



Marketing of commercial foods for infant and young children in Uruguay: sugary products, health cues on packages and fun social products on Facebook

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Abstract

Objective: To analyse the content of the marketing of commercial foods for infants and young children on packages and social media.

Design: Commercial foods targeted at children, regarded as potential breast-milk substitutes according to the Uruguayan breast-feeding standard, were considered: dairy products; teas, juices and bottled waters; glucose solutions; cereals and mixtures of fruits and vegetables. All the products sold at forty-four retail outlets were purchased. A Facebook search was performed to identify accounts of these products. For each account, all the content posted by the brands between July 2017 and July 2019 was recorded. The visual and textual information included in the packages and Facebook posts was analysed using content analysis. Products were classified using the nutrient profile model of the Pan American Health Organization.

Setting: Montevideo, Uruguay.

Results: Seventy-six unique commercial foods targeted at infants and young children were identified, 96% of which were excessive in sugar. Packages frequently included textual and visual elements to convey health-related associations, including images of fruits and vegetables, nutrient content claims and endorsement logos. Ten Facebook accounts were identified, which generated 302 posts. Parents and caregivers were the main target audience of the posts, which mainly included content related to fun and social aspects of food consumption. Additionally, the posts frequently conveyed the idea that products would contribute to children's growth and development.

Conclusions: Results suggest the need to implement comprehensive regulations on the marketing of commercial foods targeted at children, regarded as potential breast-milk substitutes according to the Uruguayan breast-feeding standard.

Keywords
Food marketing
Digital marketing
Policy making
Regulation
Food environment
Breast-milk substitutes

Complementary feeding is a critical period for the growth and development of infants⁽¹⁾. Feeding practices during this period shape infant appetite and food preferences and can have long-term effects on health and development^(2,3). Although a variety of strategies to improve the eating habits of infants and young children have been implemented across the world, inappropriate practices remain a major global health problem^(1,4). In particular, the consumption of ultra-processed products excessive in sugar, fat and Na from early age, particularly among the most vulnerable

sectors of the population, has raised increasing concern worldwide due to their potential negative effects on health^(5–8). Ultra-processed products are defined as ‘formulations of ingredients, mostly of exclusive industrial use, that result from a series of industrial processes’⁽⁹⁾.

The food environment, characterised by the ubiquitous availability and marketing of ultra-processed products, is one of the factors underlying which foods caregivers choose for infants^(10,11). Marketing makes products more salient in consumers' mind, increasing product recall and

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recognition at the point of sale, creating positive associations and expectations and subsequently increasing purchase intention⁽¹²⁾. In addition, marketing shapes social norms regarding which products are normal and acceptable to be consumed by children in different periods of their life⁽¹³⁾.

Packaging has become one of the key components of the marketing strategies food companies use to promote their products as appropriate for children⁽¹⁴⁾. Packages attract consumer attention at the point of purchase, provide information about products and create vivid expectations and conceptual associations⁽¹⁵⁾. Several studies have shown that products targeted at children do not only use a wide range of packaging elements to attract children, such as cartoon characters or bright colours, but also include cues to convey the idea that products are healthy and specifically developed for children^(14,16–18). These cues are expected to be highly relevant for parents as part of the simplified decision-making strategies they use when selecting products for their children^(19,20).

Food packages are not the only marketing element that can potentially influence parents' behaviour. In the light of the increasing popularity of social media and content-sharing platforms, digital marketing stands out as another powerful component of the marketing mix of food companies^(21,22). Digital marketing can be defined as a 'promotional activity through a digital medium, that seeks to maximize impact through creative and/or analytical methods'⁽²³⁾. This type of marketing has been claimed to be more persuasive and impactful than traditional marketing given its ubiquity, uninterrupted availability, ability to target specific groups and interactivity⁽²⁴⁾. Recent research has shown that digital marketing of ultra-processed products relies on promotions, interactive games and user-generated content to increase interaction and engagement^(25,26). Concerns over the deleterious effects of digital marketing have focused on children and adolescents. Yet, parents and caregivers are expected to be the main target audience of digital marketing of products targeted at infants given that Facebook and Instagram require users to be older than 12 years^(27,28). However, research on the topic is still scarce. The present study aims to contribute to the growing number of studies that analyse the marketing strategies of products targeted at children by focusing on commercially produced foods and beverages marketed as suitable for feeding infants and young children (6–36 months).

Recommendations to introduce regulations on the marketing of commercial foods and beverages targeted infants and young children are not new⁽²⁹⁾. The International Code of Marketing of Breast-Milk Substitutes aims to ensure 'the proper use of breast-milk substitutes, when these are necessary, on the basis of adequate information and through appropriate marketing and distribution'⁽³⁰⁾. It includes under its scope 'milk products, foods and beverages, including bottle-fed complementary foods, when marketed or otherwise represented to be suitable, with or without

modification, for use as a partial or total replacement of breast milk'⁽³⁰⁾. Governments are advised to approve regulations to make the provisions of the Code compulsory⁽³⁰⁾.

