MASTERARBEIT | MASTER'S THESIS

Titel | Title

„Digital Food Marketing to Children and Adolescents –
Brand and Influencer Marketing in Austria & Germany on Instagram and YouTube“

verfasst von | submitted by

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angestrebter akademischer Grad | in partial fulfilment of the requirements for the degree of

Master of Science (MSc)

Wien | Vienna, 2024

Studienkennzahl lt. Studienblatt	Degree programme code as it appears on the student record sheet:	UA 066 838
Studienrichtung lt. Studienblatt	Degree programme as it appears on the student record sheet:	Masterstudium Ernährungswissenschaften
Betreut von	Supervisor:	Ap. Prof.in Maria Wakolbinger, PhD MSc

Abstract

Obesity has emerged as one of the most significant health challenges worldwide. In Austria, more than half of the population and every third to fifth child are affected by overweight or obesity, putting them at risk of conditions like high blood pressure, diabetes, and other chronic diseases (STATISTIK AUSTRIA, 2019). Most of the time obesity forms in the early lifespan and persists in adulthood. The environment in which children and adolescents are exposed to foods and beverages, as well as their habits, preferences and behaviors of their social environment, shape their lifestyle later on. Several studies support the notion, that there is a correlation between high media consumption and higher body weight (Bundesministerium für Soziales, Gesundheit, Pflege und Konsumentenschutz, 2021).

In cooperation with researchers Winzer E. et al. from the Medical University of Vienna, an analysis was conducted on the landscape of food marketing targeting children and adolescents in German-speaking countries, specifically through the social media platforms Instagram and YouTube. The analysis differentiated between marketing efforts from brands or influencers. The findings revealed, that approximately 80 % of foods and beverages promoted to children and adolescents did not adhere to the guidelines set by the World Health Organization WHO (WHO, 2020b). Brands were found to have a higher marketing prevalence of foods high in fat, sugar and/or salt (HFSS) compared to the selected influencers. Moreover, most food groups exceeded nutritional content thresholds for sugar, fat and salt. Influencers on YouTube featured the highest proportion of products compliant with these thresholds, yet they also presented the highest and exclusive content featuring alcoholic beverages. These findings underscore the need for further dialogue concerning food marketing on social media platforms. It is recommended to reassess existing guidelines and regulations to more effectively control the promotion of foods and beverages that contribute to obesity, particularly among children and adolescents.

Keywords: food marketing, childhood obesity, social media, nutrition

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List of abbreviations

WHO	World Health Organization
HFSS	high sugar, fat and/or salt
UPF	ultra-processed foods
COSI	Childhood Obesity Surveillance
DGE	Deutsche Gesellschaft für Ernährung (German Nutrition Society)
BMI	body mass index
SDI	socio-demographic index
NEK	Nationale Ernährungskommission (National Nutrition Commission Austria)
NPM	nutrient profile model
EsKiMo	Nutrition Study of the KiGGS Module
KiGGs	Study for Health of Children and Adolescents in Germany
FFQ	food frequency questionnaire

1. Introduction

In the past, people were exposed to food marketing mainly through traditional media channels such as radio, television or posters from product brands. Today, we live in an environment where social media platforms and influencers have a major impact on our behavior and food and beverage choices (WHO, 2022a). The so-called “obesogenic environment” in which we now live, does not promote healthy eating and an active lifestyle due to the constant availability and accessibility of food, especially ultra-processed foods (UPFs) and foods and beverages high in fat, sugar and/or salt, (HFSS). The World Health Organization (WHO) has therefore developed action plans to combat these negative health trends (WHO, 2022b).

This master’s thesis ties up to previous work done by Winzer et al. (Winzer et al., 2022a), which describes the landscape of digital food marketing in German-speaking countries. It provides an insight into the food marketing that children and adolescents in Austria and Germany are exposed to on Instagram and YouTube.

The consumption of UPFs and HFSS products, correlates strongly with high body weight and media consumption (Bundesministerium für Soziales, Gesundheit, Pflege und Konsumentenschutz, 2021). Therefore, the focus is laid on the exposure and power parameters in social media marketing. The types of foods presented and whether or not they are permitted for marketing, according to the WHO guidelines, are examined, as well as critical nutrients such as sugar, fat, salt and alcohol and their average levels in popular products are highlighted. The goal of this study is to raise awareness of today’s obesogenic environment on social media platforms and to provide a basis for future regulation concerning food marketing to children and adolescents.

1.1. Research questions

The primary research question of this thesis is as follows:

What is the prevalence (exposure) and context (power) of food and beverage cues in brand and influencer content on social media platforms, such as Instagram and YouTube, in German-speaking countries?

The secondary research questions of this thesis are as follows:

- Is there a difference between brand and influencer marketing in terms of the number of presented products, that are not permitted by the WHO Nutrient Profile Model (NPM) on Instagram and YouTube?

- Is there a difference in the top three most promoted food categories between brands and influencers?

- Is there a difference in the average total and added sugar content, the average total and saturated fat content or the average salt content of foods and beverages promoted by brands or influencers?

- How often were the nutrient thresholds of the WHO NPM met or exceeded?

- What are the differences in children's and adolescent's exposure to alcohol through social media content by brands or influencers on Instagram and YouTube?

2. Background Literature

2.1. Overweight and obesity

Obesity is a chronic, recurrent disease associated with excessive fat storages and recognized as such by the European Commission in 2021 (Burki T., 2021). In adults it can be diagnosed by calculating the body mass index (BMI) or the waist-to-height-ratio. The BMI is calculated by taking the kg of bodyweight and dividing it through the body height in m^2. The WHO defines overweight for adults with an BMI from 25 – 29.9 kg/m^2 and obesity with a BMI higher than 30 kg/m^2 (WHO, 2024, S. 24). The waist-to-height-ratio uses the waist circumference in cm and divides it through the height in cm. People with a result higher than 0,5 are considered at risk for cardiovascular disease (Browning et al., 2010)

Since weight and height do change a lot while growing up, it is difficult to categorize children and adolescents into being affected by overweight or obesity using the BMI categories. Therefore, it is common to use percentiles to compare them to their age group. Until the age of 18 years children and adolescents above the 90^{th} percentile are considered as being affected by overweight, above the 97^{th} percentile by obesity. These percentiles can be differentiated between sexes (Kromeyer-Hauschild K., 2001, 2015; Robert Koch-Institut, 2018).

Obesity rates are rising and the disease is becoming one of the world's biggest health problems in well-established industrialized countries. The prevalence is high, not only in adults, but also in children and adolescents, as lifestyle habits and nutritional education are formed since birth and habits mostly continue in adulthood (Bundesministerium für Soziales, Gesundheit, Pflege und Konsumentenschutz, 2021). The WHO Regional Office for Europe has also observed a steady increase in obesity rates (WHO, 2022c). More than a third of the Austrian population is affected by overweight (34.3 %) or obesity (16.5 %) (STATISTIK AUSTRIA, 2019). Among children and adolescents, data from the Childhood Obesity Surveillance (COSI), initiated by the WHO, showed that one in four to one in six children in Austria is affected by overweight or obesity (Bundesministerium für Soziales, Gesundheit, Pflege und Konsumentenschutz,

2021). In Germany 15.4 % of children are affected by overweight and 5.9 % by obesity (Robert Koch-Institut, 2018). The prevalence differs geographically, i.e. between Austrian regions, with higher prevalence in the eastern parts of the country and in cities compared to rural areas. (Bundesministerium für Soziales, Gesundheit, Pflege und Konsumentenschutz, 2021; Hoebel et al., 2022). The prevalence also correlates with socio-demographic conditions. Especially lower socioeconomic groups are at risk for developing obesity (Anderson et al., 2023). These groups are drawn to unhealthier behaviors, due to social uncertainties, pricings of fresh foods and less opportunities for health-promoting behavior, like sports. This is mostly a political problem, as they create the conditions for daily living (Vandevijvere et al., 2023). A socio-demographic index (SDI), generated within the Global Burden of Disease study in 2015, combines the following data to classify countries by their level of development: income, education and fertility rate. The data shows, that the prevalence for obesity in adults increases with higher levels of the SDI. Women had a higher prevalence than men for obesity in all age groups and SDI-levels, especially aged 60 – 64 years old. Only women aged 55 – 59 years old showed higher obesity rates in lower SDI levels, than in higher ones (The GBD 2015 Obesity Collaborators, 2017). With children and adolescents, the German “KiGGS Welle 2” study found different tendencies. The older and the lower the SDI, the higher the BMI. Children and adolescents with a higher SDI were less likely to be affected (Robert Koch-Institut, 2018).

2.1.1. Consequences of obesity

An excessive BMI contributes to approximately 5 million deaths per year attributed to noncommunicable diseases, including cardiovascular disease (Singh GM, 2013), type 2 diabetes (Alkaf B., 2021), chronic respiratory diseases, types of cancer (Lauby-Secretan B., 2016), neurological and digestive disorders (numbers rising). Obesity can also have an impact on mental health, especially during childhood and adolescents, as it negatively affects quality of life, physical abilities, and wellbeing, and increases weight stigma, bullying and discrimination. Early onset of overweight or obesity often persist into adulthood, increasing the risk of associated diseases. It also poses a significant economic burden on health care systems (WHO, 2024).

2.1.2. Causes and determinants of obesity

The first answer on what causes weight gain is certainly almost always: a higher energy intake than expenditure over time. It sounds simple to mainly focus its origin on changes of dietary and physical activity patterns. But in reality, the causes and determinants of obesity are multifactorial e.g. genetic, and so much more complex (WHO, 2024).

2.1.2.1. Genetic causes

Genetics seem to also play a role in the development of obesity. Maternal over- or undernutrition, environmental exposures to hormone and endocrine disruptors etc. appear to play a critical role at programming the child's cells for obesity (Panera et al., 2022). Breastfeeding is known to be protective in terms of developing overweight and obesity in later life, but Europe currently has one of the lowest rates of breastfeeding (Horta et al., 2023). Moreover, genetics influences body composition, metabolism, appetite and satiety hormones, food preferences etc. But monogenic gene mutations that lead to obesity, such as leptin deficiency (leptin = satiety hormone), are very rare (Panera et al., 2022). Rather than focusing on genetic causes, the combination of environmental factors has been strongly attributed to the development of overweight and obesity. Health-related behaviors and practices, in particular dietary patterns, are formed at an early stage in life and can develop and change throughout the lifespan. The personal environment, shaped not only by family, friends or school, but also by the media, shapes our views, knowledge, preferences, and habits (Panera et al., 2022; B. A. Swinburn et al., 2009).

2.1.2.2. Obesogenic environment

The definition of "obesogenic environment" combines *"influences that the surroundings, opportunities or conditions of life have on promoting obesity in individuals or populations"* (B. Swinburn et al., 1999).

Today's food environment is not supportive of healthy eating and improved nutritional status. An increase in food and calorie consumption can be explained due to greater availability and accessibility of food. The food environment today promotes easy and fast choices, which are often nutrient poor and energy dense (Vandevijvere et al., 2023). Focus can be laid on the massive increase in the production and consumption of ultra-processed foods (UPFs), which already account for about 27 % of the total daily energy intake of Europeans (Mertens et al., 2022). They are generally high in fat, sugar and/or salt (HFSS), making it easier to exceed daily energy requirements without providing much volume and nutrients for satiety. They are considered to be a major cause and driver of the rising obesity rates worldwide (WHO, 2022b).

As the food industry and its marketing of predominantly HFSS products evolves, a critical environment is being created. In several studies, total energy intake increased, when people were exposed to the marketing of HFSS products (Coates et al., 2019a; Folkvord et al., 2016; Smith et al., 2019). This is thought to be due to cue reactivity, which is a theory of physiological (e.g. increased salivation, heart rate) and psychological (e.g. increased thoughts, pictures) responses to food advertising that trigger cravings and subsequent consumption of these foods and beverages (Kanoski & Boutelle, 2022).

The second biggest influence on body weight is physical activity, which has declined massively in recent decades due to less active jobs and leisure activities. The obesogenic environment hinders physical activity and energy expenditure to compensate for the increased food intake. Two-thirds of children and adolescents in Europe do not meet the recommended amount of physical activity (Vandevijvere et al., 2023). This could also be due to an increase of technology (i.e. mobile phones, tablets, tv) and media consumption. Technology leads to more inactive screentime and changes the food environment, by increasing the exposure and power it has on consumers (WHO, 2022c). Regarding the behavior of children and adolescents, there was a positive correlation with high media consumption, less sleep duration and higher body weight. 60.2 % of children from aged 6 – 9 years spend more than 2 hours a day in front of a screen and 20 – 30 % sleep less than the recommended 9 – 11

hours a day (Bundesministerium für Soziales, Gesundheit, Pflege und Konsumentenschutz, 2021).

But also, political and public health crisis of recent years have taken their toll on people's behaviors and eating habits. The COVID pandemic in 2019 had a major impact in rising obesity rates. A study from 2023 found an average weight gain of more than 1.5 kg per child during the pandemic. Higher outcomes were observed in people living in regions where the lockdowns were very strict (Anderson et al., 2023). In Europe, 25 % of children and adolescents which were already affected by obesity, now have an extreme form of this disease (Pinhas-Hamiel et al., 2022).

With this in mind, children's rights to good physical, emotional and mental health and well-being are particularly at risk. The Convention of the Rights of the Child by the United Nations wants to *"make sure, that all children's rights are respected, protected and fulfilled" (UNICEF, 2018)*. Included in these are the rights for health and adequate food. In a recent statement published by UNICEF, they approached the topic of food marketing to children online and pushed the governments to implement strategies to protect children from the negative impacts of food marketing (UNICEF, 2021).

2.1.2.3. Recommendations for sugar, fat and salt in children and adolescents

Total sugar includes naturally in foods occurring sugar and added sugar through processing. Total sugars, also known as carbohydrates, are a vital source of energy for the human body and should make up about 50 % of our daily energy intake (D-A-CH (Hrsg.), 2015). The WHO Guideline "Sugars intake for adults and children" recommends no more than 10 % of total daily energy intake coming from added sugars. Free sugars can increase the energy density of foods and promote a positive energy balance, which can lead to weight gain and obesity. Not only sweet foods, but even more so sugar-sweetened beverages are a major concern. The guideline recommends reducing the intake of added/free sugars

through the whole life span in all age groups. It is further suggested to reduce the total daily intake of added sugars to less than 5 % (WHO, 2015a).

