasive appeal used to draw children's attention such as fun, taste, health, nutrition, convenience, energy, enjoyment, price, product uniqueness, satisfaction, general superiority, according to the categories used in a previous landmark study (Gantz et al. 2007). Enhanced protection time slot was determined following the *Audiovisual Communication Law* from 8–9 am and 5–8 pm on weekdays, and 9 am–12 noon on weekends and national holidays,

where programs classified as suitable only for children over the age of 13 years are not permitted (Audiovisual Communication Law. L.N.7/ 2010).

When there were doubts or lack of agreement about the existence of a particular marketing technique, we decided by consensus whenever possible or, in case of uncertainty, we did not codify it. Marketing techniques in AFDs were coded into three groups:

- Persuasive marketing included the use of promotional characters familiar to or with appeal to children (special interest; cartoons; branded characters), sport persons, celebrities, health professionals, and others. Premium offers and gifts (small toys or products) are also in the persuasive marketing group. Finally, other techniques include sponsorship or media “tie-ins” (promotion of the product through connections with movies, series, or TV shows), misleading on characteristics, properties or benefits of the product advertised and encouragement of children to influence their parents to buy a product and/or to exploit children's trust in adults or their parents.
- Nutritional marketing included the presence of nutrition or health claims (any claim which states, suggests or implies that a food has particular beneficial nutritional or health-related properties) (Regulation (EC) no. 1924/2006); healthy models or images (suggestive of a healthy physical or mental state); support from health professionals or institutions (testimony of health professionals/scientists or presence of associations/institutions related to health and nutrition).
- Internet marketing refers to the appearance of the product website and encouragement to visit it in the advertisement; and the existence of a website focused on children.

AFDs were classified following the *International Food-Based Coding System* used in other studies (Kelly et al. 2010; Boyland et al. 2012) into two categories: core (nutrient-rich/calorie-low products), and non-core (HFSS products and/or energy-dense, plus coffee, tea, and supplements); and following the *UK Nutrient Profiling Model (UKNPM)* into two categories: healthy and less healthy (FSA 2011). The extent and nature of food advertising in this study were further addressed in our prior research, where a more detailed description of the methods can be found (Royo-Bordonada et al. 2016). In Spain, almost one of every four TV advertisements are for food products, averaging 7.5 food adverts per hour of broadcasting, most of them being for unhealthy products (Royo-Bordonada et al. 2016).

## Data analysis

Results were expressed in percentages of AFDs with marketing techniques (persuasive, nutritional and Internet marketing—Table 1) and with HFSS products classified by the *UKNPM* (less healthy products—Table 2) and the *International Food-Based Coding System* (non-core products—Table 3). Comparison of proportions of AFDs in subgroups defined according to broadcasting characteristics (Table 1), type of marketing technique (Table 2), and specific persuasive and nutritional marketing techniques (Table 3) was tested using the Chi-square test. Analysis was performed with Stata v.12.0 and Excel spreadsheet software.

## Ethical approval

Ethical approval was not required because the design (cross-sectional study of television advertisements) did not need Ethical Committee supervision in the institution.

## Results

### Primary persuasive appeals in television food and drinks advertisements

A total of 420 h of programming was recorded and 4212 AFDs were identified. Of these, 2582 were directed at children according to the PAOS Code criteria and thus included in this study. Figure 1 shows primary persuasive appeals more frequently used in AFDs to draw children's attention; these were taste (36.1%), fun (28.3%) and health/nutrition (19.8%).

### Marketing techniques in television food and drinks advertisements

Table 1 examines marketing techniques used according to AFD characteristics. Overall, persuasive and nutritional marketing techniques, and links to Internet were used in 61%, 68.5% and 65.2% of AFDs, respectively (data not shown in the table). Specifically, marketing techniques used more frequently were the appearance of a website address (65.2%) and the use of nutrition or health claims (51.7%), whereas the less frequent was the support from health professionals or institutions, with 14.1% of AFDs. From those advertisements that displayed a website address ( $n = 1684$ ), 72.1% had a website focused on children and 39.6% encouraged viewers to visit the product website.

Advertisements containing marketing techniques were broadcast more frequently during weekdays, except for

premium offers and gifts and for encouragement to visit the product website (11.4% and 8.5% higher during weekends, respectively;  $P < 0.01$ ). Almost all marketing techniques, except for the use of nutrition or health claims, were more common in advertisements on children and teenage interest channels ( $P < 0.01$ ). The percentages of AFDs with premium offers and gifts and with the appearance of a website address were higher during enhanced protected time slots, whereas the contrary was seen for the use of healthy models or images and for the support from health professionals or institutions. Nutritional marketing techniques were more frequently used for drink than for food advertisements, whereas the opposite was found for persuasive and Internet marketing techniques ( $P < 0.01$  for all the comparisons, except for other techniques). Whereas the appearance of a website address was more common for drink than for food advertisements (69.5% vs 63.6%;  $P < 0.01$ ), in those advertisements that displayed a website address the percentage of advertisements that encouraged viewers to visit the product website was higher for foods (45.3% vs 25.6%;  $P < 0.01$ ).

