








Characteristics of digital marketing of food outlets selling prepared foods: analysis of Instagram posts

Características del marketing digital de puntos de venta de comida preparada: análisis de publicaciones en Instagram

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Abstract

Digital marketing is one of the dimensions of the food environment that increasingly influences eating habits. It is one of the factors contributing to increased consumption of out-of-home foods, which has been associated with negative health outcomes. In this context, the objective of the study was to analyze the content of Instagram posts featuring retail food outlets that sell prepared foods in Montevideo, the capital city of Uruguay. A multi-step approach to analyze Instagram posts of food outlets selling prepared foods available on a meal delivery app. A total of 293 Instagram accounts were identified, which generated 5,454 posts between August 15th, 2020, and February 15th, 2021. The visual and textual content of the posts were analyzed using deductive-inductive coding. Results showed that the great majority (80%) of the outlets available in the meal ordering app had an Instagram account, most of which (68%) posted content in their feed in the 6-months period considered in the present work. The Instagram accounts promoted a diversity of dishes, foods, and beverages; most of which typically contain excessive amounts of sugars, fat, saturated fats, and/or sodium (burger, pizza, ice-cream, sandwiches and wraps, pastries, cakes and desserts). Instagram posts included several marketing techniques to increase persuasiveness, including price promotions, and cues to establish interactions with users. The visual and textual content of the posts promoted the food outlets by referring to a wide range of topics, which can be regarded as an attempt to maximize the persuasiveness of the post by triggering both systematic and heuristic information processing. These results show that marketing of food outlets selling prepared foods on Instagram is a relevant characteristic of the digital food environment that needs to be addressed as part of comprehensive marketing regulations.

Keywords: Food marketing. Out-of-home foods. Food environment.

Resumen

El marketing digital es una de las dimensiones de los entornos alimentarios que influye de forma creciente en los hábitos alimentarios. Es uno de los factores que contribuyen al aumento del consumo de alimentos fuera del hogar, el cual se ha asociado a resultados negativos para la salud. En este contexto, el objetivo del estudio fue analizar el contenido de las publicaciones en Instagram de establecimientos minoristas que venden alimentos preparados en Montevideo, la capital de Uruguay. Se utilizó un enfoque de múltiples pasos para analizar las publicaciones de Instagram de los establecimientos de comida que venden comidas preparadas disponibles en una aplicación de pedidos de comidas. Se identificaron 293 cuentas de Instagram, que generaron 5.454 publicaciones entre el 15 de agosto de 2020 y el 15 de febrero de 2021. El contenido visual y textual de las publicaciones se analizó mediante codificación deductiva-inductiva. Los resultados mostraron que la gran mayoría (80%) de los establecimientos disponibles en la aplicación de pedidos de comida tenían una cuenta de Instagram, la mayoría de los cuales (68%) publicaron contenido en el periodo de 6 meses considerado en el presente trabajo. Las cuentas de Instagram promocionaron una gran variedad de platos, alimentos y bebidas, la mayoría de los cuales suelen contener una cantidad excesiva de azúcares, grasas, grasas saturadas y/o sodio (hamburguesas, pizzas, helados, sándwiches y wraps, bollería, pasteles y postres). Las publicaciones incluyeron varias técnicas de marketing para aumentar la capacidad de persuasión, tales como promociones de precios y pistas para establecer interacciones con los usuarios. El contenido visual y textual de las publicaciones promocionaba los establecimientos de comida haciendo referencia a una amplia gama de temas, lo que puede considerarse como un intento de maximizar la persuasión de las publicaciones mediante la activación de un procesamiento de la información tanto sistemático como heurístico. Estos resultados muestran que el marketing digital de establecimientos de comida que venden alimentos preparados es una característica relevante de los entornos alimentarios digitales que debe abordarse como parte de una normativa integral de regulación de publicidad.

Palabras clave: Publicidad de alimentos. Alimentos fuera del hogar. Entorno alimentario.

Introduction

Out-of-home foods, including both foods consumed outside the home and takeaway, have become increasingly popular over the last decades, both in developed and developing countries^{1,2}. The available evidence shows that foods prepared out of home tend to have lower nutritional quality than homemade foods: they generally have higher energy density, contain more saturated fats, sugar, and sodium, and lower levels of fiber and micronutrients^{2,3}. Consumption of out-of-home foods has been associated with negative health outcomes, such as weight gain and type 2 diabetes^{2,4,5}.

Among several food system drivers contributing to consumption of out-of-home foods, digitalization of the food environment deserves special attention⁶. Widespread diffusion of mobile phone and social media use, coupled with the accelerated development of food delivery platforms, have increased the accessibility to a broader range of food service outlets⁷. Digital marketing, defined as promotional activities through digital media⁸, is another dimension of digital food environments contributing to the increase in consumption of out-of-home foods⁹.