Fats should make up around 30 % of the total daily energy intake. This is the same for adults and adolescents. Children under 4 years of age need between 30 – 40 % of their energy from fats, and for those aged 4 to 14 years it is recommended to have about 30 – 35 %. Fat is an important source of energy. It is estimated to provide 9 kcal per gram, which is more than twice as many calories as one gram of carbohydrates or protein (4 kcal). Fats differ according to their fatty acid pattern. There are three groups of fatty acids: saturated, mono-unsaturated and poly-unsaturated fatty acids (D-A-CH (Hrsg.), 2015). Special focus lays on the saturated fats, as they are in suspect of causing cardiovascular diseases. They should not make up more than 7 – 10 % of the total daily fat intake, according to the German Nutrition Association (DGE - Deutsche Gesellschaft für Ernährung) fat guidelines (DGE, 2015).

Salt (sodium chloride) is necessary in the human body for several cell- and body functions, such as the regulation of the volume of liquids in the body, blood pressure and acid-base metabolism (DGE, 2020; WHO, 2022d). When referred to the term salt or table salt, there’s actually talked about sodium chloride, which is a combination of two electrolytes. Salt is made of roughly 40 % sodium and 60 % chloride. In English speaking countries there’s mostly the sodium content mentioned. In German speaking countries, salt is mentioned and refer to the combination sodium chloride (Bundeszentrum für Ernährung (BZfE), 2022). Salt is also naturally present in food, but the main intake comes from processed foods, such as bread, cheese, deli meats and sausages, ready-made and convenience foods, sauces, dips and savory snacks. High salt intake is linked to a greater risk for high blood pressure and cardiovascular disease. The recommendation for maximum daily salt intake is 6 g for adults and 2 g for children (DGE, 2020; WHO, 2022d).

2.2. Social media and food marketing

The definition of social media describes various forms of communication through online platforms, where pictures, videos and other content are shared with an audience. Social media works by building communities with similar interests and beliefs. People can interact with the content creator by liking and commenting on the shared content. To stay in touch and updated, it is common to “follow” certain accounts. This leads to a centralization of the selected content in a personal space on the platform. The higher the number of followers and interactions, the greater the reach and power of the person or company behind the account (Kucharczuk et al., 2022). Over the last 10 years, the usage of social media worldwide has multiplied. Statistics show, that over 90 % of the Austrian population is using the internet daily. Two thirds are visiting social media platforms at least once per day (Statista, 2023).

Every year, the platform “Saferinternet.at” publishes data on the most frequently used social media platforms among children and adolescents. In 2023 the most popular ones were: Whatsapp (96 % user occurrence), YouTube (94 %), Instagram (75 %), Snapchat (69 %), TikTok (68 %) and Pinterest (39 %) (Saferinternet.at, 2023).

Since this shift in media consumption to more portable devices, such as mobile phones, every industry sector has been increasing its marketing on social media platforms. The food industry is no different. Food marketing is constantly evolving, and its power is undeniable (WHO, 2023).

The strategies of food marketing can be categorized into two variables – exposure and power. Exposure includes the amount, frequency and range of contact with products (i.e. foods and beverages) the consumers can have. The second dimension, power, describes the effects that marketing can have on the interest, preference and purchase of products (WHO, 2022b). Other exposure and power variables measured in this study are mentioned in chapter 3.3. There’s a lot of evidence, that the exposure and power of (food) marketing influence awareness, interest, preference, purchase intention and consumption of

foods. If these promoted foods are not in line with nutritional recommendations, the risk of obesity and related non-communicable diseases increases (B. Kelly, 2015; E. Boyland et al., 2022; E. J. Boyland et al., 2016; Cairns et al., 2013).

2.2.1. Food marketing targeted to children

Particularly, children under the age of 8 years might be at risk of being influenced by the effects of advertising (Sadeghirad et al., 2016). They are considered as a vulnerable target, because of their just developing cognitive abilities to identify persuasive appeals and to evaluate the nutritional content and possible health consequences of consuming certain foods and beverages are still developing (Rozendaal et al., 2010). By the age of seven it is assumed, that children are be able to distinguish a regular television program from an advertisement. The cognitive ability to fully evaluate the advertising content develops between the ages of 8 and 12 years (Gunther & Furnham, 1998). Adolescents (age 13 – 17 years old) are more likely to be able to review advertisements and their risks. This age group is known to take bigger risks more easily as they are still learning about the consequences and don't want to be rejected by their peers for not behaving the same way. Young adults spend more time with their friends than with their families and are therefore highly impacted by influencers of the same age group. This social-influence-effect has been shown to decrease with age. This could be because as people get older, they gain more self-esteem and are less influenced by others (Knoll et al., 2015). There's evidence, that children coming from ethnic minorities and a lower socioeconomic background are at higher risk for being overly exposed and influenced by food marketing on social media (Backholer et al., 2021). There was also a significant effect of the BMI (body mass index) on the energy intake. Children with a higher BMI showed a greater effect of advertising exposure and dietary intake compared to those with a lower BMI (Coates et al., 2019a, 2019b; Russell et al., 2019).

Food marketing and special products for children are very popular, as the food industry uses children's vulnerability to sell products, especially targeted to that certain age group (Rozendaal et al., 2010).

The institute for child-nutrition in Dortmund (Germany) has included foods and beverages into the term “food marketing for children”, which meet at least one of the following criteria (Forschungsinstitut für Kinderernährung Dortmund, 2003):

- being labeled with “for kids” or “kids”
- catching design of the packaging
- special shape, such as animals, comics, ...
- added games or gifts, such as stickers, collector cards, meeples, …
- marketing targeted especially at children

Research in Canada has shown that food marketing has a greater impact on children when the ad is targeted at this age group. Watching child-focused ads showed a significantly higher average food preference with children aged 9 – 12 years old, than ads targeted to adults. The impact is even higher, if there are spoken characters featured, than if there was a licensed character (i.e. Haribo goldbear) (Mulligan et al., 2023). A systematic review including all countries worldwide backs up this evidence by saying, that the preference for HFSS products is significantly higher with children, if the packaging uses marketing characters in comparison to none (Packer, Russell, McLaren, et al., 2022).

It is not only the power of marketing that is of concern, but also the amount of exposure that people face at all ages. Studies show significant correlations between the frequency of advertising and the consumption of these HFSS products (WHO, 2022a). Eating behaviors are manipulated and food intake increases with exposure to those foods in children’s entertainment media (Villegas-Navas et al., 2020).
In most cases, children’s first exposure to media may be through television. This is also one of the first places where they see food commercials (E. Boyland & Tatlow-Golden, 2017; Cairns et al., 2013). In Germany, children (aged 3 – 13 years old) spend an average of 37 minutes per day watching television (Statista, 2022). Until recently, TV commercials have been the main tool for disseminating food marketing. But since the evolution and increase of portable devices and social media this led to a revolution into more personalized media content and promotion. Through engagement on social media (likes, comments, shares) and

cookies on websites, more and more data about the users can be gathered and used to further personalize the advertising and offers they are exposed to (E. Boyland & Tatlow-Golden, 2017).

The WHO is still not satisfied with current government regulations to protect children from unwanted advertising. They emphasis the need for actions and policies, as children are influenced by social media more and more (WHO, 2022a).

2.2.2. Brand and Influencer Marketing

In the marketing industry, there is a lot of focus on who is promoting the products. Brands, but even more so social media influencers, have a strong impact on what their consumers or followers eat and drink. A wide variety of creative strategies, such as competitions, cooking or baking shows and sneaky product placement, are used to make food and beverages appealing (WHO, 2022a).
Initially, brands presented their products with colorful billboards, catchy slogans and jingles and animated licensed characters. One study from Mexico summarized the most established marketing tools used by brands on social media. Most importantly brands use their logo for reference, but also hashtags and images of the packaging or products themselves seem to be relevant for recognition. To catch attention in adolescents, interactive tools, such as challenges, giveaways or memes were used (Valero-Morales et al., 2023). 31.5 % of brand content on social media in the US contains interactive features. This tool has been shown especially with content targeted to adolescents or featuring adolescents. With these marketing tools brands try to fit into the social media environment of their target group (Bragg et al., 2020).

With the growth of social media, more and more human influencers have stepped in front of the screen. They are building an audience that sees them as role models and looks up to them. They do this by imitating a personal relationship with their followers, through sharing personal information and speaking directly to their audience (E. Boyland & Tatlow-Golden, 2017; De Jans et al., 2021). Particularly, YouTubers, with their longer videos, are able to share more snippets

of their daily lives and therefore feel more realistic to their followers. Promoting a product within an influencer's YouTube video was preferred to advertising right at the beginning of a video, as children chose to watch the influencer's video but not the advert (Coates et al., 2020). Long-time followers trust these influencers and are more likely to imitate and purchase products seen in the influencer's posts, videos, or advertisements. Consumers are thought to rely more on the opinions of friends or influencers more, than those of brands, because of their connection (E. Boyland & Tatlow-Golden, 2017; De Jans et al., 2021). Trust and similarity are higher when people have been following the brand/influencer for some time, while audiences with no connection to the promoter are initially more skeptical (Thompson, 2013). Furthermore, the ability to interact with the influencers through commenting, liking or sharing is associated with a higher impact on consumption than just with exposure alone (WHO, 2022a). How an influencer sees and interacts with brand products has a huge impact on their audience's interests, opinions, purchase behavior and consumption. Brands are now looking to work with influencers to market their products by leveraging their fan base and reach. However, influencer marketing impacts everyone – the influencer, the brand and the audience (Coates et al., 2020). Brands not only benefit from an influencer's fan base, but also are at risk for losing customers and trust, if sometime the influencer makes negative headlines. Influencers also need to choose their partners wisely to ensure the brand and product fit their social media identity and don't negatively impact their relationship with their followers. This shapes the audience's attitude towards products and brands (Coates et al., 2020).

Food marketing by brands or influencers can increase children's preferences, requests for and intake of HFSS products. Even very brief exposure to advertisements for HFSS products, such as in TV commercials, Instagram posts or advergames, resulted in children and adolescents subsequently consuming more calories from HFSS snacks such as crisps, cookies, sweets and chocolate and having stronger purchase intentions (Coates et al., 2019a; Packer, Russell, Siovolgyi, et al., 2022; Sadeghirad et al., 2016). In a randomized control trial from 2019, 151 children (71 male, 80 female) from the UK, aged 9 – 11 years old, were divided into three different study groups. Each group was exposed to a

different YouTube video containing food marketing from two well-known UK influencers. One of the influencers was male and the other was female. Participants watched the video of their same sex influencer, as children tend to be more attracted to influencers of the same sex. Group one watched a video featuring a branded non-food item (Apple iPhone 8), and groups two and three watched a video with a branded HFSS snack (thin chocolate biscuit), but either with or without a disclosure for the advertisement. More energy was consumed from the snack promoted by influencer on YouTube compared to a similar snack, but from an alternative brand (Coates et al., 2019b). Food marketing that included “protective” disclosures of the advertisement increased the intake even more. Therefore, the effectiveness of highlighting an advertisement is still under discussion (Coates et al., 2019b).

2.2.3. Policies to protect children from harmful food marketing

To date, no country in the world has implemented a comprehensive policy to better regulate what children and adolescents are exposed to on social media and to limit the marketing of HFSS foods and beverages. There’s growing evidence of the negative impact that unhealthy food marketing can have on young people, but they are still exposed to it multiple times a day on billboards, their phones, tablets, TVs, etc. The WHO published guidelines in 2022 to help protect children from unhealthy food marketing and to plan actions against the growing obesity crisis. These guidelines included more than a hundred content analysis studies showing that most foods and beverages presented were not considered healthy or recommended for frequent consumption. Therefore, actions and solutions for public health authorities to change the food environment and marketing were designed (WHO, 2022b).

The WHO proposes the following three comprehensive policy approaches: (WHO, 2022b)

- *“eliminate all forms of food marketing that is high in saturated fats, trans-fatty acids, free sugars, or salt to which a broad range of children are exposed,*

- *eliminate all forms of food marketing to which a broad range of children are exposed and*
- *eliminate all forms of marketing to which a broad range of children are exposed"*

Both the exposure and the power of food marketing to children and adolescents need to be controlled. It has been shown, that mandatory policies are needed to be effective (WHO, 2023). Since May 2022, around 60 countries have taken action to regulate the marketing of at least some types of food and beverage, either on a mandatory or voluntary basis. A third of these countries have introduced mandatory marketing restrictions, and about 18 countries are focusing on policies in the school sector. One of the problems was, that most of the policies could only cover children up to the age of twelve. This needs to be further extended, to cover all children and adolescents up to the age of 18 (WHO, 2022b). To help the countries decide which foods have to be regulated or restricted, the WHO has developed regional Nutrient Profile Models (NPMs) (WHO, 2015b). These models categorize foods and beverages as permitted or not permitted for food marketing to children, according to national or international thresholds (Muc M., 2022). More information on the NPM can be found in chapter 3.3.1.

The Austrian government obligates itself to only self-regulate the national Audiovisual Media Services based on the EU Directive. The Directive states that *"experience has shown that both co-regulation and self-regulation instruments, implemented in accordance with the different legal traditions of the Member States, can play an important role in delivering a high level of consumer protection."* (European Parliament and Council of the European Union, 2010). A study done by foodwatch® Germany in 2021 however shows that these self-regulating guidelines do not lead to health-promoting food marketing to children. 85.5 % of products promoted to children still did not meet the WHO NPMs and were considered high in sugar, fat or salt (foodwatch e. V., 2021). These self-commitments in Germany are entirely voluntary and there are no penalties planned for default. Even the goals to reduce the sugar and fat content in

breakfast cereals, sweetened dairy products and beverages targeted to children, as well as the salt content in baked goods and freezer-pizzas until 2025 will most likely not be accomplished and there will be no consequences for the producers (Bundesministerium für Ernährung und Landwirtschaft, 2018). The German "Verbraucherzentrale" (centre for consumers) declares the current confinements as completely ineffective in protecting children from HFSS foods and beverages (Verbraucherzentrale Bundesverband e. V., 2021).

In the second global nutrition policy review from 2016 to 2017, around 7 countries used NPMs to define the food groups to be included or excluded from their recommendations. In terms of the media engagement, more than 90 % of the countries included marketing on television, but only a third (29 %) also referred to social media platforms (WHO, 2018).

To protect children from the harmful impact of food marketing, UNICEF and the WHO have released an action plan with four main steps to follow (WHO & UNICEF, 2023):

- Stage 1: Policy preparation

  Focuses on each country/region individually, depending on its health and nutrition situation. This is the purpose of this Master's thesis and its information from the food marketing landscape analysis by Winzer et. al. (Bundesministerium für Soziales, Gesundheit, Pflege und Konsumentenschutz et al., 2023).

- Stage 2: Policy development

  There may still be a long way to go, but as more information that is gathered about the harmful impacts, there will be more pressure on governments to take action and develop policies.

