Les interactions entre la concentration et la diversité des marchés, les engagements liés à l'environnement alimentaire et les pratiques associées des grandes entreprises alimentaires sur les marchés européens, belges et français

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The interplay between market concentration and diversity, food environment related commitments and associated practices of major food companies across European, Belgian and French markets

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ÉCOLE DOCTORALE
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Titre : Les interactions entre la concentration et la diversité des marchés, les engagements liés à l'environnement alimentaire et les pratiques associées des grandes entreprises alimentaires sur les marchés européens, belges et français

Mots clés : Industrie alimentaire, Environnements alimentaires, Évaluation de l'impact sur les entreprises, Structure du marché, Offre de produits

Résumé : Pour mieux comprendre comment les industries alimentaires modifient les environnements alimentaires européens, leurs actions ont été évaluées d'un point vue économique et de santé publique. La concentration et la diversité du marché, les engagements liés à l'environnement et les pratiques associées ont été notamment examinés au regard de leurs implications politiques. Il s'est avéré que les catégories de produits les plus vendues ainsi que les principales industries étaient similaires en Europe avec des marchés de produits modérément voire fortement concentrés. Cela peut être préoccupant car une concentration accrue et une diversité réduite du marché ont permis de prédire une augmentation des ventes de produits ultra-transformés. Les engagements de l'industrie étaient en deçà des recommandations des politiques. Les pratiques des entreprises étaient en grande partie malsaines. Des engagements plus forts ne se traduisent pas nécessairement en des pratiques plus saines. Ces résultats suggèrent une nécessité urgente de réglementation pour guider, surveiller et soutenir l'industrie pour améliorer les environnements alimentaires.

Title : The interplay between market concentration and diversity, food environment related commitments and associated practices of major food companies across European, Belgian and French markets

Keywords : Food industry, Food environments, Business impact assessment, Market structure, Food supply

Abstract : To improve our knowledge on how the food industry affects European food environments, an assessment from both an economic and a public health perspective was conducted. Market concentration and diversity, food environment related commitments and associated practices were considered together with policy implications. It was found that most sold product categories as well as major food and beverage manufacturers were similar across Europe with moderately to highly concentrated product markets. The latter may be of concern as increased market concentration and reduced market diversity were able to predict increased sales of ultra-processed food products across Europe. Company commitments fell short of recommended policies. Company practices were largely unhealthy. There was no indication that stronger commitments translated into healthier practices. Results suggested an urgent need for government regulation to guide, monitor and support food industry efforts to improve food environments.

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LIST OF ABBREVIATIONS

Abbreviation	Definition
ATNF	Access to Nutrition Foundation
ATNI	Access To Nutrition Index
BIA	Business Impact Assessment
BIA-Obesity	Business Impact Assessment on Obesity and population-level nutrition
BMI	Body Mass Index
CGF	Consumer Goods Forum
COSI	WHO European Childhood Obesity Surveillance Initiative
CR4	Four firm concentration ratio
CSR	Corporate Social Responsibility
ENL	Evolved Nutrition Label
ESM	European Single Market
EU	European Union
Food-EPI	Healthy Food Environment Policy Index
FOP	Front-of-pack
GBO	Global Brand Owner
GDP	Gross Domestic Product
GNPD	Global New Products Database
HHI	Herfindahl-Hirschman Index
IFBA	International Food and Beverage Alliance
INFORMAS	International Network for Food and Obesity / Non-communicable Diseases (NCDs) Research, Monitoring and Action Support
MS	Market share
NBO	National Brand Owner
NCDs	Non-Communicable Diseases
QSR	Quick-Service Restaurant(s)
RTD	Ready-to-drink
SDGs	Sustainable Development Goals
SMART	Specific, Measurable, Achievable, Relevant and Time bound
WHO	World Health Organisation
WHO-model	World Health Organisation Regional Office for Europe nutrient profile model

TABLE OF CONTENTS

LIST OF PAPERS AND REPORTS INCLUDED

Published

- *Van Dam, I., Wood, B., Sacks, G. et al. A detailed mapping of the food industry in the European single market: similarities and differences in market structure across countries and sectors. Int J Behav Nutr Phys Act 18, 54 (2021). https://doi.org/10.1186/s12966-021-01117-8.*

- *Vandevijvere, S., Van Dam, I. The nature of food promotions over one year in circulars from leading Belgian supermarket chains. Arch Public Health 79, 84 (2021). https://doi.org/10.1186/s13690-021-00591-7.*

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Under review

- *Van Dam, I., Allais, O., Vandevijvere, S. Market concentration and the healthiness of packaged food and non-alcoholic beverage sales across the European single market. Public Health Nutrition.*

- *Van Dam, I., Vandevijvere, S. Benchmarking the nutrition-related commitments and practices of major French food companies. BMC Public Health.*

GENERAL INTRODUCTION AND THESIS OUTLINE

"We're not free in what we do, because we're not free in what we want."

- Dark, 2017

Let me tell you a story. A story that might sound familiar at first, but gets more complicated while we move along. A story that starts by who we are and what we eat and takes us all the way to the environment surrounding us. We all want to be healthy, have a healthy weight, look good, be happy with our body, yet sometimes this can be incredibly challenging. Without us being duly aware of it, we are surrounded by factors that determine our preferences, our cravings, our decision-making and eventually our health: food availability, food prices, food advertisements, food formulation, food accessibility and food labelling. All different factors within our environment, but they have one thing in common, they are beyond our control and are largely determined by food industry players. Alongside these food industry players, there are other important actors that influence food environments, such as the government and society. The latter affects food environments through norms, beliefs and preferences. The government however determines the boundaries in which the food industry operates and as such can regulate the influence of the food industry players on food environments.

The overall aim of this thesis was to strengthen and improve our knowledge on how the food industry (i.e. packaged food and non-alcoholic beverage manufacturers, quick-service restaurants and supermarkets) influences European food environments. To do so, market concentration and diversity, as part of market structure analysis, food environment related commitments and associated company practices (using sales- and nutritional data) were analysed. The final goal was to highlight areas where company commitments and practices should be strengthened and where national and European policies could help improve the healthiness of food environments.

To reach this aim three research questions were formulated:

- What is the market structure and level of concentration/diversity of the European food industry and how does it affect food environments? (*Chapter II and Chapter IV*)
- How transparent, comprehensive and specific are the food environment related commitments made by the European food industry and how healthy are associated practices? (*Chapter III, Chapter V, Chapter VI*)
- How well do food environment related commitments translate into healthier practices? (*Chapter V, Chapter VI*)

These questions are answered across the different chapters of this thesis. **Chapter I** will introduce the concepts of food environments and related policies, the influence of the food industry on food environments and the 'Business Impact Assessment on Obesity and population-level nutrition' tool and process. **Chapters II, III and IV** will explain how the food industry at a European level influences markets and food environments through both market- and non-market activities. These chapters provide answers to our first research question regarding the associations between European market structures and the healthiness of food environments. They also take the first steps towards answering our second research question concerning the transparency, comprehensiveness and specificity of food companies' food environment related commitments and the healthiness of associated practices with a focus on publicly available commitments. **Chapter V and Chapter VI** consist of a case-study in Belgium and in France. They expand the answer to our second research question by providing food industry representatives with the opportunity to verify and complete the publicly available food environment related commitments. Importantly, these case-studies provide an answer to our third and final research question. Several company practices are assessed, using, among others, national branded food composition data to estimate the healthiness of company product portfolios. The correlations between commitments and practices are calculated. For the big finale of this thesis the abovementioned chapters are brought together in **Chapter VII,** which discusses the findings, formulates policy recommendations and highlights areas for future research.

An overview of the content per chapter can be found in Figure 1.

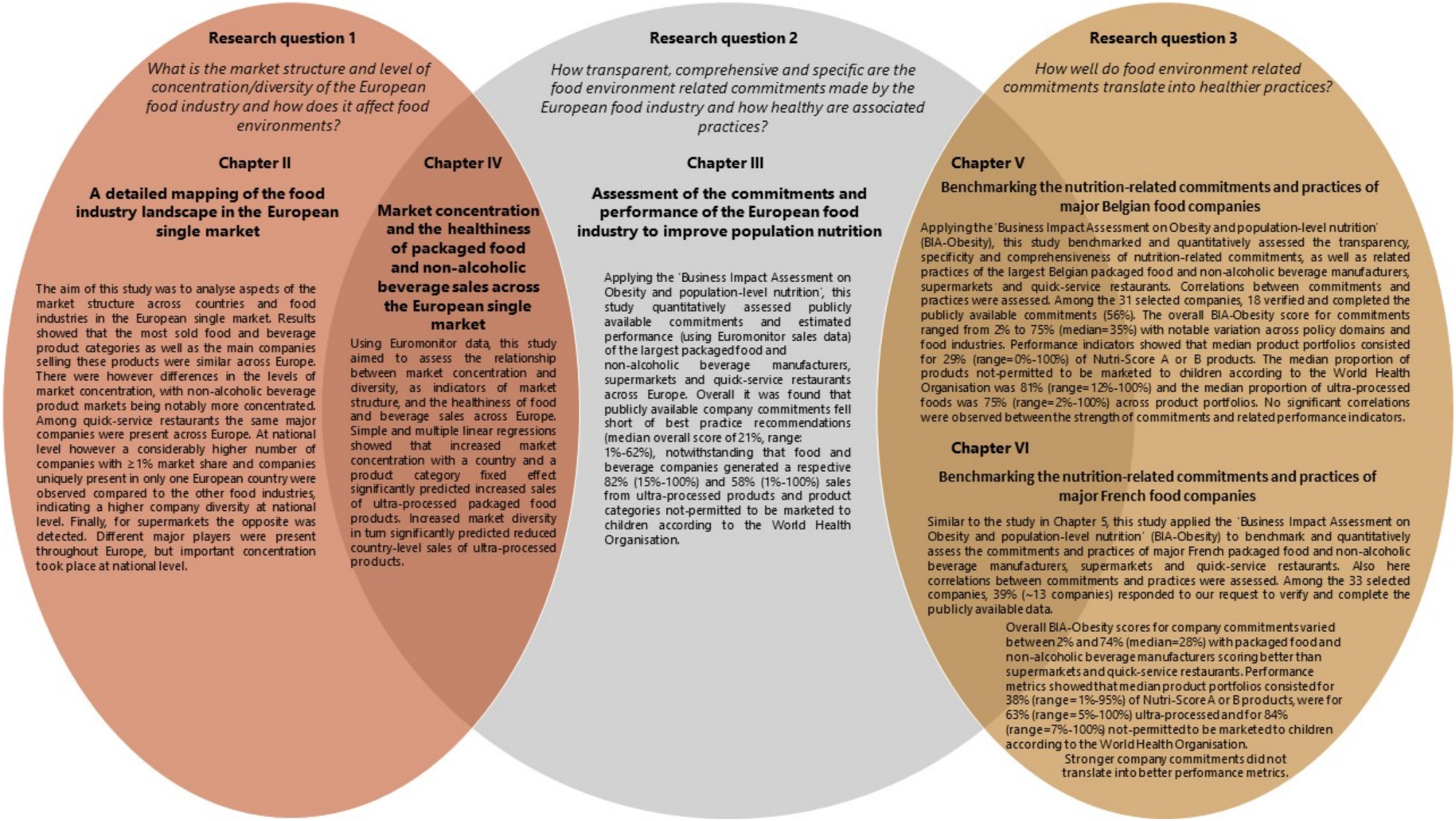


Figure 1: Thesis outline.

Chapter I Background

1.1 Overweight and Obesity

"Obesity is a normal response to an abnormal environment"

- Claudio Schuftan

- **Definition**

In its simplest form overweight can be defined as a Body Mass Index (BMI) above 25kg/m^2 and obesity as a BMI above 30kg/m^2. Both overweight and obesity are typically caused by a chronic imbalance between energy intake and energy expenditure (1). While overweight and obesity in itself are avoidable conditions, they reduce the quality of life and form a substantial risk for non-communicable diseases (NCDs) such as type II diabetes, heart diseases, musculoskeletal disorders and some cancers (1,2). Moreover, people with overweight and obesity are more prone to depression, discrimination at work, are often assumed to be lazier than people with a healthy bodyweight and regularly suffer from prejudice (3,4). Nonetheless, overweight and obesity are often seen as an individual problem caused by individual decisions (5,6). However, overweight and obesity are seldom a choice, it simply seems to happen.

- **Epidemiology**

According to WHO, on average 59% of the European adult population was considered to have overweight and 23% to have obesity in 2016, around double of what was observed in 1975. Significant country differences are observed with levels of overweight among adults ranging from 45% up to 67%. In Belgium and France levels of adult overweight and obesity were above the European average, for both countries standing at 60% and 22%, respectively (7). The data regarding obesity among seven to nine year old children, as observed by the WHO European Childhood Obesity Surveillance Initiative (COSI) in 2017 showed that overweight and obesity are certainly also of concern among children, with a prevalence of 28% and 11%, respectively (8). According to the national Belgian health survey in 2018, the prevalence of overweight and obesity among children aged two to four years old were similar to the European average, standing at 24% and 12%, respectively. The prevalence somewhat decreased for all Belgian children below the age of 18, with 19% having overweight and 6% having obesity (9). In France the prevalence in 2015 was notably lower than what was observed at European level, with 13% of the six to ten year olds having overweight and 2% having obesity. The same observation can be made when looking at French children aged six to 17 years old where the prevalence of overweight stands at 13% and obesity at 4% (10).

Overall it is estimated that numbers will further increase in 45 out of the 53 countries in the European region, including Belgium and France, with the prevalence of obesity rising up to 43% in some countries by 2025 (11). Nonetheless, the last COSI observed a decreasing trend in overweight and obesity among children in five European countries. Although the reduction in four of these countries (Greece, Italy, Portugal and Spain) is most likely because they had the highest baseline prevalence of overweight and obesity in the first and second round of COSI (8), the reduction in Slovenia may be attributable to initiatives in primary schools to include two additional hours of physical education and exclude foods with a low nutritional value from school menus (12). The question remains however, whether these decreasing trends can be maintained with the ongoing COVID-19 pandemic. Slovenia, who was managing to reverse the increasing trends in overweight and obesity, specifically among children, showed a surge in overweight and obesity between 2019 and 2020 (13).

- **Determinants**

Overweight and obesity are wicked problems, caused by many different interlinked factors. Figure 2 illustrates this complexity and highlights the interdependency of the underlying elements (14,15).

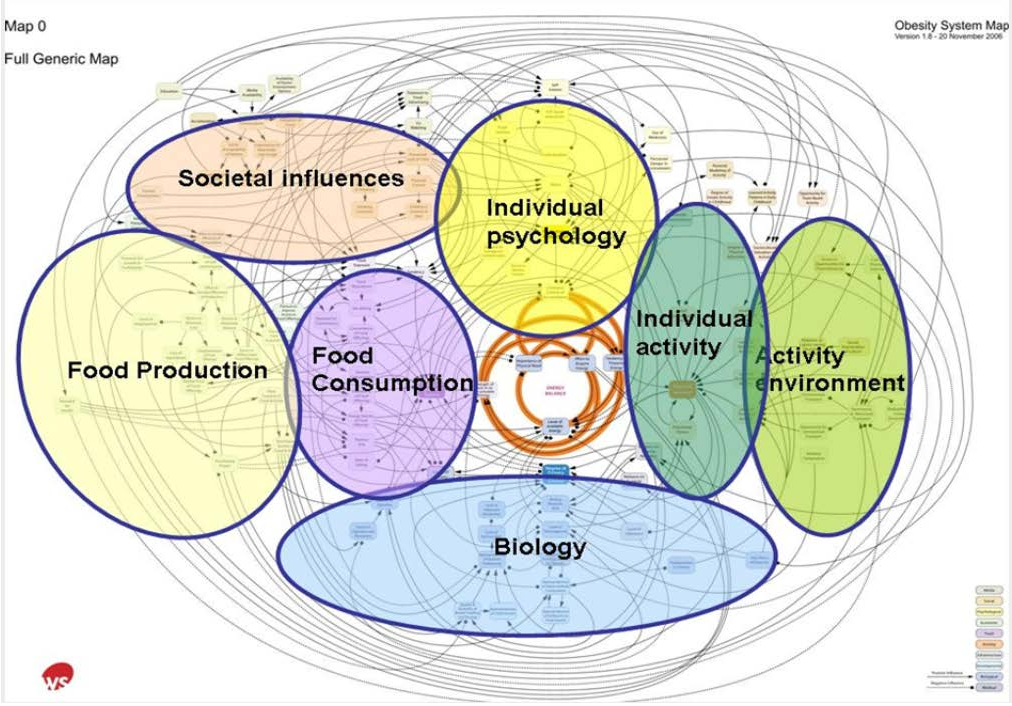


Figure 2: The obesity system map. *Source: Butland et al. 2007.*

Overweight and obesity aren't something some people are susceptible to and others are not. Everybody is at risk, yet some people more than others (5). Differences at an individual level may, among others, be attributed to metabolic factors, socio-economic status, sleeping patterns, medication use, genetic predisposition and epigenetics (16–19). Furthermore, BMI typically increases with age, something that is particularly concerning with an aging European population (11). In addition, overweight and obesity are

typically associated with lower levels of education. This trend perpetuates with severe obesity being more common among children of mothers with lower levels of education (16).

Above-mentioned factors may determine overweight and obesity at an individual level, but are inept to explain the increase in overweight and obesity at population level (19). While many different food cultures, incomes and levels of development can be observed across Europe, challenges related to overweight and obesity remain largely the same (20). Consequently, to understand how the prevalence of overweight and obesity has increased worldwide, regardless of age, gender, genetics and epigenetics or ethnicity (19,21), we need to broaden our view and look beyond the individual factors. Over the last 40-50 years the environment we live in has drastically changed, with many changes that influence the nutritional quality of population diets, such as the increased availability of ultra-processed foods, convenient foods and non-alcoholic beverages, increased marketing and less time to prepare meals (5,15,22–24). As defined by Monteiro *et al.*, ultra-processed foods are industrially formulated foods and beverages often containing many ingredients that are not commonly found at home (such as high fructose corn syrup, flavours or emulsifiers) (25,26). Examples are prepacked sandwiches, ready meals, chicken nuggets or soft drinks (25). The increased availability of such products is of concern due to the increasing number of studies pointing towards a significant association between ultra-processed food consumption and overweight and obesity (27–31). On top of this, a recent study in France found an association between ultra-processed food consumption and a higher mortality risk among the French adult population (32). Currently ultra-processed food consumption contributes to 10% up to 51% of the European purchased dietary energy, with a household availability of 14% in France rising up to 45% in Belgium (27). In both Belgium and France ultra-processed foods contributed to around 30% of the daily energy intake according to national food consumption surveys (31,33). Thus, to increase the percentage of the population with a healthy bodyweight it is essential to shift our attention away from the individual and towards the environment surrounding each and every one of us.

1.2 Food environments

- **Definition**

Our surroundings have an effect on our decision making with regards to what we eat and as such eventually influence our health. These surroundings are part of food environments, which can be defined as "the collective physical, economic, policy and sociocultural surroundings, opportunities and conditions that influence people's food and beverage choices and nutritional status" (34). One may wonder how these food environments influence our health without us necessarily being aware of it. Why is it that the unhealthy food choice most often is the easiest choice (35)?

➢ **Characteristics**

Apart from individual-level decision making, there are several actors that have an impact on what we eat: the food industry, the government and society (Figure 3). While society influences our norms, beliefs and practices, the food industry and government together determine what foods are available to us, how they are marketed and at what cost (34).

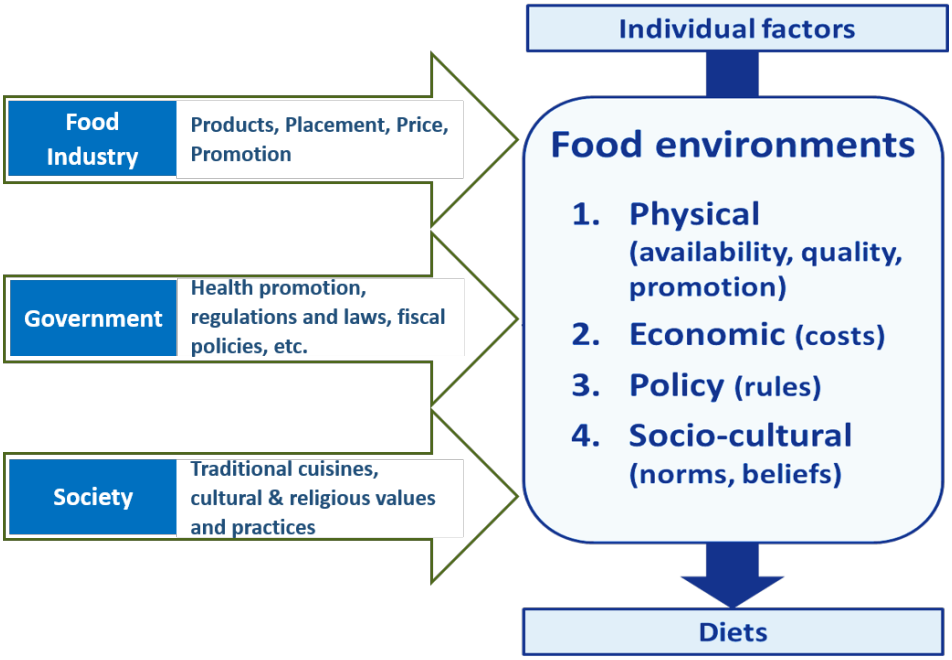


Figure 3: The main components influencing food environments and eventually diets. *Source: Swinburn et al. 2013.*

Figure 3 hides a much more complex reality than first meets the eye, with every component playing a specific role while interacting with one another. The food industry controls most of the food supply while generally promoting and marketing ultra-processed foods and influencing the public discourse on health and healthy foods within society (34,36,37). The government in turn sets the boundaries in which the food industry operates through laws and regulations. Moreover, similar to the food industry, also the government can have an impact on the public discourse of how health and healthy foods are perceived within society (34,36). Lastly, society itself influences the food environments through (cooking) traditions and preferences (34). For example, a child growing up in Vietnam might adore eating dried shrimp as a treat and dislike pizza, while many children in European and American countries would, without hesitation, choose pizza above dried shrimp. These three main components (food industry, government and society, cf. figure 3) in turn interact with one another through lobbying, setting the agenda, research funding and political decision making (34). This interaction becomes concerning when we take into account the fact that 60% of the countries worldwide have a smaller gross domestic product (GDP) than the yearly turnover of any of the top five food and beverage companies (24,38). This

discrepancy, together with the pressure of the food industry on governments, makes it challenging to implement public health policies that go against the food industry's aim to expand markets and increase profits (24,37). Nevertheless, evidence suggests that policies addressing food environments are affordable and effective in reducing overweight, obesity and NCDs (34,39–41).

Within current food environments the unhealthy choice is the default option (35). People are constantly exposed to marketing of unhealthy products via multiple broadcast and non-broadcast channels. Moreover, cheap and unhealthy products are available everywhere and at any time (24,35,37). Furthermore, the prices of healthy foods are in general higher than those of less healthy foods, something that significantly affects the food choices available to lower income groups (37,42,43). Nonetheless, consumers are often left to their own devices when it comes to making healthy food choices, but many consumers are confused about what a healthy diet and being healthy really means (36,44). This confusion leaves an opportunity for the food industry to influence food choices. Products are made to look more healthy through packaging design, by including messages such as 'low in sugar', 'natural food' or 'no preservatives', by giving brand names suggesting them to be natural and unprocessed or by marketing them as being 'organic', 'sustainable', 'local' or 'fair-trade' (36). Healthy eating is no longer merely about health and well-being, but turned into an economic asset interconnected to how people live and define themselves (36,45,46).

The message of individual responsibility and consumer empowerment conceals political ineffectiveness and fails to address the interaction between humans and their surroundings (46). We have built an economy that requires constant growth, driven by excess consumption (47). With a system that relies on an unsatisfiable hunger for more, is it really the individual who is to blame for having overweight or obesity?

A shift needs to be made away from individual responsibility and towards creating healthy food environments, defined as "Environments in which the foods, beverages and meals that contribute to a population diet meeting national dietary guidelines are widely available, affordably priced and widely promoted" (34).

1.3 Food industry

"The case of non-communicable diseases is an example of how profitable solutions are applied to problems that have a potential for profit. It is striking that problems that should be addressed through binding regulations and/or legislation are being timidly addressed in a framework that seeks 'cooperation' from the industry's and/or adhesion to 'voluntary' codes of conduct."

- Claudio Schuftan

Food companies, including packaged food and non-alcoholic beverage manufacturers, quick-service restaurants and supermarkets, directly affect food environments by manufacturing, distributing and marketing food products. To optimise returns, the less healthy foods are often heavily marketed, more available and cheaper. On the other hand food companies also indirectly influence food environments through the use of political strategies that serve to shape and influence public opinion and political decision making (48). Nonetheless, food companies could play an important role in improving population diets, especially through the improvement of their practices within food environments (49,50). Many food companies make commitments to improve health and well-being (50–55), but it remains unclear how well these commitments translate into real-world performance (56).

- **Market and non-market power**

The food industry aims at expanding markets and making a profit of the commodities they sell (24,37,57). To do so they use interconnected strategies within both the market and non-market environment (57,58). Within the market environment interactions take place between companies and other parties to improve economic performance (58). These include mergers, acquisitions and joint-ventures leading to increased market shares being in the hands of a declining number of companies, and thus increased market concentration (30,59). The increased market concentration leads to market power which provides companies with the ability to have an impact on the market environment (e.g. set prices, control the offer available to consumers and define terms of trade) while generating additional profits above what would normally be possible in a competitive market (30,60–63). The increased financial resources and economic importance can in turn be used for political influence (30,64).

Within the non-market environment, strategies involving the government, public institutions and the public itself are used to create a favourable market environment (58). These comprise overall business strategies, marketing strategies to develop and market products, discursive strategies to influence the public opinion and political strategies to create a favourable policy environment to strengthen activities taking place within the market environment (38,57,65). These activities are key to the food industry to overcome obstacles originating from public pressure or government regulation. Furthermore, as public perception and government regulation affect both individual firms and whole industries, firms can join forces through industry associations and coalitions to address issues within the non-market environment, something that is prohibited in the market environment by antitrust policies (58,66). The power necessary to create both a favourable market and non-market environment has been defined in different ways.

Clapp, Fuchs and Scrinis identify three distinct types of power: instrumental power, structural power and discursive power. The first refers to the direct influence on policy making to shape the political agenda.

Actors involved at this level are industry associations and lobbyists. Another way to exert instrumental power is through public-private partnerships (38,65). An example of instrumental power can be found during the second international conference on nutrition in 2014 to develop the 'Rome declaration on nutrition'. Although the drawbacks of ultra-processed food consumption were included in the first drafts of the 'Rome declaration on nutrition' they were eventually removed and replaced by the importance of physical activity for improved health and well-being under pressure of the International Food and Beverage Alliance (IFBA), an international group of twelve major food companies (38,67,68). The second type of power, structural power, relates to power due to market strength. This type of power affects the input side of the political agenda (38,65). This can be through the official recognition of privately developed regulations, such as the voluntary and self-regulatory marketing (e.g. the EU-Pledge (69)) and reformulation initiatives (e.g. reformulation commitments made by IFBA (68)) of the food industry (38,65). The last type of power, discursive power, refers to the opportunity to influence the dominant discourse within the public sphere by framing policies and issues (38,65). Examples for this are the focus on single nutrients instead of foods as a whole or specific food groups, the focus on individual responsibility to make healthy food choices and the emphasis on physical activity (36,38,46,65).

Luke on the other hand identifies three dimensions of power, namely decision-making power, non-decision-making power and ideological power. Decision-making power refers to the ability to control the political decision making, somewhat similar to what is described above as instrumental power. The non-decision making power in turn refers to being able to keep issues outside the political process by, among others, influencing the dominant discourse, somewhat related to what is described above in both structural and discursive power. Eventually, ideological power refers to the power to avoid conflict that may harm the interests of those in power (70,71). The latter may be both intentional as well as caused by inaction (72).

Regardless of how power is defined, the tactics used by the food industry to influence food environments, both directly and indirectly, remain largely the same. Mialon *et al.* (48) identifies six distinct practices based on the taxonomy developed by Savell *et al.* (73) to identify political activity of the tobacco industry, namely: 'Information strategy', 'Financial incentive strategy', 'Constituency building strategy', 'Policy substitution strategy', 'Legal strategy' and the 'Opposition fragmentation/destabilization strategy'. The 'Information strategy' comprises strategies such as framing the debate (i.e. focus on individual responsibility, importance of physical activity), shaping the evidence through funding and conducting of research/scientific events and stressing the economic importance of the company (48). All aspects that were also highlighted above within the different definitions of power. The 'Financial incentive strategy' identifies the activity of funding, offering gifts or providing other incentives to decision makers. The 'Constituency building strategy' on the other hand focusses on

building relationships such as public-private partnerships, involvement in the community and participating in working or advisory groups. Successively, the 'Policy substitution strategy' refers to the development of self-regulatory marketing and reformulation initiatives as described above within structural power. The 'Legal strategy' comprises tactics such as suing politicians or taking decisions regarding public policies to court. Eventually, the 'Opposition fragmentation/destabilization strategy' focusses on disrupting efforts of those opposing the (food) industry by personally attacking public health advocates as well as creating fake organisations against public health measures (48). An example of the latter can be found on the website 'Fooddrinktax.eu'. At a first glance this website gathers scientific information on why fiscal policies to reduce obesity won't work and could have a negative economic and social impact (74). However, when looking beyond the facade, it can be found that this website was created by UNESDA, the European association that represents the non-alcoholic beverage industry (74,75).

- **Company commitments and practices**

The food industry tries to position itself as part of the solution to solve public health problems such as overweight, obesity and NCDs and increase the healthiness of food environments (24,76). To do so commitments are made by individual companies as part of corporate social responsibility (CSR), through industry associations representing a specific food industry (e.g. Eurocommerce representing the European retail sector (77); UNESDA representing the European non-alcoholic beverages companies (75) or FoodDrinkEurope representing the European packaged food and non-alcoholic beverages companies (78)) and by international company groups representing a specific group of companies (e.g. IFBA representing Coca-Cola, Danone, Ferrero, General Mills, Grupo Bimbo, Kellogg's, Mars, McDonalds, Mondelēz, Nestlé, PepsiCo, and Unilever (67,68)). Commitments typically include pledges to limit marketing to children, to achieve the Sustainable Development Goals (SDGs), to reformulate products to reduce nutrients of concern (sodium, saturated fat, trans fat, added sugar and energy content) and to implement front-of-pack (FOP) labels.

A well-known self-regulatory commitment in Europe to limit marketing to children is the EU-Pledge. As stated on the website, the EU-Pledge is "a response from the industry leaders to calls made by the EU institutions for the food industry to use commercial communications to support parents in making the right diet and lifestyle choices for their children" (69). Unfortunately research showed that it does not effectively protect children from unhealthy food marketing due to the lenient nutrition criteria, the target audience definition, the sole focus on children's programs and the marketing channels covered (79,80). In addition, even though the pledge has been signed by the largest companies, many major food companies, including retailers, have not (yet) signed the pledge (69,80). Studies have however shown that well formulated and implemented policies to reduce advertisement can have a significant impact

on population health and wellbeing. A study modelling the potential health impact of withdrawing all TV advertisement in the United Kingdom throughout the day (between 5h30 and 21h) for less healthy products estimated a reduced kilocalorie intake resulting in 4% less overweight and 5% less obesity among children (aged five to 17 years old) (81). Another study in the United Kingdom assessing the impact of the ban on advertisement of unhealthy foods across the public transport in London (introduced in 2019) estimated that the ban resulted in a significant decrease of the weekly kilocalories purchased at household level (82). Studies evaluating the effect of the implementation of Chile's Law on food labelling and advertising, focussing on FOP labels in addition to the restriction of advertisement, found that the law resulted in a reduced purchase of beverages containing high levels of nutrients of concern as well as products being reformulated by the food industry (83,84). Specifically for TV advertisement in Chile it was found that the percentage of unhealthy products advertised decreased from 42% of all advertisements before the implementation to 15% after implementation of the law (85). To in turn overcome the lenient nutrition criteria of the EU-Pledge, hampering its effectiveness, a more stringent nutrient profile model, such as the World Health Organisation Regional Office for Europe nutrient profile model (WHO-model) could be implemented. This model has proven to be an adequate alternative allowing fewer products to be marketed to children (80,86).

Commitments to reach the SDGs and to reduce nutrients of concern are made by individual companies within their CSR activities (87–92) as well as by overarching food industry groups and initiatives such as the Consumer Goods Forum (CGF) (93) and IFBA (67). The CGF is a global industry network representing both food manufacturers and retailers with the vision of "Better lives through better business" and a focus on eight action areas (forests, human rights, plastics, healthier lives, food waste, food safety, supply chains and product data) (93). Within these action areas several references are made to reaching the SDGs (94,95). Also IFBA declares to support and contribute to achieving the SDGs through shaping food environments with improved nutrition, better food access and responsible marketing practices (96). Reformulation commitments focus on reducing sodium, sugar, saturated fat, trans fat and portion sizes while increasing components such as fibre, fruits and vegetables and vitamins and minerals. Within this framework member companies formulate individual commitments, similar to the ones that are part of their CSR activities (97). The same principle stands for IFBA commitments regarding responsible marketing (98).

On the subject of FOP labelling, the FOP label currently most widely used in Europe is the 'Reference Intakes label' developed by the food industry in 2014. This labelling scheme provides information on the nutrient- and energy content of a food with a reference to the daily reference intake. While the energy content has to be expressed per 100g, this is not the case for other nutrients such as fat, saturated fat, sugar and salt (99,100). Another label that was put forward by the food industry was the Evolved

Nutrition Label (ENL), a label more favourable to the food industry compared to the government endorsed Nutri-Score (99,101,102). The ENL was developed by Coca-Cola, Mars, Mondelēz, Nestlé, PepsiCo and Unilever, but came under scrutiny in 2018 for providing summary nutrition information per portion instead of per 100g, which left space for misinterpretation (99,101). The Nutri-Score in turn was developed by French researchers and categorizes products into five distinct categories based on the nutrient content of products per 100g/ml as available on the packaging (energy, sugar, saturated fat, sodium, fruits and vegetables, fibres and proteins) (99,103). The letter 'A' in dark green indicates the healthiest products and 'E' in red indicates the least healthy product categories (103). At this point in time the Nutri-Score has been endorsed as FOP label of choice by governments in Belgium, France, Luxembourg, Germany, the Netherlands and Spain (99). Research comparing FOP labels showed that, while the Nutri-Score reduced the portion sizes selected for less healthy product categories, the ENL did not lead to reduced portion sizes compared to the use of no label at all (104). In contrast, it even encouraged increased portion sizes for some product categories such as sweet spreads compared to other FOP labelling systems or the use of no labels at all (99,104). Consequently, the ENL was put on hold and further trials to test the label were suspended (99,101).

Above-mentioned commitments position the food industry as part of the solution, but also help them frame social issues and potential solutions. This framing is particularly important as it affects what appears on the public agenda, how problems are approached by policy makers and at the same time influences the public perception of the issues at hand (76). Both voluntary commitments and commitments made as part of public-private partnerships can provide company representatives with an official platform to promote company/industry efforts in improving population health and wellbeing, regardless of the commitments going beyond business as usual (105,106). Moreover, such commitments may legitimise industry representatives as actors in the development of public health policies (105), while in reality there is an inherent conflict of interest between the goal of the food industry and public health policy makers (24,48,105). Not that there are no common goals. For example, the expansion of fruit, vegetable and fish markets could be favourable from a public health perspective as well as for some food industry players (24). It is however a misconception that the food industry would place public health interests above its own interests when doing so would not contribute to their own objectives (107). On account of this conflict of interest, rather than involving the food industry in policy making, the government should deploy its regulatory power to develop policies that support and monitor the food industry to strengthen commitments and actions in improving health and the healthiness of food environments (108).

1.4 Policy responses

Science can say: could be, might be, some of us think this, and some think that. Policy-makers have either to do it or not do it — more often, not.

- Michael Marmot (109)

With the current prevalence of overweight and obesity, both preventative as well as management strategies are required from governments to reduce the prevalence of NCDs (11).

- **Food environments**

Currently the formulation of food and nutrition policies only to a limited extent takes place at a European level with the individual countries carrying the main legislative power (110–112). As the individual member states are responsible for national health policies, action of the European Commission focusses on incentive measures such as health promotion and awareness (113). Nonetheless, some binding measures have been put into place regarding food composition and food labelling. Since 2012 fruit juices can no longer contain added sugars (114) and in 2019 a legal upper limit of 2 grams artificial trans fat per 100g of fat was established (115). Furthermore, the on-pack nutritional information provided to consumers is regulated with a mandatory on-pack ingredient list and nutritional declaration (energy, fat, saturated fat, carbohydrates, sugar, protein and salt content per 100g/ml) (116). Due to this same regulation it is however prohibited to provide on-pack nutritional information regarding the added sugar and trans fat content. Moreover, the regulation forbids member states to implement mandatory FOP labels (113). Companies are however permitted to use voluntary FOP labels. In case they decide to do so it is mandatory to provide the on-pack information regarding the energy content per 100g/ml. Additional information on other nutrients such as fat, saturated fat, sugar and salt may also be included per portion or per 100g/ml (116). Nonetheless, there is a growing support from the public and private sector for interpretive FOP labelling systems across Europe, with several FOP labelling systems in place, such as the Nutri-Score in Belgium and France (20,113). Moreover, the European 'Farm to Fork' strategy launched in 2020 included a proposal for a European wide mandatory front-of-pack nutrition labelling system (117). Also the use of nutrition and health claims is regulated at European level, although, at the time of writing, the European Commission failed to link the use of claims to the healthiness of products using nutrient profile models as stated in the initial regulation (113,118). However, such nutrient profiles were again proposed within the 'Farm to Fork' strategy (117). No European regulations are in place regarding food promotion, but the directive regarding audio-visual media services (2018/1808) does forbid product placement within children's programs as children are often not able to recognise these as advertisement (113,119).

In addition to the binding directives and regulations described above, the commission encourages member states to implement voluntary policies (113). For example, there were some voluntary reformulation initiatives in place such as the 'EU Framework for National Salt Initiatives' (120) and the 'EU Framework for National Initiatives on selected nutrients' which set targets for nutrients of concern. The latter was extended by two appendices, one on saturated fat and one on added sugars (113). Within the EU Action Plan on Childhood Obesity 2014-2020 there were several objectives to limit marketing to children and promote healthy in-school food environments (113,121). Across member states, policies to stimulate healthy nutrition and physical activity within the school environment, such as physical- and nutrition education programs, standards for the foods available at school or school fruit and vegetable schemes, were frequently implemented. There was also a large support of member states for self-regulatory reformulation and marketing initiatives (as described above within 'Company commitments and practices'). In contrast, comprehensive legislation to reduce nutrients of concern and to restrict marketing of unhealthy foods to children were almost non-existent (20). However, in Spain it was recently announced that advertisement of unhealthy products across both broadcast and non-broadcast media will be restricted applying the WHO-model (122,123). The commission currently has no rules in place to increase taxes on less healthy products or reduce taxes on healthier products of which consumption should be encouraged (113). The European value-added tax rates were however recently updated to take into account, among others, public health (124). This update will most likely make it easier for European member states towards the future to make unhealthy foods relatively more expensive and healthier foods relatively cheaper. Some countries, such as Denmark, Finland, France, Hungary and the United Kingdom have already implemented food taxes (125–127). Other countries, such as Italy and Ireland, considered the implementation of such taxes, but didn't put them into effect (128). The products on which taxes are raised, as well as the tax rate, vary per country. For example, in France they comprise energy drinks and (non-)sugar-sweetened drinks, in the United Kingdom a tiered tax based on the level of sugar in non-alcoholic beverages was implemented, in Finland taxes are raised on confectionery, ice cream and soft drinks, in Denmark they include ice cream, chocolate and sweets and in Hungary a public health product tax is in place covering a range of products (salty snacks, confectionery, sugar-sweetened beverages, syrups or concentrates for soft drinks, energy drinks, flavoured beers/alcopops, condiments and fruit jam) (125,126,128).

- **Market concentration**

In 1986 the Single European Act was signed leading to the completion of the European single market in 1993 with as main task the stimulation of the "four fundamental freedoms": the free movement of goods, services, capital and people (110,129). These fundamental values aim for the removal of barriers and the liberalization of the market. When formed, the European single market was not focused on the creation

of healthy food environments as overweight and obesity were less of a concern than they are today. Nonetheless, health and current food environments are influenced by European non-health market policies (110). For example, mergers, acquisitions and joint-ventures leading to increased market concentration can provide dominant companies with the power to structure the market environment to suit their private interests (30,60–63). This in turn can translate into profit accumulation above what would normally be possible in a competitive market. Furthermore it provides companies with control over substantial capital and labour which can be used to put pressure on governments regarding the implementation of health policies that could affect company income or the stability of the wider economy (as discussed above within 'Market and non-market power') (130). This is especially of a concern within the current neoliberal economy where government regulation tends to protects corporate interests legitimized by a discourse of 'individual responsibility' and 'freedom of choice' (36,108,131).

As competition is important from a market perspective to encourage innovation and efficiency, European competition policies, combined with national competition laws, are in place (132,133). These consist of policies to regulate mergers and acquisitions as well as antitrust policies that prohibit agreements between independent companies and forbid dominant companies to abuse their position (66,133,134). Although product pricing is taken into account within competition policy (133), the potential impact on health via product variety and food composition is not an explicit consideration.

1.5 The Business Impact Assessment on Obesity and population-level nutrition (BIA-Obesity) tool and process

To assess the comprehensiveness, specificity and transparency of previously mentioned company commitments and actions to improve food environments that go beyond legislative requirements the 'Business Impact Assessment on Obesity and population-level nutrition' (BIA-Obesity) tool and process was developed by INFORMAS ('International Network for Food and Obesity / Non-communicable Diseases (NCDs) Research, Monitoring and Action Support'), an international group of organisations and researchers with an interest in public health. The network was established in 2012 with the aim of increasing the accountability of governments and the private sector to create healthier food environments and reduce the burden of NCDs (34,135). To monitor and benchmark public sector commitments and practices the 'Healthy Food Environment Policy Index' (Food-EPI) was developed with the aim of assessing government policies and practices to improve food environments. This tool has been implemented worldwide as well as at a European level and within 11 European countries (113,136). To do the same for the private sector, the BIA-Obesity tool and process was established. How the tool was developed has previously been described in detail by *Sacks et al.* (135). Summarized, the tool and process are based on the 'Access To Nutrition Index' (ATNI) which globally assesses the commitments

of packaged food and non-alcoholic beverage manufacturers to reduce both undernutrition and obesity and compare them to international standards (135,137). Unlike the ATNI, the BIA-Obesity tool and process has been developed to be applied at national level and focusses solely on overweight and obesity. In addition to packaged food and non-alcoholic beverage manufacturers, the assessment also includes quick-service restaurants and supermarkets (135).

The BIA-Obesity tool and process consists of three phases. The first phase, corresponding to the minimal approach according to INFORMAS, consists of an assessment of the commitments of the selected companies per food industry (i.e. packaged food and non-alcoholic beverage manufacturers, quick-service restaurants and supermarkets) across six domains, namely: 'Corporate strategy', 'Product formulation', 'Nutrition labelling', 'Product and brand promotion', 'Product accessibility' and 'Relationships with other organisations'. Each domain in itself consists of several indicators assessing the company commitments that go beyond the legislative requirements (34,135,138). Within the domain 'Corporate strategy' commitments regarding the overall nutritional strategy of a company as well as the reporting practices of this strategy are assessed. Within the domain 'Product formulation' the commitments to reduce nutrients of concern, such as sugar, salt, saturated fat, trans fat as well as portion sizes are evaluated. As part of the domain 'Nutrition labelling' commitments regarding the provision of nutritional information as well as the use of FOP labels and nutrition and health claims are assessed. Within the domain 'Product and brand promotion' it is assessed whether the company has commitments in place to limit marketing to children. Across the domain 'Product accessibility' it is considered if a company has commitments in place to link the pricing and availability to the healthiness of products. Lastly, as part of the domain 'Relationships with other organisations' the transparency of the relationships with other professional organisations is assessed together with the support for industry associations, external research and nutrition- and physical activity education programs (51,53,135). Within the domain 'Corporate strategy' and 'Relationships with other organisations' the indicators are the same across the food industries (i.e. packaged food and non-alcoholic beverage manufacturers, quick-service restaurants and supermarkets). For the other four domains the indicators differ as quick-service restaurants and supermarkets are in direct contact with customers, which is not the case for packaged food and non-alcoholic beverage manufacturers. For example, for supermarkets also indicators are included regarding the in-store environment (e.g. confectionery-free check-outs, in-store promotions and loyalty programs) while for quick-service restaurants indicators are included relating to menu labelling and combination meals. Indicators per domain are scored based on the comprehensiveness, specificity and transparency of the commitment in place. Within this phase first the publicly available commitments are collected. Subsequently, the companies, who are willing to, are provided with the opportunity to verify and complete the collected information. For all additional information provided some kind of proof is required (135). This first phase of the BIA-Obesity tool and

process was already implemented in several countries outside of Europe, such as Australia, Canada, New Zealand, Malaysia, Thailand and Fiji (51–55,139).

The second phase of the BIA-Obesity tool and process, corresponding to the expanded approach according to INFORMAS, consists of an evaluation of the practices and performance of companies across the same six domains as described above, depending on data availability. This typically includes an assessment of the healthiness of product portfolios as well as labelling and marketing practices (34,135,138). Lastly, within the third phase, corresponding to the optimal approach, the corporate political activity of companies is evaluated using the approach previously described by Mialon *et al.* (48) and shortly touched upon in the section above regarding market and non-market power (34,135,138).

1.6 Conclusion

The food industry has an undeniable influence on the healthiness of food environments. Up to date it has however not been mapped which market- and non-market techniques used by the European food industry might influence the healthiness of food environments. This thesis tries to fill this knowledge gap by assessing market concentration and diversity across European countries as well as companies' food environment related commitments and associated practices. In extension of the results it proposes both European and national policy responses that could help improve the healthiness of food environments.

Chapter II A detailed mapping of the food industry landscape in the European single market

This chapter is based on the following published paper:

Van Dam, I., Wood, B., Sacks, G. et al. A detailed mapping of the food industry in the European single market: similarities and differences in market structure across countries and sectors. Int J Behav Nutr Phys Act 18, 54 (2021). https://doi.org/10.1186/s12966-021-01117-8

2.1 Abstract

Background: Food environments are influenced by food industries (packaged food and non-alcoholic beverage manufacturers; supermarkets and quick-service restaurants). An important source of this influence is the significant market power held by a limited number of food companies. Market structure analysis, as part of a broader market power research agenda, has received limited attention from the public health community. The aim of this study was to analyse similarities and differences in market structure across countries and industries in the European single market.

Methods: The companies with the largest market share at the national level for each industry were identified from Euromonitor sales data in 2017/18. The market structure was assessed by the following metrics: the number of global brand owners with ≥1% market share per country, the number of companies unique for one European single market member state, the most sold packaged food and non-alcoholic beverage categories, the number of quick-service restaurants and supermarkets per 1000 inhabitants and market concentration by means of the Herfindahl-Hirschman Index (HHI) and the four firm concentration ratio (CR4). CR4-values > 40% and HHI-values > 2000 indicate concentrated markets with limited competition.

Results: The leading packaged food and non-alcoholic beverage manufacturers and the most sold food and beverage product categories were similar across countries in Europe. The observed levels of concentration were however different. Average CR4-values ranged from 21% to 72% among packaged food product markets and 60% to 76% for non-alcoholic beverage product markets. Average CR4-values for quick-service restaurants and supermarkets were 50% and 60%, respectively. Across European countries the same leading quick-service restaurants were identified, while this was not the case for supermarkets.

Conclusions: This study forms an important basis to understand key aspects of market structure of the European food industry, observing clear differences between food industries and European single market member states. This has potential implications for the implementation of food environment policies at different levels of jurisdiction.

2.2 Background

Since the second world war, diets and lifestyles in Europe have significantly changed together with the development of the European single market (ESM) (140). In 2016, on average, 59% of the European adult population was classified as being overweight (Body Mass Index, BMI ≥ 25kg/m^2) (7,20). Overweight is often seen as an issue of individual responsibility, but there are important determinants, such as those related to food environments, that are beyond the control of the individual (5,6,23,141,142).

Food environments are generally defined as: "The collective physical, economic, policy and sociocultural surroundings, opportunities and conditions that influence people's food and beverage choices and nutritional status" (34). In many areas around the world, current food environments can be described as environments that make the less healthy food choices the easiest choices, as less healthy foods are often more available, heavily marketed and cheaper (35). Food companies, including food and beverage manufacturers, supermarkets and quick-service restaurants, are considered to play a substantial role in shaping food environments (24,34,143). Food companies directly influence food environments by manufacturing, distributing and marketing food products that are made available to consumers. Food companies also indirectly influence food environments, such as through the deployment of political strategies that serve to shape and influence public opinion and political decision making (65,143,144). An important source of this influence – both direct and indirect - on food environments is the significant market power held by a limited number of food companies (143–145). Substantial market power can confer dominant food companies with the ability to structure food retail environments and food supply chains to suit their own private interests, and can also allow for the generation of considerable profits above what would be possible in a competitive market environment. These profits can then be used to fund practices that undermine public health (e.g. lobbying, intense marketing) (61,62).

An important step in examining market power is to analyse the market structure in which firms operate (63). Although market structure analysis alone does not provide a complete picture of the extent of market power held by firms, it is nevertheless useful in understanding the structural power of firms relative to other market-based actors. Market concentration, in particular, is an informative market structure metric, which, for decades, has been considered a key component of market structure analysis (146). As market concentration increases, the level of competition in the market generally decreases. In turn, given the inverse relationship between competition and market power, a decrease in the level of competition in a market is generally considered to increase the market power of incumbent companies (63,147). However, market structure analysis has not received much attention by the public health community.

This study sets out to analyse similarities and differences in market structure across countries and industries (i.e. packaged food and non-alcoholic beverage manufacturers, supermarkets and quick-service restaurants) in the European single market. Following metrics were used: the number of food companies with ≥1% market share per country, the number of companies unique for one ESM member state, the most sold packaged food and non-alcoholic beverage categories, the number of quick-service restaurant and supermarket outlets per 1000 inhabitants; and market concentration measured by the Herfindahl-Hirschman Index (HHI) and the four firm concentration ratio (CR4) 18,21 . Potential implications of the similarities and differences in market structure across countries and industries for the implementation of policies to improve the food environment at national and European level are discussed.

2.3 Methodology

- **Selection of countries**

Sales and market share data from all countries within the European single market (European Union's 28 member states and 4 EFTA – European Free Trade Association – members, ESM) were included. The Euromonitor International Passport Global Market Information Database was found to have the best available data for the majority of the selected countries and product markets. Euromonitor is the world's leading independent provider of strategic market research and collects volume sales data from various sources including trade associations, industry bodies, company financial reports, and official government statistics. These data are validated by food industry representatives.

For this study, data were obtained at the most fine-grained level (212 food subgroups in total) over the period 2009 – 2018 for packaged food and non-alcohol beverage manufacturers and supermarkets and over the period 2008-2017 for quick-service restaurants (148). For the following member states no Euromonitor data were available: Cyprus, Iceland, Liechtenstein, Luxembourg and Malta. As a result, a total of 27 EU countries were included in this study to represent the ESM, 14 in Western Europe (52%) and 13 in Eastern Europe (48%). For these 27 countries Euromonitor data for both packaged food and non-alcoholic beverage manufacturers and supermarkets were available. For quick-service restaurants, data were only available for 22 out of these 27 member states, of which eight (36%) were in Eastern Europe. Thus, for analyses related to quick-service restaurants, Croatia, Estonia, Latvia, Lithuania and Slovenia were excluded.

- **Selection of food companies**

To obtain a comprehensive overview of the food industry within the ESM, packaged food manufacturers, non-alcoholic beverage manufacturers, quick-service restaurants and supermarkets were included in the analysis. Supermarkets were considered both as food and beverage manufacturers, through own-brand

products placed on the market, as well as retailers. All food companies with ≥1% market share in at least one of the ESM member states were included. For each food industry, the company with the largest market share at the country level (hereinafter referred to as the leading company), as determined by Euromonitor sales and market share data, was identified. Country-level data on actual (USD) and percent retail sales values were sourced for both the national brand owners and the global brand owners. Throughout the article national brand owners were considered as those companies that have the rights to produce or distribute brands within a country (own brands or through licensing agreements) while global brand owners were considered as the ultimate brand owners, as defined by Euromonitor (149).

For quick-service restaurants the Euromonitor category 'Chained Consumer Foodservice' and for supermarkets the Euromonitor category 'Grocery Retailers' was used. The average number of companies included per industry is presented in Table 1.

Table 1: Average number of national and global brand owners with ≥1% market share (MS) included per food industry across countries within the European single market. Euromonitor data 2017/18.

Food industry	Average number of global brand owners with ≥1% MS per country (min – max)	Average number of national brand owners with ≥1% MS per country (min – max)
Packaged food	14 (7 – 20)	18 (9 – 25)
Non-alcoholic beverages	13 (9 – 20)	15 (10 – 20)
Quick-Service restaurants *(1)*	20 (11 – 27)	18 (14 – 25)
Supermarkets *(2)*	9 (5 – 18)	10 (5 – 19)

(1) 'Chained Consumer Foodservice': "Chained units are defined by 10 or more units. An exception is made for international chains that have a presence of fewer than 10 units in a country. In this case, they are still considered to be chained units." As defined by Euromonitor.
(2) 'Grocery Retailers': "Retailers selling predominantly food/beverages/tobacco and other everyday groceries. This is the aggregation of hypermarkets, supermarkets, discounters, convenience stores, independent small grocers, chained forecourt retailers, independent forecourt retailers, food/drink/tobacco specialists and other grocery retailers." As defined by Euromonitor.

- **Data Analysis**

Analyses were conducted separately for the four food industries using SAS 9.4 (Cary, USA, 2018). At time of data collection, in 2019, the latest available Euromonitor data were used, namely 2018 for packaged food manufacturers, non-alcohol beverage manufacturers and supermarkets and 2017 for quick-service restaurants. Earlier data were used to observe changes over time, where relevant. An overview of all metrics used to assess aspects of market structure and their respective interpretation can be found in Table 2.

Data were first analysed by country and industry to obtain an overview of the market similarities and differences throughout the ESM. To compare market structure between food industries and across member states, analyses were conducted to identify the leading companies, and their respective market share for both national and global brand owners. In addition to the leading companies, the number of

global brand owners with ≥1% market share and the number of unique companies per country and per food industry were identified to assess potential differences across countries. Unique companies were defined as companies having presence in only one ESM member state. The higher the number of global brand owners with ≥1% market share and the higher the number of unique companies, the more diverse the actors active within the respective food industry were assumed to be.

Table 2: Overview of the different metrics used to assess aspects of the market structure and their respective interpretation. ESM = European single market.

Metrics	Calculation *(using Euromonitor sales and market share data)*	Interpretation
Market similarities and differences		
Leading global brand owner per country	*Global brand owner market share data per country*	*The different (or similar) leading global brand owners across Europe*
Leading national brand owner per country	*National brand owner market share data per country*	*The different (or similar) leading companies across Europe that nationally have the right to produce or distribute brands*
Number of global brand owners with ≥1% market share per country	*The sum of all global brand owners per country with ≥1% market share*	*The higher the number of global brand owners with ≥1% market share the more diverse the food industry was assumed to be*
Number of unique companies per country	*The sum of all companies in a country having presence in only one ESM member state*	*The higher the number of unique companies, the more diverse the actors active within the food industry were assumed to be*
Leading European global brand owners	*Sum of the sales data per member state by year and global brand owner*	*The leading companies that own the most sold brands across the ESM and that may not have appeared as leading company at national level*
Top three most sold packaged food and non-alcoholic beverage categories per country	*Product category specific sales data per country*	*The different (or similar) most sold, and as such potentially most consumed, product categories per country*
Most sold European packaged food and non-alcoholic beverage categories	*Sum of the sales data per member state by year and product category*	*The different (or similar) most sold, and as such potentially most consumed, product categories across the ESM that may not have appeared among the top three at national level*
Number of quick-service restaurant outlets per country	*The number of outlets per 1000 inhabitants as obtained from Euromonitor*	*The different (or similar) density of quick-service restaurant outlets across the ESM*
Number of annual fast food transactions per country	*The number of transactions per 1000 inhabitants per year as obtained from Euromonitor*	*The different (or similar) amount of fast food transactions, and as such potential consumption levels, across the ESM*

Dominant type of quick-service restaurant per country (chained versus independent)	*The percent sales coming from chained consumer foodservice*	*The amount of fast food sales that can be attributed to larger quick-service restaurant chains*
Preferred way of ordering and eating fast food per country	*The percent of sales coming from eat in, take away, home delivery and drive through*	*The different (or similar) ways people across the ESM prefer to consume fast food*
Number of supermarket outlets per country	*Number of outlets per 1000 inhabitants as obtained from Euromonitor*	*The different (or similar) density of supermarket outlets across the ESM*
Contribution of supermarket own-brand packaged food products to the overall sale of packaged foods per country	*The percentage of packaged foods per country coming from supermarket own-brand products*	*The availability of supermarket own-brand packaged food products within the market per country. An estimation whether the sales of supermarket own-brand products is country specific*
Contribution of supermarket own-brand non-alcoholic beverages to the overall sale of non-alcoholic beverages per country	*The percentage of non-alcoholic beverages per country coming from supermarket own-brand products*	*The availability of supermarket own-brand non-alcoholic beverages within the market per country. An estimation whether the sales of supermarket own-brand products is country specific*
Market concentration		
Herfindahl-Hirschman Index (HHI) per country	*The summation of the squared market share of the firms active within the market and country*	*<1000: Unconcentrated Markets; 1000 – 2000: Moderately Concentrated Markets; >2000: Highly Concentrated Markets;*
Four firm concentration ratio (CR4) per country	*The combined market share of the four biggest firms active in the market and country*	*0: Perfect competition; 0 – 40: Effective Competition; 40 – 60: Limited competition; >60: Dominant Firms with limited competition;*

Additionally, data were pooled to obtain the total sales per global brand owner and product category across the ESM and as such identify companies that may not have appeared as leading company at national level, but overall hold a substantial market share at the European level. This was done by adding up the actual retail values per member state by year, by product category and by global brand owner.

Other analyses were conducted specific for different food industries. For packaged foods and non-alcoholic beverages, including own-brand products sold by supermarkets, the top three most sold product categories per country were identified based on retail sales value to understand whether these are similar throughout the ESM. For packaged foods, 14 product categories were included based on Euromonitor's food categorization system, namely: 'Ready meals'; 'Sauces', 'Dressings and condiments'; 'Soup'; 'Sweet spreads'; 'Dairy'; 'Confectionery'; 'Ice cream and frozen desserts'; 'Savoury snacks'; 'Sweet biscuits', 'Snack bars and fruit snacks'; 'Baked goods'; 'Breakfast cereals'; 'Processed fruit and vegetables'; 'Processed meat and seafood'; and 'Rice, pasta and noodles'. For non-alcoholic beverages, eight different

product categories were included, namely: 'Carbonates'; 'Concentrates'; 'Juice'; 'Ready-to-Drink Coffee'; 'Ready-to-Drink Tea'; 'Energy drinks'; 'Sports drinks' and 'Asian speciality drinks'. The most sold product categories by retail sales value at the country level were in turn compared with the pooled data at the European level. The contribution of each product category to the total European sales of packaged foods and non-alcoholic beverages was calculated.