Food outlets selling prepared foods and meal delivery apps use digital food marketing to promote themselves and increase their sales^{6,8,10,11}. Recent studies have reported that advertisements promoting food outlets selling prepared foods and meal delivery apps are among the most frequently seen by adolescents in social media^{11,12}. Exposure to digital marketing of out-of-home foods can increase product and brand awareness, shape social norms, and influence purchase behavior, particularly among children and adolescents¹³⁻¹⁶. This type of marketing is potentially more effective than other traditional types of marketing as a consequence of its ability to target specific segments of consumers based on demographics, interests and behavior; ubiquity; continuous availability; and interactivity^{13,17}. This last aspect deserves special consideration as it maximizes persuasiveness and enables to increase reach through user-generated content, word of mouth and online reviews¹⁷. In this sense, digital marketing has the potential to maximize positive social norms around consumption of unhealthy foods, particularly among adolescents^{12,13,16}.

Despite the relevance of the topic, an in-depth understanding of the prevalence and power of digital marketing of out-of-home foods is still lacking. This information can contribute to the development of digital marketing regulations and communication strategies to reduce the persuasive power of digital marketing. Drawing on research on digital marketing of ultra-processed products^{10,18-21}, it can be expected that digital marketing of out-of-home foods would be prevalent and include a diverse set of marketing techniques as well as references to multiple distinct topics.

In this context, the aim of the present work was to analyze the content of Instagram posts of retail food outlets selling prepared foods. The study was conducted in Uruguay, a high-income Latin American country characterized by one of the highest prevalence rates of overweight and obesity among adolescents (39%) and adults (65%) in the region²². Consumption of out-of-home foods in the country accounts for 16% of household food expenditure; reaching

23% for households in the fifth income quintile²³. Focus on Instagram is justified based on its popularity worldwide, particularly among adolescents and young adults²⁴. According to the most recent statistics, 77% of Uruguayan internet users aged 14 to 19, and 55% of users aged 20 to 34 had an Instagram account in 2019²⁵.

Materials and methods

The current cross-sectional exploratory study employed a multi-step approach to analyze Instagram posts of food outlets selling prepared foods in Montevideo, the capital city of Uruguay. Food outlets available in the most popular meal delivery app were considered. The full protocol was approved by the Ethics Committee of the School of Chemistry of Universidad de la República. Informed consent was not obtained as no human participants were involved.

Data compilation

The study commenced with a thorough survey of *PedidosYa*, one of the two food meal delivery apps available in Uruguay. Searches of food outlets were manually performed by two researchers in three different geographical locations in Montevideo: city center (located in the southern part of the city), Pocitos (the most densely populated area of the city, south-east location), Villa Española (north location). All the results from the searches were meticulously retrieved to create a master list of 365 unique retail food outlets (i.e., stores selling foods and beverages through the meal delivery app). The list comprised a wide range of outlets, including full-service restaurants, fast food outlets, bars, diners, sushi restaurants, ice cream parlors, and bakeries.

Then, a thorough examination was conducted to ascertain whether the food outlets had an Instagram profile. Manual searches using the name of all the identified outlets were performed through the search tool of the Instagram platform. From the 365 outlets in the master list, 293 had an Instagram account.

For each of the Instagram accounts, the numbers of followers and all posts generated from August 15th, 2020, to February 15th, 2021, were retrieved. This period was selected to allow comparison with a previous study analyzing the content of Instagram posts promoting ultra-processed products¹⁹. Although the time frame overlaps with the COVID-19 pandemic, it is worth highlighting that there were no compulsory lockdowns in Uruguay; therefore, it was possible to eat out during the period. The link to each of the posts was included in a spreadsheet for subsequent analysis. The number of comments and likes were recorded for each of the posts.

Data analysis

A systematic examination of the visual and textual content of the posts was performed through a manual content analysis approach based on deductive-inductive coding²⁶. The inclusion of sound and music in the posts was captured but their content (e.g., type of sound; lyrics of a song) was not analyzed. The coding frame developed in a previous study analyzing Instagram posts promoting ultra-processed products was initially used¹⁹. Specific-

ly, a sub-sample comprising 10% of the posts were first analyzed independently by two researchers to identify additional categories emerging from the posts based on inductive coding. The resultant categories served as a reference point for discussion between the two coders and an additional researcher, which led to the development of the final coding frame. Subsequently, all posts were independently coded by the three researchers. Binary variables were used to indicate whether each post included visual or textual content related to any of the themes and categories (1) or not (0). The following marketing techniques were considered: pictures; videos; price promotions; cues to establish interactions with users; memes, pranks, or games; references to music, movies, and TV shows; sound and music; social responsibility; influencers and celebrities; contests and raffles; and merchandising. For the analysis of the content of the posts, the following themes (and categories) were considered: Characteristics of the outlets (Take away; Establishment information; Daily menu; Opening of a new branch; Characteristics of the premises); Context (Meals; Day of the week; Special occasions; Weather and seasons; Places; Social context; Occasions); Pleasure; sensory characteristics; and emotions (Pleasure; Sensory characteristics; Emotions and feelings); Manufacturing process (Homemade; Quality; Traditional; Foreign cuisine; Characteristics of the manufacturing process; Uruguayan cuisine); Ingredients (Vegan/vegetarian; Ingredient description; Natural; Whole wheat); Health and nutrition (Health; Nutritional composition; Healthy lifestyle); Other product characteristics (Variety; Novelty; Fresh; Portion size; Convenience).