- Stage 3: Implementation

  As mentioned above, some countries have already started to better regulate the food marketing to which children and adolescents are exposed. By raising awareness and emphasizing the need to stop marketing of foods, which are nutritionally poor, we are one step closer to tackle the global obesity crisis.

- Stage 4: Monitoring and evaluation

  The final step is to develop a framework to monitor the compliance with these policies and to be keep working on them to improve the outcomes.

2.3. (Pre-)studies on which this thesis and data collection are based on

In 2022, a pilot study by the Medical University of Vienna investigated the exposure and power of food and beverage cues in influencer content on three social media platforms, Instagram, YouTube and TikTok. The target audience of the influencers were adolescents in German-speaking countries. According to the WHO NPM, more than three-thirds of food and beverage cues were not permitted for children (Winzer et al., 2022b; World Health Organization, Regional Office Europe, 2020). This provides further evidence that there should be better laws and regulations on food marketing not only to children but also to adolescents in the future.

Building on the previous pilot study, Winzer et al. conducted a study from 2022 to 2023, funded by the Austrian Federal Ministry of Social Affairs, Health, Care and Consumer Protection (Bundesministerium für Soziales, Gesundheit, Pflege und Konsumentenschutz et al., 2023), to provide insights into the current landscape of digital food and beverage marketing to children and adolescents. The findings may help to support policy development to better protect children from the effects of harmful digital food marketing.
Permission has been granted to use some of the data from this study for this Master's thesis.

This particular Master's thesis systematically captures food and beverage cues presented to children and adolescents on the social media platforms, Instagram and YouTube. The focus is on the prevalence of exposure to food and beverage cues on these platforms, and the differences between brand and influencer marketing. Other research questions compare the number of promoted products, which are not permitted by the WHO NPM for marketing to children, between these platforms and the promoters. Nutritional values, such as the sugar, fat, salt and alcohol content, will also be examined in relation to national thresholds.

3. Methods

To assess the exposure and power of food marketing on the social media platforms Instagram and YouTube, to children and adolescents in German-speaking countries, a comprehensive, quantitative, retrospective content analysis was conducted. This analysis was based on the protocols and templates of the "Monitoring of Marketing of Unhealthy Products to Children and Adolescents" by the WHO Regional Office for Europe and was adapted to fit the regional context (WHO, 2020b). The WHO has developed these protocols as part of their CLICK framework, which is a tool to monitor children's exposure to marketing of HFSS products online. For this study, the "Internet Monitoring Protocol V2 2024" was used to ensure systematic and internationally comparable data. It combines two key factors influencing food marketing: the nature of exposure to food and beverages, and the impact various strategies have on our decisions and behaviors related to food.

Within the "Internet Monitoring Protocol", the food groups were coded based on the WHO Nutrient Profile Model (NPM) (WHO, 2020a; WHO Europe, 2023). This model was extended by the Austrian National Nutrition Commission (Nationale Ernährungskomission, NEK) (NEK, 2021). For better comparability with international research, only the WHO NPM was considered in this master's thesis.

3.1. Preparation phase

3.1.1. Identifying the most used social media platforms

The first step was to identify the most used social media platforms by children and adolescents in Austria. For this purpose, data from the “Jugend-Internet-Monitor 2022” was used (Saferinternet.at, 2022). This data was collected via an online survey. In December 2021, 400 children and adolescents between the age of 11 – 17 were asked, which social media platforms they use most.

WhatsApp (96 %), YouTube (95 %) and Instagram (81 %) were at the top of the most popular internet platforms for young people. In fourth place were the photo-sharing app Snapchat (70 %) and the video app TikTok (70 %). There were some significant differences between the sexes. WhatsApp and YouTube were used more by males, Instagram, Snapchat and TikTok more by females.

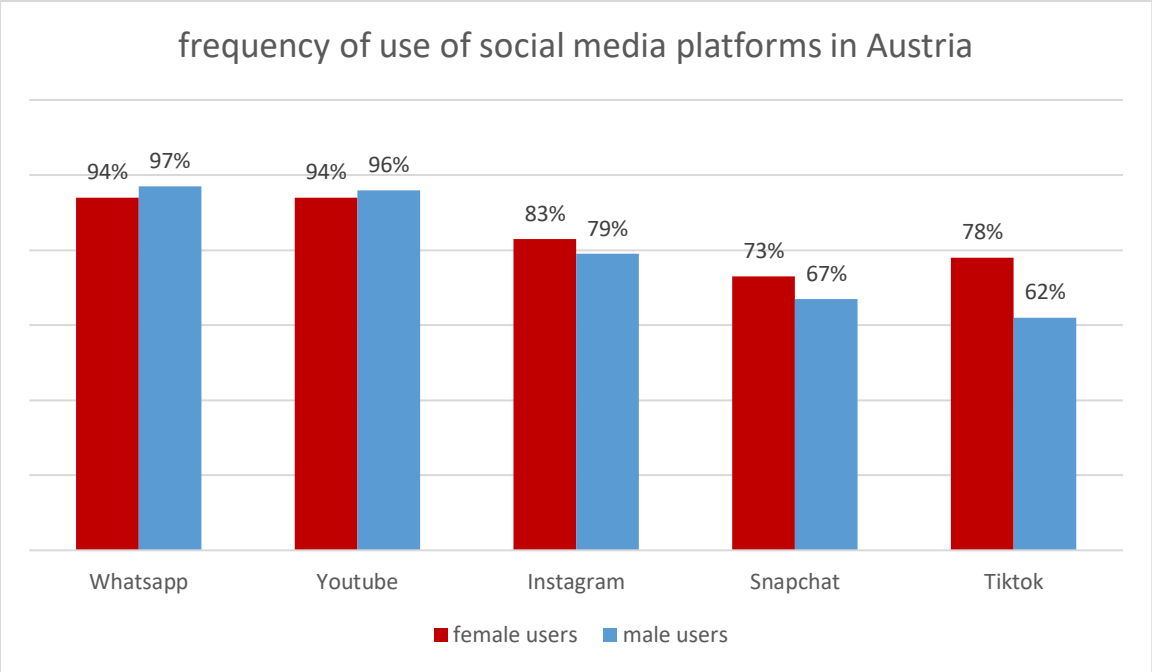

Figure 1: bar diagram “frequency of use of social media platforms in Austria”
modified after frequency of social media usage in Austria (Saferinternet.at, 2022).

Excluded social media platforms:

WhatsApp is a messenger app and Snapchat is a photo app where the so-called "snaps" disappear in up to ten seconds. Due to the combination of primarily private content and its short lifespan, WhatsApp and Snapchat were not included in the analysis. TikTok was not included, because the data was used by another student who was also involved in the data collection for the study by Winzer et al.

Included social media platforms:

According to the “Jugend-Internet-Monitor” and considering the limitations of the excluded platforms above, YouTube and Instagram are the two most used social media platforms by children and adolescents in German-speaking countries. For this master’s thesis, these two platforms will be compared.
At the time of data collection, Instagram was known as an image-sharing platform and YouTube as a video-sharing platform, making it difficult, but interesting, to compare these two forms of content. Instagram began to incorporate more video content through reels in 2020, but they have only recently become more popular. A small number of reels also made it into the data collection. Instagram Stories were not included, as they are only available for 24 hours.

3.1.2. Identifying content that appeals to children or adolescents

Two different groups were considered for data analysis: children aged 0 – 12 years and adolescents aged 13 – 17 years. YouTube can be used without registration and therefore can be used by both groups. It’s allowed to create an Instagram account starting from the age of 13 years old. This explains, why the target audience on that social media platform was only adolescents.

3.1.3. Identifying the most popular brands and influencers

Selection of brands:

To determine brand popularity in Austria, the Austrian Consumer Analyzes 2021 was used via the platform STATISTA (IMAS International, 2021). The top 3 most popular brands of different food categories were included in the analysis of social media appearances. Further inclusion criteria were:

- The brand had an Instagram or YouTube account
- The brand's account had posted within the year the data was collected
- The account was verified or official
- The brand had an Austrian or German account (i.e. ending at/de)

Selection of influencers:

Influencers, sports stars, etc. who were popular with children or adolescents on social media in Austria and Germany were identified following existing data from previous work by Winzer et al. (Winzer et al., 2022b).

The 10 most popular Austrian and German influencers on Instagram and YouTube were selected from lists by "noxinfluencer.com" and "socialblade.com":

- Top 100 Instagram Creator Accounts in Austria, sorted by followers (noxinfluencer.com, 2022a)
- Top 100 YouTubers in Austria, sorted by subscribers (noxinfluencer.com, 2022b; socialblade.com, 2022)

Further inclusion criteria:

- More than 500 000 subscribers or followers
- Popularity among children (0 – 12 years) on YouTube and popularity among adolescents (13 – 17 years old) on YouTube and Instagram

- Austrian and German influencers (German-speaking)
- High engagement rate (> 1 % per post), based on engagement rate benchmarks (engagement percentage, interactions per post, i.e. likes)
- even distribution of gender (half male, half female)
- normal, healthy BMI

3.1.4. Coding Training and Reliability

Prior to data collection, the students, who coded the data, participated in an eight-hour coding training course. They were handed out the templates and a manual based on the WHO protocols used. These were discussed together and some examples were worked through in class. Each coder then had to individually code the same sample posts/videos from the selected data of the study. The results were evaluated and discussed, errors and questions were identified by the coordinators. After training, a reliability test was conducted on a randomly selected sub-sample (10 % / 33 posts) on the different platforms. Coding reliability between the three coders was calculated using Krippendorf's alpha and Fleiss kappa, taking into account random agreement (Fleiss, 1971; Krippendorff, 2004). The majority of variables showed acceptable or reasonable agreement: Krippendorf’s alpha $k > 0.67$ and Fleiss kappa $k > 0.21$.

3.2. Data collection

The coders analyzed the content from the selected brands and influencers in a timeframe from August 2022 to February 2023 on the selected platforms. They coded exposure variables, such as basic account information (i.e. name, likes/followers, country, etc.), as well as nutritional (food category, nutrients, calories, health claims, etc.) and power variables (persuasive appeals, characters, jingles, etc.). Based on the adapted templates, data were collected using the SPSS statistical program.

3.2.1. Sample of posts and videos

Between 1 July 2021 and 31 June 2022, two posts or videos per month were randomly selected to provide a random sample for content analysis. Some accounts had fewer than 24 videos, so only the available videos were included. The random selection of posts or videos was done by the supervisors, and the list of links to the content was sent to the collectors by the supervisors.
In total, 1005 posts/videos (717 posts on Instagram and 288 videos on YouTube), were selected from brand and influencer channels respectively.
The analysis included all food and beverages (later referred to as “cues”) that were presented, either proactively or silently (i.e. placed in the background or not mentioned verbally).

3.3. Codebook

The codebook contains two different types of variables:

- the exposure variables:
  such as information about the account which was coded (platform, name, country, date and time posted, etc.), but also about the types of products that were shown. They were categorized according to the WHO Nutrient Profile Model.

- the power variables:
  include further information about the post (type, number of views/likes/ comments/shares), as well as the type of opportunities to make the product more attractive, such as music or jingles, using well-known brand characters or celebrities and persuasive appeals i.e. taste, fun, price, peer-status or health. Asking for engagement (like/comment, etc.) or special offers/competitions were coded too. Lastly the age group this post is targeted to was selected.

3.3.1. Nutritional quality of food and beverages according to the WHO nutrient profile model

The Nutrient Profile Model was developed by the WHO Regional Office for Europe as a tool for classifying foods and beverages according to their nutritional value. It serves as a basis for policies to restrict the marketing of nutritionally poor food and beverages to children and adolescents. The NPM contains 17 different categories from whole foods, such as fruit, vegetables and legumes, to bread, dairy products, fresh or processed meat or fish, and highly processed foods such as sweets and savoury snacks. It compares nutritional values, such as total energy, total and added sugar, non-sugar sweeteners, total and saturated fat or salt content per 100 g/ml of product. Nutritional thresholds, mainly from Denmark and Norway, were considered for comparison and classification in this model (WHO, 2015b).

The following table gives an overview of the nutrients mentioned in the NPM and their nutrient thresholds in g per 100 g:

Table 1: Nutritional thresholds for certain foods groups, according to the WHO NPM

Nr.:	Category:	Total fat:	saturated fat:	Total sugar:	added sugar:	Salt:
1	Chocolate + sugar confectionery	Not permitted				
2	Cakes, sweet biscuits + pastries	Not permitted				
3	Savoury snacks	-	-	-	0 g	0.1 g
4 a	Beverages - Juices	Not permitted				
4 b	Beverages – Milk drinks	2.5 g	-	-	0 g	-
4 c	Beverages - Energy Drinks	Not permitted				
4 d	Beverages – Other	-	-	-	0 g	
5	Edible ices	Not permitted				
6	Breakfast cereals	10 g	-	15 g	-	1.6 g
7	Yoghurts etc.	2.5 g	2.0 g	10 g	-	0.2 g
8	Cheese	20 g	-	-	-	1.3 g

9	Ready-made foods	10 g	4 g	10 g	-	1.0 g
10	Butter, fats and oils	-	20 g	-	-	1.3 g
11	Bread and -products	10 g	-	10 g	-	1.2 g
12	Pasta, rice + grains	10 g	-	10 g	-	1.2
13	Fresh + frozen meat, poultry, fish etc.	Permitted				
14	Processed meat etc.	20 g	-	-	-	1.7 g
15	Fresh + frozen fruit, vegetables, legumes	Permitted				
16	Processed fruit etc.	5 g	-	10 g	0 g	1.0 g
17	Sauces, dips etc.	10 g	-	-	0 g	1.0 g

If a food or beverage in this specific food group exceeds one or more of these nutrient thresholds, it is not permitted for marketing to children and adolescents. Otherwise, if the nutrient levels are below the thresholds, the food or beverage is considered as permitted for marketing to children and adolescents. “Not applicable” or “miscellaneous” was selected if the presented product could not be clearly identified or the nutrient content could not be determined (WHO, 2015b; World Health Organisation, 2020).

3.3.2. Proportion of products meeting or exceeding the thresholds

The proportion of products presented that met or exceeded the given thresholds was also determined. In addition, the number of exceedances was calculated. For each platform, brand and influencer, the percentages/percentiles that met or exceed the nutrient thresholds were calculated. Four ranges (percentiles) were defined going from 0 – 24.9 %, 25 – 49.9 %, 50 – 74.9 %, 75 – 100 %. A color scheme was developed, using green, yellow, orange and red were used to further highlight the percentiles in a positive (green and yellow) or negative (orange and red) way.

