

Content analysis of food and beverage marketing in global esports: sponsorships of the premier events, leagues, teams and players

John William Long ¹, Sara Jordan Maksi,¹ Francisco Javier López Frías,² Robin Ireland,³ Travis D Masterson¹

To cite: Long JW, Maksi SJ, Frías FJL, *et al.* Content analysis of food and beverage marketing in global esports: sponsorships of the premier events, leagues, teams and players. *BMJ Public Health* 2024;**2**:e000095. doi:10.1136/bmjph-2023-000095

► Additional supplemental material is published online only. To view, please visit the journal online (<https://doi.org/10.1136/bmjph-2023-000095>).

Received 28 March 2023
Accepted 19 March 2024



© Author(s) (or their employer(s)) 2024. Re-use permitted under CC BY-NC. Published by BMJ.

¹Department of Nutritional Sciences, College of Health and Human Development, The Pennsylvania State University, University Park, Pennsylvania, USA

²Department of Kinesiology and Rock Ethics Institute, The Pennsylvania State University, University Park, Pennsylvania, USA

³University of Glasgow, Glasgow, UK

Correspondence to
Dr Travis D Masterson;
travis.d.masterson@psu.edu

ABSTRACT

Background Food marketing has been implicated as a driving force of the obesity epidemic. Electronic sports, or ‘esports’, garners billions of viewership hours and is a consolidation of two major marketing outlets, online social media and sporting events, making it a focal point for food marketers and policy-makers.

Methods The top 10 esports events and leagues were identified using data scraped between 1 January 2021 and 15 December 2021. The 10 teams within each league (90 total teams) and up to 10 players from each team (451 total players) were identified. Of the top 10 events and leagues, 6 events and 2 leagues were held or located outside the USA, reflecting the global popularity of esports. Food and beverage brands associated with each event, league, team or player were systematically identified and extracted via official websites and social media accounts. The number of sponsorships was totalled for each brand. Brands were then categorised based on product type into the following categories: energy drinks, sugar-sweetened beverages, alcohol, candy/snacks, restaurants, food delivery and stores, and supplements. The total number of brand sponsorships was then calculated for each product category.

Results 90 unique food and beverage brands were identified. Across all brands, a total of 497 food brand sponsorships were identified. For product categories, energy drink brands had the most sponsorships (181 sponsorships, 36.4%), followed by restaurants (86 sponsorships, 17.3%) and candy/snacks (64 sponsorships, 12.8%). The individual brand with the most sponsorships was Monster Energy (47 sponsorships, 9.4%), followed by Jack Links (44 sponsorships, 8.8%) and Red Bull (42 sponsorships, 8.4%).

Conclusion Despite its nascent character, the esports industry is already heavily saturated by food and beverage marketing. There is a need to consider policies to appropriately regulate food and beverage marketing within esports communities to safeguard the health of viewers.

INTRODUCTION

Obesity is a significant global public health concern as global trends indicate a substantial

WHAT IS ALREADY KNOWN ON THIS TOPIC

⇒ Youth and adolescents are exposed to high amounts of pervasive online food marketing that contributes to the obesity epidemic. Esports is an increasingly popular sport and form of entertainment with a target demographic of youth and adolescents. No study to date has described and analysed food and beverage marketing within esports.

WHAT THIS STUDY ADDS

⇒ This is the first study to examine and analyse the current landscape of food and beverage marketing within esports by quantifying the number of sponsorships between food brands across all layers of the esports organisational structure. Esports events, leagues, teams and players collectively garner several billions of hours watched while frequently featuring marketing of food and beverage sponsorships.

HOW THIS STUDY MIGHT AFFECT RESEARCH, PRACTICE OR POLICY

⇒ As esports is a global phenomenon, our findings reinforce the urgent need for global governance and policy to limit the exploitation and safeguard the health of viewers, given the well-established evidence that food marketing influences food preferences, purchasing and consumption.

increase in the prevalence among children, adolescents and adults over recent decades.^{1–3} A key contributing factor to the obesogenic environment is unhealthy food marketing,^{4 5} which involves advertising energy-dense and nutrient-poor food and beverage products (from here on referred to as food products, food brands or food marketing) that contribute to unhealthy eating behaviours in children, adolescents and adults.^{6–8} Food marketers have used various methods and outlets to promote these unhealthy products, including sports, television, outdoor spaces, print media and digital media.^{9 10}

Sports-related marketing is of interest as it often targets a specific demographic, primarily the youth and, more specifically, younger males.^{11 12} Food marketing strategies in sports typically include product placement, sponsorships, athlete endorsements and brand advertising within sports competitions.^{11 12} Food products in sports are typically promoted through commercials, athletic events, online advertisements and in-store promotions.^{11 12} Professional sports athletes are uniquely positioned to leverage their platform to promote food products as the public may perceive them as a credible source of effective and healthy products.^{13 14} Athlete endorsements often lead to an increased positive impression of food products through explicit claims or references within marketing, a phenomenon known as the halo effect.^{15 16}

In recent years, electronic sports, or esports, has become a major player in sports broadcasting, with League of Legends being the most popular esports.¹⁷ Esports is a relatively new form of competitive video gaming at a professional level with an emphasis on strategic thinking, teamwork and fast reflexes, all without the requirement of strength and, in most cases, physical activity. The organisation of esports is similar to that of traditional sports, including the use of broadcasts, media promotions, worldwide audiences and organisational elements such as events, leagues, teams, coaches, players, referees and agents.¹⁸ Esports events are typically broadcasted on a variety of platforms, such as traditional sports outlets like ESPN and more modern livestreaming platforms such as Twitch.tv. During these broadcasts, audiences are exposed to pervasive food marketing.¹⁹