For both quick-service restaurants and supermarkets the number of outlets per 1000 inhabitants was obtained and compared between member states. Specifically, for quick-service restaurants, data pertaining to the dominant type of quick-service restaurant (i.e. chained versus independent), the amount of annual fast food transactions per 1000 inhabitants and the preferred way of ordering and eating fast food (i.e. eat in, take away, home delivery, drive through) per country were retrieved. Lastly, for supermarkets, the contribution of supermarket own-brand products to the overall sales of packaged foods and non-alcoholic beverages was examined for each country.

To assess levels of market concentration, the Herfindahl-Hirschman Index (HHI) and the four firm concentration ratio (CR4) were calculated. This was done by country for specific product markets within the packaged food and non-alcoholic beverage industries and for quick-service restaurants and supermarkets. Product markets were selected using Euromonitor's food categorization system, as highlighted above (150). The HHI (calculated by summing the squared market shares) takes into account the market share of all players (with ≥1% market share) in the market. In comparison, the CR4 considers the combined market share of the four biggest firms active in the market. For the HHI the cut-off values as defined by the European Union (EU) merger regulations in 2004 (2004/C 31/03) were applied, with HHI-values below 1000 indicating unconcentrated markets and HHI-values above 2000 indicating concentrated markets (151). CR4 values below 40% were in turn considered to represent a competitive market, values between 40% and 60% a market with limited competition and values above 60% were considered to indicate markets with limited competition and dominant firms in place (152). An overview of the interpretation of the market concentration indices is given in Table 2.

In addition to the latest concentration indices in 2018 (2017 for quick-service restaurants), the percent change of the HHI and the CR4 were calculated over the past 10 years (since 2009 for packaged food and non-alcoholic beverage manufacturers and since 2008 for quick-service restaurants).

2.4 Results

- **Packaged food manufacturers**

The top three most sold product categories in every member state of the ESM comprised of at least two of the three following product categories: 'Dairy', 'Baked goods', and 'Processed meat and seafood' ,

contributing respectively 24%, 18% and 15% to the overall European sales of packaged foods. 'Dairy' ranked as the most sold product category in 81% of the member states and 'Baked goods' in the five remaining member states (19%). In 37% of the member states, 'Confectionery' also entered the top three most sold product categories. This matched the fact that, according to the pooled ESM sales data, 'Confectionery' was the fourth most sold product category in Europe contributing 10% to the overall sales of packaged foods (data not shown).

Throughout the 27 ESM member states, 22 different global brand owner leader companies were identified with Mondelēz International, Lactalis and Arla Foods Amba being the most reoccurring leading companies at the country level (Table 3). According to the pooled sales data throughout the ESM, Unilever Group and PepsiCo joined the list of aforementioned market leaders among the packaged food industry, although not being a leader producer of packaged food in any of the individual ESM member states. Shifting attention towards the national brand owners, in 13 out of the 27 ESM member states (48%), supermarkets were the leading brand owners through own-brand packaged food products placed on the market (data not shown).

Assessing levels of market concentration, the product markets 'Soup', 'Ice cream and frozen desserts' and 'Breakfast cereals' were most concentrated, with an average CR4 across ESM member states of 72%, 67% and 59%, respectively (Table 4). The CR4 for these three product markets was not lower than 40% in any ESM member state except for 'Ice cream and frozen desserts' in Italy (23%) and 'Breakfast cereals' in Finland (39%). The average CR4 across ESM member states amounted to around 40% or above for all 14 packaged food product markets, except for 'Baked goods' (21%), indicating limited competition. Similar levels of concentration were observed for the HHI (Annex 1). The average concentration (both CR4 and HHI) for the packaged food industry slightly decreased between 2009 and 2018.

Table 3: Global brand owner leading companies, the market share of the respective global brand owner leading companies ('Market Share leader (%)'), the number of global brand owners with ≥1% market share ('# companies with ≥1% MS') and the number of unique companies ('# unique companies (with ≥1%MS)') per ESM member state and food industry. *Euromonitor data 2017/18.*

	Packaged Foods				Non-alcoholic beverages			
Country	**Global brand owner leader company**	**Market share leader (%)**	**# companies with ≥1% MS**	**# Unique companies (with ≥ 1% MS)**	**Global brand owner leader company**	**Market share leader (%)**	**# companies with ≥1% MS**	**# Unique companies (with ≥ 1% MS)**
Austria	Berglandmilch GmbH	4	13	3	Coca-Cola Co, The	19	11	6
Belgium	Mondelez International Inc	3	12	1	Coca-Cola Co, The	35	10	0
Bulgaria	Mondelez International Inc	4	16	8	Coca-Cola Co, The	31	20	10
Croatia	Agrokor dd	10	13	5	Agrokor dd	26	13	4
Czech Republic	Agrofert as	7	15	4	Karlovarské Minerální Vody	19	12	1
Denmark	Arla Foods Amba	15	11	3	Coca-Cola Co, The	15	16	2
Estonia	Tere AS	8	18	6	Olvi Oyj	23	14	4
Finland	Valio Oy	12	14	1	Coca-Cola Co, The	15	9	2
France	Lactalis, Groupe	4	14	4	Coca-Cola Co, The	16	11	1
Germany	Ferrero & related parties	3	7	0	Coca-Cola Co, The	16	14	7
Greece	Vivartia SA	4	15	8	Coca-Cola Co, The	23	17	9
Hungary	Bonafarm Group	6	12	3	Coca-Cola Co, The	26	15	4
Ireland	Mondelez International Inc	6	15	5	Coca-Cola Co, The	26	10	1
Italy	Barilla Holding SpA	4	15	7	Coca-Cola Co, The	13	15	7
Latvia	Premia Foods AS	9	19	7	Royal Unibrew A/S	22	17	6
Lithuania	Pieno Zvaigzdes AB	7	17	10	Coca-Cola Co, The	26	14	3
Netherlands	Royal FrieslandCampina NV	5	11	1	Coca-Cola Co, The	19	10	4
Norway	Tine SA	18	17	10	Coca-Cola Co, The	27	11	5
Poland	SM Mlekpol	3	18	10	Coca-Cola Co, The	17	20	11
Portugal	Lactogal - Produtos Alimentares SA	7	10	2	Sumol+Compal SA	13	12	6
Romania	Lactalis, Groupe	5	16	3	Coca-Cola Co, The	23	11	6
Slovakia	Nestlé SA and Meggle GmbH	4	19	8	Coca-Cola Co, The	13	17	5
Slovenia	Lactalis, Groupe	9	20	10	Atlantic Grupa dd	13	12	1
Spain	Danone, Groupe	4	11	3	Coca-Cola Co, The	29	12	4
Sweden	Arla Foods Amba	12	17	2	Coca-Cola Co, The	30	15	4
Switzerland	Emmi Group	4	8	2	Coca-Cola Co, The	17	14	5
United Kingdom	Mondelez International Inc	5	16	5	Coca-Cola Co, The	24	11	3
Average		**7**	**14**	**5**		**21**	**13**	**4**
Min		**3**	**7**	**0**		**13**	**9**	**0**
Max		**18**	**20**	**10**		**35**	**20**	**11**
SD		**4**	**3**	**3**		**6**	**3**	**3**
	Quick-service restaurants				**Supermarkets**			
Austria	McDonald's Corp	42	22	11	Rewe Group	27	7	3
Belgium	McDonald's Corp	16	18	10	Etn Franz Colruyt NV	21	8	1
Bulgaria	Happy Ltd	21	17	8	Schwarz Beteiligungs GmbH	22	8	3
Croatia	/	/	/	/	Agrokor dd	19	9	6
Czech Republic	McDonald's Corp	33	22	9	Schwarz Beteiligungs GmbH	26	7	2
Denmark	McDonald's Corp	24	27	19	FDB Group	29	9	3
Estonia	/	/	/	/	Coop Estonia	21	12	7
Finland	Burger-In Oy	13	23	17	S Group	45	5	2
France	McDonald's Corp	33	18	10	Carrefour SA	15	9	2
Germany	McDonald's Corp	31	19	5	Edeka Zentrale AG & Co KG	22	7	2
Greece	Vivartia SA	13	19	14	Sklavenitis J&S SA	16	8	7
Hungary	McDonald's Corp	31	18	7	Tesco Plc	14	10	3
Ireland	McDonald's Corp	15	24	14	Musgrave Group Plc	29	10	5
Italy	McDonald's Corp	25	16	12	CONAD	9	18	13
Latvia	/	/	/	/	ICA Gruppen AB	26	10	5
Lithuania	/	/	/	/	Vilniaus Prekyba UAB	33	8	3
Netherlands	McDonald's Corp	28	22	14	Koninklijke Ahold Delhaize NV	28	14	10
Norway	McDonald's Corp	12	22	10	Norgesgruppen ASA	31	6	4
Poland	McDonald's Corp	34	20	8	Jerónimo Martins SGPS SA	22	16	7
Portugal	McDonald's Corp	40	19	13	Sonae SGPS SA	19	8	1
Romania	McDonald's Corp	24	21	13	Schwarz Beteiligungs GmbH	18	7	1
Slovakia	McDonald's Corp	37	19	9	Schwarz Beteiligungs GmbH	30	8	3
Slovenia	/	/	/	/	Agrokor dd	30	11	5
Spain	McDonald's Corp	19	15	8	Mercadona SA	22	11	6
Sweden	McDonald's Corp	21	22	11	ICA Gruppen AB	39	9	5
Switzerland	Migros Genossenschaftsbund	28	11	5	Migros Genossenschaftsbund	29	7	4
United Kingdom	McDonald's Corp	8	23	15	Tesco Plc	22	12	8
Average		**25**	**20**	**11**		**25**	**9**	**4**
Min		**8**	**11**	**5**		**9**	**5**	**1**
Max		**42**	**27**	**19**		**45**	**18**	**13**
SD		**9**	**3**	**4**		**8**	**3**	**3**

Table 4: The four firm concentration ratio (CR4) for the 14 different packaged food product markets per European Single Market member state. Red indicates CR4 values >60% and markets with dominant firms and limited competition, yellow indicates CR4 values between 40% - 60% and markets with limited competition while green indicates CR4 values ≤ 40% and markets with effective competition. The percent change over the past 10 years (2009 – 2018) is included in brackets. *Euromonitor data 2018.*

Country	Soup		Ice Cream and Frozen Desserts		Breakfast Cereals		Confectionery		Savoury Snacks		Sweet Biscuits, Snack Bars and Fruit Snacks		Sweet Spreads		Dairy		Sauces, dressings and condiments		Ready meals		Rice, Pasta and Noodles		Processed Meat and Seafood		Processed Fruit and Vegetables		Baked Goods		Packaged Foods	
Austria	76	(0)	76	(3)	62	(5)	58	(8)	54	(-1)	41	(9)	66	(1)	37	(1)	49	(1)	44	(-3)	39	(2)	28	(7)	49	(-9)	8	(4)	13	(-2)
Belgium	76	(2)	50	(1)	63	(-10)	38	(-2)	53	(5)	38	(0)	43	(-6)	28	(-6)	41	(-9)	23	(14)	33	(-6)	17	(14)	26	(20)	7	(-13)	10	(-23)
Bulgaria	85	(-6)	87	(-1)	74	(6)	54	(0)	32	(16)	43	(11)	41	(-7)	26	(-17)	39	(-2)	54	(23)	43	(0)	61	(-7)	46	(6)	20	(-8)	14	(-26)
Croatia	89	(13)	94	(5)	43	(-3)	56	(-5)	38	(13)	59	(12)	50	(-4)	62	(0)	65	(-1)	47	(-8)	49	(20)	72	(-1)	65	(21)	20	(15)	29	(-4)
Czech Republic	84	(-2)	75	(-3)	71	(-1)	70	(-5)	42	(-16)	62	(-9)	43	(-15)	39	(9)	44	(-8)	53	(-4)	37	(-17)	39	(-1)	36	(-5)	22	(-5)	20	(-8)
Denmark	70	(8)	51	(-15)	58	(-2)	46	(-8)	54	(-1)	38	(-16)	54	(-6)	64	(-4)	45	(-1)	43	(-6)	23	(1)	35	(4)	25	(8)	23	(-35)	24	(-8)
Estonia	64	(9)	83	(8)	48	(-15)	61	(1)	46	(-22)	49	(46)	43	(9)	65	(6)	32	(-11)	49	(9)	31	(-6)	56	(-2)	40	(-19)	64	(1)	24	(11)
Finland	54	(-3)	83	(-1)	39	(-13)	74	(-1)	53	(0)	54	(-4)	45	(-29)	53	(-21)	43	(-3)	53	(-1)	37	(-4)	49	(0)	30	(-2)	35	(-31)	28	(-17)
France	76	(-3)	64	(3)	70	(1)	48	(11)	45	(4)	50	(14)	56	(17)	38	(2)	40	(0)	34	(9)	54	(13)	24	(10)	29	(17)	8	(14)	12	(-5)
Germany	66	(0)	47	(2)	55	(3)	41	(4)	40	(2)	26	(8)	48	(0)	14	(-9)	44	(-4)	38	(4)	30	(5)	10	(32)	27	(5)	16	(-1)	9	(-3)
Greece	100	(8)	70	(-1)	68	(-8)	71	(-1)	51	(-6)	56	(4)	28	(-30)	35	(-18)	57	(-3)	47	(10)	55	(-20)	34	(14)	45	(-17)	12	(-27)	14	(-21)
Hungary	84	(1)	54	(-20)	47	(-8)	53	(-7)	39	(-8)	43	(-6)	30	(-10)	34	(-18)	41	(0)	35	(-11)	31	(-6)	28	(-21)	25	(-5)	7	(6)	15	(-30)
Ireland	72	(-3)	73	(-3)	68	(-2)	75	(-2)	58	(-14)	46	(-6)	49	(-17)	35	(-18)	44	(-16)	34	(-20)	44	(-6)	57	(1)	57	(2)	24	(-11)	20	(-10)
Italy	63	(-23)	23	(-22)	80	(-8)	61	(2)	38	(-16)	44	(-5)	51	(-17)	29	(-3)	37	(-16)	29	(1)	33	(-15)	19	(20)	30	(0)	11	(7)	10	(-30)
Latvia	67	(0)	75	(8)	81	(-1)	69	(2)	56	(-19)	70	(-5)	44	(12)	62	(13)	65	(3)	40	(-17)	33	(7)	51	(15)	65	(4)	50	(2)	29	(11)
Lithuania	75	(-3)	69	(-7)	68	(-6)	60	(-15)	59	(-3)	58	(28)	55	(3)	66	(-9)	43	(-24)	47	(21)	41	(-6)	44	(-5)	49	(-4)	43	(25)	20	(0)
Netherlands	68	(-10)	71	(2)	50	(3)	37	(-6)	40	(-13)	37	(-15)	35	(-4)	30	(-20)	43	(-13)	27	(8)	34	(-12)	10	(18)	43	(0)	11	(-20)	13	(-16)
Norway	89	(-2)	90	(7)	62	(-7)	72	(-1)	62	(-10)	61	(0)	67	(0)	86	(0)	57	(-3)	73	(-4)	44	(-18)	57	(-3)	25	(-20)	32	(-11)	41	(-6)
Poland	75	(-13)	66	(-3)	60	(-12)	47	(-7)	43	(-5)	39	(-31)	33	(-4)	35	(7)	45	(-2)	30	(-18)	33	(-20)	42	(4)	36	(-9)	5	(55)	11	(-14)
Portugal	56	(-24)	76	(6)	56	(-7)	43	(-2)	34	(-10)	25	(-13)	33	(19)	49	(-3)	31	(-13)	18	(-15)	40	(-2)	24	(-2)	18	(-32)	9	(7)	19	(-4)
Romania	63	(25)	63	(2)	68	(6)	66	(-2)	45	(-8)	33	(-7)	46	(16)	48	(-13)	37	(-9)	36	(-43)	49	(23)	36	(-8)	38	(4)	9	(89)	12	(4)
Slovakia	67	(-13)	67	(-2)	72	(-4)	69	(-1)	31	(-37)	61	(6)	42	(-14)	35	(-12)	29	(-11)	51	(-21)	26	(-39)	42	(1)	35	(-21)	16	(-10)	15	(-6)
Slovenia	87	(14)	68	(0)	43	(7)	57	(-2)	47	(4)	33	(-10)	30	(-7)	54	(-2)	33	(-4)	48	(-4)	61	(-6)	60	(-4)	47	(1)	32	(-10)	21	(-10)
Spain	50	(-6)	56	(-18)	49	(-20)	40	(-7)	38	(-6)	42	(-20)	38	(0)	34	(-17)	22	(-6)	25	(-6)	33	(-15)	20	(-7)	21	(-26)	21	(32)	15	(17)
Sweden	82	(5)	65	(-10)	44	(-17)	58	(0)	55	(-3)	32	(-23)	40	(-3)	60	(-11)	46	(6)	44	(-6)	29	(-22)	45	(-7)	24	(-18)	42	(-8)	25	(-9)
Switzerland	66	(-3)	54	(0)	42	(-1)	28	(0)	48	(2)	32	(-1)	36	(-4)	26	(1)	52	(-1)	10	(-27)	20	(-13)	9	(0)	17	(-13)	5	(4)	10	(0)
United Kingdom	53	(-22)	46	(11)	60	(-8)	66	(-1)	45	(-16)	37	(11)	42	(4)	21	(-7)	33	(-21)	13	(-21)	33	(-5)	17	(1)	35	(-1)	28	(-22)	13	(-4)
Average	72	(-2)	67	(-2)	59	(-5)	56	(-2)	46	(-6)	45	(-1)	44	(-4)	43	(-6)	43	(-6)	39	(-5)	37	(-6)	37	(3)	36	(-4)	21	(2)	18	(-8)
Min	50	(-24)	23	(-22)	39	(-20)	28	(-15)	31	(-37)	25	(-31)	28	(-30)	14	(-21)	22	(-24)	10	(-43)	20	(-39)	9	(-21)	17	(-32)	5	(-35)	9	(-30)
Max	100	(25)	94	(11)	81	(7)	75	(11)	62	(16)	70	(46)	67	(19)	86	(13)	65	(6)	73	(23)	61	(23)	72	(32)	65	(21)	64	(89)	41	(17)
SD	12	(11)	15	(8)	12	(7)	13	(5)	8	(11)	12	(16)	10	(12)	17	(9)	10	(7)	14	(15)	10	(13)	17	(11)	13	(13)	15	(26)	8	(12)

- **Non-alcoholic beverage manufacturers**

The top three most sold non-alcoholic beverage product categories across ESM member states comprised 'Carbonates', 'Juices' and 'Energy drinks', contributing to 44%, 30% and 11% of the overall European sales of non-alcoholic beverages, respectively. 'Carbonates' was the most sold product category in 89% of the ESM member states. Other product categories entering the top three were 'Ready-to-Drink Tea' and 'Concentrates', respectively in 19% and 11% of the ESM member states and contributing 6% and 5% to overall European non-alcoholic beverage sales (data not shown).

Throughout the 27 ESM member states, seven global brand owners were identified as being national market leaders. The Coca-Cola Company was the leading global brand owner in 21 of the member states (Table 3). Only in Croatia (Agrokor), the Czech Republic (Karlovarské Minerální Vody), Estonia (Olvi Oyj), Latvia (Royal Unibrew), Portugal (Sumol+Compal) and Slovenia (Atlantic Grupa) other leading global brand owners were observed. Where The Coca-Cola Company was not the leading company, they held the second largest market share in all countries except Slovenia. When looking at the pooled sales data throughout the ESM, additional market leaders within the non-alcoholic beverage industry were identified (PepsiCo, Nestlé, Danone and Suntory Holdings, data not shown).

According to the CR4 and HHI, the markets for 'Carbonates' and 'Energy drinks' were highly concentrated in most ESM member states. For both product markets the CR4 was on average 76% (Table 5). The HHI was 3069 and 2494, respectively (Annex 2). The markets for 'Ready-to-Drink Coffee' and 'Sport drinks' joined the list with an average CR4 of 76% and 74% and an average HHI of 2852 and 2755, respectively. For the eight different non-alcoholic beverage product markets, the average CR4 did not go below 52%. Germany was the only country in which the CR4 was lower than 40% for all product markets except for 'Carbonates', 'Ready-to-drink Tea' and 'Energy drinks'. The average HHI did not go below 2000 for any non-alcoholic beverage product market except for 'Concentrates' and 'Juices' (Annex 2). In contrast to the packaged food markets, the concentration of the non-alcoholic beverage markets increased from 2009 to 2018 according to both the average CR4 and the HHI. Summarized, the CR4 and HHI indicated moderately to highly concentrated markets (Table 5).

Table 5: The four firm concentration ratio (CR4) for the 8 different non-alcoholic beverage product markets per European Single Market member state. Red indicates CR4 values >60% and markets with dominant firms and limited competition, yellow indicates CR4 values between 40% - 60% and markets with limited competition while green indicates CR4 values ≤ 40% and markets with effective competition. Between brackets the percent change over the past 10 years is included (2009 – 2018).

Euromonitor data 2018. RTD=Ready-to-drink. For 'Asian Specialty Drinks' data were lacking in several countries.

Country	Carbonates		RTD Coffee		Energy Drinks		Sports Drinks		RTD Tea		Concentrates		Juice		Asian Speciality Drinks		Soft Drinks	
Austria	70	(1)	74	(-6)	70	(3)	72	(-6)	67	(-4)	55	(5)	50	(6)			48	(-1)
Belgium	77	(7)	81	(55)	68	(21)	72	(9)	72	(8)	50	(-21)	32	(-9)			50	(1)
Bulgaria	77	(5)	74	(-7)	81	(-1)	77	(-3)	66	(10)	54	(-30)	47	(-12)			47	(-6)
Croatia	81	(11)	85	(15)	94	(2)	79	(3)	78	(13)	63	(3)	69	(8)			63	(20)
Czech Republic	76	(0)	87	(-1)	49	(-31)	93	(7)	64	(19)	59	(-2)	52	(-2)			52	(-8)
Denmark	71	(3)	85	(4)	84	(33)	80	(5)	68	(-14)	63	(-2)	47	(-12)			42	(-9)
Estonia	87	(19)	83	(-2)	85	(15)	92	(12)	94	(15)	60	(-2)	66	(1)			55	(22)
Finland	72	(-7)	67	(-8)	73	(6)	77	(-9)	57	(20)	45	(-14)	60	(-5)			50	(-9)
France	82	(-2)	92	(106)	84	(-7)	86	(26)	65	(6)	59	(6)	48	(28)	84	(5)	43	(-4)
Germany	56	(-8)	35	(14)	66	(7)	24	(0)	44	(-8)	34	(57)	26	(-8)	38	(7)	27	(-1)
Greece	84	(-8)	85	(-6)	91	(-4)	99	(9)	82	(-10)	77	(6)	68	(-4)			51	(-8)
Hungary	82	(-1)	55	(-24)	78	(28)	64	(53)	68	(-10)	41	(16)	58	(22)			43	(-4)
Ireland	86	(-2)	74	(-15)	93	(1)	90	(7)	65	(-33)	67	(3)	40	(-10)			59	(-4)
Italy	67	(-8)	63	(-20)	88	(23)	82	(8)	52	(-14)	57	(4)	43	(-10)	91	+∞	40	(-2)
Latvia	68	(4)	57	(-26)	85	(62)	72	(20)	93	(8)	78	(71)	76	(18)			55	(3)
Lithuania	84	(17)	93	(56)	54	(23)	43	(-50)	77	(-8)	57	(-24)	56	(-7)			44	(12)
Netherlands	63	(1)	70	(19)	76	(53)	53	(-8)	64	(25)	62	(10)	43	(-2)	76	(49)	43	(-2)
Norway	89	(1)	93	(10)	81	(-13)	79	(-9)	82	(5)	85	(7)	53	(8)			64	(-9)
Poland	77	(6)	49	(2)	76	(26)	93	(15)	61	(-18)	58	(3)	61	(5)			41	(-5)
Portugal	79	(3)	100	(0)	57	(-32)	23	(-71)	37	(-8)	52	(-35)	53	(3)	58	+∞	34	(-13)
Romania	66	(4)	91	(87)	72	(-13)	75	(-25)	83	(14)	40	(-52)	49	(-12)			44	(-9)
Slovakia	67	(-3)	76	(-10)	64	(-15)	78	(-10)	59	(-18)	42	(-2)	48	(8)			35	(-4)
Slovenia	88	(5)	66	(15)	84	(-8)	56	(19)	85	(8)	66	(4)	69	(-12)			46	(-3)
Spain	80	(-1)	66	(-33)	65	(-5)	85	(-4)	83	(14)	79	(-4)	41	(10)			41	(-11)
Sweden	85	(6)	94	(58)	83	(11)	95	(1)	73	(-7)	74	(15)	59	(11)			50	(-5)
Switzerland	75	(4)	85	(23)	67	(18)	71	(3)	38	(10)	43	(-5)	34	(-13)			32	(-7)
United Kingdom	80	(1)	85	(152)	87	(2)	88	(3)	70	(-15)	57	(-4)	43	(31)	12	(-57)	45	(-3)
Average	76	(2)	76	(17)	76	(8)	74	(0)	68	(0)	58	(1)	52	(1)	60	(1)	46	(-3)
Min	56	(-8)	35	(-33)	49	(-32)	23	(-71)	37	(-33)	34	(-52)	26	(-13)	12	(-57)	27	(-13)
Max	89	(19)	100	(152)	94	(62)	99	(53)	94	(25)	85	(71)	76	(31)	91	(49)	64	(22)
SD	8	(7)	15	(42)	12	(22)	19	(22)	14	(14)	13	(24)	12	(12)	28	(38)	9	(8)

- **Quick-service restaurants**

Within the ESM in 2017, on average across member states, 20% of the quick-service restaurant sales came from international chains or restaurants with 10 or more outlets in the country (with a minimum of 7% in Italy and going up to 44% in the United Kingdom, data not shown). Consumers spent more on eat-in than take-away, home-delivery and drive-through. On average 77% (min 64% in France to max 86% in Austria) of the sales could be attributed to meals consumed in the restaurant. Drive-through seemed to be the least popular in the ESM, only contributing on average 1% to the sales (min 0% in Greece up to max 3% in France). Take-away and home-delivery on average contributed 16% and 5%, respectively (data not shown). Per 1000 inhabitants, a country within the ESM in 2017 on average counted 3.7 quick-service restaurant outlets. The lowest number was observed in Romania (1.3 outlets/1000 inhabitants) and the highest in Portugal (8 outlets/1000 inhabitants). The annual average number of quick-service restaurant transactions within the ESM in 2017 was 91651 per 1000 inhabitants (46499 in Poland up to 217372 in Spain, per 1000 inhabitants) (data not shown).

In all 22 ESM member states for which data were available, except Greece, McDonald's was the leading company (82%) or the company with the second largest market share (14%) with on average 1.8 outlets per 1000 inhabitants (with a minimum of 0.2 in Greece and a maximum of 4.2 in Switzerland, data not shown). Other companies that held the leader position were Happy Ltd in Bulgaria, Burger-In Oy in Finland, Vivartia in Greece and Migros Genossenschaftsbund in Switzerland (Table 3).

The CR4 was 50% on average and did not go below 40% in any of the ESM member states apart from Ireland and the United Kingdom (Table 6). In contrast, the HHI indicated unconcentrated markets in 50% of the ESM member states. This discrepancy was also observed when looking at the percent change from 2008 to 2017. While the CR4 had increased in all the ESM member states, the HHI had decreased in all except Austria, the Netherlands, Poland and Spain. This difference between both concentration indices could be attributed to the market share of the top four firms increasing as well as being more evenly distributed.

Table 6: The four firm concentration ratio (CR4) and the Herfindahl-Hirschman Index (HHI) for the quick-service restaurant industry per European Single Market member state. Red indicates CR4 values >60% and HHI values >2000 so highly concentrated markets, yellow indicates CR4 values between 40% - 60% and HHI values between 1000 - 2000 so moderately concentrated markets and green indicates CR4 values ≤ 40 and HHI < 1000 so unconcentrated markets. Between brackets the percent change over the past 10 years is included (2008 – 2017). *Euromonitor data 2017.*

	Austria	Belgium	Bulgaria	Czech Republic	Denmark	Finland	France	Germany	Greece	Hungary	Ireland	Italy	Netherlands	Norway	Poland	Portugal	Romania	Slovakia	Spain	Sweden	Switzerland	United Kingdom	Average	Min	Max	SD
CR4	58	55	53	61	42	41	46	47	42	61	36	52	44	42	59	59	56	63	42	47	71	29	50	29	71	10
% Change since 2008	*(51)*	*(187)*	*(195)*	*(43)*	*(55)*	*(184)*	*(33)*	*(45)*	*(15)*	*(19)*	*(102)*	*(83)*	*(73)*	*(172)*	*(85)*	*(46)*	*(75)*	*(62)*	*(189)*	*(67)*	*(128)*	*(129)*	*(93)*	*(15)*	*(195)*	*(58)*
HHI	1860	885	1004	1460	783	595	1192	1073	574	1310	498	951	988	628	1489	1764	1229	1711	648	739	1616	363	1062	363	1860	435
% Change since 2008	*(13)*	*(-12)*	*(-13)*	*(-32)*	*(-25)*	*(-25)*	*(-16)*	*(-13)*	*(-62)*	*(-54)*	*(-24)*	*(-21)*	*(15)*	*(-10)*	*(8)*	*(-4)*	*(-21)*	*(-12)*	*(36)*	*(-28)*	*(-7)*	*(-28)*	*(-15)*	*(-62)*	*(36)*	*(21)*

- **Supermarkets**

For the purpose of this analysis, supermarkets were considered as manufacturers of packaged foods and non-alcoholic beverages through own-brand products placed on the market and as retailers selling the products. Among the packaged foods and non-alcoholic beverages available on the market, 15% (SD: 8.8) of the packaged foods and 7% (SD: 5.5) of the non-alcoholic beverages could be attributed to supermarket own-brand products. Within Estonia no supermarket had a market share of ≥1% for selling own-brand packaged food products. In contrast, in Switzerland, 39% of the sold packaged food products were supermarket own-brand products. For the sales of non-alcoholic beverages a similar picture could be observed as for packaged foods. In Romania and Greece no supermarket had a market share of ≥1% for selling own-brand non-alcoholic beverages. In Switzerland, 23% of the non-alcoholic beverage sales were supermarket own-brand products. This suggested that the role of supermarkets as producers of own-brand packaged foods and non-alcoholic beverages was country specific. A country within the ESM on average counted 2.4 supermarket outlets per 1000 inhabitants. This decreased to one outlet per 1000 inhabitants in nine ESM member states (Austria, Denmark, Finland, Germany, Ireland, Norway, Slovenia, Sweden and the United Kingdom) and increased up to six in Bulgaria and Greece (in 2018, data not shown).

The most reoccurring supermarket within the ESM was Schwarz Beteiligungs (brands: Kaufland, Lidl and Plus) being the global brand owner in four countries and having a presence in 24 of the 27 ESM member states. Other supermarkets playing a leading role in several countries were Agrokor (brands: Getro, Hura!, Konzum, Mercator, Slobodna Dalmacija and Tisak) Tesco (brands: One Stop, S-Market, Savia, Tesco and Zabka) and ICA Gruppen (brands: ICA, Rimi, Supernetto and Säästumarket), all being the leader in two ESM member states and having a presence in two, six and four member states, respectively.

Although several different supermarkets were present throughout the ESM, noteworthy concentration took place at national level with an average CR4 of 60% (Table 7). The CR4 only dropped below 40% in Bulgaria, Greece, Italy and Romania and did not go below 30% in any of the ESM member states. The average HHI within the ESM member states stood at 1245 with highly concentrated markets (>2000) in Finland, Norway and Sweden. In 44% of the ESM member states the HHI remained below 1000 indicating unconcentrated markets. Within these unconcentrated markets however, only 33% of the member states also had a CR4 below 40%. In 82% of the ESM member states both the CR4 and HHI had increased since 2009 (Table 7).

Summarized, it was concluded that, even though the overall market remained relatively unconcentrated in most ESM member states, most of the market share tended to be controlled by the four biggest national supermarkets.

Table 7: The four firm concentration ratio (CR4) and the Herfindahl-Hirschman Index (HHI) for the supermarket industry per European Single Market member state. Red indicates CR4 values >60% and HHI values >2000 so highly concentrated markets, yellow indicates CR4 values between 40% - 60% and HHI values between 1000 - 2000 so moderately concentrated markets and green indicates CR4 values ≤ 40 and HHI < 1000 so unconcentrated markets. Between brackets the percent change over the past 10 years is included (2008 – 2017). *Euromonitor data 2017.*

	Austria	Belgium	Bulgaria	Croatia	Czech Republic	Denmark	Estonia	Finland	France	Germany	Greece	Hungary	Ireland	Italy	Latvia	Lithuania	Netherlands	Norway	Poland	Portugal	Romania	Slovakia	Slovenia	Spain	Sweden	Switzerland	United Kingdom	Average	Min	Max	SD
CR4	77	59	37	48	64	76	69	94	46	70	39	46	62	31	68	65	62	84	48	54	37	70	70	41	79	60	53	60	31	94	16
% Change since 2009	*(11)*	*(6)*	*(96)*	*(16)*	*(19)*	*(7)*	*(4)*	*(4)*	*(1)*	*(14)*	*(142)*	*(-4)*	*(14)*	*(12)*	*(19)*	*(-10)*	*(11)*	*(12)*	*(66)*	*(14)*	*(36)*	*(19)*	*(-10)*	*(19)*	*(4)*	*(-4)*	*(-4)*	*(19)*	*(10)*	*(142)*	*(32)*
HHI	1780	994	587	748	1247	1872	1308	3272	679	1273	497	779	1300	346	1510	1545	1151	2145	804	930	499	1538	1629	654	2116	1440	917	1245	346	3272	631
% Change since 2009	*(18)*	*(13)*	*(426)*	*(-10)*	*(45)*	*(8)*	*(8)*	*(6)*	*(1)*	*(29)*	*(401)*	*(7)*	*(27)*	*(12)*	*(24)*	*(-21)*	*(7)*	*(30)*	*(172)*	*(37)*	*(108)*	*(52)*	*(-22)*	*(60)*	*(7)*	*(-16)*	*(-3)*	*(53)*	*(-22)*	*(426)*	*(109)*

- **Combined results for the four food industries**

As shown in Figure 4, both the average number of global brand owners per country with ≥1% market share and unique companies per country with ≥1% market share across ESM member states tended to be lower among supermarkets than what was observed for packaged food and non-alcoholic beverage manufacturers and quick-service restaurants. A ESM member state on average counted 14 packaged food global brand owners with ≥1% market share (minimum 7 in Germany up to maximum 20 in Slovenia), 13 non-alcoholic beverage companies (minimum 9 in Finland up to 20 in Bulgaria and Poland), 20 quick-service restaurants (minimum 11 in Switzerland and 27 in Denmark) and nine supermarkets (minimum 5 in Finland and maximum 18 in Italy). Similar results were observed for the unique companies, with a ESM member state on average having five unique packaged food companies (no unique companies in Germany going up to ten in Lithuania, Norway, Poland and Slovenia), four unique non-alcoholic beverage companies (no unique companies in Belgium to maximum 11 in Poland), 11 unique quick-service restaurants (minimum 5 in Switzerland and Germany going up to 19 in Denmark) and four unique supermarkets (minimum one in Belgium, Portugal and Romania and maximum 13 in Italy) (Table 3, Figure 4).

In contrast, the average market share per country in the hands of the leading global brand owners was the highest for quick-service restaurants and supermarkets, with both holding, on average per country, 25% market share (minimum 8% to maximum 42% for quick-service restaurants and minimum 9% to maximum 45% for supermarkets). The average market share per country in the hands of the leading packaged food and non-alcoholic beverage company was 7% (3% - 18%) and 21% (13% - 35%), respectively (Table 3, Figure 4).

The considerably higher average number of global brand owners with ≥1% market share and unique companies per country among quick-service restaurants was indicative of a higher in-country diversity of quick-service restaurants. This was not observed for supermarkets.

Figure 4: Average market share (MS) in hands of the leading global brand owner company (yellow), average number of global brand owners with ≥1% market share (orange) and average number of unique companies (green) across European Single Market member states and per food industry. The error bars indicate the respective standard deviation.

2.5 Discussion

Using Euromonitor sales and market share data, this study set out to provide an analysis of the food industry within the ESM, comparing aspects of market structure for four food industries, namely packaged foods, non-alcoholic beverages, quick-service restaurants and supermarkets. Substantial differences were found across European countries and food industries. For packaged food and non-alcoholic beverage manufacturers similar companies and most sold product categories were observed throughout the ESM with the main difference between both industries being the higher level of market concentration within the non-alcoholic beverage industry and respective product markets. For quick-service restaurants the same leading companies were detected throughout Europe with increased market share moving towards the four largest companies since 2008. In spite of these levels of market concentration, quick-service restaurants showed to have a considerable higher number of global brand owners with ≥1% market share and unique companies than any other food industry. In contrast,

supermarkets were shown to have a diversity of companies throughout Europe, but noteworthy concentration took place at country level with most of the market share being in hands of the four national supermarkets with the largest market share. This was also reflected in the lower number of global brand owners with ≥1% market share and unique companies.

Our data showed that the most sold packaged food and non-alcoholic beverage categories were similar throughout Europe with 'Baked goods', 'Dairy', 'Processed meat and seafood' and 'Confectionery', contributing a combined 67% to the overall European sales of packaged foods and 'Carbonates', 'Juices' and 'Energy drinks' contributing to 85% of the sales of non-alcoholic beverages. The companies selling these product categories were also similar across Europe with a country on average having only five unique packaged food companies and four non-alcoholic beverage companies.

These similar players and most sold product categories across the ESM suggest that from a public health point of view the market for packaged foods and non-alcoholic beverages could be approached as one territory and could facilitate the implementation of regulations affecting packaged food and non-alcoholic beverage manufacturers at a European level. Implementing regulations such as marketing restrictions (for certain media like food packages, internet and social media), reformulation targets and front-of-pack labelling at a European level would potentially be preferable to pursuing national policy measures from a public health point of view. This would ensure policy consistency across the region and would be likely to ease the administrative burden associated with policy development and implementation. Furthermore, a harmonised policy framework across the ESM would likely facilitate implementation from a food industry point of view, as has been argued by some companies that have pushed for the Nutri-Score to be made mandatory at European level (153–155). For the moment a variety of policy measures are already in place throughout the ESM, but the policy content and implementation varies by country (20,113). The trans fat regulation and obligatory on-pack nutritional information (detailing how much energy and nutrients a product contains) are examples of successful European-wide legislation in this area (110,156).

Our data showed that in about 50% of the ESM member states, supermarkets were the leading national brand owners selling packaged foods through own-brand products placed on the market. However, their role as producers of packaged foods and non-alcoholic beverages varied significantly throughout the ESM. In addition, in most ESM member states, the combined market share of the four biggest supermarkets was on average 60% (31% - 94%). This places them in a unique position for in-store health promoting interventions with the potential to influence purchasing behaviour of a significant proportion of the population. Currently only limited voluntary initiatives have been made by supermarkets in the Netherlands, the United Kingdom and Austria introducing healthy checkout counters (157–161). Studies have, however, shown that all-inclusive interventions combining price incentives, nutritional information

and easy access to healthy foods could considerably help improve the in-store food environment (162). Nonetheless, our data showed that the role of supermarkets is rather country specific and as such regulations affecting the in-store environment would potentially benefit from being implemented at a national level. However, first more research is needed to summarize the commitments already made by supermarkets and identify policy options adapted to the national food environment that could help ensure that supermarkets use their unique position to move the market in a healthier direction.

Alongside supermarkets, quick-service restaurants have an important role within the food environment (22,163,164). Our results showed that ESM member states on average have more quick-service restaurant outlets than supermarkets (3.7 and 2.4 per 1000 inhabitants, respectively). Although, among quick-service restaurants on average 50% of all the market share was in hands of the four biggest companies, the industry also counted the highest average number of unique companies for one ESM member state and companies with ≥ 1% market share compared to packaged food manufacturers, non-alcoholic beverage manufacturers and supermarkets. The latter was reflected in the low concentration levels according to the HHI. These data suggest that, even though the bigger players are present in most of the ESM member states, smaller players at national level are important and should be taken into account when formulating nutrition policies. As such, similar to supermarkets, regulations affecting quick-service restaurants could potentially benefit from being implemented at national level. Potential policies could be the implementation of nudging techniques and menu-labelling which have shown to be effective in schools and among non-overweight individuals, respectively (163–166). However, first more research is required to identify the unique national companies, understand the national food environment and summarize the commitments already made by quick-service restaurants.

Within the abovementioned four food industries and respective product markets, our data indicated moderately to highly concentrated markets. These levels of market concentration may be of concern from a public health perspective for a number of reasons, including how the extra profits may be used to support or hamper the implementation of government policies affecting the food environment (61,62). This is especially of concern when many of the product portfolios of the companies consist of less healthy products. Selling less healthy, but more profitable products in concentrated markets can in turn increase profit margins (60,167). These profits can then be used to fund corporate practices, such as marketing of unhealthy food, lobbying and paying fees to supermarkets to place unhealthy products at favourable locations in the shop, that may undermine public health efforts to improve population diets (60,62). However, to understand to what extent such practices take place, more research into European and country specific corporate activities is required.

The study has several strengths. Most importantly, this study forms a basis to understand how certain aspects of the market structure of key European food industries may influence food environments. A key

strength of the study is the amount of data used to identify the similarities and differences across Europe as well as the levels of concentration per food industry and respective product markets. It also highlights the importance of a transdisciplinary approach, not only taking into account the effectiveness of policies to improve the food environment, but additionally looking at the economic environment surrounding it. There were however also limitations identified. The Euromonitor database is based around the ownership of brands (e.g. national and global brand owners) rather than companies. As a result, the global brand owners identified may change when brands are sold to new brand owners. Further, having looked at the aforementioned levels of concentration it must be kept in mind that these may be an underestimation. Companies being considered independent in Euromonitor (due to the database being built around brand ownership), and as such for the concentration calculations, may still sell well-known brands from other companies through licensing agreements. In addition, not all products within one food category, as determined by the Euromonitor's food categorization system, are interchangeable from a consumer point of view (for example, the category 'Baked goods' contains both bread and pastries). Hence, levels of concentration may increase when calculating the concentration indices for more specific food categories. Furthermore, for this study the geographic boundaries were defined based on the available data (at national level using Euromonitor's food categorisation system), but in reality, the geographic boundaries, especially for supermarkets and quick-service restaurants, may be different to national boundaries (132,150,168). In addition, to further assess market structure, other aspects should be considered, such as barriers to entry and degree of vertical integration. Another step towards the future is to connect the players with the largest market share per food industry with their nutritional commitments and the healthiness of their product portfolios to identify gaps between commitments and performance and point out areas that could be improved by the implementation of nutrition policies.

2.6 Conclusions

This study provided an analysis of the packaged food manufacturing, non-alcoholic beverage manufacturing, quick-service restaurant and supermarket industries within the ESM. While similarities in market structure throughout the ESM were observed for packaged food and non-alcoholic beverage manufacturers, a different picture was seen for quick-service restaurants and supermarkets. The first displayed a remarkably higher diversity of companies at the national level while the latter demonstrated the contrary. Due to these structural differences between food industries, a differentiation between European and national level regulations by industry was suggested to potentially facilitate the implementation of nutrition policies. This study highlights the importance of a transdisciplinary approach taking into account not only the effectiveness of nutrition policies to improve the food environment, but also the economic environment surrounding

Chapter III Assessment of the commitments and performance of the European food industry to improve population nutrition

This chapter is based on the following paper currently under review:

Van Dam, I., Guillon, E., Robinson, E. et al. Assessment of the commitments and performance of the European food industry to improve population nutrition. Int J Public Health.

3.1 Abstract

Background: Food companies could play an important role in improving population diets, but often escape accountability through unspecific commitments. This study evaluated nutrition-related commitments and estimated performance of the largest packaged food and non-alcoholic beverage manufacturers, supermarkets and quick-service restaurants in Europe.

Methods: To quantitatively assess companies' publicly available commitments in 2020, the 'Business Impact Assessment on Obesity and population-level nutrition' was applied. The proportion of sales from ultra-processed and 'unhealthy' food categories (product categories not-permitted to be marketed to children) and over time changes in the number of quick-service restaurant transactions and quick-service restaurant and supermarket outlets were calculated.

Results: Company commitments fell short of best practice recommendations (median overall score of 21%, range: 1%-62%). Food and beverage companies generated 82% (15%-100%) and 58% (1%-100%) sales from ultra-processed and 'unhealthy' products, respectively. The number of QSR outlets and transactions substantially increased in Europe since 2011, while QSR commitments to improve population nutrition remained limited.

Conclusion: Whilst most companies made some nutrition-related commitments, they did not comply with best practice recommendations. A large proportion of sales was generated from ultra-processed/unhealthy products and quick-service restaurant outlets increased. Government regulations are urgently needed.

3.2 Background

Throughout Europe different food cultures, income levels and inequalities can be observed, but the challenges relating to unhealthy diets and overweight remain largely the same (20). In 2016, approximately only 41% of the European population was classified as having a normal bodyweight (Body Mass Index, BMI <25kg/m^2 and ≥18.5kg/m^2) (7,20). Genetics may be able to explain weight variations at an individual level, but cannot explain the continued weight gain across populations and age categories (19). Food environments, defined as "the collective physical, economic, policy and sociocultural surroundings, opportunities and conditions that influence people's food and beverage choices and nutritional status" (34), are now thought to be the primary drivers of unhealthy diets and obesity (5,34,138,169).

Within current food environments food and beverage companies are attempting to profile themselves as responsible actors that are part of the solution to improving population nutrition and reducing obesity, instead of contributing to the underlying problem (24,76,167). Solutions proposed by food companies are generally voluntary and self-regulatory in nature (24). For example, the EU-Pledge is a European wide initiative to address marketing of unhealthy foods and beverages towards children (69,170). Although compliance to this pledge by signatory companies is high, this does not translate into effective protection of children from unhealthy food marketing, due to the target audience definition, the limited number of national signatories and the lenient nutrition criteria (79,86). An alternative nutrient profiling system to determine whether food products should be permitted to be marketed to children is the World Health Organisation Regional Office for Europe nutrient profile model (WHO-model), which is considerably stricter than the EU-Pledge and allows fewer products to be marketed to children (86,171).

To ensure that commitments made by the food industry translate into real-world good practices, it is essential to monitor and evaluate them (138). The Access to Nutrition Initiative (ATNI) benchmarks the largest food and beverage manufacturers on their nutrition-related policies and practices at a global level (137,172–175). The International Network for Food and Obesity/Non-communicable Diseases (NCDs) Research, Monitoring and Action Support (INFORMAS) developed the 'Business Impact Assessment on Obesity and Population Nutrition' (BIA-Obesity) based on the ATNI methods, a review of relevant academic papers, WHO documents and other grey literature reports (135,138). While the ATNI evaluates commitments and performance of global packaged food and beverage manufacturers to reduce both undernutrition and obesity (137,172–175), the BIA-Obesity focusses solely on overweight and obesity and is less resource intensive (176). In addition to packaged food and beverage manufacturers, the BIA-Obesity assessment includes quick-service restaurants (QSR) and supermarkets (135,138). Per company the comprehensiveness, transparency, and specificity of

commitments and practices are assessed across six policy domains: 'Corporate strategy', 'Product formulation', 'Nutrition labelling', 'Product and brand promotion', 'Product accessibility', and 'Relationships with other organisations'. While for the latter and the first domain the indicators are the same for all food industries (i.e. packaged food and beverage manufacturers, QSR and supermarkets), the indicators within the other four domains differ for QSR and supermarket as both industries are in direct contact with consumers, something that is rarely the case for packaged food and beverage manufacturers (135). Collecting company commitments across these policy domains ensures industry accountability, but also makes it possible to assess whether the commitments in place meet best practice examples and as such could be sufficient to improve food environments. Eventually, areas where commitments are currently lacking can be identified (176).

To date, the BIA-Obesity has been applied in six countries (51–55,139). This study is the first to apply BIA-Obesity in the European context. This study aimed to quantitatively assess publicly available nutrition-related commitments made by the largest packaged food and beverage manufacturers, supermarkets and QSR in Europe (2020). Company performance was estimated by calculating the proportion of packaged food and beverage sales from ultra-processed and 'unhealthy' food categories. For QSR and supermarkets, the number of outlets and annual fast food transactions (the latter for QSR only) were considered, to estimate their presence throughout Europe and link with the importance of having comprehensive, transparent and specific commitments.

3.3 Methodology

- **Adaptation of the BIA-Obesity tool and process to the European context**

The indicators across BIA-Obesity domains relate to company commitments that go beyond legislative requirements. For this reason, before the BIA-Obesity is applied in a particular jurisdiction, indicators and scoring criteria are modified to suit the particular legislative context.

In collaboration with the INFORMAS team, the BIA-Obesity indicators were adapted to the European context (135,138). Firstly, indicators not applicable to the European context were removed, such as those related to the on-pack disclosure of the ingredients list, trans fat and added sugar content. This is regulated by the European Union (EU) Regulation No 1169/2011 (116).

Secondly, the scoring of the remaining indicators was adapted. Indicators assessing if a commitment was in place were scored higher if the commitment specifically applied to Europe (or referred to more than two European countries) instead of solely being a global commitment. Indicators that scored the content of the commitments, were scored based on the comprehensiveness, transparency, and specificity of the commitment, regardless of whether it was applied at European or global level (135). If

an active declaration was found stating that the company had no activity in a certain area (e.g. committed not to make political donations), the maximum score was assigned. The complete tool, including scoring criteria, can be found in Annex 3.

- **Selection of food companies**

Food companies were selected among four European food industries, namely, packaged food and non-alcoholic beverage manufacturers, QSR and supermarkets. The Euromonitor International Passport database was used to select companies based on their overall market share in both Eastern- and Western Europe per industry in 2017/2018 (148). Euromonitor uses a geographical definition of Europe, including 17 countries in both Eastern- and Western Europe. Consequently, some non-EU members were also included (Belarus, Georgia, Moldova, Ukraine and Russia for Eastern Europe and Andorra, Iceland, Lichtenstein, Monaco, Norway, Switzerland and Turkey for Western Europe according to the Euromonitor classification).

Selection of packaged food and beverage manufacturers was at company level. For QSR and supermarkets, selection was at brand level (e.g. KFC and Pizza Hut are both brands from Yum! Brands). For QSR, data were available for all 17 West European countries, but only for eight East European countries. Within each industry, the most prominent European companies/brands were selected on two criteria: 1) ≥1% market share in Eastern- and Western Europe, 2) Presence across East- and West European countries. For example, companies only present within the aforementioned non-EU countries, were excluded.

For packaged food manufacturers an additional selection was conducted based on companies' contribution to the sales of specific food categories such as 'Breakfast cereals', 'Confectionery', 'Ice-cream and frozen desserts', 'Sweet biscuits and cereal bars', 'Drinking milk products', 'Yoghurts', 'Savoury snacks' and 'Ready meals'. For the purpose of this project, alcoholic beverages, edible oils, bottled water, infant formula and baby foods were excluded.

- **Data collection**
    - **Nutrition-related commitments**

An internet search was conducted for each selected company to identify publicly available nutrition-related commitments (138). The available data were downloaded or screenshots were taken. Where it existed, the European company website was searched alongside the global website. Brand websites were also included. For supermarkets, an additional selection of national company websites was searched to identify commitments made in two or more individual European countries. Due to language barriers these national websites were limited to websites in English, Dutch, French, Spanish

and German. Where available, financial and corporate social responsibility reports were also examined. Lastly, industry pledges and initiatives (i.e. the EU-Pledge and IFBA reformulation commitments) were taken into account.

As BIA-Obesity indicators are identical for packaged food and beverage manufacturers and several companies are active within both areas, both industries are discussed together throughout the article.

- **Performance estimation metrics**

Due to limited data available at European level to assess performance as recommended by INFORMAS, performance was estimated using Euromonitor International sales data (2018) (138,148). Food companies were not contacted with the request to share nutritional data.

For packaged food and beverage manufacturers, the healthiness of product sales was used as a measure to assess company 'performance' in two BIA-Obesity domains: 'Product formulation' and 'Product and brand promotion'.

Data on product categories sold by each company were collected for 27 European countries, 13 in Eastern- and 14 in Western Europe. The healthiness of these product categories was assessed using two classification systems, the NOVA-classification and the WHO-model (25,148,171). The NOVA-classification categorises products into four groups according to the level of processing: 1) Unprocessed or minimally processed foods, 2) Processed culinary ingredients, 3) Processed foods and 4) Ultra-processed foods (25), and was used in this study to calculate, for each selected company and across European countries, the proportion of packaged food/beverage sales from ultra-processed products. The WHO-model is used to determine whether products are permitted to be marketed to children. While some product categories are entirely permitted or not-permitted to be marketed to children, for some product categories, nutrient thresholds are defined. Once a product exceeds the threshold for one nutrient, it is no longer permitted to be marketed to children. In addition to the WHO-model categories that are entirely not-permitted to be marketed to children (category 1, 2, 4a, 4c and 5), also 'Milk drinks with sugar' (part of category 4b) and 'Sweetened soft drinks' (part of category 4d) were considered as not-permitted (171). An overview of the different WHO-model categories and how they were classified at category level for the purpose of this study can be found in Annex 4. An overview on how Euromonitor food categories were classified according to both the NOVA and the WHO-model classification can be found in Annex 5.

For QSR and supermarkets, the number of outlets and annual fast food transactions (the latter for QSR only) was obtained from Euromonitor, to estimate their presence throughout Europe and link with the importance of having strong commitments, especially within the 'Product accessibility' domain. The

number of QSR outlets and transactions for McDonald's only included the brand McDonald's (not McCafé) and for Pizza Hut only included Pizza Hut (not Pizza Hut Express). Similarly, the number of outlets for Auchan did not comprise Auchan City or Auchan outlets in hands of CONAD, Carrefour outlets did not comprise Carrefour Express, Carrefour Market or Carrefour Planet and Tesco outlets did not comprise Tesco Express and Tesco Extra.

- **Data Analysis**
  - **Nutrition-related commitments**

The scoring of the commitments was completed in Microsoft Excel. Annex 6 provides an example of how the commitments were scored. The scores were assigned by two authors (EG and IVD) and subsequently a sample of six companies (two companies per food industry) were re-scored blindly by a third author (ER). Scoring discrepancies were discussed until an agreement was obtained. The scores per domain and food sector were weighted according to the BIA-Obesity methodology (Annex 7) (135).

The median scores (range) for the commitments per BIA-Obesity domain were calculated for each food industry and across food industries.

- **Performance estimation metrics**

The proportion (range, standard deviation (SD)) of sales for ultra-processed and not-permitted food categories (i.e. 'unhealthy' food categories), as well as the average number of QSR outlets and annual fast food transactions in 2018, were calculated per company across European countries. To estimate changes over time, the average percent change was calculated over a 10-year period (2009 – 2018) for packaged food and beverage manufacturers and over an 8-year period (2011-2018) for supermarkets and QSR (due to Euromonitor data availability).

Associations between performance estimation metrics and BIA-Obesity scores were assessed.

3.4 Results

A total of 30 companies were assessed, 17 packaged food and beverage manufacturers, six QSR and seven supermarkets. An overview of the included companies together with their market shares in Eastern- and Western Europe and the number of countries they were present with ≥1% market share can be found in Table 8.

Table 8: Companies included for the Business Impact Assessment on Obesity and Population Level Nutrition (BIA-Obesity) tool in Europe, 2020, together with their market share or brand share in Eastern- and Western Europe and the number of countries they operate in. Sourced from Euromonitor 2017/18.

	Market share 2017/2018 (%)		Number of countries operating in with ≥1% market share	
Company	Eastern Europe	Western Europe	Eastern Europe	Western Europe
PACKAGED FOOD MANUFACTURERS				
Danone Group	3	2	10/17	9/17
Ferrero Group	2	2	12/17	8/17
Intersnack Knabber-Gebäck GmbH & Co KG [1]	0.3	0.5	0/17	2/17
Kellogg Co [1]	0.3	0.6	0/17	1/17
Lactalis, Groupe	1	2	7/17	7/17
Mars Inc	2	1	16/17	10/17
Mondelēz International Inc	2	2	14/17	15/17
Nestlé SA	2	2	13/17	11/17
Oetker-Gruppe [1]	0.2	0.5	0/17	1/17
Pepsico Inc [2]	3	0.9	6/17	7/17
Unilever Group	1	2	12/17	16/17
TOTAL MARKET SHARE 2018	17	15		
BEVERAGE MANUFACTURERS				
Britvic Plc	/	2	/	3/17
Coca-Cola Co	18	21	17/17	17/17
Eckes-Granini Group GmbH	0.6	2	3/17	5/17
Maspex Wadowice Grupa	3	/	7/17	/
Pepsico Inc [2]	12	6	17/17	17/17
Red Bull GmbH	2	3	0/17	5/17
Suntory LTd	0.2	3	1/17	7/17
TOTAL MARKET SHARE 2018	23	33		
QUICK-SERVICE RESTAURANTS [3]				
Burger King (Restaurant Brands International Inc)	8	5	7/8	16/17
Domino's Pizza Inc	0.8	2	6/8	16/17
KFC (Yum! Brands Inc)	12	3	8/8	10/17
McDonald's (McDonald's Corp)	27	19	8/8	17/17
Pizza Hut	1	1	6/8	13/17
Subway (Doctor's Associates Inc)	2	2	7/8	11/17
TOTAL BRAND SHARE 2017	51	31		
SUPERMARKETS [4]				
Aldi	0.4	5	1/17	9/17
Auchan (Auchan Group)	2	2	5/17	2/17
Carrefour (Carrefour SA)	0.7	3	3/17	5/17
Lidl (Schwarz Beteiligungs GmbH)	4	5	9/17	15/17
Maxima (Vilniaus Prekyba UAB) [5]	0.8	/	3/17	/
Spar (Internationale Spar Centrale BV)	1	1	5/17	7/17 [6]
Tesco (Tesco Plc)	2	2	4/17	2/17
TOTAL BRAND SHARE 2018	10	17		

1. Added based on their importance towards obesity in general and among children, as determined by their contribution to specific Euromonitor food categories such as 'Breakfast cereals', 'Confectionery', 'Ice-cream and frozen desserts', 'Sweet biscuits and cereal bars', 'Drinking milk products', 'Yoghurts', 'Savoury snacks' and 'Ready meals'. Intersnack Knabber-Gebäck GmbH & Co KG did not have more than 1% market share in Eastern and Western Europe, but was a considerable contributor to the sales of 'Savoury snacks' with 5.3% and 9.1% of the market share of 'Savoury snacks' in Eastern and Western Europe, respectively. Kellogg Co in turn was the biggest company selling 'Breakfast cereals' in both Eastern and Western Europe with a market share of 6.6% and 27%, respectively, within this food category. They also substantially contributed to the sales of 'Sweet biscuits and cereal bars' and 'Savoury snacks', making them important to include towards childhood obesity. Lastly, Oetker-Gruppe was identified as the biggest company specialised in 'Ready meals' in Western Europe with a market share of 5.5% and was also among the top 5 in Eastern Europe with a market share of 2.3%.
2. Pepsico Inc was included both as packaged food and beverage manufacturer. This was not done for other companies already included as packaged food manufacturers, such as Danone and Nestlé, as they, although having a high market share for beverages, showed to mainly contribute to the sales of bottled water and derivate products such as sugared/juicy/aromatic waters.
3. Brand share was defined as the brand share among 'Chained consumer food services' as obtained from Euromonitor 2017/2018. Euromonitor defines 'Chained Consumer Foodservices' as: "Chained units are defined by 10 or more units. An exception is made for international chains that have a presence of fewer than 10 units in a country. In this case, they are still considered to be chained units.".
4. Brand share was defined as the brand share among 'Grocery Retailers', defined as: "Retailers selling predominantly food/beverages/tobacco and other everyday groceries. This is the aggregation of hypermarkets, supermarkets, discounters, convenience stores, independent small grocers, chained forecourt retailers, independent forecourt retailers, food/drink/tobacco specialists and other grocery retailers." by Euromonitor 2017/2018.
5. Maxima (Vilniaus Prekyba UAB) was added to the selection as they were the biggest supermarket in Estonia, Latvia and Lithuania with a market share of 17.5%, 24.5% and 32.8%, respectively. The only other supermarkets present in this geographical area was Lidl in Lithuania.
6. Spar (Internationale Spar Centrale BV) had an additional market share of 0.9% in two West European countries bringing the overall coverage to nearly 9/17.