In addition, products were also classified as HFSS (high in fat, sugar and salt) or non-HFSS products. “High” means that it exceeded the thresholds for one of these nutrients. There were several possible variations:

- High in all three nutrients (fat, sugar AND salt) = HFSS product
- High in two nutrients (fat AND sugar, fat AND salt) = HFS product
- High in two nutrients (sugar AND salt) = HSS product
- High in only one nutrient (fat, sugar OR salt) = high in … product
- Not high in any of the nutrients = no HFSS product

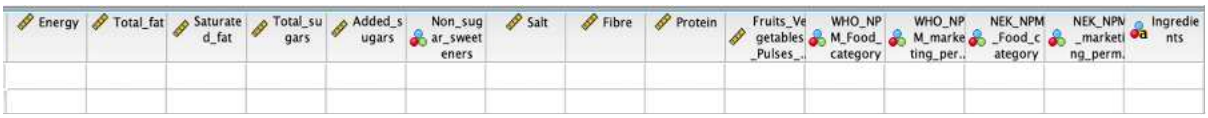

Figure 2: Screenshot from the adapted WHO "Internet Coding Templates V2 2020"

3.3.3. Alcohol exposure

Alcohol consumption is strictly forbidden for children and adolescents up to a certain age and should always be consumed responsibly. In Austria, the law for the protection of minors completely prohibits the consumption of alcoholic beverages completely under the age of 16 years old. Between the ages of 16 and 18, adolescents are allowed to drink beer and wine. From the age of 18, they are also allowed to consume spirits (Österreichische Jugendinfos (Hrsg.), 2022). In order to also take a look at the amount of alcohol exposure on social media that children and adolescents are exposed to, this was also part of the data collection and analysis.

3.4. Data analysis

The statistical programme SPSS version 28.0. was used to analyse the collected data. The statistical significance level α was set at $p < 0.05$.
All data were analysed descriptively.
All metric variables, such as number of likes, and nutritional values, such as sugar, fat, salt and alcohol, were presented using mean and standard deviation or median and range, depending on the normal distribution. These variables were

tested for normality using the Kolmogorov-Smirnov test and for homogeneity of variance using the Levene test.
The absolute and relative frequencies of the nominal parameters were presented as percentages. Differences between nominally scaled variables (i.e. brands/influencers, Instagram/YouTube, permission to market to children according to WHO NPM: permitted/not permitted) were first analysed for occurrence. The Chi^2 test was then used to compare them and show the significance of the differences.

4. Results

4.1. Sample description

Brands:
A total of 47 brands on Instagram and YouTube were included. All of them were present on Instagram, but only 25 of them were also present on YouTube. On average they had 25.476 followers on Instagram and 7.156 followers on YouTube. Unlike with the influencers, the total posts/videos were not counted here.

Influencers:
For data analysis a total of 20 influencers were included. Six of the influencers were present on both platforms. For YouTube four were exchanged with more popular ones on this platform. Gender was distributed quite even, as within 10 influencers on Instagram, 4 of them were female and 6 male genders. On YouTube it was distributed as 5 males to 5 females. The mean age was 29.3 years old on Instagram and 29 years on YouTube. Their mean number of followers was 7.8 Mio. on Instagram and 4.2 Mio. on YouTube.

Table 2: Sample description of brands and influencers on Instagram and YouTube

Brands (n = 47)	**Instagram (n = 47)**		**YouTube (n = 25)**	
country	28 (59.6%) AT	19 (40.4%) DE	20 (80%) AT	5 (20%) DE
follower (mean)	25 476		7 156	
Influencer (n = 20)	**Instagram (n = 10)**		**YouTube (n = 10)**	
country	5 (50%) AT	5 (50%) DE	5 (50%) AT	5 (50%) DE
gender	4 (40%) females	6 (60%) males	5 (50%) females	5 (50%) males
age (mean)	29.3 years		29 years	
follower (mean)	7 897 396		4 252 983	
total posts	1 523		1 844	

A list of the selected brands and influencers can be found in the appendix (tables 18 – 21).

4.2. Recording statistics

Instagram

- Brands

On Instagram, 511 brand posts were coded. This resulted in 714 food and beverage cues. 118 (23.1 %) of these posts were brand advertisements, where only the logo etc. was shown, and no product itself. The other 76.9 % (n = 393) had at least one product featured.

- Influencers

A total of 576 cues were coded. These cues were included in 206 posts, of which 46 (22.3 %) were brand focused and only showed brand imagery and no products in particular. 77.7 % (n = 160) of influencer posts had at least one food or beverage featured.

YouTube

- Brands

With brands on YouTube 204 cues in 117 videos were coded. 102 of these videos (87.2 %) featured at least one brand product, 15 (12.8 %) videos were brand ads.

- Influencers

There were 171 YouTube influencer videos coded, which resulted in 1039 food and beverage cues. When looking at brand or product focused posts 979 of these cues were valid, 60 were missing in the statistics. Of these valid cues 22 (2.2 %) were brand focused and 957 (97.8 %) were product focused. The missing data regarding brand focus is due to mistakes in the coding process.

4.3. Nutritional quality of foods and beverages

According to the WHO NPM, 79.9 % (n = 626) of the presented foods and beverages featured by brands (n = 783) are classified as not permitted for marketing to children and adolescents. In total, 81.3 % (n = 486) on Instagram are not permitted, compared to 75.7 % (n = 140) on YouTube.
In comparison, 67.4 % (n = 856) of the food and beverages presented in influencer posts are not permitted. When breaking down influencer posts by platform, the percentages were 48.7 % (n = 155) on Instagram and 73.6 % (n = 701) on YouTube.

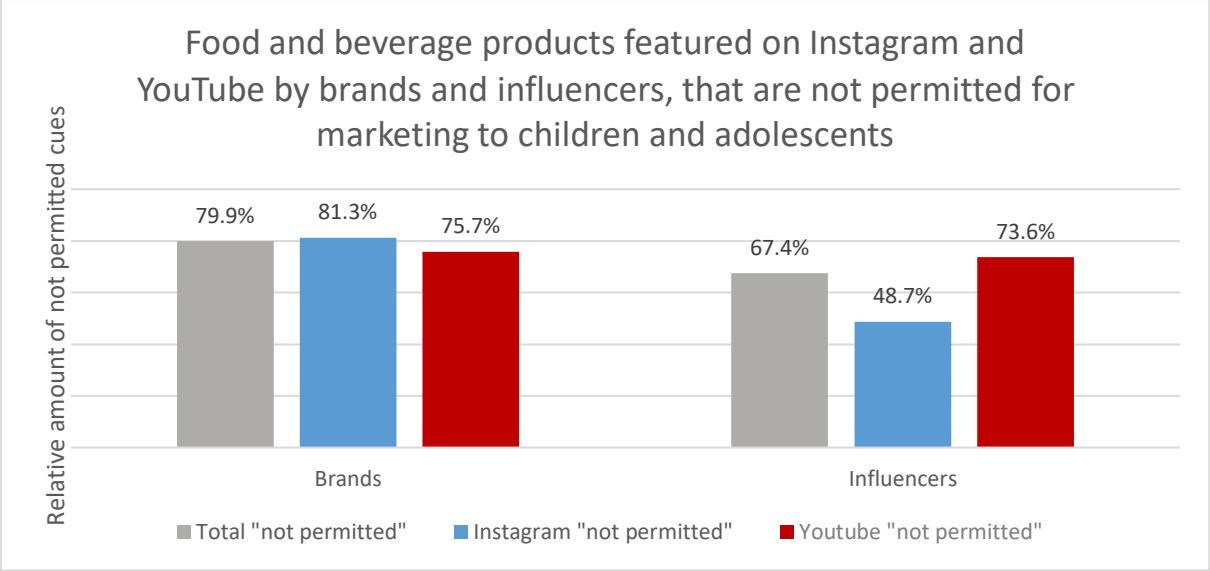

Figure 3: Food and beverage products featured on Instagram and YouTube by brands and influencers that are not permitted for marketing to children and adolescents, according to the WHO NPM

4.3.1. Top three most presented food categories

This chapter compares the three most presented food groups by brands or influencers on Instagram and YouTube. The top three most presented permitted vs. not permitted food categories will be featured.

When it comes to permitted foods and beverages, brands on Instagram (n = 105 cues) did present the category “fresh and frozen fruit, vegetables and legumes” the most (47.6 %, n = 50), followed by “beverages – other” (15.2 %, n = 16) and “beverages – milk drinks” (8.6 %, n = 9). On YouTube (n = 45) number one was “beverages – other” (26.7 %, n = 12), “fresh meat, poultry, fish and similar” coming second (24.4%, n = 11) and “fresh and frozen fruit, vegetables and legumes” third (15.6 %, n = 7).

Comparing that to the top three of permitted food groups presented by influencers on Instagram (n = 71) “fresh and frozen fruit, vegetables or legumes” comes first (84.5 %, n = 60), followed by “beverages – other” (7.0 %, n = 5). The third place is taken by two categories equally: “cheese” and “fresh meat, poultry, fish and similar” (2.8 % each, n = 2 each).

On YouTube (n = 224) influencers focused on the same groups in the same rankings. “Fresh or frozen fruit, vegetables and legumes” first (71.0 %, n = 159), “beverages – other” on second place (13.8 %, n = 31) and lastly “fresh meat, poultry, fish and similar” with 10.7 % (n = 24).

The top three most presented permitted food and beverage categories did not differ significantly between brands and influencers, or between the two selected social media platforms, Instagram and YouTube. The most featured food categories were “fresh and frozen fruit, vegetables and legumes”, “other beverages” (which includes cola, lemonade, orangeade; sweetened beverages, mineral and/or flavoured waters (including carbonated) with added sugar or sweeteners) and “fresh meat, poultry, fish and similar”.

Top three most presented food categories: brands vs. influencers
(**permitted** by the WHO NPM)

Table 3: Top three most presented foods and beverages by food category, permitted for marketing to children and adolescents, according to the WHO NPM

Instagram:	**YouTube:**
Brands: (n = 105 cues)	**(n = 45 cues)**
1. Fresh and frozen fruit, vegetables and legumes (47.6%)	1. Beverages Other (26.7%)
2. Beverages Other (15.2%)	2. Fresh meat, poultry, fish and similar (24.4%)
3. Beverages – Milk drinks (8.6%)	3. Fresh and frozen fruit, vegetables and legumes (15.6%)
Influencer: (n = 71 cues)	**(n = 224 cues)**
1. Fresh and frozen fruit, vegetables or legumes (84.5%)	1. Fresh or frozen fruit, vegetables and legumes (71.0%)
2. Beverages Other (7.0%)	2. Beverages Other (13.8%)
3. Cheese + Fresh meat, poultry, fish and similar (7.9% each)	3. Fresh meat, poultry, fish and similar (10.7%)

When comparing the occurrence of unpermitted, HFSS foods and beverages, brands on Instagram (n = 486 cues) did show “chocolate and sugar confectionary” the most (19.5 %, n = 95), followed by “processed fruit, vegetables and legumes” (10.5 %, n = 51) and “ready-made and convenience foods” (8.8 %, n = 43). On YouTube (n = 140) brands did focus on the category “beverages - juices” (18.6 %, n = 26). The second place in the ranking is occupied by three categories: “chocolate and sugar confectionary”, “cakes and pastries”, as well as “fresh or dried pasta and grains” (13.6 % or n = 19 each). Lastly there’s “ready-made and convenience foods” (8.6 %, n = 12) just like on Instagram.

In comparison, influencers did not show significant differences. On Instagram (n = 155) these categories were ranked downwards: “cakes and pastries” (21.9 %, n = 34), “chocolate and sugar confectionary” (16.1 %, n = 25) and “processed fruit, vegetables and legumes” (14.8 %, n = 23). The most cues were coded with influencers on YouTube (n = 701). There the most dominant category was “beverages – other” (15.5 %, n = 109), close to “chocolate and sugar confectionary” (15.3 %, n = 107) and lastly on the third place came “cakes and pastries” with 12.0 % (n = 84).

Total top three most presented product categories: brands vs. influencers (**not permitted** by the WHO NPM)

Table 4: Top three most presented foods and beverages by food category, not permitted for marketing to children and adolescents, according to the WHO NPM

Instagram:	**YouTube:**
Brands: (n = 486 cues)	**(n = 140 cues)**
1. Chocolate and sugar confectionary (19.5%)	1. Beverages Juices (18.6%)
2. Processed fruit, vegetables and legumes (10.5%)	2. Chocolate and sugar confectionary + Cakes and pastries + Fresh or dried pasta and grains (13.6% each)
3. Ready-made and convenience foods (8.8%)	3. Ready-made and convenience foods (8.6%)

Influencer: (n = 155 cues)	(n = 701)
1. Cakes and pastries (21.9%)	1. Beverages Other (15.5%)
2. Chocolate and sugar confectionary (16.1%)	2. Chocolate and sugar confectionary (15.3%)
3. Processed fruit, vegetables and legumes (14.8%)	3. Cakes and pastries (12.0%)

The category “chocolate and sugar confectionary” was present and either the first or second most featured by brands and influencers across all platforms. “Cakes and pastries” were also very popular. “Ready-made and convenience foods” came third with brands on both platforms, but didn’t make it into the top three with influencers. The category “processed fruit, vegetables and legumes” was only present in the top three on Instagram with by brands, but not on YouTube. For beverages, “juices” was the top category by brands and “other beverages” by influencers on the platform YouTube but were not highly presented on Instagram. Overall, influencers were most likely to feature “fresh and frozen fruits, vegetables or legumes”, which are permitted for marketing to children by WHO guidelines. Brands were more likely to feature “processed fruit, vegetables, or legumes”. Except for “fresh fruits, vegetables and legumes” all the food categories most frequently featured by brands overall, were not permitted for marketing to children or adolescents.

4.3.2. Nutrient content

4.3.2.1. Total and added sugar content

There was a significant difference in the amount of total sugars in products promoted by brands or influencers, but no significant difference in added sugars.