The same procedure was used to code the food categories promoted in each of the posts. The following categories were considered: No specific product (brand marketing); Meat burgers; Pizza; Ice-cream; Sandwiches and wraps; Pastries; Cakes and desserts; Salads; Coffee and coffee beverages; Pasta; Menus including different foods; Meat dishes; Milanesas (breaded steak of chicken) or nuggets; Empanadas; Sushi; Vegan burgers; Smoothies and juices; Alcoholic beverages; Chicken dishes; French fries; Pies and quiches; Arepas and tacos; Rice dishes; Croquette; Vegetable dishes; Snacks and dips; Packaged foods; Hot dogs and sausages; Bread; Fish and seafood; Ingredients; Cereals and cereal bars; Egg dishes; Chinese or Japanese dishes; Others. Inter-rater reliability was deemed adequate according to the kappa coefficient ($\kappa=0.93$).

Descriptive statistics were used to summarize the data. Averages, ranges, and standard deviations were considered for number of posts, likes, and comments. The number and percentage of posts including content related to each of the categories were calculated. Examples of posts were selected and translated to English by one of the researchers to exemplify the categories.

Results

From the 293 Instagram accounts, 200 had posted content in the 6 months considered as the target period (August 15th, 2020–February 15th, 2021). These accounts had a median and an average number of followers of 3,520 and 7,068 (SD=9,362), respectively. The number of posts generated by each of the 200 accounts ranged between 1 and 398, with an average of 31.2 (SD=45.4) and a median of

17. Regarding user interaction with the posts, the average number of likes per post ranged from 0 to 5560 (Average=90.8, SD=176.6, Median=48), and the number of comments from 0 to 1575 (Average=3.5, SD=42.2, Median=0).

A total of 5,454 Instagram posts were identified, which promoted a wide range of foods, dishes, and beverages. As shown in **Table 1**, 26.6% of the posts (n=1,451) promoted the food outlets without any specific reference to a dish, food, or beverage. The most frequently promoted dishes were meat burgers, pizza, ice-cream, sandwiches and wraps, pastries, cakes and desserts, salads, and coffee beverages.

Marketing techniques included in the Instagram posts

All the Instagram posts included at least one marketing technique. All posts included either pictures (n=4771, 87.5%) or videos (n=683, 12.5%). Pictures or videos of a dish or beverage were the most frequent; most posts included this type of content (n=3,959, 72.6%). Pictures or videos depicting the logo of the outlet (n=977, 17.9%), food outlet premises (n=971, 17.8%), and people (n=919, 16.9%) were also frequent. In particular, 3.7% of the posts (n=206) included a picture of a teenager or young adult, and 2.1% (n=114) a picture of a child. Other images identified in the posts included descriptions of the manufacturing process (e.g., the fermentation of a sour bread dough), nature and botany (e.g., plants), and animals (e.g., dogs).

Price promotions were the second most frequent marketing technique. Approximately 1 out of 5 Instagram posts (n=1,123, 20.6%) referred to discounts, price promotions, or stressed the low price of the promoted products (e.g., '🔥Promotion👉 Empanadas👉 for \$130!! only!'). A similar proportion of posts (n=1,042, 19.1%) included cues to establish interactions with users by encouraging them to, for example, answer questions or send comments about their products (e.g., 'We have a NEW ROLL and we want our community of sushi lovers to name it'). In addition, 11.4% of the posts included memes, pranks, or games (e.g., 'Samuel L. Jackson preferential price at XXX'). The rest of the marketing techniques were identified in less than 10% of the posts: references to music, movies, and TV shows (n=330, 6.1%, e.g., 'May you never lack the company of an #Tentation ice cream when choosing a new series. Any suggestions? 🍦👉'); sound and music (n=206, 3.8%); social responsibility (n=194, 3.6%, e.g., 'Did you know that for every English pudding you buy at your neighborhood bakery you are helping the Perez Scremini Foundation? 🍮 A fresh, tasty, handmade pudding and, what's more, it's solidarity! ❤️'); influencers and celebrities (n=121, 2.2%, e.g., 'A pleasure to receive musicians of this level at [outlet name] 🎵'); contests and raffles (n=108, 2.0%, e.g., 'Next to the comment tag someone who does not follow us. Best answers compete for a voucher for 5 reinforcements 🍪'); merchandising (n=22; 0.4%, e.g., 'This bag will make you want to go out and run errands').

Content of the Instagram posts

The visual and textual content of the posts promoted the food outlets by referring to a wide array of topics (**Table 2**). The most frequent theme was 'Characteristics of the

Table 1. Number of Instagram accounts of food outlets selling prepared foods and Instagram posts promoting different product categories in Montevideo, Uruguay, between August 15th, 2020, and February 15th, 2021.