In 1996, a resolution by the World Health Assembly urged states to ensure the eradication of inappropriate marketing of complementary foods that may undermine exclusive or sustained breast-feeding⁽³¹⁾. The idea of protecting children from inappropriate marketing practices has been recently reinforced by international consensus on the need to end inappropriate promotion of foods for infants and young children⁽³²⁾. According to the guidance provided by the WHO, promotion of products with high content of sugar, fats and Na should be regarded as inappropriate as it may undermine efforts to promote healthy eating, contributing to childhood obesity and non-communicable diseases⁽³³⁾.

Aim of the study and context

The aim of the present work was to analyse the content of the marketing of commercial foods targeted at infants and young children on packages and social media with the goal of identifying key practices that may undermine efforts to promote healthy eating, and obtaining insights for policy making.

The study was conducted in Uruguay, a Latin American country with high prevalence of overweight and obesity among infants (10.1% among children younger than 24 months)⁽³⁴⁾. Studies conducted in the country have shown a low consumption of fruits, vegetables and meat, as well as a relatively high consumption of ultra-processed products with excessive content of sugar, fat and Na among children younger than 24 months^(34,35). Uruguay has approved national regulations to introduce some of the provisions of the Code^(36,37). However, those regulations do not include under their scope packaging and marketing of commercial foods targeted at infants and young children.

Materials and methods

The study was part of the periodic assessment of the level of compliance with the Internal Code of Marketing of Breast-milk Substitutes performed by the Uruguayan government. Data collection was performed between March and July 2019. Focus was restricted to commercial foods and beverages targeted infants and young children, regarded as potential breast-milk substitutes according to the Uruguayan National Breastfeeding Standard: dairy products; teas, juices and bottled waters; glucose solutions; cereals and mixtures of fruits and vegetables⁽³⁶⁾. First, products available in retail stores were surveyed. Once the products were identified, all the information available in the packages was analysed. Subsequently, a search for Facebook and Instagram accounts of the identified products was



performed and the content posted on the identified accounts was extracted and analysed.

Selection of retail outlets

The study was conducted in Montevideo, the capital city of Uruguay. Following the recommendations of the NetCode toolkit⁽³⁸⁾, a total of forty-four retail outlets were selected based on two criteria: (i) proximity to thirty-three health facilities selected using probability proportional to size sampling and (ii) purposive sampling. The closest pharmacy to each of the thirty-three health facilities was selected using Google Maps[®]. In addition, two pharmacies, six supermarkets, two baby stores and one perfumery were purposively sampled based on local knowledge.

Products

Commercial foods targeted at children, which are regarded as potential breast-milk substitutes according to the Uruguayan National Breastfeeding Standard, were considered⁽³⁶⁾: dairy products; teas, juices and bottled waters; glucose solutions; cereals and mixtures of fruits and vegetables. For each category, only products targeted at children were considered. To be eligible, products should meet a minimum of two of five criteria adapted from previous studies^(16,39,40): (i) references to children, (ii) cartoon characters or child-oriented images, (iii) unusual shapes, bright colours or childish font, (iv) cross-promotions and tie-ins with children's programmes, merchandise or films and (v) games, toys or other giveaways targeting small children.

Sampling

Initially, a spreadsheet containing a list of commercial products targeted at children within each of the four categories was developed based on the products available in online supermarkets. The spreadsheet included the following information: product description, product name, flavour, product brand and manufacturer name. Four fieldworkers used the spreadsheet to register all the products targeted at children available at each of the forty-four retail outlets. All areas of the retail outlets were thoroughly surveyed to identify eligible products. Any new products not found on the spreadsheet were added to the list for all subsequent retail outlets to be visited. Different flavours of a product were considered as different products, whereas products with different package sizes (e.g. different sizes of multi-serving packages) were listed as one product. A package of each of the products was purchased.

Social media

The two most popular social media in the country were considered: Facebook and Instagram⁽⁴¹⁾. The search tool of each social media was used to search for accounts, using brand and manufacturer names as keywords. Only Uruguayan accounts were considered. For each of the identified accounts, 24 months of content posted on the

accounts by the brands was extracted for the analysis (from July 2017 to July 2019). Stories were not included in the analysis, as they are only visible for a short period of time. All the content of the posts was considered for the analysis: images, videos, text, captions, as well as engagement data (i.e. number of likes, number of comments and number of shares). A spreadsheet containing the following information was created: account, link to the post, date, title of the post, number of reactions, total number of reactions, number of reactions for each type (Like, Love, Laugh, Surprised, Angry, Sad).

Data analysis

After data collection was completed, the information available on the package of each of the products was analysed. For each of the products, the ingredient list and nutritional information available on the packages were recorded. Products were classified according to the NOVA food classification based on their processing characteristics and ingredient list⁽⁴²⁾. Two researchers familiar with the NOVA system independently performed the classification. In a subsequent meeting, consistency between them was checked and no differences were found. In addition, the content of sugar, fat, saturated fat and Na was classified according to the nutrient profile model of the Pan American Health Organization (PAHO) and the Uruguayan nutrient profile model underlying the front-of-package regulation^(43,44). For juices and dairy products not reporting sugar content, carbohydrate content was considered as proxy for sugar content. Free sugars were estimated based on the recommendations of the PAHO nutrient profile model⁽⁴³⁾.