The overall BIA-Obesity score ranged from 1% (Maspex Wadowice and Red Bull GmbH) to 62% (Danone), with a median score across all companies of 21%. The median scores for packaged food and beverage manufacturers, QSR and supermarkets were 35% (range: 1%-62%), 15% (range: 3%-30%) and 15% (range: 7%-27%), respectively (Figure 5, Table 9).

The best performing companies within the 'Corporate strategy' domain made specific, measurable, achievable, relevant and time bound (SMART) targets within their overarching nutrition strategy, referred to global priorities (WHO recommendations and Sustainable Development Goals) and published regular reports on their approach to population nutrition. Within the 'Product formulation' domain, best performing companies committed to not use artificial trans fat and had some SMART targets in place to reduce either salt, saturated fats, sugar and energy content of products. Within the 'Nutrition labelling' domain, best performing companies provided nutritional information online on a per 100g/ml basis while supporting a European wide implementation of the Nutri-Score and linking the use of nutrition and health claims with the nutritional profile of products. Companies scoring well within the 'Product and brand promotion' domain were a signatory to the EU-Pledge and made some additional commitments to not sponsor or market in settings where children gather using unhealthy brands. Only limited commitments were found within the 'Product accessibility' domain with best performing companies committing to increase the proportion of healthy products within their portfolio as well as supporting some forms of taxation to make healthier foods relatively cheaper and unhealthy foods relatively more expensive. The latter domain is especially important for QSR and supermarkets. Best performing QSR committed to not provide free refills for soft drinks and provided healthy drink and side items within combination meals while best performing supermarkets committed for checkouts to be free from unhealthy items. Within the last domain, 'Relationships with other organisations', best performing companies disclosed supported professional organisations, external research, nutrition education and

active lifestyle programs and involvement in public-private partnerships as well as committed to not make political donations.

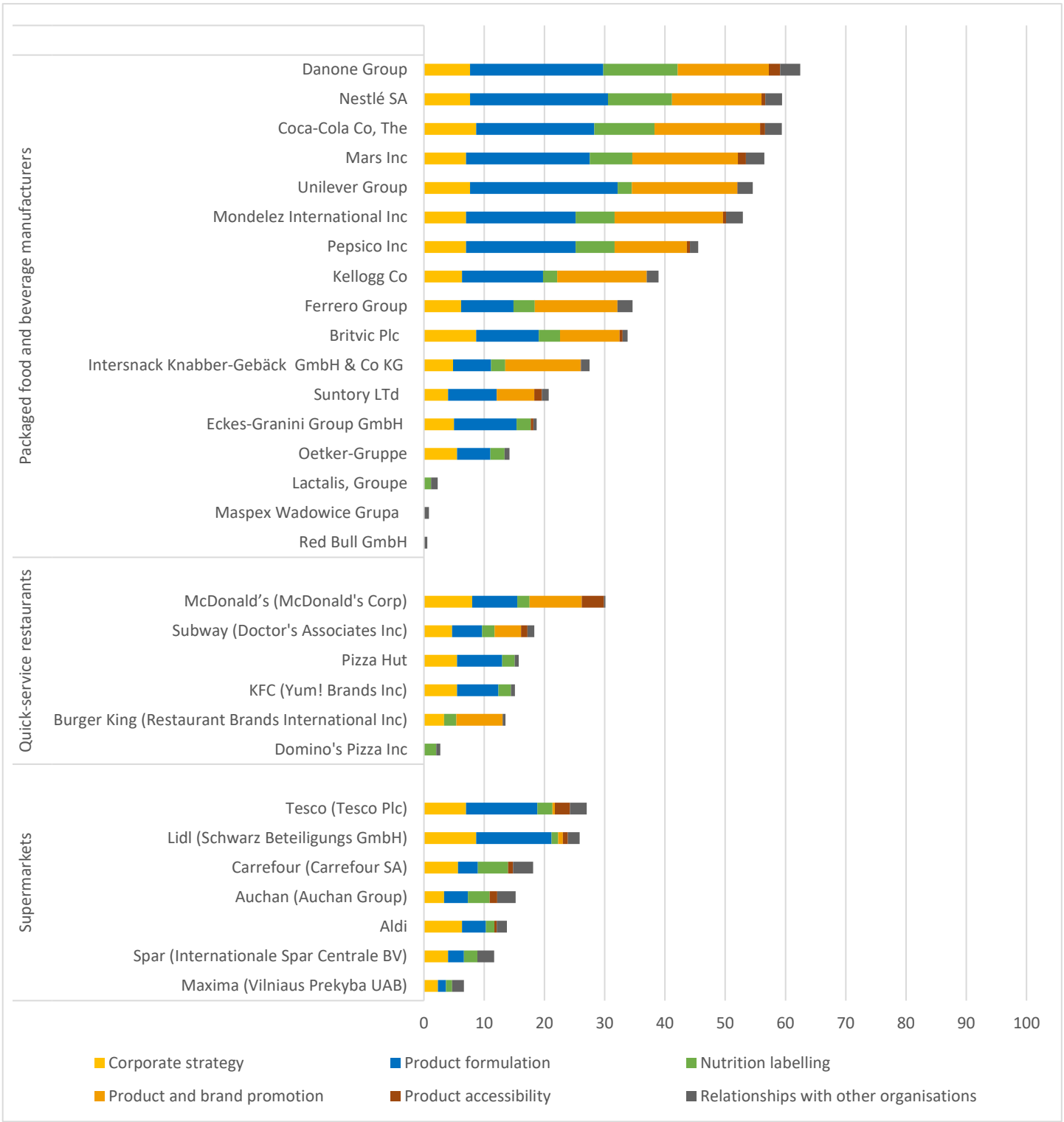


Figure 5: Overall Business Impact Assessment on Obesity and Population Level Nutrition (BIA-Obesity) scores for selected packaged food and beverage manufacturers, quick-service restaurants and supermarkets in Europe, 2020.

Table 9: The total Business Impact Assessment on Obesity and Population Level Nutrition (BIA-Obesity) scores as well as the scores for the individual domains per company (based on publicly available data, 2020).

Company Name	Total BIA-score (%)	Corporate strategy (%)	Product formulation (%)	Nutrition labelling (%)	Product and brand promotion (%)	Product accessibility (%)	Relationships with other organisations (%)
PACKAGED FOOD MANUFACTURERS							
Danone Group	62	77	74	62	50	38	67
Ferrero Group	35	62	29	18	46	0	50
Intersnack Knabber-Gebäck GmbH & Co KG	27	48	21	12	42	2	28
Kellogg Co	39	63	45	12	50	0	39
Lactalis, Groupe	2	0	0	6	0	0	22
Mars Inc	56	70	68	35	58	27	61
Mondelēz International Inc	53	70	61	32	60	10	56
Nestlé SA	59	77	76	53	50	13	56
Oetker-Gruppe	14	55	18	12	0	0	17
Pepsico Inc*	46	70	61	32	40	10	28
Unilever Group	55	77	82	12	58	2	50
Median	**46**	**70**	**61**	**18**	**50**	**2**	**50**
Min	**2**	**0**	**0**	**6**	**0**	**0**	**17**
Max	**62**	**77**	**82**	**62**	**60**	**38**	**67**
NON-ALCOHOLIC BEVERAGE MANUFACTURERS							
Britvic Plc	34	87	35	18	33	10	17
Coca-Cola Co, The	59	87	65	50	58	17	56
Eckes-Granini Group GmbH	19	50	35	12	0	8	11
Maspex Wadowice Grupa	1	0	0	0	0	0	17
Pepsico Inc*	46	70	61	32	40	10	28
Red Bull GmbH	1	0	0	0	0	0	11
Suntory LTd	21	40	27	0	21	25	22
Median	**21**	**50**	**35**	**12**	**21**	**10**	**17**
Min	**1**	**0**	**0**	**0**	**0**	**0**	**11**
Max	**59**	**87**	**65**	**50**	**58**	**25**	**56**

Median overall (packaged food & non-alcoholic beverage manufacturers)	**35**	**63**	**35**	**12**	**42**	**8**	**28**
Min overall (packaged food & non-alcoholic beverage manufacturers)	**1**	**0**	**0**	**0**	**0**	**0**	**11**
Max overall (packaged food & non-alcoholic beverage manufacturers)	**62**	**87**	**82**	**62**	**60**	**38**	**67**
QUICK-SERVICE RESTAURANTS							
Burger King (Restaurant Brands International Inc)	14	33	0	14	31	0	9
Domino's Pizza Inc	3	0	0	14	0	0	14
KFC (Yum! Brands Inc)	15	55	28	14	0	0	14
McDonald’s (McDonald's Corp)	30	80	30	14	35	18	5
Pizza Hut	16	55	30	14	0	0	14
Subway (Doctor's Associates Inc)	18	47	20	14	18	5	23
Median	**15**	**51**	**24**	**14**	**9**	**0**	**14**
Min	**3**	**0**	**0**	**14**	**0**	**0**	**5**
Max	**30**	**80**	**30**	**14**	**35**	**18**	**23**
SUPERMARKETS							
Aldi	14	63	16	9	0	2	33
Auchan (Auchan Group)	15	33	16	24	0	6	61
Carrefour (Carrefour SA)	18	57	13	33	0	4	67
Lidl (Schwarz Beteiligungs GmbH)	26	87	50	7	3	4	39
Maxima (Vilniaus Prekyba UAB)	7	23	5	7	0	0	39
Spar (Internationale Spar Centrale BV)	12	40	11	15	0	0	56
Tesco (Tesco Plc)	27	70	47	17	2	13	56
Median	**15**	**57**	**16**	**15**	**0**	**4**	**56**
Min	**7**	**23**	**5**	**7**	**0**	**0**	**33**
Max	**27**	**87**	**50**	**33**	**3**	**13**	**67**
OVERALL MEDIAN	**21**	**57**	**29**	**14**	**18**	**4**	**28**
OVERALL MIN	**1**	**0**	**0**	**0**	**0**	**0**	**5**
OVERALL MAX	**62**	**87**	**82**	**62**	**60**	**38**	**67**

- **Packaged food and non-alcoholic beverage manufacturers**

The domain 'Corporate strategy' scored the highest with a median score of 63% (range: 0%-87%). The domain 'Product accessibility' obtained the lowest score, with a median score of 8% (range: 0%-38%).

Packaged food manufacturers that obtained an overall score above 50% were Danone (62%), Nestlé (59%), Mars (56%) and Unilever (55%). Among beverage manufacturers Coca-Cola obtained the highest overall BIA-score (59%), followed by PepsiCo (46%), Britvic (34%) and the Eckes-Granini Group (19%) (Figure 5, Table 9).

Within the domain 'Product formulation', 14 out of the 17 selected packaged food and beverage manufacturers had some commitments, with a median score of 35% (range: 0%-82%). Packaged food manufacturers scored considerably higher than beverage manufacturers, with a median score of 61% (range: 0%-82%), compared to 35% (range: 0%-65%) (Table 9).

Packaged food and beverage manufacturers generated on average 82% (range:15%-100%) of sales from ultra-processed foods, or 79% (range: 15%-100%) and 85% (range: 66%-100%), respectively. Apart from Lactalis, that generated only 15% of sales from ultra-processed foods, there were no companies that generated less than 65% of sales from ultra-processed foods. Among the 17 selected packaged food and beverage manufacturers, sales generated by ultra-processed foods on average increased over the last 10 years (2009–2018) for six of the companies (+4%, range: 0.9%-9%), did not change for two and decreased for nine (-7%, range:-0.2% - -15%) (Table 10). As shown in Figure 6, companies with stronger commitments in the domain of 'Product formulation' did not have healthier product portfolio's according to the sales generated from ultra-processed foods compared to those with weaker commitments within this domain.

Similar to the domain 'Product formulation', 14 out of the 17 selected packaged food and beverage manufacturers committed to limit advertising to children below 12-years of age, with the domain 'Product and brand promotion' obtaining a median score of 42% (range: 0%-60%). Category specific sales data however revealed that selected packaged food and beverage manufacturers generated on average 58% (range: 1%-100%) of their 2018 sales across Europe from 'unhealthy' food categories. Beverage manufacturers generated almost all of their sales (average: 81%, range: 60%-100%) from these food categories, whilst for packaged food manufacturers this was approximately half of all sales (average: 43%, range: 1%-83%). Over a 10-year period (2009-2018), eight companies had on average increased sales (+16%, range: 0.3%-79%) from 'unhealthy' food categories, whilst this decreased for the remaining nine companies (-11%, range: -0.4% - -23%) (Table 10). In line with the findings in the domain 'Product formulation' and shown in Figure 7, companies with stronger commitments in the domain of 'Product

and brand promotion' did not have healthier product portfolio's according to the sales generated from 'unhealthy' food categories compared to those with weaker commitments in these domains.

- **Quick-service restaurants**

Similar to packaged food and beverage manufacturers, the domain 'Corporate strategy' was the highest scoring and 'Product accessibility' the lowest scoring domain, with median scores of 51% (range: 0%-80%) and 0% (range: 0%-18%), respectively (Figure 5, Table 9).

McDonald's obtained the highest overall BIA-Obesity score (30%) as well as the highest score in all domains except for the 'Relationships with other organisations' domain, where the highest score was obtained by Subway (23%). Subway, Pizza Hut, KFC and Burger King, all obtained overall scores between 14% and 18%. Domino's Pizza had the lowest overall BIA-Obesity score (3%).

The limited nutrition-related commitments made by QSR, reflected in a median overall BIA-score of 15% (range: 3%-30%), may be of concern as the selected QSR on average counted 4494 European outlets (range: 1477-8714) and 875 million annual fast food transactions (range: 62 million-3311 million) across Europe in 2018. Both the number of outlets and annual transactions substantially increased since 2011 with on average 75% (range: 19%-133%) and 88% (range: 23%-188%), respectively (Table 10).

- **Supermarkets**

As with the other sectors, the domain 'Corporate strategy' was the highest scoring domain with a median score of 57% (range: 23%-87%). Unlike other sectors, the lowest scoring domain was 'Product and brand promotion', with a median score of 0% (range: 0%-3%) (Figure 5, Table 9).

Tesco obtained the highest overall BIA-Obesity score (27%), closely followed by Lidl (26%). Across the individual domains, Lidl scored the highest within 'Corporate strategy' (87%), 'Product formulation' (50%) and 'Product and brand promotion' (3%). Carrefour scored the highest within 'Nutrition labelling' (33%) and 'Relationships with other organisations' (67%) and Tesco within 'Product accessibility' (13%).

The selected supermarkets on average counted 4492 outlets across Europe in 2018 (range: 479-10581). The number of outlets increased since 2011 for all supermarkets, apart from Tesco, with on average 50% (range: -2%-238%) (Table 10).

Table 10: The performance indicators per company and food industry (packaged food and beverage manufacturers[1], quick-service restaurants[2], supermarkets[3]).

Company Name	Performance indicators					
	Proportion (%) of sales not-permitted to be marketed to children across Europe according to WHO-model (2018)			Proportion (%) of sales that are ultra-processed across Europe according to the NOVA-classification (2018)		
	Average (Min – Max)	Standard Deviation	% Change (2009-2018)	Average (Min – Max)	Standard Deviation	% Change (2009-2018)
PACKAGED FOOD MANUFACTURERS						
Danone Group	13 (0 – 71)	16	12.8	68 (37 – 98)	19	5.2
Ferrero Group	79 (0 – 100)	35	0.3	100 (100 – 100)	0	0.0
Intersnack Knabber-Gebäck GmbH & Co KG	1 (0 – 12)	3	79.2	79 (0 – 100)	23	-0.4
Kellogg Co	27 (0 – 64)	16	-22.5	100 (97 – 100)	1	-0.2
Lactalis, Groupe	6 (0 – 20)	7	-11.8	15 (0 – 47)	15	-11.2
Mars Inc	69 (0 – 100)	35	-0.4	75 (0 – 100)	37	0.0
Mondelēz International Inc	83 (0 – 100)	22	3.9	95 (0 – 100)	20	4.6
Nestlé SA	48 (0 – 94)	28	-17.1	74 (0 – 100)	30	-11.2
Oetker-Gruppe	39 (0 – 100)	33	17.5	96 (39 – 100)	13	9.4
Pepsico Inc*	60 (0 – 100)	31	-15.6	82 (0 – 100)	28	-7.1
Unilever Group	52 (0 – 74)	16	8.7	89 (0 – 100)	23	2.1
Average	**43 (1 - 83)**			**79 (15 - 100)**		
Standard Deviation	**27**			**23**		
BEVERAGE MANUFACTURERS						
Britvic Plc	67 (0 – 100)	47	-13.7	66 (0 – 100)	46	-14.8
Coca-Cola Co, The	91 (0 – 100)	19	-4.2	89 (0 – 100)	19	-6.0
Eckes-Granini Group GmbH	95 (0 – 100)	22	-4.8	87 (0 – 100)	30	-5.8
Maspex Wadowice Grupa	61 (0 – 100)	43	2.2	78 (0 – 100)	38	0.9
Pepsico Inc*	60 (0 – 100)	31	-15.6	82 (0 – 100)	28	-7.1
Red Bull GmbH	100 (100 – 100)	0	3.9	100 (100 – 100)	0	3.9
Suntory LTd	95 (0 – 100)	21	-4.6	95 (0 – 100)	21	-4.4
Average	**81 (60 - 100)**			**85 (66 - 100)**		
Standard Deviation	**16**			**10**		

Average packaged food & beverage manufacturers	**58 (1 - 100)**			**82 (15 - 100)**		
Standard Deviation packaged food & beverage manufacturers	**31**			**20**		
	Number of outlets across Europe (2018)			**Number of annual fast food transactions across Europe (2018)**		
	Total Outlets		% Change (2011 - 2018)	Total transactions (x1000)		% Change (2011 - 2018)
QUICK-SERVICE RESTAURANTS						
Burger King (Restaurant Brands International Inc)	4608		75.8	919128		92.0
Domino's Pizza Inc	3523		132.7	160300		188.4
KFC (Yum! Brands Inc)	3102		127.1	527613		132.1
McDonald's (McDonald's Corp)	8714		19.1	3311362		23.2
Pizza Hut	1477		24.0	61676		33.0
Subway (Doctor's Associates Inc)	5542		69.3	267542		59.4
Average	**4494**		**75**	**874603**		**88**
Min	**1477**		**19**	**61676**		**23**
Max	**8714**		**133**	**3311362**		**188**
SUPERMARKETS						
Aldi	7992		6.6			
Auchan (Auchan Group)	764		238.1			
Carrefour (Carrefour SA)	1721		78.3			
Lidl (Schwarz Beteiligungs GmbH)	10581		9.4			
Maxima (Vilniaus Prekyba UAB)	479		14.9			
Spar (Internationale Spar Centrale BV)	8551		6.6			
Tesco (Tesco Plc)	1358		-1.5			
Average	**4492**		**50**			
Min	**479**		**-2**			
Max	**10581**		**238**			

1. *For packaged food and beverage manufacturers the proportion of sales coming from food groups not-permitted to be marketed to children (according to the World Health Organisation, WHO) and ultra-processed (according to NOVA) in 2018 is provided, including the change over the past 10 years (2009 – 2018).*
2. *For quick-service restaurants the number of outlets and annual fast food transactions as well as the change over time is provided (2011 – 2018).*
3. *For supermarkets the number of outlets and change over time is provided (2011 – 2018).*

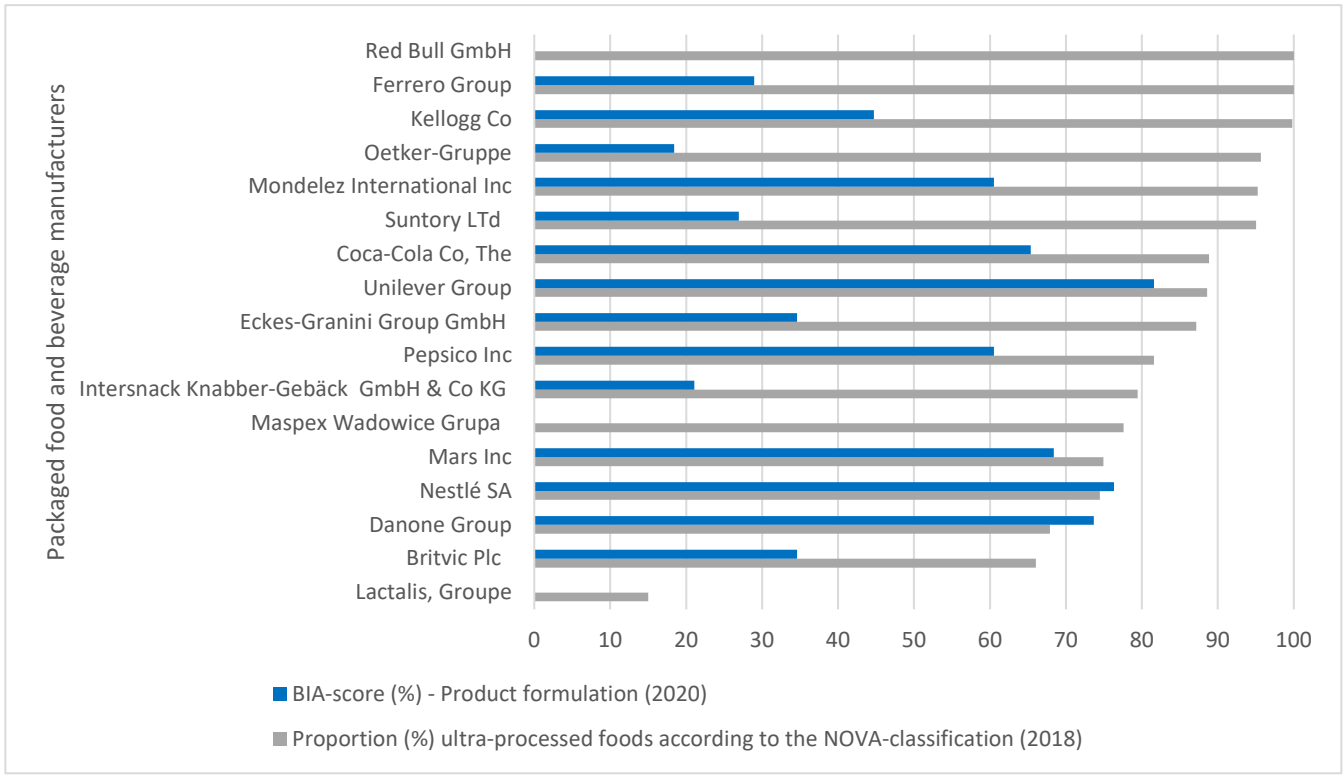


Figure 6: The Business Impact Assessment on Obesity and Population Level Nutrition score (BIA-score) for the domain 'Product formulation' (%) compared with the proportion of sales coming from food groups that are ultra-processed (according to NOVA in 2018) per selected packaged food and beverage manufacturer.

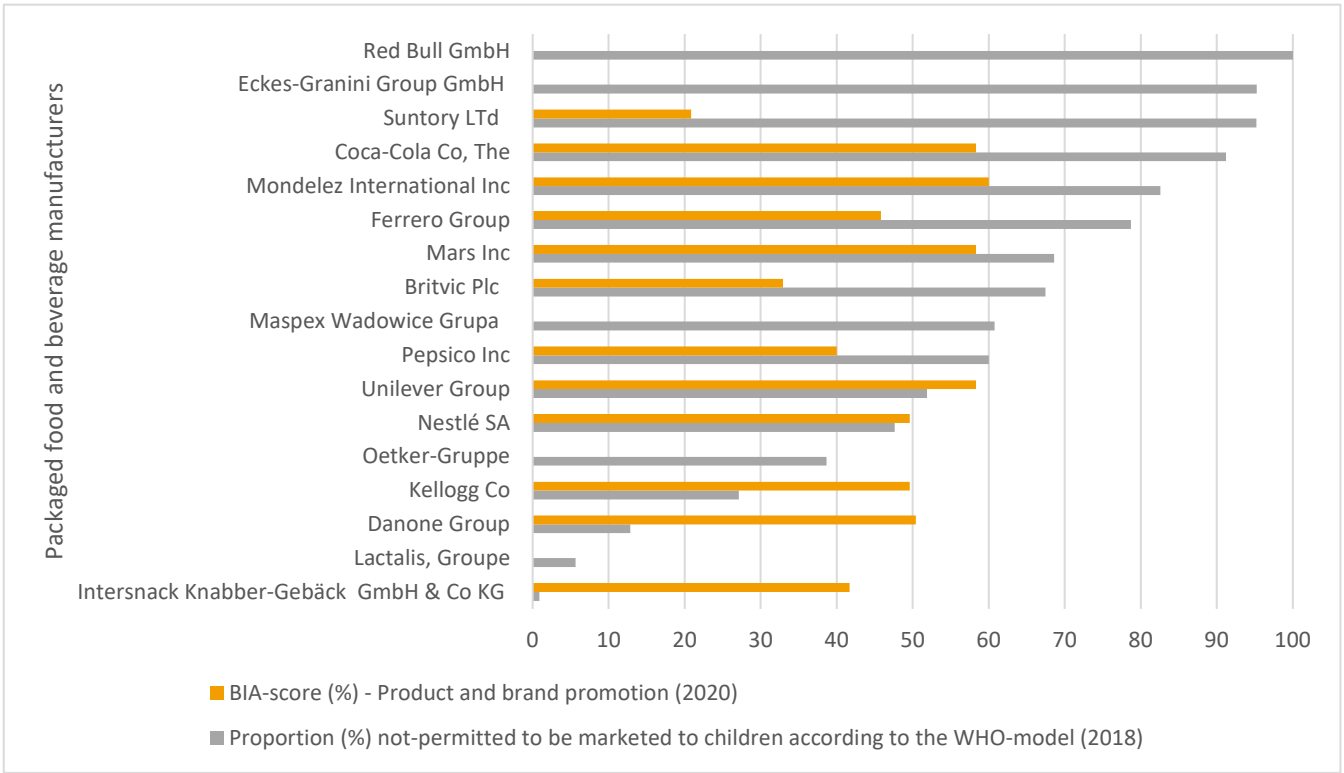


Figure 7: The Business Impact Assessment on Obesity and Population Level Nutrition score (BIA-score) for the domain 'Product and brand promotion' (%) compared with the proportion of sales coming from food groups that are not-permitted to be marketed to children (according to the World Health Organisation Regional Office for Europe Nutrient Profile model, WHO-model in 2018) per selected packaged food and beverage manufacturer.

3.5 Discussion

BIA-Obesity scores showed that most selected packaged food and beverage manufacturers, QSR and supermarkets recognised their role in improving food environments, but fell short of recommended best practices. Publicly available nutrition-related commitments largely differed in levels of transparency, specificity and comprehensiveness, with overall scores ranging from 1% to 62%.

The median overall BIA-Obesity score across food industries in Europe was lower than what was found in Australia and New Zealand (21% vs 41% and 38%, respectively). Previous studies showed that scores typically increase for companies engaging with the BIA-Obesity (51,53,54). As such the difference in scores is likely due to the European assessment being based on only publicly available data, whereas for Australia and New Zealand the assessment included internal policy information provided by companies (53,54). Regardless of the root of the lower BIA-Obesity score, the lack of comprehensiveness, specificity and transparency of the publicly available commitments is concerning in light of their influence on food environments (24,47,48,177).

'Corporate strategy' was the highest scoring domain, emphasizing that companies like to profile themselves as part of the solution to reducing obesity and improving population nutrition (24,76,167). 'Product accessibility' was the lowest scoring domain. The low scores within the 'Accessibility' domain could potentially be explained by the pricing and distribution of healthier products being less of a concern for companies or being more complex due to the number of actors involved (53,173,174). These findings are similar to previous findings (51,53,54) and are also in line with findings from the ATNI 2018 Global Index, which identified 'Governance' as the highest scoring and 'Accessibility' the lowest scoring domain (174).

Companies could strengthen their role in improving food environments through the enhancement of their nutrition-related commitments. To meet best practice recommendations they could develop SMART targets for product reformulation using an official nutrient profiling system, commit to only label products with nutrition and health claims when products are healthy and develop a marketing policy that applies to children up to the age of 18 (applying the WHO-model). QSR could commit to only advertise 'healthy' sides and drinks in combination meals, commit to not use price incentives such as supersizing and commit to not open new stores near schools. Supermarkets could commit to limit multi-buy specials on unhealthy foods, dedicate a maximum amount of shelf/floor space to less healthy products and limit the placement of unhealthy items at high-traffic areas (135). Such commitments and practices could help the food industry to move beyond profiling themselves as responsible actors (24,76,167) towards actively improving the healthiness of food environments and population diets (50,178).

No associations were observed between commitment scores and performance estimation metrics for packaged food and beverage manufactures. Across Europe in 2018 on average 82% and 58% of sales were generated from ultra-processed and 'unhealthy' food categories, respectively. These findings indicate that companies with stronger reformulation and marketing to children commitments are still deriving a large proportion of their sales from ultra-processed and unhealthy products. The high proportion of sales derived from ultra-processed foods is particularly concerning within the growing body of literature showing an association between the consumption of ultra-processed foods and overweight (27–29). The sales generated from 'unhealthy' foods are likely an underestimation, as the study only classified products that are not-permitted to be marketed to children under any circumstances. Foods and beverages that are within other WHO-model categories may still exceed the predefined nutrient-thresholds and in practice be not-permitted to be marketed to children (171).

For QSR, scores for commitments were low, while the number of outlets and annual fast food transactions increased substantially over the last eight years. Although market expansion and thus an increase in the number of outlets and fast food transactions is an inherit aim of the food industry (24,37), this may be concerning as the increase in annual fast food transactions as well as the proximity of QSR outlets to schools and homes have been positively associated with a BMI increase (177,179). Likewise, countries that implemented stricter policies to regulate fast food consumption also experienced a slower increase in BMI (179,180). Nonetheless, more research using European-wide nutritional data from QSR is required to assess whether (un)healthy products are responsible for the observed increase in annual fast food transactions.

Policy measures already in place at European level are the obligatory on-pack nutritional information and trans-fat regulation (110,156). Across individual European countries, policies have been implemented to support healthy nutrition and physical activity within the school environment, support self-regulatory marketing and reformulation initiatives and a growing support for front-of-pack labelling (20,113). Nevertheless, European countries are not on track to meet global nutrition-related targets (20). These findings, combined with our results that show that food industry nutrition-related commitments fall short of best practice recommendations, highlight the need for more ambitious government regulations, both at European level and across countries.

This study has several strengths. It was the first to evaluate the comprehensiveness, specificity and transparency of publicly available nutrition-related commitments in the European context applying the BIA-Obesity tool. It pointed out domains where commitments were in place to improve food environments and highlighted areas for improvement. By estimating performance it also emphasized the need to improve the relative availability of healthier food choices across Europe while decreasing the proportion sales generated from ultra-processed and unhealthy products. Nonetheless, several

limitations were identified. This study solely included publicly available information and as such was not designed to capture internal company commitments. A clear distinction between companies was however evident. Additionally, information was primarily obtained from global company websites and reports. As a result, it was not always clear how commitments were applied in Europe or within individual European countries. For supermarkets in particular, European and global level information was limited and difficult to obtain as the majority of supermarkets operated at the country level. Lastly, due to limited data available at European level, performance across food industries could only be estimated within a few BIA-Obesity domains.

To overcome aforementioned limitations, future research should apply the BIA-Obesity within individual European countries, especially for supermarkets, and data on the nutritional composition of product portfolios, labelling practices, the availability/affordability of products and promotion to children should be collected to more accurately assess performance across all domains of BIA-Obesity. Following the findings and recommendations of this study, the authors applied the BIA-Obesity tool and process in both Belgium and France. Both studies included detailed performance metrics which enabled a more accurate assessment of the relationship between company commitment BIA-Obesity scores and practices (181,182).

In conclusion, this study found that most major European packaged food and beverage manufacturers, QSR and supermarkets made commitments to improve food environments, albeit with varying transparency, specificity and comprehensiveness. These commitments did not meet best practice recommendations. Even though food companies recognised their role in improving food environments and profiled themselves as part of the solution, the relative availability of healthier packaged food and beverage choices was limited across Europe. As a result, more ambitious government regulations are needed, both at European- and national-level.

Chapter IV Market concentration and the healthiness of packaged food and non-alcoholic beverage sales across the European single market

This chapter is based on the following paper currently under review:

Van Dam, I., Allais, O., Vandevijvere, S. Market concentration and the healthiness of packaged food and non-alcoholic beverage sales across the European single market. Public Health Nutrition.

4.1. Abstract

Background: European food and beverage product markets are moderately to highly concentrated with low market diversity. This provides dominant companies with the opportunity to shape markets to benefit them, potentially at the expense of population health. Using Euromonitor data, this study aimed to assess the relationship between market concentration and diversity, as indicators of market structure, and the healthiness of food and beverage sales across Europe.

Methods: Market share data per country were used to calculate market concentration, assessed by the four firm concentration ratio and market diversity, assessed by the number of companies with ≥1% market share and the number of companies uniquely present in one European country. The healthiness of food sales was assessed by applying the NOVA-classification (level of processing). Simple and multiple linear regressions were performed to assess the relationship between market concentration, diversity and the healthiness of food and beverage sales.

Results: Increased market concentration with a country and a product category fixed effect significantly predicted increased sales of ultra-processed packaged food products. There was insufficient data variability in the level of processing of non-alcoholic beverage product categories to formulate conclusions for non-alcoholic beverages. Increased market diversity in turn significantly predicted reduced country-level sales of ultra-processed products.

Conclusion: The results indicated a relationship between market structure and the healthiness of packed food products sold on the European market. However, more research with detailed nutritional data is warranted to document and quantify this interaction.

4.2. Background

Food environments are defined as "the collective physical, economic, policy and sociocultural surroundings, opportunities and conditions that influence people's food and beverage choices and nutritional status" (34). Currently these environments are characterised by easily available cheap and unhealthy food products (30,35,62) with ultra-processed foods contributing to 10% up to 51% of the purchased dietary energy across Europe (27). Ultra-processed foods are products such as soft drinks, confectionery and ready meals that contain substances that aren't commonly found at home (25). A growing body of literature shows an association between overweight and the consumption of such ultra-processed foods (27–30). Furthermore, many packaged foods and non-alcoholic beverages contain high levels of salt, sugar, sweeteners and fats, and as such are detrimental to health and well-being. Nonetheless, they are still permitted to be advertised to children according to voluntary food industry pledges (79,86,171).

Market structure describes the degree at which competition takes place between different companies for specific goods and services within (product) markets (63,130). A key metric to assess the market structure and the market power of companies is market concentration (146). When market concentration increases, this translates into an increasing part of the market share being held by a decreasing number of companies (30,183). Other key market structure indicators, measuring the diversity within the food industry, are the number of companies with ≥1% market share (MS) and the number of unique companies having presence in only one European country (183).

While the food industry on the one hand positions itself as part of the solution to create heathier food environments (24,38), they at the same time try to shape markets in ways that fit their private interests (130). High levels of market concentration provide dominant companies with an opportunity to shape markets in ways that benefit them financially and economically, something that doesn't necessarily benefit population health and wellbeing (30,130).

Across countries in Europe packaged food and non-alcoholic beverage product markets have shown to be moderately to highly concentrated with a low number of companies with ≥1% market share and companies uniquely present in one European country (183). The resulting market power provides companies with the opportunity to position themselves as stakeholders and influence policy making and food environments for commercial gain (30,178). Examples of how the food industry may influence food environments include the framing of policy debates, intensive marketing, nutritional positioning (*i.e. focus on single nutrients instead of whole foods, an approach that could promote the sales of heavily processed foods*), focus on individual responsibility and freedom of choice, unenforceable self-regulatory

codes and the emphasis that food is a basic human right (24,30,38). Nonetheless, research assessing the influence of market structure on food environments remains limited.

This study sets out to assess whether market structure, assessed by levels of market concentration and diversity within the packaged food and non-alcoholic beverage industry across European countries is associated with the healthiness of products sold, measured by the proportion of sales of ultra-processed food products according to the NOVA-classification.

4.3. Methodology

The Euromonitor International Passport database was used to obtain market share data per European single market member state, per packaged food and drink product category and per year (148). Data were obtained at the most fine-grained Euromonitor product categorisation level (212 food subgroups in total) over the period 2009–2018. For Cyprus, Iceland, Liechtenstein, Luxembourg and Malta no Euromonitor data were available. A total of 27 European countries were included in the analysis.

- **Market concentration**

Levels of market concentration and its changes over time (2009–2018) were assessed by calculating the four firm concentration ratio (CR4) per country for 14 packaged food product markets (*'Baked Goods', 'Breakfast Cereals', 'Confectionary', 'Dairy', 'Ice Cream and Frozen Desserts', 'Processed Fruit and Vegetables', 'Processed Meat and Seafood', 'Ready meals', 'Rice, Pasta and Noodles', 'Sauces, dressings and condiments', 'Savoury Snacks', 'Soup', 'Sweet Biscuits, Snack Bars and Fruit Snacks' and 'Sweet Spreads'*) and eight non-alcoholic beverage product markets (*'Asian Speciality Drinks', 'Carbonates', 'Concentrates', 'Energy Drinks', 'Juice', 'Ready-To-Drink (RTD) Coffee', 'RTD Tea' and 'Sports Drinks'*). The CR4 is calculated by combining the market share of the top four firms per country active within a product market. The higher the CR4, the more concentrated the product market. CR4-values below 40 are considered to represent a competitive market. Values above 40 are considered to represent markets with limited competition and above 60 limited competition with potential dominant firms (152).

The number of companies with ≥1% MS and the number of unique companies per country were assessed to estimate levels of diversity within packaged food and non-alcoholic beverage product markets. Unique companies were defined as companies having presence in only one European single market member state. Similar to previous research, the higher the number of companies with ≥1% MS and unique companies, the more diverse the industry was assumed to be (183).

- **Products sold**

To assess the proportion of sales coming from ultra-processed products the NOVA-classification (25) was applied to the most fine-grained Euromonitor product subcategory sales data within abovementioned packaged food and non-alcoholic beverage product categories. An overview of how the Euromonitor product subcategories were classified according to the NOVA-classification can be found in Annex 5. For five countries (Croatia, Estonia, Latvia, Lithuania and Slovenia) data were only available for the most fine-grained product subcategories within eight (out of the 22) Euromonitor product categories ('Baked Goods', 'Concentrates', 'Dairy', 'Energy Drinks'; 'Ice Cream and Frozen Desserts', 'RTD Coffee', 'Rice, Pasta and Noodles' and 'Sports Drinks').

The NOVA-classification makes a distinction between products based on the level of processing, namely non-ultra-processed (unprocessed or minimally processed foods, processed culinary ingredients and processed foods) and ultra-processed products (25). Per Euromonitor product category the proportion of sales coming from ultra-processed subcategories was calculated by expressing the ultra-processed sales per country and product category on the total sales within the same country and product category. Finally, also the change over the past 10 years (2009–2018) of the proportion of sales coming from ultra-processed products was assessed.

- **The relationship between market concentration, diversity and healthiness of packaged food and drink products sold across European countries**

Analyses were conducted separately for packaged food and non-alcoholic beverage product categories. A multiple linear regression was calculated across selected countries and product categories to assess whether and to what extent market concentration measured by the CR4 influences the proportion of sales of ultra-processed products. The product categories containing only 100% ultra-processed products were removed from the analysis. Among packaged food products these were 'Confectionary', 'Ice Cream and Frozen Desserts' and 'Soup'. Among the non-alcoholic beverages all product categories were 100% ultra-processed apart from 'Juice'. Consequently, there was not enough variability in the model and no multiple linear regression was calculated for non-alcoholic beverages. The final multiple regression model for packaged foods included the CR4, a country fixed effect and a category fixed effect as predictor variables (Table 11). The product category 'Rice, Pasta and Noodles' was used as reference category as, on average, this was the least processed product category.

Simple linear regression analyses were performed to determine whether the number of companies per country with ≥1% MS and the number of unique companies within packaged food and non-alcoholic beverage product markets significantly predicted the proportion of sales from ultra-processed products at country-level in 2018.

Correlations of changes over time in the proportion of sales from ultra-processed products with changes in levels of market concentration were assessed. R-values >0.5 were considered to represent a strong correlation. P-values <0.05 were considered statistically significant.

All analyses were performed using Microsoft Excel and SAS 9.4 (Cary, USA, 2018).

4.4. Results

The product categories 'Asian Speciality Drinks', 'Carbonates', 'Concentrates', 'Confectionary', 'Energy Drinks', 'Ice Cream and Frozen Desserts', 'RTD Coffee', 'RTD Tea', 'Soup' and 'Sports Drinks' were for 100% ultra-processed across all European countries. Within the remaining 12 product categories the proportion of ultra-processed sales varied per country (Table 12).

- **Market concentration and sales of less healthy products**

A multiple linear regression model including the CR4, a country fixed effect and a product category fixed effect (Table 11) was significant and explained 93% of the variance in sales of ultra-processed packaged foods ($F(37,219)=78.13$, $p < .0001$).

The CR4 ($p=0.046$), the country ($p=0.004$) and the product category ($p<0.0001$) were all significant predictors of sales of ultra-processed packaged food products. It was estimated that the proportion of sales of ultra-processed packaged food products increased with 0.13 for a one unit increase of the CR4, in addition to the increase caused by product category or the decrease caused by country, relative to the product category 'Rice, Pasta and Noodles' and the United Kingdom as reference country (Table 11, Annex 8). The fixed effect estimates, together with the p-values and 95% confidence intervals per product category and per country can be found in Annex 8.

Table 11: Results of the two multiple linear regressions and the predictor variables included.

Predictor variable	Regression [95% Confidence Interval]
Intercept	17.03 [9.21 – 24.85]
CR4	0.13 [0.002 – 0.25]
Country fixed effect	YES
Product category fixed effect	YES

No significant correlations were detected between changes over the past 10 years in levels of market concentration and the proportion of sales of ultra-processed products (data not shown).

➢ **Market diversity and sales of less healthy products**

The number of companies with ≥1% MS and the number of unique companies per country both significantly predicted sales of ultra-processed packaged food products (β=-2.73, p=0.004 and β=-3.06, p=0.003, respectively).This was not the case for non-alcoholic beverages. Concretely, when per country the number of packaged food companies with ≥1% MS and the number of unique packaged food companies increased, the sales of ultra-processed foods significantly decreased. Results are visually represented in Figure 8.

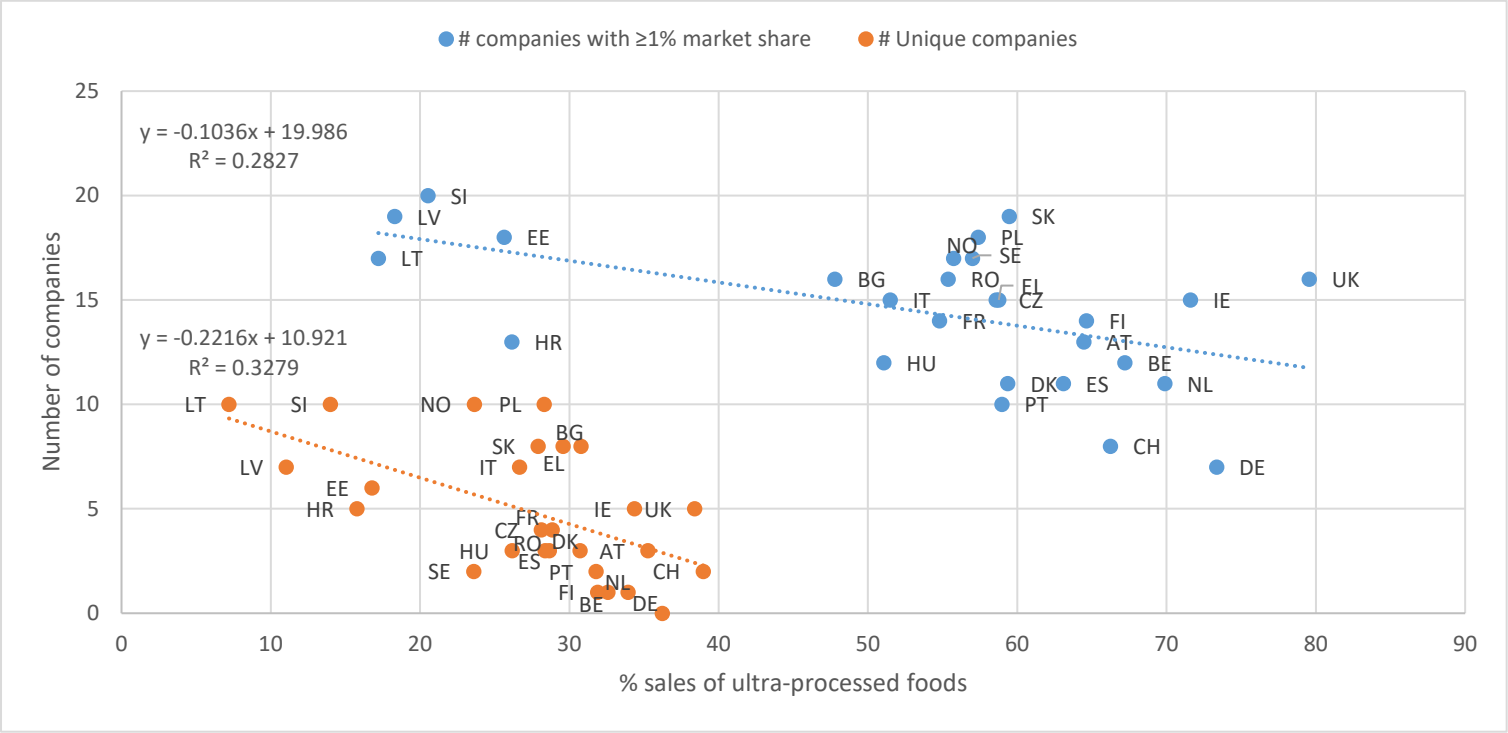


Figure 8: Regression of sales ultra-processed packaged food products (NOVA) with the number of companies with ≥1% market share (blue) and the number of unique companies (orange).

Countries are indicated to the right of the blue dots (the number of companies with ≥1% market share) and to the left of the orange dots (the number of unique companies).

Table 12: The proportion of sales from ultra-processed products (NOVA) and levels of market concentration according to the four firm concentration ratio (CR4) per country and product category. Euromonitor data 2018.

Red indicates CR4 values >60% and proportion of sales >80%. Yellow indicates CR4 values >40%.

Country	Asian Speciality Drinks		Baked Goods		Breakfast Cereals		Carbonates		Concentrates		Confectionary		Dairy		Energy Drinks		Ice Cream and Frozen Desserts		Juice		Processed Fruit and Vegetables	
	NOVA	CR4	NOVA	CR4	NOVA	CR4	NOVA	CR4	NOVA	CR4	NOVA	CR4	NOVA	CR4	NOVA	CR4	NOVA	CR4	NOVA	CR4	NOVA	CR4
Austria			86	8	100	62	100	70	100	55	100	58	36	37	100	70	100	76	61	50	23	49
Belgium			99	7	99	63	100	77	100	50	100	38	42	28	100	68	100	50	68	32	23	26
Bulgaria			95	20	100	74	100	77	100	54	100	54	12	26	100	81	100	87	97	47	24	46
Croatia			100	20		43		81	100	63		56	17	62	100	94	100	94		69		65
Czech Republic			98	22	96	71	100	76	100	59	100	70	31	39	100	49	100	75	90	52	16	36
Denmark			99	23	68	58	100	71	100	63	100	46	29	64	100	84	100	51	73	47	35	25
Estonia			100	64		48		87	100	60		61	13	65	100	85	100	83		66		40
Finland			98	35	64	39	100	72	100	45	100	74	37	53	100	73	100	83	84	60	25	30
France	100	84	99	8	95	70	100	82	100	59	100	48	32	38	100	84	100	64	48	48	21	29
Germany	100	38	100	16	95	55	100	56	100	34	100	41	48	14	100	66	100	47	88	26	23	27
Greece			93	12	85	68	100	84	100	77	100	71	21	35	100	91	100	70	97	68	8	45
Hungary			99	7	93	47	100	82	100	41	100	53	33	34	100	78	100	54	97	58	8	25
Ireland			98	24	74	68	100	86	100	67	100	75	42	35	100	93	100	73	60	40	34	57
Italy	100	91	97	11	100	80	100	67	100	57	100	61	35	29	100	88	100	23	95	43	10	30
Latvia			100	50		81		68	100	78		69	10	62	100	85	100	75		76		65
Lithuania			100	43		68		84	100	57		60	14	66	100	54	NA	69		56		49
Netherlands	100	76	99	11	69	50	100	63	100	62	100	37	41	30	100	76	100	71	78	43	26	43
Norway			86	32	69	62	100	89	100	85	100	72	28	86	100	81	100	90	50	53	21	25
Poland			94	5	96	60	100	77	100	58	100	47	31	35	100	76	100	66	79	61	8	36
Portugal	100	58	99	9	87	56	100	79	100	52	100	43	36	49	100	57	100	76	90	53	10	18
Romania			98	9	100	68	100	66	100	40	100	66	28	48	100	72	100	63	100	49	11	38
Slovakia			99	16	97	72	100	67	100	42	100	69	38	35	100	64	100	67	93	48	15	35
Slovenia			100	32		43		88	100	66		57	10	54	100	84	100	68		69		47
Spain			99	21	99	49	100	80	100	79	100	40	41	34	100	65	100	56	88	41	9	21
Sweden			94	42	78	44	100	85	100	74	100	58	20	60	100	83	100	65	77	59	29	24
Switzerland			93	5	99	42	100	75	100	43	100	28	28	26	100	67	100	54	67	34	27	17
United Kingdom	100	12	93	28	84	60	100	80	100	57	100	66	54	21	100	87	100	46	45	43	44	35

	Processed Meat and Seafood		RTD Coffee		RTD Tea		Ready meals		Rice, Pasta and Noodles		Sauces, dressings and condiments		Savoury Snacks		Soup		Sports Drinks		Sweet Biscuits, Snack Bars and Fruit Snacks		Sweet Spreads	
	NOVA	CR4	NOVA	CR4	NOVA	CR4	NOVA	CR4	NOVA	CR4	NOVA	CR4	NOVA	CR4	NOVA	CR4	NOVA	CR4	NOVA	CR4	NOVA	CR4
Austria	11	28	100	74	100	67	99	44	6	39	89	49	70	54	100	76	100	72	95	41	87	66
Belgium	23	17	100	81	100	72	93	23	3	33	90	41	88	53	100	76	100	72	99	38	93	43
Bulgaria	4	61	100	74	100	66	91	54	1	43	73	39	64	32	100	85	100	77	95	43	63	41
Croatia		72	100	85		78		47	0	49		65		38		89	100	79		59		50
Czech Republic	29	39	100	87	100	64	100	53	21	37	80	44	88	42	100	84	100	93	93	62	57	43
Denmark	19	35	100	85	100	68	98	43	13	23	89	45	78	54	100	70	100	80	68	38	78	54
Estonia		56	100	83		94		49	0	31		32		46		64	100	92		49		43
Finland	8	49	100	67	100	57	98	53	13	37	85	43	79	53	100	54	100	77	88	54	47	45
France	12	24	100	92	100	65	78	34	4	54	86	40	77	45	100	76	100	86	86	50	75	56
Germany	36	10	100	35	100	44	96	38	1	30	82	44	74	40	100	66	100	24	88	26	76	48
Greece	34	34	100	85	100	82	94	47	1	55	93	57	91	51	100	100	100	99	95	56	68	28
Hungary	13	28	100	55	100	68	86	35	11	31	81	41	77	39	100	84	100	64	94	43	48	30
Ireland	13	57	100	74	100	65	91	34	38	44	97	44	96	58	100	72	100	90	93	46	65	49
Italy	14	19	100	63	100	52	64	29	0	33	91	37	87	38	100	63	100	82	90	44	89	51
Latvia		51	NA	57		93		40	0	33		65		56		67	100	72		70		44
Lithuania		44	100	93		77		47	0	41		43		59		75	100	43		58		55
Netherlands	47	10	100	70	100	64	99	27	11	34	85	43	85	40	100	68	100	53	95	37	81	35
Norway	11	57	100	93	100	82	95	73	18	44	87	57	82	62	100	89	100	79	87	61	81	67
Poland	20	42	100	49	100	61	96	30	21	33	78	45	84	43	100	75	100	93	91	39	62	33
Portugal	58	24	100	100	100	37	88	18	5	40	85	31	71	34	100	56	100	23	88	25	51	33
Romania	24	36	100	91	100	83	73	36	1	49	75	37	75	45	100	63	100	75	99	33	60	46
Slovakia	26	42	100	76	100	59	98	51	38	26	82	29	88	31	100	67	100	78	98	61	60	42
Slovenia		60	100	66		85		48	0	61		33		47		87	100	56		33		30
Spain	43	20	100	66	100	83	74	25	19	33	90	22	78	38	100	50	100	85	95	42	81	38
Sweden	23	45	100	94	100	73	99	44	3	29	87	46	79	55	100	82	100	95	78	32	78	40
Switzerland	21	9	100	85	100	38	96	10	4	20	94	52	94	48	100	66	100	71	94	32	75	36
United Kingdom	30	17	100	85	100	70	93	13	41	33	95	33	95	45	100	53	100	88	85	37	76	42

- NA means no sales of that category in that country in 2018 according to the Euromonitor data.
- Empty cells are countries for which no data were available at the most detailed level of the Euromonitor product categorization system and as such products could not be classified.

4.5. Discussion

This study set out to assess if market concentration, as measured by the CR4, and market diversity, assessed by the number of companies with ≥1% MS and the number of unique companies per country, can predict the proportion of sales from ultra-processed products. A multiple linear regression model with the CR4, the country and the product category as predictor variables found that all three predictor variables significantly predicted the proportion of sales attributed to ultra-processed packaged food products. Increased market diversity in turn showed to significantly reduce sales of ultra-processed packaged food products, but not non-alcoholic beverages. These results imply that increased market concentration, as measured by the CR4, may favour the increase in sales of ultra-processed packaged food products when taking into account both the product category and country. In contrast, increased market diversity in turn might be able to reduce sales of ultra-processed packaged food products.

Similar to our findings, also a study in Asia found that market forces, including market concentration, were significant but variable drivers of the nutrition transition and thus the increase in sales of ultra-processed products. This study also observed that concentration was highest in ultra-processed product markets such as soft drinks, biscuits and snack foods (184). This matches our finding that the product category had a strong effect in predicting sales of ultra-processed packaged food products.

A potential explanation for the decreased sales of ultra-processed products when more companies with ≥1% MS and unique companies are present in the market could be that smaller, and thus often less powerful companies, lack both the financial and political resources to shape food environments and undermine public health (58,62). Nonetheless, the sales of ultra-processed products is expanding worldwide, according to a study at global level using Euromonitor data. A development closely linked to the industrialization of food systems, technological change and globalization, including growth in the market and political activities of transnational food corporations and inadequate policies to protect nutrition (30).

This study documents the possible impact of market structure on the healthiness of packaged foods and non-alcoholic beverages while highlighting the importance of looking beyond food policy to improve the healthiness of food environments. Nevertheless, this study has several limitations. Levels of market concentration may be an underestimation. The Euromonitor database focuses on brand ownership rather than companies. Consequently, companies that are considered independent in Euromonitor (and for the calculation of market concentration) may still sell brands from other companies through licensing agreements. Due to the lack of nutritional data at European level there was insufficient variability to formulate conclusions for non-alcoholic beverages. Towards the future more research is required using

country-level data and detailed nutritional information to strengthen our understanding of the nutritional implications of market structures across Europe.

In conclusion, our results suggest that increased market concentration and reduced market diversity may predict increased sales of ultra-processed packaged food products across Europe. It is therefore recommended to take into account the market structure, in addition to policy effectiveness, when developing policies to improve food environments.

Chapter V Benchmarking the nutrition-related commitments and practices of major Belgian food companies

This chapter is based on the following published report:

Vandevijvere, S., Van Dam, I. Food companies' commitments and practices on food environments and nutrition in Belgium: A detailed assessment. Company assessments and recommendations using the Business Impact Assessment on obesity and population nutrition (BIA-Obesity). Sciensano 2021. Sciensano, Brussels, 2021. Legal Depot: D/2021/14.440/52

This chapter is based on the following published paper:

Van Dam, I., Reimes, N., Vandevijvere, S. Benchmarking the nutrition-related commitments and practices of major Belgian food companies. Int J Behav Nutr Phys Act (2022). *https://doi.org/10.1186/s12966-022-01269-1*.

5.1 Abstract

Background: To benchmark and quantitatively assess the transparency, specificity and comprehensiveness of nutrition-related commitments, as well as related practices of the largest Belgian food companies.

Methods: The 'Business Impact Assessment on Obesity and population-level nutrition' (BIA-Obesity) was applied to evaluate nutrition-related commitments and practices concerning product formulation, labelling, promotion and accessibility made by the biggest Belgian food and non-alcoholic beverage manufacturers (n=19), supermarkets (n=5) and quick-service restaurants (n=7). Publicly available commitments were collected and company representatives given the opportunity to verify and complete the information (2019-2020). Commitments were scored according to the BIA-Obesity. To assess company practices, the following indicators were calculated: median Nutri-Score of product portfolios, the proportion of products not-permitted to be marketed to children (using the World Health Organisation Regional Office for Europe nutrient profile model), the proportion of ultra-processed food products (using the NOVA-classification) and the proportion of products displaying Nutri-Score on the front-of-pack. Promotions in supermarket flyers were analysed over a one-year period and quick-service restaurant density around schools was calculated. Correlations between commitments and performance indicators were calculated applying the Spearman's rank correlation coefficient.