Although esports is a relatively new form of entertainment, its global audience in 2021 was 489.5 million and is expected to grow by 8.7% to reach 532 million by the end of 2022.²⁰ Similar to traditional sports, the audience is primarily male (66%); however, spectators tend to be younger than those in traditional sports.²⁰ For example, 32% of the audience is 16–24 years, and 62% of the audience is 16–34 years.^{20 21} Major esports events also garner a substantial amount of engagement comparable to traditional sports. For example, the 2021 League of Legends World Championship was watched for 1.69 million hours, and the finals reached 73.8 million peak concurrent viewers.^{22 23} This is comparable to traditional sporting events, as the last two Super Bowls reached 167 million viewers in 2022 and 92 million viewers, respectively, in 2021.^{24 25}

With technology becoming increasingly influential in modern society, it is unsurprising to see an increase in both esports consumption and participation. A recent analysis compared esports and sports spectator motives and found traditional sports and esports to be consumed alike, indicating that esports events can be marketed similarly to traditional sports events.²⁶ However, while there are marketing parallels, esports and traditional sports differ significantly in certain aspects. For example, esports relies on extensive screen exposure, which has been linked to several negative health outcomes.²⁷ Unlike

traditional sports that often involve physical strength and coordination, esports presents unique challenges associated with prolonged sitting and screen exposure. Nevertheless, the similarities between traditional sports and esports permit food marketers to use esports analogously to traditional sports. For example, product and brand placement commonly observed during esports events is similar to marketing campaigns seen in traditional sports.^{28 29}

These marketing partnerships reach through the entire esports organisational structure, with companies being able to use static and dynamic advertisements, include product placement and feature their brands on team jerseys.^{30 31} However, the modern digital environments that broadcast esports events often have unique aspects that provide marketers with opportunities to increase brand exposure and drive immediate purchase behaviours beyond what traditional sports provides.^{30 31} This type of marketing is not only contained to the leagues and events, but brands garner further attention in a unique manner as professional and former professional esports players often have their own livestreams to play games and interact with viewers. In esports, players interact with their viewers and showcase products and brands while casually playing games on their livestream, amplifying the power of sponsorships. This can create a marketing dynamic unique to esports, wherein food marketing messaging is reinforced through extensive screen-time exposure to onscreen product use and promotion, which could lead to heightened expectations and permissiveness of food marketing at live events. Additionally, influencers such as livestreamers and gamers also promote food, beverage and alcohol products during their livestream and amplify the message to millions.³² Therefore, food marketers can generate up to millions of hours of exposure by partnering with a prominent esports streamer.^{11 12}

In addition to broadcast elements, another avenue for pervasive food marketing in esports is through social media channels. As people spend more time in the online digital space, food marketers have exploited the opportunity to leverage brand exposure with their social media accounts. A recent report from 2017 indicated that one-quarter of US esports fans reported interest in using social media to follow esports sponsors, demonstrating that digital and social media marketing is an effective outlet to reach esports fans.³³ Social media accounts are used to market products and services, such as cross-promotion sponsorships between food products and esports events, leagues, teams and players.³² The cross-promotion across social media increases the reach of the marketing campaigns as well as viewer engagement with both the food brands and esports.

The underlying esports structure and potential marketing outlets are key to understanding the breadth and depth of food marketing in esports. Each layer in the esports organisational structure, such as players, teams, leagues and events, provides a unique marketing outlet for brand exposure through sponsorships specifically

tailored to the respective esports audience. At the macro level, esports is structured similarly to traditional sports as esports teams play video games organised into leagues and events. An esports league involves players or teams that compete in a structured order on a regular (eg, weekly) basis, typically called a season, and the league generally crowns a champion based on a win/loss ratio, points accumulated or by wins in a structured tournament. Esports leagues are present across major regions of the world; however, they are typically regional (eg, North America, Europe), and the viewership for weekly league matches tends to be lower than larger one-off esports events or worldwide championship events. Esports events can also be incorporated within an existing league system (eg, a playoff series) or can be 'one-off' special events (eg, Dorito's Bowl). An analogous example in traditional sports is the comparison between a playoff match in the National Basketball Association (NBA) and basketball at the Olympics. The NBA playoffs is an event within the premier basketball league in North America, and the Olympics is a special event for teams and players outside of a specific league system. In traditional sports, the National Football League (NFL) represents the league structure. Teams such as the Dallas Cowboys compete regularly within the NFL, similar to esports leagues. The NFL hosts special events, such as the Pro Bowl, separate from the regular league matches.

In order to capture the depth of marketing within esports, it is essential to distinguish between macro level elements (ie, events and leagues) and micro level elements (ie, teams and players). For instance, while a major league may have a primary sponsorship with a brand, a team within that league may be endorsed by a specific company, and an individual player on that team could have a personal partnership with a different brand. Players themselves often foster unique partnerships that may be promoted through their own social media and livestreaming channels. Despite widespread criticism from the public health community over the use of professional sports for marketing energy-dense, nutrient-poor foods, the depth of such marketing within esports remains unexplored.³⁴ The goal of this paper is to identify and quantify sponsorships across both macro-components and micro-components of the esports organisational structure.

METHODS

To identify the scope of food brands in esports, we identified four possible subdivisions of the esports structure, including events, leagues, teams and players. For the purposes of this analysis, leagues were defined as any competition spread over a long period of time. These competitions often, especially in the North American context, culminate in a playoff and/or a final competition. Events were defined as any invited short-term or one-off tournament or competition. Teams were defined as any organised group of players that played within a

sanctioned competition. Players were defined as any individual who competed as part of an identified team in a league or event.

We identified the major leagues, events, teams and players using the number of hours watched globally for each of these subdivisions as an indicator of popularity. The number of hours watched was pulled from the Stream Hatchet data analytics platforms through a paid subscription.²² We accessed all data through Stream Hatchet's online platform and requested additional data from their analytics team related to esports teams. The hours watched are defined as the sum of time that unique viewers spend watching a particular event, league, team or player.³⁵ Once major leagues, events, teams and players were identified, searches of official websites, social media accounts and livestreaming accounts were conducted to determine associated food brands. Specific details for each step of this identification and association process are described subsequently.