All the textual and visual elements included on the food packages on a voluntary basis were analysed using content analysis⁽⁴⁵⁾. Mandatory information was not included in the analysis. Two researchers with previous experience in content analysis used inductive coding to identify categories with similar meaning by going through the text and the images included on the packages⁽⁴⁵⁾. The final categories were defined by agreement between the two researchers. The categories were subsequently grouped into dimensions using the same approach.

All social media posts were analysed using a combined deductive/inductive coding approach⁽⁴⁵⁾. Using a deductive approach, the following themes were selected for the analysis: target audience, marketing techniques included in the post and message conveyed of the post. One of the researchers used an inductive approach to identify categories within each of the themes, as they emerged when examining the visual and textual elements of the posts. The coding was revised by another researcher, who checked for inconsistencies. The final categories were defined by agreement between the researchers. Following the same approach, categories in the theme 'Message conveyed by the post' were grouped into dimensions.

Table 1 Characteristics of the commercial products targeted at children within the food categories regarded as breast-milk substitutes according to the Uruguayan National Breastfeeding Standard. Products were identified in forty-four retail outlets in Montevideo (Uruguay) between March and July 2019

Category	Ultra-processed products (%)	Products added with sugars (%)	Products containing sweeteners (%)	Products classified as excessive in at least one nutrient according to PAHO nutrient profile model (%)	Products classified as excessive in at least one nutrient according to Uruguayan regulations (%)
Dairy products (<i>n</i> 38)	97	97	11	97	74
Milk desserts (<i>n</i> 17)	100	100	0	100	100
Yogurts (<i>n</i> 11)	100	100	36	100	27
Flavoured milks (<i>n</i> 7)	100	100	0	100	86
Flavoured cheeses (<i>n</i> 2)	100	100	0	100	100
Ultra-pasteurised milk (<i>n</i> 1)	0	0	0	0	0
Teas, juices and bottled waters (<i>n</i> 31)	94	81	68	100	71
Juices (<i>n</i> 21)	90	71	57	100	71
Soya-based beverages (<i>n</i> 10)	100	100	90	100	70
Cereals and mixtures of fruits and vegetables (<i>n</i> 7)	100	86	0	100	86
Cereals (<i>n</i> 5)	100	80	0	100	80
Mixtures of fruits and vegetables (<i>n</i> 2)	100	100	0	100	100
Total	96	89	33	96	74

Results were summarised using descriptive statistics at the aggregate level and separate for each product category. Inferential statistics were not used given the small number of products identified within some of the categories.

Results

A total of seventy-six unique commercial foods relevant for the study were identified. Dairy products (milk desserts and yogurts) were the most prevalent, followed by juices and soya-based beverages (Table 1). According to the NOVA classification, 96% of the products (*n* 73) were ultra-processed; the only exceptions were three minimally processed products (one ultra-pasteurised milk and two pasteurised fruit juices without the addition of any other ingredient).

The great majority of the products (95%, *n* 72) had added sugar and/or non-nutritive sweeteners: 62% (*n* 47) had added sugar, 28% (*n* 21) had both added sugar and non-nutritive sweeteners and 5% (*n* 4) contained non-nutritive sweeteners but did not contain added sugar. Only 5% of the products (*n* 4) did not have added sugar or sweeteners. According to the PAHO nutrient profile model, all ultra-processed products (96%, *n* 73) were excessive in free sugars, whereas according to the Uruguayan front-of-package regulation the percentage of products classified as excessive in sugar was 74% (*n* 56) (Table 1). In addition, according to the PAHO nutrient profile model, 11% of the dairy products (*n* 4) were classified as excessive in fat and 29% (*n* 11) as excessive in saturated fat. According to the Uruguayan nutrient profile model, only one of the dairy

products was classified as excessive in saturated fat (results not shown).

Characteristics of the packages

As shown in Table 2, cartoon characters or child-oriented images were the most frequently used technique to target products at children (e.g. Fig. 1), followed by unusual shapes, bright colours or childish font (e.g. Fig. 1(d)). Textual or visual references to children were not frequent, except for categories targeted exclusively at infants (ultra-pasteurised milk and cereals and mixtures of fruits and vegetables), flavoured cheeses and soya-based beverages (Table 2).

Content analysis performed on the textual and visual references included on the packages identified six main dimensions. As shown in Table 3, packages frequently included references to *Ingredients* and *Nutrition and Health*. Within the dimension *Ingredients*, images of fruits and vegetables were the most prevalent element, even in some products that did not include fruit as ingredient (e.g. Fig. 1(a)). In addition, juices and cereals and mixtures of fruits and vegetables frequently included claims related to the absence of ingredients (preservatives, colourings and flavourings), as well as visual references to other natural foods (e.g. soyabeans, wheat, rice).