### Nutritional quality of products advertised

Table 2 describes the nutritional quality of advertisements of food and drinks by type of marketing techniques. Using the *UKNPM*, the percentages of HFSS (less healthy) food and drinks were higher for advertisements using persuasive marketing (75.3% vs 63.5%;  $P < 0.01$ ) and Internet marketing (74.4% when the website address was shown in the AFDs vs 63.6% when it was not;  $P < 0.01$ ). Among the AFDs that showed a website address ( $n = 1666$ ), the percentage of less healthy advertisements was much higher when there was an encouragement to visit the webpage than when there was not (88% vs 65.3%;  $P < 0.01$ ). Similar differences, but somewhat smaller in magnitude, were seen for non-core food and drinks advertisements using the *International Food-Based Coding System*. On the contrary, non-core products were less frequent in advertisements using nutritional marketing (71.8% vs 60.5%;  $P < 0.01$ ).

Table 3 describes the nutrition quality of AFDs directed at children for each specific persuasive and nutritional marketing technique used. The percentage of products classified as less healthy or non-core was higher for AFDs using premium offers and gifts, among those using persuasive marketing techniques (92.6%), and for AFDs using healthy models or images, among those using nutritional marketing techniques (77.2%). These differences were statistically significant ( $P < 0.01$ ).

**Table 1** Marketing techniques in advertisements of food and drinks (AFDs) directed at children, according to AFD characteristics, in Spain, 2012

AFD characteristics	N	Persuasive marketing						Nutritional marketing											
		Promotional characters familiar to or with appeal to children <sup>a</sup>			Premium offers and gifts			Other techniques <sup>b</sup>			Nutrition or health claims			Healthy models or images			Support from health professionals or institutions		
		N	%	P value <sup>c</sup>	N	%	P value <sup>c</sup>	N	%	P value <sup>c</sup>	N	%	P value <sup>c</sup>	N	%	P value <sup>c</sup>	N	%	P value <sup>c</sup>
Day of broadcast			0.13		< 0.01	0.06		0.14		0.03		< 0.01							
Weekday	1693	550	32.5	488	28.8	425	25.1	893	52.8	775	45.8	262	15.5						
Weekend	889	315	35.4	357	40.2	254	28.6	442	49.7	367	41.3	101	11.4						
Television network			< 0.01		< 0.01	0.03		0.05		< 0.01		< 0.01							
General interest	954	235	24.6	213	22.3	228	23.9	517	54.2	270	28.3	90	9.4						
Children and teenage interest	1628	630	38.7	632	38.8	451	27.7	818	50.3	872	53.6	273	16.8						
Enhanced protection time slot			0.20		0.04	0.17		0.66		0.02		0.02							
Yes	846	269	31.8	300	33.5	237	28.0	432	51.1	346	40.9	100	11.8						
No	1735	596	34.4	545	31.4	442	25.5	902	52.0	796	45.9	263	15.2						
Type of product			< 0.01		< 0.01	0.91		< 0.01		< 0.01		< 0.01							
Food	1874	669	35.7	684	36.5	494	26.4	870	46.4	703	37.5	171	9.1						
Drink	708	196	27.7	161	22.7	185	26.1	465	65.7	439	62.0	192	27.1						
Total AFD	2582	865	33.5	845	32.7	679	26.3	1335	51.7	1142	44.2	363	14.1						
AFD characteristics																			
Internet marketing <sup>c</sup>																			
Appearance of a website address in AFDs																			
	N	N	%	P value <sup>c</sup>	N	N	%	P value <sup>c</sup>	N	N	%	P value <sup>c</sup>	N	N	%	P value <sup>c</sup>	N	N	%
Day of broadcast				< 0.01				0.08											< 0.01
Weekday	1693	1143	67.5	1143	809	70.8	1143	809	70.8	1143	421	36.8							
Weekend	889	541	60.9	541	405	74.9	541	405	74.9	541	245	45.3							
Television network				< 0.01				< 0.01											< 0.01
General interest	954	428	44.9	428	202	47.2	428	202	47.2	428	87	20.3							
Children and teenage interest	1628	1256	77.2	1256	1012	80.6	1256	1012	80.6	1256	579	46.1							
Enhanced protection time slot				0.04				0.09											0.13
Yes	846	1156	66.6	1156	395	74.8	1156	395	74.8	1156	223	42.2							
No	1735	528	62.4	528	819	70.9	528	819	70.9	528	443	38.3							
Type of product				< 0.01				0.13											< 0.01
Food	1874	1192	63.6	1192	872	73.2	1192	872	73.2	1192	540	45.3							
Drink	708	492	69.5	492	342	69.5	492	342	69.5	492	126	25.6							