Identification of top events, leagues, teams and players

To determine the major contributors of the broader esports structure, we began by identifying aspects of the macrostructure, including the top 10 major esports events and the top 10 major esports leagues. This was accomplished by ranking all known events and leagues using the total number of hours watched across all livestreaming platforms (eg, YouTube, Twitch, Facebook) between January 2021 and December 2021 using the data analytics platform Stream Hatchet.²² As the purpose of this study was to evaluate esports, rather than livestreaming, only events and leagues with data related to official organised esports events were included in the final analysis. This process identified the top 10 events and leagues globally. From this pool of top macrostructural elements, a total of 90 unique teams were subsequently identified. From these teams, 451 unique players with a livestreaming and social media presence were identified. Overall, this systematic process selected 10 events, 10 leagues, 90 teams and 451 players for further investigation. The specific top 10 esports events and leagues can be found in online supplemental tables 1 and 2.

Identifying and categorising brands

Food brand sponsorships with leagues, events, teams and players were determined by examining official websites, social media accounts and livestreaming accounts. In addition to searches on these official sources, a follow-up Google search was conducted for each event, league, team and player alongside the word 'sponsors' (eg, 'League of Legends 2021 World Championship sponsors'). All brands, both food and non-food, from all sources were noted. All food brands were then subsequently categorised based on product type into specific categories using a data-driven approach, considering the patterns and associations identified within our collected data. These categories included energy drinks (which includes coffee and energy supplements), sugar-sweetened beverages,

alcohol, snacks and candy, restaurants, food delivery and stores (which includes convenience and grocery stores as well as frozen prepared meals).

Number of brand sponsorships and hours watched

The total number of food brands for each esports subcategory was tallied for each event, league, team and player. Therefore, the number of sponsorships for any given brand within the analysis is indicative of the brand's overall sponsorships across the various events, leagues, teams and players. In order to estimate the potential magnitude of sponsorship, the hours watched are reported as a surrogate metric of potential impact. The hours watched for a specific brand or product category is the sum of hours from all events, leagues, teams and players sponsored by that particular brand. However, it is important to note that the total hours watched metric does not represent hours of direct exposure of the brand to the audience but rather serves as a metric to quantify the magnitude or popularity of the entertainment content sponsored by the food brands. In esports, food and beverage marketing exposure occurs intermittently throughout the broadcasts, and viewers may not be actively engaged with brand-related content during the entire event. We were not able to determine whether sponsorships were paid arrangements or involved other forms of compensation.

Patient and public involvement

Patients and/or the public were not involved in the design, conduct, reporting or dissemination plans of our research.

RESULTS

Unique brands

Our data collection process identified 90 unique food brands overall. Total sponsorship counts for each product category are reported in [table 1](#), which also reports the top three brands within each product category based on the number of sponsorships. [Table 2](#) reports the unique brands and total sponsorships across the events, leagues, teams and players. In summary, energy drinks had the greatest number of unique brands (22 unique brands, 24.4% of all brands), followed by restaurants (17 unique brands, 18.8%) and candy/snacks (14 unique brands, 15.5%). When considering all unique brands, Monster Energy (energy drink brand) had the greatest number of sponsorships, with 47 sponsorships and 232,136,176 hours of potential exposure, followed by Jack Links, (candy/snack brand) with 44 total sponsorships, and Red Bull (energy drink brand), with 42 total sponsorships.

Total sponsorships

There were 497 food brands to esports sponsorships identified across all esports subcategories (see [figure 1](#)). [Table 1](#) reports the top three unique brands in each respective esports subcategory. Across all brand categories, energy drinks had the greatest number of total

sponsorships (181 sponsorships, 36.4%), followed by restaurant (86 sponsorships, 17.3%) and candy/snack brands (64 sponsorships, 12.8%).

Event sponsorships

There were nine food brands and event sponsorships. Across all brand categories, only energy drinks, restaurants and candy/snacks were associated with esports events. Energy drinks predominated the total events (5 events, 55.5%), followed by restaurant (2 events, 22.2%) and candy/snack brands (2 events, 22.2%).

League sponsorships

There were 17 food brands and league sponsorships. Across all brand categories, energy drinks had the greatest number of total leagues (5 leagues, 29.4%), followed by candy/snacks (4 leagues, 23.5%) and restaurant brands (3 leagues, 17.6%).

Team sponsorships

There were 84 food brands and team sponsorships. Across all brand categories, energy drinks had the greatest number of total teams (25 teams, 29.7%), followed by restaurant (18 teams, 21.4%) and candy/snack brands (11 teams, 13.0%).

Player sponsorships

There were 388 food brands and player sponsorships. Across all brand categories, energy drinks had the greatest number of total players (146 players, 37.6%), followed by restaurant (63 players, 16.2%) and candy/snack brands (47 players, 12.1%).

DISCUSSION

This study is the first that we are aware of to describe the use of food marketing across the multiple layers of the esports organisational structure. Our findings expand on previous work within traditional sports.^{11 12 28 36} Our data show that energy drinks predominated the food marketing landscape with 181 sponsorships and 1.5 billion hours of content sponsored by energy drink brands. These findings are not entirely surprising given that previous literature examining food marketing on online video game streaming platforms, such as Twitch, also reports that energy drinks are the most marketed food or beverage product to this demographic.^{35 37} We found that food and beverage brands represented 26% of the total brands in the esports environment, indicating a notable presence of these products within esports settings. Previous work has indicated a high prevalence of food and beverage brands in advertising and that they have been growing year-to-year.³⁵ This emphasises the extensive potential exposure generated by these sponsorships and highlights the urgent need for policies to align with the rapidly evolving landscape of digital marketing in esports.