Regarding references to *Nutrition and health*, 46% of the packages (*n* 35) included nutrient content claims related to vitamins (43%, *n* 33), minerals (36%, *n* 27), no cholesterol (17%, *n* 13), energy content (12%, *n* 9) and no lactose (8%, *n* 6). Relative nutrient claims about reduced energy content or reduced sugar content were identified in a relatively small number of packages

**Table 2** Strategies used to target products at children within the food categories regarded as breast-milk substitutes according to the Uruguayan National Breastfeeding Standard. Products were identified in forty-four retail outlets in Montevideo (Uruguay) between March and July 2019

Category	Percentage of the packages including . . .				
	References to children	Cartoon characters or child-oriented images	Bright colours or childish font	Cross-promotions and tie-ins with children's programmes, merchandise or film	Games, toys or giveaways targeting small children
Dairy products (<i>n</i> 38)	8	82	82	21	8
Milk desserts (<i>n</i> 17)	0	88	88	24	6
Yogurts (<i>n</i> 11)	0	100	82	36	18
Flavoured milks (<i>n</i> 7)	0	29	57	0	0
Flavoured cheeses (<i>n</i> 2)	100	100	100	0	0
Ultra-pasteurised milk (<i>n</i> 1)	100	100	100	0	0
Teas, juices and bottled waters (<i>n</i> 31)	19	71	55	19	42
Juices (<i>n</i> 21)	0	86	76	14	14
Soya-based beverages (<i>n</i> 10)	60	40	10	30	30
Cereals and mixtures of fruits and vegetables (<i>n</i> 7)	100	71	0	0	0
Cereals (<i>n</i> 5)	100	100	0	0	0
Mixtures of fruits and vegetables (<i>n</i> 2)	100	0	0	0	0
Total	21	76	63	18	12

(Table 3). It is worth stressing that products highlighting reduced sugar content (e.g. '33 % reduced in sugars') contained non-nutritive sweeteners. Voluntary information about nutrient content was also included on 30 % of the packages (*n* 23) using the guidelines daily amount system. In most cases (26 %, *n* 20) the guidelines daily amount system only featured energy content (e.g. Fig. 1(b)), whereas in the remaining 4 % of the packages (*n* 4) it featured the content of key nutrients (energy, sugars, fat, saturated fat and Na). Endorsement logos issued by three health-related organisations (the Uruguayan Association of Pediatrics, the Uruguayan Celiac Association and the Uruguayan Diabetics Association) were found on the packages of dairy products and juices (Table 3).

Other elements conveying health-related associations were found on 20 % of the packages (*n* 15). These included health claims (e.g. 'It helps to strengthen the baby's natural defenses'), statements associating the product with health (e.g. 'Day-to-day, more life, better life' or 'A healthy lifestyle'), as well as indirect references to health through the name of the brand (e.g. 'Pure life' or 'More life'). In addition, 18 % of the packages (*n* 14) included other references to nutrients and nutrition, such as the statement 'It provides nutrients' or the term 'Optistart'. Other health-related associations comprised visual references to sports and physical activity (e.g. the silhouette in Fig. 1(b) or the basketball and the racket in Fig. 1(c)), visual references to strength and energy (e.g. Hulk in Fig. 1(b) and lightnings in Fig. 1(c)), comparisons with products (e.g. 'The same amount of calcium than milk') and references to growth either explicit (e.g. 'To accompany their growth' or '(Brand name) child cereals offer infants essential vitamins and minerals that

significantly contribute to their growth') or implicit through the product name (e.g. 'First steps').

Information about the recommended age of introduction was only found on the ultra-pasteurised milk and the cereals and mixtures of fruits and vegetables. In compliance with Uruguayan regulations⁽³⁷⁾, products with added vitamins and minerals should include the legend 'This product has not been formulated for children under 36 months' if the content of nutrients does not take into consideration the requirements of that specific age group. This corresponded to 46 % of all the identified products (37 % of the dairy products, *n* 10; and 68 % of the juices and soya-based beverages, *n* 21). The legend was always located on the back or side of the package with a small font.

Packages also included elements to convey associations not related to health. References to the sensory and hedonic characteristics of products were the most frequent (Table 3), using both textual (e.g. 'Delicious' or 'Flavour') and visual cues (e.g. visual representations of the products or the emoji face savouring delicious food in Fig. 1(e)). Visual elements conveying associations related to psychological aspects of food consumption were identified in 38 % of the packages (*n* 29). References to happiness were mainly included through smiling characters (e.g. Fig. 1(c) and (e)), whereas references to fun were mainly conveyed through visual references to toys or cartoon characters (e.g. Fig. 1(d) and (f)). As shown in Table 2, other elements included on the packages intended to convey associations with social aspects of food consumption (e.g. references to school snack) and references to convenience (e.g. 'Ready for snack. Just open and squeeze' or 'To take with you everywhere').



Fig. 1 (colour online) Examples of the packages of products targeted at infants and small children within the food categories regarded as complementary foods according to the Uruguayan National Breastfeeding Standard: (a) flavoured yogurt, (b and c) soya-based beverage, (d) ultra-pasteurised milk and (e and f) milk dessert

Marketing of the products in social media

Ten Facebook accounts were identified, four of which replicated the exact same content on Instagram. Considering that brands relied on cross-posting across platforms, in the present work only the content posted on Facebook is presented.

The ten Facebook accounts corresponded to brands of dairy products and juices and soya-based beverages (Table 4). No social media accounts were identified for cereals and mixtures of fruits and vegetables. The number of followers of the accounts ranged from 14 176 to 304 122, except for the Uruguayan accounts of two international brands which had more than 1 million followers (2 362 564 and 1 191 387). Considering that the

Uruguayan population is 3.5 million people, it can be concluded that the number of followers of those two accounts corresponded to the total number of followers of the brands worldwide and not to the followers of the Uruguayan account.