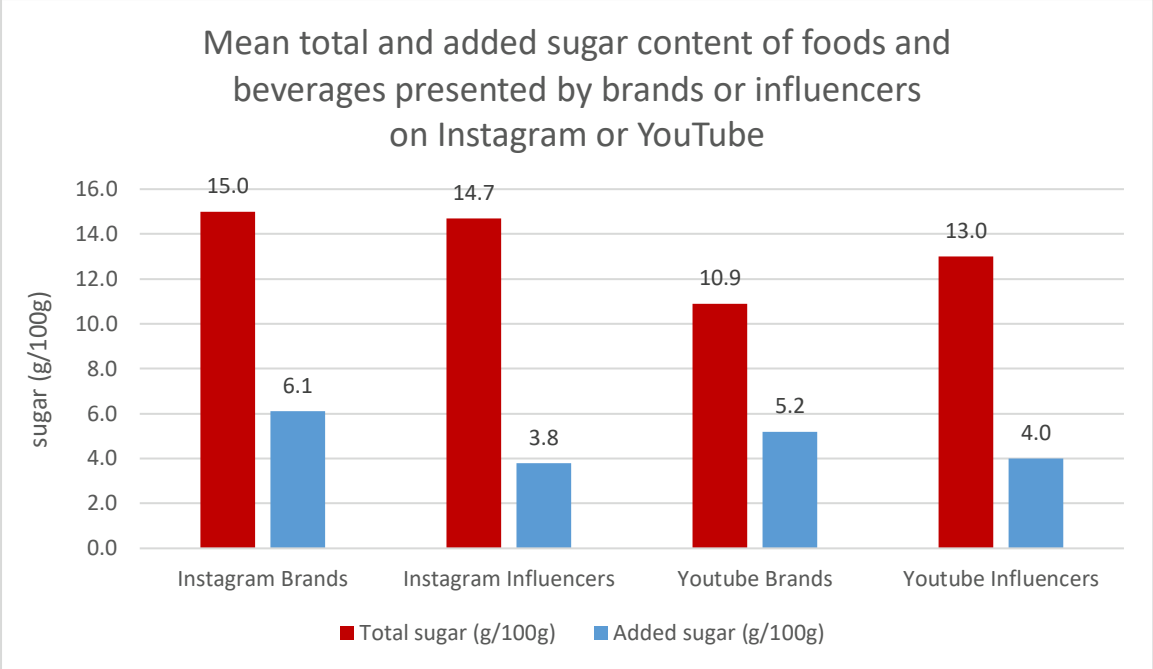

Figure 4: Mean total and added sugar content of food and beverages presented by brands or influencers on Instagram or YouTube

Brand content on Instagram resulted in a mean total sugar content of 15.0 g and a mean added sugar content of 6.1 g per 100 g of product. On YouTube the mean content was measured at 10.9 g of total and 5.2 g of added sugar per 100 g. Influencers did show quite a similar mean total sugar content on Instagram with 14.7 g, but a lower mean added sugar content with 3.8 g per 100 g in their products referenced. In comparison, the mean total sugar content on YouTube was higher with influencers, than with brands, and was measured at 13.0 g per 100 g and 4.0 g of added sugar on average.

The highest added sugar content was found in the food category “chocolate and sugar confectionary, energy bars, sweet toppings and desserts” with a mean added sugar content of 49.9 g per 100 g of the product, followed by “cakes, sweet biscuits and pastries” with 24.7 g and thirdly the category “breakfast cereal” with 12.3 g per 100 g. “Beverages – juices” resulted in a mean added sugar content of 10.0 g per 100 ml, and “beverages – energy drinks” in 11.0 g per 100 ml.

4.3.2.2. Total and saturated fat content

The results showed a significant difference between brands and influencers regarding the mean total and saturated fat contents of foods and beverages promoted.

On Instagram, the products promoted by brands had a mean total fat content of 2.6 g per 100 g and saturated fat content of 0.5 g per 100 g. With influencers the mean total fat content was 3.1 g and the mean saturated fat content was measured at 0.6 g per 100 g. The video platform YouTube showed similar results for both brands and influencers. Brands and influencers featured foods and beverages with a mean total fat content of 2.0 g and a saturated fat content of 0.5 g to 0.4 g per 100 g.

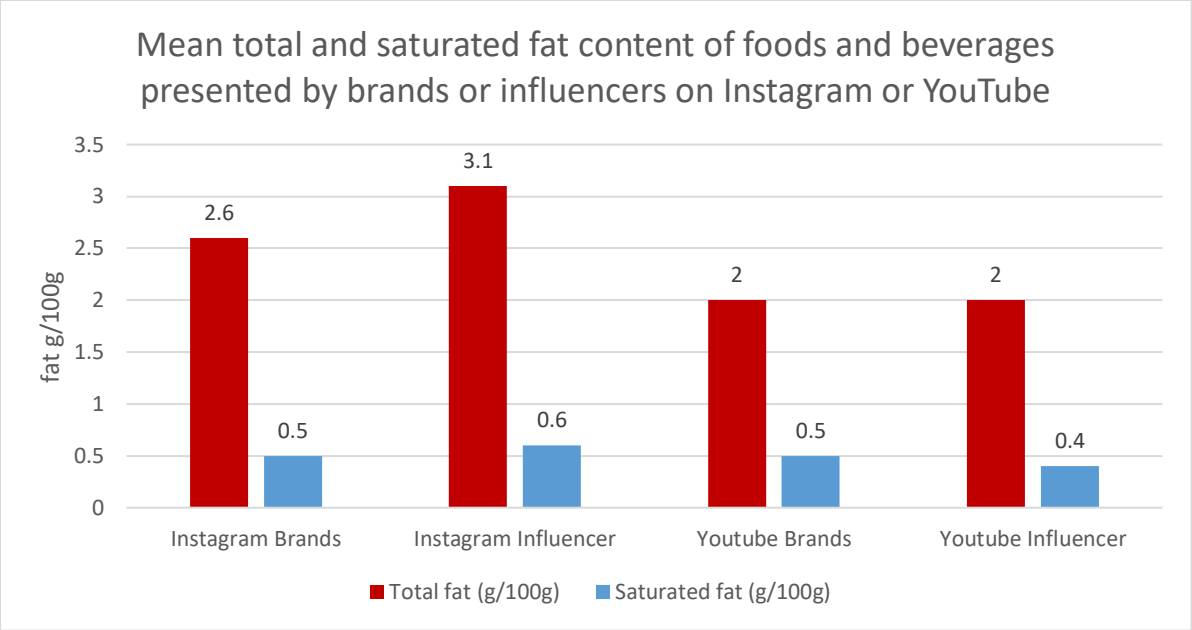

Figure 5: mean total and saturated fat content of foods and beverages presented by brands or influencers on Instagram or YouTube

When differentiated according to the various WHO nutrient profile categories, the highest fat and saturated fat contents were as follows: Apart from “butter and other fats and oils”, which unsurprisingly had the highest total fat content, there was “savory snacks” with a mean total fat content of 30 g and a saturated fat content of 3 g per 100 g. “Cheese” was second with a total fat content of 24 g and

a saturated fat content of 17 g per 100 g. “Cakes, sweet biscuits and pastries” came third with a mean total fat content of 20 g and an average saturated fat content of 6.8 g per 100 g of food.

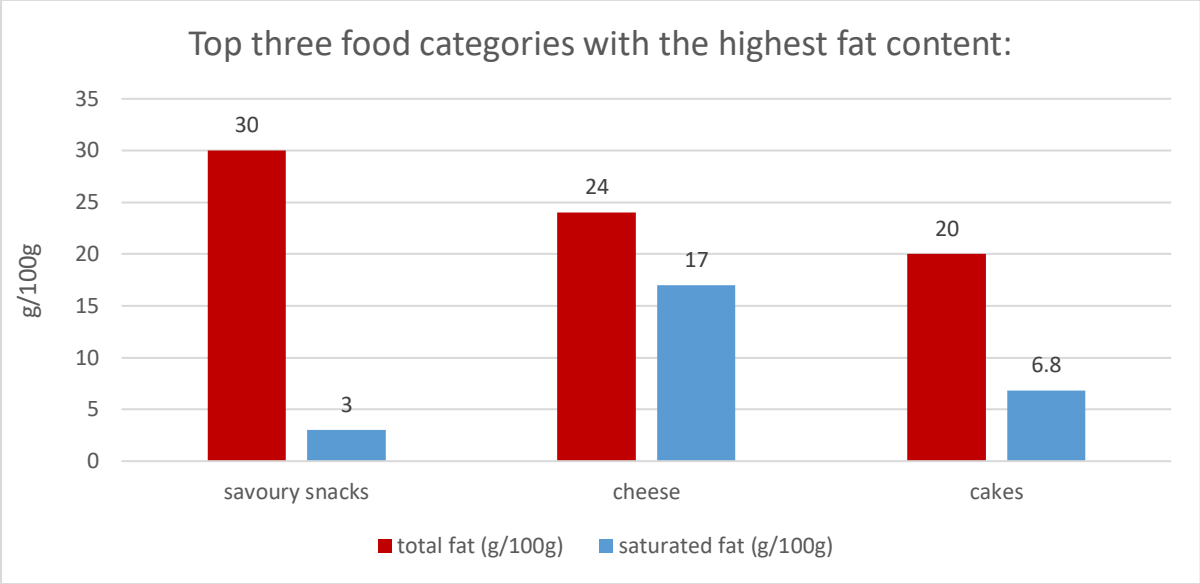

Figure 6: Top three food categories with the highest fat content

4.3.2.3. Salt content

The results showed no significant difference between brands and influencers regarding the mean salt content of foods and beverages promoted.

Foods and beverages featured by brands had a mean salt content of 0.12 g per 100 g on Instagram and 0.10 g per 100 g on YouTube. In comparison, the products mentioned by influencers had a mean salt content of 0.10 g per 100 g on both platforms.

The food groups with the highest salt content were “savory snacks”, “bread, bread products and crisp bread”, “cheese”, “ready-made, convenience foods and composite dishes”, “processed meat, poultry, fish and similar”, “processed fruit, vegetables and legumes” and “sauces, dips and dressings”.
“Sauces, dips and dressings” showed a mean salt content of 2.08 g per 100 g followed by “savory snacks” (including popcorn and maize corn, seeds, nuts and mixed nuts, savory biscuits and pretzels, other snacks made from rice, maize,

dough or potato) with 2.01 g per 100 g of product, the third highest was “processed fruit, vegetables and legumes” (includes tinned fruit, vegetables and legumes, dried fruit, dried vegetables and legumes, marmalade, jams, pickled vegetables and fruit, stewed fruits, fruit peel, frozen french fries, frozen fruit with added sugar) at 1.83 g per 100 g. The category “cheese” had an average salt content of 1.48 g per 100 g, “processed meat, poultry, fish and similar” had a mean salt content of 1.47 g per 100 g, “bread, bread products and crisp bread” resulted in 1.32 g salt per 100 g and “ready-made, convenience foods and composite dishes” had 1.11 g per 100 g.

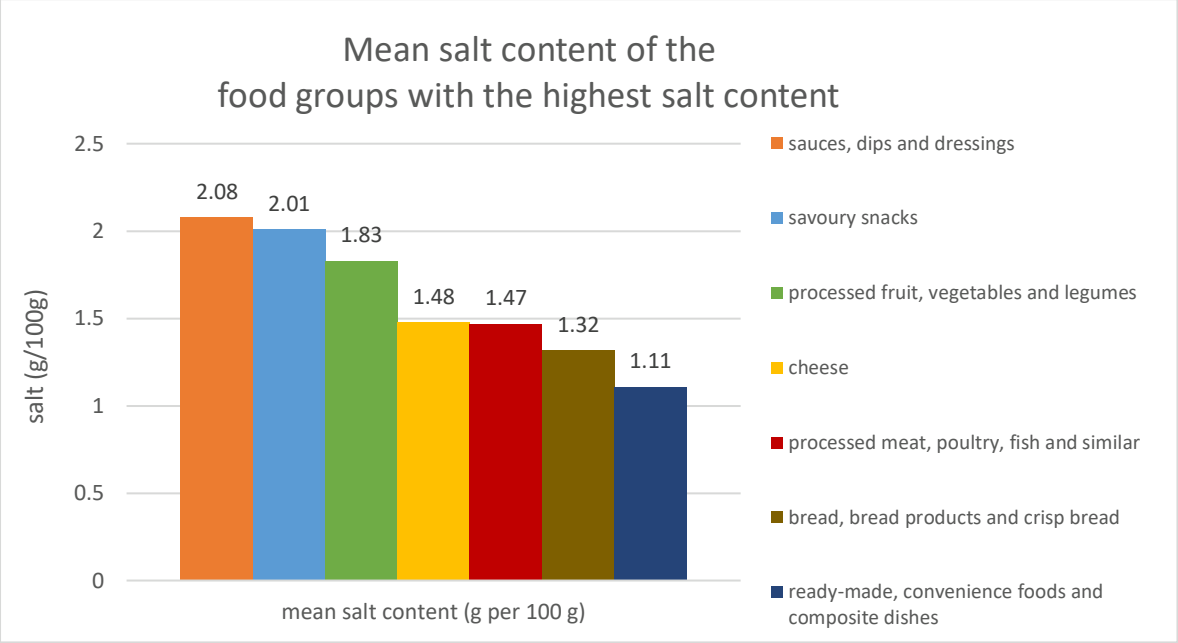

Figure 7: mean salt content of food groups with the highest salt content

4.3.3. Foods and beverages meet or exceed nutrient thresholds, according to the WHO NPM

For a result to be positive, it was defined, that the threshold criteria had to be met at least 50 % of the time (shown in green and yellow in the tables). Percentages below this were considered negative and are shown in orange and red.

Nutrient and ingredient criteria and thresholds met:

Products presented by influencers on YouTube and Instagram were the most likely to meet the thresholds, with 28.4 % and 22.1 % respectively. Products featured by brands were less compliant, with 21.1 % on YouTube and only 16.2 % on Instagram.

- The maximum total sugar criteria were hardly ever met. Only in the category “yoghurt, sour milk, cream, etc.” on YouTube for both brands and influencers, and also once in the category “processed fruit, vegetables and legumes” for influencers on Instagram.
- Only products presented by brands on Instagram in the category “processed fruit, vegetables and legumes” were able to meet the maximum added sugar threshold at the 75th percentile with 92.7 %. Otherwise, products featured by brands on YouTube and by influencers on Instagram in the “other beverages” category met the criteria at least 50 % of the time.
- The maximum total fat content threshold was met on all platforms and with brands and influencers in the categories “bread and bread products” and “fresh or dried pasta, rice and grains”.
- Besides with influencers on YouTube the food category “ready-made and convenience foods” met the criteria for maximum saturated fat content for 76 % or more of the presented products.
- A minimum of 3/4 of products in the food groups “breakfast cereals”, “yoghurts, sour milk, cream, etc.”, “butter, fats and oils” and “fresh or dried pasta, rice and grains” met the criteria for salt content.

Nutrient and ingredient criteria and thresholds exceeded:

Products presented by influencers exceeded the nutrient thresholds in 71.6 % (YouTube) and 77.9 % (Instagram) of cases. Products featured by brands showed even higher percentages with 78.9 % of exceeding on YouTube and 83.8 % on Instagram.