Energy drinks are marketed toward gamers as a product that can improve reaction time and performance.^{37 38} Energy drinks typically contain large amounts of sugar

Table 1 Top three brands in each of the product categories based on sponsorships

Category	Brand	Sponsorships	Potential reach (hours)
Energy drink	Total	181	1 501 410 061
	Monster Energy	47	232 136 176
	Red Bull	42	801 218 909
	G Fuel	27	202 859 070
Restaurant	Total	86	849 276 265
	Jack In the Box	32	31 815 360
	Chipotle	9	74 690 708
	Wahlburgers	8	5 447 296
Candy/snack	Total	64	341 919 540
	Jack Links	44	105 193 996
	Pringles	5	64 942 913
	Kit Kat	3	93 129 591
Food delivery and stores	Total	62	216 656 042
	Grubhub	10	102 689 813
	Favor	10	28 655 380
	Rewe	10	14 599 091
Alcohol	Total	42	223 931 966
	Bud light	18	79 047 976
	Twisted Tea	4	37 852 266
	Truly Hard Seltzer	3	32 056 120
SSB	Total	41	150 066 181
	Mountain Dew	27	45 247 989
	Coca-Cola	3	36 828 427
	Vitamalz	3	410 363
Supplement	Total	21	42 985 556
	Nature's Bounty	9	15 326 868
	FreeCo	6	7 836 174
	CTRL	2	5 402 560

SSB, sugar-sweetened beverages.

(21–34 g) and caffeine (80–150 mg) per 8 oz serving. This increases the risk of obesity and type 2 diabetes and facilitates a method to reach or exceed the upper limit recommendation of daily caffeine intake.^{39 40} Caffeine ingestion, particularly in high doses, is associated with

various negative health outcomes, including but not limited to caffeine dependence and caffeine withdrawal.^{41–43} Energy drink consumption is noticeably high among gamers, as recent insight reports that 18% of gamers regularly consume energy drinks while gaming

Table 2 The unique brands, total sponsorships, total events, total leagues, total teams and total players across each food and beverage category

	Energy drinks	Restaurant	Candy and snack	Alcohol	Food delivery and stores	SSB	Supplement
Unique brands	22	17	14	10	12	9	6
Total sponsorships	181	86	64	42	62	41	21
Event sponsorships	5	2	2	0	0	0	0
League sponsorships	5	3	4	2	1	2	0
Team sponsorships	25	18	11	10	8	8	4
Player sponsorships	146	63	47	30	53	32	17

SSB, sugar-sweetened beverages.

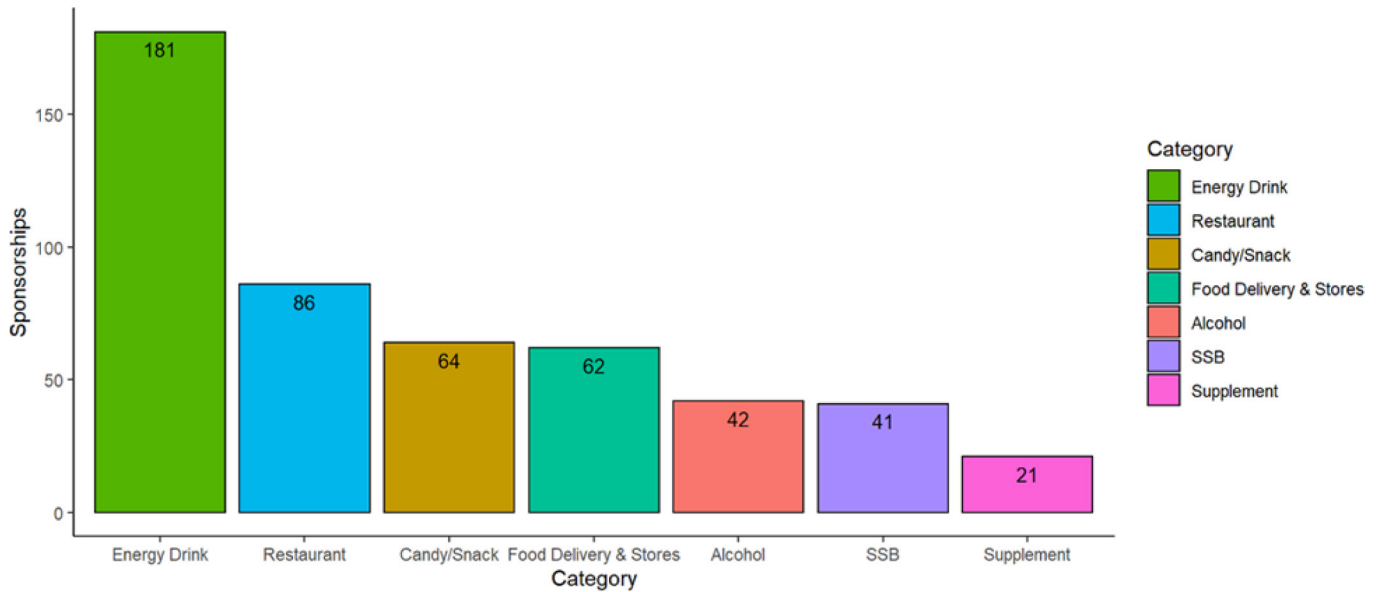


Figure 1 The total sponsorships for each food and beverage category. SSB, sugar-sweetened beverages.

and 27% regularly consume energy drinks while viewing games.^{44 45} In addition, gamers tend to rate beverages and energy drinks more favourably when compared with non-gamers.⁴⁶

The target demographic of young males in traditional sporting events and esports events is showcased by the marketing of flagship sponsors such as Red Bull and Mountain Dew.⁴⁷⁻⁵¹ Previous reports indicate that increasing sales of Mountain Dew, as well as positive feelings and attitudes towards their product, can be attributed to the marketing and brand association with sporting events.^{52 53} Energy drinks, specifically Red Bull, were among the first major non-endemic food and beverage partnerships within esports, as partnerships with esports players began as early as 2006.⁵⁴ Non-endemic partnerships represent products or services not directly associated with a market.⁵⁵ Non-endemic food partnerships are associated with some of the most prominent esports events, such as Coca-Cola being the title sponsor for the 2016 League of Legends Worlds Finals in Los Angeles, which featured a venue with 15000 live spectators and was watched live by 45 million people globally.³¹ Many companies, endemic and non-endemic, have created energy drink products specifically targeted at gamers. For example, ‘Respawn’ was developed by the gaming hardware brand Razer, and ‘Coke Energy’ was developed by Coca-Cola. While energy drinks initially entered esports as non-endemic partners, their substantial presence and use within the esports landscape have led them to be considered endemic sponsors. These partnerships have paved the way for increased brand exposure, as well as creating a sense of congruency between esports players, product suggestion and performance.⁵⁶⁻⁵⁸ Additionally, these partnerships have led to energy drinks being in the top three products identified within esports despite being a non-endemic brand.⁵⁹