The number of posts generated by the accounts in the period under consideration (from July 2017 to July 2019) ranged between 0 and 103, giving a total of 302 posts. Pictures and videos were the most frequent marketing techniques included in the posts (Table 4). Compared with posts of juices and soya-based beverages, the posts of dairy products more frequently relied on a diversity of marketing techniques, such as cartoon characters, competitions and prizes, promotions (packs and special packages, e.g. Fig. 2(a)) and

**Table 3** Content analysis of the information included on the packages of products targeted at children within the food categories regarded as breast-milk substitutes according to the Uruguayan National Breastfeeding Standard. Products were identified in forty-four retail outlets in Montevideo (Uruguay) between March and July 2019

Dimension/category	Percentage of the packages (%)			
	Dairy products (<i>n</i> 38)	Juices and soya-based beverages (<i>n</i> 31)	Cereals and mixtures of fruits and vegetables (<i>n</i> 7)	Total (<i>n</i> 76)
Ingredients	55	100	100	78
Images of fruits and vegetables	45	94	100	70
Absence of ingredients	3	74	57	37
References to natural foods (except from fruit and vegetables)	5	29	71	21
References to naturalness	5	19	0	11
Nutrition and health	55	94	71	72
Nutrient content claims	29	77	0	46
GDA system	13	58	0	30
Endorsement logos	34	29	0	29
References to health	3	32	57	20
Other references to nutrients or nutrition	3	26	71	18
Relative nutrient claims	16	16	0	14
References to sports and physical activity	0	26	0	11
References to strength and energy	0	26	0	11
Comparison with natural foods	0	13	0	5
References to growth	3	6	14	5
Sensory and hedonic characteristics	61	48	57	55
Sensory characteristics	39	39	57	41
Hedonics	26	29	0	25
Psychological aspects of food consumption	42	42	0	38
References to happiness	37	39	0	34
References to fun	16	29	29	22
Social aspects of food consumption	47	26	0	34
References to school	32	16	0	22
References to parents	11	6	0	8
References to friendship	8	3	0	5
References to convenience	13	13	0	12

Table 4 Characteristics of the Facebook posts generated by Uruguayan accounts of brands of products targeted at children within the food categories regarded as breast-milk substitutes according to the Uruguayan National Breastfeeding Standard, between July 2017 and July 2019

	Dairy products	Juices and soya- based beverages	Total
Number of Facebook accounts (<i>n</i>)	5	5	10
Number of posts (<i>n</i>)	239	63	302
Marketing techniques (%)			
Pictures	90	61	67
Videos	10	39	33
Cartoon characters	19	0	16
Competitions and prizes	16	6	14
Promotions (e.g. packs and special packages)	10	0	8
Games	8	0	6
Events	5	5	5
Recipes	3	3	3
Interactions with users	1	3	1
App	1	0	1
Engagement with the posts			
Average number of shares per post	20.0	31.7	22.5
Average number of comments per post	24.6	49.9	29.9
Average number of reactions per post	129.0	210.5	146.1
Positive reactions (%)	99.8	99.9	99.8
Negative reactions (%)	0.2	0.1	0.2

games. Posts aimed at establishing conversations with users through the posts were not frequent (Table 4).

Engagement with the posts was highly heterogeneous, ranging from zero to 2400 shares, 1200 comments and 2305 reactions. However, the median number of shares per post was 2, and the average number of reactions to the post was 22 (Table 4). Most of the reactions were positive (Like, Love, Laugh and Surprised), whereas negative reactions to the posts (Sad and Angry) were only a minority (0.2%).

Fifty-five percent of the posts (*n* 166) included explicit references to specific products (e.g. Fig. 2(a)), whereas the remaining 45% (*n* 136) only included references to the brand, without any kind of reference to a specific product (e.g. Fig. 2(b)). As expected, parents and caregivers were the main target audience of the posts, as exemplified in Fig. 2. None of the posts included information about the recommended age of introduction of the products.

Results from the content analysis of the posts are shown in Table 5. The most frequent content conveyed by the posts was related to psychological aspects of food consumption, through references to fun or happiness. Associations between the products and fun were conveyed through textual elements of the posts (e.g. 'Brand name), fun assured', 'Fun needs its source of