Results: 18 out of 31 companies participated (56%). Overall BIA-Obesity scores for commitments ranged from 2% to 75% (median: 35%) with notable variation across policy domains and food industries. The proportion of portfolios consisting of A and B Nutri-Score products ranged from 0% to 100% (median: 29%). The median proportion of products not-permitted to be marketed to children was 81% (range: 12%-100%) and the median proportion of ultra-processed foods was 75% (range: 2%-100%) across product portfolios. No significant correlations were observed between the strength of commitments and related performance indicators.

Conclusion: Food industry actions do not meet recommended best practices. Performance indicators show large potential for improvement across policy domains and industries. Government regulations are urgently needed to support food industry efforts and ensure that commitments translate into improved practices.

5.2 Background

In Belgium one in two adults and one in five youngsters (2-17 years of age) are overweight (185). Both overweight and obesity significantly increase the risk of non-communicable diseases (NCDs) (2,186). This has indisputable economic consequences with a one unit Body Mass Index (BMI) reduction in Belgium being associated with a 15.9 billion euro total economic benefit over a time span of 20 years (187,188). It has been established that unhealthy food environments support the increase in overweight and NCDs as they make the unhealthy choices easier than the healthy choices (35). Actions from the government, society and the food industry together with individual factors such as income, preferences and habits influence the healthiness of food environments (34). A regulatory environment that supports profit growth enables the food industry to influence food environments without due consideration of the impact on health (34,37,167). Many food companies have made commitments to improve some aspects of food environments through voluntary reformulation, labelling and marketing initiatives, but commitments are often non-specific and fall short of best-practice recommendations (51,54,135). To ensure that commitments translate into real-world improvement of food environments it is essential to monitor and evaluate commitments made by food companies as well as related company practices and performances (135,138).

In addition to commitments made by individual companies, a number of overarching industry pledges and voluntary public policy initiatives to improve food environments are in place in Belgium. These include the Nutri-Score (103,189), the 'Convention for a balanced diet' (190) and the 'Belgian Pledge' (191). The Nutri-Score classifies food and drink products in five categories based on the nutrient content per 100g/ml and is the official front-of-pack labelling system in Belgium since 2019 (103,189). Categories are distinguished by five letters (colours) with 'A' (dark green) being the most healthy and 'E' (red) the least healthy category (103). As part of the 'Convention for a balanced diet' the Ministry of Public Health encourages the food industry to commit to reformulate products within selected food categories and reduce portion sizes (190). The 'Belgian Pledge' in turn is an industry initiative to limit marketing of products to children that do not meet the nutrition criteria in media where at least 35% of the audience is under 12-years of age (191). The nutrition criteria enforced by the 'Belgian Pledge' are the same as the 'EU Pledge' which have been scrutinized for not effectively protecting children from unhealthy food marketing due to lenient nutrition criteria and the target audience definition (79,86). An alternative, more stringent nutrient profiling model that allows fewer products to be marketed to children, is the World Health Organisation Regional Office for Europe nutrient profile model (WHO-model) (86,171).

To date the transparency, comprehensiveness and specificity of the nutrition-related commitments made by the Belgian food industry, both by individual companies as through overarching industry pledges, have not yet been evaluated. Neither has it been assessed if stronger nutrition-related

commitments translate into stronger practices and performance. This study set out to benchmark and quantitatively assess the nutrition-related commitments concerning product (re)formulation, labelling, promotion and accessibility made by the biggest Belgian food and non-alcoholic beverage manufacturers, supermarkets and quick-service restaurants, as well as their practices within these same policy domains. To our knowledge this study is the first to make a combined assessment of both nutrition-related commitments and practices of the food industry.

5.3 Methodology

To assess food industry commitments and practices the 'Business Impact Assessment on Obesity and population-level nutrition' (BIA-Obesity) tool and process was applied. The BIA-Obesity has been developed by the International Network for Food and Obesity/Non-communicable Diseases Research, Monitoring and Action Support (INFORMAS) and was previously described in detail by Sacks et al. (34,135). The tool consists of six domains across which commitments and practices are assessed. The 'Corporate strategy' domain considers companies' overall nutrition strategy, taking into account specific targets and reporting practices. The 'Product formulation' domain assesses voluntary reformulation commitments related to sodium, saturated fat, trans fat, added sugar and energy content. In case companies made commitments to reduce palm-oil within their product portfolio this was taken into account for the indicator regarding saturated fat reduction. The 'Nutrition labelling' domain evaluates the application of voluntary front-of-pack labelling systems, the extent to which the use of nutrition and health claims is linked to the healthiness of products, menu labelling practices (for quick-service restaurants) and the use of shelf labels (for supermarkets). The 'Product and brand promotion' domain considers commitments for reducing the exposure of children to unhealthy food marketing, including the in-store environment of supermarkets and quick-service restaurants. Within the 'Product accessibility' domain commitments regarding food pricing and availability of healthy versus less healthy foods are evaluated. The 'Relationships with other organisations' domain assesses the transparency regarding funding provided to external groups such as nutrition and physical activity programs, external research and industry groups (135).

All indicators relate to commitments that go beyond legislative requirements. Consequently, indicators and scoring criteria were adapted to the Belgian context. Indicators related to the on-pack disclosure of the ingredients list, trans fat and added sugar content were removed as this is regulated by the European Union (116). As it is not common practice in Belgium for supermarkets to have in-store restaurants, also indicators relating to menu-labelling of restaurant foods in supermarkets were removed. The remaining indicators were adapted to suit the Belgian regulatory environment and take into account relevant industry pledges (i.e. Belgian Pledge) and voluntary government-led initiatives (i.e. Nutri-Score, Convention for a Balanced Diet).

In addition to the commitments, dependent on Belgian data availability, a selection of performance indicators were calculated across BIA-Obesity domains. The healthiness of product portfolios was assessed within the domain 'Product formulation', the proportion of products not-permitted to be marketed to children and the promotions within supermarket flyers analysed within the domain 'Product and brand promotion', the proportion of products displaying Nutri-Score assessed within the domain 'Product labelling' and the quick-service restaurant density around schools evaluated within the domain 'Product accessibility'.

This study was approved by the Human Ethics Committee of the University of Ghent (number: 2019/0780).

- **Selection of food companies**

Food companies with a combined market share of over 40% among packaged food manufacturers (44%) and non-alcoholic beverage manufacturers (50%), supermarkets (49%) and quick-service restaurants (52%) were selected using Belgian Euromonitor 2018 market share data (Table 13) (148). For packaged food manufacturers, an additional selection was conducted based on companies' market share within specific food categories to ensure that the most prominent companies per food category were covered by the selection (*'Breakfast cereals', 'Baked goods' 'Confectionery', 'Ice-cream and frozen desserts', 'Processed Fruit and Vegetables', 'Processed Meat and Seafood', 'Sweet biscuits and cereal bars', 'Drinking milk products', 'Yoghurts', 'Savoury snacks' and 'Ready meals'*). Four additional companies were included based on this extra selection (Dr. Oetker, Bonduelle, Imperial Meat Products and McCain).

- **Data collection and analyses**
    - **Nutrition-related commitments**

Publicly available commitments and policies were collected between March 2019 and October 2020. Company websites (national and global), brand websites, financial and corporate social responsibility reports, industry association websites and media articles were taken into account as well as abovementioned industry pledges and initiatives.

All relevant information was saved by downloading documents and through screenshots of the webpages. Commitments were entered in an Excel spreadsheet per BIA-Obesity indicator. A report was written for each company summarizing the collected information per BIA-Obesity domain and providing an overview of the scoring. Company representatives were contacted via various channels, including meetings with industry associations (Bemora, Comeos, Fevia), phone call inquiries, contact information on company/brand websites and LinkedIn. Emails were sent to representatives explaining the study.

Table 13: The market shares per food industry as determined by Euromonitor and most sold product categories of companies included in the study (Belgium, Euromonitor, 2018).

Companies	Market share (%)	Most sold (own-brand) product categories
Packaged food manufacturers		
Mondelēz	3.1	Bread & bakery products, Confectionary, Dairy
Unilever	2.5	Dairy, Convenience foods, Sauces
Nestlé	2	Dairy, Non-alcoholic beverages, Cereal & grain products
Danone	1.9	Dairy
Friesland Campina	1.3	Dairy
PepsiCo [1]	1.1	Non-alcoholic beverages, Savoury snack foods
Ter Beke	1.1	Convenience foods
Ferrero	1	Bread & bakery products, Confectionary
GB Foods *(Previously Continental Foods)*	1	Sauces, Convenience foods
Mars	0.9	Confectionary, Sauces, Cereal & grain products
Lotus Bakeries	0.9	Bread & bakery products
Kellogg's	0.8	Cereal & grain products
Iglo	0.7	Fruits & vegetables, Convenience foods, Meat & fish products
Dr. Oetker [2]	0.7	Convenience foods, Bread & bakery products, Dairy
Bonduelle [3]	0.3	Fruits & vegetables
Imperial Meat Products [4]	0.9	Meat & fish products
McCain [3]	0.2	Fruits & vegetables
N=17	***20.4*** [5]	
Non-alcoholic beverage manufacturers		
Coca-Cola	35.4	Non-alcoholic beverages
PepsiCo [1]	3.2	Non-alcoholic beverages, Savoury snack foods
Schweppes *(Suntory Holdings)*	3	Non-alcoholic beverages
N= 3	***41.6*** [6]	
Supermarkets		
Colruyt	15.9	Fruits & vegetables, Non-alcoholic beverages, Dairy
Delhaize	15.6	Fruits & vegetables, Non-alcoholic beverages, Dairy
Aldi	6.3	Dairy, Non-alcoholic beverages, Fruits & vegetables
Carrefour	6.2	Fruits & vegetables, Non-alcoholic beverages, Convenience foods
Lidl	3.8	Dairy, Non-alcoholic beverages, Bread & bakery products
N= 5	***52.4***	
Quick-service restaurants		
McDonald's	17	Burgers
Quick	12	Burgers
Panos	9	Bread & bakery products
Pizza Hut	6	Pizza
Exki	6	Bread & bakery products, Convenience foods
Domino's Pizza	17	Pizza
Paul	12	Bread & bakery products
N = 7	***49.4***	

1: PepsiCo was scored as both food and a non-alcoholic beverage manufacturer.
2: The largest market share within the Euromonitor food category 'Ready meals'.
3: Having among the largest market share within the Euromonitor food category 'Processed Fruit and Vegetables'.
4: Having among the largest market share within the Euromonitor food category 'Processed Meat and Seafood'.
5 and 6: Excluding the supermarkets as food and beverage manufacturers (market share foods: 23.3%; market share beverages: 8.8%).

Companies willing to participate signed a written informed consent and were sent the summary report and complete Excel file providing them with the opportunity to verify and complete the collected data. All additional information had to be substantiated with supporting documents. When requested by company representatives, non-disclosure agreements could be signed for sensitive information that was provided to improve the BIA-Obesity scoring. For companies that refused participation or failed to share feedback in time, the assessment was based solely on publicly available information. Supermarkets were assessed as both retailers and food manufacturers (own-brand products).

The nutrition-related commitments were scored in Excel. Annex 9 provides examples of how scores were assigned. All company commitments were scored independently by IVD and NR. Discrepancies were discussed till an agreement was obtained. The final BIA-Obesity scores per domain were weighted as recommended by INFORMAS (Annex 7).

Median scores (range), overall and per BIA-Obesity domain, were calculated including all food industries and separately for food and non-alcoholic beverage manufacturers, supermarkets and quick-service restaurants. For companies that verified and completed the public information, median scores before and after participation were calculated. A one-tailed Wilcoxon signed-rank test was conducted to compare scores before and after participation. A two-tailed Wilcoxon rank-sum test was used to compare scores of companies that engaged with the process to scores of those that did not engage.

- **Practices**

Practices were assed across the BIA-Obesity domains 'Product formulation' and 'Product and brand promotion' for all food industries. To some extent practices were assessed within the domain 'Product labelling' for food and beverage manufacturers and 'Product accessibility' for quick-service restaurants. No performance indicators were included for the domains 'Corporate strategy' and 'Relationships with other organisations' due to feasibility and data availability. An overview of all performance indicators can be found in Table 14.

Table 14: An overview of the Belgian performance indicators per food industry and 'Business Impact assessment on Obesity and Population Nutrition' (BIA-Obesity) domain. The data source and the year of data collection are specified per indicator.

Food Industry	BIA-Obesity Domain	Performance indicators	Data sources	Years
Food and beverage manufacturers	**Product formulation**	*For full product portfolio:* ✓ Median Nutri-Score ✓ % of products with Nutri-Score A and B ✓ % of products with Nutri-Score D and E ✓ % of products that are ultra-processed	Nutritrack branded food composition database Belgium	2018
	Nutrition labelling	*For full product portfolio:* ✓ % of products with Nutri-Score displayed on the front-of-pack	Pictures of all food products with Nutri-Score on the front-of-pack in-store	2019
	Product and brand promotion	*For full product portfolio:* ✓ % of products not-permitted to be marketed to children according to the World Health Organisation Regional Office for Europe nutrient profile model (WHO-Model)	Nutritrack branded food composition database Belgium	2018
Supermarkets	**Product formulation**	*For full own-brand product portfolio:* ✓ Median Nutri-Score ✓ % of Nutri-Score A and B ✓ % of Nutri-Score D and E ✓ % of products that are ultra-processed	Nutritrack branded food composition database Belgium	2018
	Nutrition labelling	*For full own-brand product portfolio:* ✓ % of products with Nutri-Score displayed on the front-of-pack	Pictures of all food products with Nutri-Score on front-of-pack in-store	2019
	Product and brand promotion	*For full own-brand product portfolio:* ✓ % of products not permitted to be marketed to children according to the WHO-Model *For all food products:* ✓ % of promotions for foods that are ultra-processed ✓ % of promotions for fresh fruit and vegetables ✓ % of promotions with promotional characters	Nutritrack branded food composition database Belgium Supermarket circulars	2018 2019-2020

(Table 14 continued)

Quick-service restaurants	**Product formulation**	*For meals and food portfolio online:* ✓ Median Nutri-Score ✓ % of meals with Nutri-Score A and B ✓ % of meals with Nutri-Score D and E	Company websites	2020 [1]
	Product and brand promotion	*For meals and food portfolio online:* ✓ % of foods and meals not-permitted to be marketed to children according to the WHO-Model	Company websites	2020
	Product accessibility	*Outlet density around schools:* ✓ Proportion of outlets within 500m road network distance from primary schools (Flanders only) ✓ Proportion of outlets within 500m road network distance from secondary schools (Flanders only)	Locatus food retail database	2020

1: 2017 for Quick. No data available for Exki and Pizza Hut.

Product formulation

Portfolios of food and beverage manufacturers, including supermarkets, were analysed using the Belgian Nutritrack branded food database 2018. This database contains products from the five biggest retailers in Belgium. It was compiled using pictures taken of all food products available in Carrefour, Lidl and Aldi. For Delhaize the nutritional data on own-brand products were received from the retailer. For Colruyt web scraping of nutritional information and ingredient lists from the online grocery store was applied. For the company Ter Beke only two food products were present in the Nutritrack branded food database 2018 as many of their product are sold outside of supermarkets. Consequently, this company is not discussed within the performance results, but data were included in graphs and tables. Alcoholic beverages, infant formula and baby foods were excluded.

For quick-service restaurants a database was compiled in 2020 using the nutritional information available on the national websites (Domino's Pizza, McDonald's and Panos). The nutritional information on the national website of Paul was incomplete. The missing nutritional information was completed using data from the French website. On the website of Quick no nutritional information was available per 100g and no portion sizes were specified. Instead, an online table with nutritional information for Belgium and Luxembourg from 2017 was used (192). For Exki and Pizza Hut no nutritional information was available per 100g, no portion sizes were specified and no other data could be obtained.

The Nutri-Score (103,189), the WHO-model (171) and the NOVA-classification (25) were applied to assess the nutritional quality of company portfolio's. The NOVA-classification distinguishes products based on their level of processing (unprocessed or minimally processed foods, processed culinary

ingredients, processed foods and ultra-processed foods) (25). The proportion of portfolios that are ultra-processed (NOVA), the proportion of products not-permitted to be marketed to children (WHO-Model), as well as the median Nutri-Score and the proportion of products with Nutri-Score A and B and D and E, were examined by company.

Product labelling

In November and December 2019, pictures were taken of all products carrying the Nutri-Score on the front-of-pack in stores of the five biggest supermarkets (Delhaize, Carrefour, Colruyt, Aldi, Lidl). Data were entered into a database and the distribution of the Nutri-Score was assessed.

Product and brand promotion

Food promotions in weekly or two-weekly supermarket flyers available from supermarket websites were collected over a one-year period (2019–2020) for the five biggest supermarkets. All promotions were entered into a database and classified according to the NOVA-classification and the 17 food categories of the WHO-model (Annex 4). Per product the following information was recorded: product- and brand name, food category, Nutri-Score, the type of promotional character and the type of premium offer (193). The proportion of promotions for ultra-processed foods, foods per WHO-model product category and for fresh fruits and vegetables as well as the proportion of promotions with promotional characters and premium offers were calculated. Data were analysed separately per supermarket and a distinction was made between promotions on the cover and on the inside of flyers. Methods were previously detailed by Vandevijvere et al. (194).

Product accessibility

The accessibility to quick-service restaurants near schools was assessed through the proportion of all company outlets within 500m road network distance from the entrance of primary and secondary schools in Flanders. For this the Locatus database of food retailers for Flanders (2020) was used (195). Locatus collects information on different types of retail outlets for commercial purposes across Flanders. It includes information on location, type, size, and opening times of all retailers through systemic area scans, which are conducted by employees of Locatus via field audits. Food outlets in shopping areas are audited every year, while other food outlets are audited every two to three years. The company Paul was excluded for this analysis as there were only two outlets identified in Flanders.

- **The relationship between commitments and practices**

Correlations between commitments and practices were calculated applying the Spearman's rank correlation coefficient. Correlations were calculated between commitments made within the domain

'Product formulation' and the proportion of products within the portfolio with Nutri-Score A and B and D and E as well as the median Nutri-Score of the portfolio. Correlations between this domain and the proportion of ultra-processed products were also calculated. Lastly, correlations between commitments within the domain 'Product and brand promotion' and the proportion of products not-permitted to be marketed to children (WHO-model) were assessed.

R-values >0.5 were considered to represent a strong correlation. P-values <0.05 were considered statistically significant. All analyses were performed using SAS 9.4.

5.4 Results

- **Nutrition-related commitments**

Out of the 31 selected companies, 18 verified and completed the publicly available information, five accepted participation but did not provide feedback in time and eight declined participation (Figure 9).

Overall BIA-Obesity scores ranged from 2% to 75% (median: 35%). The median overall score was 45% (range: 14-75%) for food and beverage manufacturers, 46% (range: 29-60%) for supermarkets and 15% (range: 2-35%) for quick-service restaurants (Figure 9). Scores per BIA-Obesity domain and per company are presented in Table 15. For the 18 companies that participated (response rate: 56%), the median overall BIA-Obesity score significantly increased from 34% (scoring based on public information) to 51% ($p<0.001$). Overall BIA-Obesity scores were significantly higher for companies that participated compared to companies that did not ($p<0.05$) (data not shown).

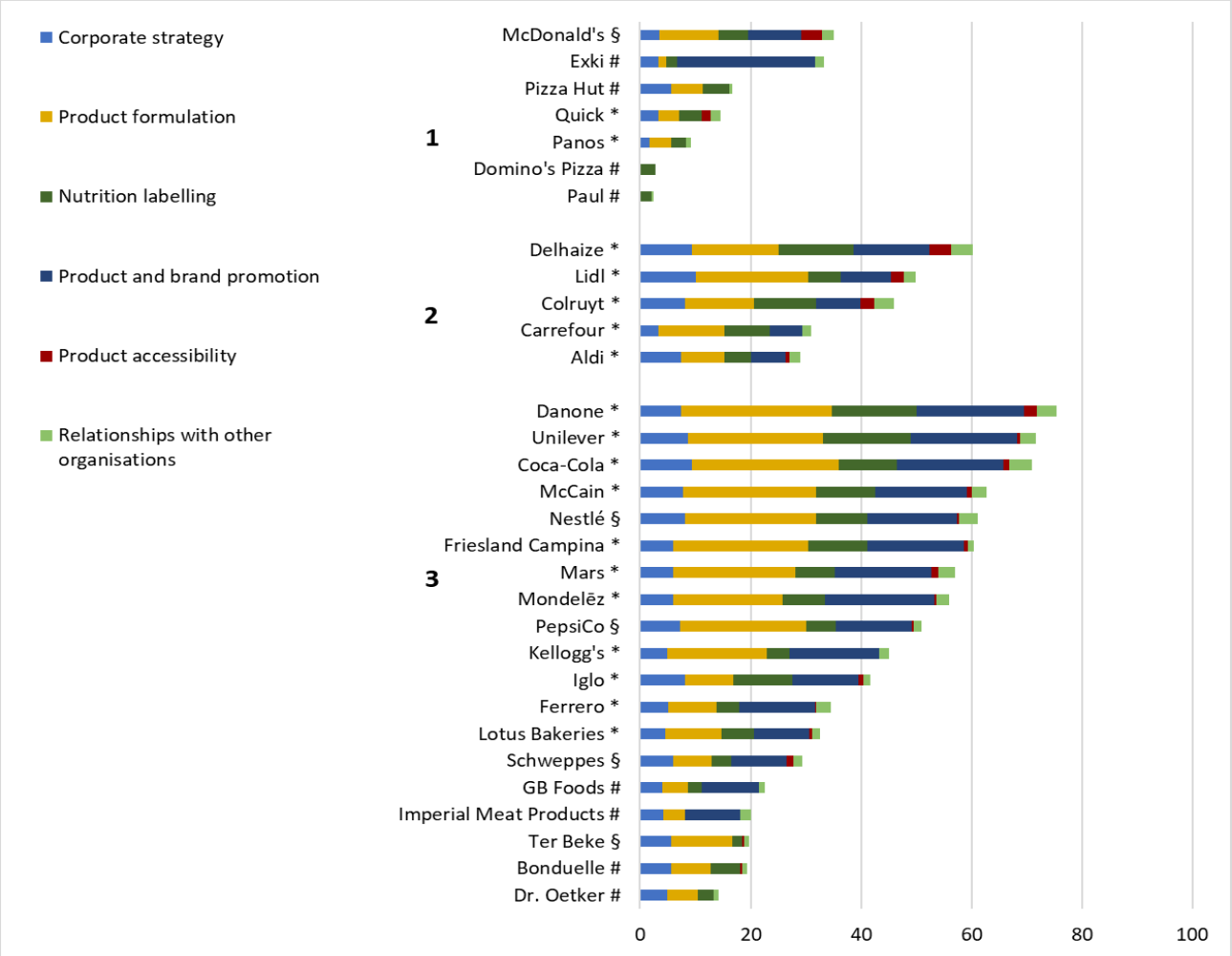


Figure 9: Overall and domain-specific 'Business Impact assessment on Obesity and Population Nutrition' (BIA-Obesity) scores for 1. Quick-service restaurants, 2. Supermarkets, 3. Food and beverage manufacturers. ** Full engagement with the process (N=18); # Declined participation (N=8); § Accepted participation, but contributions not received in time (N=5); For # and §: Assessment of commitments was based on publically available information only.*

The domain 'Corporate strategy' (median: 57%, range: 0-100%) was the best performing BIA-Obesity domain and the domain 'Product accessibility' (median: 8%, range: 0-46%) the worst. All companies, apart from two, made commitments within the 'Corporate strategy' domain. Supermarkets (median: 82%) performed better than food and beverage manufacturers (median: 60%) and quick-service restaurants (median: 33%) within this domain. Best performing companies recognised both national ('Convention for a balanced diet' or 'Nutri-Score') and international ('The United Nations Sustainable Development Goals' or 'the WHO global NCD action plan') priorities while regularly reporting on the progress toward their nutrition-related targets. The lowest performing companies made little or no mention of nutrition-related issues.

Within the 'Product accessibility' domain only limited commitments were in place. Supermarkets had the highest median score (11%), closely followed by food and beverage manufacturers (median: 10%). Quick-service restaurants scored the lowest (median: 0%). Ten out of 31 companies had no commitments

within this domain. Among supermarkets, one committed to have checkouts free from unhealthy items while another committed to link in-store price promotion and promotions through loyalty program to the healthiness of products as determined by the Nutri-Score. Among the quick-service restaurants, one restaurant committed to not provide free refills. The implementation of taxes on some unhealthy food products was supported by two companies and opposed by seven.

The median score within the domain 'Product formulation' was 37% (0-91%) with food and beverage manufacturers scoring the highest (61%) followed by supermarkets (50%) and quick-service restaurants (15%). Two quick-service restaurants did not have any commitments in this area. Seven out of the 19 food and beverage manufacturers, four out of five supermarkets and one out of seven quick-service restaurants made commitments to reduce all applicable nutrients of concern (sodium, saturated fat, trans fat, added sugar and energy content). Commitments to reduce the energy content and portion size where in place least of all. Two out of the 19 food and beverage manufacturers and two out of five supermarkets already applied the Nutri-Score to guide reformulation.

The domain 'Nutrition labelling' obtained a median score of 32% (range: 0-90%). Only one company had no commitments within this area. When comparing food industries it was clear that supermarkets performed better (median: 55%) than food and beverage manufacturers (median: 29%) and quick-service restaurants (median: 18%). The highest score was obtained by a supermarket (90%) that committed to apply the Nutri-Score on own-brand food products as well as to all available products using in-store shelf tags and the company website. All supermarkets and six out of the 19 food and beverage manufacturers committed to the implementation of the Nutri-Score. None of the quick-service restaurants committed to menu labelling, but all provided online nutritional information to some extent. One company publicly committed not to display nutrition and health claims on products defined as unhealthy according to their own classification system.

The domain 'Product and brand promotion' obtained a median score of 36% (range: 0-100%). Food and beverage manufacturers obtained a median score of 46%, supermarkets of 32% and quick-service restaurants 0%. Eight companies made no commitments to reduce marketing towards children (five quick-service restaurants and three food and beverage manufacturers). All supermarket and almost all food and beverage manufacturers (15/19) were a signatory to the Belgian Pledge.

Only one quick-service restaurant was a signatory. One quick-service restaurant in turn specifically committed to not advertise at all. None of the selected companies developed marketing policies for children up to the age of 18 years.

Lastly, the median score for the domain 'Relationships with other organisations' was 33% (range: 0-83%). One quick-service restaurant had no publicly available information for this domain. Median scores per

food industry ranged from 33% for food and beverage manufacturers up to 44% for supermarkets and down to 19% for quick-service restaurants. Few companies specifically committed to not making any political donations.

- **Practices**

The performance results per indicator and per company are presented in Table 15.

Product formulation

Across all food industries, the proportion portfolios consisting of A and B Nutri-Score products ranged from two companies with 0% of their portfolio having a score A or B up to one company having 100% products with Nutri-Score A or B (median: 29%).The median Nutri-Score of food and beverage portfolios ranged from A to E. All selected supermarkets and quick-service restaurants had a median Nutri-Score C apart from one supermarket with a median Nutri-Score D. The proportion of portfolios with Nutri-Score A and B ranged from 0% to 100% for food and beverage manufacturers (median: 20%), 26% to 41% for supermarkets (median: 38%) and from 25% to 48% for quick-service restaurants (median: 30%). According to the NOVA-classification, median portfolios of selected food and beverage manufacturers consisted for 84% of ultra-processed foods (one company with 2% up to four companies with 100% ultra-processed products). For supermarkets this was 49% (44%-63%). Median portfolios across all industries consisted for 75% of ultra-processed foods.

Product labelling

A total of 1781 products in the supermarkets displayed the Nutri-Score by the end of 2019. This represented about 10% of all products available on the Belgian market. About 90% of products displaying the Nutri-Score on pack were supermarket own-brand products. The two best performing food and beverage manufacturers had 34% of their products labelled with the Nutri-Score, for the best performing supermarket this was 30% of their portfolio. From the products displaying the Nutri-Score, 56% displayed Nutri-Score A or B. 26% displayed Nutri-Score D or E (data no shown).

Product and brand promotion

All food and beverage portfolios of companies not mainly selling fruits and vegetables consisted of at least 61% products not-permitted to be marketed to children. Food and beverage portfolios were for 86% (median) not-permitted to be marketed to children (range: 12%-100%). For supermarkets this median decreased to 71% (range: 64%-82%) not-permitted products. Quick-service restaurants had the highest proportion of products not-permitted to be marketed to children (median: 90%, range: 58%-92%). Overall 81% of portfolios were not suitable to be marketed to children.

Looking at food promotions in supermarket flyers over a one-year period, a total of 15.271 food promotions were analysed. According to the WHO-model, 'Processed meat, poultry and fish' (11.8%), 'Fresh and frozen fruit and vegetables and legumes' (9.5%) and 'Soft drinks and sweetened beverages' (9.0%) were promoted most regularly (data not shown). About 52% (range: 43%-63%) of all promotions were for ultra-processed products. Less than 10% of the promotions were for fresh fruits and vegetables (range: 4%-18%). Premium offers were used in 20% (range: 2%-42%) of the promotions and promotional characters in 5% (range: 1%-9%). The Nutri-Score was only visible for less than 2% of the promotions (data not shown). Products promoted on the cover of flyers tended to be healthier than the promotions throughout the entire flyers. Data are presented in Table 15. Data were previously published and described in detail by Vandevijvere et al. (194).

Product accessibility

Among quick-service restaurants, four out of six companies had more than 50% of their outlets in Flanders located within 500m road distance of primary and secondary schools (Table 15). Around both primary and secondary schools this percentage increased since 2008 for three quick-service restaurants.

Table 15: An overview of the Belgian 'Business Impact assessment on Obesity and Population Nutrition' (BIA-Obesity) scores for commitments and practices per company. Data are sorted by descending total BIA-Obesity score per food industry (food and beverage manufacturers, supermarkets and quick-service restaurants). Green indicates a score within the top third of companies per food industry and red indicates a score within the lowest third of companies per food industry. Yellow indicates the companies in between.

Company	Commitments							Practices									
	Total BIA-Score	Corporate strategy	Product formulation	Nutrition labelling	Product and brand promotion	Product accessibility	Relationships with other organisations	# Products	Median Nutri-Score	% Nutri-Score A+B	% Nutri-Score D+E	% Ultra-processed	% Not-permitted	% outlets within 500m road distance primary school	% outlets within 500m road distance secondary school	% promotions fresh fruit and vegetable (covers only)	% promotions UPF (covers only)
Food and beverage manufacturers																	
Danone	75.4	73.3	91.2	76.7	65.0	45.8	72.2	202	B	74.3	3.5	68.3	80.7				
Unilever	71.6	86.7	81.6	79.4	64.2	11.7	55.6	274	D	14.2	58.4	88.3	69.7				
Coca-Cola	71.0	93.3	88.5	52.9	64.2	22.5	83.3	147	D	30.6	51.7	70.1	72.8				
McCain	62.7	78.3	80.0	53.3	55.4	16.7	55.6	45	A	95.6	0.0	2.2	46.7				
Nestlé	61.1	81.7	78.9	46.7	53.8	10.0	66.7	242	C	20.3	47.5	79.3	85.5				
Friesland Campina	60.4	60.0	81.6	53.3	58.3	12.5	22.2	50	B	60.0	18.0	10.0	96.0				
Mars	57.1	60.0	73.7	35.3	58.3	26.7	61.1	121	C	33.9	44.6	82.6	61.2				
Mondelēz	55.9	60.0	65.8	38.2	66.3	7.5	44.4	213	E	2.8	84.5	91.6	100.0				
PepsiCo	51.0	71.7	76.3	26.5	45.8	10.0	27.8	171	C	10.5	48.5	83.6	97.1				
Kellogg's	45.0	48.3	60.5	20.6	54.2	0.0	33.3	53	D	13.2	50.9	100.0	100.0				
Iglo	41.7	81.7	28.9	53.3	40.0	16.7	27.8	122	B	84.3	2.5	32.8	18.0				
Ferrero	34.6	51.7	28.9	20.6	45.8	1.7	55.6	54	E	0.0	100.0	100.0	100.0				
Lotus Bakeries	32.5	45.0	34.2	29.4	33.3	10.0	27.8	86	E	4.7	89.5	100.0	100.0				
Schweppes	29.4	60.0	23.1	17.6	33.3	25.0	33.3	54	E	13.0	83.3	96.3	87.0				
GB Foods	22.6	40.0	15.8	11.8	34.8	0.0	22.2	136	D	21.3	54.4	96.3	61.0				

Imperial Meat Products	20.1	41.7	13.2	0.0	33.3	0.0	38.9	41	E	0.0	100.0	68.3	100.0				
Ter Beke	19.7	56.7	36.8	8.8	0.0	8.3	16.7	2	B/C	50.0	0.0	100.0	50.0				
Bonduelle	19.4	56.7	23.7	26.7	0.0	8.3	16.7	43	A	100.0	0.0	14.0	11.6				
Dr. Oetker	14.1	48.3	18.4	14.7	0.0	0.0	16.7	104	D	7.7	51.9	96.2	95.2				
Median (Min – Max)	**45 (14-75)**	**60 (40-93)**	**61 (13-91)**	**29 (0-79)**	**46 (0-66)**	**10 (0-46)**	**33 (17-83)**	**104 (2-274)**	**D (A-E)**	**20 (0-100)**	**51 (0-100)**	**84 (2-100)**	**86 (12-100)**				
Supermarkets																	
Delhaize	60.2	93.3	63.2	90.0	55.0	19.6	77.8	2829	C	38.4	39.2	48.8	70.7			6.8 (24.3)	52.1 (10.3)
Lidl	49.9	100.0	81.6	40.0	36.3	11.3	44.4	1074	C	29.1	49.1	61.6	78.0			9.5 (24.5)	42.9 (19.4)
Colruyt	45.9	81.7	50.0	75.0	31.6	12.5	72.2	2049	C	40.9	39.1	43.8	64.3			3.9 (12.5)	61.6 (72.2)
Carrefour market	31.0	33.3	47.4	55.0	23.8	0.0	33.3	2851	C	39.8	40.6	48.7	68.5			9.9 (20.5)	45.7 (19.0)
Aldi	29.0	73.3	31.6	32.5	24.5	4.2	38.9	602	D	26.3	55.2	63.0	82.2			17.5 (40.8)	59.6 (36.7)
Median (Min – Max)	**46 (29-60)**	**82 (33-100)**	**50 (32-82)**	**55 (33-90)**	**32 (24-55)**	**11 (0-20)**	**44 (33-78)**	**2049 (602-2851)**	**C (C-D)**	**38 (26-41)**	**41 (39-55)**	**49 (44-63)**	**71 (64-82)**			**10 (4-18)**	**52 (43-62)**
Quick-service restaurants																	
McDonald's	35.1	35.0	42.5	36.4	38.5	18.4	43.8	105	C	25.0	45.0		91.4	30.6	26.5		
Exki	33.3	33.3	5.3	13.6	100.0	0.0	31.3	/	/	/	/		/	50.0	50.0		
Pizza Hut (Delivery)	16.7	56.7	22.5	31.8	0.0	0.0	12.5	/	/	/	/		/	35.9 (73.1)	25.6 (61.5)		
Quick	14.6	33.3	15.0	27.3	0.0	7.9	37.5	90	C	25.3	48.3		92.2	36.7	20.0		
Panos	9.3	16.7	15.8	18.2	0.0	0.0	18.8	276	C	39.6	41.1		80.0	68.9	75.5		
Domino's Pizza	2.7	0.0	0.0	18.2	0.0	0.0	0.0	210	C	48.1	13.0		58.2	78.7	68.1		
Paul	2.4	0.0	0.0	13.6	0.0	0.0	6.3	122	C	30.4	46.1		89.8	/	/		

Median (Min – Max)	**15 (2-35)**	**33 (0-57)**	**15 (0-43)**	**18 (14-36)**	**0 (0-100)**	**0 (0-18)**	**19 (0-44)**	**122 (90-276)**	**C (C-C)**	**30 (25-48)**	**45 (13-48)**		**90 (58-92)**	**43 (31-79)**	**38 (20-75)**		
Overall median across industries (Min – Max)	**35 (2-75)**	**57 (0-100)**	**37 (0-91)**	**32 (0-90)**	**36 (0-100)**	**8 (0-46)**	**33 (0-83)**	**122 (2-2851)**	**C (A-E)**	**29 (0-100)**	**48 (0-100)**	**75 (2-100)**	**81 (12-100)**				

- **The relationship between commitments and practices**

No significant correlations were observed between commitments within the domains 'Product formulation' and 'Product and brand promotion' and respective performance indicators. As five out of seven selected quick-service restaurants made no commitments within the domain 'Product and brand promotion', no correlations could be calculated with practices as determined by the WHO-model.

It can be observed from Table 15 that companies within the top third for commitments within the domain of 'Product formulation' don't necessarily have the healthiest portfolios as determined by the Nutri-Score and NOVA-classification. On the contrary, there are companies within the lowest third for commitments that still have among the heathiest portfolios. The same can be observed for commitments and practices within the domain 'Product and brand promotion'.

These results suggest that companies with more specific, transparent and comprehensive commitments to reformulate products and limit marketing towards children don't necessarily have healthier portfolios with less ultra-processed products and a larger proportion of products permitted to be marketed to children.

5.5 Discussion

This study was the first to quantitatively assess both nutrition-related commitments and practices of the largest Belgian food and beverage manufacturers, supermarkets and quick-service restaurants. A large variation was observed between companies according to the BIA-Obesity scores and performance indicators. Overall BIA-Obesity scores ranged from 2% to 75% (median: 35%). The domain 'Corporate strategy' performed best while the domain 'Product accessibility' performed worst. The performance indicators indicated unhealthy food environments with the majority of portfolios consisting of ultra-processed foods and products not-permitted to be marketed to children, only limited promotion of fresh fruits and vegetables in supermarket flyers and several quick-service restaurants having most of their outlets within 500m road distance of schools.

Median overall BIA-Obesity scores as well as the scores per domain in Belgium were similar to results previously found in Australia and New Zealand and higher than the scores found in Malaysia (51,53,54). Similar to these previous studies, this study showed that BIA-Obesity scores significantly increased for companies that engaged with the process and verified and completed the publicly available data (53,54). The response rates were slightly higher in Belgium (56%) compared to Australia (47%) and New Zealand (48%) and significantly higher than in Malaysia (18%) (51,53,54) (Annex 10). Nonetheless, across all four countries the domain 'Corporate strategy' was identified as the best performing domain and 'Product accessibility' as the worst. These findings are in line with the results of the global Access To Nutrition

Index (ATNI) which in 2018 and 2021 identified the domain 'Governance' as the highest scoring category and 'Accessibility' the lowest (174,175). In a similar manner to the BIA-Obesity, the ATNI benchmarks food company commitments and practices, but does this at global level for only food and beverage manufacturers while looking at both over- and undernutrition (137,138).

The ATNI in 2018 also applied the WHO-model to assess practices and found that globally the portfolios of selected companies consisted for more than 50% of products not-permitted to be marketed to children (174). These findings are similar to our results that found that food and beverage portfolios of companies not mainly selling fruits and vegetables consisted of at least 61% products not-permitted to be marketed to children. Previous research also found that on average 36% of foods consumed in Belgium in 2014-2015 were ultra-processed according to the NOVA-classification and contributed to 30% of the daily energy intake (31). These results are not surprising as our data showed that median portfolios of the biggest Belgian food and beverage manufacturers (including supermarkets) consisted for 75% of ultra-processed foods. This is however of concern with an increasing number of studies showing an association between consumption of ultra-processed foods and overweight (27–29).

Companies should strengthen their role in improving food environments by enhancing their nutrition-related commitments. Current voluntary commitments fall short of recommended best practices. It is recommended for all companies to commit to SMART (Specific, Measurable, Achievable, Relevant and Time bound) reformulation targets to reduce nutrients of concern (salt, sugar, trans fat, saturated fat and energy) using an official nutrient profiling system (such as the Nutri-Score), develop a marketing policy using the WHO-model that applies to all children below the age of 18 and support evidence-based fiscal policies. For food and beverage manufacturers it is recommended to only label products with nutrition- and health claims when products are healthy.

Specifically for quick-service restaurants it is recommended to disclose nutritional information on menus and commit to not open new outlets in the vicinity of schools. Lastly, for supermarkets, it is recommended to dedicate a minimum amount of floor space to healthy products and limit the placement of unhealthy products at high-traffic areas such as end of aisles and cash registers. It is expected that strengthened commitments will translate into improved practices and performance. Nevertheless, this needs to be closely monitored as research in the UK has shown that voluntary reformulation policies between 2015 and 2018 did not translate into noteworthy changes in the nutritional quality of products sold by the top ten food and beverage manufacturers (196). Also in Canada it was found that companies with stronger commitments within the area of product reformulation did not have portfolios with a better nutritional quality (56). Moreover, research has pointed out the importance of being cautious with voluntary company commitments or commitments made through public-private partnerships. Such commitments can legitimise a company's role in the

formulation of public health policies as well as provide them with an official platform to advertise their efforts to improve health and wellbeing, irrespective of the ongoing efforts going beyond business as usual and truly having an impact on health (105,106). Furthermore, it has been suggested that voluntary commitments, instead of strengthening public health, have rather undermined policy implementation in areas most effective to improve population health, such as marketing restrictions and fiscal policies to make unhealthy foods relatively more expensive compared to healthier alternatives (106,107). As stated by Douglas *et al*., "the industry is not a disinterested partner in public health" (105). It is a misconception that the food industry will place population health above its own interests (107). Regardless of the opposition, government regulation can provide the necessary tools to motivate the food industry to strengthen actions and ensure that commitments move towards recommended best practices (108).

This study has several strengths and weaknesses. A key strength is that it is the first study to take into account a wide-range of performance indicators in addition to the nutrition-related commitments across the BIA-Obesity domains. It is anticipated that, because of liaising with company representatives, there is a higher chance of the recommendations to be implemented at company-level. Nonetheless, also important limitations were identified. Only about half of the selected companies verified and completed the publicly available data, resulting in the assessment of the remaining companies being based on publicly available information only. In addition, the assessment of practices was a snapshot in time and does not capture potential changes over time due to strengthened company policies. It is recommended for future applications of the BIA-Obesity to consider changes overtime in these performance indicators and to assess associations between these changes and the commitments made across BIA-Obesity domains. This iteration was not able to capture practices related to corporate political activities (such as lobbying, political donations and funding of research) that may influence food policies. Towards the future it is recommended to include such performance indicators linking to the BIA-Obesity domain of 'Relationships with other organisations'.

In conclusion, Belgium is currently relying on voluntary actions by the food industry to improve food environments. Voluntary actions that fall short of recommended best practices while performance indicators show there is still large potential for improvement. No associations were observed between the strength of nutrition-related commitments and practices. So, even though food companies may recognise their role in improving food environments, government regulation is urgently needed to support their efforts and ensure that commitments translate into improved practices and performance and eventually food environments that one day might make healthy food choices easier than unhealthy ones.

Chapter VI Benchmarking the nutrition-related commitments and practices of major French food companies

This chapter is based on the following published report:

Van Dam, I., Vandevijvere, S. Food companies' commitments and practices on food environments and nutrition in France: A detailed assessment. Company assessments and recommendations using the Business Impact Assessment on obesity and population nutrition (BIA-Obesity). Sciensano 2022. Sciensano, Brussels 2022. Legal Depot: D/2021/14.440/83

This chapter is based on the following paper currently under review:

Van Dam, I., Vandevijvere, S. Benchmarking the nutrition-related commitments and practices of major French food companies. BMC Public Health.

6.1 Abstract

Background: To benchmark and quantitatively assess the transparency, specificity and comprehensiveness of nutrition-related commitments and related practices of the major companies within the French food industry.

Methods: To evaluate the nutrition-related commitments and practices across policy domains such as product reformulation, labelling, marketing, and accessibility, the 'Business Impact Assessment on Obesity and population-level nutrition' (BIA-Obesity) was applied. A total of 33 French food companies were selected using Euromonitor 2018 market share data, including major packaged food and non-alcoholic beverage manufacturers (N=20), quick-service restaurants (N=7), and supermarkets (N=6). During 2019-2020 the publicly available commitments were collected for each company, scored according to the BIA-Obesity, and company representatives were provided with the opportunity to complete and verify the collected data. The following performance metrics were included to assess company practices: the median Nutri-Score of product portfolios, the proportion of products with Nutri-Score A or B, the percentage of products (not-)permitted to be marketed to children according to the World Health Organisation Europe nutrient profile model and the proportion of ultra-processed food products as determined by the NOVA classification. In addition, supermarket flyers were collected over a 6-months period to assess the healthiness of product promotions. Correlations between commitments and performance metrics were assessed applying the Spearman's rank correlation coefficient.

Results: Among the selected food companies, 13 companies verified and completed the publicly available data (response rate: 39%). Overall BIA-Obesity scores for company commitments varied between 2% and 74% with a median score of 28%. Scores for packaged food and non-alcoholic beverage manufacturers were higher than those for supermarkets and quick-service restaurants. The median proportion of foods with Nutri Score A or B within product portfolios was 38% (range: 1%-95%), while the median proportion of non-permitted products was 84% (range: 7% 100%) and the median proportion of ultra-processed food products 63% (range: 5%-100%). Stronger company commitments did not translate into better performance metrics.

Conclusion: There is room for significant improvement of both company commitments and performance. Current food industry action does not meet recommended best practices. The French government is urged to regulate food industry practices to create healthier food environments.

6.2 Background

In France about two out of five adults and one in seven adolescents have a body mass index (BMI) above 25kg/m^2 and as such can be considered to have overweight or obesity (10). Both overweight and obesity significantly increase the risk of non-communicable diseases (NCDs) (2,186), which are major public health problems in France. A high BMI, as well as unhealthy diets are among the top risk factors driving death and disability (197). Nonetheless, French people consume about one third of their energy from ultra-processed food products (33). High consumption of such products has been associated with weight gain, overweight and even increased mortality (27–29,32).

The high consumption of such food products is driven by the current policy environment, which allows the food industry to affect food environments without taking into account the vast health impact (34,37,167). Most food companies have commitments in place to improve the healthiness of food environments through voluntary marketing codes, reformulation targets and labelling initiatives. However, such voluntary codes often fall short of recommended best practices (51,53,54,56,182). As a result it becomes of utmost importance to monitor and evaluate food company commitments as well as their practices to ensure that commitments translate into real-world improvement of marketing practices, healthiness of product portfolios, front-of-pack (FOP) labelling practices and increased accessibility of healthier products across different settings (135,138). Moreover, improving population nutrition is crucial in achieving the United Nations Sustainable Development Goals (SDGs) (198).

While food companies make individual commitments as part of their corporate social responsibility, there are also government-led initiatives in place in France. The most well-known policy is the Nutri-Score, the government endorsed FOP labelling system that was introduced in France in 2017 and classifies products in five product categories (A being the most healthy to E being the least healthy category) based on the nutrient composition per 100g/ml (103,199). In terms of reformulation, companies have been encouraged to reduce nutrients of concern such as salt, sugar, fat and trans-fat across product portfolios by the 'Voluntary Commitment Charter for Nutritional Progress' (*'La charte d'engagement volontaires de progrès nutritionnel'*) (200). Through this charter, voluntary company commitments to improve the nutritional quality of products are validated by public authorities (200). In contrast to several other countries, there is no overarching industry pledge in place in France to limit the marketing of unhealthy food products to children (191,201,202). Companies can however sign up to the European wide initiative, the EU-Pledge, through which commitments are made to not market products to children below the age of 12 years that do not meet the set out nutrition criteria (69,170). Still, these nutrition criteria have been under scrutiny for not adequately protecting children from unhealthy food marketing (79,86). An alternative model, the World Health Organisation Regional Office for Europe

nutrient profile model (WHO-model), with much stricter nutrition criteria has however been developed to overcome the aforementioned shortcoming (86,171).

This study set out to, for the first time, benchmark and quantitatively assess the commitments and practices related to obesity prevention and population nutrition of the largest French food companies. The study included four industry sectors: packaged food manufacturers, non-alcoholic beverage manufacturers, supermarkets and quick-service restaurants. The objective was to highlight where French food companies are demonstrating leadership in relation to obesity prevention and nutrition, and to identify areas for improvement. In addition, this study aimed to assess whether stronger nutrition-related commitments translated into stronger practices and performance.

6.3 Methodology

To assess food industry commitments and practices, the 'Business Impact Assessment on Obesity and population-level nutrition' (BIA-Obesity) was applied, as developed by the International Network for Food and Obesity/Non-communicable Diseases Research, Monitoring and Action Support (INFORMAS) and previously described in detail by Sacks et al. (34,135). The tool assesses the transparency, comprehensiveness and specificity of commitments as well as practices across six domains, namely: 'Corporate strategy', 'Product formulation', 'Nutrition labelling', 'Product and brand promotion', 'Product accessibility' and 'Relationships with other organisations' (135).

All indicators within these domains relate to commitments that go beyond legislative requirements. As a result, indicators and scoring criteria need to be adapted to the local context prior to implementation of the tool. Indicators related to the on-pack disclosure of the ingredients list and nutritional declaration were removed as this is regulated by the European Union (116). As it is not common in France for supermarkets to have in-store restaurants, indicators relating to menu-labelling were removed for this food industry. Furthermore, non-alcoholic beverages containing added sugars or sweeteners in France are subject to a tax (203). Consequently, commitments to increase prices of sugary beverages compared to healthier drinks were not taken into account. Since the provision of unlimited refills was banned in France in 2017 (204) the indicator relating to commitments of quick-service restaurants to not provide free refills was removed. Lastly, the indicator regarding the publication of political donations was removed as in France legal persons (including, and in particular, companies) are not authorized to pay any donation or any benefit in kind to political parties (205). The remaining indicators were adapted to suit the French regulatory environment and take into account relevant industry pledges and voluntary government-led initiatives (i.e. Nutri-Score).

This study was approved by the Human Ethics Committee of the University of Ghent (number: 2019/0780).

- **Selection of food companies**

Food companies with a combined market share of over 34% among packaged food manufacturers (35%), non-alcoholic beverage manufacturers (52%), supermarkets (48%) and quick-service restaurants (50%) were selected using French Euromonitor 2018 market share data (Table 16) (148). For packaged food manufacturers, an additional selection was conducted based on companies' market share within specific food categories to ensure that the most prominent companies per food category were covered by the selection (*'Breakfast cereals', 'Baked goods' 'Confectionery', 'Ice-cream and frozen desserts', 'Processed Fruit and Vegetables', 'Processed Meat and Seafood', 'Sweet biscuits and cereal bars', 'Drinking milk products', 'Yoghurts', 'Savoury snacks' and 'Ready meals'*). Three additional companies were included based on this extra selection (Kellogg's, Barilla and Bonduelle).

Table 16: The market shares per food industry as determined by Euromonitor and most sold product categories of companies included in the study (France, Euromonitor, 2018).

Packaged food manufacturers		
Companies	Market share (%)	Most sold (own-brand) product categories
Lactalis	3.4	Dairy
Mondelēz	2.9	Bread & bakery products, Confectionary, Savoury snack foods
Nestlé	2.6	Dairy, Confectionary, Non-alcoholic beverages
Ferrero	2.1	Confectionary, Bread & bakery products, Cereal & grain products
Fleury Michon	1.9	Meat & fish products, Convenience foods
Danone	1.6	Dairy, Non-alcoholic beverages
Unilever	1.3	Dairy, Sauces, Convenience foods
Savencia	1.3	Dairy, Confectionary, Meat & fish products
Bel	1.2	Fruit & vegetable products, Dairy
Panzani	1.0	Cereal & grain products, Convenience foods, Sauces
Barilla [1]	0.9	Bread & bakery products, Cereal & grain products, Sauces
Bonduelle [2]	0.6	Fruit & vegetable products, Convenience foods
Kellogg's [3]	0.5	Cereal & grain products, Savoury snack foods
William Saurin	0.3	Convenience foods, Meat & fish products
N=14	***21.6*** [4]	
Non-alcoholic beverage manufacturers		
Coca-Cola	17.2	Non-alcoholic beverages
PepsiCo	8.8	Non-alcoholic beverages, Savoury snack foods, Cereal & grain products
Orangina Suntory	7.6	Non-alcoholic beverages
Eckes-Granini	3.9	Non-alcoholic beverages
Fruité Entreprises	4.0	Non-alcoholic beverages
Andros	2.0	Fruit & vegetable products, Dairy, Bread & bakery products, Non-alcoholic beverages
N= 6	***43.5*** [5]	

1: The largest market share within the Euromonitor food category 'Baked goods'.
2: The largest market share within the Euromonitor food category 'Processed Fruit and Vegetables'.
3: The largest market share within the Euromonitor food category 'Breakfast cereals'.
4 and 5: Excluding the supermarkets as food and beverage manufacturers (market share foods: 13.2%; market share beverages: 8.2%).

(Table 16 continued)

Supermarkets		
E. Leclerc	11.1	Dairy, Fruit & vegetable products, Meat & fish products
Intermarché	9.8	Dairy, Fruit & vegetable products, Bread & bakery products
Carrefour	8.8	Dairy, Fruit & vegetable products, Meat & fish products
Auchan	8.2	Meat & fish products, Fruit & vegetable products, Dairy
Super U	5.2	Meat & fish products, Fruit & vegetable products, Dairy
Lidl	4.4	
N= 6	***47.5***	
Quick-service restaurants		
McDonald's	32.2	Burgers
KFC	4.1	Burgers
Quick	3.9	Burgers
Burger King	2.9	Burgers
Paul	2.6	Bread & bakery products, Convenience foods
La Brioche Dorée	2.1	Bread & bakery products, Convenience foods
Domino's Pizza	1.9	Pizza
N = 7	***49.7***	

- **Data collection and analyses**

  - **Nutrition-related commitments**

Publicly available commitments and policies were collected between June 2019 and December 2020. Relevant information was collected from company websites, company reports, brand websites and relevant industry pledges and initiatives. Per selected company, screenshots were taken of relevant webpages and relevant documents were downloaded.

Subsequently, the information was entered in an Excel spreadsheet per BIA-Obesity indicator. A report summarizing the collected information as well as the preliminary scoring was compiled per company. Company representatives were contacted via various channels, including meetings with industry associations (ANIA and L'Alliance 7), phone call inquiries, contact information on company/brand websites and LinkedIn. Companies willing to verify and complete the collected data were sent the summary reports after signing a written informed consent. For all additional information some kind of evidence was required. Upon request companies could sign non-disclosure agreements prior to sharing sensitive internal documents. For companies that refused participation or failed to share feedback in time, the assessment was based solely on publicly available information. Supermarkets were assessed as both retailers and food manufacturers (own-brand products).

The nutrition-related commitments were scored in Excel. Annex 9 provides examples of how scores were assigned for BIA-Obesity indicators. All company commitments were scored by IVD and two companies per food industry (a total of eight companies) were blindly re-scored by YZ. Discrepancies

were discussed until an agreement was obtained. The final BIA-Obesity scores per domain were weighted as recommended by INFORMAS (Annex 7).

Median scores (range), overall and per BIA-Obesity domain, were calculated for each food industry and across food industries. For companies that verified and completed the public information, median scores before and after participation were calculated. A one-tailed Wilcoxon signed-rank test was conducted to compare scores before and after participation. A two-tailed Wilcoxon rank-sum test was used to compare scores of companies that engaged with the process to scores of those that did not engage. Both tests are non-parametric tests, the first for dependent- and the latter for independent variables.

- **Practices**

For some of the BIA-Obesity policy domains, a set of key performance indicators was selected to assess company practices on population nutrition. The selected indicators, as well as the sources where the data were derived from and the years, are presented below in Table 17. For the domains on 'Corporate nutrition strategy' and 'Relationships with other organisations', no performance indicators (such as an assessment of companies' corporate political activities) were included due to a lack of time and resources available to collect data within these domains. For the domains 'Nutrition labelling' and 'Product accessibility' no performance data were available at the time of assessment. For the other BIA-Obesity domains, specific indicators were included, dependent on data availability and feasibility of the assessment. An overview of the different performance indicators can be found in Table 17.

Product formulation

For packaged food and non-alcoholic beverage manufacturers and supermarkets (own-brand products), the healthiness of the complete product portfolios was analysed using Open Food Facts data for France in 2018. As Open Food Facts cannot guarantee the accuracy and completeness of the data, the nutritional data of all products that could be found on Mintel GNPD (Global New Products Database), on brand websites or supermarket websites were verified using the aforementioned sources. Duplication of products was avoided by ensuring that each barcode appeared only once.

For quick-service restaurants, the nutritional information per 100g was obtained from the national brand websites in 2019, where possible (Burger King, Domino's Pizza, McDonald's and Paul). For KFC no nutritional information was available per 100g and no portion sizes were specified on the national website, so an online table with nutritional information from 2018 was used. On the website of Brioche Dorée and Quick no nutritional information was available per 100g and portion sizes were not defined. As a result, the product portfolios of Brioche Dorée and Quick could not be analysed.

Table 17: An overview of the French performance indicators per food industry and 'Business Impact assessment on Obesity and Population Nutrition' (BIA-Obesity) domain. The data source and the year of data collection are specified per indicator.

Food Industry	BIA-Obesity Domain	Performance indicators	Data sources	Years
Food and beverage manufacturers	**Product formulation**	*For full product portfolio:* ✓ Median Nutri-Score ✓ % of products with Nutri-Score A and B ✓ % of products with Nutri-Score D and E ✓ % of products that are ultra-processed	Open Food Facts data France [1]	2018
	Product and brand promotion	*For full product portfolio:* ✓ % of products not-permitted to be marketed to children according to the World Health Organisation Regional Office for Europe nutrient profile model (WHO-Model)	Open Food Facts data France [1]	2018
Supermarkets	**Product formulation**	*For full own-brand product portfolio:* ✓ Median Nutri-Score ✓ % of Nutri-Score A and B ✓ % of Nutri-Score D and E ✓ % of products that are ultra-processed	Open Food Facts data France [1]	2018
	Product and brand promotion	*For full own-brand product portfolio:* ✓ % of products not permitted to be marketed to children according to the WHO-Model *For all food products:* ✓ % of promotions for foods that are ultra-processed ✓ % of promotions for fresh fruit and vegetables ✓ % of promotions with promotional characters ✓ % of promotions with discounts ✓ % of promotions with incentive offers	Open Food Facts data France [1] Supermarket circulars	2018 October 2019 – March 2020
Quick-service restaurants	**Product formulation**	*For online product portfolio:* ✓ Median Nutri-Score ✓ % of meals with Nutri-Score A and B ✓ % of meals with Nutri-Score D and E	Company websites	2019 [2]
	Product and brand promotion	*For online product portfolio :* ✓ % of foods and meals not-permitted to be marketed to children according to the WHO-Model	Company websites	2019 [2]

1: Verified using Mintel GNPD (Global New Products Database) data or nutritional values from brand or supermarket websites.