Previous reports show that sponsorships, both food and non-food, generate the majority of revenue (~60% of market revenue) for esports.⁶⁰ In both traditional and esports marketing, food companies’ sponsorships with athletes are often used to promote the purchase and consumption of energy-dense, nutrient-poor products.^{11 13 61} Athlete endorsements of foods and beverages represented the second-largest marketing category within traditional sports.¹³ Similar to the ethical considerations of marketing energy drinks and energy-dense, nutrient-poor products to developing adolescents and young adults, there are parallel ethical considerations when marketing alcohol to these age groups. Adolescent alcohol use and abuse are associated with development, social, legal, educational and medical issues, including a higher likelihood of being diagnosed with an alcohol use disorder and an association with adult drug dependence.^{62 63}

We observed a concerning presence of alcohol sponsorship, with Bud Light emerging as the most prominent sponsor. Bud Light accounted for 18 of the 42 sponsorships in the alcohol category. These findings highlight the growing concerns about the impact of alcohol sponsorship and marketing within both traditional and esports marketing landscapes.⁶⁴⁻⁶⁷ Several systematic reviews have concluded a positive association between exposure to alcohol marketing and consumption.^{66 68-71} Of particular interest is the impact on young people, as several systematic reviews have concluded that, when exposed to alcohol marketing, young people will start to drink and, if they are alcohol consumers already, increase their consumption.^{66 68-71} Our findings suggest that alcohol sponsorship is present across multiple layers of the esports structure, although at lower levels than in traditional sports.^{66 71 72} Previous work investigating livestreaming platforms has shown an increase in the amount of alcohol

advertising occurring within gaming communities such as esports.^{35 37} In addition, previous reports indicate avid gamers are more likely to consume alcohol when playing and watching esports.⁶⁴ There are young, vulnerable populations, particularly those with high screen time and low physical activity, within the gaming communities that should be considered due to the potential short-term and long-term consequences associated with exposure to alcohol marketing within these contexts.⁷³

Gamers and esports enthusiasts have very high amounts of screen-based media consumption.⁶⁵ Increased screen time and sitting are risk factors for numerous chronic diseases and all-cause mortality.^{74–78} In addition to food marketing, there are other considerations associated with gaming, such as poor posture, increased screen time, decreased levels of physical activity, poorer diet, and quality and duration of sleep, as well as increased sweetened beverage consumption, body mass index, and eye strain and neck pain.^{65 79} Therefore, gamers, influencers and organisations should consider the gaming environments they cultivate for players and users. A growing body of literature calls for a better framework for esports governance and policy, as there are currently minimal efforts being made.^{17 80} These policies should include specific provisions to regulate food and beverage marketing within esports, given its extensive reach and impact on the target demographic. As esports is a global phenomenon, there is also a need to consider global governance to limit the exploitation of vulnerable populations, such as the youth, adolescents and those with high screen time and low physical activity, being exposed to pervasive marketing.

This study is the first to analyse the current landscape of food marketing within esports by quantifying the number of current sponsorships between food brands across all layers of the esports organisational structure. Despite numerous strengths, there are several limitations. The nature of cross-sectional data collection, as is the case for this study, leads to only a snapshot of the current landscape but does not measure and analyse the landscape of marketing across time. Therefore, future research is warranted to longitudinally monitor the online marketing landscape within esports. Additionally, this study captured the sponsorships between displayed advertisements of brands across all layers of the esports organisational structure. However, some teams and players may not fully disclose or report all of their existing partnerships on their website or social media despite previous work indicating that the feature of #ad resulted in an increase in products consumed.⁸¹ Additionally, we constrained our analysis to only the most visible events, leagues, teams and players. Consequently, our results may represent an underestimation of the existing partnerships within esports, given the potential for non-disclosure of some partnerships.

CONCLUSION

In conclusion, esports is heavily saturated with food and beverage marketing. The esports landscape features

energy drinks as the predominant category, followed by a significant representation of restaurant and candy/snack brands. Our data emphasise the extensive exposure generated by these unhealthy food and beverage sponsorships, including alcohol, and highlights the urgent need for policies to align with the rapidly evolving landscape of digital marketing in esports. Stringent regulations regarding the marketing of alcohol in esports environments are necessary to safeguard the health of vulnerable populations, such as minors. Future research is warranted to understand the effectiveness of governance and policy restrictions on harmful products in this burgeoning sector.

Contributors JWL and TDM were involved in the conception of the study. JWL and TDM analysed and interpreted the data. The data extraction was completed by JWL. The manuscript was written by JWL, SJM, FJLF, RI and TDM. All authors read and approved the final manuscript. TDM is the guarantor and accepts full responsibility for the work and/or the conduct of the study, and controlled the decision to publish.

Funding The authors have not declared a specific grant for this research from any funding agency in the public, commercial or not-for-profit sectors.

Competing interests TDM has previous and current funding from The National Institutes of Health and current funding from The McCormick Science Institute. TDM has received payment or honoraria from the Academy of Nutrition and Dietetics, support for attending meetings and/or travel from The European Congress on Obesity and Wageningen University, has stock in Social Impact Technologies and a role in Neurotine. FJLF has received support for attending meetings and/or travel from the Kinesiology Department and Rock Ethics Institute. FJLF also has leadership or fiduciary role in the European Association for the Philosophy of Sport, International Association for the Philosophy of Sport, and Spanish Association for the Philosophy of Sport. All other authors have no competing interests.

Patient and public involvement Patients and/or the public were not involved in the design, or conduct, or reporting, or dissemination plans of this research.

Patient consent for publication Not applicable.

Provenance and peer review Not commissioned; externally peer reviewed.

Data availability statement Data are available on reasonable request. The datasets used and/or analysed during the current study are available from the corresponding author on reasonable request.