**Table 1** (continued)

AFD characteristics	Internet marketing <sup>c</sup>									
	Appearance of a website address in AFDs			Website focused on children						
	N	%	P value <sup>c</sup>	N	%	P value <sup>c</sup>				
Total AFD	2582	1684	65.2	1684	1214	72.1 <sup>d</sup>	1684	666	39.6 <sup>d</sup>	P value <sup>e</sup>

<sup>a</sup>Promotional characters familiar to or with appeal to children included: special interest characters, cartoon characters, branded characters, sports persons, celebrities, health professionals, and others

<sup>b</sup>Other techniques included: sponsorship; misleading on characteristics, properties or benefits of the product and/or exploiting the imagination, inexperience or credulity of children; encouraging children to persuade their parents to buy the product and/or exploiting the special trust relationship

<sup>c</sup>Comparison of proportions was tested using Chi-square test

<sup>d</sup>The percentage was from the total AFDs with the appearance of a product (food or drink) website (N = 1684)

<sup>e</sup>Internet marketing refers to the appearance of the product website and encouragement to visit it in the advertisement; and the existence of a website focused on children

## Discussion

This study shows that the primary persuasive appeals used in TV AFDs directed at children in Spain were taste and fun. Nutritional marketing, appearing in more than two-thirds of AFDs, was the group of techniques most commonly used by the food industry. The appearance of a website address (in almost two-thirds of AFDs) and the use of nutrition or health claims (in more than a half of AFDs) were the two more frequently used marketing techniques. Marketing techniques were more common during weekdays and on channels with particular appeal to children and teenagers. Persuasive and Internet marketing techniques were more frequent during enhanced protected time slots. The nutritional quality of the products advertised was lower for AFDs using any kind of marketing techniques, particularly for those that encouraged children to visit the webpage displayed in the advertisement.

Taste and/or fun were used as primary persuasive appeals in 64.4% of AFDs directed at children in Spain. While a similar figure was found by Boyland et al. (66.5%), an appeal to fun was more common in their study. In a systematic review conducted by Jenkin et al., these two appeals were present in 17 of the 38 studies analysed, with taste or fun as recurrent persuasive appeals in a number of studies, appearing in 33%–85% of AFDs (Jenkin et al. 2014).

The presence of nutritional marketing in AFDs directed at children in Spain has remained stable at approximately 70% of AFDs compared with a similar study conducted in 2008 (Cuevas-Casado et al. 2012). However, Internet marketing has emerged as a way to reach children through channels with less parental control. In a study undertaken in the UK in 2008, 30.8% of food advertisements promoted a website, and of those advertisements targeting children, 20.4% directed the viewer to a website (Boyland et al. 2012). In our study, undertaken in 2012, the figures doubled, indicating how fast these new integrated marketing techniques are introduced in food advertising aimed at children. Similarly, a study showed that almost half of food advertisements in magazines for children directed readers towards food web sites, where they were again exposed to persuasive techniques of marketing (Cowburn and Boxer 2007). This growing tendency of linking television and Internet marketing is a matter of concern, because children less than 12 years of age are unable to identify marketing advertisements in a web page (Blades et al. 2013). Furthermore, integrated TV and Internet marketing strategies can potentially deliver double the effectiveness of either form of advertising by itself (Bellman et al. 2014). Marketing techniques directed at children are becoming more sophisticated and able to hide or distort the facts about the

**Table 2** Percentage of advertisements directed at children, for less healthy and non-core products by type of marketing technique, in Spain, 2012