Category	Number of accounts promoting the category	Percentage of accounts (%)	Number of posts	Percentage of all the posts (%)
No specific product (brand marketing)	131	65.5	1451	26.7
Meat burgers	59	29.5	524	9.6
Pizza	51	25.5	281	5.2
Ice-cream	17	8.5	259	4.7
Sandwiches and wraps	47	23.5	245	4.5
Pastries	40	20.0	241	4.4
Cakes and desserts	62	31.0	230	4.2
Salads	49	24.5	212	3.9
Coffee and coffee beverages	21	10.5	210	3.9
Pasta	42	21.0	168	3.1
Menus including different foods	32	16.0	143	2.6
Meat dishes	29	14.5	126	2.3
<i>Milanesas</i> (breaded steak of chicken) or nuggets	43	21.5	120	2.2
Empanadas	17	8.5	110	2.0
Sushi	6	3.0	97	1.8
Vegan burgers	14	7.0	89	1.6
Smoothies and juices	24	12.0	88	1.6
Alcoholic beverages	31	15.5	87	1.6
Chicken dishes	23	11.5	85	1.6
French fries	34	17.0	70	1.3
Pies and quiches	22	11.0	68	1.2
Arepas and tacos	10	5.0	67	1.2
Rice dishes	14	7.0	62	1.1
Croquette	18	9.0	55	1.0
Vegetable dishes	24	12.0	55	1.0
Snacks and dips	20	10.0	54	1.0
Packaged foods	5	2.5	53	1.0
Hot dogs and sausages	13	6.5	44	0.8
Bread	18	9.0	28	0.5
Fish and seafood	13	6.5	24	0.4
Ingredients	4	2.0	24	0.4
Cereals and cereal bars	4	2.0	21	0.4
Egg dishes	10	5.0	21	0.4
Chinese or Japanese dishes	7	3.5	20	0.4
Others	11	5.5	22	0.4
Total (all categories)	200	100.0	5,454	100.0

Note: Accounts could promote more than one category.

Table 2. Number and percentage of Instagram posts promoting food retail outlets including content related to the different themes and categories identified in the deductive-inductive coding. For each of the categories, examples are provided.

Theme/Category	Examples	Number of posts	Percentage of posts (%)
Characteristics of the outlets		3006	55.1
Take away	"We have delivery. Now we go to your door!"	1729	31.7
Establishment information (opening hours, reservations, location)	'Make your reservation or order to take away at XXX. We are at XXX from Monday to Saturday from 12 to 24 h. Sunday from 12 to 17 h'	1661	30.5
Daily menu	'Suggestion of the day. Petit entrecot with pepper and potatoes'	1222	22.4
Opening of a new branch	'Today, after so many announcements, the city of CANELONES has a XXX'	91	1.7
Characteristics of the premises	'XXXX changed her skin, thank you beloved friend @ XXX for materializing this change that we had been developing internally and for capturing it through your design on the most visible wall of our house'	48	0.9
Context		2441	44.8
Meals	'Burger night!'	1109	20.3
Day of the week	'Start the week off on the right foot at XXX with a spectacular executive menu'	759	13.9
Special occasions	'At XXX we declare love to pizza all year long 🍕❤️. Happy Valentine's Day, we believe that love is how you choose to spend it 🥰'	622	11.4
Weather and seasons	'SPRING is here and with it the beautiful and warm days 🌞 >> our juices 🍏🍊 are ideal to cool you down'	457	8.4
Places	'Vacations at home? They're going to be amazing because you can have these Crunchy Bonbons in your fridge 🍪'	449	8.2
Social context	'You're in a zoom meeting... Suddenly this breakfast arrives to join you'	254	4.7
Occasions	'Vacations are synonymous with ice cream and fun!'	229	4.2
Pleasure, sensory characteristics, and emotions		2391	43.8
Pleasure	'Start the week by giving yourself a treat 🍰 Now all you have to do is choose what to pair it with'	1777	32.6
Sensory characteristics	'It's not all about savory, we also have yummy sweet things to gladden your heart! ❤️'	837	15.3
Emotions and feelings	'Meat, smoke and a lot of love are what make our XXX a real pleasure.... 🍖❤️'	511	9.4
Manufacturing process		1543	28.3
Homemade	'It is a mixture of gourmet flavors that gives you just the right amount of each taste and the homemade flavor of 'they prepared it for me with a homemade taste, with hands that knead the bread and prepare each part with care'	782	14.3
Quality	'A good coffee to start off the week!'	736	13.5
Traditional	'NAPOLITANA! A classic that cannot be left out of in any menu 🍕'	196	3.6

...continuation table 2.

Theme/Category	Examples	Number of posts	Percentage of posts (%)
Foreign cuisine	'The last days of winter must be celebrated. What do you think of Mexican food for today?'	195	3.6
Characteristics of the manufacturing process	'Sponge Edges, Sourdough, Wood-fired Oven, 48 Leavening, 70% Hydration'	119	2.2
Uruguayan cuisine	'Our own flavors, very gaucho, with the best selected meats'	40	0.7
Ingredients		850	15.6
Vegan/vegetarian	'🌻EVERY DAY, FRESH, HANDMADE BISCUITS AND OF COURSE ... VEGAN! 🌻'	490	9.0
Ingredient description	'A delight of fresh salmon, philadelphia cheese, arugula and sun dried tomato pesto finished with parmesan flambé!'	299	5.5
Natural	'Bagels? 100% fresh, natural and without preservatives'	140	2.6
Whole wheat	'All the breads we use in XXX are 100% cocoa, without preservatives, fresh and natural'	18	0.3
Health and nutrition		739	13.5
Health	'May this Friday be full of Color! 🍓🍓. Always Healthy'	508	9.3
Nutritional composition	'We focus on making the perfect mix so that your salad contains a good amount of fiber, protein, vitamins and nutrients. And so we give you the perfect lunch! 🍅🥬🥦'	382	7.0
Healthy lifestyle	'Protein and energy source'	77	1.4
Other product characteristics		649	11.9
Variety	'Mini tartlet! They are Delicious 🍪. Many different flavors'	262	4.8
Novelty	'TODAY ! We present our new and long-awaited section of VEGAN HANDCRAFTED ICE CREAMS which we call #VERDELADOS 🍦🌱' 'We have created a new option for you to enjoy summer nights at XXX with friends!'	186	3.4
Fresh	'To start the day with a delicious smell of coffee and freshly baked scones!'	128	2.3
Portion size	'Take the opportunity to taste our XL Frankfurters!'	106	1.9
Convenience	'Whether you are commuting to the office or working from home, we have the ideal solution for you so that you don't waste time cooking and thinking about what to eat and get the most out of your productivity!'	30	0.6