Supplemental material This content has been supplied by the author(s). It has not been vetted by BMJ Publishing Group Limited (BMJ) and may not have been peer-reviewed. Any opinions or recommendations discussed are solely those of the author(s) and are not endorsed by BMJ. BMJ disclaims all liability and responsibility arising from any reliance placed on the content. Where the content includes any translated material, BMJ does not warrant the accuracy and reliability of the translations (including but not limited to local regulations, clinical guidelines, terminology, drug names and drug dosages), and is not responsible for any error and/or omissions arising from translation and adaptation or otherwise.

Open access This is an open access article distributed in accordance with the Creative Commons Attribution Non Commercial (CC BY-NC 4.0) license, which permits others to distribute, remix, adapt, build upon this work non-commercially, and license their derivative works on different terms, provided the original work is properly cited, appropriate credit is given, any changes made indicated, and the use is non-commercial. See: <http://creativecommons.org/licenses/by-nc/4.0/>.

ORCID iD

John William Long <http://orcid.org/0000-0002-9874-2971>

REFERENCES

- 1 Fryar CD, Carroll MD, Afful J. Prevalence of overweight, obesity, and severe obesity among adults aged 20 and over: United States, 1960–1962 through 2017–2018. National Health and Nutrition Examination Survey E-Stats; 2020. Available: <https://www.cdc.gov/nchs/products/index.htm> [Accessed 08 Sep 2022].