	UK nutrient profile model			International food-based coding system		
	<i>N</i>	Less healthy <i>n</i> (%)	<i>P</i> value <sup>c</sup>	<i>N</i>	Non-core <i>n</i> (%)	<i>P</i> value <sup>c</sup>
<b>Marketing techniques</b>						
<b>Persuasive marketing<sup>a</sup></b>						
Yes	1549	1166 (75.3)	< 0.01	1574	1054 (67.0)	< 0.01
No	983	624 (63.5)		1008	600 (59.5)	
<b>Nutritional marketing<sup>b</sup></b>						
Yes	1745	1220 (69.9)	0.20	1769	1070 (60.5)	< 0.01
No	787	570 (72.4)		813	584 (71.8)	
<b>Internet marketing</b>						
<b>Appearance of a website address in the AFD</b>						
Yes	1666	1239 (74.4)	< 0.01	1684	1128 (67.0)	< 0.01
No	866	551 (63.6)		898	526 (58.6)	
<b>Website focused on children<sup>d</sup></b>						
Yes	1200	951 (79.3)	< 0.01	1214	843 (69.4)	< 0.01
No	466	288 (61.8)		470	285 (60.6)	
<b>Encouragement to visit the product website<sup>d</sup></b>						
Yes	666	586 (88.0)	< 0.01	666	519 (77.9)	< 0.01
No	1000	653 (65.3)		1018	609 (59.8)	
Total AFDs ( <i>N</i> )	2532			2582		

The Internet marketing techniques 'website focused on children' and 'encouragement to visit the product website' were not grouped together into one variable, as they were related to each other and content in 'appearance of a website address'

<sup>a</sup>Persuasive marketing techniques included: promotional characters familiar to or with appeal to children; premium offers and gifts; sponsorships; misleading on characteristics, properties or benefits of the product and/or exploiting the imagination, inexperience or credulity of children; encouraging children to persuade their parents to buy the product and/or exploiting their special trust relationship

<sup>b</sup>Nutritional marketing techniques included: nutritional or health claims, healthy models or images and support from health professionals or institutions

<sup>c</sup>Comparison of proportions was tested using Chi-square test

<sup>d</sup>The total AFDs with this technique was from those that displayed a website address (*N* = 1666 and 1684)

product in favour of the advertiser, negatively influencing children food preferences and consumption patterns (McDermott et al. 2004; Hastings et al. 2006; McGinnis et al. 2006; King et al. 2011; Cairns et al. 2013).

Similar to the findings of other studies (Boyland et al. 2012; Harris et al. 2011, 2015), most AFDs using persuasive or nutritional marketing techniques and Internet links were for HFSS products, with figures among the highest in our study. The frequency of HFSS products was higher in AFDs using premium offers and gifts, in agreement with two similar studies conducted in the UK and Australia (Boyland et al. 2012; Harris et al. 2015). Furthermore, compared to a previous study conducted in Spain during 2008, there has been a worrisome increase in the percentage of less healthy products, according to the *UKNPM*, among AFDs using nutritional marketing techniques (from 55% in 2008 to 69.9% in 2012) (Cuevas-Casado et al. 2012), which could be seriously misleading Spanish consumers. The presence of nutritional marketing techniques has been observed to lead children and parents alike to

perceive products as being more nutritional and healthier, show a greater willingness to buy them and be induced to choose HFSS products (Harris et al. 2011). Thus, if we are to allow consumers to make informed food choices, standard criteria according to nutrient profiles should be required for products advertised using nutritional marketing techniques (Royo-Bordonada 2015).

Regulation of advertising is complex, especially with self-regulated pledges. In Spain, although the PAOS Code considers in their standards some marketing techniques, these are neither comprehensive nor adequately fulfilled. For example, companies participating in the Code acknowledge that promotional characters familiar to or with special appeal to children and other persuasive marketing techniques should not be used to advertise their products to children; yet they were present in 33.5% and 26.3% of AFDs, respectively. This is consistent with the results of a previous study that analysed the degree of compliance with the PAOS Code, showing that almost half AFDs directed at children by TV in Spain were not

**Table 3** Percentage of advertisements directed at children, for less healthy and non-core products according to specific persuasive and nutritional marketing techniques, in Spain, 2012

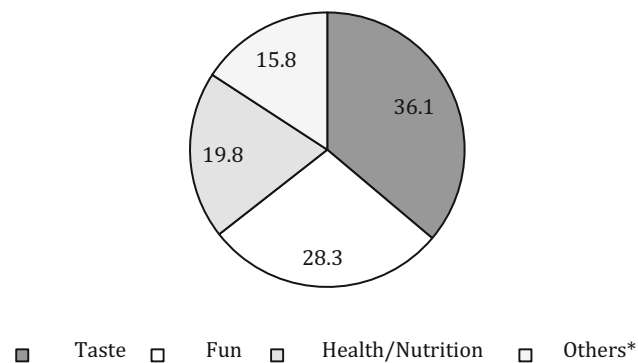
	UK nutrient profile model			International food-based coding system		
	<i>N</i>	Less healthy <i>n</i> (%)	<i>P</i> value <sup>c</sup>	<i>N</i>	Non-core <i>n</i> (%)	<i>P</i> value <sup>c</sup>
<b>Marketing techniques</b>						
Persuasive marketing	1549	1166 (75.3)		1574	1054 (67.0)	
Promotional characters familiar to or with appeal to children <sup>a</sup>	393	205 (52.2)	< 0.01	393	179 (45.6)	< 0.01
Premium offers and gifts	486	450 (92.6)		502	440 (87.6)	
Other persuasive techniques <sup>b</sup>	670	511 (76.3)		679	435 (64.1)	
Nutritional marketing	1745	1220 (69.9)		1769	1070 (60.5)	
Nutrition or health claims	470	346 (73.6)	< 0.01	491	365 (74.3)	< 0.01
Healthy models or images	912	704 (77.2)		915	584 (63.8)	
Support from health professionals or institutions	363	170 (46.8)		363	121 (33.3)	
Total AFDs ( <i>N</i> )	2532			2582		