2: 2018 for KFC. No data available for Brioche Dorée and Quick.

The healthiness of the entire portfolios or menus of all selected food companies was analysed using the Nutri-Score, which is the official front-of-pack labelling system in place in France since March 2017 (199). The proportion of products with Nutri-Score A, B, C, D and E was determined, as well as the median Nutri-Score across the company's portfolio or menu. When calculating the Nutri-Score for non-alcoholic beverages, it was assumed that no juices had a fruit and vegetable content above 40% as the data sources and product ingredient lists did not allow for a distinction to be made between the fruit and vegetable content of different juices. To check the viability of this assumption, a Pearson correlation coefficient was calculated between the Nutri-Score available through Open Food Facts and the calculated Nutri-Score for non-alcoholic beverages. A strong correlation was observed between both Nutri-scores ($R=0.84$, $p<0.0001$). In addition, a correlation between the Open Food Facts Nutri-Score and the calculated Nutri-Score was also conducted for the entire dataset. A very strong correlation was observed between the calculated Nutri-Score and the Nutri-Score displayed within Open Food Facts ($R=0.98$, $p<0.0001$).

The company's portfolios were also analysed in relation to the proportion of ultra-processed foods (according to the NOVA classification) (25). The NOVA-classification distinguishes products based on their level of processing (unprocessed or minimally processed foods, processed culinary ingredients, processed foods and ultra-processed foods) (25). The proportion of portfolios that are ultra-processed (NOVA) as well as the median Nutri-Score and the proportion of products with Nutri-Score 'A and B' and 'D and E', were examined by company. The results were reported as a proportion of products with Nutri-Score 'A and B' and 'D and E' as this was considered to reflect the healthiness of companies' overall product portfolios. The proportion of products with Nutri-Score 'A and B' was deemed to represent healthier alternatives within the product portfolio while the proportion with Nutri-Score 'D and E' was considered to signify less healthy products.

Product and brand promotion

To assess the proportion of products within company portfolio's (not-)permitted to be marketed to children the WHO-model was applied. The WHO-model determines per product category whether products should be (not-)permitted to be marketed to children. An overview of the 17 product categories included in the WHO-model can be found in Annex 4. While a threshold for nutrients of concern determines if a product should be permitted to be marketed to children for most product categories, some categories are entirely permitted (such as '*Fresh and frozen meat, poultry, fish and similar*' and '*Fresh and frozen fruit, vegetables and legumes*') or not-permitted to be marketed to children (such as '*Chocolate and sugar confectionery, energy bars, and sweet toppings and desserts*'; '*Cakes, sweet biscuits and pastries, other sweet bakery wares, and dry mixes for making such*'; '*Juices*'; '*Energy drinks*' and '*Edible ices*') (171). From a public health perspective it would be expected that companies with a

higher proportion of products not-permitted to be marketed to children would have stronger commitments in place to reduce such practices.

To specifically evaluate the products promoted by supermarkets, food promotions in the flyers of the six biggest supermarkets in France were collected online from the weekly/two-weekly circulars over a six-months period (October 2019 – March 2020). All promotions were entered into a database and manually classified according to the NOVA-classification and the 17 food categories of the WHO-model (Annex 4). Per product the following information was recorded: product- and brand name, type of promotional character, the level of discount, type of incentive offer, if the product was a fresh fruit or vegetable, whether the product was a fresh meat or fish product and the Nutri-Score (193). The proportion of promotions for ultra-processed foods, foods with promotional characters, incentive offers or discounts and the proportion of promotions for fresh fruits and vegetables were calculated. Data were analysed separately per supermarket.

- **The relationship between commitments and practices**

Correlations between commitments and practices were calculated applying the Spearman's rank correlation coefficient, a non-parametric test that measures the direction and strength of association between two variables. Correlations were calculated between commitments made within the domain 'Product formulation' and the proportion of products within the portfolio with Nutri-Score 'A and B' and 'D and E'. Correlations between the domain 'Product formulation' and the proportion of ultra-processed products were also calculated. Lastly, correlations between commitments within the domain 'Product and brand promotion' and the proportion of products not-permitted to be marketed to children according to the WHO-model were assessed.

R-values >0.5 were considered to represent a strong correlation. P-values <0.05 were considered statistically significant. All analyses were performed using Microsoft Excel and SAS 9.4 (Cary, USA, 2018)

6.4 Results

- **Nutrition-related commitments**

Out of the 33 selected food companies, 13 verified and completed the publicly available information, 11 accepted participation but did not provide feedback in time, five declined participation and four companies were unreachable (Figure 10).

French food companies demonstrated some commitment to improving population nutrition, but much stronger action is needed across sectors and across BIA-Obesity policy domains. The overall scores ranged from 2% (Lactalis) up to 74% (Danone) with a median overall score of 28%. The best performing

domain was 'Corporate nutrition strategy' (median score: 53%, range: 0-93%) while the worst performing domain was 'Product accessibility' (median score: 6%, range: 10-50%). Packaged food and beverage manufacturers had substantially more transparent, comprehensive and specific commitments in place with a median overall BIA-Obesity scores of 44% (range: 2-74%) compared to 12% for supermarkets (range: 7-20%) and 11% for quick-service restaurants (range: 5-39%). Domain-specific scores were also lower for quick-service restaurants and supermarkets (considered as both retailer and packaged food and non-alcoholic manufacturer) than for packaged food and beverage manufacturers. In particular the median score for both the domains 'Product and brand promotion' and 'Product accessibility' was 0 for quick-service restaurants and supermarkets.

Scores per BIA-Obesity domain and per company are presented in Table 18. For the 13 food companies that participated (response rate: 39%), the median overall BIA-Obesity score significantly increased from 38% (scoring based on public information only) to 50% (scoring after full participation) ($p<0.001$). Overall BIA-Obesity scores were significantly higher for companies that participated compared to companies that did not ($p<0.05$) (data not shown).

Within the 'Corporate strategy' domain seven out of the 33 companies had no commitments in place. Packaged food and beverage companies (median: 63%) performed better than supermarkets (median: 33%) and quick-service restaurants (median: 0%) for this domain. Some companies recognized both national (i.e. Nutri-Score) as well as international (i.e. The United Nations Sustainable Development Goals or the World Health Organization global NCD action plan) priorities within their corporate strategy. Others published annual national reports detailing their progress against objectives and targets. The lowest performing companies made little or no mention of nutrition-related issues and did not identify population nutrition as a clear priority focus area.

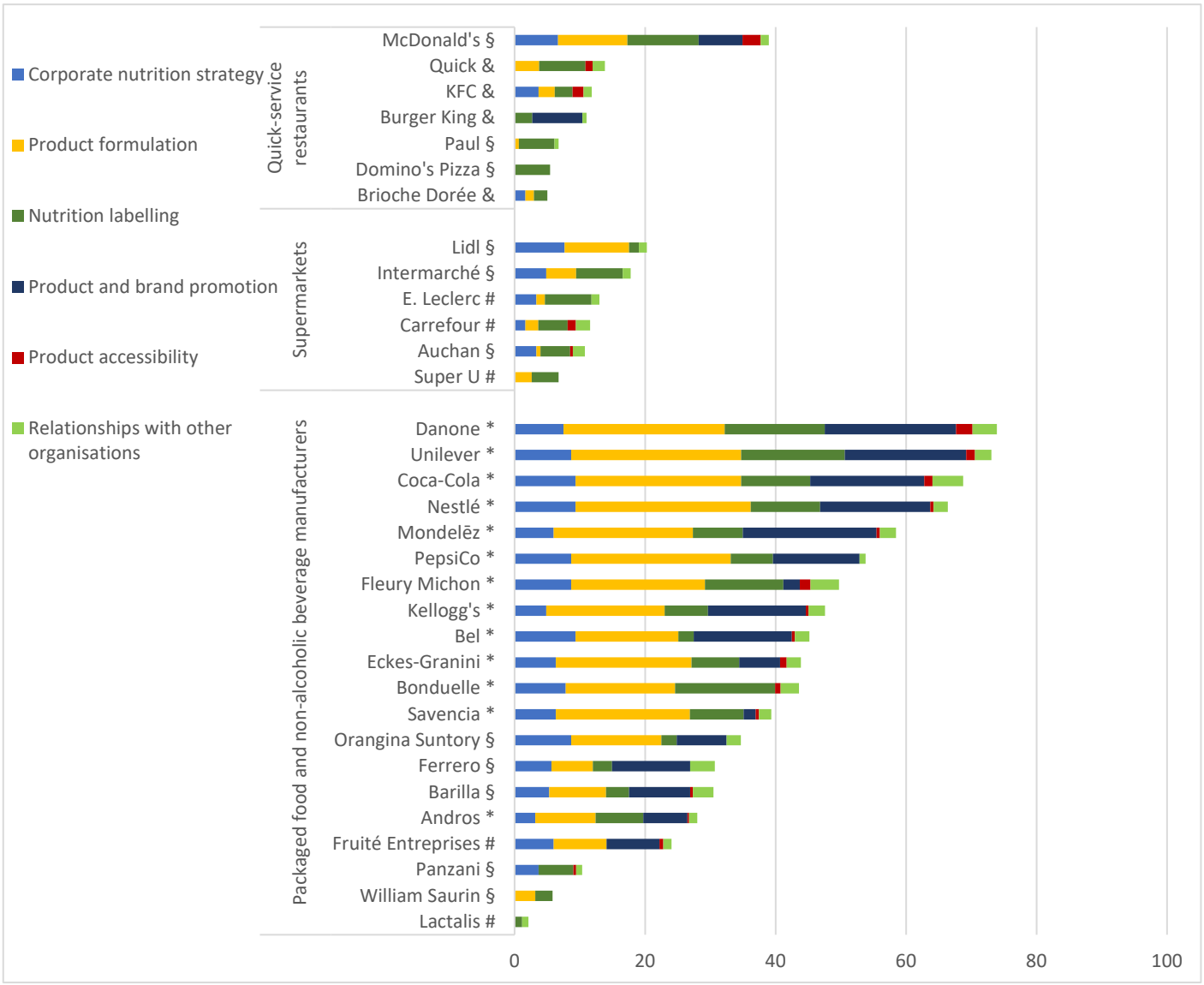


Figure 10: Business Impact Assessment on Obesity and Population Nutrition (BIA-Obesity), France 2020 – Overall and domain-specific scores for quick-service restaurants, supermarkets and packaged food and non-alcoholic beverage manufacturers. ** Full engagement with the process (N=13); # Declined participation (N=5); § Accepted participation, but contributions not received in time (N=11); & Not able to contact the company (N=4); For #, § and &: Assessment of commitments was based on publicly available information only.*

Within the 'Product accessibility' domain only a limited number of companies made commitments to address the accessibility of healthy compared to 'less healthy' products (12 out of the 33 companies). Packaged food and beverage manufacturers had the highest median score (10%) while supermarkets and quick-service restaurants had a median score of 0%, lacking all commitments regarding best practice actions in this domain, such as confectionary free checkouts for supermarkets or commitments to limit supersizing among quick-service restaurants. The implementation of taxes on some unhealthy food products was supported by three companies and opposed by seven. Supermarkets neither opposed or supported the implementation of such taxes.

The median score within the domain 'Product formulation' was 29% (0-89%) with food and beverage manufacturers scoring the highest (58%) followed by supermarkets (9%) and quick-service restaurants (5%). Nestlé obtained the highest score while four companies made no commitments in this area (Lactalis, Panzani, Burger King and Domino's Pizza). 11 out of 20 food and beverage manufacturers and two supermarkets had targets in relation to reducing the sodium content, while 14 out of 20 food and beverage manufacturers and two supermarkets had targets in relation to reducing the added sugar content. Eight out of 20 food and beverage manufacturers and one out of five supermarkets had targets in relation to reducing portion sizes. Only one out of seven quick-service restaurants had such targets. Three out of the 20 food and beverage manufacturers applied the Nutri-Score to guide reformulation. This was not the case for any quick-service restaurants or supermarkets.

The domain 'Nutrition labelling' obtained a median score of 33% (0-79%). All companies apart from one (Fruité Entreprises) made commitments within this area. When comparing food industries, food and beverage manufacturers (median: 35%) and quick-service restaurants (median: 36%) performed better than supermarkets (median: 30%). The top performer in this domain (Unilever) publicly committed to link the use of nutrition and health claims to the healthiness of products as determined by their own classification system. Two additional companies had a similar commitment in place, but this was not publicly available. 12 out of 20 packaged food and beverage manufacturers and all six supermarkets committed to implement the government-endorsed Nutri-Score on their (own-brand) products. All quick-service restaurants provided nutritional information about products online to some extent, although sometimes only per serving (without indication of portion size) instead of per 100g. In addition, four out of seven quick-service restaurants committed to labelling their menu boards in-store.

The domain 'Product and brand promotion' obtained a median score of 8% (range: 0-68%) and was the second worst scoring BIA-Obesity domain in France. Food and beverage manufacturers obtained a median score of 29%, while supermarkets and quick-service restaurants obtained a median score of 0%. 15 out of all 33 companies had no commitments within this domain, including all six supermarkets and five out of the seven quick-service restaurants. None of the selected companies developed marketing policies for children up to the age of 18 years and only three packaged food and beverage manufacturers committed not to sponsor children's sporting, cultural or other activities using unhealthy foods and brands.

Lastly, the median score for the domain 'Relationships with other organisations' was 38% (range: 0-94%). Only four companies did not have any commitments within this domain (William Saurin, Brioche Dorée, Domino's Pizza and Super U). Median scores per food industry ranged from 13% for quick-service restaurants up to 25% for supermarkets and 44% for food and beverage manufacturers.

- **Practices**

The performance results per indicator and per company are shown in Table 18.

Product formulation

Across all selected companies, the proportion of portfolios consisting of A and B Nutri-Score products ranged from 0.6% for Ferrero to 95% for Eckes-Granini (median: 38%). One food and beverage company had a median Nutri-Score A (Bonduelle) across its entire portfolio while two companies had a median Nutri Score E (Ferrero and Mondelēz). The product portfolios of supermarket own-brand products and quick-service restaurants all had a median Nutri-Score C apart from one supermarket (Lidl) and two quick-service restaurants (Burger King and Paul). The proportion of products within portfolios with Nutri-Score A and B ranged from 1% to 95% for food and beverage manufacturers (median: 43%), 26% to 48% for supermarkets (median: 41%) and from 13% to 29% for quick-service restaurants (median: 23%). The median proportion of ultra-processed food products within portfolios of selected food and beverage manufacturers was 73% (range: 5-100%). For supermarkets this was 61% (range: 53-64%).

Product and brand promotion

According to the WHO-model, the median proportion of products within portfolios across food and beverage manufacturers not-permitted to be marketed to children was 93% (ranging from 7% for Bonduelle to 100% for Ferrero and Eckes-Granini). For quick-service restaurants this was 84% (range: 74-94), and for supermarkets this was 72% (range: 66-82%).

For the food promotions in the supermarket flyers, it was found that promotions were mostly for ultra-processed foods (median: 52%). Nonetheless, considerable variation was observed between the different supermarkets with the proportion of promotions for ultra-processed foods ranging from 49% (Carrefour and Super U) up to 61% (Lidl) of all promotions. Across the entire circular, Carrefour most frequently promoted fresh fruits and vegetables (7% of all promotions) and Auchan least frequently (3% of all promotions). Throughout the flyers only around 5% (range: 0-9%) of promotions had promotional characters while 68% of products were discounted (range: 29-73%) (Table 18).

- **The association between commitments and practices**

No significant correlations were observed between commitments within the domains 'Product formulation' and 'Product and brand promotion' and respective performance indicators. As no supermarkets and only two out of five quick-service restaurants made commitments to limit marketing to children within the domain 'Product and brand promotion', no correlations with practices, as assessed

by the WHO-model, could be calculated for these food industries. As none of the French supermarkets had a commitment in place to have a minimum proportion of products promoted in their regular flyers to be healthier products, no correlation could be calculated between commitments and the healthiness of products promoted in supermarket flyers.

From Table 18 it can be observed that food companies within the top third for commitments within the domain of 'Product formulation' don't necessarily have the healthiest portfolios as determined by the Nutri-Score and NOVA-classification. On the contrary, there are companies within the lowest third for commitments that still have among the heathiest portfolios. The same can be observed for commitments and practices within the domain 'Product and brand promotion'.

Table 18: An overview of the French 'Business Impact assessment on Obesity and Population Nutrition' (BIA-Obesity) scores for commitments and practices per company. Data are sorted by descending total BIA-Obesity score per food industry (food and beverage manufacturers, supermarkets and quick-service restaurants). Green indicates a score within the top third of companies per food industry and red indicates a score within the lowest third of companies per food industry. Yellow indicates the companies in between.

Company	Commitments							Practices									
	Total BIA-Score	Corporate strategy	Product formulation	Nutrition labelling	Product and brand promotion	Product accessibility	Relationships with other organisations	# Products	Median Nutri-Score	% Nutri-Score A+B	% Nutri-Score D+E	% Ultra-processed	% Not-permitted	% promotions for fresh fruit and vegetables	% promotions UPF	% promotions with promotional characters	% promotions discounted
Food and beverage manufacturers																	
Danone	73.9	75.0	82.4	76.7	67.1	50.0	75.0	603	B	60.0	9.6	85.9	78.1				
Unilever	73.1	86.7	86.8	79.4	62.1	26.7	50.0	780	C	19.5	46.9	83.0	72.1				
Coca-Cola	68.7	93.3	84.6	52.9	58.3	25.0	93.8	238	B	52.1	45.4	63.0	83.6				
Nestlé	66.4	93.3	89.5	53.3	56.3	10.0	43.8	2095	D	19.4	53.6	81.6	89.2				
Mondelēz	58.5	60.0	71.1	38.2	68.3	10.0	50.0	640	E	6.4	81.7	92.7	99.8				
PepsiCo	53.8	86.7	81.6	32.4	44.2	0.0	18.8	1188	C	29.9	45.7	80.0	92.7				
Fleury Michon	49.7	86.7	68.4	60.0	8.3	33.3	87.5	395	C	41.0	11.4	99.0	72.2				
Kellogg's	47.6	48.3	60.5	33.3	50.0	8.3	50.0	516	D	9.9	61.6	99.0	99.2				
Bel	45.2	93.3	52.6	11.8	50.0	10.0	43.8	682	C	45.3	43.1	7.5	95.2				
Eckes-Granini	43.9	63.3	69.2	36.7	20.8	20.0	43.8	235	B	95.3	4.7	4.7	100.0				
Bonduelle	43.6	78.3	55.9	76.7	0.0	16.7	56.3	415	A	90.6	0.5	31.8	7.5				
Savencia	39.3	63.3	68.4	41.2	6.3	10.0	37.5	1059	D	5.3	83.1	40.5	98.8				
Orangina Suntory	34.2	86.7	46.2	11.8	25.4	-10.0	43.8	331	D	13.3	82.8	91.2	96.4				
Ferrero	30.7	56.7	21.1	14.7	40.0	0.0	75.0	165	E	0.6	97.6	100.0	100.0				
Barilla	30.5	53.3	28.9	17.6	31.3	8.3	62.5	334	B	57.5	23.4	42.8	54.2				
Andros	28.0	31.7	30.8	36.7	22.5	5.0	25.0	739	C	44.52	33.42	40.32	96.08				

Fruité Entreprises	24.1	60.0	26.9	0.0	27.1	12.0	25.0	266	C	47.8	47.0	65.0	98.9				
Panzani	10.4	36.7	0.0	26.7	0.0	8.3	18.8	546	B	68.2	12.3	44.1	33.9				
William Saurin	5.8	0.0	10.5	13.3	0.0	0.0	0.0	87	B	81.6	11.5	98.9	16.1				
Lactalis	2.1	0.0	0.0	5.9	0.0	0.0	18.8	772	D	22.8	64.6	5.4	93.1				
Median (Min – Max)	**44 (2-74)**	**63 (0-93)**	**58 (0-89)**	**35 (0-79)**	**29 (0-68)**	**10 (-10-50)**	**44 (0-94)**	**531 (87-2095)**	**C (A-E)**	**43 (1-95)**	**46 (0-98)**	**73 (5-100)**	**93 (7-100)**				
Supermarkets																	
Lidl	20.3	76.7	39.5	10.0	0.0	0.0	25.0	4683	D	26.3	51.7	63.7	81.9	5.3	60.8	0.0	28.7
Intermarché	17.8	48.3	18.4	47.5	0.0	0.0	25.0	512	C	47.7	35.2	52.9	72.7	5.2	53.9	9.1	69.2
E. Leclerc	13.0	33.3	5.3	47.5	0.0	0.0	25.0	2322	C	40.2	39.8	58.8	72.9	4.9	52.1	8.6	66.8
Carrefour	11.6	16.7	7.9	30.0	0.0	6.3	43.8	1842	C	41.2	41.4	64.3	72.0	7.0	49.3	7.9	72.5
Auchan	10.8	33.3	2.6	30.0	0.0	2.1	37.5	4417	C	37.5	43.7	61.5	71.4	3.2	52.7	2.6	72.7
Super U	6.8	0.0	10.5	27.5	0.0	0.0	0.0	1879	C	45.5	38.4	60.2	66.0	5.7	49.4	0.2	37.8
Median (Min – Max)	**12 (7-20)**	**33 (0-77)**	**9 (3-39)**	**30 (10-48)**	**0 (0-0)**	**0 (0-6)**	**25 (0-44)**	**2101 (512-4683)**	**C (C-D)**	**41 (26-48)**	**41 (35-52)**	**61 (53-64)**	**72 (66-82)**	**10 (4-18)**	**52 (43-62)**	**5 (0-9)**	**68 (29-73)**
Quick-service restaurants																	
McDonald's	39.0	66.7	42.5	72.7	26.9	13.9	25.0	111.0	C	27.1	46.7		84.3				
Quick [1]	13.8	0.0	15.0	47.3	0.0	5.6	37.5	/	/	/	/		/				
KFC	11.8	36.7	10.0	18.2	0.0	8.3	25.0	98.0	C	28.7	41.5		73.9				
Burger King	11.0	0.0	0.0	18.2	30.8	0.0	12.5	69.0	D	13.2	50.9		84.1				
Paul	6.7	0.0	2.6	36.4	0.0	0.0	12.5	80.0	C/D	23.1	50.0		93.7				
Domino's Pizza	5.5	0.0	0.0	36.4	0.0	0.0	0.0	243.0	C	12.6	40.0		85.8				
Brioche Dorée [1]	5.0	16.7	5.3	13.6	0.0	0.0	0.0	/	/	/	/		/				
Median (Min – Max)	**11 (5-39)**	**0 (0-67)**	**5 (0-43)**	**36 (14-73)**	**0 (0-31)**	**0 (0-14)**	**13 (0-38)**	**98 (69-243)**	**C (C-D)**	**23 (13-29)**	**47 (40-51)**		**84 (74-94)**				
Overall median across industries (Min – Max)	**28 (2-74)**	**53 (0-93)**	**29 (0-89)**	**33 (0-79)**	**8 (0-68)**	**6 (-10-50)**	**38 (0-94)**	**516 (69-4683)**	**C (A-E)**	**38 (1-95)**	**44 (0-98)**	**63 (5-100)**	**84 (7-100)**				

1. *On the website of Brioche Dorée and Quick no nutritional information was available per 100g and portion sizes were not defined. As a result the product portfolios of Brioche Dorée and Quick could not be analysed. This is indicated in the table with a '/'.*

6.5 Discussion

This study quantitatively assessed for the first time the commitments and practices related to obesity prevention and population nutrition of the major food companies in France. The findings showed a large variation between companies based on the overall scores for the transparency, comprehensiveness and specificity of commitments as well as the performance indicators. Overall BIA-Obesity scores ranged from 2% to 74% (median: 28%). The median overall score was 11% for quick-service restaurants, 12% for supermarkets and 44% for packaged food and non-alcoholic beverage manufacturers. The best performing domain was 'Corporate strategy' while the worst performing domain was 'Product accessibility'. The performance indicators indicated that the majority of portfolios consisted of ultra-processed foods (63%) and products not-permitted to be marketed to children according to WHO (84%). Only a limited proportion of the promotions in supermarket flyers was for fresh fruits and vegetables while more than half of the promotions were for ultra-processed foods. Performance metrics relating to food formulation and marketing were not associated with the overall BIA-Obesity score on commitments.

The overall BIA-Obesity scores in France were lower than the scores obtained in previous studies in Australia, New Zealand and Belgium, but higher than the scores in Malaysia. This observation matches the response rates which were higher than in Malaysia, but lower than in the other countries where companies had the opportunity to complete and verify the data (51,53,54,182). BIA-scores and response rates are presented in Annex 10. As previous research has shown that the BIA-Obesity scores significantly increase for companies that engage with the process (53,54,182), the lower response rate in France might be able to explain the lower BIA-Obesity scores. Since this is the first assessment in France, it is anticipated that more companies will engage with future assessments. In France it was also observed that quick-service restaurants and supermarkets scored notably lower than packaged food and non-alcoholic beverage manufacturers. This difference might, in part, be attributable to the fact that among the latter some companies verified and completed the data while for all quick-service restaurants and supermarkets the assessment was based solely on publicly available data as the companies within these industries could not be reached, declined participation or did not provide feedback in time (indicated in Figure 10). However, BIA-Obesity scores in Australia and Malaysia followed a similar trend (51,54), suggesting that the observed difference between food industries might not solely be attributable to the difference in response rates. As both quick-service restaurants and supermarkets are in direct contact with consumers, the domain 'Product accessibility' has a higher weighting (weighting of 20%) than it has among packaged food and non-alcoholic beverage manufacturers (weighting of 5%; Annex 7) (135). Potentially not by coincidence, this domain was also observed as the worst performing BIA-Obesity

domain. Consequently, this difference in weighting might also contribute to the lower overall BIA-Obesity scores of quick-service restaurants and supermarkets.

Across all abovementioned countries, 'Corporate strategy' was the best performing BIA-Obesity domain and 'Product accessibility' the worst (51,53,54,182), findings similar to what was observed at global level by the 'Access To Nutrition Index' (ATNI) in 2018 and 2021 (174,175). The ATNI benchmarks food company commitments and practices in a similar way to the BIA-Obesity, but does this at global level for only food and beverage manufacturers. As it is a global assessment, the ATNI looks at both over- and undernutrition, something that is not the case for BIA-Obesity (135,137,138). France however scored notably lower in the domain 'Product and brand promotion' compared to other countries. Most likely this can be attributed to the lack of a (voluntary) code to restrict marketing to children in France, something that is in place in Belgium, New Zealand and Australia (191,201,202).

Similar across all studies and countries however, company commitments fell short of recommended best practices. To improve commitments companies should use an official nutrient profiling system (such as the Nutri-Score) to guide reformulation of products and ensure time-bound reduction of nutrients of concern such as salt, sugar, trans fat, saturated fat and the energy content. Furthermore, it is recommended for companies to limit marketing to all children below the age of 18 to products that meet the WHO-model nutrition criteria. Specifically for packaged food and beverage manufacturers it is advised to limit the use of nutrition and health claims to products that are healthy according to an official nutrient profiling system such as the Nutri-Score. For quick-service restaurants it would be desirable to make nutritional information available on menus. Preferably, quick-service restaurants would also commit to not open new outlets within walking distance of schools. Finally, French supermarkets need to step up their commitments in the areas of 'Product and brand promotion' and 'Product accessibility' as none of the selected supermarkets made commitments to limit marketing to children, to limit the in-store promotion of less healthy products or to increase the accessibility of healthier products compared to less healthy alternatives. Underlying the importance of strengthening the commitments lies the assumption that stronger commitments will translate into improved practices and performance. Similar to earlier research however, this study found no relationship between voluntary commitments and healthier product portfolios (56,196). More importantly, earlier research pointed towards the importance of being cautious with voluntary company commitments as these might help to legitimize and advertise the food industry's role in improving population health without any assurance that company practices go beyond business as usual (105,106). Providing the food industry with an official communication platform through public-private partnerships might even undermine public health policies. For example, such platforms can provide companies with the opportunity to influence the public discourse regarding health (e.g. focus on individual responsibility and freedom of choice (206)) and

frame public health problems and potential solutions (105,107). Consequently, it is important to monitor the relationship between company commitments and practices, and ensure that appropriate performance metrics are used to assess how company commitments translate into practice. Government regulation remains primordial to ensure better company practices and healthier food environments (108).

When comparing performance indicators across Belgium and France it was observed that overall median product portfolios have a higher proportion of products with Nutri-Score A and B (182). This could potentially be explained by the fact that the Nutri-Score became the government endorsed FOP labelling system in France in 2017 (199) while it was only introduced in Belgium in 2019 (103,189). Also the proportion of product portfolios consisting of ultra-processed products was slightly lower in France (63%) than what was observed in Belgium (75%) (182). This observation is in line with previous research that found a significant higher household availability of ultra-processed food products in Belgium than in France (27). Nonetheless, such numbers are of concern as a recent study in France found a probable association between the consumption of ultra-processed foods and a higher mortality risk (32). This association is however merely part of the growing body of literature highlighting the risks of ultra-processed food consumption (27–29). Eventually, the proportion of products permitted to be marketed to children was similar across these neighbouring countries, standing at 16% in France and 19% in Belgium (182). These findings are also similar to those of ATNI in 2018 and 2021 that found that only 14% and 9%, respectively, of product portfolios of the major multinational companies consisted of products permitted to be marketed to children according to WHO (174,175). The lower percentage in 2021 might be because the latest ATNI study used the regional WHO nutrient profile models instead of the European WHO-Model that was used in the 2018 ATNI and the abovementioned BIA-Obesity studies (174,175,182).

An important strength of this study is that it allows for a first intra-European country comparison of BIA-Obesity data in regards of both commitments and performance. Nonetheless, towards the future a more in-depth analysis comparing BIA-Obesity data across a wider range of European countries would be recommended, especially including countries from different European regions. An important limitation of this French BIA-Obesity study is the low response rate of company representatives (39%). As less than half of the companies verified and completed the publicly available data it might be that in reality the BIA-Obesity scores are higher than what was observed in the study. Even so, it is expected that response rates will increase during future iterations. Concerning the performance data, Open Food Facts data had to be used. Consequently, it cannot be guaranteed that all products present on the market in 2018 were included in the study. Moreover, some level of data duplication might be possible. Even though it was ensured that each barcode appeared only once in the database, products that changed

barcode throughout the year or had wrong barcodes assigned within the Open Food Facts database might be accounted for multiple times. Another limitation is the fact that performance indicators were not able to capture changes overtime in the healthiness of product portfolios of selected companies potentially resulting from the commitments in place. To overcome this limitation, it is recommended for following studies to assess the associations between commitments in place and the changes of performance indicators over time. Within the current iteration of the BIA-Obesity the proportion of products within company portfolios (not-)permitted to be marketed to children according to the WHO-model was assessed. However, such performance metric does not capture to what extent such not-permitted products are in practice marketed to children across various media and settings by food companies. Consequently, it is recommended for future iterations to assess the extent and nature of not-permitted food and beverage advertisements targeted to children in (non-)broadcast media. Eventually, due to data availability and time constraints, this study did not capture practices related to corporate political activities (such as lobbying or research funding) that may affect food policies. Including performance data on such practices might however be able to partially explain why no association can be found between commitments and practices.

In conclusion, although French food companies have taken a few steps as part of a societal response to unhealthy diets and obesity, there is a much greater role for them to play. The overall and domain-specific BIA-Obesity scores showed that there is a lot of room for food companies across all four industries to improve the comprehensiveness, specificity and transparency of their nutrition-related commitments, as well as their practices related to population nutrition, in particular 'Product reformulation' and 'Product and brand promotion'. The next iterations of the BIA-Obesity should include a wider list of performance metrics of companies in relation to product formulation, labelling, promotion and accessibility. In view of these results, it is clear that stronger government regulations on food environments will be essential to achieve the goals of the World Health Organization action plan on chronic diseases as well as the Sustainable Development Goals.

Chapter VII Discussion, recommendations and general conclusion

"What we know is a drop, what we don't know is an ocean."

- Isaac Newton

The overall purpose of this thesis was to increase our drops of knowledge on how packaged food and non-alcoholic beverage manufacturers, quick-service restaurants and supermarkets influence the healthiness of European food environments. To do so the food industry was assessed from an economic perspective as well as a public health perspective. The market structure of the food industry across Europe was evaluated, the food environment related commitments collected and scored and the translation of commitments into practices assessed to eventually highlight areas where national and European policies could be implemented to benefit the healthiness of food environments.

It was observed that major packaged food and non-alcoholic beverage manufacturers were similar across Europe with moderately to highly concentrated product markets (*Chapter II*). This level of concentration might be of concern as market concentration significantly predicted the proportion of sales attributed to ultra-processed packaged food products according to the NOVA-classification (*Chapter IV*). The biggest companies among supermarkets and quick-service restaurants on average held one fourth of the market share per country, but both showed a higher level of market diversity compared to packaged food and non-alcoholic beverage manufacturers. Supermarkets displayed a remarkably higher level of diversity across Europe, but a notably lower level of diversity at national level. Among quick-service restaurants the biggest (multinational) players were similar across Europe, but there was a remarkably higher number of companies unique for one country, indicating a higher in-country diversity than what was observed among the other food industries (*Chapter II)*.

Publicly available food environment related commitments of the major food companies at European level fell short of best practice recommendations. Nonetheless, the lion's share of company sales were for ultra-processed product categories and product categories not-permitted to be marketed to children according to WHO (*Chapter III)*. The national-level case-studies in Belgium and France had companies verify and complete the publicly available food environment related commitments and collected additional performance data across domains such as 'Product formulation', 'Nutrition labelling', 'Product and brand promotion' and 'Product accessibility'. Across both countries the performance indicators exposed predominantly unhealthy practices. No significant correlations were observed between the strength of the food environment related commitments in place and the associated performance indicators (*Chapter V and Chapter VI*).

7.1. Main findings and interpretation

- **BIA-Obesity companies, commitments and practices**

When comparing the companies selected across Europe, Belgium and France to be included in the BIA-Obesity studies, it was observed that several (multinational) companies were included in all three studies. An overview of the different companies included per food industry and BIA-Obesity study, with an indication of companies that were included only once, can be found in Annex 11. Several of the included packaged food and non-alcoholic beverage manufacturers (e.g. among others, Nestlé, Unilever, Friesland Campina, Danone, PepsiCo, Kellogg's, Ferrero and Coca-Cola) were also part of the global ATNI (which solely assess commitments and practices of packaged food and non-alcoholic beverage manufacturers) (137,174,175). In Europe, Belgium and France McDonalds had the most comprehensive, specific and transparent commitments among quick-service restaurants. Different supermarkets were included in the three studies so also different best performing supermarkets were identified (Tesco at European level, Delhaize in Belgium and Lidl in France). Danone had the most comprehensiveness, specific and transparent commitments among packaged food and beverage manufacturers in Europe, Belgium and France. Although Danone was the best performing company according to the global ATNI in 2013, this was no longer the case according to the global ATNI in 2016, 2018 and 2019 (172–175). From 2018 onwards it was Nestlé who obtained the highest ATNI ranking, a company that was also among the highest scoring companies in our BIA-Obesity studies, while Danone moved down to the fourth place (174,175). The main reason for Danone dropping in the overall rankings in 2016 was because the company's nutrition targets were not yet available at time of publication (173). The difference between the ATNI and our results might also be caused by the ATNI taking into account additional commitments concerning undernutrition and breast-milk substitutes when formulating the global ranking (137). For this same reason no more in-depth comparison between the BIA-Obesity rankings in Europe, Belgium and France and the global ATNI was conducted.

Similar to previous studies, the Belgian and French BIA-Obesity case-studies showed that BIA-Obesity scores significantly increased for companies that engaged with the process and verified and completed the publicly available data (51,53,54). Comparing the overall BIA-Obesity scores across countries it was observed that French companies scored slightly lower than selected companies in Australia, New Zealand and Belgium (Annex 10). This lower overall score is mainly caused by the lower median score obtained by French supermarkets (12%), compared to supermarkets in Belgium (median: 46%), New Zealand (median: 44%) and Australia (median: 26%) (53,54). This can potentially be explained by the fact that in France none of the selected supermarkets verified and completed the publicly available commitments, while in all other countries at least one supermarket did and in Belgium all supermarkets did. Overall BIA-Obesity scores at European level were lower than what was observed at national level

in abovementioned countries. This is most likely due to the fact that companies at European level were not provided with the opportunity to verify and complete the publicly available commitments. In addition, in particular supermarkets seemed to mainly operate at national level, translating into limited publicly available data at a European level.

When evaluating domain specific BIA-Obesity scores obtained in Europe, Belgium and France and comparing them with scores obtained outside of a European setting, it was observed that across all regions and countries 'Corporate strategy' was the best performing BIA-Obesity domain and 'Product accessibility' the worst (51,53,54,139). These findings are in line with the results of the latest global ATNI which identified the domain 'Governance' as the highest scoring category and 'Accessibility' the lowest (174,175). The fact that the 'Corporate strategy' domain scores the best accentuates that companies like to profile themselves as part of the solution to increasing the healthiness of food environments and reducing overweight, obesity and NCDs (24,76,167). The low scores within the 'Product accessibility' domain potentially reflect the challenges of making such commitments due to the vast number of stakeholders along the food supply chain involved in determining product pricing and availability (53,207). Another explanation could be that food companies are less eager to make commitments that link the healthiness of products to their pricing and accessibility as turning such commitments into practice might reduce company revenues (24,37). For most BIA-Obesity domains the scores obtained in Belgium and France were somewhat comparable to those obtained in Australia and New Zealand (53,54). Unexpectedly, the domain 'Product and brand promotion' scored notably lower in France (median: 8%) compared to New Zealand (median: 35%), Australia and Belgium (median: 36% in both countries). The most likely explanation for this is the fact that all countries apart from France had some kind of voluntary 'responsible' marketing code in place to which companies could sign up (e.g. the 'Belgian Pledge' in Belgium (191), the 'Children and Young People's Advertising Code' in New Zealand (202) and the voluntary 'Responsible Children's Marketing Initiative' developed by the Australian Food and Grocery Council (201)) (53,54). Within the domain 'Nutrition labelling' both Belgian and French companies had a lower median score (32% and 33%, respectively) compared to Australia and New Zealand (54% and 47%, respectively). This might be caused by the earlier introduction of the voluntary FOP labelling system in Australia and New Zealand, the Health Star Rating, which was introduced in 2014 (208) while the government endorsed Nutri-Score was only introduced in France in 2017 (199) and in Belgium in 2019 (103,189).

Regardless, all companies across above-mentioned countries fell short of recommended best practices across the BIA-Obesity policy domains. While several companies had commitments in place to reduce nutrients of concern, they often reported to use internally developed reformulation targets or product classification systems instead of officially recognised nutrient profiling systems such as the Nutri-Score.

Furthermore, most companies made commitments to limit marketing to children through industry-wide initiatives such as the 'Belgian Pledge' (191) or the 'EU Pledge' (69) in addition to company specific commitments. Both initiatives have as goal to protect children against marketing of less healthy products across broadcast and non-broadcast media where at least 35% of the audience is under 12-years of age. Underlying both pledges are the same nutrition criteria (170). These criteria have however been scrutinized for not providing effective protecting against unhealthy food marketing (79,86). Finally, a very limited number of companies had commitments in place to link the use of nutrition- and health claims to the healthiness of products (publicly available for Unilever) (209,210), but the underlying system often remained unclear and did not consist of an officially recognised product classification or nutrient profiling system.

Across all selected supermarkets, two Belgian supermarkets (Delhaize and Bio-Planet from Colruyt) made a commitment to use shelf-tags to provide in-store summary nutrition information. Recent research in one of these Belgian supermarkets however showed that the use of shelf-tags in itself is unlikely to change consumer behaviour (211). None of the selected supermarkets made clear commitments to limit the in-store promotion of unhealthy products, limit the placement of unhealthy products at high-traffic areas or assign a minimum amount of floor/shelf space to healthy products. Finally, among the selected quick-service restaurants, some French companies stated to disclose nutrition information on their menus. Since the completion of the data collection in France as part of this thesis, several French quick-service restaurants committed to display the Nutri-Score online and in-store for products within their permanent product range (212,213). In both Belgium and France some quick-service restaurants provided in-store nutrition information (on in-store ordering machines or on the wrapping in which the food is served). None of the companies committed to not open new outlets in the vicinity of schools, notwithstanding that such commitments could have an important impact based on the findings of a recent study in Belgium that found an association between the density of quick-service restaurant outlets around primary schools and the weight status of children below the age of 12 (214).

Although voluntary commitments have shown to be widely ineffective and fall short of recommended best practices (178,215), it becomes apparent from the above that they help to create a certain credibility of the food industry in the area of nutrition, health and wellbeing. However, due to the limited accountability of the commitments in place, it is important to look beyond industry and company commitment towards the performance of these same companies. Across Europe it was estimated that the sales of major packaged food and beverage companies consisted mainly of ultra-processed product categories (median: 82%). This is very much of a concern in light of the increasing number of studies showing an association between the consumption of ultra-processed products and overweight (27–29). In particular an inpatient study conducted by Hall *et al.*, which compared the effects of unprocessed and

ultra-processed diets among 20 weight-stable individuals, was able to accentuate the weight increase due to the consumption of the ultra-processed foods (28). Specifically for Europe, earlier research from Monteiro *et al.* showed that an increased household availability of ultra-processed foods resulted into an increased prevalence of obesity across 19 European countries (27). The national case-studies with detailed nutritional data in turn provided the opportunity to obtain a more in-depth insight in the healthiness of company product portfolios as well as assess other company practices. In France the median product portfolio of selected companies consisted for 63% (range: 5-100%) of ultra-processed products while in Belgium this was 75% (range: 2-100%). This result is in line with the European study of Monteiro *et al.*, that was introduced above, that found a notably higher household availability of ultra-processed foods in Belgium compared to France (45% compared to 14%, respectively) (27).

At European level 58% of company sales were for product categories entirely not-permitted to be marketed to children in 2018. With the availability of detailed nutritional data allowing for the complete application of the WHO-model, this increased up to 81% and 84% of products within the product portfolio of major companies in Belgium and France, respectively. This result is consistent with what was observed by the ATNI in 2018 when the WHO-model was applied to the product portfolios of selected companies and found that 86% of products did not meet the nutritional targets to be marketed to children (174). In 2021 the ATNI found that this had increased up to 91% (175). Among the selected companies, some product portfolios consisted for 100% of products not-permitted to be marketed to children. For example, according to both the Belgian and French case-studies as well the ATNI in 2018 and 2021, the product portfolio of Ferrero consisted for 100% of products that did not meet the nutritional criteria to be marketed to children (174,175). This leads to the highly controversial, yet important question if such companies should be permitted to advertise their products at all across broadcast and non-broadcast media and in places where children could be present. Especially as emerging evidence is showing that exposure to food marketing not merely influences children's attitudes and beliefs towards foods, but also their food consumption and food-related health outcomes (216).

Eventually the healthiness of company product portfolios was assessed by applying the Nutri-Score. Median product portfolio's in Belgium and France consisted for 29% and 38% of products with Nutri-Score A or B, respectively, and as such could be classified as healthy. This difference, in a similar manner as stated above in regards to the BIA-Obesity score for the domain 'Nutrition labelling', might be attributable to the earlier introduction of the Nutri-Score in France compared to Belgium (103,189,199). The Nutri-Score was implemented with the goal to, among others, incentivise food and beverage manufacturers to reformulate products within their product portfolio (199,217). Consequently, food companies in France potentially already had a little more time to improve the composition of

products within their product portfolio to obtain a better Nutri-Score. Median portfolios in turn consisted for 48% (Belgium) and 44% (France) of unhealthy products with a Nutri-Score D or E. Although the ATNI in 2018 and 2021 used the Health Star Rating instead of the Nutri-Score to determine if products can be classified as healthy, they found that overall around 30% of products could be classified as healthy, matching our findings from above (174,175). It is however important to be cautious with such comparison as research has shown that food products may be ranked as healthy by one scheme, and unhealthy by another. The Nutri-Score and Health Star Rating especially showed discrepancies between their rating for product categories such as cheese and cooking oils (218).

Looking at the promotions in supermarket flyers it was observed that in both Belgium and France 52% of promotions were for ultra-processed foods. Even so, in Belgium 10% of promotions were for fresh fruits and vegetables while this was only 5% in France. This difference is hard to explain, but may be partially due to the stronger efforts of supermarkets in Belgium to promote health and wellbeing, compared to France. This is reflected in the median overall BIA-Obesity scores of supermarkets in Belgium (46%) compared to France (12%). Although, as highlighted above, the difference in scoring is likely made more severe by the fact that in France no supermarkets verified and completed the publicly available data, it is too large a difference to remain unnoticed.

Without verification and completion of the publicly available food environment related commitments and short of nutritional data at European level, the European data lacked the strength to calculate statistical associations between commitments and practices. Nonetheless, visually assessing the data and placing the BIA-Obesity scores for commitments next to the performance estimation metrics, no relation between commitments and performance was observed. At national level the commitments were verified and completed by company representatives and branded food composition data were available. Consequently, data allowed to accurately calculate correlations between food environment related commitments and performance indicators within the BIA-Obesity domains 'Product formulation' and 'Product and brand promotion'. Within the domain 'Product formulation' correlations were calculated between commitment and the proportion of products with Nutri-Score A and B, products with Nutri-Score D and E, the median Nutri-Score of the portfolio and the proportion of ultra-processed products. Although some companies made a few strong commitments in regards to product (re)formulation and others scored well according to the performance indicators, no associations were observed between the specificity, transparency and comprehensiveness of the commitments and the healthiness of the product portfolios (as assessed by the abovementioned performance indicators). Commitments within the domain 'Product and brand promotion' were in turn correlated with the proportion of products not-permitted to be marketed to children according to WHO. Notwithstanding that several companies had some commitments in place to reduce marketing to children and others

only had a limited number of products not-permitted to be marketed to children within their product portfolio, also here no association was observed between the specificity, transparency and comprehensiveness of the commitments and the proportion of product portfolios inadequate to be marketed to children. This may be because the imperfect performance metrics were not capable of capturing changes of product portfolios over time, but then again it can be assumed that companies with strong commitments have already undertaken greater efforts in the past to improve the healthiness of product portfolios. Another, more debateable, interpretation is that the food environment related commitments rather aim to answer to concerned consumers and market the 'goodwill' of companies than truly improve healthiness and wellbeing. As argued by Douglas *et al.*, the "industry is not a disinterested partner in public health" (105). As a matter of fact, there is a lot at stake for them, but their goal of maximising profits and the means necessary to do so, in several cases completely oppose the aim of public health policies.

- **European market environment**

All abovementioned companies with their commitments and practices are actors within the global and European economic playing field. An environment in which markets are moderately to highly concentrated with a varying level of diversity across European countries. Among packaged food manufacturers it was observed that a European country on average counted 14 (range: 7-20) companies with ≥1% market share and five companies (range: 0-10) uniquely present in only one European single market member state. This was similar to what was observed for non-alcoholic beverage manufacturers, which counted 13 (range: 9-20) companies with ≥1% market share and four unique companies (range: 0-11). The main difference between both industries was the level of market concentration, with non-alcoholic beverage product markets being highly concentrated and the major company holding a higher proportion of the total market share (on average 21% among the non-alcoholic beverage product markets compared to 7% among the packaged food product markets). This level of market concentration and dominant presence of leading non-alcoholic beverage manufacturers has led to an illusion of choice among beverages. While it often seems as if there is an abundance of different brands present on supermarket shelves, most brands can be traced back to only a limited number of companies leaving consumers with the mere choice of buying from a specific company or not buying such a product at all (219). This serves as an example of how, without of us being duly aware of it, a lot of power along the food chain can be attributed to only a few players.

The observed levels of market concentration and diversity combined with the reasonably established relation between market concentration and market power (30,60–63), gave rise to the question of how market concentration might affect European food environments. At first the purpose was to assess the relationship of market concentration and diversity with companies' food environment related

commitments and practices. However, as the above-mentioned BIA-Obesity studies found no relationship between the commitments of companies and their respective practices, this thesis instead assessed the direct relationship between European market concentration and the healthiness of food and beverage sales. Using simple and multiple linear regression models it was established that market concentration significantly predicted the proportion of sales classified as ultra-processed packaged food products according to the NOVA-classification. This finding is in line with the earlier work of Baker *et al.* that found that market concentration across Asia, as part of a broader spectrum of market forces, was a significant though variable driver of the nutrition transition and thus the increased sales of ultra-processed products (184). In contrast, increased market diversity was associated with reduced sales of ultra-processed packaged food products. No regression models could be applied for non-alcoholic beverages, but in light of the found relationship between market concentration and sales of ultra-processed packaged food products, it may be acceptable to assume that the high levels of market concentration and high sales of ultra-processed non-alcoholic beverage product categories have something to do with one another.

For both the packaged food and non-alcoholic beverage industries the same major companies were identified across the European single market with similar most sold product categories, namely 'Baked goods', 'Dairy', 'Processed meat and seafood' and 'Confectionery' and 'Carbonates', 'Juices' and 'Energy drinks' contributing to 67% and 85% of packaged food and non-alcoholic beverage sales, respectively. These observations, combined with aforementioned low level of European market diversity, suggest that the European packaged food and non-alcoholic beverage markets may be approached as a homogenous area from a public health point of view. Such an approach would undeniably support the implementation of food environment related policies at a European level, although it does not take into account the fact that national governments generally prefer to keep health-related policies at national level (110). It would however facilitate the implementation of nutrition policies from an industry point of view as they would not have to abide to different regulations across European countries. Moreover, implementing such regulations at European level could ease the administrative burden accompanying policy development and implementation. Examples of successful European-wide nutrition policies, showing that such an approach is possible, are the recently implemented legal upper limit for trans fats (115) and the obligatory on-pack nutritional information and ingredient list (116).

In contrast to the packaged food and non-alcoholic beverage industries, supermarkets and quick-service restaurants showed a different picture in relation to market concentration and diversity. While supermarkets showed to be highly concentrated at national level, there were no supermarkets identified that were active across all European countries. What is more, according to the own-brand packaged food and beverage sales data, the role of supermarkets as producers of own-brand food products might

also be rather different across European countries. Contrary to supermarkets, the same major quick-service restaurants were present across Europe and held a noteworthy part of the market share within European countries, but a strikingly high number of companies with ≥1% market share (average: 20; range: 11-27) and unique companies (average: 11; range: 5-19) were identified, indicating an important in-country diversity. Because of these considerable differences across European supermarket and quick-service restaurant industries, it would most likely be wise to approach these industries as heterogeneous across Europe from a public health point of view. This approach then translates into a recommendation to implement potential nutrition policies at country level after further research into the practices already in place to improve food environments at national level.

7.2. Strengths and limitations

This thesis has several strengths. First off, this work was the first to implement the BIA-Obesity tool and process in a European setting. Moreover, it was the first to implement phase two of the BIA-Obesity tool and process, assessing company practices, alongside phase one which solely assesses the food environment related commitments. What is more, this thesis looked beyond company commitments and practices and took into account the European economic environment, assessing the market structure and level of diversity of the food industry (i.e. packaged food and non-alcoholic beverage manufacturers, quick-service restaurants and supermarkets). Although several studies have referred to a link between the healthiness of sales and market concentration as a measure of market structure (30,62,130,184), this study was the first to statistically confirm such relationship using simple and multiple regression models. Eventually this thesis was the first to question at what level nutrition policy implementation might be most efficient based on the European food industry market structures and diversity.

Regardless of aforementioned strengths and insights, this thesis has a number of limitations. Starting off, the BIA-Obesity studies only included major companies based on their overall market share as well as their market share within specific product categories. Consequently, it cannot be guaranteed that obtained BIA-Obesity scores are representative for the commitments and practices of all companies across the complete European, Belgian or French market. Potentially the bigger companies have a team working fulltime on the company nutrition strategy and communication, something that may not be affordable for smaller companies. Therefore, it might be that by including smaller players, a different picture is obtained. However, in practice it might be a challenge to do so as implementing the BIA-Obesity tool and process is time consuming and burdensome for both the researchers and companies involved. Lastly, both the national-level case studies were conducted in West-European countries while the European mapping and BIA-Obesity studies showed that major differences exist across Europe, especially for supermarkets and quick-service restaurants. Accordingly, results of the BIA-Obesity in Eastern Europe might tell a different story as the one told here.

Continuing with the national case-studies, the products in the Belgian Nutritrack database and the French Open Food Facts data were manually classified using the FoodSwitch categorisation system. This was only done by one person, and although checks were put into place, some products may have been misclassified. As a consequence, products were possibly placed in the wrong WHO-model food category or NOVA-group leading to products being wrongly classified as (not-)permitted to be marketed to children or (non-)ultra-processed. Furthermore this classification formed the basis of calculating the Nutri-Score as it was used to allocate products in the correct groups to calculate the Nutri-Score (products without fruits and vegetables; products with ≤40% fruits and vegetables; products with >40% fruits and vegetables; products with >60% fruits and vegetables; products with >80% fruits and vegetables; cheeses; fats; beverages without fruit and beverages with fruit). As such, misclassifications may have caused a miscalculation of the Nutri-Score. However, these miscalculations are estimated to be highly limited as a very strong correlation was observed between the calculated Nutri-Score in France and the Nutri-Score displayed within the Open Food Facts database. It should also be noted that performance metrics were a snapshot in time and were not capable of capturing previously implemented changes in practices. It may be assumed that the changes in practices, such as the improvement in the healthiness of product portfolios, might correlate more closely with company food environment related commitments. Due to time-constraints and data availability, practices within the area of 'Relationships with other organisations' were not assessed within this thesis and practices in the domain of 'Product accessibility' and 'Product labelling' were merely touched upon in the Belgian case-study. Within the domain of 'Product and brand promotion' the performance indicators were limited to the proportion of product portfolios suitable to be marketed to children and failed to capture the amount of products actively being promoted to children via broadcast and non-broadcast media. Finally, the third phase of the BIA-Obesity tool and process, assessing companies' corporate political activity (48,135,138), could not be implemented within the timeframe of this thesis. Implementing this third phase might however be able to shed light on why no correlation was found between company commitments and practices.

Another source of uncertainty is the use of the Euromonitor data to identify companies and calculate market concentration. The Euromonitor database is built around brand ownership (at national and global level). Hence, companies operating independently according to Euromonitor may still sell brands from other companies through licensing agreements. As a consequence, the calculated level of market concentration might be an underestimation. Strengthening this potential underestimation is the fact that concentration was calculated at food category level as determined by Euromonitor's food categorization system. However, from a consumer point of view, not all products within a Euromonitor product category are interchangeable, a prerequisite for determining a relevant product market according to European competition law (150). Another condition to determine a relevant market is the geographical boundary. Within this thesis market concentration was calculated at national level due to

the data availability, but as stated by the European Commission, in reality further analysis is required to determine the relevant geographic market (which could be sub-national or comprise a broader area) (132,150). Although the latter might also lead to an underestimation of the true market concentration, the overall effect is estimated to be marginal. Eventually, to obtain a completer picture of market structure and market power, aspects such as mergers and acquisitions, barriers to entry, the degree of vertical integration and companies' income distribution should have been considered in addition to market concentration and diversity (30,59,62,64,130).

7.3. Recommendations towards the future

This thesis was merely a drop in the ocean of research necessary to expand our knowledge on how to improve the healthiness of food environments and thus reduce overweight and obesity. All I ask for is it to cause a ripple that, combined with past and future research, might one day turn into a wave of change. To strengthen policy responses, support future research and overcome before mentioned limitations, several recommendations can be formulated, both for the BIA-Obesity tool and process as well as in regards to market structure research in relation to health.

- **Policy recommendations**

"Appointing the fox to guard the hen house by delegating policy making and regulation to commercial interests represents a dereliction of government responsibility that will inevitably raise suspicions of undue influence."

- Mindell et al. 2012 (108)

Within this thesis food environments were approached from both an economic perspective as well as a public health point of view. Consequently, also recommended policy responses have been approached within this dual perspective. Based on the BIA-Obesity studies, areas could be identified where nutrition policies are necessary to strengthen food industry commitments and practices. Based on the studies regarding the European market structure and its relationship to the healthiness of packaged food and beverage sales, recommendations affecting the level of policy implementation could be formulated, as discussed above (in the section 'European market environment') as well as recommendations regarding the inclusion of health in antitrust and competition policy.

Building on aforementioned shortcomings in company commitments and practices, this thesis urges for government regulation in the areas of product formulation, product marketing, product labelling and product accessibility. An argument used against government-endorsed policies is often that food products are essential to life and as such should not be regulated in a similar manner to tobacco or alcohol (24). Yet, many foods currently on the market are no more essential to life than smoking or

drinking alcohol and as such could definitely be regulated more stringently. While government regulations are often seen as interfering with personal freedom and freedom of choice, such regulations may as well be seen as prioritizing the right to health and healthy food environments above the right to consume (206).

Based on the findings throughout this thesis, there would seem to be a need for the European Commission to develop European-wide guidelines to support member states in the development and implementation of policies that restrict marketing towards children below the age of 18 using a more stringent nutrient profiling model, such as the WHO-model (171). Furthermore, it urges the European Commission to push forward with the implementation of a nutrient profile model to link the healthiness of products to the use of nutrition and health claims, as suggested in the initial regulation and more recently within the 'Farm to Fork' strategy (113,117,118). This might be the British Food Standards Agency nutrient profiling system that is used to calculate the Nutri-Score (220) in case the Nutri-Score is rolled out as the (mandatory) European-wide FOP labelling system. Applying the Nutri-Score, it could for example be that only products with Nutri-Score A or B are eligible to carry nutrition and health claims. As one message became clear from all performance indicators, regardless of commitments to reformulate, overall product portfolios were unhealthy. As such, a last recommendation at European level would be to develop legal upper limits per product category for all nutrients of concern, such as done for trans fats (115).

Continuing at national level, fiscal policies linked to nutrient profiling systems could be introduced to make healthier foods relatively cheaper and unhealthy foods relatively more expensive, something that has recently become easier due to the updated European value-added tax rates to support, among others, public health (124). Strengthening this suggestion, research has shown that food taxes generally cause a reduction in the consumption of the taxed products (125). Moreover, research following the implementation of the United Kingdom soft drink levy in 2018 suggested that the tiered tax incentivised non-alcoholic beverage manufacturers to reduce sugar in their beverages (126). Although no changes were observed in the amount of soft drinks available to consumers or the amount of soft drinks consumed, a reduction in the sugar uptake at household level was observed. Such results indicate that the implementation of fiscal policies might benefit public health without negatively affecting the food industry (127). The design of fiscal policies however remains key to ensure the effectiveness and avoid consumers shifting to other products equally high in taxed ingredient (e.g. sugar, salt or saturated fat) (125). Other policies than fiscal policies could be implemented for quick-service restaurants, such as policies to ban the opening of new outlets within close proximity of schools and restrict take-away options within existing establishments. The importance of such policies was recently highlighted by a study in Belgium that found that in 2015-2016 on average for each quick-service restaurant outlet within

500m of the entrance of primary schools, the BMI of students aged between six and 12 years old increased with 0.059 kg/m² (214). For supermarkets the in-store food environment could be regulated to nudge people towards healthier options and the placement of unhealthy products at cash registers (to stimulate impulse buying) could be restricted, both policies that have proven to be effective in increasing healthy food purchases (221–223).