- 2 Prevalence of childhood obesity in the United States. Available: <https://www.cdc.gov/obesity/data/childhood.html> [Accessed 08 Sep 2022].
- 3 Okunogbe A, Nugent R, Spencer G, *et al*. Economic impacts of overweight and obesity: current and future estimates for 161 countries. *BMJ Glob Health* 2022;7:e009773.
- 4 Swinburn BA, Sacks G, Hall KD, *et al*. The global obesity pandemic: shaped by global drivers and local environments. *Lancet* 2011;378:804–14.
- 5 Wood B, Williams O, Nagarajan V, *et al*. Market strategies used by processed food manufacturers to increase and consolidate their power: a systematic review and document analysis. *Global Health* 2021;17:17.
- 6 Folkvord F, Hermans RCJ. Food marketing in an obesogenic environment: a narrative overview of the potential of healthy food promotion to children and adults. *Curr Addict Rep* 2020;7:431–6.
- 7 Scully M, Wakefield M, Niven P, *et al*. Association between food marketing exposure and adolescents' food choices and eating behaviors. *Appetite* 2012;58:1–5.
- 8 Boyland EJ, Nolan S, Kelly B, *et al*. Advertising as a cue to consume: a systematic review and meta-analysis of the effects of acute exposure to unhealthy food and nonalcoholic beverage advertising on intake in children and adults. *Am J Clin Nutr* 2016;103:519–33.
- 9 Smith R, Kelly B, Yeatman H, *et al*. Food marketing influences children's attitudes, preferences and consumption: a systematic critical review. *Nutrients* 2019;11:875.
- 10 Truman E, Elliott C. Identifying food marketing to teenagers: a scoping review. *Int J Behav Nutr Phys Act* 2019;16:67.
- 11 Bragg MA, Roberto CA, Harris JL, *et al*. Marketing food and beverages to youth through sports. *J Adolesc Health* 2018;62:5–13.
- 12 Bragg MA, Miller AN, Roberto CA, *et al*. Sports sponsorships of food and nonalcoholic beverages. *Pediatrics* 2018;141:e20172822.
- 13 Bragg MA, Yanamadala S, Roberto CA, *et al*. Athlete endorsements in food marketing. *Pediatrics* 2013;132:805–10.
- 14 Dixon H, Scully M, Wakefield M, *et al*. Parent's responses to nutrient claims and sports celebrity endorsements on energy-dense and nutrient-poor foods: an experimental study. *Public Health Nutr* 2011;14:1071–9.
- 15 Whalen R, Harrold J, Child S, *et al*. The health halo trend in UK television food advertising viewed by children: the rise of implicit and explicit health messaging in the promotion of unhealthy foods. *Int J Environ Res Public Health* 2018;15:560.
- 16 Kelly B, Baur LA, Bauman AE, *et al*. "Food company sponsors are kind, generous and cool": (Mis)conceptions of junior sports players. *Int J Behav Nutr Phys Act* 2011;8:95.
- 17 Chao LL. "You must construct additional pylons": building a better framework for esports governance. *Fordham Law Rev* 2017;2:737–65. Available: http://fordhamlawreview.org/wp-content/uploads/2017/10/Chao_November_v86.pdf
- 18 Wattanapitit A, Wattanapitit S, Wongsiri S. Public health perspectives on eSports. *Public Health Rep* 2020;135:295–8.
- 19 Keiper MC, Manning RD, Jenny S, *et al*. No reason to Lol at Lol: the addition of esports to intercollegiate athletic departments. *J Study Sport Athletes Educ* 2017;11:143–60.
- 20 Newzoo global games market report 2021 | free version. Available: <https://newzoo.com/insights/trend-reports/newzoo-global-games-market-report-2021-free-version> [Accessed 08 Sep 2022].
- 21 Financesonline. 75 significant Esports statistics: 2022 market, viewership & investment growth. Available: <https://financesonline.com/esports-statistics/> [Accessed 31 Aug 2022].
- 22 Business intelligence for Esports - stream hatchet. Available: <https://streamhatchet.com/> [Accessed 08 Sep 2022].
- 23 League of legends world championship is coming to chase center for the worlds 2022 finals - youtube. Available: https://www.youtube.com/watch?v=DRsWFEaRi9c&ab_channel=ChaseCenter [Accessed 31 Aug 2022].
- 24 Super Bowl LV. Draws nearly 92 million TV viewers. Nielsen. Available: <https://www.nielsen.com/news-center/2021/super-bowl-lv-draws-nearly-92-million-tv-viewers/> [Accessed 08 Sep 2022].
- 25 NBC sports' coverage of super bowl LVI averages total audience delivery of 112.3 million viewers, reaches 167 million viewers on unprecedented day in sports media history. Available: <https://nbcportsgrouppressbox.com/2022/02/15/nbc-sports-coverage-of-super-bowl-lvi-averages-total-audience-delivery-of-112-3-million-viewers-reaches-167-million-viewers-on-unprecedented-day-in-sports-media-history/> [Accessed 08 Sep 2022].
- 26 Pizzo AD, Baker BJ, Na S, *et al*. eSport vs. sport: a comparison of spectator motives. *Sport Mark Q* 2018;27:108–24.
- 27 Stamatakis E, Hamer M, Dunstan DW. Screen-based entertainment time, all-cause mortality, and cardiovascular events: population-based study with ongoing mortality and hospital events follow-up. *J Am Coll Cardiol* 2011;57:292–9.
- 28 Ireland R, Muc M, Bunn C, *et al*. Marketing of unhealthy brands during the 2018 Fédération Internationale de football association (FIFA) world cup UK broadcasts—a frequency analysis. *J Strateg Mark* 2021;1–16.
- 29 LEC renews partnerships with secretlab, red Bull and Warner music - esports insider. Available: <https://esportsinsider.com/2022/01/lec-2022-red-bull-secretlab-warner-music> [Accessed 31 Aug 2022].
- 30 Seo Y, Kim M, Lee D, *et al*. Attention to eSports advertisement: effects of ad animation and in-game dynamics on viewers' visual attention. *Behav Inf Technol* 2018;37:1194–202.
- 31 Gawrysiak J, Burton R, Jenny S, *et al*. Using esports efficiently to enhance and extend brand perceptions—a literature review. *Phys Cult Sport Stud Res* 2020;86:1–14.
- 32 Haushalter K, Pritschet SJ, Long JW, *et al*. User engagement with a popular food brand before, during and after a multi-day interactive marketing campaign on a popular live streaming platform. *Public Health Nutr* 2023;26:1–9.
- 33 Esports playbook for brands; Available: <https://www.nielsen.com/insights/2019/esports-playbook-for-brands/> [Accessed 31 Aug 2022].
- 34 Nestle M. Food marketing and childhood obesity — a matter of policy. *N Engl J Med* 2006;354:2527–9.
- 35 Edwards CG, Pollack CC, Pritschet SJ, *et al*. 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;25:1–12.
- 36 Ireland R, Bunn C, Chambers S, *et al*. How unhealthy commodity Industries find a global audience in the English premier league: three case studies of brand engagement. *Soccer Soc* 2022;23:334–48.
- 37 Pollack CC, Kim J, Emond JA, *et al*. Prevalence and strategies of energy drink, soda, processed snack, candy and restaurant product marketing on the online streaming platform twitch. *Public Health Nutr* 2020;23:2793–803.
- 38 Stout H. Selling the young on 'gaming fuel'. The New York Times. Available: <https://www.nytimes.com/2015/05/20/business/energy-drink-industry-under-scrutiny-looks-to-gamers-to-keep-sales-surging.html> [Accessed 31 Aug 2022].
- 39 American Academy of Child and Adolescent Psychiatry. Caffeine and children. 2020. Available: https://www.aacap.org/AACAP/Families_and_Youth/Facts_for_Families/FFF-Guide/Caffeine_and_Children-131.aspx [Accessed 08 Sep 2022].
- 40 Alsunni AA. Energy drink consumption: beneficial and adverse health effects. *Int J Health Sci (Qassim)* 2015;9:468–74.
- 41 Yang C-Y, Chang F-C, Rutherford R, *et al*. Excessive gaming and online energy-drink marketing exposure associated with energy-drink consumption among adolescents. *Int J Environ Res Public Health* 2022;19:10661.
- 42 Larson N, Laska MN, Story M, *et al*. Sports and energy drink consumption are linked to health-risk behaviours among young adults. *Public Health Nutr* 2015;18:2794–803.
- 43 Reissig CJ, Strain EC, Griffiths RR. Caffeinated energy drinks -- a growing problem. *Drug Alcohol Depend* 2009;99:1–10.
- 44 Meehan O. 80% of Gamers regularly eat or drink while playing: gamer consumption habits in North America, Western Europe & APAC. Newzoo; 2020. Available: <https://newzoo.com/insights/articles/gamer-food-and-drink-consumption-consumer-brands-consumer-insights> [Accessed 08 Sep 2022].
- 45 Weustink J. What do gamers eat & drink when playing and viewing games? 2021. Available: <https://newzoo.com/insights/articles/the-eating-and-drinking-habits-of-consumers-while-playing-and-viewing-games> [Accessed 08 Sep 2022].
- 46 Newzoo Consumer Insights Games & Esports. How consumers are engaging with games in 2022. 2022. Available: <https://newzoo.com/insights/trend-reports/how-consumers-are-engaging-with-games-in-2022> [Accessed 08 Sep 2022].
- 47 Bennett G, Ferreira M, Lee J, *et al*. The role of involvement in sports and sport spectatorship in sponsor's brand use: the case of mountain dew and action sports sponsorship. *Sport Mark Q* 2009;18:14–24. Available: <https://www.researchgate.net/publication/288942573>
- 48 Belzer J. Action sports sponsorship the life blood of mountain dew. 2014. Available: <https://www.forbes.com/sites/jasonbelzer/2014/12/16/action-sports-sponsorship-the-life-blood-of-mountain-dew/?sh=3013ad532fdf> [Accessed 30 Sep 2022].
- 49 Carp S. NBA and PepsiCo renew sponsorship deal ahead of all-star weekend - sportspro. 2021. Available: <https://www.sportspromedia.com/news/nba-pepsico-sponsorship-deal-renewal-all-star-weekend/> [Accessed 30 Sep 2022].