outlets', identified in 55.1% of the posts (n=3,006). These posts referred to take away, provided information about the outlet (e.g., opening, address, how to make reservations), or described the daily menu. A smaller percentage of the posts described the opening of a new branch or highlighted characteristics of the premises.

'Context' was the second most frequent theme. As shown in **Table 2**, 44.8% of the posts described the context of product consumption, mainly by referring to the meal where a specific dish, food, or beverage could be consumed, specific days of the week, or special occasions. References to

other contextual information were also identified, including weather and seasons, places, social contexts, and eating occasions.

The third most frequent theme was 'Pleasure, sensory characteristics, and emotions.' Approximately one third of the posts referred to the pleasure derived from consuming the promoted dishes, foods, or beverages. A smaller proportion of the posts described the sensory characteristics of the products, mainly by referring to flavor (n=550, 10.1%; e.g., sweetness, citric flavor), and texture (n=119, 2.2%; e.g., crunchiness). References to emotions or feelings as-

sociated with product consumption were also found (e.g., love, happiness, surprise, calmness).

Several Instagram posts also included references to the manufacturing process. As shown in **Table 2**, 14.3% of the posts (n=782) described dishes as homemade, whereas 13.5% (n=736) stressed their quality. Other less frequent categories of content within this overarching theme were related to tradition, foreign or Uruguayan cuisine, or the characteristics of the manufacturing process.

The last three themes identified in the content analysis were found in less than 20% of the posts. The theme 'Ingredients' comprised the identification of vegan or vegetarian dishes and beverages, descriptions of the ingredients, dishes or beverages, and references to naturalness. In addition, 18 posts (0.3%) referred to the use of whole wheat. Meanwhile, the theme 'Health and nutrition' was identified in 13.5% of the posts (n=739). Interestingly, this dimension was rarely used to promote discretionary foods, such as burgers (2.5%), ice-creams (5.0%), or pastries (9.8%). The frequency of including references to this dimension ranged between 25% and 35% for posts promoting salads, bread, pasta, smoothies and juices, pies and quiches, and vegetable dishes (data not shown). The most frequent category within the theme 'Health and nutrition' was health, which mainly comprised descriptions of the promoted products as healthy. Regarding nutritional composition, gluten free was the most frequent characteristic highlighted by the posts (n=323, 5.9%), followed by vitamins and minerals (n=34, 0.6%), sugar reduced/free (n=26, 0.5%), and no salt (n=14, 0.3%). A minority of posts (n=77, 1.4%) associated the promoted products with a healthy lifestyle (data not shown). Finally, the last theme 'Other product characteristics' included references to variety, novelty, freshness, large portion size, and convenience (**Table 2**).

Discussion

The present study intends to contribute to filling a gap in the food marketing literature by analyzing the content of Instagram posts generated by food outlets selling prepared foods in the capital city of a country with particularly high overweight and obesity rates (Montevideo, Uruguay). Results showed that the great majority (80%) of the food outlets available in a meal ordering app in three areas of the city had an Instagram account, most of which (68%) posted content in their feed in the 6-months period considered in the present work. Active Instagram accounts corresponded to a wide range of food outlets, from full menu restaurants to fast food chains. These results provide additional evidence that Instagram is not only used for promoting packaged products but also to promote consumption of out-of-home foods, in agreement with previous studies analyzing adolescents' experiences with digital food marketing and live streamed events on different platforms^{11,12,27}.

The Instagram accounts promoted a diversity of dishes, foods, and beverages. However, the most frequently promoted categories (burger, pizza, ice-cream, sandwiches and wraps, pastries, cakes and desserts) typically contain an excessive amount of sugars, fat, saturated fats, and/or sodium^{28,29}. These categories have been reported to be the most widely available in meal delivery apps in different cities across the globe^{30,31}. In particular, the frequent pro-

motion of burgers matches Uruguayan adolescents' experiences with digital food marketing¹².

Instagram posts did not only promote specific foods and beverages but also the outlets, without making any reference to specific products. Such an approach has been previously reported in other studies analyzing different types of food advertising^{19,20,32}. In the specific case of food outlets selling prepared foods, reliance on this approach is expected considering that the food service industry offers experiences that go beyond eating specific foods³³. Moreover, this type of marketing can increase purchase intention by increasing awareness and recognition of the food outlets, while also generating positive associations¹³. Lack of references to specific foods and beverages introduces complexities for the development of regulations aimed at reducing exposure to digital marketing of unhealthy foods. In this sense, the United Kingdom has introduced restrictions on marketing activities intended to promote foods and beverages with high content of sugar, fat, and/or sodium³⁴.