Eventually, in the light of the established relation between market concentration, market diversity and the healthiness of packaged food sales, similar to the earlier recommendation of Swinburn *et al.* (224), it is recommended to expand the concern for consumer welfare within antitrust and competition policy to more than (low) product pricing. This could be done by explicitly considering the potential impact on health via product variety and the nutritional composition of foods on the market.

- **Recommendations for future monitoring and research**

First off, it is recommended to solely apply the BIA-Obesity tool at national level and not at European level, especially for supermarkets as this study showed that they in general operate at country level and made very limited European-wide commitments. Adding on to this, the data available to assess performance at European level is currently highly limited, highlighting an area for future research to answer questions such as "To what extent are company product portfolios similar across Europe?" or "Do companies that perform well do so across all European countries or can significant regional differences be identified?". Continuing, it would be suggested to conduct a national BIA-Obesity study including smaller market players to assess potential differences in outcomes with BIA-Obesity studies that include only the major companies. It would also be beneficial to implement the BIA-Obesity study in a number of East European countries, as both case-studies included in this thesis were conducted in West European countries. To make the BIA-Obesity tool and process less time-consuming and facilitate its use as a regular monitoring tool it would be beneficial to transform the current tool into an interactive online platform. On such a platform companies could, per indicator, upload available commitments. The uploaded commitments would, after approval of the research team, translate into a publicly available improved company scoring. Although the baseline study to collect the company commitments would remain a long process, the following itineraries would be simplified as company representatives could upload new commitments to the online platform. An additional benefit of implementing such a platform would be that it allows for real-time inclusion of new company commitments and practices for companies who would be interested in uploading newly launched commitments onto the platform.

Building on the relation found between market concentration and diversity and the sales of ultra-processed packaged food products at European level, a similar study to this one should be carried out at national level using detailed nutritional information and the definition of a relevant market as

defined by the European Commission (150). Moreover, there is a need to further investigate such relationship for other product categories and food industries as well as with other factors that might affect the healthiness of product portfolios. In addition to assessing the relationship with market concentration, the current approach to market structures should be broadened to include information regarding barriers to entry and the degree of vertical integrations as to obtain a more complete picture of the effect of market power on population health (62,130). The adapted structure-conduct-performance model as described by Wood *et al.* (130) could provide a useful starting point to strengthen the incorporation of market- structure and power analysis into public health research. The model describes how market structure (*including market concentration, barriers to entry and the number of competing companies active in a given market*) interacts with companies' conduct (*i.e. companies' strategies and behaviour such as mergers and acquisitions, the ability to set prices and exploit their market power*) and performance (*i.e. the economic results of companies' conduct such as profitability and efficiency*) within the market environment and how these activities in turn influence the non-market environment through, for example, interactions with policymakers and government officials (58,130,225).

Due to time constraints this thesis was not able to implement the third phase of the BIA-Obesity, which assesses companies' corporate political activity as previously described by Mialon *et al.* (48) and touched upon within the introduction in light of the different forms of power. Earlier research however found that the food industry in several countries across the world has substantial political influence and affects public health policies in ways that favour food industry interests (226–230). Future research in this area is key in understanding how companies weaken and delay policies to create healthier food environments. Moreover, to some extent, it might be able to explain the link between market structures and the healthiness of food environments. Additional work that could be done in this same area, is a social discourse analysis taking into account the tactics of all health-harming industries instead of focussing on isolated factors that negatively affect the healthiness of (food) environments. Such an interdisciplinary approach could reinforce the position of public health stakeholders who in general work individually on different risk factors for NCDs (e.g. nutrition, alcohol or tobacco) while emerging evidence shows that several industry actors work across different health-harming industries to strengthen their policy responses (231).

In light of the Lancet report published in 2019 (224) and the 'EU Code of Conduct on Responsible Food Business and Marketing Practices' launched in 2021 (232), both emphasising the interconnectedness of obesity, undernutrition and climate change, it is recommended to develop a similar tool to the BIA-Obesity that assesses company commitments and performance in regards to sustainability that can be integrated or combined with the existing BIA-Obesity tool. A final recommendation towards future research is to develop and implement a similar tool to evaluate company commitments and practices

regarding infant formula and baby foods, something that was not part of this thesis, yet deserves significant attention due to the rapid growth of the baby food industry and the importance of improving health in the earliest stages of life (233). Despite existing regulation to reduce advertisement of inappropriate foods for infants and young children, the baby food industry has a key position within the scientific and medical field that provides them with the opportunity to portray themselves as experts on child-related topics and influence the public opinion (234). This was highlighted by the recent WHO reports that found that the advertisement of inappropriate foods for infants and young children is still ongoing in Europe despite the regulations in place (235,236).

"If we can eat in a way that works for our planet as well as our bodies, the natural balance of the planet's resources will be restored. The very nature that is disappearing holds the key to human and planetary survival. "

– Dr. Richard Horten (237)

7.4. Conclusion

Over the timespan of three years this thesis set out to increase the knowledge available regarding the impact of the food industry on European food environments through market structures, food companies' commitments and associated practices. Taken together, the five studies conducted as part of this thesis led to following overall conclusions:

- Taking into account European market structures might facilitate the implementation of nutrition policies. More specifically it was suggested that, for food industries such as packaged food and non-alcoholic beverage manufacturers that are relatively homogenous across Europe, it could be beneficial from both a public and a private point of view to implement nutrition policies at European level. To the contrary, for more heterogeneous markets, such as quick-service restaurants and supermarkets, it would most likely be beneficial to keep policy development and implementation at national level.

- Increased market concentration and reduced market diversity, as indicators of market structure, predicted increased sales of ultra-processed packaged food products across Europe.

- Companies among packaged food and non-alcoholic beverage manufacturers, supermarkets and quick-service restaurants made commitments to improve health and wellbeing across domains such as 'Product formulation', 'Nutrition labelling', 'Product and brand promotion' and 'Product accessibility', but they highly varied in transparency, specificity and comprehensiveness and did not meet recommended best practices. Especially an improvement of the commitments

to increase accessibility to healthier products and reduce accessibility to less healthy products are urgently needed.

- More comprehensive, specific and transparent commitments regarding 'Product formulation' and 'Product and brand promotion' did not translate into stronger performance according to performance indicators such as the percentage of product portfolios with Nutri-Score A or B, the proportion of ultra-processed products or the amount of products not-permitted to be marketed to children. The juxtaposition of these findings suggested an urgent need for government regulation to improve food industry efforts and ensure that commitments translate into healthier practices.

Overall, tackling wicked problems such as overweight and obesity through the improvement of food environments requires a transdisciplinary approach. Efforts across multiple policy domains by both private and public institutions are required. Despite food companies recognising their role in improving food environments, their practices are predominantly unhealthy and European and national government regulations are required to improve the healthiness of food environments.

SUMMARY

The main objective of this thesis was to analyse from an economic and a public health perspective how the food industry (packaged food and beverage manufacturers, quick-service restaurants and supermarkets) influences what foods we acquire, prepare and consume. This influence takes place each time that we interact with the physical, economic, political and socio-cultural aspects of the environment surrounding us, collectively called the food environments. Examples of such interactions are the advertisements on TV, the sweets at supermarket checkouts and the higher prices of healthier products compared to less healthy alternatives. Other activities take place behind closed doors. Think of lobbying, campaigns to influence the public opinion, mergers, acquisitions and how companies position themselves on the market. These are all activities which can provide companies with the ability to structure food environments to suit their own private interests.

Within the economic perspective, it was assessed how market concentration and diversity across Europe affects food environments. It was found that the major food and beverage manufacturers were similar across European countries with moderately to highly concentrated product markets. The latter may be of concern as this thesis found that market concentration significantly predicted an increase in the proportion of sales derived from (less healthy) ultra-processed foods. Based on the similarity of food and beverage manufacturers across Europe this thesis suggested that food and beverage markets may benefit from being approached as homogenous across Europe from a public health point of view. This would facilitate the implementation of nutrition policies for the industry and reduce the administrative burden accompanying policy development, implementation and monitoring. The picture observed for quick-service restaurants and supermarkets was different from the one for food and beverage manufacturers. Comparable to the latter, the biggest quick-service restaurants were similar across Europe, but there was a remarkably higher number of small companies at national level. In contrast, several different supermarkets were observed across Europe, but at country level only a limited number of different supermarkets could be identified. As such it is suggested to approach these industries as heterogeneous across Europe from a public health perspective. Consequently this thesis recommended to maintain the development and implementation of nutrition policies affecting quick-service restaurants and supermarkets at country level.

Within the public heath perspective, this thesis assessed the transparency, comprehensiveness and specificity of the food environment related commitments made by the food industry as well as some company practices and the relationship between commitments and practices. At European level it was found that publicly available food environment related commitments of major food companies fell short of recommended best practices. The lion's share of sales was for ultra-processed product categories and product categories not-permitted to be marketed to children. A similar pattern was observed within the

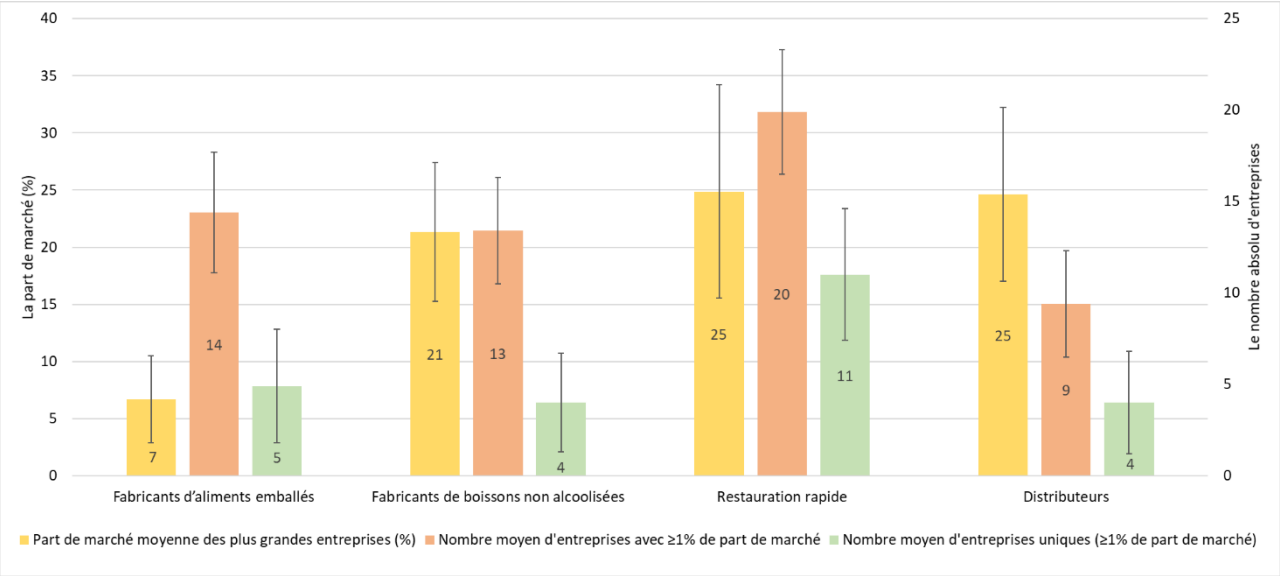
case-studies in Belgium and France where companies had the opportunity to verify and complete the publicly available commitments. The additionally collected performance data across domains such as 'Product formulation' and 'Product and brand promotion' documented largely unhealthy company practices. There was no indication of a relationship between the strength of companies' commitments and the healthiness of company practices according to the performance indicators.

All results indicated a need for European and national government regulation to guide, monitor and support food industry efforts to improve food environments.

RÉSUMÉ

L'objectif principal de cette thèse était d'analyser, d'un point de vue économique et de santé publique, comment l'industrie alimentaire (fabricants de boissons et d'aliments emballés, restauration rapide et supermarchés) influence les produits que nous acquérons, préparons et consommons. Cette influence s'exerce à chaque fois que nous interagissons avec les aspects physiques, économiques, politiques et socioculturels de l'environnement, appelés les environnements alimentaires. La publicité à la télévision, les sucreries aux caisses des supermarchés et les prix plus élevés des produits les plus sains comparés aux alternatives moins saines en sont des exemples. D'autres activités d'influence moins sur le devant de la scène existent. Pensez au lobbying, aux campagnes visant à influencer l'opinion publique, aux fusions/acquisitions et à la façon dont les entreprises se positionnent sur le marché. Toutes ces activités permettent aux entreprises de structurer les environnements alimentaires en fonction de leurs intérêts.

S'agissant de la perspective économique, il a été évalué comment la concentration et la diversité des marchés en Europe affectent les environnements alimentaires. Il a été constaté que les principaux fabricants d'aliments et de boissons étaient similaires dans les pays européens, avec des marchés de produits modérément voire fortement concentrés (Résumé figure 1). Cela peut être préoccupant car une concentration accrue et une diversité réduite du marché ont permis de prédire une augmentation des ventes de produits ultra transformés (moins sains). Compte tenu de la similarité des fabricants d'aliments et de boissons en Europe, il est suggéré que ces marchés pourraient bénéficier d'une politique de santé publique homogène au niveau de l'Europe. Cela faciliterait leur application pour l'industrie et réduirait la charge administrative accompagnant leur élaboration et leur application. Le constat est différent pour la restauration rapide et les supermarchés. Les plus grandes chaines de restauration rapide étaient similaires dans toute l'Europe, mais il existait un nombre remarquablement plus élevé de petites entreprises au niveau national. En revanche, plusieurs supermarchés différents ont été observés à travers l'Europe, mais au niveau national, seul un nombre limité de supermarchés différents a pu être identifié (Résumé figure 1). Il est suggéré d'aborder ces industries comme hétérogènes à travers l'Europe dans une perspective de santé publique. Cette thèse recommande de maintenir le développement et l'application de politiques nutritionnelles pour la restauration rapide et les supermarchés au niveau national.

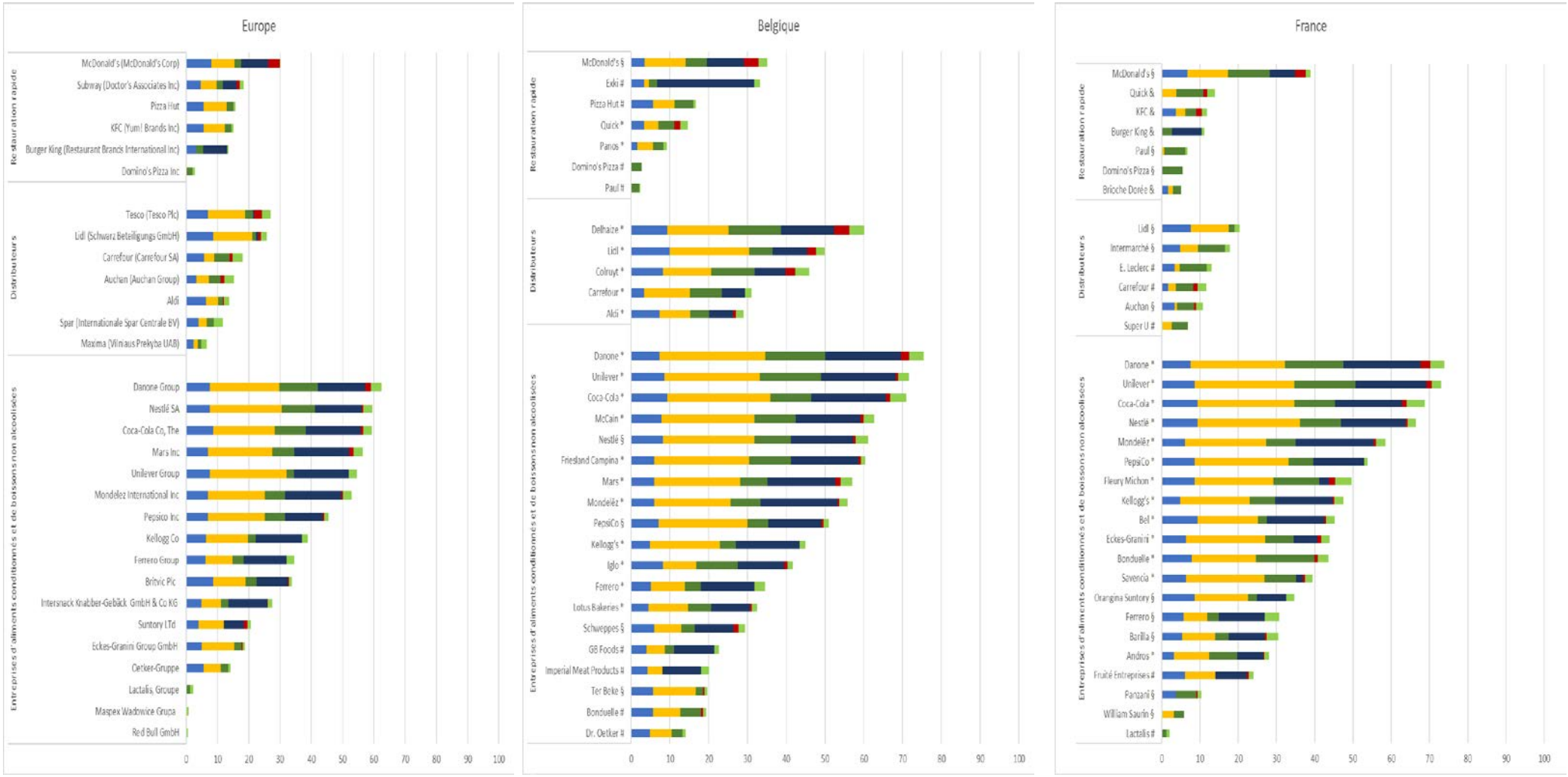


Résumé figure 1: Ce graphique montre la part de marché moyenne des plus grandes entreprises (jaune), le nombre moyen d'entreprises avec une part de marché ≥1% (orange) et le nombre moyen d'entreprises uniques (vert) par secteur d'industrie alimentaire dans les États membres du marché unique européen. Les barres d'erreur indiquent les écarts types respectifs.

La part de marché moyenne des plus grandes entreprises (jaune) correspond aux niveaux globaux de concentration du marché de ces industries alimentaires (bien qu'elle augmente considérablement lorsqu'on examine chaque catégorie de produits). Le nombre moyen d'entreprises avec une part de marché ≥1% (orange) et le nombre moyen d'entreprises uniques (vert) mesurent la diversité du marché dans un pays.

Pour les fabricants de produits alimentaires emballés et de boissons non alcoolisées, les mêmes entreprises et les mêmes catégories de produits les plus vendus ont été observées sur l'ensemble du marché unique européen. La principale différence entre les deux industries étant le niveau plus élevé de concentration du marché dans le secteur des boissons non alcoolisées et sur les marchés de produits respectif. Pour les restaurants à service rapide, les plus grandes entreprises sont similaires dans toute l'Europe. Malgré ces niveaux de concentration du marché, les restaurants à service rapide ont montré qu'ils comptaient un nombre considérablement plus élevé d'entreprises avec une part de marché ≥1% et d'entreprises uniques que les autres secteurs d'industrie alimentaire considérés. En revanche, les supermarchés ont montré une diversité d'entreprises dans toute l'Europe, mais une concentration notable a eu lieu au niveau national : quatre supermarchés nationaux détenant la quasi-totalité des part de marché Cela se reflétait également dans le nombre plus faible d'entreprises ayant une part de marché ≥1% et d'entreprises uniques.

S'agissant de la perspective de santé publique, la transparence, l'exhaustivité et la spécificité des engagements pris par l'industrie agroalimentaire en matière de nutrition ont été évalués, ainsi que certaines pratiques des entreprises et la relation entre les engagements et les pratiques. Au niveau européen, on a constaté que les engagements nutritionnels des grandes entreprises agroalimentaires étaient en deçà des meilleures pratiques recommandées (Résumé figure 2). La plupart des ventes concernait les produits ultra-transformés et les produits non autorisés à être commercialisés auprès des enfants. La même chose a été observé dans deux études en Belgique et en France dans laquelle les entreprises ont eu la possibilité de vérifier et compléter les données publiques disponibles (Résumé figure 2).



Résumé figure 2: 'Business Impact Assessment on Obesity and Population Nutrition (BIA-Obesity)' pour Europe (gauche), Belgique (centre) et France (droite). Le BIA-Obesity évalue l'exhaustivité, la spécificité et la transparence des engagements nutritionnels des entreprises. Le graphique indique les scores totaux et par domaine (les différentes couleurs) pour le secteur de la restauration rapide (en haut), les distributeurs (centre) et les entreprises d'aliments emballés et de boissons non alcoolisées (au bas).

Les graphiques montrent que les engagements nutritionnels des grandes entreprises alimentaires sont en deçà des meilleures pratiques recommandées pour les industries alimentaires en Europe, en Belgique et en France.

** Collaboration à BIA-Obesity; # Participation refusée; § Participation acceptée, mais contributions non reçues à temps; & Impossible de joindre l'entreprise; Pour #, § et &: L'évaluation est basée sur des informations disponibles publiquement.*

Les données de performance collectées dans les domaines 'Formulation de produit' (Résumé table 1) et 'Marketing produit et marque' (Résumé table 2) ont révélé des pratiques largement malsaines. Rien n'indique dans nos données que des engagements plus forts se traduisent par des meilleures pratiques des entreprises.

Résumé table 1: Une vue d'ensemble des scores belges (à gauche) et français (à droite) du 'Business Impact assessment on Obesity and Population Nutrition' (BIA-Obesity) pour les engagements et les pratiques dans le domaine de la 'Formulation produits' par entreprise. Les données sont classées par score BIA-Obesity décroissant pour le domaine 'Formulation produits' par secteur d'industrie alimentaire [fabricants d'aliments et de boissons (en haut), supermarchés (centre) et restaurants à service rapide (au bas)]. Le vert indique un score dans le tiers supérieur des entreprises par industrie alimentaire et le rouge indique un score dans le tiers inférieur des entreprises par industrie alimentaire. Le jaune indique les entreprises se situant entre les deux.

Le tableau montre que rien dans nos données ne prouve que des engagements plus forts dans le domaine de la 'formulation produits' se traduisent par de meilleures pratiques commerciales selon les indicateurs de performance respectifs.

Entreprises belges	Formulation produit	Médian Nutri-Score	% Nutri-Score A+B	% Nutri-Score D+E	% Ultra-transformé
Danone	91.2	B	74.3	3.5	68.3
Coca-Cola	88.5	D	30.6	51.7	70.1
Unilever	81.6	D	14.2	58.4	88.3
Friesland Campina	81.6	B	60.0	18.0	10.0
McCain	80.0	A	95.6	0.0	2.2
Nestlé	78.9	C	20.3	47.5	79.3
PepsiCo	76.3	C	10.5	48.5	83.6
Mars	73.7	C	33.9	44.6	82.6
Mondelēz	65.8	E	2.8	84.5	91.6
Kellogg's	60.5	D	13.2	50.9	100.0
Ter Beke	36.8	B/C	50.0	0.0	100.0
Lotus Bakeries	34.2	E	4.7	89.5	100.0
Iglo	28.9	B	84.3	2.5	32.8
Ferrero	28.9	E	0.0	100.0	100.0
Bonduelle	23.7	A	100.0	0.0	14.0
Schweppes	23.1	E	13.0	83.3	96.3
Dr. Oetker	18.4	D	7.7	51.9	96.2
GB Foods	15.8	D	21.3	54.4	96.3
Imperial Meat Products	13.2	E	0.0	100.0	68.3
Percentile 33	**28.9**		**12.8**	**43.0**	**70.0**
Percentile 66	**76.0**		**33.5**	**54.1**	**95.6**
Lidl	81.6	C	29.1	49.1	61.6
Delhaize	63.2	C	38.4	39.2	48.8
Colruyt	50.0	C	40.9	39.1	43.8
Carrefour market (HM)	47.4	C	39.8	40.6	48.7
Aldi	31.6	D	26.3	55.2	63.0
Percentile 33	**48.2**		**32.1**	**39.6**	**48.7**
Percentile 66	**58.4**		**39.3**	**46.0**	**57.0**
McDonald's	42.5	C	25.0	45.0	
Pizza Hut (Delivery)	22.5		/	/	
Panos	15.8	C	39.6	41.1	
Quick	15.0	C	25.3	48.3	
Exki	5.3		/	/	
Domino's Pizza	0.0	C	48.1	13.0	
Paul	0.0	C	30.4	46.1	
Percentile 33	**5.16**		**26.94**	**42.35**	
Percentile 66	**15.76**		**36.32**	**45.69**	

Entreprises françaises	Formulation produit	Médian Nutri-Score	% Nutri-Score A+B	% Nutri-Score D+E	% Ultra-transformé
Nestlé	89.5	D	19.4	53.6	81.6
Unilever	86.8	C	19.5	46.9	83.0
Coca-Cola	84.6	B	52.1	45.4	63.0
Danone	82.4	B	60.0	9.6	85.9
PepsiCo	81.6	C	29.9	45.7	80.0
Mondelēz	71.1	E	6.4	81.7	92.7
Eckes-Granini	69.2	B	95.3	4.7	4.7
Fleury Michon	68.4	C	41.0	11.4	99.0
Savencia	68.4	D	5.3	83.1	40.5
Kellogg's	60.5	D	9.9	61.6	99.0
Bonduelle	55.9	A	90.6	0.5	31.8
Bel	52.6	C	45.3	43.1	7.5
Orangina Suntory	46.2	D	13.3	82.8	91.2
Andros	30.8	C	44.52	33.42	40.32
Barilla	28.9	B	57.5	23.4	42.8
Fruité Entreprises	26.9	C	47.8	47.0	65.0
Ferrero	21.1	E	0.6	97.6	100.0
William Saurin	10.5	B	81.6	11.5	98.9
Panzani	0.0	B	68.2	12.3	44.1
Lactalis	0.0	D	22.8	64.6	5.4
Percentile 33	**34.9**		**20.4**	**26.1**	**43.2**
Percentile 66	**68.9**		**50.1**	**50.5**	**84.6**
Lidl	39.5	D	26.3	51.7	63.7
Intermarché	18.4	C	47.7	35.2	52.9
Super U	10.5	C	45.5	38.4	60.2
Carrefour	7.9	C	41.2	41.4	64.3
E. Leclerc	5.3	C	40.2	39.8	58.8
Auchan	2.6	C	37.5	43.7	61.5
Percentile 33	**7.0**		**39.3**	**39.3**	**59.7**
Percentile 66	**12.9**		**42.5**	**42.1**	**62.1**
McDonald's	42.5	C	27.1	46.7	
Quick &	15.0	/	/	/	
KFC	10.0	C	28.7	41.5	
Brioche Dorée &	5.3	/	/	/	
Paul	2.6	C/D	23.1	50.0	
Burger King	0.0	D	13.2	50.9	
Domino's Pizza	0.0	C	12.6	40.0	
Percentile 33	**2.58**		**16.36**	**43.17**	
Percentile 66	**9.81**		**25.65**	**48.82**	

Résumé table 2: Une vue d'ensemble des scores belges (à gauche) et français (à droite) du 'Business Impact assessment on Obesity and Population Nutrition' (BIA-Obesity) pour les engagements et les pratiques dans le domaine 'Marketing produit et marque' par entreprise. Les données sont classées par score BIA-Obesity décroissant pour le domaine 'Marketing produit et marque' par secteur d'industrie alimentaire [fabricants d'aliments et de boissons (en haut), supermarchés (centre) et restaurants à service rapide (au bas)]. Le vert indique un score dans le tiers supérieur des entreprises par industrie alimentaire et le rouge indique un score dans le tiers inférieur des entreprises par industrie alimentaire. Le jaune indique les entreprises se situant entre les deux.

Le tableau montre que rien dans nos données ne prouve que des engagements plus forts dans le domaine de la 'Marketing produit et marque' se traduisent par de meilleures pratiques commerciales selon les indicateurs de performance respectifs.

Entreprises belges	Marketing produit et marque	% Interdit de commercialisation aux enfants (Organisation mondiale de la santé)
Mondelēz	66.3	100.0
Danone	65.0	80.7
Coca-Cola	64.2	72.8
Unilever	64.2	69.7
Friesland Campina	58.3	96.0
Mars	58.3	61.2
McCain	55.4	46.7
Kellogg's	54.2	100.0
Nestlé	53.8	85.5
PepsiCo	45.8	97.1
Ferrero	45.8	100.0
Iglo	40.0	18.0
GB Foods	34.8	61.0
Lotus Bakeries	33.3	100.0
Schweppes	33.3	87.0
Imperial Meat Products	33.3	100.0
Ter Beke	0.0	50.0
Bonduelle	0.0	11.6
Dr. Oetker	0.0	95.2
Percentile 33	**34.7**	**69.2**
Percentile 66	**55.3**	**95.9**
Delhaize	55.0	70.7
Lidl	36.3	78.0
Colruyt	31.6	64.3
Aldi	24.5	82.2
Carrefour market (HM)	23.8	68.5
Percentile 33	**26.8**	**69.2**
Percentile 66	**34.6**	**75.4**
Exki	100.0	/
McDonald's	38.5	91.4
Pizza Hut (Delivery)	0.0	/
Panos	0.0	80.0
Quick	0.0	92.2
Domino's Pizza	0.0	58.2
Paul	0.0	89.8
Percentile 33	**0.00**	**83.15**
Percentile 66	**0.00**	**90.85**

Entreprises françaises	Marketing produit et marque	% Interdit de commercialisation aux enfants (Organisation mondiale de la santé)
Mondelēz	68.3	99.8
Danone	67.1	78.1
Unilever	62.1	72.1
Coca-Cola	58.3	83.6
Nestlé	56.3	89.2
Kellogg's	50.0	99.2
Bel	50.0	95.2
PepsiCo	44.2	92.7
Ferrero	40.0	100.0
Barilla	31.3	54.2
Fruité Entreprises	27.1	98.9
Orangina Suntory	25.4	96.4
Andros	22.5	96.08
Eckes-Granini	20.8	100.0
Fleury Michon	8.3	72.2
Savencia	6.3	98.8
Bonduelle	0.0	7.5
William Saurin	0.0	16.1
Panzani	0.0	33.9
Lactalis	0.0	93.1
Percentile 33	**21.3**	**79.6**
Percentile 66	**47.3**	**96.2**
Lidl	0.0	81.9
Intermarché	0.0	72.7
Super U	0.0	66.0
Carrefour	0.0	72.0
E. Leclerc	0.0	72.9
Auchan	0.0	71.4
Percentile 33	**0.0**	**71.8**
Percentile 66	**0.0**	**72.7**
Burger King	30.8	84.1
McDonald's	26.9	84.3
Quick &	0.0	/
KFC	0.0	73.9
Brioche Dorée &	0.0	/
Paul	0.0	93.7
Domino's Pizza	0.0	85.8
Percentile 33	**0.00**	**84.14**
Percentile 66	**0.00**	**85.24**

Tous ces résultats montrent la nécessité d'une réglementation européenne et nationale pour guider, contrôler et soutenir les efforts de l'industrie agroalimentaire pour améliorer les environnements alimentaires

SAMENVATTING

Het doel van deze thesis was om te analyseren hoe de voedingsindustrie (producenten van verpakte voedingsmiddelen en dranken, snelbedieningsrestaurants en supermarkten) vanuit een economisch en volksgezondheidsperspectief beïnvloedt welk voedsel wij verwerven, bereiden en consumeren. Deze beïnvloeding vindt plaats bij elke interactie tussen ons en de fysieke, economische, politieke en sociaal culturele aspecten van de ons omringende omgeving, samen de voedselomgevingen genoemd. Voorbeelden van dergelijke interacties zijn de reclames op TV, snoepjes aan de kassa's van supermarkten en de hogere prijzen van gezondere producten in vergelijking met minder gezonde alternatieven. Bijkomende activiteiten vinden plaats achter gesloten deuren. Denk aan lobbyen, campagnes om de publieke opinie te beïnvloeden, fusies, overnames en hoe bedrijven zich positioneren op de markt. Dit zijn allemaal activiteiten die bedrijven de mogelijkheid kunnen bieden om de voedselomgevingen te (her)structureren om hun eigen belangen te dienen.

Binnen het economisch perspectief werd nagegaan hoe marktconcentratie en -diversiteit in Europa de voedselomgevingen zouden kunnen beïnvloeden. Er werd vastgesteld dat de belangrijkste producenten van verpakte levensmiddelen en dranken in heel Europa vergelijkbaar waren, met matig tot sterk geconcentreerde productmarkten. Dit is mogelijks van belang aangezien dat uit deze studie bleek dat marktconcentratie significant het aandeel van de verkoop van (minder gezonde) ultra verwerkte voedingsproducten voorspelde. Op basis van de overeenkomsten tussen de producenten van voedingsmiddelen en dranken in Europa werd in deze thesis gesuggereerd dat het vanuit het oogpunt van de volksgezondheid nuttig zou kunnen zijn om de markten voor verpakte voeding en dranken in heel Europa als homogeen te benaderen. Dit zou het uitvoeren van een voedingsbeleid voor de industrie vergemakkelijken en voor overheden de administratieve last die gepaard gaat met beleidsontwikkeling en -uitvoering verminderen. Voor snelbedieningsrestaurants en supermarkten was het beeld anders dan voor fabrikanten van verpakte levensmiddelen en dranken. De grootste snelbedieningsrestaurants in heel Europa waren vergelijkbaar, maar er was een opmerkelijk groter aantal kleine bedrijven op nationaal niveau. Daarentegen werden in heel Europa verschillende supermarkten waargenomen, maar op nationaal niveau kon slechts een beperkt aantal verschillende supermarkten worden geïdentificeerd. Als zodanig wordt gesuggereerd om deze industrieën vanuit het oogpunt van de volksgezondheid in heel Europa als heterogeen te benaderen. Bijgevolg wordt in dit proefschrift aanbevolen om de ontwikkeling en uitvoering van het voedingsbeleid dat van invloed is op snelbedieningsrestaurants en supermarkten op nationaal niveau te (blijven) handhaven.

Binnen het volksgezondheidsperspectief beoordeelde deze thesis de transparantie, volledigheid en specificiteit van de bedrijfsengagementen inzake voeding en gezondheid, evenals sommige bedrijfspraktijken en de relatie tussen engagementen en praktijken. Op Europees niveau werd

vastgesteld dat de voor het publiek beschikbare engagementen inzake voeding en gezondheid van de voedingsbedrijven niet voldeden aan de aanbevelingen. Niettemin betrof het merendeel van de verkoop ultra-bewerkte productcategorieën en productcategorieën die niet geschikt zijn voor reclame aan kinderen. Een soortgelijk patroon werd waargenomen in de studies in België en Frankrijk, waar de bedrijven de gelegenheid kregen om de engagementen inzake voeding en gezondheid te controleren en aan te vullen. De aanvullende gegevens die verzameld werden aangaande bedrijfspraktijken binnen de domeinen 'Product (her)formulering' en 'Product- en merkpromotie' brachten overwegend ongezonde bedrijfspraktijken aan het licht. Er waren geen aanwijzingen voor een verband tussen de engagementen inzake voeding en gezondheid en de bedrijfspraktijken.

Uit alle resultaten bleek dat er nood is aan een sterk Europees en nationaal voedingsbeleid om de inspanningen van de voedingsindustrie te versterken, controleren en ondersteunen ter verbetering van de voedselomgevingen.

ANNEX

Annex 1. Herfindahl-Hirschman Index (HHI) and percent change over 10 years (food industry: packaged foods).

Annex 1: The Herfindahl-Hirschman Index (HHI) for the 14 different packaged food product markets per European single market member state. Red indicates HHI values >2000 and highly concentrated markets, yellow indicates HHI-values between 1000 - 2000 and moderately concentrated markets and green indicates HHI-values < 1000 and unconcentrated markets. Between brackets the percent change over the past 10 years is included (2009 – 2018).
Euromonitor data 2018.

Country	Soup		Ice Cream and Frozen Desserts		Breakfast Cereals		Confectionary		Dairy		Sweet Biscuits, Snack Bars and Fruit Snacks		Savoury Snacks		Sweet Spreads		Sauces, dressings and condiments		Ready meals		Processed Meat and Seafood		Processed Fruit and Vegetables		Rice, Pasta and Noodles		Baked Goods		Packaged Foods	
Austria	3694	(3)	3900	(1)	1021	(2)	1161	(11)	546	(4)	624	(24)	1605	(-9)	1670	(2)	759	(-2)	591	(-3)	249	(9)	1156	(-9)	458	(7)	18	(0)	60	(2)
Belgium	2303	(55)	1051	(-1)	2029	(-35)	558	(-7)	252	(-10)	484	(-13)	1266	(6)	778	(-23)	546	(-19)	175	(18)	83	(8)	165	(1)	315	(-15)	14	(21)	38	(-19)
Bulgaria	4740	(6)	3706	(13)	2816	(19)	1210	(5)	273	(-18)	684	(53)	390	(57)	570	(-11)	547	(-4)	990	(38)	1103	(-39)	710	(15)	671	(2)	161	(27)	75	(-31)
Croatia	4371	(21)	6185	(15)	604	(-4)	939	(-8)	1591	(-1)	1534	(23)	548	(10)	925	(-33)	1363	(-6)	846	(-29)	1767	(6)	2044	(61)	720	(31)	136	(55)	264	(-5)
Czech Republic	2614	(-10)	2124	(15)	1666	(-1)	1574	(-10)	460	(11)	2238	(-28)	669	(-45)	602	(-29)	744	(-13)	950	(-16)	619	(-2)	376	(-12)	425	(-38)	221	(-4)	149	(-10)
Denmark	1472	(6)	1042	(-27)	1123	(-1)	637	(-24)	2885	(-14)	460	(-25)	1465	(-6)	806	(-10)	588	(-4)	571	(-11)	524	(0)	215	(15)	204	(4)	240	(-57)	269	(-16)
Estonia	1327	(-16)	2415	(15)	705	(-28)	1580	(12)	1294	(6)	804	(66)	779	(-41)	655	(15)	361	(-34)	918	(35)	951	(-14)	575	(-28)	378	(-17)	1304	(0)	212	(13)
Finland	892	(-11)	3083	(-2)	436	(-24)	2153	(-3)	1446	(-36)	1690	(46)	924	(-1)	655	(-56)	706	(-1)	897	(-6)	861	(-1)	339	(4)	492	(-10)	508	(-49)	296	(-28)
France	2198	(-9)	1465	(2)	1927	(-11)	694	(21)	495	(3)	1552	(18)	668	(6)	941	(9)	522	(-5)	336	(16)	184	(15)	310	(43)	1483	(24)	20	(35)	63	(0)
Germany	1262	(-5)	757	(4)	779	(3)	577	(12)	90	(-8)	201	(8)	613	(9)	717	(7)	567	(-6)	450	(9)	31	(27)	217	(5)	306	(6)	98	(0)	25	(-15)
Greece	8785	(67)	1668	(-18)	1452	(-42)	1890	(4)	370	(-33)	1723	(14)	1122	(-20)	277	(-56)	1716	(2)	840	(38)	350	(8)	1157	(-18)	1144	(-32)	43	(-46)	76	(-33)
Hungary	3796	(3)	1286	(-12)	890	(-21)	799	(-16)	407	(-33)	829	(-23)	434	(-24)	252	(-18)	539	(-5)	369	(-25)	364	(-35)	217	(-7)	299	(-25)	16	(0)	87	(-27)
Ireland	1341	(-16)	3356	(-4)	1535	(-27)	1884	(-11)	434	(-33)	609	(-16)	1182	(-37)	797	(-39)	671	(-26)	428	(-29)	1331	(5)	842	(-1)	536	(-13)	217	(-20)	160	(-22)
Italy	1178	(-42)	222	(-39)	3333	(-15)	1198	(-2)	309	(3)	919	(-11)	587	(-16)	1225	(-36)	443	(-24)	293	(2)	135	(29)	326	(7)	412	(-41)	36	(16)	39	(-12)
Latvia	1562	(-11)	2844	(30)	1883	(-17)	1613	(6)	1425	(20)	1766	(-13)	1164	(-9)	543	(27)	1695	(13)	573	(-23)	773	(15)	1159	(12)	394	(1)	698	(5)	246	(16)
Lithuania	1879	(-12)	1363	(-10)	1962	(-13)	1166	(-29)	1233	(-24)	978	(48)	1043	(-17)	866	(11)	546	(-43)	703	(31)	613	(-6)	968	(11)	477	(-16)	702	(56)	152	(-12)
Netherlands	2547	(-21)	4465	(14)	865	(9)	421	(-10)	374	(-50)	471	(-21)	856	(-32)	367	(-7)	638	(-29)	286	(18)	39	(67)	527	(-2)	352	(-21)	40	(-37)	64	(-33)
Norway	3652	(-15)	3628	(23)	1479	(0)	1601	(3)	4469	(-10)	1675	(-26)	1207	(-19)	1836	(-7)	1294	(-13)	2104	(-23)	1337	(-18)	217	(-43)	654	(-34)	344	(-19)	577	(-10)
Poland	2092	(-27)	1324	(-2)	1953	(-33)	697	(-13)	376	(-11)	446	(-62)	675	(-17)	380	(-10)	627	(-5)	348	(-22)	545	(11)	429	(-10)	420	(-26)	6	(318)	66	(-17)
Portugal	2343	(-40)	4003	(22)	1375	(-16)	597	(-1)	753	(-9)	224	(-34)	478	(-15)	387	(23)	430	(-23)	111	(-23)	210	(-15)	103	(-41)	505	(-2)	30	(24)	113	(-15)
Romania	1561	(76)	1171	(-2)	2280	(44)	1204	(-15)	775	(-14)	447	(-8)	852	(2)	719	(18)	442	(-20)	443	(-69)	470	(-2)	368	(-26)	793	(40)	22	(455)	61	(14)
Slovakia	2224	(-13)	1960	(32)	1653	(-14)	1482	(-7)	413	(-22)	1850	(20)	342	(-66)	671	(-20)	318	(-7)	795	(-38)	605	(8)	373	(-34)	256	(-54)	133	(-2)	99	(-18)
Slovenia	3053	(35)	1192	(-2)	825	(17)	945	(-6)	1127	(-9)	290	(-25)	962	(-5)	242	(-11)	353	(5)	819	(-9)	1112	(-9)	1036	(29)	1045	(-10)	392	(-12)	182	(-12)
Spain	798	(-20)	1406	(-31)	1361	(-37)	492	(-16)	391	(-29)	625	(-40)	803	(-3)	419	(-1)	161	(-7)	183	(-18)	130	(-14)	149	(-23)	363	(-32)	243	(66)	47	(-30)
Sweden	1830	(13)	1578	(-25)	725	(-17)	1106	(6)	2011	(-26)	535	(-47)	925	(-3)	668	(-18)	681	(19)	635	(5)	648	(-13)	214	(-27)	249	(-40)	614	(-14)	254	(-21)
Switzerland	2394	(3)	1389	(0)	689	(-3)	242	(-1)	251	(0)	347	(-5)	1209	(-5)	377	(-14)	894	(3)	45	(-41)	29	(-3)	96	(-20)	137	(-24)	8	(-7)	35	(-1)
United Kingdom	1206	(-31)	1100	(35)	1059	(-30)	1285	(-7)	137	(-19)	425	(-2)	773	(-33)	513	(-11)	316	(-34)	44	(-46)	74	(-19)	377	(0)	313	(-11)	242	(-42)	70	(-10)
Average	2486	(0)	2210	(2)	1423	(-11)	1100	(-4)	911	(-13)	905	(-3)	872	(-12)	699	(-11)	684	(-11)	583	(-8)	561	(1)	543	(-4)	511	(-13)	241	(28)	140	(-13)
Min	25	(-42)	44	(-39)	161	(-42)	798	(-29)	242	(-50)	90	(-62)	242	(-66)	222	(-56)	342	(-43)	201	(-69)	6	(-39)	436	(-43)	96	(-54)	29	(-57)	137	(-33)
Max	577	(76)	2104	(35)	1716	(44)	8785	(21)	1836	(20)	4469	(66)	2153	(57)	6185	(27)	1605	(19)	2238	(38)	1304	(67)	3333	(61)	2044	(40)	1767	(455)	1483	(16)
SD	119	(29)	413	(19)	387	(19)	1610	(11)	377	(16)	951	(31)	495	(22)	1372	(21)	323	(14)	591	(27)	296	(20)	689	(24)	448	(22)	458	(108)	301	(14)

Annex 2. Herfindahl-Hirschman Index (HHI) and percent change over 10 years (food industry: non-alcoholic beverages)

Annex 2: The Herfindahl-Hirschman Index (HHI) for the 8 different non-alcoholic beverage product markets per European single market member state. Red indicates HHI values >2000 and highly concentrated markets, yellow indicates HHI-values between 1000 - 2000 and moderately concentrated markets and green indicates HHI-values < 1000 and unconcentrated markets. Between brackets the percent change over the past 10 years is included (2009 – 2018).
Euromonitor data 2018. RTD = Ready-to-drink. For 'Asian Specialty Drinks' data were lacking in several countries.

Country	Carbonates		RTD Coffee		Sports Drinks		Energy Drinks		RTD Tea		Concentrates		Juice		Asian Speciality Drinks		Soft Drinks	
Austria	3310	(4)	1865	(-17)	2086	(-10)	3811	(29)	2693	(-20)	946	(11)	910	(2)			689	(-4)
Belgium	4225	(8)	2536	(38)	3533	(18)	2275	(7)	3006	(-23)	1195	(-41)	309	(-22)			1320	(-5)
Bulgaria	3555	(23)	1645	(-27)	2246	(-38)	2049	(-38)	2075	(7)	1238	(-60)	828	(-9)			1112	(1)
Croatia	3789	(16)	1960	(4)	1687	(-9)	2922	(12)	2187	(33)	1400	(-5)	1928	(45)			1284	(36)
Czech Republic	1940	(-11)	2682	(-2)	2604	(18)	883	(-59)	1169	(33)	1048	(-3)	898	(0)			780	(-18)
Denmark	1616	(-25)	3672	(-45)	5301	(59)	2105	(26)	2993	(-26)	1184	(-25)	951	(-38)			550	(-30)
Estonia	3646	(40)	2973	(-59)	4950	(15)	2143	(29)	7243	(49)	1008	(-14)	1541	(12)			1060	(54)
Finland	1764	(-19)	1719	(-68)	2378	(-18)	1986	(28)	994	(-15)	635	(-32)	1748	(1)			699	(-16)
France	4353	(-11)	4768	(333)	2512	(-2)	3009	(-14)	2570	(0)	1477	(6)	715	(83)	2349	(9)	628	(-6)
Germany	1670	(-7)	400	(-2)	576	(35)	2009	(-22)	606	(-9)	632	(338)	244	(-16)	1414	(15)	322	(0)
Greece	4885	(-22)	2543	(-14)	4496	(63)	2805	(-66)	2263	(-53)	2808	(75)	1982	(-43)			922	(-10)
Hungary	3724	(7)	909	(-42)	1292	(120)	2028	(50)	1302	(-44)	608	(28)	1020	(50)			841	(10)
Ireland	3437	(-9)	4474	(-40)	2863	(13)	3479	(-21)	2551	(-67)	2903	(21)	525	(-15)			1096	(-12)
Italy	2334	(-15)	2363	(2)	2455	(4)	6033	(50)	792	(-41)	978	(4)	516	(-23)	4215	(+∞)	492	(-11)
Latvia	2436	(19)	1091	(-74)	1802	(56)	2109	(150)	4464	(41)	1950	(110)	2455	(34)			1035	(9)
Lithuania	3795	(38)	2738	(108)	835	(-78)	905	(48)	2999	(17)	1943	(-8)	945	(-14)			873	(50)
Netherlands	2422	(14)	1989	(-43)	1048	(-15)	5089	(162)	1818	(-7)	2405	(20)	910	(1)	4296	(67)	609	(8)
Norway	3315	(1)	6080	(-15)	3419	(-13)	2587	(-2)	2947	(30)	3021	(16)	1203	(-1)			1251	(-22)
Poland	2745	(30)	1056	(47)	2868	(-38)	1615	(21)	1606	(-37)	870	(-1)	1563	(9)			575	(-9)
Portugal	2775	(9)	6808	(-32)	283	(-88)	2123	(-66)	888	(21)	1305	(-54)	1591	(41)	3341	(+∞)	407	(-7)
Romania	2139	(42)	3773	(320)	4345	(-12)	1684	(-38)	2518	(-17)	1132	(-62)	827	(-11)			723	(1)
Slovakia	1609	(-8)	1967	(-18)	3192	(-21)	1961	(-29)	1041	(-32)	598	(4)	627	(20)			417	(-12)
Slovenia	3066	(10)	2172	(19)	886	(38)	3008	(-22)	2856	(4)	1503	(-1)	3143	(-24)			708	(-9)
Spain	4173	(-3)	2095	(-78)	5690	(19)	2138	(-13)	4763	(54)	2248	(-18)	541	(27)			918	(-18)
Sweden	4051	(22)	4674	(163)	3592	(-11)	1884	(-43)	2607	(4)	2848	(0)	983	(14)			1140	(5)
Switzerland	2741	(7)	4124	(-13)	1513	(9)	2384	(-3)	378	(2)	992	(32)	359	(-31)			433	(-10)
United Kingdom	3352	(-11)	3926	(443)	5937	(28)	2314	(-16)	1741	(-70)	1743	(-23)	595	(79)	70	(-81)	778	(2)
Average	3069	(6)	2852	(33)	2755	(5)	2494	(6)	2336	(-6)	1504	(12)	1106	(6)	2614	(2)	802	(-1)
Min	322	(-25)	1609	(-78)	598	(-88)	400	(-66)	378	(-70)	883	(-62)	283	(-43)	244	(-81)	70	(-30)
Max	1320	(42)	4885	(443)	3021	(120)	6808	(162)	7243	(54)	6033	(338)	5937	(83)	3143	(+∞)	4296	(54)
SD	282	(19)	914	(129)	742	(42)	1536	(54)	1431	(34)	1083	(74)	1555	(32)	678	(53)	1522	(19)

Annex 3. The 'Business Impact Assessment on Obesity and population-level nutrition' (BIA-Obesity) tool and process to assess food company policies and commitments related to obesity prevention and population nutrition – Adaptation for Europe 2020.

Annex 3: The 'Business Impact Assessment on Obesity and Population Level Nutrition' (BIA-Obesity) tool and process, adaptation Europe 2020.

Annex 3 Table 1: Indicators and scoring criteria for packaged food and non-alcoholic beverage manufacturers

Indicator ID	Domain and indicator	Scoring
M-STRAT	**Corporate strategy**	**Maximum total points = 30**
M-STRAT1	Does the company have an overarching commitment to improving population nutrition and health articulated in strategic documents (e.g., corporate strategy document, corporate responsibility reports)?	10: Yes, a specific commitment to improving population nutrition and health, at the European level or at the global level with reference to the European market or multiple European countries, publicly available in strategic documents 7.5: Yes, a specific global commitment to improving population nutrition and health, publicly available in strategic documents 5: Yes, a European- or global- level commitment, but not publicly-available, OR general reference to nutrition and health as part of general corporate strategy 0: No clear commitments to improving population nutrition and health
M-STRAT2	Does the company's commitment to improving population nutrition and health (where it exists) include specific objectives and targets for obesity and NCDs (including for improving population nutrition)?	(Can be multiple, max of 10 points) 2: Contains specific, measurable, achievable, relevant and time bound (SMART) objectives and targets 2: Recognition or reference to relevant priorities set out in the WHO Global Action Plan for the Prevention and Control of NCDs 2013 - 2020, the WHO European Food and Nutrition Action Plan 2015 – 2020, the Sustainable Development Goals, or the WHO Report on Ending Childhood Obesity 2: Recognition or reference to relevant priorities in European policy documents relating to population nutrition and obesity/NCD prevention (e.g. A Strategy for Europe on Nutrition, Overweight and Obesity related health issues; EU Action Plan on Childhood Obesity 2014-2020; Horizon 2020; Fruit and vegetable regime) 2: Comprehensive in nature (e.g., includes three or more domains in this document, such as formulation, marketing and labelling)

Indicator ID	Domain and indicator	Scoring
		2: Key Performance Indicators (KPIs) (and/or remuneration) of management linked to nutrition strategy/policy/targets
M-STRAT3	Does the company regularly publish details of its approach to population nutrition and health related to obesity and NCDs?	10: Regular, publicly available reports including reporting against objectives and targets, a clear outlook of future plans and challenges, external verification / review, and that specifically refers to Europe or multiple European countries 7.5: Regular, publicly available global reports with no specific reference to Europe or European countries 5: Regular reports including some of the relevant information 2.5: Irregular reporting 0: None published
M-FORM	**Product formulation**	**Maximum total points = 95**
M-FORM1	Does the company publish a comprehensive set of commitments or objectives related to new product development and reformulating its existing products with respect to reducing the nutrients of concern and energy (salt/sodium, saturated fats, trans fats, added sugar and kilojoules/portion size)?	10: Yes, specific European commitments/objectives or specific global commitments/objectives that include specific reference to multiple European countries, publicly available 7.5: Yes, specific global commitments/objectives that are publicly available 5: Has specific European commitments/objectives or specific global commitments/objectives with reference to multiple European countries, but not publicly available 2.5: Has European or global-level commitments/objectives in this area that are available publicly, but these commitments/objectives are vague and non-specific OR has global commitments/objectives but not publicly available 0: No commitment/ no policy information available to the research team
M-FORM2	Is the company a signatory to European and/or global industry initiatives on product reformulation or do they commit to voluntary programs on product reformulation? *(e.g. IFBA commitments on reformulation)*	5: Yes, and noted on company website / annual reports 2.5 Yes, but not noted on company website / annual reports (e.g. government/ NGO/ industry organisation's website or disclosed directly to INFORMAS) 0: No / no information
	Salt/sodium (only assess where relevant to a company's product portfolio and if not mandatory according to European government policy) REMARK: In some EU countries there may be policies in place	

Indicator ID	Domain and indicator	Scoring
M-FORM3.1	Has the company set a target/targets or provided detailed evidence of having taken significant action to reduce/reach lower levels of salt/sodium in products, and is it applicable to Europe?	10: Set SMART targets or provided detailed evidence of having taken significant action in all key categories/subcategories, published 5: Targets (not necessarily SMART) set or significant action taken in some key products/sub-categories/not published 2.5: General or vague commitment to reducing levels of salt/sodium in products, published or disclosed to INFORMAS team 0: No target / no information
M-FORM3.2	When is the baseline year and target year? What are the targets?	[Information only, not to be scored]
	Trans and saturated fats (only assess where relevant to a company's product portfolio and if not mandatory according to European government policy, not applicable to beverage industry) REMARK: In some EU countries there may be policies in place, e.g. Denmark	
M-FORM4.1	Has the company set a target/targets or provided detailed evidence of having taken significant action to reduce artificial trans fat added to products during the manufacturing process, and is it applicable to Europe? *!Keep in mind possible upcoming EU regulation on max content of trans fats in foods (open for consultation)*	10: Set a target or provided detailed evidence of having taken significant action to eliminate trans fat in all relevant categories/subcategories, published 5: Set a target or taken significant action to eliminate/reduce in some relevant products/sub-categories/not published 2.5: General or vague commitment to reducing/eliminating use of trans fats in products, published or disclosed to INFORMAS team 0: No target / no information
M-FORM4.2	When is the baseline year and target year? What are the targets?	[Information only, not to be scored]
M-FORM5.1	Has the company set a target/targets or provided detailed evidence of having taken significant action to reduce/reach lower levels of saturated fats, and is it applicable to Europe?	10: Set SMART targets or provided detailed evidence of having taken significant action in all key categories/subcategories, published 5: Targets (not necessarily SMART) set or taken significant action in some key products/sub-categories/not published 2.5: General or vague commitment to reducing use of saturated fats in products, published or disclosed to INFORMAS team 0: No target / no information
M-FORM5.2	When is the baseline year and target year? What are the targets?	[Information only, not to be scored]

Indicator ID	Domain and indicator	Scoring
	Added sugars (only assess where relevant to a company's product portfolio and if not mandatory according to government policy)	
M-FORM6.1	Has the company set a target/targets or provided detailed evidence of having taken significant action to reduce/reach lower levels of added sugars, and is it applicable to Europe?	10: Set SMART targets or provided detailed evidence of having taken significant action in all key categories/subcategories, published 5: Targets (not necessarily SMART) set or taken significant action in some key products/sub-categories / not published 2.5: General or vague commitment to reducing use of added sugars in products, published or disclosed to INFORMAS team 0: No target / no information
M-FORM6.2	When is the baseline year and target year? What are the targets?	[Information only, not to be scored]
	Portion size (energy content) (only assess where relevant to a company's product portfolio and if not mandatory according to government policy)	
M-FORM7.1	Does the company have a target/targets or provided detailed evidence of having taken significant action to reduce the portion size / energy content of single serve snacks, and is it applicable to Europe?	10: Set SMART targets or provided detailed evidence of having taken significant action in all key categories/subcategories, published 5: Targets (not necessarily SMART) set or taken significant action in some key products/sub-categories / not published 2.5: General or vague commitment to reducing portion size / energy content in products, published or disclosed to INFORMAS team 0: No target / no information
M-FORM7.2	When is the baseline year and target year? What are the targets?	[Information only, not to be scored]
	Classification system	
M-FORM8.1	What system / criteria (e.g., product classification system or nutrient profiling system) does the company use to classify the healthiness of products for the purposes of **product development / reformulation**?	10: Uses government guidelines/government endorsed classification system (where available e.g. WHO Europe nutrient profile model) 7.5**: Publicly** available system, developed in consultation with experts and in line with government guidelines, published in peer reviewed literature 5: **Publicly** available system, developed in consultation with experts and in line with government guidelines (not published in peer reviewed literature)

Indicator ID	Domain and indicator	Scoring
		2.5: **Publicly** available system with no details of development/alignment with government guidelines OR **not publicly** available but developed in consultation with experts and aligned with government guidelines 0: No information / poor alignment / does not have a system
M-FORM8.2	If a proprietary product classification system has been developed, which products, nutrients and food characteristics are covered, and what are the details?	[Information only, not to be scored]
	Policy position on reformulation	
M-FORM9.1	Does the company publish its policy position (in relation to government policy) on **product reformulation?**	10: Yes, on own website 5: Yes, on industry association website 2.5: Policy position made available to INFORMAS team 0: Not publicly available
M-FORM9.2	Does the company's policy position support WHO's position on **product reformulation** in relation to nutrients of concern, as articulated in the Global Action Plan for the Prevention and Control of NCDs 2013-2020 or the WHO European Food and Nutrition Action Plan 2015 – 2020?	10: Support for government-led efforts to reformulate the food supply in relation to several nutrients of concern 5: Support for government-led efforts to reformulate the food supply in relation to only one nutrient of concern 0: No details available -5: Somewhat opposed (e.g., opposes some aspects of implementation of government-led efforts to reformulate the food supply) -10: Opposed to government-led efforts to reformulate the food supply in relation to nutrients of concern
M-LABEL	**Nutrition labelling**	**Maximum total points = 90**
	General nutrition labelling information	
M-LABEL1	Does the company commit to provide on-pack information on trans fat content?	2.5: Yes, on all relevant products 1: Yes, on some products 0: No commitment / no information available to the research team