- 50 NBA interest by gender US 2022 | Statista. Available: <https://www.statista.com/statistics/1098381/national-basketball-association-interest-gender/> [Accessed 30 Sep 2022].
- 51 Tejwani K. *Wings of change: how the world's biggest energy drink manufacturer made a mark in football*. PITCH Publishing LTD, 2020.
- 52 Browne D. *Amped: how big air, big dollars, and a new generation took sports to the extreme*. In: Browne D, ed. Bloomsbury USA, 2004.
- 53 Dees W, Hall T, Tsuji Y, et al. Examining the effects of fan loyalty and goodwill on consumer perceptions of brands at an action sports event. *J Spons* 2010;4:38–50. Available: <https://www.researchgate.net/publication/266602166>
- 54 Stubbs M. How red Bull used its extreme sports experience to enter the esports world. *Forbes*; 2020. Available: <https://www.forbes.com/sites/mikestubbs/2020/04/03/how-red-bull-used-its-extreme-sports-experience-to-enter-the-esports-world/?sh=5d47ce5f3578> [Accessed 08 Sep 2022].
- 55 Huettermann M, Trail GT, Pizzo AD, et al. Esports sponsorship: an empirical examination of esports consumers' perceptions of non-endemic sponsors. *J Glob Sport Manag* 2023;8:524–49.
- 56 Li H, Lo HY. Do you recognize its brand? The effectiveness of online in-stream video advertisements. *J Advert* 2015;44:208–18.
- 57 Calvo-Porrá C, Rivaroli S, Orosa-González J. The influence of celebrity endorsement on food consumption behavior. *Foods* 2021;10:2224.
- 58 Choi SM, Rifon NJ. It is a match: the impact of congruence between celebrity image and consumer ideal self on endorsement effectiveness. *Psychol Mark* 2012;29:639–50.
- 59 Chikish Y, Carreras-Simo M, Garci J. eSports: a new era for the sports industry and a new impulse for the research in sports (and) economics? In: *Sports Econ*. 2019: 477–508. Available: https://www.researchgate.net/publication/332781901_eSports_A_New_Era_for_the_Sports_Industry_and_a_New_Impulse_for_the_Research_in_Sports_and_Economics
- 60 Newzoo global games market report 2022 | free version. Available: <https://newzoo.com/insights/trend-reports/newzoo-global-games-market-report-2022-free-version> [Accessed 08 Sep 2022].
- 61 Hsiao CH, Tang KY, Su YS. An empirical exploration of sports sponsorship: activation of experiential marketing, sponsorship satisfaction, brand equity, and purchase intention. *Front Psychol* 2021;12:677137.
- 62 Brown SA, McGue M, Maggs J, et al. Underage alcohol use: summary of developmental processes and mechanisms: ages 16–20. *Alcohol Res Heal* 2009;32:41.
- 63 Masten AS, Faden VB, Zucker RA, et al. A developmental perspective on Underage alcohol use. *Alcohol Res Heal* 2009;32:3.
- 64 Kelly SJ, Van der Leij D. A new frontier: alcohol sponsorship activation through esports. *Mark Intell Plan* 2021;39:533–58.
- 65 Chan G, Huo Y, Kelly S, et al. The impact of eSports and online video gaming on lifestyle behaviours in youth: a systematic review. *Comput Human Behav* 2022;126:106974.
- 66 Brown K. Association between alcohol sports sponsorship and consumption: a systematic review. *Alcohol Alcohol* 2016;51:747–55.
- 67 Purves RI, Critchlow N, Stead M, et al. Alcohol marketing during the UEFA EURO 2016 football tournament: a frequency analysis. *Int J Environ Res Public Health* 2017;14:704.
- 68 Anderson P, de Bruijn A, Angus K, et al. Impact of alcohol advertising and media exposure on adolescent alcohol use: a systematic review of longitudinal studies. *Alcohol Alcohol* 2009;44:229–43.
- 69 Smith LA, Foxcroft DR. The effect of alcohol advertising, marketing and portrayal on drinking behaviour in young people: systematic review of prospective cohort studies. *BMC Public Health* 2009;9:51.
- 70 Snyder LB, Milici FF, Slater M, et al. Effects of alcohol advertising exposure on drinking among youth. *Arch Pediatr Adolesc Med* 2006;160:18–24.
- 71 Jernigan DH. The extent of global alcohol marketing and its impact on youth. *Contemp Drug Probl* 2010;37:57–89.
- 72 Chambers T. Alcohol sponsorship and esports: reinforcing the need for legislative restrictions on alcohol sponsorship. *Alcohol Alcohol* 2020;55:144–6.
- 73 Lapiere MA, Fleming-Milici F, Rozendaal E, et al. The effect of advertising on children and adolescents. *Pediatrics* 2017;140:S152–6.
- 74 Biswas A, Oh PI, Faulkner GE, et al. Sedentary time and its association with risk for disease incidence, mortality, and hospitalization in adults. *Ann Intern Med* 2015;162:123–32.
- 75 Patterson R, McNamara E, Tainio M, et al. Sedentary behaviour and risk of all-cause, cardiovascular and cancer mortality, and incident type 2 diabetes: a systematic review and dose response meta-analysis. *Eur J Epidemiol* 2018;33:811–29.
- 76 Bailey DP, Hewson DJ, Champion RB, et al. Sitting time and risk of cardiovascular disease and diabetes: a systematic review and meta-analysis. *Am J Prev Med* 2019;57:408–16.
- 77 Chau JY, Grunseit AC, Chey T, et al. Daily sitting time and all-cause mortality: a meta-analysis. *PLoS One* 2013;8:e80000.
- 78 Rezende LFM, Sá TH, Mielke GI, et al. All-cause mortality attributable to sitting time: analysis of 54 countries worldwide. *Am J Prev Med* 2016;51:253–63.
- 79 Hanphitakphong P, Thawinchai N, Poomsalood S. Effect of prolonged continuous smartphone gaming on upper body postures and fatigue of the neck muscles in school students aged between 10–18 years. *Cogent Eng* 2021;8.
- 80 Kelly SJ, Derrington S, Star S. Governance challenges in esports: a best practice framework for addressing integrity and wellbeing issues. *Int J Sport Policy Polit* 2022;14:151–68.
- 81 Coates AE, Hardman CA, Halford JCG, et al. The effect of influencer marketing of food and a “protective” advertising disclosure on children's food intake. *Pediatr Obes* 2019;14:e12540.