- A high rate of exceeding was observed for total sugars in “breakfast cereals”, “bread and bread products” and “fresh or dried pasta, rice and grains”.
- The added sugar content was exceeded at least 50 % of the time by “savory snacks”, “beverages - milk drinks”, “beverages other”, “processed fruit, vegetables and legumes” and “sauces, dips and dressings”.
- Products shown by influencers on Instagram, such as “beverages – milk drinks”, “breakfast cereals” and “cheese” did not meet the criteria for maximum total fat content.
- Besides once it was analyzed that brands on Instagram exceeded the amount of saturated fat in “butter, fats and oils” in more than 50 % of cases.
- When it comes to the thresholds for maximum salt content per 100 g of the product presented, it was “savory snacks”, “cheese”, “ready-made and convenience foods” and “sauces, dips and dressings” that often exceeded the criteria.

Table 5: Share of products meeting the WHO NPM’s nutrient and ingredient criteria (Brand Page Instagram)

Share of products meeting the WHO NPM’s nutrient and ingredient criteria (Brand Page Instagram):					
	Total fat	Saturated fat	Total sugar	Added sugar	Salt
Frequency total:	26.3 %	8.3 %	7.8 %	1.7 %	24.5 %
1 chocolate and sugar confectionary					
2 Cakes, sweet biscuits and pastries					
3 Savoury snacks				-	-
4.1 Beverages - Juices					
4.2 Beverages - Milk drinks	81.0 %			-	
4.3 Beverages - Energy drinks					
4.4 Beverages - Other				27.3 %	
5 Edible ices					
6 Breakfast cereals	-		11.1 %		77.8 %
7 Yoghurts, sour milk, cream , …	46.2 %	51.3 %	46.2 %		100 %
8 Cheese	35.7 %				100 %
9 Ready-made and convenience foods	64.0 %	76.0 %	40.0 %		54.0 %
10 Butter and other fats and oils		20.0 %			100 %

11 Bread, bread products and crisp breads	100 %		-		81.8 %
12 Fresh or dried pasta, rice and grains	100 %		-		100 %
13 Fresh and frozen meat, poultry, fish and similar					
14 Processed meat, poultry, fish and similar	93.8 %				68.8 %
15 Fresh and frozen fruit, vegetables and legumes					
16 Processed fruit, vegetables and legumes	85.5 %		30.9 %	92.7 %	69.1 %
17 Sauces, dips and dressings	46.2 %			-	11.5 %
According to: WHO NPM (World Health Organization Nutrient Profile Model) Color scheme: 0 – 24.9 % (red), 25 – 49.9 % (orange), 50 – 74.9 % (yellow), 75 – 100 % (green)					

Table 6: Share of products exceeding the WHO NPM's nutrient and ingredient criteria (Brand Page Instagram)

Share of products <u>exceeding</u> the WHO NPM's nutrient and ingredient criteria (Brand Page Instagram):					
	Total fat	Saturated fat	Total sugar	Added sugar	Salt
Frequency total:	10.5 %	4.3 %	17.9 %	23.7 %	15 %
1 chocolate and sugar confectionary					
2 Cakes, sweet biscuits and pastries					
3 Savoury snacks				100 %	100 %
4.1 Beverages - Juices					
4.2 Beverages - Milk drinks	19.0 %			100 %	
4.3 Beverages - Energy drinks					
4.4 Beverages - Other				72.7 %	
5 Edible ices					
6 Breakfast cereals	100 %		88.9 %		-
7 Yoghurts, sour milk, cream , …	53.8 %	48.7 %	53.8 %	-	-
8 Cheese	64.3 %				-
9 Ready-made and convenience foods	36.0 %	16.0 %	60.0 %		44.0 %
10 Butter and other fats and oils		80.0 %			-
11 Bread, bread products and crisp breads	-		100 %		18.2 %
12 Fresh or dried pasta, rice and grains	-		100 %		-

13 Fresh and frozen meat, poultry, fish and similar					
14 Processed meat, poultry, fish and similar	6.3 %				31.3 %
15 Fresh and frozen fruit, vegetables and legumes					
16 Processed fruit, vegetables and legumes	14.5 %		65.5 %	-	27.3 %
17 Sauces, dips and dressings	53.8 %			100 %	88.5 %
According to: WHO NPM (World Health Organisation Nutrient Profile Model) Quelle!					
Color scheme: 0 – 24.9 % (green), 25 – 49.9 % (yellow), 50 – 74.9 % (orange), 75 – 100 % (red)					

Table 7: Share of products meeting the WHO NPM's nutrient and ingredient criteria (Brand Channel YouTube)

Share of products meeting the WHO NPM's nutrient and ingredient criteria (Brand Channel YouTube):					
	Total fat	Saturated fat	Total sugar	Added sugar	Salt
Frequency total:	27.4 %	8.1 %	10.8 %	9.1 %	26.3 %
1 chocolate and sugar confectionary					
2 Cakes, sweet biscuits and pastries					
3 Savoury snacks					
4.1 Beverages - Juices					
4.2 Beverages - Milk drinks	-			-	
4.3 Beverages - Energy drinks					
4.4 Beverages - Other				65.4 %	
5 Edible ices					
6 Breakfast cereals					
7 Yoghurts, sour milk, cream , …	33.3 %	33.3 %	100 %		100 %
8 Cheese	-				80,0%
9 Ready-made and convenience foods	69.2 %	84.6 %	53.8 %		15.4 %
10 Butter and other fats and oils		75.0 %			100 %
11 Bread, bread products and crisp breads	100 %		-		66.7 %
12 Fresh or dried pasta, rice and grains	95.0 %		-		95.0 %

13 Fresh and frozen meat, poultry, fish and similar					
14 Processed meat, poultry, fish and similar	80.0 %				100 %
15 Fresh and frozen fruit, vegetables and legumes					
16 Processed fruit, vegetables and legumes	80.0 %		66.7 %	-	60 %
17 Sauces, dips and dressings	60.0 %			-	20.0 %
According to: WHO NPM (World Health Organization Nutrient Profile Model) Color scheme: 0 – 24.9 % (red), 25 – 49.9 % (orange), 50 – 74.9 % (yellow), 75 – 100 % (green)					

Table 8: Share of products exceeding the WHO NPM's nutrient and ingredient criteria (Brand Channel YouTube)

Share of products exceeding the WHO NPM's nutrient and ingredient criteria (Brand Channel YouTube):					
	Total fat	Saturated fat	Total sugar	Added sugar	Salt
Frequency total:	10.2 %	2.7 %	17.7 %	16.7 %	12.4 %
1 chocolate and sugar confectionary					
2 Cakes, sweet biscuits and pastries					
3 Savoury snacks					
4.1 Beverages - Juices					
4.2 Beverages - Milk drinks	100 %			100 %	
4.3 Beverages - Energy drinks					
4.4 Beverages - Other				34.6 %	
5 Edible ices					
6 Breakfast cereals					
7 Yoghurts, sour milk, cream , …	66.7 %	66.7 %	-		-
8 Cheese	100 %				20.0 %
9 Ready-made and convenience foods	30.8 %	15.4 %	46.2 %		84.6 %
10 Butter and other fats and oils		25.0 %			-
11 Bread, bread products and crisp breads	-		100 %		33.3 %
12 Fresh or dried pasta, rice and grains	-		100 %		-

13 Fresh and frozen meat, poultry, fish and similar					
14 Processed meat, poultry, fish and similar	20.0 %				-
15 Fresh and frozen fruit, vegetables and legumes					
16 Processed fruit, vegetables and legumes	20.0 %		33.3 %	100 %	40.0 %
17 Sauces, dips and dressings	40.0 %			100 %	80.0 %
According to: WHO NPM (World Health Organization Nutrient Profile Model) Color scheme: 0 – 24.9 % (green), 25 – 49.9 % (yellow), 50 – 74.9 % (orange), 75 – 100 % (red)					

Table 9: Share of products meeting the WHO NPM's nutrient and ingredient criteria (Influencer Instagram)

Share of products meeting the WHO NPM's nutrient and ingredient criteria (Influencer Instagram):					
	Total fat	Saturated fat	Total sugar	Added sugar	Salt
Frequency total:	6.3 %	1.4 %	2.4 %	1.7 %	8.7 %
1 chocolate and sugar confectionary					
2 Cakes, sweet biscuits and pastries					
3 Savoury snacks				-	50.0 %
4.1 Beverages - Juices					
4.2 Beverages - Milk drinks	-			-	
4.3 Beverages - Energy drinks					
4.4 Beverages - Other				64.3 %	
5 Edible ices					
6 Breakfast cereals	-		-		100 %
7 Yoghurts, sour milk, cream , …					
8 Cheese	-				-
9 Ready-made and convenience foods	88.9 %	88.9 %	11.1 %		44.4 %
10 Butter and other fats and oils					
11 Bread, bread products and crisp breads	100 %		-		80.0 %

12 Fresh or dried pasta, rice and grains	100 %		-		100 %
13 Fresh and frozen meat, poultry, fish and similar					
14 Processed meat, poultry, fish and similar	100 %				100 %
15 Fresh and frozen fruit, vegetables and legumes					
16 Processed fruit, vegetables and legumes	58.8 %		76.5 %	5.9 %	58.8 %
17 Sauces, dips and dressings	-			-	100 %
According to: WHO NPM (World Health Organization Nutrient Profile Model) Color scheme: 0 – 24.9 % (red), 25 – 49.9 % (orange), 50 – 74.9 % (yellow), 75 – 100 % (green)					

Table 10: Share of products exceeding the WHO NPM's nutrient and ingredient criteria (Influencer Instagram)

Share of products exceeding the WHO NPM's nutrient and ingredient criteria (Influencer Instagram):					
	Total fat	Saturated fat	Total sugar	Added sugar	Salt
Frequency total:	5.4 %	0.2 %	8.0 %	4.2 %	3.1 %
1 chocolate and sugar confectionary					
2 Cakes, sweet biscuits and pastries					
3 Savoury snacks				100 %	50.0 %
4.1 Beverages - Juices					
4.2 Beverages - Milk drinks	100 %			100 %	
4.3 Beverages - Energy drinks					
4.4 Beverages - Other				28.6 %	
5 Edible ices					
6 Breakfast cereals	100 %		100 %		-
7 Yoghurts, sour milk, cream , …					
8 Cheese	100 %				100 %
9 Ready-made and convenience foods	11.1 %	11.1 %	88.9 %		55.6 %
10 Butter and other fats and oils					
11 Bread, bread products and crisp breads	-		100 %		20.0 %
12 Fresh or dried pasta, rice and grains	-		100 %		-

13 Fresh and frozen meat, poultry, fish and similar					
14 Processed meat, poultry, fish and similar	-				-
15 Fresh and frozen fruit, vegetables and legumes					
16 Processed fruit, vegetables and legumes	41.2 %		23.5 %	94.1 %	41.2 %
17 Sauces, dips and dressings	100 %			100 %	-
According to: WHO NPM (World Health Organization Nutrient Profile Model) Color scheme: 0 – 24.9 % (green), 25 – 49.9 % (yellow), 50 – 74.9 % (orange), 75 – 100 % (red)					

Table 11: Share of products meeting the WHO NPM's nutrient and ingredient criteria (Influencer YouTube)

Share of products meeting the WHO NPM's nutrient and ingredient criteria (Influencer YouTube):					
	Total fat	Saturated fat	Total sugar	Added sugar	Salt
Frequency total:	17.5 %	6.8 %	4.1 %	4.6 %	19.5 %
1 chocolate and sugar confectionary					
2 Cakes, sweet biscuits and pastries					
3 Savoury snacks				-	15.4 %
4.1 Beverages - Juices					
4.2 Beverages - Milk drinks	58.8 %			-	
4.3 Beverages - Energy drinks					
4.4 Beverages - Other				35.3 %	
5 Edible ices					
6 Breakfast cereals	87.5 %		-		100 %
7 Yoghurts, sour milk, cream , …	33.3 %	33.3 %	86.7 %		100 %
8 Cheese	25.0 %				60.0 %
9 Ready-made and convenience foods	59.2 %	70.4 %	12.7 %		59.2 %
10 Butter and other fats and oils		50.0 %			93.8 %

11 Bread, bread products and crisp breads	96.3 %		-		44.4 %
12 Fresh or dried pasta, rice and grains	100 %		-		94.7
13 Fresh and frozen meat, poultry, fish and similar					
14 Processed meat, poultry, fish and similar	66.7 %	52.4 %			
15 Fresh and frozen fruit, vegetables and legumes					
16 Processed fruit, vegetables and legumes	65.9 %		51.2 %	7.3 %	73.2
17 Sauces, dips and dressings	55.6 %			8.3 %	30.6 %
According to: WHO NPM (World Health Organization Nutrient Profile Model) Color scheme: 0 – 24.9 % (red), 25 – 49.9 % (orange), 50 – 74.9 % (yellow), 75 – 100 % (green)					

Table 12: Share of products exceeding the WHO NPM's nutrient and ingredient criteria (Influencer YouTube)

Share of products <u>exceeding</u> the WHO NPM's nutrient and ingredient criteria (Influencer YouTube):					
	Total fat	Saturated fat	Total sugar	Added sugar	Salt
Frequency total:	9.7 %	4.3 %	14.1 %	19.6 %	12.9 %
1 chocolate and sugar confectionary					
2 Cakes, sweet biscuits and pastries					
3 Savoury snacks				100 %	84.6 %
4.1 Beverages - Juices					
4.2 Beverages - Milk drinks	41.2 %			100 %	
4.3 Beverages - Energy drinks					
4.4 Beverages - Other				64.7 %	
5 Edible ices					
6 Breakfast cereals	12.5 %		100 %		-
7 Yoghurts, sour milk, cream , …	66.7 %	66.7 %	13.3 %		-
8 Cheese	75.0 %				40.0 %
9 Ready-made and convenience foods	40.8 %	26.8 %	87.3 %		40.8 %
10 Butter and other fats and oils		50.0 %			6.3 %

11 Bread, bread products and crisp breads	3.7 %		100 %		55.6 %
12 Fresh or dried pasta, rice and grains	-		100 %		5.3 %
13 Fresh and frozen meat, poultry, fish and similar					
14 Processed meat, poultry, fish and similar	33.3 %	47.6 %			
15 Fresh and frozen fruit, vegetables and legumes					
16 Processed fruit, vegetables and legumes	34.1 %		48.8 %	92.7 %	26.8
17 Sauces, dips and dressings	44.4 %			91.7 %	69.4
According to: WHO NPM (World Health Organization Nutrient Profile Model) Color scheme: 0 – 24.9 % (green), 25 – 49.9 % (yellow), 50 – 74.9 % (orange), 75 – 100 % (red)					

HFSS products

When looking at the percentage of HFSS (high in fat, sugar and salt) products that exceeded the thresholds for one to all three of these nutrients, the comparison between social media platforms and brands and influencers revealed the following:

Table 13: Comparison of HFSS products presented across platforms and brands and influencers

Platform	Marketing	Percentage of HFSS products shown
Instagram	**Brands**	28.7 %
	Influencer	12.8 %
YouTube	**Brands**	37.6 %
	Influencer	26.3 %

Brands showed a higher percentage of HFSS product content than influencers (26.3 %), particularly on YouTube with 37.6 %. The lowest HFSS content was shown by influencers on Instagram with 12.8 %, compared to brands with 28.7 %. This is consistent with the results presented in chapter 4.3. regarding the percentages of permitted and not permitted products.