Indicator ID	Domain and indicator	Scoring
		N/A: if commitment to eliminate use of all industrially produced trans fat across portfolio
M-LABEL2	Does the company commit to provide on-pack information on added sugar content?	2.5: Yes, on all relevant products 1: Yes, on some products 0: No commitment / no information available to the research team
M-LABEL3	Does the company provide nutrition information online for food products within its portfolio?	10: Yes, comprehensive nutrition information (calories, sodium, saturated fat, total fat, sugar) for most (>80%) products, including on a per 100g/100ml basis 7.5: Yes, comprehensive nutrition information (calories, sodium, saturated fat, total fat, sugar) for most (>80%) products, or comprehensive nutrition information for all products per serving only 5: Comprehensive nutrition information for some (>50%) products 2.5: Limited nutrition information (i.e. does not include calories, sodium, saturated fat, total fat or sugar) for some (>50%) products 0: <50% of products or no information
M-LABEL4	Does the company have a policy to provide information on food composition to the EU commission , on request? (if applicable, e.g., information has been requested by government)	5: Yes, all products (published or not published) 2.5: Yes, some products 0: No policy / no information available to the research team
	Front of pack (FOP) nutrition labelling	
M-LABEL5.1	**IF A VOLUNTARY GOVERNMENT-ENDORSED FOP NUTRITION LABELLING SCHEME EXISTS:** Does the company have a published commitment to rolling out a government endorsed FOP labelling system (e.g. Nutri-Score, Traffic light)?	10: Yes, with implementation plan across all product categories (published or unpublished) 7.5: Yes, with implementation plan across a selection of product categories (published or unpublished) 5: Yes, but with no specific implementation plan (published or unpublished) 0: No
M-LABEL5.2	If the company **does not commit to full implementation of a government endorsed FOP labelling system**, what FOP labelling system does the company use? Remark: Own FOP labelling systems do hamper the development and implementation of government endorsed FOP labelling systems	10: Interpretive information (such as, stars, traffic lights, warning labels, etc.), applied across all product categories 7.5: Symbols or logos that indicate healthy products, applied across all product categories 5: Numeric information with % of recommended daily intake, applied across all product categories 2.5: Numeric information on levels of key nutrients, not showing % of recommended daily intake, applied across all product categories

Indicator ID	Domain and indicator	Scoring
		0: No FOP labelling used **DIVIDE POINTS IN HALF IF ONLY USED FOR SOME PRODUCTS / CATEGORIES** **N/A if full implementation of government endorsed system**
M-LABEL6.1	Does the company publish its policy position (in relation to government policy) on front of pack nutrition labelling?	10: Yes, on own website 5: Yes, on industry association website 2.5: Policy position made available to INFORMAS team 0: Not publicly available
M-LABEL6.2	Does the company's policy position (in relation to government policy) support WHO's position on front of pack nutrition labelling, as articulated in the WHO Report of the Commission on Ending Childhood Obesity (Recommendation 1.7) or the WHO European Food and Nutrition Action plan 2015 - 2020? *(Statement on Recommendation 1.7: Implement interpretive front-of-pack labelling, supported by public education of both adults and children for nutrition literacy)* *(EU Action plan: Increase consumer-friendly labelling by establishing easy-to-understand or interpretative front - of package labels that help consumers to identify healthier options)*	10: Strong support (with a focus on "interpretive" to mean readily understandable and providing easy comparison of products e.g. using traffic light colours or stars to compare products for those with low nutritional literacy; broadly implemented) 5: Weak support (e.g., supports scheme that only provides limited interpretive information, such as % Daily Intake Guide for energy content only) 0: No details available -5: Somewhat opposed (e.g., opposes some aspects of implementation of an interpretive scheme) -10: Strongly opposed (e.g., opposes interpretive labelling)
	Health and nutrition claims	
M-LABEL7	Does the company state that it will place a health claim on a product (or use a health claim as part of product advertising) only when the product is 'healthy'?	10: Yes, commitment is published 5: Yes, commitment is not published 0: No commitment/ no information available to the research team

Indicator ID	Domain and indicator	Scoring
M-LABEL8	Does the company state that it will place a nutrition claim on a product (or use a nutrition claim as part of product advertising) only when the product is 'healthy'?	10: Yes, commitment is published 5: Yes, commitment is not published 0: No commitment/ no information available to the research team
M-LABEL9.1	What system / criteria (e.g., product classification system or nutrient profiling system) does the company use to classify the healthiness of products for the purposes of **health and/or nutrition claims?**	10: Adopted an official classification system (developed by WHO, PAHO, national government, etc.) 5: Developed own system that has been validated and shows strong alignment with official classification systems / dietary guidelines, published in peer-reviewed literature 2.5: Developed own system that has been validated and shows alignment with official classification systems / dietary guidelines, not published in peer-reviewed literature 0: No information / poor alignment / does not have a system
M-LABEL9.2	If a proprietary product classification system has been developed, which products, nutrients and food characteristics are covered, and what are the details?	[Information only, not to be scored]
M-PROMO	**Product and brand promotion**	**Maximum total points = 120**
	Broadcast media	
M-PROMO1.1	Does the company have an explicit policy to reduce the exposure of children to unhealthy food marketing on broadcast media (TV, radio)? *(Note: check if the company supports the EU Pledge. If yes and no other comments, then EU pledge is scored)*	10: Yes, European policy or policy that refers to multiple European countries and noted on company website / annual reports 7.5: Yes, global policy and noted on company website / annual reports 5: Yes, European policy or policy that refers to multiple European countries, but not noted on company website / annual reports OR noted on industry association website 2.5: Yes, global policy but not noted on company website / annual reports 0: No policy/ no information available to the research team

Indicator ID	Domain and indicator	Scoring
M-PROMO1.2	To what age group(s) does the broadcast marketing policy apply? *(Note: check if the company supports the EU Pledge. If yes and no other comments, then EU pledge is scored)*	10: 18 years and under 8: 16 years and under 6: 14 years and under 4: 12 years and under 2: Under 10 years 0: No policy / no information
M-PROMO1.3	How is the 'target audience' or 'audience exposed' defined? *(Note: check if the company supports the EU Pledge. If yes and no other comments, then EU pledge is scored)*	10: Time-based restrictions, based on children's peak viewing times (e.g., no advertising before 9:00pm) 5: Based on a percentage of the children's audience that are likely to be viewing (e.g. if >10% of total children are watching) 2.5: Based on a percentage of the audience that are likely to be children (e.g., if >10% of audience are children) 1: Children's programmes only 0: No explicit threshold / definition
	Non-broadcast media	
M-PROMO2.1	Does the company have an explicit policy to reduce the exposure of children to unhealthy food marketing on non-broadcast media (including websites, DVDs/games, social media, print media, product placement, outdoor marketing (school zones excluded - under PROMO4), in store marketing / point of sales marketing)? *(Note: check if the company supports the EU Pledge. If yes and no other comments, then EU pledge is scored)*	10: Yes, European policy or policy that refers to multiple European countries and noted on company website / annual reports 7.5: Yes, global policy and noted on company website / annual reports 5: Yes, European policy or policy that refers to multiple European countries, but not noted on company website / annual reports OR noted on industry association website 2.5: Yes, global policy but not noted on company website / annual reports 0: No policy/ no information available to the research team
M-PROMO2.2	To what age group(s) does the non-broadcast marketing policy apply? *(Note: check if the company supports the EU Pledge. If yes and no other comments, then EU pledge is scored)*	10: 18 years and under 8: 16 years and under 6: 14 years and under 4: 12 years and under 2: Under 10 years 0: No policy / no information

Indicator ID	Domain and indicator	Scoring
M-PROMO3	Does the company commit not to sponsor children's sporting, cultural or other activities using unhealthy brands (foods or company brands)? *(Note: check if the company supports the EU Pledge. If yes and no other comments, then EU pledge is scored)*	10: Yes, comprehensive commitment including products and brands 5: Yes, comprehensive commitment including products only (brands still permitted) 2.5: Some commitments in the area, including some events or some forms of sponsorship 0: No commitment / no information available to the research team
M-PROMO4	Does the company commit not to use marketing in settings where children gather using unhealthy brands (foods or company brands)? *(Note: check if the company supports the EU Pledge. If yes and no other comments, then EU pledge is scored)*	(Can be multiple) 2: Commits IN early childcare settings and primary schools (children up to age 11) 2: Commits NEAR (e.g. within 500m) of early childcare settings and primary schools (children up to age 11) 2: Commits IN secondary schools (children between age 12 and 18) 2: Commits NEAR (e.g., within 500m) of secondary schools (children between age 12 and 18) 2: Commits in other places where children gather (family and child clinics, paediatric services or other health facilities, sporting or recreation centres, or sporting or cultural events held at those premises)
	General policies regarding promotion to children	
M-PROMO5.1	Does the company pledge not to use celebrities in marketing of products to children other than those that meet the company's healthy standard? *(Note: check if the company supports the EU Pledge. If yes and no other comments, then EU pledge is scored)*	5: All forms of marketing 2.5: Some forms of marketing (e.g., excludes packaging) or applies only to those celebrities that appeal primarily to children 0: No policy / no information available to the research team
M-PROMO5.2	Does the company pledge not to use fantasy and animation characters with a strong appeal to children in marketing of products other than those that meet the company's healthy standard? *(Note: check if the company supports the EU Pledge. If yes and no other comments, then EU pledge is scored)*	5: All forms of marketing (includes no use of characters with strong appeal to children across **all** forms of marketing) 2.5: Some forms of marketing (includes no use of characters with strong appeal to children across **some** forms of marketing) 0: No policy / no information available to the research team

Indicator ID	Domain and indicator	Scoring
M-PROMO5.3	Does the company commit to not use premium offers (e.g., promotional toys, games, vouchers and competitions) in marketing of products other than those that meet the company's healthy standard? *(Note: check if the company supports the EU Pledge. If yes and no other comments, then EU pledge is scored)*	5: All forms of marketing 2.5: Some forms of marketing (e.g., excludes packaging) 0: No commitment / no information available to the research team
M-PROMO6	Does the company audit/monitor its compliance with its policy on marketing to children at the? *(Note: check if the company supports the EU Pledge. If yes and no other comments, then EU pledge is scored)*	5: Yes, the policy is audited by an independently appointed third party 2.5: Yes, the policy independently audited 1: No, the policy is not independently audited 0: No auditing is conducted
	Classification system	
M-PROMO7.1	What system / criteria (e.g., product classification system or nutrient profiling system) does the company use to classify the healthiness of products for the purposes of **promotion to children**? *(Note: check if the company supports the EU Pledge. If yes and no other comments, then EU pledge is scored)*	10: Adopted an official classification system (developed by WHO, PAHO, national government, etc.) 5: Developed own system that has been validated and shows strong alignment with official classification systems / dietary guidelines, published in peer-reviewed literature 2.5: Developed own system that has been validated and shows alignment with official classification systems / dietary guidelines, not published in peer-reviewed literature 0: No information / poor alignment / does not have a system
M-PROMO7.2	If a proprietary product classification system has been developed, which products, nutrients and food characteristics are covered, and what are the details?	[Information only, not to be scored]
	Policy position on marketing of unhealthy foods to children	

Indicator ID	Domain and indicator	Scoring
M-PROMO8.1	Does the company publish its policy position (in relation to government policy) on reducing the exposure of children and /or adolescents to, and the power of, the marketing of unhealthy foods?	10: Yes, on own website 5: Yes, on industry association website 0: Not publicly available
M-PROMO8.2	Does the company's policy position support WHO's position on government-led policy action related to reducing the exposure of children and adolescents to, and the power of, the marketing of unhealthy foods, as articulated in the WHO Global Action Plan for NCDs, the WHO European Food and Nutrition Action Plan and other key WHO documents (such as the Report of the Commission on Ending Childhood Obesity)? *According to the World Health Assembly resolution WHA63.14, marketing policy should aim to reduce the impact on children of marketing of foods high in saturated fats, trans fatty acids, free sugars or salt by reducing both exposure of children to, and power of, marketing of foods high in these nutrients, with uniform implementation across all implementing bodies. The policy should include settings where children gather. The government should be the key stakeholder in developing the policy including implementation, monitoring and evaluation, and enforcement systems should be in place including clear definitions of sanctions. Additional details available at: http://apps.who.int/iris/bitstream/10665/44416/1/9789241500210_eng.pdf* *Part of Objective 1 EU Action plan: Establish strong measures to reduce the overall impact on children of all forms of marketing of foods high in energy, saturated fat, trans fats, sugar or salt.*	10: Strong support (e.g., includes support for government-led action of marketing to children and adolescents, related to power and exposure) 5: Weak support (e.g., includes support for government-led action of marketing to children or adolescents, related to either power or exposure,) 0: No details available -5: Somewhat opposed (e.g., opposes government-led efforts to restrict some aspects of promotion to children / adolescents) -10: Strongly opposed (e.g., opposes any actions to reduce promotion to children)

Indicator ID	Domain and indicator	Scoring
	Experience suggests that self-regulatory, voluntary approaches have loopholes and government leadership is required.	
M-ACCESS	**Product accessibility**	**Maximum total points = 60**
M-ACCESS1	Does the company make a commitment to address the price / affordability of its healthier products relative to its unhealthy products? (if applicable, i.e. if company has both 'healthy' and 'unhealthy' products)	10: Clear and specific targets for the whole business, published and applied in Europe or multiple European countries 7.5: Clear and specific targets for whole business, not published and applied 5: Broad commitment, published and applied in Europe or multiple European countries 2.5: Broad commitment, not published or applied 0: No commitment/ no information available to the research team
M-ACCESS2	Does the company have a policy to increase the number/proportion of healthy products in the company's portfolio?	10: Clear and specific commitment to increase the proportion of healthy products across portfolio, published and applied in Europe or multiple European countries 7.5: Clear and specific commitment to increase the proportion of healthy products across portfolio, not published and applied 5: General commitment to increasing the number of healthy products across the portfolio, published, and applied in Europe or multiple European countries 2.5: General commitment to increasing the number of healthy products across the portfolio, not published or applied 0: No commitment / no information
M-ACCESS3	Does the company make a clear and specific commitment to increase the availability of **healthy** products in settings?	5: Yes, published and clear commitment for a range of key settings (including remote communities, schools, hospitals and community events)

Indicator ID	Domain and indicator	Scoring
		2.5: Yes, not published or clear commitment for some specific settings (e.g, schools, remote communities, community events or hospitals) 1: Some commitment applicable to one setting (e.g., schools, remote communities, community events or hospitals) 0: No commitment / no information
M-ACCESS4	Does the company make a clear and specific commitment to decrease the availability of **unhealthy** products in settings?	5: Yes, published and clear commitment for a range of key settings (including remote communities, schools, hospitals and community events) 2.5: Yes, not published or clear commitment for some specific settings (e.g, schools, remote communities, community events or hospitals) 1: Some commitment applicable to one setting (e.g., schools, remote communities, community events or hospitals) 0: No commitment / no information
	Classification system	
M-ACCESS5.1	What system / criteria (e.g., product classification system or nutrient profiling system) does the company use to classify the healthiness of products for the purposes of **food pricing, distribution and/or availability**?	10: Adopted an official classification system (developed by WHO, PAHO, national government, etc.) 5: Developed own system that has been validated and shows strong alignment with official classification systems / dietary guidelines, published in peer-reviewed literature 2.5: Developed own system that has been validated and shows alignment with official classification systems / dietary guidelines, not published in peer-reviewed literature 0: No information / poor alignment / does not have a system
M-ACCESS5.2	If a proprietary product classification system has been developed, which products, nutrients and food characteristics are covered, and what are the details?	[Information only, not to be scored]
	Policy position in relation to fiscal policies	
M-ACCESS6.1	Does the company publish its policy position (in relation to government policy) on fiscal policies to make healthier foods relatively cheaper and unhealthy foods relatively more expensive?	10: Yes, on own website 5: Yes, on industry association website 0: Not publicly available

Indicator ID	Domain and indicator	Scoring
M-ACCESS6.2	Does the company's policy position support WHO's position on fiscal policies to make healthier foods relatively cheaper and unhealthy foods relatively more expensive, as articulated in the WHO Global Action Plan for NCDs, the WHO European Food and Nutrition Action Plan and the Report of the Commission on Ending Childhood Obesity, Recommendation 1.2)? *(ECHO Statement on Recommendation 1.2: Implement an effective tax on sugar-sweetened beverages.)* *(Global Action Plan: consider economic tools that are justified by evidence, and may include taxes and subsidies, that create incentives for behaviours associated with improved health outcomes, improve the affordability and encourage consumption of healthier food products and discourage the consumption of less healthy options.)* *(Part of Objective 1 EU Action plan: Consider the range of economic tools, including supply chain incentives, targeted subsidies and taxes, that could decrease or increase price, notably at point of purchase, and that could improve the affordability of a healthy diet and discourage the consumption of food products high in energy, saturated fats, trans fats, sugar or salt.)*	10: Strong support (e.g., includes support for taxes on unhealthy foods, broadly defined, as well as subsidies for healthy foods) 5: Weak support (e.g., includes support for taxes on unhealthy foods, narrowly defined, or subsidies for healthy foods) 0: No details available -10: Strongly opposed (e.g., opposes soft drinks tax or unhealthy foods tax OR both taxes)
M-RELAT	**Relationships with other organisations**	**Maximum total points = 90**
M-RELAT1	Does the company publish details of the **professional organisations** (e.g., professional associations for nutrition or dietetics, physical activity or exercise organisations, medical organisations or societies, etc.) and/or scientific events (e.g.,	10: Yes, information on European activity or activity in multiple European countries is publicly available (website or document) in a consolidated and cumulative form OR active declaration/policy stating no activity in this area (either publicly available or disclosed to INFORMAS team)

Indicator ID	Domain and indicator	Scoring
	conferences) it funds or supports, including awards/prizes, making clear the nature of that support?	5: Yes, information is available, but is not consolidated and easy to locate OR information is available at the global level only OR comprehensive information about their activities in the area provided to the project team 0: No information available / provided
M-RELAT2	Does the company publish details of the **external research** (e.g., conducted by individuals/groups/organisations) it funds or supports, including awards/prizes?	10: Yes, information on European activity or activity in multiple European countries is publicly available (website or document) in a consolidated and cumulative form OR active declaration/policy stating no activity in this area (either publicly available or disclosed to INFORMAS team) 5: Yes, information is available, but is not consolidated and easy to locate OR information is available at the global level only OR comprehensive information about their activities in the area provided to the project team 0: No information available / provided
M-RELAT3	**For philanthropic funding,** does the company publish details of the groups or organisations it funds or supports?	10: Yes, information on European activity or activity in multiple European countries is publicly available (website or document) in a consolidated and cumulative form OR active declaration/policy stating no activity in this area (either publicly available or disclosed to INFORMAS team) 5: Yes, information is available, but is not consolidated and easy to locate OR information is available at the global level only OR comprehensive information about their activities in the area provided to the project team 0: No information available / provided
M-RELAT4.1	Does the company publish details of the **nutrition education / healthy diet oriented programs** it funds or supports?	10: Yes, information on European activity or activity in multiple European countries is publicly available (website or document) in a consolidated and cumulative form OR active declaration/policy stating no activity in this area (either publicly available or disclosed to INFORMAS team) 5: Yes, information is available, but is not consolidated and easy to locate OR information is available at the global level only OR comprehensive information about their activities in the area provided to the project team 0: No information available / provided

Indicator ID	Domain and indicator	Scoring
M-RELAT4.2	**For nutrition education / health diet oriented programs**, does the company have a commitment to align programs to national or regional dietary guidelines?	[Information only, not to be scored]
M-RELAT5	Does the company publish details of the **active lifestyle programs** (sports, physical activity) it funds or supports?	10: Yes, information on European activity or activity in multiple European countries is publicly available (website or document) in a consolidated and cumulative form OR active declaration/policy stating no activity in this area (either publicly available or disclosed to INFORMAS team) 5: Yes, information is available, but is not consolidated and easy to locate OR information is available at the global level only OR comprehensive information about their activities in the area provided to the project team 0: No information available / provided
M-RELAT6	Does the company publish details of its involvement in public-private partnerships and/or joint ventures with government organisations / agencies? (in addition to those covered as part of M-RELAT4.1 and M-RELAT5)	10: Yes, information on European activity or activity in multiple European countries is publicly available (website or document) in a consolidated and cumulative form OR active declaration/policy stating no activity in this area (either publicly available or disclosed to INFORMAS team) 5: Yes, information is available, but is not consolidated and easy to locate OR information is available at the global level only OR comprehensive information about their activities in the area provided to the project team 0: No information available / provided
M-RELAT7	Does the company publish details of its political donations? (when not prohibited by government policy)	10: Yes, information on European-level activity is publicly available (on a company website or document) OR declaration of no activity in this area 5: Yes, for specific European countries only OR actively declares no activity in some countries 0: No
M-RELAT8	Does the company publish its membership / support for / ownership of industry associations, think tanks, interest groups, community organisations or other organisations that	10: Yes, information on European activity or activity in multiple European countries is publicly available (website or document) in a consolidated and cumulative form OR active declaration/policy stating no activity in this area (either publicly available or disclosed to INFORMAS team)

Indicator ID	Domain and indicator	Scoring
	lobby in relation to population nutrition and/or obesity and NCD issues?	5: Yes, information is available, but is not consolidated and easy to locate OR information is available at the global level only OR comprehensive information about their activities in the area provided to the project team 0: No information available / provided
M-RELAT9	Does the company make publicly available its submissions (or submissions with which the company is associated, such as through industry associations) to public consultations regarding relevant population nutrition policies?	10: Yes, on company website or in a document that is publicly available or available upon request OR active declaration/policy stating no activity in this area (either publicly available or disclosed to INFORMAS team) 5: Yes, through industry association/European website/document 0: No
M-RELAT10	Does the company have written policy and guidelines related to any of the above (funding or support for professional organisations, external research, philanthropic funding, nutrition education / healthy diet oriented programs, active lifestyle programs), including details of how it will be involved in these activities?	[Information only, not to be scored]

Annex 3 Table 2: Indicators and scoring criteria for supermarkets

Indicator ID	Domain and indicator	Scoring
S-STRAT	**Corporate strategy**	**Maximum total points = 30**
S-STRAT1	Does the supermarket have an overarching commitment to improving population nutrition and health articulated in strategic documents (e.g., corporate strategy document, corporate responsibility reports)?	10: Yes, a specific commitment to improving population nutrition and health, at the European level or at the global level with reference to the European market or multiple European countries, publicly available in strategic documents 7.5: Yes, a specific global commitment to improving population nutrition and health, publicly available in strategic documents 5: Yes, a European- or global- level commitment, but not publicly-available, OR general reference to nutrition and health as part of general corporate strategy 0: No clear commitments to improving population nutrition and health
S-STRAT2	Does the supermarkets commitment to improving population nutrition and health (where it exists) include specific objectives and targets for obesity and NCDs?	(Can be multiple, max of 10 points) 2: Contains specific, measurable, achievable, relevant and time bound (SMART) objectives and targets 2: Recognition or reference to relevant priorities set out in the WHO Global Action Plan for the Prevention and Control of NCDs 2013 - 2020, the WHO European Food and Nutrition Action Plan 2015 – 2020, the Sustainable Development Goals, or the WHO Report on Ending Childhood Obesity 2: Recognition or reference to relevant priorities in European policy documents relating to population nutrition and obesity/NCD prevention (e.g. A Strategy for Europe on Nutrition, Overweight and Obesity related health issues; EU Action Plan on Childhood Obesity 2014-2020; Horizon 2020; Fruit and vegetable regime) 2: Comprehensive in nature (e.g., includes three or more domains in this document, such as formulation, marketing and labelling) 2: Key Performance Indicators (KPIs) (and/or remuneration) of management linked to nutrition strategy/policy/targets

Indicator ID	Domain and indicator	Scoring
S-STRAT3	Does the supermarket regularly publish details of its approach to population nutrition and health related to obesity and NCDs?	10: Regular, publicly available reports including reporting against objectives and targets, a clear outlook of future plans and challenges, external verification / review, and that specifically refers to Europe or multiple European countries 7.5: Regular, publicly available global reports with no specific reference to Europe or European countries 5: Annual reports including some of the relevant information 2.5: Irregular reporting 0: None published
S-FORM	**Product formulation (own-brand products only)**	**Maximum total points = 95**
S-FORM1	Does the supermarket publish a comprehensive set of commitments or objectives related to new product development and reformulating its existing products with respect to reducing the nutrients of concern and energy (salt/sodium, saturated fats, trans fats, added sugar and kilojoules/portion size)?	10: Yes, specific European commitments/objectives or specific global commitments/objectives that include specific reference to multiple European countries, publicly available 7.5: Yes, specific global commitments/objectives that are publicly available 5: Has specific European commitments/objectives or specific global commitments/objectives with reference to multiple European countries, but not publicly available 2.5: Has European or global-level commitments/objectives in this area that are available publicly, but these commitments/objectives are vague and non-specific OR has global commitments/objectives but not publicly available 0: No commitment/ no policy information available to the research team
S-FORM2	Is the supermarket a signatory to European and/or global industry initiatives on product reformulation or do they commit to voluntary programs on product reformulation? *(e.g. IFBA commitments on reformulation)*	5: Yes, and noted on company website / annual reports 2.5 Yes, but not noted on company website / annual reports (e.g. government/ NGO/ industry organisation's website or disclosed directly to INFORMAS) 0: No
	Salt/sodium (only assess where relevant to a company's product portfolio and if not mandatory according to European government policy) REMARK: In some EU countries there may be policies in place	

Indicator ID	Domain and indicator	Scoring
S-FORM3.1	Has the supermarket set a target/targets or provided detailed evidence of having taken substantive action to reduce/reach lower levels of salt/sodium in products?	10: Set SMART targets or provided detailed evidence of having taken significant action in all key categories/subcategories, published 5: Targets (not necessarily SMART) set or significant action taken in some key products/sub-categories/not published 2.5: General or vague commitment to reducing levels of salt/sodium in products, published or disclosed to INFORMAS team 0: No target / no information
S-FORM3.2	When is the baseline year and target year? What are the targets?	[Information only, not to be scored]
	Trans and saturated fats (only assess where relevant to a company's product portfolio and if not mandatory according to European government policy, not applicable to beverage industry) REMARK: In some EU countries there may be policies in place, e.g. Denmark	
S-FORM4.1	Has the supermarket set a target/targets or provided detailed evidence of having taken significant action to reduce artificial trans fat added to products during the manufacturing process, and is it applicable to Europe? *!Keep in mind possible upcoming EU regulation on max content of trans fats in foods (open for consultation)*	10: Set a target or provided detailed evidence of having taken significant action to eliminate trans fat in all relevant categories/subcategories, published 5: Set a target or taken significant action to eliminate/reduce in some relevant products/sub-categories/not published 2.5: General or vague commitment to reducing/eliminating use of trans fats in products, published or disclosed to INFORMAS team 0: No target / no information
S-FORM4.2	When is the baseline year and target year? What are the targets?	[Information only, not to be scored]
S-FORM5.1	Has the supermarket set a target/targets or provided detailed evidence of having taken substantive action to reduce/reach lower levels of saturated fats, and is it applicable to Europe?	10: Set SMART targets or provided detailed evidence of having taken significant action in all key categories/subcategories, published 5: Targets (not necessarily SMART) set or taken significant action in some key products/sub-categories/not published 2.5: General or vague commitment to reducing use of saturated fats in products, published or disclosed to INFORMAS team 0: No target / no information
S-FORM5.2	When is the baseline year and target year? What are the targets?	[Information only, not to be scored]

Indicator ID	Domain and indicator	Scoring
	Added sugars (only assess where relevant to a company's own-brand product portfolio and if not mandatory according to government policy)	
S-FORM6.1	Has the supermarket set a target/targets or provided detailed evidence of having taken substantive action to reduce/reach lower levels of added sugars, and is it applicable to Europe?	10: Set SMART targets or provided detailed evidence of having taken significant action in all key categories/subcategories, published 5: Targets (not necessarily SMART) set or taken significant action in some key products/sub-categories / not published 2.5: General or vague commitment to reducing use of added sugars in products, published or disclosed to INFORMAS team 0: No target / no information
S-FORM6.2	When is the baseline year and target year? What are the targets?	[Information only, not to be scored]
	Portion size (energy content) (only assess where relevant to a company's own-brand product portfolio and if not mandatory according to government policy)	
S-FORM7.1	Does the supermarket have a target/targets or provided detailed evidence of having taken substantive action to reduce the portion size / energy content of single serve snacks, and is it applicable to Europe?	10: Set SMART targets or provided detailed evidence of having taken significant action in all key categories/subcategories, published 5: Targets (not necessarily SMART) set or taken significant action in some key products/sub-categories / not published 2.5: General or vague commitment to reducing portion size / energy content in products, published or disclosed to INFORMAS team 0: No target / no information
S-FORM7.2	When is the baseline year and target year? What are the targets?	[Information only, not to be scored]
	Classification system	
S-FORM8.1	What system / criteria (e.g., product classification system or nutrient profiling system) does the supermarket use to classify the healthiness of products for the purposes of **own-brand product development / reformulation**?	10: Uses government guidelines/government endorsed classification system (where available e.g. WHO Europe nutrient profile model) 7.5**: Publicly** available system, developed in consultation with experts and in line with government guidelines, published in peer reviewed literature

Indicator ID	Domain and indicator	Scoring
		5: **Publicly** available system, developed in consultation with experts and in line with government guidelines (not published in peer reviewed literature) 2.5: **Publicly** available system with no details of development/alignment with government guidelines OR **not publicly** available but developed in consultation with experts and aligned with government guidelines 0: No information / poor alignment / does not have a system
S-FORM8.2	If a proprietary product classification system has been developed, which products, nutrients and food characteristics are covered, and what are the details?	[Information only, not to be scored]
	Policy position on reformulation	
S-FORM9.1	Does the supermarket publish its policy position (in relation to government policy) on **own-brand product reformulation?**	10: Yes, on own website 5: Yes, on industry association website 2.5: Policy position made available to INFORMAS team 0: Not publicly available
S-FORM9.2	Does the supermarkets policy position support WHO's position on **product reformulation** in relation to nutrients of concern, as articulated in the Global Action Plan for the Prevention and Control of NCDs 2013-2020 or the WHO European Food and Nutrition Action Plan 2015–2020?	10: Support for government-led efforts to reformulate the food supply in relation to several nutrients of concern 5: Support for government-led efforts to reformulate the food supply in relation to only one nutrient of concern 0: No details available -5: Somewhat opposed (e.g., opposes some aspects of implementation of government-led efforts to reformulate the food supply) -10: Opposed to government-led efforts to reformulate the food supply in relation to nutrients of concern
S-LABEL	**Nutrition labelling**	**Maximum total points = 150**
	General nutrition labelling information	

Indicator ID	Domain and indicator	Scoring
S-LABEL1	Does the supermarket commit to provide on-pack information on trans fat content **for own-brand products?**	2.5: Yes, on all relevant products 1: Yes, on some products 0: No commitment / no information available to the research team N/A: if commitment to eliminate use of all industrially produced trans fat across portfolio
S-LABEL2	Does the supermarket commit to provide on-pack information on added sugar content **for own-brand products?**	2.5: Yes, on all relevant products 1: Yes, on some products 0: No commitment / no information available to the research team
S-LABEL3	Does the supermarket provide nutrition information online **for own brand products**?	10: Yes, comprehensive nutrition information (calories, sodium, saturated fat, total fat, sugar) for most (>80%) products, including on a per 100g/100ml basis 7.5: Yes, comprehensive nutrition information (calories, sodium, saturated fat, total fat, sugar) for most (>80%) products, OR comprehensive nutrition information for all products per serving only 5: Comprehensive nutrition information for some (>50%) products 2.5: Limited nutrition information (i.e. does not include calories, sodium, saturated fat, total fat or sugar) for some (>50%) items 0: <50% of products or no information
M-LABEL4	Does the company have a policy to provide information on food composition to the EU commission, on request? (if applicable, e.g., information has been requested by government)	5: Yes, all products (published or not published) 2.5: Yes, some products 0: No policy / no information available to the research team
	Front of pack (FOP) nutrition labelling (own brand products only)	
S-LABEL5.1	**IF A VOLUNTARY GOVERNMENT-ENDORSED FOP NUTRITION LABELLING SCHEME EXISTS:** Does the supermarket have a published commitment to rolling out a government endorsed FOP labelling system on **own brand** products? (e.g. Nutri-Score, Traffic light)	10: Yes, with implementation plan across all product categories (published or unpublished) 7.5: Yes, with implementation plan across a selection of product categories (published or unpublished) 5: Yes, but with no specific implementation plan (published or unpublished) 0: No commitment / no information available to the research team

Indicator ID	Domain and indicator	Scoring
S-LABEL5.2	If the supermarket **does not commit to full implementation of a government endorsed FOP labelling system**, what FOP labelling system does the supermarket use? Remark: Own FOP labelling systems do hamper the development and implementation of government endorsed FOP labelling systems	10: Interpretive information (such as, stars, traffic lights, warning labels, etc.), applied across all product categories 7.5: Symbols or logos that indicate healthy products, applied across all product categories 5: Numeric information with % of recommended daily intake, applied across all product categories 2.5: Numeric information on levels of key nutrients, not showing % of recommended daily intake, applied across all product categories 0: No FOP labelling used **DIVIDE POINTS IN HALF IF ONLY USED FOR SOME PRODUCTS / CATEGORIES** **N/A if full implementation of government endorsed system**
	Policy position on front of pack nutrition labelling	
S-LABEL6.1	Does the supermarket publish its policy position (in relation to government policy) on front of pack nutrition labelling?	10: Yes, on own website 5: Yes, on industry association website 2.5: Policy position made available to INFORMAS team 0: Not publicly available
S-LABEL6.2	Does the supermarkets policy position (in relation to government policy) support WHO's position on front of pack nutrition labelling, as articulated in the WHO Report of the Commission on Ending Childhood Obesity (Recommendation 1.7) or the WHO European Food and Nutrition Action Plan? *(Statement on Recommendation 1.7: Implement interpretive front-of-pack labelling, supported by public education of both adults and children for nutrition literacy)* *(EU Action plan: Increase consumer-friendly labelling by establishing easy-to-understand or interpretative front - of*	10: Strong support (with a focus on "interpretive" to mean readily understandable and providing easy comparison of products e.g. using traffic light colours or stars to compare products for those with low nutritional literacy; broadly implemented) 5: Weak support (e.g., supports scheme that only provides limited interpretive information, such as % Daily Intake Guide for energy content only) 0: No details available -5: Somewhat opposed (e.g., opposes some aspects of implementation of an interpretive scheme) -10: Strongly opposed (e.g., opposes interpretive labelling)

Indicator ID	Domain and indicator	Scoring
	package labels that help consumers to identify healthier options)	
	Health and nutrition claims	
S-LABEL7	Does the supermarket state that it will place a health claim on a product (or use a health claim as part of product advertising) only when the product is 'healthy'?	10: Yes, commitment is published 5: Yes, commitment is not published 0: No commitment /no information available to the research team
S-LABEL8	Does the supermarket state that it will place a nutrition claim on a product (or use a nutrition claim as part of product advertising) only when the product is 'healthy'?	10: Yes, commitment is published 5: Yes, commitment is not published 0: No commitment / no information available to the research team
S-LABEL9.1	What system / criteria (e.g., product classification system or nutrient profiling system) does the supermarket use to classify the healthiness of own-brand products for the purposes of **health and/or nutrition claims?**	10: Adopted an official classification system (developed by WHO, PAHO, national government, etc.) 5: Developed own system that has been validated and shows strong alignment with official classification systems / dietary guidelines, published in peer-reviewed literature 2.5: Developed own system that has been validated and shows alignment with official classification systems / dietary guidelines, not published in peer-reviewed literature 0: No information / poor alignment / does not have a system
S-LABEL9.2	If a proprietary product classification system has been developed, which products, nutrients and food characteristics are covered, and what are the details?	[Information only, not to be scored]
	Nutrition labelling in-store / in-store nutrition education	
S-LABEL10	Does the supermarket use shelf tags that provide summary nutrition information (apart from possible FOP labelling)? *(e.g. Guiding Stars, Health Star Rating, nutritioniQ, NuVal)*	10: Yes, labelling system used for **all** product categories, classification based on an official classification system (developed by WHO, PAHO, national government, etc.). 7.5: Yes, labelling system used for **some** product categories, classification based on an official classification system (developed by WHO, PAHO, national government, etc.). 5: Yes, labelling system used for **all** product categories, classification based on own system that has been validated and shows strong alignment with official classification systems / dietary guidelines, published in peer-reviewed literature.

Indicator ID	Domain and indicator	Scoring
		2.5: Yes, labelling system used for **some** product categories, classification based on own system that has been validated and shows strong / moderate alignment with official classification systems / dietary guidelines, not published in peer-reviewed literature 0: No
S-LABEL11	Does the supermarket provide summary nutrition information online? *(e.g. Nutri-Score, NuVal)*	10: Yes, labelling system used for **all** product categories, classification based on an official classification system (developed by WHO, PAHO, national government, etc.). 7.5: Yes, labelling system used for **some** product categories, classification based on an official classification system (developed by WHO, PAHO, national government, etc.). 5: Yes, labelling system used for **all** product categories, classification based on own system that has been validated and shows strong alignment with official classification systems / dietary guidelines, published in peer-reviewed literature. 2.5: Yes, labelling system used for **some** product categories, classification based on own system that has been validated and shows strong / moderate alignment with official classification systems / dietary guidelines, not published in peer-reviewed literature 0: No
S-LABEL12	Does the supermarket have an ongoing nutrition/healthy eating education program in-store? (e.g., dietitians in stores, nutrition education materials, etc.)	5: Yes, in all/most stores 2.5: Seasonal /intermittent programs only, or only in some selected stores 1: Actively considering/engaged in options for nutrition/healthy eating education programs 0: No
	Menu labelling (if takeaway/ready to eat foods prepared on site; <u>if not: Non-applicable</u>)	
S-LABEL13.1	Does the supermarket commit to disclose nutrition information (e.g., on menus) for takeaway or ready-to-eat foods that are prepared on site?	10: Yes, relates to all menu items and commitment is publicly available 7.5: Yes, relates to all menu items, commitment is not publicly available 5: Yes, relates to some menu items and commitment is publicly available 2.5: Yes, relates to some menu items, commitment is not publicly available 0: No commitment / no information available to the research team
S-LABEL13.2	What nutrition information does the supermarket commit to providing (e.g., on menus) for takeaway or ready-to-eat foods that are prepared on site?	*Up to 10 points maximum:* 5: Energy / calories 5: Symbol or logo indicating 'healthy' items 2: Sodium/salt

Indicator ID	Domain and indicator	Scoring
	(only applicable if not government mandated and if these services are offered in store)	2: Saturated fat 2: Total fat 2: Trans fat 2: Sugar
S-LABEL13.3	If energy / calorie information is displayed, does the supermarket provide a contextual statement regarding the number of kJ / calories that should be consumed in a day for the average adult to maintain a healthy weight?	5: Yes 0: No N/A where mandated by government policy
S-LABEL14	Does the supermarket publish its policy position (in relation to government policy if government policy exists) on **menu labelling?**	10: Yes, on own website 5: Yes, on industry association website 2.5: Policy position made available to INFORMAS team 0: Not publicly available
S-PROMO	**Product and brand promotion**	**Maximum total points = 160**
	Promotion to children and adolescents– broadcast media	
S-PROMO1.1	Does the supermarket have an explicit policy to reduce the exposure of children to unhealthy food marketing on broadcast media (TV, radio)? (*Note: check if the supermarket supports the EU Pledge. If yes and no other comments, then EU pledge is scored)*	10: Yes, European policy or policy that refers to multiple European countries and noted on company website / annual reports 7.5: Yes, global policy and noted on company website / annual reports 5: Yes, European policy or policy that refers to multiple European countries, but not noted on company website / annual reports OR noted on industry association website 2.5: Yes, global policy but not noted on company website / annual reports 0: No policy/ no information available to the research team
S-PROMO1.2	To what age group(s) does the broadcast marketing policy apply? (*Note: check if the supermarket supports the EU Pledge. If yes and no other comments, then EU pledge is scored)*	10: 18 years and under 8: 16 years and under 6: 14 years and under 4: 12 years and under

Indicator ID	Domain and indicator	Scoring
		2: Under 10 years 0: No policy / no information
S-PROMO1.3	How is the 'target audience' or 'audience exposed' defined? (*Note: check if the supermarket supports the EU Pledge. If yes and no other comments, then EU pledge is scored)*	10: Time-based restrictions, based on children's peak viewing times (e.g., no advertising before 9:00pm) 5: Based on a percentage of the children's audience that are likely to be viewing (e.g. if >10% of total children are watching) 2.5: Based on a percentage of the audience that are likely to be children (e.g., if >10% of audience are children) 1: Children's programmes only 0: No explicit threshold / definition
	Promotion to children and adolescents – non-broadcast media	
S-PROMO2.1	Does the supermarket have an explicit policy to reduce the exposure of children to unhealthy food marketing on non-broadcast media (including websites, DVDs/games, social media, print media, product placement, outdoor marketing, in store marketing / point of sales marketing)? (*Note: check if the supermarket supports the EU Pledge. If yes and no other comments, then EU pledge is scored)*	10: Yes, European policy or policy that refers to multiple European countries and noted on company website / annual reports 7.5: Yes, global policy and noted on company website / annual reports 5: Yes, European policy or policy that refers to multiple European countries, but not noted on company website / annual reports OR noted on industry association website 2.5: Yes, global policy but not noted on company website / annual reports 0: No policy/ no information available to the research team [Information only – what specific media channels are included]
S-PROMO2.2	To what age group(s) does the non-broadcast marketing policy apply? (*Note: check if the supermarket supports the EU Pledge. If yes and no other comments, then EU pledge is scored)*	10: 18 years and under 8: 16 years and under 6: 14 years and under 4: 12 years and under 2: Under 10 years 0: No policy / no information
	Promotion to children and adolescents – general	

Indicator ID	Domain and indicator	Scoring
S-PROMO3.1	Does the supermarket pledge not to use celebrities in marketing of products to children other than those that meet the company's healthy standard? (*Note: check if the supermarket supports the EU Pledge. If yes and no other comments, then EU pledge is scored)*	5: All forms of marketing 2.5: Some forms of marketing (e.g., excludes packaging) or applies only to those characters that appeal primarily to children 0: No policy / no information available to the research team
S-PROMO3.2	Does the supermarket pledge not to use fantasy and animation characters with a strong appeal to children in marketing of products other than those that meet the company's healthy standard? (*Note: check if the supermarket supports the EU Pledge. If yes and no other comments, then EU pledge is scored)*	5: All forms of marketing (includes no use of characters with strong appeal to children across **all** forms of marketing) 2.5: Some forms of marketing (includes no use of characters with strong appeal to children across **some** forms of marketing) 0: No policy / no information available to the research team
S-PROMO3.3	Does the supermarket commit to not use premium offers (e.g., promotional toys, games, vouchers and competitions) in marketing of products other than those that meet the company's healthy standard? (*Note: check if the supermarket supports the EU Pledge. If yes and no other comments, then EU pledge is scored)*	5: All forms of marketing 2.5: Some forms of marketing (e.g., excludes packaging) 0: No commitment / no information available to the research team
S-PROMO4	Does the supermarket audit/monitor its compliance with its policy on marketing to children at the? *(Note: check if the company supports the EU Pledge. If yes and no other comments, then EU pledge is scored)*	5: Yes, the policy is audited by an independently appointed third party 2.5: Yes, the policy independently audited 1: No, the policy is not independently audited 0: No auditing is conducted
	Classification system	
S-PROMO5.1	What system / criteria (e.g., product classification system or nutrient profiling system) does the supermarket use to classify the healthiness of products for the purposes of **promotion to children and adolescents**?	10: Adopted an official classification system (developed by WHO, PAHO, national government, etc.) 5: Developed own system that has been validated and shows strong alignment with official classification systems / dietary guidelines, published in peer-reviewed literature 2.5: Developed own system that has been validated and shows alignment with official classification systems / dietary guidelines, not published in peer-reviewed literature 0: No information / poor alignment / does not have a system

Indicator ID	Domain and indicator	Scoring
S-PROMO5.2	If a proprietary product classification system has been developed, which products, nutrients and food characteristics are covered, and what are the details?	[Information only, not to be scored]
	Policy position on marketing of unhealthy foods	
S-PROMO6.1	Does the supermarket publish its policy position (in relation to government policy) on reducing the exposure of children and /or adolescents to, and the power of, the marketing of unhealthy foods?	10: Yes, on own website 5: Yes, on industry association website 0: Not publicly available
S-PROMO6.2	Does the supermarkets policy position support WHO's position on **government-led** policy action related to reducing the exposure of children and adolescents to, and the power of, the marketing of unhealthy foods, as articulated in the WHO Global Action Plan for NCDs, the WHO European Food and Nutrition Action Plan and other key WHO documents (such as the Report of the Commission on Ending Childhood Obesity)? *According to the World Health Assembly resolution WHA63.14, marketing policy should aim to reduce the impact on children of marketing of foods high in saturated fats, trans fatty acids, free sugars or salt by reducing both exposure of children to, and power of, marketing of foods high in these nutrients, with uniform implementation across all implementing bodies. The policy should include settings where children gather. The government should be the key stakeholder in developing the policy including implementation, monitoring and evaluation, and*	10: Strong support (e.g., includes **support for government-led** action of marketing to children and adolescents, related to power and exposure) 5: Weak support (e.g., includes support for government-led action of marketing to children or adolescents, related to either power or exposure,) 0: No details available -5: Somewhat opposed (e.g., opposes government-led efforts to restrict some aspects of promotion to children / adolescents) -10: Strongly opposed (e.g., opposes any actions to reduce promotion to children)

Indicator ID	Domain and indicator	Scoring
	enforcement systems should be in place including clear definitions of sanctions. Additional details available at: http://apps.who.int/iris/bitstream/10665/44416/1/9789241500210_eng.pdf *Part of Objective 1 EU Action plan: Establish strong measures to reduce the overall impact on children of all forms of marketing of foods high in energy, saturated fat, trans fats, sugar or salt. Experience suggests that self-regulatory, voluntary approaches have loopholes and government leadership is required.*	
	Promotion to all consumers	
S-PROMO7	Does the supermarket have a marketing policy to reduce the power and exposure of all consumers to unhealthy food marketing?	5: Yes, and noted on company website / annual reports 2.5 Yes, but not noted on company website / annual reports 0: No policy / no information available to the research team
S-PROMO8	To which media / settings does the marketing policy (related to all consumers) apply?	(Can be multiple) 5: Broadcast media (TV, Radio) 5: Non-broadcast media (including websites, DVDs/games, social media, print media, product placement, outdoor marketing)
S-PROMO9	Does the supermarket have a policy to limit their in-store promotion of unhealthy products?	10: Yes, published policy commits to only promote healthy products in-store 7.5: Yes, published policy commits to ensuring that a minimum proportion of in-store promotion is for healthy products 5: Policy exists, but not published 0: No policy / no information available to the research team
S-PROMO10	Does the supermarket have a policy on the proportion of healthy (compared with unhealthy foods) foods promoted in their regular catalogues/circulars?	10: Yes, published policy commits to only promote healthy products in regular catalogues/circulars 7.5: Yes, published policy commits to ensuring that a minimum proportion of products promoted in regular catalogues/circulars is for healthy products

Indicator ID	Domain and indicator	Scoring
		5: Policy exists, but not published 0: No policy / no information available to the research team
S-PROMO11	Does the supermarket have a policy to link rewards programs or loyalty programs to healthy food items?	5: Yes, published policy commits to link rewards / loyalty schemes to healthy food products 2.5: Yes, published policy commits to link a proportion of rewards / loyalty schemes to healthy food products / not published 0: No policy / no information available to the research team
S-PROMO12	Does the supermarket have a policy to ensure that in-store product presentations, product giveaways or tastings are for healthy products (including giveaways to children)?	5: All presentations, product giveaways or tastings must be for healthy products 2.5: Some presentations or tastings (e.g. those aimed at children) must be for healthy products 0: No policy / no information available to the research team
S-PROMO13	Does the supermarket audit/monitor its compliance with its policy on marketing to all consumers?	5: Yes, the policy is audited by an independently appointed third party 2.5: Yes, the policy independently audited 1: No, the policy is not independently audited 0: No auditing is conducted
	Product classification for promotion to all consumers (including children)	
S-PROMO14.1	What system / criteria (e.g., product classification system or nutrient profiling system) does the supermarket use to classify the healthiness of products for the purposes of **product promotion to all consumers (e.g. in-store catalogues, brochures, flyers, shelf tags, promotional posters)**?	10: Adopted an official classification system (developed by WHO, PAHO, national government, etc.) 5: Developed own system that has been validated and shows strong alignment with official classification systems / dietary guidelines, published in peer-reviewed literature 2.5: Developed own system that has been validated and shows alignment with official classification systems / dietary guidelines, not published in peer-reviewed literature 0: No information / poor alignment / does not have a system
S-PROMO14.2	If a proprietary product classification system has been developed, which products, nutrients and food characteristics are covered, and what are the details?	[Information only, not to be scored]
S-ACCESS	**Product accessibility**	**Maximum total points = 120**

Indicator ID	Domain and indicator	Scoring
S-ACCESS1	Does the supermarket make a commitment to address the price / affordability of healthy products relative to unhealthy products, particularly where there are comparable substitutes?	10: Commitment that standard prices of healthy products are lower than standard prices of comparable unhealthy products 7.5: Commitment that standard prices of **own-brand** healthy products are lower than standard prices of comparable **own-brand** unhealthy products 5: Commitment that standard prices of healthy products are equivalent to standard prices of comparable unhealthy products 2.5: Commitment that standard prices **own-brand** healthy products are equivalent to standard prices of comparable **own-brand** unhealthy products OR broad commitment only (related to own-brand products or other products) 0: No commitment / no information available to the research team
S-ACCESS2	Does the supermarket have a published position on the size and nature of discounts / price promotions applied to healthy and unhealthy foods?	10: Commitment to no price promotions on unhealthy foods 7.5: Commitment to greater levels of discount typically applying to healthy foods compared to unhealthy foods across all food categories 5: Commitment to the same types / levels of discounts typically applying on healthy and unhealthy foods across all food categories 2.5: Commitment to the same types / levels of discounts typically applying on healthy and unhealthy foods for some food categories 0: No policy / no information available to the research team
S-ACCESS3	Does the supermarket make a commitment to limit multi-buy specials (e.g. two for one) on unhealthy foods?	10: Commitment to no multi-buy specials for unhealthy foods 5: Commitment to limit multi-buy specials for unhealthy foods 0: No commitment / no information available to the research team
	Policy position in relation to fiscal policies	
S-ACCESS4.1	Does the supermarket publish its policy position (in relation to government policy) on fiscal policies to make healthier foods relatively cheaper and unhealthy foods relatively more expensive?	10: Yes, on own website 5: Yes, on industry association website 0: Not publicly available
S-ACCESS4.2	Does the supermarkets policy position support WHO's position on fiscal policies to make healthier foods	10: Strong support (e.g., includes support for taxes on unhealthy foods or sugar sweetened beverages, broadly defined, as well as subsidies for healthy foods)

Indicator ID	Domain and indicator	Scoring
	relatively cheaper and unhealthy foods relatively more expensive, as articulated in the WHO Global Action Plan for NCDs, the WHO European Food and Nutrition Action Plan and other key WHO documents (such as the Report of the Commission on Ending Childhood Obesity, Recommendation 1.2)? *(ECHO Statement on Recommendation 1.2: Implement an effective tax on sugar-sweetened beverages.)* *(Global Action Plan: consider economic tools that are justified by evidence, and may include taxes and subsidies, that create incentives for behaviours associated with improved health outcomes, improve the affordability and encourage consumption of healthier food products and discourage the consumption of less healthy options.)* *(Part of Objective 1 EU Action plan: Consider the range of economic tools, including supply chain incentives, targeted subsidies and taxes, that could decrease or increase price, notably at point of purchase, and that could improve the affordability of a healthy diet and discourage the consumption of food products high in energy, saturated fats, trans fats, sugar or salt.)*	5: Weak support (e.g., includes support for taxes on unhealthy foods or sugar sweetened beverages, narrowly defined, or subsidies for healthy foods) 0: No details available -5: Somewhat opposed (e.g., opposes taxes on unhealthy foods or subsidies for healthy foods) -10: Strongly opposed (e.g., opposes all measures in this area)
	Distribution/availability (own-brand products)	

Indicator ID	Domain and indicator	Scoring
S-ACCESS5.1	Does the supermarket have a policy to increase the number/proportion of healthy products in the supermarkets own portfolio?	10: Clear and specific commitment to increase the proportion of healthy products across portfolio, published and applicable to Europe or multiple European countries. 7.5: Clear and specific commitment to increase the proportion of healthy products across portfolio, not published, but applicable to Europe or multiple European countries. 5: General commitment to increasing the number of healthy products across the portfolio, published and applicable to Europe, in multiple European countries or globally 2.5: General commitment to increasing the number of healthy products across the portfolio, not published 0: No commitment / no information
S-ACCESS5.2	Does the supermarket make a clear and specific commitment to increase the availability of **healthy** products in settings?	5: Yes, published and clear commitment for a range of key settings (including remote communities, schools, hospitals and community events) 2.5: Yes, not published or clear commitment for some specific settings (e.g, schools, remote communities, community events or hospitals) 1: Some commitment applicable to one setting (e.g., schools, remote communities, community events or hospitals) 0: No commitment / no information
S-ACCESS5.3	Does the supermarket make a clear and specific commitment to decrease the availability of **unhealthy** products in settings?	5: Yes, published and clear commitment for a range of key settings (including remote communities, schools, hospitals and community events) 2.5: Yes, not published or clear commitment for some specific settings (e.g, schools, remote communities, community events or hospitals) 1: Some commitment applicable to one setting (e.g., schools, remote communities, community events or hospitals) 0: No commitment / no information
	In-store availability initiatives	
S-ACCESS6	Does the supermarket make a clear and specific commitment to dedicate a minimum amount or proportion of shelf space or floor space to healthy products?	10: Clear commitment for whole business, and is published 7.5: Clear commitment for whole business, is not published 5: Broad commitment, is published 2.5: Broad commitment, is not published 0: No commitment / no information available to the research team

Indicator ID	Domain and indicator	Scoring
S-ACCESS7	Does the supermarket make a clear and specific commitment to dedicate a maximum amount or proportion of shelf space or floor space to less healthy products?	10: Clear commitment for whole business, and is published 7.5: Clear commitment for whole business, is not published 5: Broad commitment, is published 2.5: Broad commitment, is not published 0: No commitment / no information available to the research team
S-ACCESS8	Does the supermarket have a policy that checkouts are free from unhealthy items (including confectionery, chocolate and soft drinks)? *(No unhealthy items displayed near the cash register)*	10: Yes, no unhealthy items, applies to all checkouts in stores across Europe 7.5: Yes, no unhealthy items, applies to some checkouts OR limit unhealthy items, applies to all checkouts (in stores across Europe) 5: Limit unhealthy items, applies to some checkouts OR applies to stores in some countries in Europe 2.5: Actively considering/engaged in healthy checkout options 0: No policy / no information available to the research team
S-ACCESS9	Does the supermarket have a published position on the placement of unhealthy items (such as confectionery, chocolate and soft drinks) at end of aisle displays or other high-traffic areas?	10: Yes, no unhealthy items, applies to all high-traffic areas 7.5: Yes, no unhealthy items, applies to some high-traffic areas 5: Limit unhealthy items, applies to all high-traffic areas 2.5: Limit unhealthy items, applies to some high-traffic areas 0: No commitment / no information available to the research team
	Product classification	
S-ACCESS10.1	What system / criteria (e.g., product classification system or nutrient profiling system) does the supermarket use to classify the healthiness of products for the purposes of **product pricing and availability (e.g. dedicated amount of shelf space, product placement at end of aisles/high traffic areas, product placement at checkout)**?	10: Adopted an official classification system (developed by WHO, PAHO, national government, etc.) 5: Developed own system that has been validated and shows strong alignment with official classification systems / dietary guidelines, published in peer-reviewed literature 2.5: Developed own system that has been validated and shows alignment with official classification systems / dietary guidelines, not published in peer-reviewed literature 0: No information / poor alignment / does not have a system
S-ACCESS10.2	If a proprietary product classification system has been developed, which products, nutrients and food characteristics are covered, and what are the details?	[Information only, not to be scored]

Indicator ID	Domain and indicator	Scoring
S-RELAT	**Relationships with other organisations**	**Maximum total points = 90**
S-RELAT1	Does the supermarket publish details of the **professional organisations** (e.g., professional associations for nutrition or dietetics, physical activity or exercise organisations, medical organisations or societies, etc.) and/or scientific events (e.g., conferences) it funds or supports, including awards/prizes, making clear the nature of that support?	10: Yes, information on European activity or activity in multiple European countries is publicly available (website or document) in a consolidated and cumulative form OR active declaration/policy stating no activity in this area (either publicly available or disclosed to INFORMAS team) 5: Yes, information is available, but is not consolidated and easy to locate OR information is available at the global level only OR comprehensive information about their activities in the area provided to the project team 0: No information available / provided
S-RELAT2	Does the supermarket publish details of the **external research** (e.g., conducted by individuals/groups/organisations) it funds or supports, including awards/prizes?	10: Yes, information on European activity or activity in multiple European countries is publicly available (website or document) in a consolidated and cumulative form OR active declaration/policy stating no activity in this area (either publicly available or disclosed to INFORMAS team) 5: Yes, information is available, but is not consolidated and easy to locate OR information is available at the global level only OR comprehensive information about their activities in the area provided to the project team 0: No information available / provided
S-RELAT3	**For philanthropic funding,** does the supermarket publish details of the groups or organisations it funds or supports?	10: Yes, information on European activity or activity in multiple European countries is publicly available (website or document) in a consolidated and cumulative form OR active declaration/policy stating no activity in this area (either publicly available or disclosed to INFORMAS team) 5: Yes, information is available, but is not consolidated and easy to locate OR information is available at the global level only OR comprehensive information about their activities in the area provided to the project team 0: No information available / provided

Indicator ID	Domain and indicator	Scoring
S-RELAT4.1	Does the supermarket publish details of the **nutrition education / healthy diet oriented programs** it funds or supports?	10: Yes, information on European activity or activity in multiple European countries is publicly available (website or document) in a consolidated and cumulative form OR active declaration/policy stating no activity in this area (either publicly available or disclosed to INFORMAS team) 5: Yes, information is available, but is not consolidated and easy to locate OR information is available at the global level only OR comprehensive information about their activities in the area provided to the project team 0: No information available / provided
S-RELAT4.2	**For nutrition education / health diet oriented programs**, does the supermarket have a commitment to align programs to national or regional dietary guidelines?	[Information only, not to be scored]
S-RELAT5	Does the supermarket publish details of the **active lifestyle programs** (sports, physical activity) it funds or supports?	10: Yes, information on European activity or activity in multiple European countries is publicly available (website or document) in a consolidated and cumulative form OR active declaration/policy stating no activity in this area (either publicly available or disclosed to INFORMAS team) 5: Yes, information is available, but is not consolidated and easy to locate OR information is available at the global level only OR comprehensive information about their activities in the area provided to the project team 0: No information available / provided
S-RELAT6	Does the supermarket publish details of its involvement in public-private partnerships and/or joint ventures with government organisations / agencies? (in addition to those covered as part of S-RELAT4.1 and S-RELAT5)	10: Yes, information on European activity or activity in multiple European countries is publicly available (website or document) in a consolidated and cumulative form OR active declaration/policy stating no activity in this area (either publicly available or disclosed to INFORMAS team) 5: Yes, information is available, but is not consolidated and easy to locate OR information is available at the global level only OR comprehensive information about their activities in the area provided to the project team 0: No information available / provided
S-RELAT7	Does the supermarket publish details of its political donations? (when not prohibited by government policy)	10: Yes, information on European-level activity is publicly available (on a company website or document) OR declaration of no activity in this area 5: Yes, for specific European countries only OR actively declares no activity in some countries 0: No