Internet marketing techniques are analysed in Table 2

<sup>a</sup>Promotional characters familiar to or with appeal to children included: special interest characters, cartoon characters, branded characters, sports persons, celebrities, health professionals and others

<sup>b</sup>Other persuasive marketing techniques included: sponsorship; misleading on characteristics, properties or benefits of the product and/or exploiting the imagination, inexperience or credulity of children; encouraging children to persuade their parents to buy the product and/or exploiting their special trust relationship

<sup>c</sup>Comparison of proportions was tested using Chi-square test or likelihood ratio test



**Fig. 1** Percentage of primary advertising appeals in television advertisements directed to children in Spain, 2012 (*N* = 2582). Asterisk: included diet, convenience, energy, enjoyment, price, uniqueness, satisfaction and general superiority

compliant with one or more standards of the Code (Romero-Fernández et al. 2010). Indeed, most products were HFSS in advertisements using promotional characters familiar to or with special appeal to children and other persuasive marketing techniques (52% and 76%, respectively). This shows that the PAOS Code is insufficient to protect children from the pernicious influence of food advertising, mainly because it does not regulate the nutrition composition of the products advertised, nor cover all marketing techniques used by the food industry, which

usually finds a way to bypass regulations. Moreover, 14% of AFDs breach Article 44 of the Law on Food Security and Nutrition issued in 2011, which prohibits the support from health professionals or scientific institutions in food advertising [Law on Food Security and Nutrition. L.N.17/2011 (2011)].

The use of two classification systems of nutritional quality for advertised products is considered a strength of the study that facilitates international comparisons. However, our findings should be interpreted in the context of the study's limitations. The main limitation lies in the presence of a certain component of subjectivity when it comes to evaluating the existence of some marketing techniques. To minimise this problem, whenever a doubt about a given technique arose, we solved it by consensus. Furthermore, most marketing techniques were easy to check objectively, such as the presence of promotional characters, premium offers and links to product web pages. An additional limitation resided in the possible lack of representativeness of the sample. First, the study was restricted to products advertised on TV. Second, by limiting the recording period to the months of January through April, we may have missed out on some seasonal variations. Third, the broadcast of minority-audience, pay-per-view, and regional channels were not recorded. Nevertheless, these limitations would not seem relevant, given the



inclusion of children's favourite channels, the large sample size, and the repetition of AFDs on different TV channels.

## Conclusions

There is an extensive use of persuasive and nutritional marketing techniques, and Internet links in TV AFDs directed at children in Spain, and the products advertised using these techniques are mostly HFSS. In Spain, self-regulation has been deemed insufficient to protect children from the pernicious influence of food advertising by TV (Romero-Fernández et al. 2010; Ramos and Navas 2015). In the absence of a complete ban on food advertising to children, there is a need to strengthen and extend existing rules to cover nutritional criteria and common marketing techniques used in food advertising, with particular attention given to integrated marketing between TV and Internet, a relatively new and sophisticated technique spreading at an alarming rate. Worldwide, self-regulation codes are the main type of regulation of food and beverage advertising aimed at children (Hawkes 2007). However, the pitfalls of the self-regulation mechanisms, such as insufficient coverage in time slots in which children represent a substantial audience but are not the main audience and influence children by targeting other audiences or marketing during family television programs (Potvin et al. 2011; Théodore et al. 2017), are behind the lack of progress achieved in restricting the marketing of unhealthy food products to children around the world (Kraak et al. 2016). Thus, stronger leadership is required from governmental institutions to ensure the effectiveness of policies regulating food advertising directed at children.

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## Compliance with ethical standards

**Conflict of interest** K. León-Flández on behalf of all authors declares that they have no conflict of interest.

**Ethical approval** This article does not contain any studies with human participants or animals performed by any of the authors.

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