The following tables show more detailed results, divided between platforms and brands and influencers:

Table 14: Share of HFSS (high in fat, sugar and/or salt) products (WHO NPM) (Brand Page Instagram)

Share of HFSS (high in fat, sugar and/or salt) products (WHO NPM) (Brand Page Instagram):	
	Percentage:
No HFSS product	29.8 %
HFSS product	28.7 %
Product high in fat and sugar	2.9 %
Product high in fat and salt	0.4 %
Product high in sugar and salt	9.8 %
Product high in fat	3.6 %
Product high in sugar	20.6 %
Product high in salt	1.5 %

Table 15: Share of HFSS (high in fat, sugar and/or salt) products (WHO NPM) (Brand Channel YouTube)

Share of HFSS (high in fat, sugar and/or salt) products (WHO NPM) (Brand Channel YouTube):	
	Percentage:
No HFSS product	21.5 %
HFSS product	37.6 %
Product high in fat and sugar	2.7 %
Product high in fat and salt	1.6 %
Product high in sugar and salt	6.5 %
Product high in fat	4.3 %
Product high in sugar	23.1 %
Product high in salt	2.2 %

Table 16: Share of HFSS (high in fat, sugar and/or salt) products (WHO NPM) (Influencer Instagram)

Share of HFSS (high in fat, sugar and/or salt) products (WHO NPM) (Influencer Instagram):	
	Percentage:
No HFSS product	59.5 %

HFSS product	12.8 %
Product high in fat and sugar	3.0 %
Product high in fat and salt	0.9 %
Product high in sugar and salt	1.0 %
Product high in fat	0.2 %
Product high in sugar	6.4 %
Product high in salt	-

Table 17: Share of HFSS (high in fat, sugar and/or salt) products (WHO NPM) (Influencer YouTube)

Share of HFSS (high in fat, sugar and/or salt) products (WHO NPM) (Influencer YouTube):	
	Percentage:
No HFSS product	36.1 %
HFSS product	26.3 %
Product high in fat and sugar	3.4 %
Product high in fat and salt	1.7 %
Product high in sugar and salt	7.3 %
Product high in fat	3.3 %
Product high in sugar	18.3 %
Product high in salt	1.0 %

4.3.4. Alcohol exposure

Alcoholic beverages were only shown or mentioned by influencers on the platform YouTube. Out of a total of 1039 food and beverage cues, 50 (4.8 %) of them were identified as alcohol. Brands overall and the platform Instagram did not show alcoholic beverages in their posts and videos.

5. Discussion

Brands and influencers on social media, with their high numbers of and engagement with their followers, do have a big impact on the food preferences, intentions to buy and other lifestyle habits of children and adolescents. This study revealed that 80 % of the food marketing that children and adolescents in German-speaking countries are exposed to on the social media platforms Instagram and YouTube is actually classified by the WHO as not permitted for marketing to this age group because of its high sugar, fat and salt content (WHO, 2015b). High consumption of HFSS foods can increase the risk of obesity and lead to other negative health outcomes, such as heart disease, diabetes, etc. (WHO, 2024) There is strong evidence in the literature (Coates et al., 2019a; Folkvord et al., 2016; Kanoski & Boutelle, 2022) of a link between exposure to HFSS food marketing and consumption of these foods, further raising awareness for more regulatory tools (WHO, 2024). HFSS foods and beverages were present in more than a third of influencer or brand content on Instagram or YouTube. Nutrient thresholds for sugar, fat and salt contents were met in less than a quarter of cases. More than 70 % of the foods and beverages featured exceeded the given thresholds. Another risk factor was the presence of alcoholic beverages in 5 % of the influencer's YouTube videos, as alcohol consumption under the age of 16 is legally prohibited and should therefore be communicated responsibly (Österreichische Jugendinfos (Hrsg.), 2022).

The goal of this study was to provide an overview of the landscape of food marketing on social media in German-speaking countries, with a focus on children and adolescents as the target group. The results should raise awareness of the obesogenic environment the population is exposed to and to put pressure on the Austrian government to set targets to decrease the number of HFSS foods in marketing, especially social media food marketing.
The following discussion combines the results of the study by Winzer et al. (Bundesministerium für Soziales, Gesundheit, Pflege und Konsumentenschutz et al., 2023) with existing literature, dietary assessments and guidelines from public health organizations worldwide.

5.1. Nutritional quality of foods and beverages

As already mentioned in the background chapter, marketing and advertising of HFSS foods and beverages is increasing and supporting (childhood) obesity (Bundesministerium für Soziales, Gesundheit, Pflege und Konsumentenschutz, 2021; Coates et al., 2019a; B. A. Swinburn et al., 2009; WHO, 2022a).
Using the WHO “Internet Coding Templates V2 2020” made it possible to categorize the cues in the Instagram posts and YouTube videos as either “permitted” or “not permitted” for marketing to children and adolescents.
While no significant difference was found between food marketing by brands and influencers on YouTube, there was a significant difference of 32% in the presentation of items classified as “not permitted” my brands on Instagram.
In line with current evidence, this content analysis also showed that nutritionally poor foods dominate children’s digital food environments:
A study from Mexico (Valero-Morales et al., 2023) also investigated the landscape of food marketing by brands on social media platforms such as Facebook, Instagram and YouTube and its impact on preferences, purchasing and eating habits. They also based their content analysis on the WHO monitoring protocols and used the WHO NPM to classify the promoted products as permitted or not-permitted for marketing to children and adolescents. 93 % of their cues were classified as “not permitted” and therefore should not be promoted to children and adolescents (Valero-Morales et al., 2023). These results do match with the data collected from German-speaking countries above (WHO, 2015b, 2020b)
Comparing the influencer food marketing landscape with data from 2021, where Winzer et al. (Winzer et al., 2022a) already assessed the impact of food and beverage cues on social media on adolescents, it was and still is prevalent that more than two-thirds of products shown are considered as not-permitted for marketing to children and adolescents, according to the WHO NPM (Winzer et al., 2022a).
These high numbers of exposure can be highlighted as part of the obesogenic environment children and adolescents are affected by, that influences them into wanting, buying, and consuming more HFSS products, which puts them at higher

risk for obesity, diabetes, heart-disease etc (WHO, 2022b). With intentions to restrict the marketing of not-permitted items and positively highlighting and promoting unprocessed, permitted foods and beverages, the health risks could be decreased massively (WHO, 2023). This could not only benefit the health of the population, but also relieve the health care system and decrease treatment expenses (WHO & UNICEF, 2023).

5.2. Top three most presented food categories

The food marketing landscape on social media, regardless of whether brands or influencers are promoting the products, is not as consistent as expected. The majority of foods and beverages presented by brands in their top three, such as “chocolate and sugar confectionary”, “beverages - juices” and “ready-made and convenience foods”, were not permitted for marketing to children or adolescents, while the number one food category promoted by influencers was one of the permitted categories “fresh or frozen fruit, vegetables or legumes”.
Similar data, regarding the dominance of not permitted food categories, was evaluated by Mertens et al. (Mertens et al., 2022) where the top three most consumed HFSS foods in Europe were fine bakery wares, sausages and composite dishes (same as “ready-made and convenience foods”), followed by a high consumption of bread products, chocolate and breakfast cereals, which matches the results of this study. Mertens et al. also observed changes in the amount of daily energy coming from HFSS foods over the lifetime, within six European countries. Austria showed the most significant change with a decrease of 15 % for women and 13 % for men. Women did show a slightly bigger decrease in all countries that were highlighted. Reasons for these changes were not mentioned (Mertens et al., 2022). This demonstrates that there are possibilities to make the shares decline comprehensively in the future.

5.3. Total and added sugar content

This study, did not collect the actual intake of these products by the target group, but the results can be compared with the findings of the EsKiMo II study by the German Robert-Koch-Institute. This study collected information on the food and beverage intake of children and adolescents in Germany between 2015 and 2017. Added sugars accounted for approximately 20 % of the total daily energy intake (Robert-Koch-Institut, 2017), which is twice the amount recommended by the WHO (WHO, 2015a). The majority of children and adolescents exceeded the recommendation to have a max. of 10 % of the total daily energy intake come from added sugar by at least 150 % (Robert-Koch-Institut, 2017). This leads to the assumption that the intakes in Austria and other German-speaking countries may be at least as high.

As already mentioned in chapter 4.3.2.1., the food categories with the highest added sugar content were “chocolate and sugar confectionary”, “cakes, sweet biscuits and pastries”, “breakfast cereals”, as well as “beverages – juices” and “energy drinks” for the drinks categories. These results are similar to those from the German researchers M. Düren and M. Kersting, who not only analyzed the most frequently promoted food and beverage categories in Germany, but also their sugar content. They focused on products, which are especially targeted to children, i.e. by using a licensed character (M. Düren, 2003). Products especially targeted to children have a strong impact on their interest in these foods (Mulligan et al., 2023). Their results for food categories with the highest added sugar content do show similar results, as the sugar content in drinks per portion exceeded the recommendations by around 100 % and the contents in breakfast cereal by up to 80 % (M. Düren, 2003). This is alarming, as children are a vulnerable target for marketing concerning nutritionally poor foods and beverages, without knowing and thinking about the health consequences (Rozendaal et al., 2010).

5.4. Total and saturated fat content

According to the data from EsKiMo II children and adolescents the median total fat consumption was 3 % higher than the recommended 30 % of total daily energy. The composition of the different fatty acids was also not ideal. The intake of saturated fat was too high, the intake of monosaturated fatty acids was in the range and the intake of unsaturated fatty acid intake was too low for the age group. This is because the main food groups contributing to fat intake, were processed meats, sweets, cakes and dairy products (Robert-Koch-Institut, 2017). The same categories were most promoted in this study, supporting the notion, that there is a link between the marketing of HFFS foods and the total and saturated fat intake (Coates et al., 2019a; De Menezes et al., 2023; Russell et al., 2019).

Galvan-Portillo et al. conducted a cross-sectional study, using a semi-quantitative FFQ, to characterise eating patterns in Mexican children and adolescents aged 5 -15 years old. Three patterns were identified by cluster analysis: *"diverse dietary pattern, high fat dietary pattern and high sugar dietary pattern"* (Galvan-Portillo et al., 2018). 36 % of the 878 participants were followed the high fat pattern, resulting in a median total fat consumption of 35 % and a saturated fat consumption of 33 % instead of the recommended maximum of 30 % and 10 % (D-A-CH (Hrsg.), 2015; DGE, 2015). In addition, low parental occupation and high amounts of screen time were positively correlated with following the high-fat eating pattern (Galvan-Portillo et al., 2018),

The same associations with high media consumption were described in a systematic review by De Menez et al. (De Menezes et al., 2023). They analysed 16 different studies, evaluating dietary patterns of children and adolescents. Two different patterns ("healthy" and "unhealthy") were defined. Dietary patterns containing mostly UPF, high in fat, sugar and/or salt, were considered as "unhealthy", previously described as nutrient-poor. Screen time was strongly associated with the category "unhealthy dietary pattern". The longer the screen time, the higher the consumption of foods high in fat or sugar (i.e. crisps, cookies, etc.) (De Menezes et al., 2023). This has already been confirmed in previous

literature (E. Boyland & Tatlow-Golden, 2017; Cairns et al., 2013; Villegas-Navas et al., 2020; WHO, 2022a).

5.5. Salt content

The recommended daily maximum salt intake is 5 – 6 g (< 2 g of sodium) for adults, and only 2 g of salt (0.8 g sodium) for children. Actual daily salt intake in Europe is between 8 and 19 g per day, well above the recommendations. Contributing to this are processed foods, such as savory snacks, ready-made/convenience/fast foods, bread, deli meats and cheese (WHO, 2022d). These food groups, as well as the categories “processed fruit, vegetables and legumes” and “sauces and dips" were found to have the highest salt content in this study. Compared with the WHO sodium benchmarks (WHO, 2021) the food categories “savory snacks” and “bread products” had a higher mean sodium content than recommended. The sodium benchmark for savory snacks is set at 280 – 760 mg per 100 g and the mean sodium content of this category in the study was calculated at 804 mg per 100 g. Bread products exceeded the benchmarks of max. 330 mg per 100 g by almost 200 %.
There’s evidence that the tolerance, liking and preference for salt in food are not innate, but developed throughout life. Studies show that the more children are exposed to and consume high-salt foods, the more they accept and like the taste. Their taste preferences and tolerance for salt increase, leading to higher salt intake (Liem, 2017). It is recommended to keep salt intake low in early childhood and to keep an eye on salt consumption in adulthood. Risks of high salt intake include high blood pressure and cardiovascular disease. There may also be a higher risk for developing kidney disease, osteoporosis and colon cancer (BfR - Bundesinstitut für Risikobewertung, 2023; Liem, 2017). The WHO has set targets for reformulating foods to lower sodium levels, standardising sodium targets and improving sodium labelling (WHO, 2021).

5.6. Nutritional thresholds met or exceeded

Tables 5 – 12 in chapter 4.3.3. analyse the percentages by which defined food groups meet or exceed the thresholds set by the WHO NPM. The proportions of products were further divided into four quartiles, which were also highlighted with a colour scheme from green to red, according to their positive or negative outcome in meeting or exceeding the nutrient thresholds for total/saturated fat, total/added sugar or salt per 100 g. This made it possible to further highlight the amounts of critical nutrients in products promoted to children and adolescents. In most cases, the recommended amounts in products and the intakes of the target group were higher. Only about a quarter or less of the foods and beverages presented met the criteria. In particular, products presented by brands met the thresholds by 80 % on average, compared to 75 % for influencers. This may correlate with the findings of high levels of promotion of foods that are not permitted for marketing, according to the WHO (WHO Europe, 2023). What influencers showed on their platforms were not only branded and processed HFSS foods, but also fresh foods such as fruit and vegetables. Research has already shown, that specific combinations of fat, sugar and salt lead to greater liking and consumption. The so-called “bliss point” is thought to be the point at which food tastes best to most consumers. The food industry uses this knowledge across all sectors to develop ultimate products. The sensory profile of these foods, makes consumers like them and eat more of them. It is sometimes described as making the food “addicting”, where people can’t stop eating it. This is due to the release of endorphins and the rewarding feeling that this blissful taste gives the consumer (Wildt, 2016).