Food outlets selling prepared foods used several marketing strategies to increase the persuasiveness of the posts. Pictures or videos were included in all posts, as expected given the fact that Instagram is a picture and video sharing platform. Price promotions and cues to establish interactions with users were the second and third most frequent marketing strategies identified in the posts. Recent studies have verified these strategies as positive contributors to the effect of social media marketing to word-of-mouth and brand loyalty of fast-food chains^{35,36}. Compared to Instagram posts promoting ultra-processed products¹⁹, those promoting food outlets more frequently included price promotions as well as memes, pranks and jokes, but less frequently featured influencers and celebrities. The use of memes can be regarded as an attempt to position the food outlets as part of the current culture³⁷.

Instagram posts included a wide range of content to communicate specific characteristics of the outlets and their foods and beverages, as well as to raise emotional and conceptual associations. This can be regarded as an attempt to maximize the persuasiveness of the post by triggering both systematic and heuristic information processing³⁸. As such, the current research extends previous studies focused on digital marketing of ultra-processed products^{19,21}.

The most frequent content intended to trigger systematic and rational processing was to provide objective information about the food outlets, in agreement with the fact that perceived relevance and informativeness of social media marketing have been positively associated with purchase intention of fast food³⁵. This represents a key difference with digital marketing of ultra-processed products, which rarely includes objective information about the products¹⁸⁻²¹.

Furthermore, the posts included content related to eating contexts and pleasure, which have been identified as key motives for eating out³³. Pleasure is a key determinant of food choices³⁹, and has been reported to be frequently used by the food industry to promote ultra-processed products²⁰. Frequent inclusion of references to pleasure in the digital marketing of ultra-processed products and food

outlets promoting discretionary foods can shape social representations and contribute to the unhealthy=tasty intuition (i.e., the belief that unhealthy foods are tasty, whereas healthy foods are not)⁴⁰. This stresses the need to make references to pleasure more prevalent also as part of public health communication campaigns aimed at encouraging healthier and more sustainable eating habits.

References to nutrition and health were not frequently included in the Instagram posts. This is another key difference with the digital marketing strategies of ultra-processed products^{20,21}. According to a recent study, approximately 1 out of 3 Instagram posts promoting ultra-processed products include a reference to health, nutrition, or wellbeing, despite the increasing body of evidence reporting associations between consumption of such products and negative health outcomes.

Adolescents are highly vulnerable to digital marketing due to their frequent use of digital media and their susceptibility to social pressure and symbolism associated with product and brand consumption^{41,42}. Results from the present work showed that Instagram posts did not seem to be frequently designed to appeal to this population segment. Only of the 3.7% of the Instagram posts included an explicit visual reference to adolescents or young adults, whereas 11.4% included a meme, prank, or game. However, it is worth mentioning that adolescents regard posts promoting foods they like as targeted at them⁴³. This suggests that the most frequently promoted foods by food outlets selling prepared foods in Montevideo may be particularly appealing for adolescents. Thus, the current characteristics of digital marketing of these outlets may promote consumption of out-of-home foods high in nutrients associated with non-communicable diseases among adolescents. This is aligned with the experiences of adolescents with digital food marketing reported in a recent qualitative work¹².

Taken together, results from the present work suggest the need to include digital marketing of out-of-home foods should be considered as part of comprehensive regulations to protect children and adolescents from the negative effects of exposure to unhealthy food marketing. However, it should be noted that digital marketing poses several challenges in terms of regulation and monitoring, mainly due to its strong reliance on targeting strategies⁴⁴. A potential feasible way to overcome the challenges associated with developing a regulation focused on a specific segment of the population would be a total ban of digital marketing of foods and beverages high in sugars, fat and/or sodium, as proposed by the United Kingdom⁴⁵.

Strengths and limitations

As far as can be ascertained, the present study is the first to perform a comprehensive analysis of digital marketing of food outlets selling prepared foods. By breaking new ground, the current work offers novel information about the characteristics of marketing consumers are exposed to in their everyday life, which is expected to shape their associations and purchase decisions.

Regarding limitations, the study considered a single social media in 1 city during a 6-months period, which limits generalizability. Further research is needed to expand the results from the present work to other settings. Addition-

ally, the study only considered the content posted by the Instagram accounts of food outlets, leaving out other types of content, such as paid advertisements, stories, and live broadcast. Smartphone apps would be needed to capture these types of content¹¹.

Conclusions

This study shows that Instagram was frequently used by food outlets selling prepared foods available in a meal ordering app. Frequent exposure to this type of marketing may contribute to shape associations with out-of-home foods and increase their consumption, thus suggesting the need to also incorporate this type of marketing in the research agenda to fully characterize digital food environments. The results further indicate the need to develop comprehensive regulations on digital marketing of energy-dense foods high in sugars, fat, and/or sodium. In the specific case of out-of-home foods, such regulations may have complexities in the case of food service outlets due to difficulties to access accurate nutrition information. Additional research is needed to expand the results of the current work to other settings and to generate evidence on the effects of exposure to digital food marketing of food outlets selling prepared foods on the consumption of out-of-home foods.

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Conflict of Interest

The authors declare no financial or non-financial relationships with the potential to bias their work.