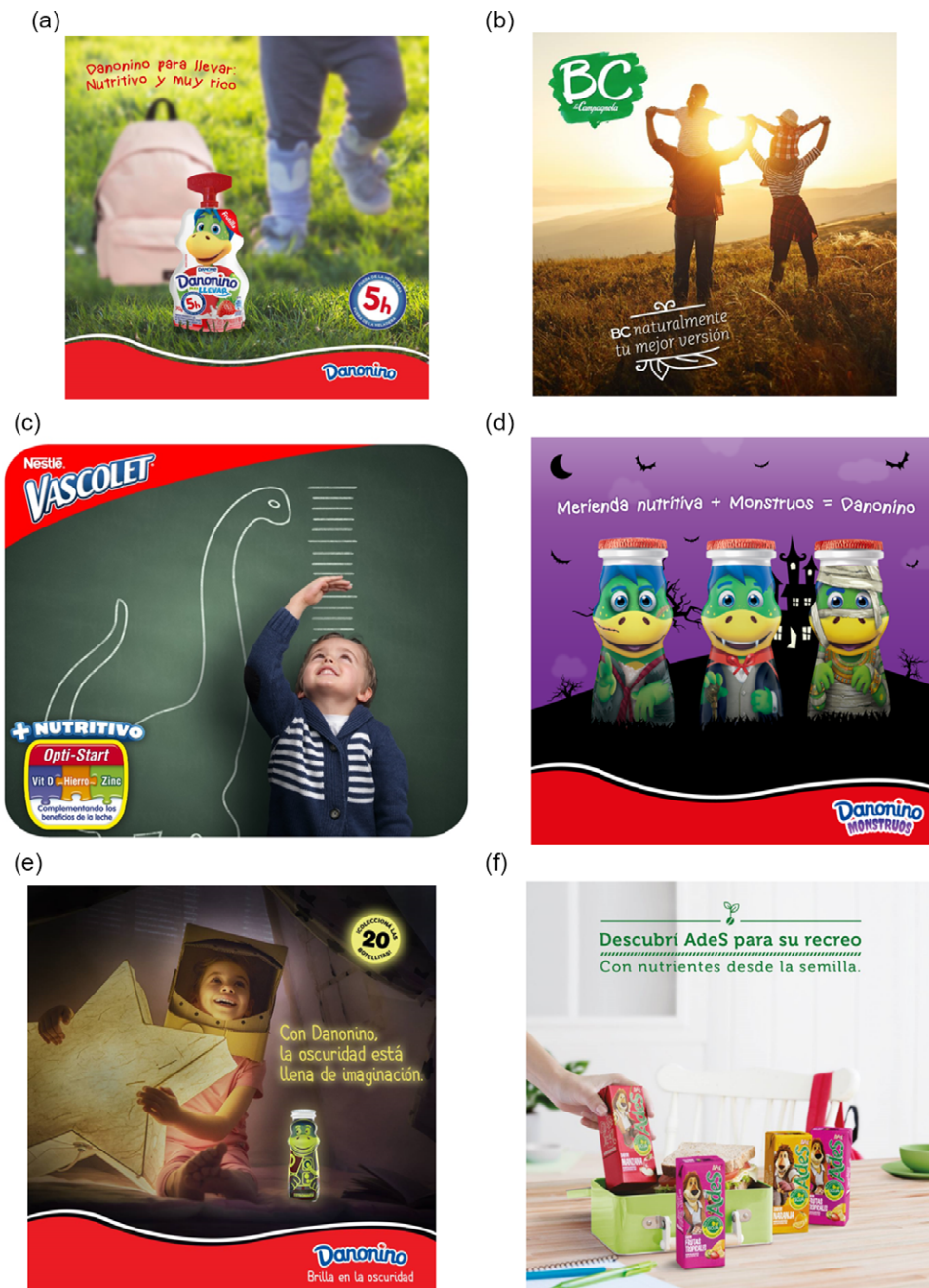


Fig. 2 (colour online) Examples of images included in the Facebook posts generated by Uruguayan accounts of brands of products targeted at infants and young children within the food categories regarded as complementary foods according to the Uruguayan National Breastfeeding Standard. Notes: The English text of the images correspond to the following: (a) (product name) nutritious and very yummy. 5 h outside the fridge; (b) (brand name) naturally your best version; (c) more nutritive. Optistart. Vitamin D, Fe, Zn, complementing the benefits of milk; (d) nutritious snack + monsters = (product name); (e) collect the 20 bottles. With (product name) darkness is full of imagination. (Product name) shines in the dark and (f) discover (product name) for their school break. With nutrients from seed

energy’, or ‘We leave you the instructions so that you can have fun playing’) or visual elements (e.g. collectible packages, Fig. 2(d)). References to happiness included both text (e.g. ‘Yes to everything that makes them happy’) and facial expressions depicted in the images (e.g. Fig. 2(e)). The second most frequently identified dimension was ‘Social aspects of food consumption’, related

to textual and visual references to school (e.g. Fig. 2(f)), parents (e.g. Fig. 2(b)) or friendship.

References to nutrition and health were identified in 36 % of the posts (*n* 109), as previously reported for packages. However, objective information about nutrient content was not as frequent (c.f. Tables 3 and 5). Conversely, the posts included textual and visual cues to

**Table 5** Content analysis of the Facebook posts generated by Uruguayan accounts of brands of products targeted at children within the food categories regarded as complementary foods according to the Uruguayan National Breastfeeding Standard, between July 2017 and July 2019

Dimension/category	Percentage of the posts (%)		
	Dairy products (<i>n</i> 239)	Teas, juices and bottled waters (<i>n</i> 63)	Total (<i>n</i> 302)
Psychological aspects of food consumption	65	46	61
References to fun	65	43	60
References to happiness	5	10	6
Social aspects of food consumption	38	70	45
References to school	29	21	27
References to parents	8	56	18
References to friendship	4	5	4
Nutrition and health	38	29	36
References to strength and energy	15	11	14
Other references to nutrients or nutrition	12	14	13
References to intelligence/learning and imagination/creativity	5	15	13
Nutrient content claims	9	14	10
References to sports and physical activity	8	6	8
Comparison with products	0	6	5
References to growth	4	8	5
Endorsements by health organisations	1	0	1
Relative nutrient claims	1	0	1
References to health	1	2	1
Ingredients	13	71	25
Fruit images	13	41	19
References to naturalness	0	29	6
Absence of ingredients	0	10	2
References to natural ingredients (except from fruit)	1	8	3
Sensory and hedonic	18	14	18
Hedonics	16	6	14
Sensory characteristics	5	8	5
References to convenience	13	5	11

convey the idea that products would provide strength and energy, contributing to their growth and development (Table 5). Examples of the statements included in the posts are provided below, whereas an example of a visual reference conveying an association with growth is shown in Fig. 2(c):