Knowing, that most products presented in food marketing are not compliant with the WHO nutrient thresholds, this leads to action plans on reformulating these products to make them more suitable for consumption. Research by Holliday N. et al. (Holliday et al., 2024) recalculated the results by incorporating various reformulation options. By reducing the energy, fat, sugar and/or salt content in selected foods and beverages (i.e. bread, breakfast cereals, processed meat and fish) by around 30 %, the number of products, permitted by the WHO according

to their nutritional profil increased by up to 50 %. This was particularly the case in categories such as convenience foods, yoghurt, and bread (Holliday et al., 2024). The researchers believe, that their hypothetical reformulations are feasible to implement within the food sector in Germany. The German government has already published strategies to reduce the consumption of sugar, fat and salt. Plans include promoting nutrient-dense food choices through education, regulating the food marketing landscape and focusing on reformulation and low-energy sugar alternatives and non-nutritive sweeteners (Bundesministerium für Ernährung und Landwirtschaft, 2018).

5.7. Interpretation of the amount of alcohol exposed

Alcoholic beverages were present only in 5 % (n = 50 cues) of the content posted by influencers on YouTube. Branded content did not include any alcoholic beverages. One explanation for this could be that these products were mostly present in the influencers' vlogs, where they show their everyday life. As most of them are young adults themselves, alcohol might play a role in their lives, especially on the weekends or at social gatherings. However, as the majority of their followers is mostly under the legal drinking age, this exposure and presence of alcoholic beverages is alarming. The Austrian Advertising Council (german: Werberat) defines itself as a body of voluntary self-regulation to maintain and strengthen consumer confidence in commercial communication. One of the statutes in the code of ethics of the Austrian Advertising Council is that children and adolescents must not be exposed to any physical or psychological harm. Alcohol is an example of undesirable product placement in advertising aimed at children. Unfortunately, compliance with these statutes is considered voluntary (Österreichischer Werberat, 2021). Advertising that causes concern can be reported and may will be discussed with the marketing provider. Advertising of alcohol may make it more attractive to young people and lead them to start drinking earlier and more often. The influence of their role models on social media is strong, as already mentioned. In 2022 the Austrian Advertising Council published a summary of all the complaints they had dealt with in the previous year. They found a slight increase in complaints (503 complaints, an increase of

90 compared to the previous year), but fewer decisions to stop the campaigns altogether. Only one of the complaints concerned alcohol. This shows, that not all the complaints made by consumers were about the ethics of advertising (Österreichischer Werberat, 2023).

5.8. Possible strategies

Germany has already developed strategies to reduce the amount of sugar, fat or salt in ready-made and convenience products (Bundesministerium für Ernährung und Landwirtschaft, 2018). The existing nutrient thresholds, provided by the WHO, could also provide guidance to manufacturers on how to change their product formulations (WHO Europe, 2023). With UPFs already accounting for around 27 % European's daily energy intake (Mertens et al., 2022), reformulation could be one of the tools to tackle the obesity crisis. However, replacing i.e. sugar with low-calorie sweeteners may not be the perfect solution, as the scientific evidence on health outcomes of these sweeteners is still conflicting. In particular, the impact on the gut microbiome is unknown (Conz et al., 2023). The reduction of trans-fats to a maximum of 2 % (European Union, 2019) and the setting of limits for salt content in bread to a maximum of 1.7 % per kilogram (Verbraucherzentrale NRW, 2014) have already been successfully implemented, giving hope that other nutrients will be better regulated in the future too,

In line with the focus of this study the best strategy to start with, and to combine with the plans for reformulation, will be to better regulate marketing provided to children and adolescents. The WHO has already defined action plans for countries worldwide to help change the food environment and protect children from harmful food marketing that contributes to rising obesity rates (WHO, 2022b). Unfortunately, the guidelines are not yet backed up by legislation and each country continues to self-regulate its food marketing landscape. As mentioned in chapter 2.2.3. it seems necessary to implement binding measures in order to achieve effective results soon (WHO, 2023).

Preferences, tastes and purchasing behaviors develop early in life and can be influenced not only by family and friends, but also by social media. Brands and

especially influencers now have a lot of power and influence on eating, drinking and lifestyle behaviours of their followers. A study by De Jans et al. (De Jans et al., 2021) showed, that influencers can also be used to promote healthy eating. When their followers see what their idol eats, drinks or does, they may be motivated to mirror that behavior. Exposure to an influencer with a sedentary lifestyle and negative health behaviors was shown to encourage children to choose a healthier snack. This could be because they were confronted with the effects of an unhealthy lifestyle and food choices. This should not indicate that only influencers with a sedentary and unhealthy lifestyle are able to influence children and adolescents into choosing healthier choices. It is expected that any influencer with a good emotional connection to their followers will be able to make them want to mirror their behaviour. Governments should therefore try to work together with influencers with large followings to encourage children and adolescents to make healthier lifestyle choices (De Jans et al., 2021).

The obesogenic environment and children's wellbeing could be monitored and regulated not only by governmental institutions, but also by other monitoring bodies and agencies, such as public health institutions, media agencies, child and consumer protection organisations, schools etc. A multidisciplinary approach is likely to be most effective (WHO, 2023).

5.9. Limitations, strengths and weaknesses

This study is a content analysis, which limits its representativeness of effects. However with its high number of codings and the one year of coding, it supports previous evidence of the dominance of HFFS foods on social media (foodwatch e. V., 2021; WHO, 2022a; Winzer et al., 2022a). The study only represents German-speaking countries, but by using the WHO NPM it can be compared with similar studies from other countries and regions worldwide. As actual dietary intake was not measured, the results need to be combined with existing dietary analysis, to provide an insight into the eating habits of children and adolescents. Although only two popular social media platforms, Instagram and YouTube, were included, this combination of picture- and video-focused platforms provides a

good overview on the marketing landscape. Previous studies have already shown evidence of a strong correlation between the exposure to HFSS food marketing and subsequent higher intake of the presented foods and beverages afterwards (Coates et al., 2019a; Russell et al., 2019; Sadeghirad et al., 2016). By providing information on the two marketing tools of exposure and power, these findings may help to further raise awareness for policy reforms regarding food marketing to children.

6. Conclusion and Outlook

Data was collected on the food marketing landscape to which children and adolescents in German-speaking countries are exposed. With around 80 % of prohibited products, according to the WHO, being shown on the social media platforms Instagram and YouTube, the findings reveal a major determinant for (childhood) obesity. The level of exposure to HFSS foods and beverages on these platforms and the power of brands and influencers to influence behaviour, is receiving increasing attention. Action plans are needed to create a health-promoting environment on social media platforms. Previously published policy briefs and guidelines from the WHO and UNICEF do provide a good starting point (WHO, 2022b; WHO & UNICEF, 2023). They give practical directory for governments to create a better marketing environment for children and adolescents worldwide.

In 2023, the German Federal Ministry of Food and Agriculture presented a plan for new legislation to better regulate food marketing to children and adolescents (BMEL, 2023). Germany could set an example for other countries to take action in improving regulation and make a nutritious, health-promoting diet more visible and attractive to children and adolescents.

By the time this thesis was submitted in August 2024, no final decisions had been made on new legislation in Germany or Austria. But there’s hope, that the work of Winzer et al. brings up discussions again.

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8. Appendix:

Zusammenfassung (German)

List of brands selected

- Table 18: List of brands selected on Instagram
- Table 19: List of brands selected on YouTube

List of influencers selected

- Table 20: List of influencers selected on Instagram
- Table 21: List of influencers selected on YouTube

Zusammenfassung

Fettleibigkeit hat sich weltweit zu einer der größten gesundheitlichen Herausforderungen entwickelt. In Österreich sind mehr als die Hälfte der Bevölkerung und jedes dritte bis fünfte Kind von Übergewicht oder Fettleibigkeit betroffen, was sie einem erhöhten Risiko für Erkrankungen wie Bluthochdruck, Diabetes und andere chronische Krankheiten aussetzt (STATISTIK AUSTRIA, 2019). Häufig entsteht Fettleibigkeit bereits in jungen Jahren und bleibt bis ins Erwachsenenalter bestehen. Die Umgebung, in der Kinder und Jugendliche mit Lebensmitteln und Getränken in Kontakt kommen, sowie ihre Gewohnheiten, Vorlieben und das Verhalten ihres sozialen Umfelds, prägen ihren späteren Lebensstil. Zahlreiche Studien unterstützen die Annahme, dass es einen Zusammenhang zwischen hohem Medienkonsum und höherem Körpergewicht gibt (BMSGPK, 2021).

In Zusammenarbeit mit den Forschern Winzer E. et al. von der Medizinischen Universität Wien wurde eine Analyse der Lebensmittelwerbung, die sich an Kinder und Jugendliche in deutschsprachigen Ländern richtet, speziell auf den Social-Media-Plattformen Instagram und YouTube durchgeführt. Die Analyse unterschied zwischen Marketingmaßnahmen von Marken oder Influencern. Die Ergebnisse zeigten, dass etwa 80 % der beworbenen Lebensmittel und Getränke für Kinder und Jugendliche nicht den von der Weltgesundheitsorganisation (WHO) festgelegten Richtlinien entsprachen (WHO, 2020b). Es wurde festgestellt, dass Marken häufiger Lebensmittel mit hohem Gehalt an Fett, Zucker und/oder Salz (HFSS) bewarben als die ausgewählten Influencer. Darüber hinaus überschritten die meisten Lebensmittelgruppen die Nährstoffgrenzwerte für Zucker, Fett und Salz. Influencer auf YouTube zeigten den höchsten Anteil an Produkten, die diesen Grenzwerten entsprachen, präsentierten jedoch auch den höchsten und ausschließlich alkoholhaltigen Inhalt. Diese Ergebnisse verdeutlichen die Notwendigkeit eines weiteren Dialogs über Lebensmittelwerbung auf Social-Media-Plattformen. Es wird empfohlen, bestehende Richtlinien und Vorschriften zu überarbeiten, um die Werbung für Lebensmittel und Getränke, die zur Fettleibigkeit beitragen, insbesondere bei Kindern und Jugendlichen, wirksamer zu kontrollieren.

List of brands selected:

Instagram:

Table 18: List of brands selected on Instagram

Brand:	Handle on social media:
Mc Donalds	Mcdonalds_austria
Burgerking	Burgerkingaustria
Nordsee	Nordsee_deutschland
Soletti	Joe_soletti
Kelly's	Kellys_austria
Pringles	Pringles_de
Iglo	Igloo_oesterreich
Knorr	Knorroesterreich
Efko	Efko.at
Felix	Meinfelix
Heinz	Heinz_deutschland
Darbo	Darbo_official
Nutella	Nutella.de
Inzersdorfer	Inzersdorfer_original
Vier Diamanten	Vierdiamenten
Ja!Natürlich	Ja_natuerlich
Chiquita	Chiquitabanana
Zurück zum Ursprung	Zurueckzumursprung
Spar	Spar_oesterreich
Vöslauer	Voeslauermineralwasser
Rama	Rama_de
Waldquelle	Waldquelle_at
Redbull	Redbullaustria
Innocent	Innocentdeutschland
Pago	Pago_fruchtsaft
Coca Cola	Cocacola_at
Almdudler	Almdudler
Fanta	Fantaaustria
Rauch	Rauch_fruchtsaft
Nestea	Nestea
Ölz	Oelzmeisterbaecker
Kelloggs	Kelloggs_de
Nesquik	Nesquikde

Recheis	Recheis_nudeln
Ben's	Bensoriginalde
Schärdinger	Schaerdinger.at
Philadelphia	Philadelphia_deutschland
Nöm	Noembleibfrisch
Fruchtzwerge	Fruchtzwerge_de
Milka	Milka_at
Kinder	Kinder_riegel.de
Kitkat	Kitkat_austria
Manner	Mannerfriends
Oreo	Oreo_deutschland
Haribo	Haribo_deutschland
Ricola	Ricola_de
Dany von Danone	danyvondanone

YouTube: (number smaller, because not every brand uses YouTube)

Table 19: List of brands selected on YouTube

Brand:	Handle on social media:
Mc Donalds Österreich	McDonaldsAT
Burger King Österreich	Burgerkingoesterreich7258
Iglo Österreich	igloOesterreich
Hofstädter	Hofstadter179
Efko	Efko_at
Heinz Deutschland	HeinzDeutschland_de
Inzersdorfer	Inzersdorfer-allesisstgut444
Ja!Natürlich	Janatuerlich2008
Chiquita	OfficialChiquita
Zurück zum Ursprung	Zurueckzumursprung
Spar Österreich	SPAROesterreich
Vöslauer Mineralwasser	Voeslauer
Waldquelle_at	Waldquelle2013
Pago Fruchtsäfte	Pagofruchtsaft1230
Coca Cola Austria	CocaColaAustria
Almdudler	Almdudler
Rauch Fruchtsäfte	RauchFruchtsaefte
Ölz Meisterbäcker	OelzMeisterbaecker

Recheis	Recheis5291
Barilla Deutschland – Österreich – Schweiz	BarillaDeutschland
Schärdinger	Schaerdingertv
Danone D-A-CH	DanoneDeutschland
Milka	Milka
Manner	MANNERmagmaneben
Haribo Deutschland	Haribo_deutschland

List of influencers selected:

Instagram:

Table 20: List of influencers selected on Instagram

Real name:	Handle on social media:
Fabio Wibmer	wibmerfabio
Dominic Thiem	domithiem
Marcel Dähne	ksfreak
Victoria Steiner	victoriavs
Giannis Antetokounmpo	giannis_an34
Sarina Hütter	sarina_vs
Mesut Özil	m10_official
Bianca Claßen	bibisbeautypalace
Thomas Müller	esmuellert
Pamela Reif	pamela_rf

YouTube:

Table 21: List of influencers selected on YouTube

Real name:	Handle on social media:
Fabio Wibmer	Wibmerfabio
Marcel Dähne	Ksfreakwhatelse
Victoria Steiner	VictoriaSarina
Sarina Hütter	
Sascha Huber	SaschaHuber
Kim Lianne	KimLianne
Bianca Claßen	BibisBeautyPalace
Luca Thilo Scharpenberg	laserluca
Pamela Reif	pamela_rf
Patrick Mayer	Paluten