References

1. Janssen HG, Davies IG, Richardson LD, Stevenson L. Determinants of takeaway and fast food consumption: a narrative review. *Nutr Res Rev.* 2018;31(1):16-34. doi:10.1017/S0954422417000178
2. Gesteiro E, García-Carro A, Aparicio-Ugarriza R, González-Gross M. Eating out of home: influence on nutrition, health, and policies: A scoping review. *Nutrients.* 2022;14(6):1265. doi:10.3390/nu14061265
3. Jaworowska A, M. Blackham T, Long R, et al. Nutritional composition of takeaway food in the UK. *Nutr Food Sci.* 2014;44(5):414-430. doi:10.1108/NFS-08-2013-0093
4. Summerbell CD, Douthwaite W, Whittaker V, et al. The association between diet and physical activity and subsequent excess weight gain and obesity assessed at 5 years of age or older: a systematic review of the epidemiological evidence. *Int J Obes.* 2009;33 Suppl 3(S3):S1-92. doi:10.1038/ijo.2009.80
5. Bezerra IN, Curioni C, Sichieri R. Association between eating out of home and body weight. *Nutr Rev.* 2012;70(2):65-79. doi:10.1111/j.1753-4887.2011.00459.x
6. Granheim SI, Løvhaug AL, Terragni L, Torheim LE, Thurston M. Mapping the digital food environment:

- A systematic scoping review. *Obes Rev.* 2022;23(1). doi:10.1111/obr.13356
7. WHO European Office for the Prevention and Control Noncommunicable diseases. *Slide to Order: A Food Systems Approach to Meals Delivery Apps*. Copenhagen: WHO Regional Office for Europe; 2021.
8. Montgomery K, Chester J. *Digital Food Marketing to Children and Adolescents. Problematic Practices and Policy Interventions*. Oakland, CA: National Policy and Legal Analysis Network to Prevent Childhood Obesity; 2011.
9. Turner C, Aggarwal A, Walls H, et al. Concepts and critical perspectives for food environment research: A global framework with implications for action in low- and middle-income countries. *Glob Food Sec.* 2018;18:93-101. doi:10.1016/j.gfs.2018.08.003
10. Vassallo AJ, Kelly B, Zhang L, Wang Z, Young S, Freeman B. Junk food marketing on instagram: Content analysis. *J Med Internet Res.* 2018;20(6):1-11. doi:10.2196/publichealth.9594
11. Elliott C, Truman E, Aponte-Hao S. Food marketing to teenagers: Examining the power and platforms of food and beverage marketing in Canada. *Appetite.* 2022;173:105999. doi:10.1016/j.appet.2022.105999
12. Ares G, Antúnez L, de León C, et al. 'Even if you don't pay attention to it, you know it's there': A qualitative exploration of adolescents' experiences with digital food marketing. *Appetite.* 2022;176:106128. doi:10.1016/j.appet.2022.106128
13. Kelly B, King L, Chapman K, Boyland E, Bauman AE, Baur LA. A hierarchy of unhealthy food promotion effects: Identifying methodological approaches and knowledge gaps. *Am J Public Health.* 2015;105(4):e86-e95. doi:10.2105/AJPH.2014.302476
14. Buchanan L, Kelly B, Yeatman H, Kariippanon K. The effects of digital marketing of unhealthy commodities on young people: A systematic review. *Nutrients.* 2018;10(2):1-19. doi:10.3390/nu10020148
15. Boyland E, McGale L, Maden M, et al. Association of Food and Nonalcoholic Beverage Marketing with Children and Adolescents' Eating Behaviors and Health: A Systematic Review and Meta-analysis. *JAMA Pediatr.* 2022;176(7). doi:10.1001/jamapediatrics.2022.1037
16. Qutteina Y, Hallez L, Raedschelders M, De Backer C, Smits T. Food for teens: how social media is associated with adolescent eating outcomes. *Public Health Nutr.* July 2021;1-13. doi:10.1017/S1368980021003116
17. Kannan PK, Li H. Digital marketing: A framework, review and research agenda. *Int J Res Mark.* 2017;34(1):22-45. doi:10.1016/j.ijresmar.2016.11.006
18. Buchanan L, Yeatman H, Kelly B, Kariippanon K. A thematic content analysis of how marketers promote energy drinks on digital platforms to young Australians. *Aust N Z J Public Health.* 2018;42(6):530-531. doi:10.1111/1753-6405.12840
19. Gugliucci V, Machín L, Alcaire F, et al. The content of Instagram posts featuring ultra-processed products through the lens of the heuristic-systematic model. *Appetite.* 2023;181:106393. doi:10.1016/j.appet.2022.106393
20. Antúnez L, Alcaire F, Brunet G, Bove I, Ares G. COVID-washing of ultra-processed products: The content of digital marketing on Facebook during the COVID-19 pandemic in Uruguay. *Public Health Nutr.* 2021;24(5):1142-1152. doi:10.1017/S1368980021000306
21. Bleakley A, Ellithorpe ME, Jordan AB, Hennessy M, Stevens R. A content analysis of sports and energy drink advertising. *Appetite.* 2022;174:106010. doi:10.1016/j.appet.2022.106010
22. Parlamento del Uruguay. *Diálogo Nacional "Uruguay: Hacia Sistemas Alimentarios Más Saludables, Sostenibles e Inclusivos."* Montevideo; 2021.
23. Köncke F, Berón C, Toledo C, et al. *Consumo Aparente de Alimentos y Bebidas En Los Hogares Uruguayos. Una Mirada a La Realidad Nacional y En Hogares Donde Viven Niños Menores de 5 Años.* Montevideo; 2022.
24. Statista. Number of Instagram users worldwide from 2019 to 2023. <https://www.statista.com/statistics/183585/instagram-number-of-global-users/>. Published 2022. Accessed April 18, 2022.
25. INE. *Encuesta de Usos de Tecnologías de La Información.* Montevideo: INE; 2019.
26. Bengtsson M. How to plan and perform a qualitative study using content analysis. *NursingPlus Open.* 2016;2:8-14. doi:10.1016/j.npls.2016.01.001
27. Edwards CG, Pollack CC, Pritschet SJ, Haushalter K, Long JW, Masterson TD. Prevalence and comparisons of alcohol, candy, energy drink, snack, soda, and restaurant brand and product marketing on Twitch, Facebook Gaming and YouTube Gaming. *Public Health Nutr.* 2022;25(1):1-12. doi:10.1017/S1368980021004420
28. Partridge SR, Gibson AA, Roy R, et al. Junk food on demand: A cross-sectional analysis of the nutritional quality of popular online food delivery outlets in Australia and New Zealand. *Nutrients.* 2020;12(10):3107. doi:10.3390/nu12103107
29. Mahawar N, Jia SS, Korai A, et al. Unhealthy food at your fingertips: Cross-sectional analysis of the nutritional quality of restaurants and takeaway outlets on an online food delivery platform in New Zealand. *Nutrients.* 2022;14(21):4567. doi:10.3390/nu14214567
30. Horta PM, Souza J de PM, Rocha LL, Mendes LL. Digital food environment of a Brazilian metropolis: food availability and marketing strategies used by delivery apps. *Public Health Nutr.* 2021;24(3):544-548. doi:10.1017/S1368980020003171
31. Poelman MP, Thornton L, Zenk SN. A cross-sectional comparison of meal delivery options in three international cities. *Eur J Clin Nutr.* 2020;74(10):1465-1473. doi:10.1038/s41430-020-0630-7
32. Boyland E, Halford JCG. Television advertising and branding. Effects on eating behaviour and food preferences in children. *Appetite.* 2013;62:236-241. doi:10.1016/j.appet.2012.01.032