'Improve their performance, concentration, growth and development with the new (Product name)'

'A breakfast with (Product name) is ideal for improving performance, concentration, growth and development'

'(Product name) is made with milk, calcium and Vitamin D. Apart from being delicious, it provides your child energy to play and learn.
#NutritiousSnack'

'When children drink (Product name) their imagination takes off and their creativity comes to light.
#NurturingPossibilities'

As shown in Table 5, Facebook posts also included visual and textual elements to convey associations about the products' ingredients, such as fruit images or references to natural ingredients (e.g. soyabean), references to naturalness (e.g. Fig. 1(b)) and statements on the absence of

ingredients (e.g. 'No preservatives'). Finally, references to the sensory and hedonic characteristics of the products (e.g. 'The flavor your child loves') and convenience (e.g. 'These holidays take (Product name) wherever you want', 'Convenient and tasty') were found in 18% (*n* 54) and 11% of the posts (*n* 33), respectively (Table 5).

Discussion

The present study analysed the marketing of commercial foods targeted at infants and young children, which can be regarded as breast-milk substitutes according to the Uruguayan National Breastfeeding Standard⁽³⁶⁾. A total of seventy-six products were identified, the great majority of which (96%) were ultra-processed excessive in sugar according to the criteria of the PAHO nutrient profile model. This result is in agreement with the large availability of ultra-processed products in the current food environment^(4,42). Similar results have been previously reported for products targeted at children, including complementary foods, commercialised in different countries worldwide^(16–18,46,47).

Although most products were excessive in sugar according to both the PAHO and Uruguayan nutrient profile model, their packages included a wide range of elements to convey the idea that they were appropriate for children and to attract their attention. In line with results from



previous studies, cartoon characters, bright colours and childish font were the most frequent elements identified in the packages⁽¹⁸⁾. In addition, the majority of the packages included elements to convey health-related associations, such as images of fruits and vegetables, claims related to the absence of ingredients (e.g. preservatives) and nutrient content claims. Research has shown that consumers frequently rely on these elements to judge product healthiness instead of relying on more complex information about the nutritional composition of products^(20,48). In particular, references to vitamins and minerals have been reported to be relevant cues for parents when selecting foods for their children^(19,49,50).

Although some of the claims were related to the nutritional composition of the products (e.g. nutrient content claims), others did not have any scientific basis. This was the case of statements associating the product with children's growth or 'a healthy lifestyle'. Similar results have been reported by Pomeranz *et al.* when analysing the labelling practices of toddler milks, formulas and milks in the USA⁽⁵¹⁾. In addition, it is worth stressing that some of the health-related associations were implicitly conveyed using images (e.g. a silhouette), terms developed by the brand (e.g. Optistart), the brand's name or even the specific name of the product.

It is worth noting that only products targeted exclusively at infants (ultra-pasteurised milk and cereals and mixtures of fruits and vegetables) included information about the appropriate age of introduction. The remaining products did not comply with the recommendations provided by the WHO on the guidance for ending the inappropriate promotion of foods for infants and young children regarding the need to include information about the appropriate age of introduction⁽³³⁾. As established in Uruguayan regulations⁽³⁷⁾, products with added vitamins and minerals (46 % of all the identified products) included the legend 'This product has not been formulated for children under 36 months' as they were not formulated considering the nutritional requirements of this specific age group. Nonetheless, the statement does not provide clear information about the recommended age of introduction of the products. Further research should address whether parents and caregivers are aware of this legend and how they interpret it. In addition, considering that this statement was included on the back of the package and in a small font it is unlikely that parents read it before purchasing the products⁽⁵²⁾.

Results from the present work confirmed the existence of digital marketing of foods targeted at infants and young children in Uruguay, particularly within the categories dairy foods and juices and soya-based beverages. The posted content targeted parents in agreement with age requirements on Facebook and Instagram^(27,28). Cross-posting across platforms was identified, suggesting that the brands included in the present research do not generate platform-specific content.

Content analysis of Facebook posts identified a wide range of marketing techniques to promote the products, in agreement with previous studies^(25,26). The textual and visual elements of the posts prioritised the generation of references to fun and social aspects of food consumption. Results from the present work suggest that the digital marketing of commercial foods targeted at infants and young children intends to create symbolic meaning to products and embrace these products as part of children's culture, as discussed by Elliot⁽⁵³⁾. These strategies complement the health associations conveyed by food packages, suggesting that products are a normal part of children's life, as well as good for their health. In this sense, Facebook posts also included references to nutrition and health. However, most of the references were not based on a description of the nutritional characteristics of the products. Instead, several posts included idealisations of the effects of products on children's health, growth and development. This shows a clear contradiction with the growing body of evidence about the negative health effects of ultra-processed products⁽⁵⁴⁾.