33. Edwards JSA. The foodservice industry: Eating out is more than just a meal. *Food Qual Prefer*. 2013;27(2):223-229. doi:10.1016/j.foodqual.2012.02.003
34. Committee of Advertising Practice. Identifying Brand Advertisement That has the Effect of Promoting an HFSS Product. Advertising Guidance. <https://www.asa.org.uk/static/uploaded/d6617362-4ff8-493d-bc53f7fff57e0078.pdf>. Published 2017. Accessed August 12, 2022.
35. Rajeh Hanaysha J, Sharma A, M. Momani A. An exploration of social media marketing features and brand loyalty in the fast food industry. *J Content Community Commun*. 2021;14(8):81-92. doi:10.31620/JCCC.12.21/08
36. Hanaysha JR. Impact of price promotion, corporate social responsibility, and social media marketing on word of mouth. *Bus Perspect Res*. 2021;9(3):446-461. doi:10.1177/2278533721989839
37. Davison P. The language of Internet memes. In: Mandiberg M, ed. *The Social Media Reader*. New York: New York University Press; 2012:120-136.
38. Harris JL, Brownell KD, Bargh JA. The food marketing defense model: Integrating psychological research to protect youth and inform public policy. *Soc Issues Policy Rev*. 2009;3(1):211-271. doi:10.1111/j.1751-2409.2009.01015.x
39. Saper CB, Chou TC, Elmquist JK. The Need to feed. *Neuron*. 2002;36(2):199-211. doi:10.1016/S0896-6273(02)00969-8
40. Garaus M, Lalicic L. The unhealthy-tasty intuition for online recipes – When healthiness perceptions backfire. *Appetite*. 2021;159:105066. doi:10.1016/j.appet.2020.105066
41. Valkenburg PM, Piotrowski JT. *Plugged in: How Media Attract and Affect Youth*. New Haven, CT: Yale University Press; 2017.
42. Lowe CJ, Morton JB, Reichelt AC. Adolescent obesity and dietary decision making—a brain-health perspective. *Lancet Child Adolesc Health*. 2020; 4: 388–396.
43. Ares G, Antúnez L, Alcaire F, Natero V, Otterbring T. Is this advertisement designed to appeal to you? Adolescents' views about Instagram advertisements promoting ultra-processed products. *Public Health Nutr*. 2024, 10.1017/S1368980024000533
44. Sacks G, Looi ESY. The advertising policies of major social media platforms overlook the imperative to restrict the exposure of children and adolescents to the promotion of unhealthy foods and beverages. *Int J Env Res Public Health*. 2020; 17(11): 4172. <https://doi.org/10.3390/ijerph17114172>
45. Department of Health and Social Care. *Introducing a total online advertising restriction for products high in fat, sugar and salt (HFSS)*, Department of Health and Social Care. London: Department of Health and Social Care; 2021.