Policy implications

Results from the present work showed that many products regarded as potential breast-milk substitutes by the Uruguayan National Breastfeeding Standard are promoted using inappropriate strategies, conveying the idea that they are appropriate for children despite being excessive in sugar. Several policy implications can be derived from the content analysis of marketing strategies used on packages and Facebook posts.

One policy recommendation arising from the present work is the need to include clear information about the appropriate age of introduction of products targeted at infants and young children, as recommended by the WHO⁽³³⁾. To date, parents do not have reliable information about the appropriate age of introduction of products targeted at children, which may lead to inappropriate feeding decisions. This is particularly relevant in Uruguay given the large proportion of infants who frequently consume juices and sweetened dairy products⁽³⁵⁾. Considering that parents make their food purchases in short time frames and without engaging in a detailed evaluation of all the information included on packages⁽⁵²⁾, information about the appropriate age of introduction of products should be included on the front-of-package using a design that easily catches their attention.

In addition, policy makers should introduce marketing regulations that restrict the use of child-oriented elements on the packages of foods excessive in sugars, fat or Na. These regulations have the potential to improve the nutritional composition of products targeted at children, as recently reported in Chile for breakfast cereals⁽⁵⁵⁾.

The implementation of simplified front-of-package nutritional information can raise parents' awareness of the



nutritional composition of commercial foods targeted at infants and young children. In this sense, Uruguay has recently approved the implementation of nutritional warnings (black octagonal signs with the expression 'Excess') to highlight products excessive in sugar, fat, saturated fat and Na, which became fully effective in February 2021⁽⁴⁴⁾. Preliminary findings have shown that warnings are expected to make the excessive content of nutrients salient on consumers' mind, encouraging healthier food choices^(56,57). In this sense, it is worth stressing that 74% of the products identified in the present work would feature nutritional warnings according to the Uruguayan regulation.

Stricter regulations regarding the use of elements conveying health-related associations are also necessary. Restrictions on the use of nutrient content claims and relative nutrient claims should be implemented based on the nutritional composition of products, as currently done in Australia and New Zealand⁽⁵⁸⁾. Furthermore, other textual and visual cues on the labels, such as images of fruits and silhouettes, also deserve attention from policy makers. These cues generate health-related associations and could undermine the efficacy of nutritional warnings^(59,60). Considering that images are open to interpretation, regulations on visual cues are not expected to be easily approved or, even less, accepted by the food industry. Still, experience from tobacco policies suggests that such endeavour is feasible⁽⁶¹⁾.

Results from the present work also suggest the need to introduce digital marketing regulations. Most of the posts identified in the present work were targeted at parents, suggesting that they would not be included on most marketing regulations focused on marketing 'targeted at' or 'appealing to' children and adolescents^(62,63). Therefore, focus on children and adolescents may not be enough to protect them from the inappropriate marketing practices of ultra-processed products. This suggests that regulations of products targeted at children should also include marketing targeted at mixed audiences. However, such regulations are expected to face strong opposition based on censorship of commercial expression and infringement of legal rights^(64,65).

Finally, results from the present work showed that a branding approach to digital marketing was highly prevalent, that is, Facebook accounts intended to create positive associations with brands without mentioning specific products. This approach challenges most voluntary and mandatory marketing regulations, which focus on products with high content of sugar, fat and Na^(62,63). Brand marketing should be a central part of digital marketing regulations despite the challenges associated with the identification of what brands should be included within their scope.

Limitations of the study

The present research is not free of limitations. The study was conducted in a single country in Latin America and involved the evaluation of a limited number of product categories,

regarded as potential breast-milk substitutes according to national regulations. In addition, although the recommendations of the NetCode toolkit were followed, a limited number of retail outlets from a single city were considered, which may have limited the number of products considered. Further research should be conducted to confirm and expand results from the present work.

Another limitation of the study is that sugar content in some of the dairy products identified in the study was estimated based on the carbohydrate content as sugar declaration is not compulsory in the country. Regarding the analysis of digital marketing, advertisements presented to Facebook users, while using the platform, were not considered. Although this endeavour is not expected to be easy due to the audience targeting strategies of social media, future studies in this regard are needed.

Finally, parents and caregivers' perception of the information available on the packages and social media posts was not analysed. This suggests that further research should be carried out to gain an in-depth understanding of how the marketing strategies of foods targeted at infants and young children shape their social representations and influence parents' infant feeding decisions.

Conclusions

Results from the present work showed that the marketing of commercial complementary foods through packaging and Facebook in Uruguay can be regarded as inappropriate according to the guidance issued by the WHO. Packages frequently included cues to convey health-related associations despite the fact that most products were excessive in sugars. Digital marketing targeted at parents intended to raise positive associations between products, fun and social aspects of food consumption and also promoted the products as ideal for growth and development. These results stress the need to implement multi-faceted strategies to protect children from the deleterious effects of the marketing of ultra-processed products, including restrictions on the inclusion of child-oriented elements on packages of foods excessive in nutrients associated with non-communicable diseases, simplified front-of-package nutritional information, stricter regulations on the use of elements conveying health-related associations and digital marketing regulations. It would be advisable that such regulations include marketing targeted at parents and caregivers under their scope.

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