Indicator ID	Domain and indicator	Scoring
S-RELAT8	Does the supermarket publish its membership / support for / ownership of industry associations, think tanks, interest groups, community organisations or other organisations that lobby in relation to population nutrition and/or obesity and NCD issues?	10: Yes, information on European activity or activity in multiple European countries is publicly available (website or document) in a consolidated and cumulative form OR active declaration/policy stating no activity in this area (either publicly available or disclosed to INFORMAS team) 5: Yes, information is available, but is not consolidated and easy to locate OR information is available at the global level only OR comprehensive information about their activities in the area provided to the project team 0: No information available / provided
S-RELAT9	Does the company make publicly available its submissions (or submissions with which the company is associated, such as through industry associations) to public consultations regarding relevant population nutrition policies?	10: Yes, on company website or in a document that is publicly available or available upon request OR active declaration/policy stating no activity in this area (either publicly available or disclosed to INFORMAS team) 5: Yes, through industry association/European website/document 0: No
S-RELAT10	Does the company have written policy and guidelines related to any of the above (funding or support for professional organisations, external research, philanthropic funding, nutrition education / healthy diet oriented programs, active lifestyle programs), including details of how it will be involved in these activities?	[Information only, not to be scored]

Annex 3 Table 3: Indicators and scoring criteria for chain restaurants

Indicator ID	Domain and indicator	Scoring
R-STRAT	**Corporate strategy**	**Maximum total points = 30**
R-STRAT1	Does the chain restaurant have an overarching commitment to improving population nutrition and health articulated in strategic documents (e.g., corporate strategy document, corporate responsibility reports)?	10: Yes, a specific commitment to improving population nutrition and health, at the European level or at the global level with reference to the European market or multiple European countries, publicly available in strategic documents 7.5: Yes, a specific global commitment to improving population nutrition and health, publicly available in strategic documents 5: Yes, a European- or global- level commitment, but not publicly-available, OR general reference to nutrition and health as part of general corporate strategy 0: No clear commitments to improving population nutrition and health
R-STRAT2	Does the chain restaurants commitment to improving population nutrition and health (where it exists) include specific objectives and targets for obesity and NCDs?	(Can be multiple, max of 10 points) 2: Contains specific, measurable, achievable, relevant and time bound (SMART) objectives and targets 2: Recognition or reference to relevant priorities set out in the WHO Global Action Plan for the Prevention and Control of NCDs 2013 - 2020, the WHO European Food and Nutrition Action Plan 2015 – 2020, the Sustainable Development Goals, or the WHO Report on Ending Childhood Obesity 2: Recognition or reference to relevant priorities in European policy documents relating to population nutrition and obesity/NCD prevention (e.g. A Strategy for Europe on Nutrition, Overweight and Obesity related health issues; EU Action Plan on Childhood Obesity 2014-2020; Horizon 2020; Fruit and vegetable regime) 2: Comprehensive in nature (e.g., includes three or more domains in this document, such as formulation, marketing and labelling) 2: Key Performance Indicators (KPIs) (and/or remuneration) of management linked to nutrition strategy/policy/targets
R-STRAT3	Does the chain restaurant regularly publish details of its approach to population nutrition and health related to obesity and NCDs?	10: Regular, publicly available reports including reporting against objectives and targets, a clear outlook of future plans and challenges, external verification / review, and that specifically refers to Europe or multiple European countries

Indicator ID	Domain and indicator	Scoring
		7.5: Regular, publicly available global reports with no specific reference to Europe or European countries 5: Regular reports including some of the relevant information 2.5: Irregular reporting 0: None published
R-FORM	**Product formulation**	**Maximum total points = 100**
R-FORM1	Does the chain restaurant publish a comprehensive set of commitments or objectives related to new product development and reformulating its existing products with respect to nutrients of concern and energy (salt/sodium, saturated fats, trans fats, added sugar and kilojoules/portion sizes)?	10: Yes, specific European commitments/objectives or specific global commitments/objectives that include specific reference to multiple European countries, publicly available 7.5: Yes, specific global commitments/objectives that are publicly available 5: Has specific European commitments/objectives or specific global commitments/objectives with reference to multiple European countries, but not publicly available 2.5: Has European or global-level commitments/objectives in this area that are available publicly, but these commitments/objectives are vague and non-specific OR has global commitments/objectives but not publicly available 0: No commitment/ no policy information available to the research team
R-FORM2	Is the chain restaurant a signatory to European and/or global industry initiatives on product reformulation or do they commit to voluntary programs on product reformulation? *(e.g. IFBA commitments on reformulation)*	5: Yes, and noted on company website / annual reports 2.5 Yes, but not noted on company website / annual reports (e.g. government/ NGO/ industry organisation's website or disclosed directly to INFORMAS) 0: No / no information
	Salt/sodium (only assess where relevant to a company's product portfolio and if not mandatory according to European government policy) REMARK: In some EU countries there may be policies in place	
R-FORM3.1	Has the chain restaurant set a target/targets or provided detailed evidence of having taken substantive action to reduce/reach lower levels of salt/sodium in products, and is it applicable to Europe?	(Can be multiple) 5: Set SMART target or provided detailed evidence of having taken substantive action for children's meals, published (2.5 if not published, or not SMART) 5: Set SMART target or provided detailed evidence of having taken substantive action for other relevant products/sub-categories, published (2.5 if not published, or not SMART) 0: No target / no information
R-FORM3.2	When is the baseline year and target year?	[Information only, not to be scored]

Indicator ID	Domain and indicator	Scoring
	What are the targets?	
	Trans and saturated fats (only assess where relevant to a company's product portfolio and if not mandatory according to European government policy, not applicable to beverage industry) REMARK: In some EU countries there may be policies in place, e.g. Denmark	
R-FORM4.1	Has the chain restaurant set a target/targets or provided detailed evidence of having taken significant action to reduce artificial trans fat added to products during the manufacturing process, and is it applicable to Europe? *!Keep in mind possible upcoming EU regulation on max content of trans fats in foods (open for consultation)*	10: Set a target or provided detailed evidence of having taken significant action to eliminate trans fat in all relevant categories/subcategories, published 5: Set a target or taken significant action to eliminate/reduce in some relevant products/sub-categories/not published 2.5: General or vague commitment to reducing/eliminating use of trans fats in products, published or disclosed to INFORMAS team 0: No target / no information
R-FORM4.2	When is the baseline year and target year? What are the targets?	[Information only, for evidence document, not to be scored]
R-FORM5.1	Has the chain restaurant set a target/targets or provided detailed evidence of having taken substantive action to reduce/reach lower levels of saturated fats, and is it applicable to Europe?	(Can be multiple) 5: Set SMART target or provided detailed evidence of having taken substantive action for children's meals, published (2.5 if not published, or not SMART) 5: Set SMART target or provided detailed evidence of having taken substantive action for other relevant products/sub-categories, published (2.5 if not published, or not SMART) 0: No target / no information
R-FORM5.2	When is the baseline year and target year? What are the targets?	[Information only, for evidence document, not to be scored]
R-FORM5.3	Does the chain restaurant have commitments or taken substantive action to improving the healthiness of oils used in frying foods / frying practices? (if applicable)	5: Does not fry foods, or commits to using non-hydrogenated vegetable oils 0: No commitments / no information available to the research team
	Added sugars (only assess where relevant to a company's product portfolio and if not mandatory according to government policy)	
R-FORM6.1	Has the chain restaurant set a target/targets or provided detailed evidence of having taken substantive action to reduce/reach lower levels of added sugars, and is it applicable to Europe?	(Can be multiple) 5: Set SMART target or provided detailed evidence of having taken substantive action for children's meals, published (2.5 if not published, or not SMART) 5: Set SMART target or provided detailed evidence of having taken substantive action for other relevant products/sub-categories, published (2.5 if not published, or not SMART)

Indicator ID	Domain and indicator	Scoring
		0: No target / no information
R-FORM6.2	When is the baseline year and target year? What are the targets?	[Information only, for evidence document, not to be scored]
	Portion size (energy content) (only assess where relevant to a company's product portfolio and if not mandatory according to government policy)	
R-FORM7.1	Does the chain restaurant have a target/targets or provided detailed evidence of having taken substantive action to reduce portion size / energy content, and is it applicable to Europe?	(Can be multiple) 5: Set SMART target or provided detailed evidence of having taken substantive action for children's meals, published (2.5 if not published, or not SMART) 5: Set SMART target or provided detailed evidence of having taken substantive action for other relevant products/sub-categories, published (2.5 if not published, or not SMART) 0: No target / no information
R-FORM7.2	When is the baseline year and target year? What are the targets?	[Information only, for evidence document, not to be scored]
	Classification system	
R-FORM8.1	What system / criteria (e.g., product classification system or nutrient profiling system) does the chain restaurant use to classify the healthiness of products **for the purposes of product development / reformulation**?	10: Uses government guidelines/government endorsed classification system (where available e.g. WHO Europe nutrient profile model) 7.5**: Publicly** available system, developed in consultation with experts and in line with government guidelines, published in peer reviewed literature 5: **Publicly** available system, developed in consultation with experts and in line with government guidelines (not published in peer reviewed literature) 2.5: **Publicly** available system with no details of development/alignment with government guidelines OR **not publicly** available but developed in consultation with experts and aligned with government guidelines 0: No information / poor alignment / does not have a system
R-FORM8.2	If a proprietary product classification system has been developed, which products, nutrients and food characteristics are covered, and what are the details?	[Information only, not to be scored]
	Policy position on reformulation	

Indicator ID	Domain and indicator	Scoring
R-FORM9.1	Does the chain restaurant publish its policy position (in relation to government policy) on **product reformulation?**	10: Yes, on own website 5: Yes, on industry association website 0: Not publicly available
R-FORM9.2	Does the chain restaurants policy position support WHO's position on **product reformulation** in relation to nutrients of concern, as articulated in the Global Action Plan for the Prevention and Control of NCDs 2013-2020 or the WHO European Food and Nutrition Action Plan 2015 – 2020?	10: Support for government-led efforts to reformulate the food supply in relation to several nutrients of concern 5: Support for government-led efforts to reformulate the food supply in relation to only one nutrient of concern 0: No details available -5: Somewhat opposed (e.g., opposes some aspects of implementation of government-led efforts to reformulate the food supply) -10: Opposed to government-led efforts to reformulate the food supply in relation to nutrients of concern
R-LABEL	**Nutrition labelling**	**Maximum total points = 60**
R-LABEL1	Does the chain restaurant commit to disclose nutrition information on its menus?	10: Yes, relates to all menu items and commitment is publicly available 7.5: Yes, relates to all menu items, commitment is not publicly available 5: Yes, relates to some menu items and commitment is publicly available 2.5: Yes, relates to some menu items, commitment is not publicly available 0: No commitment / no information available to the research team
R-LABEL2.1	What nutrition information does the chain restaurant commit to providing on menus?	*Up to 10 points maximum:* 5: Energy / calories 5: Symbol or logo indicating 'healthy' items according to overall nutritional profile 2: Sodium/salt 2: Saturated fat 2: Total fat 2: Trans fat 2: Sugar
R-LABEL2.2	If energy / calorie information is displayed on menus, does the chain restaurant provide a contextual statement	5: Yes 0: No / no information N/A where mandated by government policy

Indicator ID	Domain and indicator	Scoring
	regarding the number of calories that should be consumed in a day for the average adult to maintain a healthy weight?	
R-LABEL3	Does the chain restaurant provide nutrition information online?	10: Yes, comprehensive nutrition information (calories, sodium, saturated fat, total fat, sugar) for most (>80%) products, including on a per 100g/100ml basis 7.5: Yes, comprehensive nutrition information (calories, sodium, saturated fat, total fat, sugar) for most (>80%) products, or comprehensive nutrition information for all products per serving only 5: Comprehensive nutrition information for some (>50%) products 2.5: Limited nutrition information (i.e. does not include calories, sodium, saturated fat, total fat or sugar) for some (>50%) products 0: <50% of products or no information
R-LABEL4	Does the chain restaurant have a policy that they will provide comprehensive nutrition information in-store?	10: Yes, comprehensive nutrition information (calories, sodium, saturated fat, total fat, sugar) for most (>80%) products, including on a per 100g/100ml basis 7.5: Yes, comprehensive nutrition information (calories, sodium, saturated fat, total fat, sugar) for most (>80%) products, or comprehensive nutrition information for all products per serving only 5: Comprehensive nutrition information for some (>50%) products 2.5: Limited nutrition information (i.e. does not include calories, sodium, saturated fat, total fat or sugar) for some (>50%) products 0: <50% of products or no information
R-LABEL5	Does the chain restaurant have a policy to provide information on food composition to the EU commission, on request? (if applicable, e.g., information has been requested by government)	5: Yes, all products (published or not published) 2.5: Yes, some products 0: No policy / no information available to the research team

Indicator ID	Domain and indicator	Scoring
R-LABEL6	Does the chain restaurant publish its policy position (in relation to government policy) on **menu labelling?**	10: Yes, on own website 5: Yes, on industry association website 2.5: Policy position made available to INFORMAS team 0: Not publicly available
R-PROMO	**Product and brand promotion**	**Maximum total points = 130**
	Broadcast media	
R-PROMO1.1	Does the chain restaurant have an explicit policy to reduce the exposure of children to unhealthy food marketing on broadcast media (TV, radio)? *(Note: check if the company supports the EU Pledge. If yes and no other comments, then EU pledge is scored)*	10: Yes, European policy or policy that refers to multiple European countries and noted on company website / annual reports 7.5: Yes, global policy and noted on company website / annual reports 5: Yes, European policy or policy that refers to multiple European countries, but not noted on company website / annual reports OR noted on industry association website 2.5: Yes, global policy but not noted on company website / annual reports 0: No policy/ no information available to the research team
R-PROMO1.2	To what age group(s) does the broadcast marketing policy apply? *(Note: check if the company supports the EU Pledge. If yes and no other comments, then EU pledge is scored)*	10: 18 years and under 8: 16 years and under 6: 14 years and under 4: 12 years and under 2: Under 10 years 0: No policy / no information
R-PROMO1.3	How is the 'target audience' or 'audience exposed' defined? *(Note: check if the company supports the EU Pledge. If yes and no other comments, then EU pledge is scored)*	10: Time-based restrictions, based on children's peak viewing times (e.g., no advertising before 9:00pm) 5: Based on a percentage of the children's audience that are likely to be viewing (e.g. if >10% of total children are watching) 2.5: Based on a percentage of the audience that are likely to be children (e.g., if >10% of audience are children) 1: Children's programmes only 0: No explicit threshold / definition

Indicator ID	Domain and indicator	Scoring
	Non-broadcast media	
R-PROMO2.1	Does the chain restaurant have an explicit policy to reduce the exposure of children to unhealthy food marketing on non-broadcast media (including websites, DVDs/games, social media, print media, product placement, outdoor marketing, in store marketing / point of sales marketing)? *(Note: check if the company supports the EU Pledge. If yes and no other comments, then EU pledge is scored)*	10: Yes, European policy or policy that refers to multiple European countries and noted on company website / annual reports 7.5: Yes, global policy and noted on company website / annual reports 5: Yes, European policy or policy that refers to multiple European countries, but not noted on company website / annual reports OR noted on industry association website 2.5: Yes, global policy but not noted on company website / annual reports 0: No policy/ no information available to the research team [Information only – what specific media channels are included]
R-PROMO2.2	To what age group(s) does the non-broadcast marketing policy apply? *(Note: check if the company supports the EU Pledge. If yes and no other comments, then EU pledge is scored)*	10: 18 years and under 8: 16 years and under 6: 14 years and under 4: 12 years and under 2: Under 10 years 0: No policy / no information
R-PROMO3	Does the chain restaurant commit not to sponsor children's sporting, cultural or other activities using unhealthy brands (foods or company brands)? *(Note: check if the company supports the EU Pledge. If yes and no other comments, then EU pledge is scored)*	10: Yes, comprehensive commitment including products and brands 5: Yes, comprehensive commitment including products only (brands still permitted) 2.5: Some commitments in the area, including some events or some forms of sponsorship 0: No commitment / no information available to the research team
R-PROMO4	Does the chain restaurant commit not to use marketing in settings where children gather using unhealthy brands (foods or company brands)? *(Note: check if the company supports the EU Pledge. If yes and no other comments, then EU pledge is scored)*	(Can be multiple) 2: Commits IN early childcare settings and primary schools (children up to age 11) 2: Commits NEAR (e.g. within 500m) of early childcare settings and primary schools (children up to age 11) 2: Commits IN secondary schools (children between age 12 and 18) 2: Commits NEAR (e.g., within 500m) of secondary schools (children between age 12 and 18) 2: Commits in other places where children gather (family and child clinics, paediatric services or other health facilities, sporting or recreation centres, or sporting or cultural events held at those premises)

Indicator ID	Domain and indicator	Scoring
	General policies to reduce promotion to children	
R-PROMO5.1	Does the chain restaurant pledge not to use celebrities in marketing of products other than those that meet the chain restaurants healthy standard? *(Note: check if the company supports the EU Pledge. If yes and no other comments, then EU pledge is scored)*	5: All forms of marketing 2.5: Some forms of marketing (e.g., excludes packaging) or applies only to those characters that appeal primarily to children 0: No / no information
R-PROMO5.2	Does the chain restaurant pledge not to use fantasy and animation characters with a strong appeal to children in marketing of products other than those that meet the chain restaurants healthy standard? *(Note: check if the company supports the EU Pledge. If yes and no other comments, then EU pledge is scored)*	5: All forms of marketing (includes no use of characters with strong appeal to children across **all** forms of marketing) 2.5: Some forms of marketing (includes no use of characters with strong appeal to children across **some** forms of marketing) 0: No policy / no information available to the research team
R-PROMO5.3	Does the chain restaurant commit to not use premium offers (e.g., promotional toys, games, vouchers and competitions) in marketing of products (including as part of children's meals) other than those that meet the chain restaurants healthy standard? *(Note: check if the company supports the EU Pledge. If yes and no other comments, then EU pledge is scored)*	5: All forms of marketing 2.5: Some forms of marketing (e.g., excludes packaging) 0: No / no information
R-PROMO6	Does the chain restaurant commit to only advertise or display 'healthy' sides and 'healthy' drinks in children's combination meals in restaurants (for example, on menus and menu boards or in advertisements in restaurants)?	10: Yes, commits to only advertising both healthy sides and healthy drinks for children's meals or does not advertise children's meals 5: Yes, commits to only advertising either healthy sides or health drinks 0: No commitment / no information available to the research team
R-PROMO7	Does the chain restaurant audit/monitor its compliance with its policy on marketing to children at the? *(Note: check if the company supports the EU Pledge. If yes and no other comments, then EU pledge is scored)*	5: Yes, the policy is audited by an independently appointed third party 2.5: Yes, the policy independently audited 1: No, the policy is not independently audited 0: No auditing is conducted
	Classification system	

Indicator ID	Domain and indicator	Scoring
R-PROMO8.1	What system / criteria (e.g., product classification system or nutrient profiling system) does the chain restaurant use to classify the healthiness of products for the purposes of **promotion to children and adolescents**?	10: Adopted an official classification system (developed by WHO, PAHO, national government, etc.) 5: Developed own system that has been validated and shows strong alignment with official classification systems / dietary guidelines, published in peer-reviewed literature 2.5: Developed own system that has been validated and shows alignment with official classification systems / dietary guidelines, not published in peer-reviewed literature 0: No information / poor alignment / does not have a system
R-PROMO8.2	If a proprietary product classification system has been developed, which products, nutrients and food characteristics are covered, and what are the details?	[Information only, not to be scored]
	Policy position on marketing of unhealthy foods to children	
R-PROMO9.1	Does the chain restaurant publish its policy position (in relation to government policy) on reducing the exposure of children and /or adolescents to, and the power of, the marketing of unhealthy foods?	10: Yes, on own website 5: Yes, on industry association website 0: Not publicly available
R-PROMO9.2	Does chain restaurants policy position support WHO's position on government-led policy action related to reducing the exposure of children and adolescents to, and the power of, the marketing of unhealthy foods, as articulated in the WHO Global Action Plan for NCDs, the WHO European Food and Nutrition Action Plan 2015 - 2020 and other key WHO documents (such as the Report of the Commission on Ending Childhood Obesity)? *According to the World Health Assembly resolution WHA63.14, marketing policy should aim to reduce the impact on children of marketing of foods high in saturated fats, trans fatty acids, free sugars or salt by reducing both exposure of children to, and power of, marketing of foods high in these nutrients, with uniform implementation across all*	10: Strong support (e.g., includes support for government-led action of marketing to children and adolescents, related to power and exposure) 5: Weak support (e.g., includes support for government-led action of marketing to children or adolescents, related to either power or exposure) 0: No details available -5: Somewhat opposed (e.g., opposes government-led efforts to restrict some aspects of promotion to children / adolescents) -10: Strongly opposed (e.g., opposes any actions to reduce promotion to children)

Indicator ID	Domain and indicator	Scoring
	implementing bodies. The policy should include settings where children gather. The government should be the key stakeholder in developing the policy including implementation, monitoring and evaluation, and enforcement systems should be in place including clear definitions of sanctions. Additional details available at: http://apps.who.int/iris/bitstream/10665/44416/1/9789241500210_eng.pdf *Part of Objective 1, EU Action plan: Establish strong measures to reduce the overall impact on children of all forms of marketing of foods high in energy, saturated fat, trans fats, sugar or salt. Experience suggests that self-regulatory, voluntary approaches have loopholes and government leadership is required.*	
R-ACCESS	**Product accessibility**	**Maximum total points = 95**
R-ACCESS1	Does the chain restaurant make a commitment to address the price / affordability of its healthy products relative to its unhealthy products?	10: Commitment that standard prices of healthy products are lower than standard prices of comparable unhealthy products, published and applicable to Europe or multiple European countries 7.5: Commitment that standard prices of healthy products are lower than standard prices of comparable unhealthy products, not published or unclear if applicable to Europe or multiple European countries 5: Commitment that standard prices of healthy products are equivalent to standard prices of comparable unhealthy products 2.5: Broad and global commitment, not published 0: No commitment/ no information available to the research team
R-ACCESS2	Does the chain restaurant have a policy that price promotions are used only on healthy products?	10: Policy that all price promotions are for healthy products 5: Policy that factors the healthiness of products into price promotion decisions

Indicator ID	Domain and indicator	Scoring
		2.5: No specific policy in the area, but 'meal deals' include the option of healthy sides and drinks 0: No policy / no information available to the research team
R-ACCESS3	Does the chain restaurant explicitly commit to not use price incentives (such as 'supersizing') that incentivise consumers to purchase larger portion sizes for minimal extra cost?	5: Yes 0: No explicit commitment / no policy information available to the research team
R-ACCESS4	Does the chain restaurant commit to not provide free refills for caloric soft drinks / soda?	5: Yes 0: No commitment / no policy information available to the research team N/A if no free refills available
R- ACCESS5.1	Does the chain restaurant have a policy that 'assigned' or 'default' drink items included as part of *children's combination meals* are healthy items (e.g., water)? IF APPLICABLE	5: Yes, healthy drink items are assigned by default for all children's combination meals 2.5: Yes, healthy drink items are available for children's combination meals, but not by default 0: No commitment/ no policy information available to the research team
R-ACCESS5.2	Does the chain restaurant have a policy that 'assigned' or 'default' drink items included as part of *'non-children's' combination meals* are healthy items (e.g., water)? IF APPLICABLE	5: Yes, healthy drink items are assigned by default for all non-children's combination meals 2.5: Yes, healthy drink items are available for non-children's combination meals, but not by default 0: No commitment/ no policy information available to the research team
R-ACCESS6.1	Does the chain restaurant have a policy that 'assigned' or 'default' side items included as part of *children's combination meals* are healthy items (e.g., salad, fruit, vegetables)? IF APPLICABLE	5: Yes, for all children's meals 2.5: Children's combination meals offer healthy side items as one of the options, but not by default 0: No commitment/ no policy information available to the research team
R-ACCESS6.2	Does the chain restaurant have a policy that 'assigned' or 'default' side items included as part of *'non-children's' combination meals* are healthy items (e.g., salad, vegetables)? IF APPLICABLE	5: Yes, for all other meals (non-children's meals) 2.5: Yes, offer 'healthier' options, but not by default 0: No commitment/ no policy information available to the research team

Indicator ID	Domain and indicator	Scoring
R-ACCESS7	Does the chain restaurant commit to not opening new stores near schools?	(Can be multiple) 5: Commits to not opening a new location near (e.g., within 500m) of primary schools, published (2.5 if not published) 5: Commits to not opening a new location near (e.g., within 500m) of secondary schools, published (2.5 if not published)
R- ACCESS8	Does the restaurant have salt sachets / shakers available only upon request? Is extra salt only available on request?	5: Yes 0: No
	Classification system	
R-ACCESS9.1	What system / criteria (e.g., product classification system or nutrient profiling system) does the chain restaurant use to classify the healthiness of products for the purposes of **product pricing, availability and selection**?	10: Adopted an official classification system (developed by WHO, PAHO, national government, etc.) 5: Developed own system that has been validated and shows strong alignment with official classification systems / dietary guidelines, published in peer-reviewed literature 2.5: Developed own system that has been validated and shows alignment with official classification systems / dietary guidelines, not published in peer-reviewed literature 0: No information / poor alignment / does not have a system
R-ACCESS9.2	If a proprietary product classification system has been developed, which products, nutrients and food characteristics are covered, and what are the details?	[Information only, not to be scored]
	Policy position in relation to fiscal policies	
R-ACCESS10.1	Does the chain restaurant publish its policy position (in relation to government policy) on fiscal policies to make healthier foods relatively cheaper and unhealthy foods relatively more expensive?	10: Yes, on own website 5: Yes, on industry association website 0: Not publicly available
R-ACCESS10.2	Does the chain restaurants policy position support WHO's position on fiscal policies to make healthier foods relatively cheaper and unhealthy foods relatively more expensive, as articulated in the WHO Global Action Plan for NCDs, the WHO European Food and Nutrition Action Plan 2015 - 2020 and other key WHO documents (such as the Report of the	10: Strong support (e.g., includes support for taxes on unhealthy foods, broadly defined, as well as subsidies for healthy foods) 5: Weak support (e.g., includes support for taxes on unhealthy foods, narrowly defined, or subsidies for healthy foods) 0: No details available -5: Somewhat opposed (e.g., opposes taxes on unhealthy foods or subsidies for healthy foods)

Indicator ID	Domain and indicator	Scoring
	Commission on Ending Childhood Obesity, Recommendation 1.2)? *(ECHO Statement on Recommendation 1.2: Implement an effective tax on sugar-sweetened beverages.)* *(Global Action Plan: consider economic tools that are justified by evidence, and may include taxes and subsidies, that create incentives for behaviours associated with improved health outcomes, improve the affordability and encourage consumption of healthier food products and discourage the consumption of less healthy options.)* *(Part of Objective 1 EU Action plan: Consider the range of economic tools, including supply chain incentives, targeted subsidies and taxes, that could decrease or increase price, notably at point of purchase, and that could improve the affordability of a healthy diet and discourage the consumption of food products high in energy, saturated fats, trans fats, sugar or salt.)*	-10: Strongly opposed (e.g., opposes all measures in this area)
R-RELAT	**Relationships with other organisations**	**Maximum total points = 90**
R-RELAT1	Does the chain restaurant publish details of the **professional organisations** (e.g., professional associations for nutrition or dietetics, physical activity or exercise organisations, medical organisations or societies, etc.) and/or scientific events (e.g., conferences) it funds or supports, including awards/prizes, making clear the nature of that support?	10: Yes, information on European activity or activity in multiple European countries is publicly available (website or document) in a consolidated and cumulative form OR active declaration/policy stating no activity in this area (either publicly available or disclosed to INFORMAS team) 5: Yes, information is available, but is not consolidated and easy to locate OR information is available at the global level only OR comprehensive information about their activities in the area provided to the project team 0: No information available / provided

Indicator ID	Domain and indicator	Scoring
R-RELAT2	Does the chain restaurant publish details of the **external research** (e.g., conducted by individuals/groups/organisations) it funds or supports, including awards/prizes?	10: Yes, information on European activity or activity in multiple European countries is publicly available (website or document) in a consolidated and cumulative form OR active declaration/policy stating no activity in this area (either publicly available or disclosed to INFORMAS team) 5: Yes, information is available, but is not consolidated and easy to locate OR information is available at the global level only OR comprehensive information about their activities in the area provided to the project team 0: No information available / provided
R-RELAT3	**For philanthropic funding,** does the chain restaurant publish details of the groups or organisations it funds or supports?	10: Yes, information on European activity or activity in multiple European countries is publicly available (website or document) in a consolidated and cumulative form OR active declaration/policy stating no activity in this area (either publicly available or disclosed to INFORMAS team) 5: Yes, information is available, but is not consolidated and easy to locate OR information is available at the global level only OR comprehensive information about their activities in the area provided to the project team 0: No information available / provided
R-RELAT4.1	Does the chain restaurant publish details of the **nutrition education / healthy diet oriented programs** it funds or supports?	10: Yes, information on European activity or activity in multiple European countries is publicly available (website or document) in a consolidated and cumulative form OR active declaration/policy stating no activity in this area (either publicly available or disclosed to INFORMAS team) 5: Yes, information is available, but is not consolidated and easy to locate OR information is available at the global level only OR comprehensive information about their activities in the area provided to the project team 0: No information available / provided
R-RELAT4.2	**For nutrition education / health diet oriented programs**, does the chain restaurant have a commitment to align programs to national or regional dietary guidelines?	[Information only, not to be scored]

Indicator ID	Domain and indicator	Scoring
R-RELAT5	Does the chain restaurant publish details of the **active lifestyle programs** (sports, physical activity) it funds or supports?	10: Yes, information on European activity or activity in multiple European countries is publicly available (website or document) in a consolidated and cumulative form OR active declaration/policy stating no activity in this area (either publicly available or disclosed to INFORMAS team) 5: Yes, information is available, but is not consolidated and easy to locate OR information is available at the global level only OR comprehensive information about their activities in the area provided to the project team 0: No information available / provided
R-RELAT6	Does the chain restaurant publish details of its involvement in public-private partnerships and/or joint ventures with government organisations / agencies? (in addition to those covered as part of R-RELAT4.1 and R-RELAT5)	10: Yes, information on European activity or activity in multiple European countries is publicly available (website or document) in a consolidated and cumulative form OR active declaration/policy stating no activity in this area (either publicly available or disclosed to INFORMAS team) 5: Yes, information is available, but is not consolidated and easy to locate OR information is available at the global level only OR comprehensive information about their activities in the area provided to the project team 0: No information available / provided
R-RELAT7	Does the chain restaurant publish details of its political donations? (when not prohibited by government policy)	10: Yes, information on European-level activity is publicly available (on a company website or document) OR declaration of no activity in this area 5: Yes, for specific European countries only OR actively declares no activity in some countries 0: No
R-RELAT8	Does the chain restaurant publish its membership / support for / ownership of industry associations, think tanks, interest groups, community organisations or other organisations that lobby in relation to population nutrition and/or obesity and NCD issues?	10: Yes, information on European activity or activity in multiple European countries is publicly available (website or document) in a consolidated and cumulative form OR active declaration/policy stating no activity in this area (either publicly available or disclosed to INFORMAS team) 5: Yes, information is available, but is not consolidated and easy to locate OR information is available at the global level only OR comprehensive information about their activities in the area provided to the project team 0: No information available / provided

Indicator ID	Domain and indicator	Scoring
R-RELAT9	Does the company make publicly available its submissions (or submissions with which the company is associated, such as through industry associations) to public consultations regarding relevant population nutrition policies?	10: Yes, on company website or in a document that is publicly available or available upon request OR active declaration/policy stating no activity in this area (either publicly available or disclosed to INFORMAS team) 5: Yes, through industry association/European website/document 0: No
R-RELAT10	Does the chain restaurant have written policy and guidelines related to any of the above (funding or support for professional organisations, external research, philanthropic funding, nutrition education / healthy diet oriented programs, active lifestyle programs), including details of how it will be involved in these activities?	[Information only, not to be scored]

Annex 4. The World Health Organisation Regional Office for Europe Nutrient Profile model (WHO-model) categories and how the classification was applied at category level.

Annex 4: The World Health Organisation Regional Office for Europe Nutrient Profile model (WHO-model) as applied at category level.

Group	Name	Marketing to children
1	Chocolate and sugar confectionery, energy bars, and sweet toppings and desserts	Not-permitted
2	Cakes, sweet biscuits and pastries; other sweet bakery wares, and dry mixes for making such	Not-permitted
3	Savoury snacks	Potentially permitted
4	Beverages	
4A	a) Juices	Not-permitted
4B	b) Milk drinks	With sugar: Not-permitted, Others: Potentially permitted
4C	c) Energy drinks (often contain o.a. guarana, taurine, glucuronolactone and vitamins)	Not-permitted
4D	d) Other beverages (Soft drinks, sweetend beverages)	Sweetened soft drinks: Not-permitted, Others: Potentially permitted
5	Edible ices	Not-permitted
6	Breakfast cereals	Potentially permitted
7	Yoghurts, sour milk, cream and other similar foods	Potentially permitted
8	Cheese	Potentially permitted
9	Ready-made and convenience foods and composite dishes	Potentially permitted
10	Butter and other fats and oils	Potentially permitted
11	Bread, bread products and crisp breads	Potentially permitted
12	Fresh or dried pasta, rice and grains	Potentially permitted
13	Fresh and frozen meat, poultry, fish and similar +eggs	Permitted
14	Processed meat, poultry, fish and similar	Potentially permitted
15	Fresh and frozen fruit, vegetables and legumes	Permitted
16	Processed fruit, vegetables and legumes	Potentially permitted
17	Sauces, dips and dressings	Potentially permitted

Annex 5. Euromonitor product subcategories per Euromonitor product category and their respective classifications according to the NOVA and World Health Organisation Regional Office for Europe Nutrient Profile model.

Annex 5: Euromonitor product subcategories per Euromonitor product category (indicated in orange) and their respective classifications according to NOVA and the World Health Organisation Regional Office for Europe Nutrient Profile model.

ND = No data; not enough information to classify as (not-) permitted without nutritional data.

Euromonitor food groups	NOVA	WHO-model	Euromonitor food groups	NOVA	WHO-model
Edible Oils			**Savoury Snacks**		
Edible Oils	Non-ultra-processed	ND	**Nuts, Seeds and Trail Mixes**	Non-ultra-processed	ND
Ready meals			**Potato Chips**	Ultra-processed	ND
Shelf Stable Ready Meals	Ultra-processed	ND	**Tortilla Chips**	Ultra-processed	ND
Chilled Lunch Kits	Ultra-processed	ND	**Puffed Snacks**	Ultra-processed	ND
Chilled Pizza	Ultra-processed	ND	**Rice Snacks**	Ultra-processed	ND
Chilled Ready Meals	Ultra-processed	ND	**Vegetable, Pulse and Bread Chips**	Ultra-processed	ND
Dinner Mixes	Ultra-processed	ND	**Savoury Biscuits**	Ultra-processed	ND
Dried Ready Meals	Ultra-processed	ND	**Popcorn**	Ultra-processed	ND
Frozen Pizza	Ultra-processed	ND	**Pretzels**	Ultra-processed	ND
Frozen Ready Meals	Ultra-processed	ND	**Other Savoury Snacks**	Ultra-processed	ND
Prepared Salads	Non-ultra-processed	ND			
Sauces, dressings and condiments			**Sweet Biscuits, Snack Bars and Fruit Snacks**		
Gravy Cubes and Powders	Ultra-processed	ND	**Dried Fruit**	Non-ultra-processed	ND
Liquid Stocks and Fonds	Ultra-processed	ND	**Processed Fruit Snacks**	Ultra-processed	ND
Stock Cubes and Powders	Ultra-processed	ND	**Cereal Bars**	Ultra-processed	Not-permitted
Dry Sauces	Ultra-processed	ND	**Energy Bars**	Ultra-processed	Not-permitted
Herbs and Spices	Non-ultra-processed	ND	**Fruit and Nut Bars**	Non-ultra-processed	Not-permitted
Monosodium Glutamate	Ultra-processed	ND	**Other Snack Bars**	Ultra-processed	Not-permitted
Pasta Sauces	Ultra-processed	ND	**Chocolate Coated Biscuits**	Ultra-processed	Not-permitted
Cooking Sauces	Ultra-processed	ND	**Cookies**	Ultra-processed	Not-permitted
Dips	Ultra-processed	ND	**Filled Biscuits**	Ultra-processed	Not-permitted

Pickled Products	Ultra-processed	ND	**Plain Biscuits**	Ultra-processed	Not-permitted
Barbecue Sauces	Ultra-processed	ND	**Wafers**	Ultra-processed	Not-permitted
Fish Sauces	Ultra-processed	ND	**Baked Goods**		
Ketchup	Ultra-processed	ND	**Packaged Flat Bread**	Non-ultra-processed	ND
Mayonnaise	Ultra-processed	ND	**Unpackaged Flat Bread**	Non-ultra-processed	ND
Mustard	Ultra-processed	ND	**Packaged Leavened Bread**	Ultra-processed	ND
Oyster Sauces	Ultra-processed	ND	**Unpackaged Leavened Bread**	Non-ultra-processed	ND
Salad Dressings	Ultra-processed	ND	**Packaged Cakes**	Ultra-processed	Not-permitted
Soy Sauces	Ultra-processed	ND	**Unpackaged Cakes**	Non-ultra-processed	Not-permitted
Chili Sauces	Ultra-processed	ND	**Dessert Mixes**	Ultra-processed	Not-permitted
Other Table Sauces	Ultra-processed	ND	**Frozen Baked Goods**	Ultra-processed	Not-permitted
Tomato Pastes and Purées	Ultra-processed	ND	**Packaged Pastries**	Ultra-processed	Not-permitted
Yeast-based Spreads	Ultra-processed	ND	**Unpackaged Pastries**	Non-ultra-processed	Not-permitted
Other Sauces, Dressings and Condiments	Ultra-processed	ND			
Soup			**Breakfast Cereals**		
Shelf Stable Soup	Ultra-processed	ND	**Hot Cereals**	Non-ultra-processed	ND
Chilled Soup	Ultra-processed	ND	**Children's Breakfast Cereals**	Ultra-processed	Not-permitted
Dehydrated Soup	Ultra-processed	ND	**Flakes**	Ultra-processed	ND
Frozen Soup	Ultra-processed	ND	**Muesli and Granola**	Ultra-processed	ND
Instant Soup	Ultra-processed	ND	**Other RTE Cereals**	Ultra-processed	ND
Sweet Spreads			**Processed Fruit and Vegetables**		
Honey	Non-ultra-processed	Not-permitted	**Shelf Stable Beans**	Non-ultra-processed	ND
Chocolate Spreads	Ultra-processed	Not-permitted	**Shelf Stable Fruit**	Non-ultra-processed	ND
Jams and Preserves	Ultra-processed	Not-permitted	**Shelf Stable Tomatoes**	Non-ultra-processed	ND
Nut and Seed Based Spreads	Ultra-processed	Not-permitted	**Shelf Stable Vegetables**	Non-ultra-processed	ND
Dairy			**Frozen Fruit**	Non-ultra-processed	ND
Butter	Non-ultra-processed	ND	**Frozen Processed Potatoes**	Ultra-processed	ND
Cooking Fats	Non-ultra-processed	ND	**Frozen Processed Vegetables**	Non-ultra-processed	ND
Margarine and Spreads	Ultra-processed	ND	**Processed Meat and Seafood**		
Spreadable Processed Cheese	Ultra-processed	ND	**Shelf Stable Processed Red Meat**	Ultra-processed	ND

Other Processed Cheese	Ultra-processed	ND	**Shelf Stable Processed Poultry**	Ultra-processed	ND
Packaged Hard Cheese	Non-ultra-processed	ND	**Chilled Processed Red Meat**	Non-ultra-processed	ND
Unpackaged Hard Cheese	Non-ultra-processed	ND	**Chilled Processed Poultry**	Non-ultra-processed	ND
Soft Cheese	Non-ultra-processed	ND	**Frozen Processed Red Meat**	Non-ultra-processed	ND
Dairy Only Flavoured Milk Drinks	Ultra-processed	Not-permitted	**Frozen Processed Poultry**	Non-ultra-processed	ND
Flavoured Milk Drinks with Fruit Juice	Ultra-processed	Not-permitted	**Shelf Stable Seafood**	Ultra-processed	ND
Fresh Milk	Non-ultra-processed	ND	**Chilled Processed Seafood**	Non-ultra-processed	ND
Shelf Stable Milk	Non-ultra-processed	ND	**Frozen Processed Seafood**	Non-ultra-processed	ND
Goat Milk	Non-ultra-processed	ND	**Chilled Meat Substitutes**	Ultra-processed	ND
Powder Milk	Non-ultra-processed	ND	**Frozen Meat Substitutes**	Ultra-processed	ND
Soy Drinks	Ultra-processed	ND	**Shelf Stable Meat Substitutes**	Ultra-processed	ND
Other Milk Alternatives	Ultra-processed	ND	**Rice, Pasta and Noodles**		
Sour Milk Products	Non-ultra-processed	ND	**Chilled Noodles**	Non-ultra-processed	ND
Drinking Yoghurt	Ultra-processed	ND	**Instant Noodle Cups**	Ultra-processed	ND
Flavoured Yoghurt	Ultra-processed	ND	**Instant Noodle Pouches**	Ultra-processed	ND
Plain Yoghurt	Non-ultra-processed	ND	**Plain Noodles**	Non-ultra-processed	ND
Chilled Dairy Desserts	Ultra-processed	Not-permitted	**Chilled Pasta**	Non-ultra-processed	ND
Shelf Stable Dairy Desserts	Ultra-processed	Not-permitted	**Dried Pasta**	Non-ultra-processed	ND
Chilled Snacks	Ultra-processed	ND	**Rice**	Non-ultra-processed	ND
Coffee Whiteners	Ultra-processed	ND	**Bottled Water**		
Flavoured Condensed Milk	Ultra-processed	ND	**Carbonated Natural Mineral Bottled Water**	Non-ultra-processed	ND
Plain Condensed Milk	Non-ultra-processed	ND	**Carbonated Spring Bottled Water**	Non-ultra-processed	ND
Cream	Non-ultra-processed	ND	**Carbonated Purified Bottled Water**	Non-ultra-processed	ND
Flavoured Fromage Frais and Quark	Non-ultra-processed	ND	**Flavoured Bottled Water**	Ultra-processed	Not-permitted
Plain Fromage Frais and Quark	Non-ultra-processed	ND	**Functional Bottled Water**	Non-ultra-processed	ND

Savoury Fromage Frais and Quark	Non-ultra-processed	ND	**Still Natural Mineral Bottled Water**	Non-ultra-processed	ND
Confectionary			**Still Spring Bottled Water**	Non-ultra-processed	ND
Chocolate Pouches and Bags	Ultra-processed	Not-permitted	**Still Purified Bottled Water**	Non-ultra-processed	ND
Boxed Assortments	Ultra-processed	Not-permitted	**Carbonates**		
Chocolate with Toys	Ultra-processed	Not-permitted	**Low Calorie Cola Carbonates**	Ultra-processed	Not-permitted
Countlines	Ultra-processed	Not-permitted	**Regular Cola Carbonates**	Ultra-processed	Not-permitted
Seasonal Chocolate	Ultra-processed	Not-permitted	**Lemonade/Lime**	Ultra-processed	Not-permitted
Tablets	Ultra-processed	Not-permitted	**Ginger Ale**	Ultra-processed	Not-permitted
Other Chocolate Confectionery	Ultra-processed	Not-permitted	**Tonic Water/Other Bitters**	Ultra-processed	Not-permitted
Bubble Gum	Ultra-processed	Not-permitted	**Orange Carbonates**	Ultra-processed	Not-permitted
Chewing Gum	Ultra-processed	Not-permitted	**Other Non-Cola Carbonates**	Ultra-processed	Not-permitted
Boiled Sweets	Ultra-processed	Not-permitted	**Concentrates**		
Liquorice	Ultra-processed	Not-permitted	**Liquid Concentrates**	Ultra-processed	Not-permitted
Lollipops	Ultra-processed	Not-permitted	**Powder Concentrates**	Ultra-processed	Not-permitted
Medicated Confectionery	Ultra-processed	Not-permitted	**Juice**		
Power Mints	Ultra-processed	Not-permitted	**Not from Concentrate 100% Juice**	Non-ultra-processed	Not-permitted
Standard Mints	Ultra-processed	Not-permitted	**Reconstituted 100% Juice**	Ultra-processed	Not-permitted
Pastilles, Gums, Jellies and Chews	Ultra-processed	Not-permitted	**Juice Drinks (up to 24% Juice)**	Ultra-processed	Not-permitted
Toffees, Caramels and Nougat	Ultra-processed	Not-permitted	**Nectars**	Ultra-processed	Not-permitted
Other Sugar Confectionery	Ultra-processed	Not-permitted	**Coconut and Other Plant Waters**	Non-ultra-processed	ND
Ice Cream and Frozen Desserts			**RTD Coffee**		
Frozen Desserts	Ultra-processed	Not-permitted	**RTD Coffee**	Ultra-processed	Not-permitted
Frozen Yoghurt	Ultra-processed	Not-permitted	**RTD Tea**		
Single Portion Dairy Ice Cream	Ultra-processed	Not-permitted	**Carbonated RTD Tea**	Ultra-processed	Not-permitted
Single Portion Water Ice Cream	Ultra-processed	Not-permitted	**Still RTD Tea**	Ultra-processed	Not-permitted
Unpackaged Ice Cream	Ultra-processed	Not-permitted	**Energy Drinks**		
Bulk Dairy Ice Cream	Ultra-processed	Not-permitted	**Energy Drinks**	Ultra-processed	Not-permitted
Ice Cream Desserts	Ultra-processed	Not-permitted	**Sports Drinks**		

Multi-Pack Dairy Ice Cream	Ultra-processed	Not-permitted	**Sports Drinks**	Ultra-processed	Not-permitted
Bulk Water Ice Cream	Ultra-processed	Not-permitted	**Asian Speciality Drinks**		
Multi-Pack Water Ice Cream	Ultra-processed	Not-permitted	**Asian Speciality Drinks**	Ultra-processed	Not-permitted

Annex 6. Examples of how publicly available commitments were collected and scored at European level according to the 'Business Impact Assessment on Obesity and Population Level Nutrition (BIA-Obesity) tool'

Annex 6: Examples of how publicly available commitments were collected and scored according to the European 'Business Impact Assessment on Obesity and Population Level Nutrition' (BIA-Obesity) tool and process.

Domain	Indicator	Policy content	Scoring criteria	score
Corporate strategy	*Does the company have an overarching commitment to improving population nutrition and health articulated in strategic documents (e.g., corporate strategy document, corporate responsibility reports)?*	*"Our mission is to bring health through food to as many people as possible. We have created a unique portfolio of healthy products to complete this mission, and we strive to continuously optimize their nutritional profile." - Danone*	*10: Yes, a specific commitment to improving population nutrition and health, at the European level or at the global level with reference to the European market or multiple European countries, publicly available in strategic documents* *7.5: Yes, a specific global commitment to improving population nutrition and health, publicly available in strategic documents* *5: Yes, a European- or global- level commitment, but not publicly-available, OR general reference to nutrition and health as part of general corporate strategy* *0: No clear commitments to improving population nutrition and health*	*7.5*
Product formulation	*Has the company set a target/targets or provided detailed evidence of having taken significant action to reduce/reach lower levels of added sugars, and is it applicable to Europe?*	*"1. By 2020, we will remove 25% of sugar from our ready-to-drink tea products, as set out in our position statement on sugar. To meet this stretching target, we developed more drinks that meet our Highest Nutritional Standards (HNS) of 5g or less sugar per 100ml. And by 2018, we had removed 20% of sugar across all our sweetened tea-based beverages (against a 2010 baseline).* *2. We focus on beverages and ice cream because that is where we can have the biggest impact on sugar reduction and therefore public health." - Unilever*	*10: Set SMART targets or provided detailed evidence of having taken significant action in all key categories/subcategories, published* *5: Targets (not necessarily SMART) set or taken significant action in some key products/sub-categories / not published* *2.5: General or vague commitment to reducing use of added sugars in products, published or disclosed to INFORMAS team* *0: No target / no information*	*5*

Nutrition labelling	*Does the company have a published commitment to rolling out a government endorsed FOP labelling system (e.g. Nutri-Score, Traffic light)?*	*"We aim to implement Nutri-Score at scale, starting in countries that already support the scheme, such as France, Belgium, Switzerland and Germany. Constructive engagement will continue in other countries to ensure the best possible outcome for all Europeans." - Nestlé*	*10: Yes, with implementation plan across all product categories (published or unpublished)* *7.5: Yes, with implementation plan across a selection of product categories (published or unpublished)* *5: Yes, but with no specific implementation plan (published or unpublished)* *0: No*	*10*
Product and brand promotion	*Does the company have an explicit policy to reduce the exposure of children to unhealthy food marketing on broadcast media (TV, radio)?* *(Note: check if the company supports the EU Pledge. If yes and no other comments, then EU pledge is scored)*	*"The Intersnack Group is a member of the European Snacks Association (ESA) and a signatory of the EU Pledge, a voluntary initiative by leading food and beverage companies to change food and beverage advertising to children under the age of twelve in the European Union." - Intersnack Knabber-Gebäck*	*10: Yes, European policy or policy that refers to multiple European countries and noted on company website / annual reports* *7.5: Yes, global policy and noted on company website / annual reports* *5: Yes, European policy or policy that refers to multiple European countries, but not noted on company website / annual reports OR noted on industry association website* *2.5: Yes, global policy but not noted on company website / annual reports* *0: No policy/ no information available to the research team*	*10*
Product accessibility	*Does the company publish its policy position (in relation to government policy) on fiscal policies to make healthier foods relatively cheaper and unhealthy foods relatively more expensive?*	*"Obesity and NCDs are extremely complex problems and the right answers aren't always the simple ones. Experience from around the world shows no evidence that a tax on soft drinks helps to reduce obesity. We're determined to help create a healthy food environment in Europe and we are committed to supporting and accelerating what works, which is why reducing sugar from our drinks is such a top priority. We've already seen consumer behavior changing, but we know there is much more work to be done." – Coca-Cola*	*10: Yes, on own website* *5: Yes, on industry association website* *0: Not publicly available*	*10*

Relationships with other organisations	*Does the company publish details of the nutrition education / healthy diet oriented programs it funds or supports?*	*"1. 'Partnership for Health' is a programme designed by four partners: the Institute of Mother and Child and the following companies: Danone, Biedronka and Lubella. "Partnership for Health" is a unique initiative on the Polish market. The three commercial companies and the Institute started a joint initiative in order to tackle the problem of an unbalanced diet of Polish children and its dramatic effects on health and society.* *2. This educational program is addressed to students in the sixth-eighth grades of primary school and third grade of junior high school and their teachers. In the school year 2018/19, as many as 160,000 pupils from primary and junior high schools from all over Poland took part in it! They gained not only extensive knowledge about healthy lifestyle, nutrition principles, lack of food and cooking, but also participated in special competitions in which attractive prizes were available!" - Maspex Wadowice*	*10: Yes, information on European activity or activity in multiple European countries is publicly available (website or document) in a consolidated and cumulative form OR active declaration/policy stating no activity in this area (either publicly available or disclosed to INFORMAS team)* *5: Yes, information is available, but is not consolidated and easy to locate OR information is available at the global level only OR comprehensive information about their activities in the area provided to the project team* *0: No information available / provided*	*5*

Annex 7. Weighting per domain of the 'Business Impact Assessment on Obesity and Population level Nutrition' (BIA-Obesity) tool, adapted per food industry as determined by INFORMAS ('*International Network for Food and Obesity / Non-communicable Diseases (NCDs) Research, Monitoring and Action Support*').

Annex 7: Weighting per 'Business Impact Assessment on Obesity and population-level nutrition' (BIA-Obesity) domain and food industry.

BIA-Obesity domains	Packaged food and non-alcoholic beverage manufacturers	Quick-service restaurants	Supermarkets
Corporate strategy	10	10	10
Product formulation	30	25	25
Nutrition labelling	20	15	15
Product and brand promotion	30	25	25
Product accessibility	5	20	20
Relationships with other organisations	5	5	5
TOTAL	100	100	100

Annex 8. The multiple linear regression model output to predict the proportion of sales of ultra-processed packaged food products, including the CR4, a country fixed effect and a product category fixed effect.

Annex 8: The fixed effect estimates together with the p values and 95% confidence intervals of the multiple linear regression model to predict the proportion of sales of ultra-processed packaged food product with the CR4, a product category and a country fixed effect as predictor variables.

Parameter	Estimate	Standard Error	t Value	Pr > |t|	95% Confidence Interval	
Intercept	17.03	3.97	4.29	<.0001	9.21	24.85
CR4	0.13	0.06	2.00	0.047	0.00	0.25
Overarching_cat Baked Goods	88.77	2.89	30.75	<.0001	83.08	94.46
Overarching_cat Breakfast Cereals	73.39	3.30	22.27	<.0001	66.90	79.89
Overarching_cat Dairy	19.07	2.72	7.01	<.0001	13.71	24.44
Overarching_cat Processed Fruit and Vegetables	8.61	2.90	2.97	0.003	2.90	14.32
Overarching_cat Processed Meat and Seafood	11.89	2.90	4.11	<.0001	6.19	17.60
Overarching_cat Ready meals	78.43	2.90	27.05	<.0001	72.71	84.14
Overarching_cat Sauces, dressings and condiments	73.25	2.94	24.95	<.0001	67.47	79.04
Overarching_cat Savoury Snacks	68.48	2.98	22.94	<.0001	62.59	74.36
Overarching_cat Sweet Biscuits, Snack Bars and Fruit Snacks	77.61	2.95	26.35	<.0001	71.81	83.42
Overarching_cat Sweet Spreads	57.32	2.96	19.36	<.0001	51.49	63.16
Overarching_cat Rice, Pasta and Noodles	0.00	.	.	.	.	.
Geography Austria	-9.38	4.28	-2.19	0.029	-17.82	-0.95
Geography Belgium	-3.61	4.23	-0.86	0.393	-11.94	4.71
Geography Bulgaria	-16.80	4.28	-3.93	0.000	-25.23	-8.37
Geography Croatia	-19.44	6.65	-2.93	0.004	-32.53	-6.34
Geography Czech Republic	-8.60	4.26	-2.02	0.045	-17.00	-0.20
Geography Denmark	-11.90	4.27	-2.79	0.006	-20.30	-3.49
Geography Estonia	-22.25	6.79	-3.28	0.001	-35.63	-8.87
Geography Finland	-15.15	4.29	-3.53	0.001	-23.60	-6.69
Geography France	-12.45	4.26	-2.93	0.004	-20.84	-4.07
Geography Germany	-6.27	4.23	-1.48	0.139	-14.60	2.06
Geography Greece	-11.12	4.29	-2.59	0.010	-19.57	-2.67
Geography Hungary	-13.48	4.22	-3.19	0.002	-21.80	-5.15
Geography Ireland	-6.25	4.32	-1.45	0.149	-14.76	2.25
Geography Italy	-10.63	4.23	-2.51	0.013	-18.97	-2.30
Geography Latvia	-22.36	6.71	-3.33	0.001	-35.58	-9.15
Geography Lithuania	-21.50	6.73	-3.19	0.002	-34.77	-8.24
Geography Netherlands	-4.74	4.22	-1.12	0.263	-13.07	3.58
Geography Norway	-14.53	4.49	-3.23	0.001	-23.39	-5.68
Geography Poland	-10.37	4.23	-2.45	0.015	-18.71	-2.03
Geography Portugal	-9.90	4.23	-2.34	0.020	-18.23	-1.57
Geography Romania	-14.36	4.25	-3.38	0.001	-22.74	-5.98
Geography Slovakia	-5.42	4.25	-1.28	0.203	-13.79	2.95
Geography Slovenia	-22.49	6.72	-3.35	0.001	-35.73	-9.24
Geography Spain	-5.60	4.23	-1.32	0.187	-13.93	2.73
Geography Sweden	-12.37	4.26	-2.90	0.004	-20.78	-3.97
Geography Switzerland	-5.28	4.24	-1.24	0.215	-13.64	3.08
Geography United Kingdom	0.00	.	.	.	.	.

Annex 9. Examples of how publicly available commitments were collected and scored at national level according to the 'Business Impact Assessment on Obesity and Population Level Nutrition (BIA-Obesity) tool'

Annex 9: Examples of how publicly available commitments were collected and scored according to the Belgian 'Business Impact Assessment on Obesity and Population Level Nutrition' (BIA-Obesity) tool and process.

Domain	Indicator	Policy content	Scoring criteria	Score
Corporate strategy	Does the company have an overarching commitment to improving population nutrition and health articulated in strategic documents (e.g., corporate strategy document, corporate responsibility reports)?	"According to the WHO, it is important to limit the intake of sugar, salt and fat in the fight against welfare diseases (obesity and diet-related diseases). We therefore strive to limit the content of these nutrients in our products." – Friesland Campina	10: Yes, a specific national-level (country-specific) commitment to improving population nutrition and health, publicly available in strategic documents 7.5: Yes, a specific global- or European level (not country -specific) commitment to improving population nutrition and health, publicly available in strategic documents 5: Yes, a national-, European- or global- level commitment, but not publicly-available, OR general reference to nutrition and health as part of general corporate strategy 0: No clear commitments to improving population nutrition and health	*7.5*
Product formulation	Has the company set a target/targets or provided detailed evidence of having taken significant action to reduce/reach lower levels of added sugars, and is it applicable to the country in question?	"Thanks to this continued commitment, we want to achieve a 17.7% reduction in the average sugar content of our beverages by 2020 compared to 2010. Calorie reduction per litre through reduced sugar content" – Coca-Cola	10: Set SMART targets or provided detailed evidence of having taken significant action in all key categories/subcategories, published 5: Targets (not necessarily SMART) set or taken significant action in some key products/sub-categories / not published 2.5: General commitment to reducing use of added sugars in products (vague or global level only), published or disclosed to INFORMAS team 0: No target / no information	*10*

Nutrition labelling	Does the company have a published commitment to rolling out the government-endorsed Nutri-Score?	"McCain is committed to the implementation of the Nutri-Score. Further explanation about the Nutri-Score can be found on McCain's website." - McCain	10: Yes, with implementation plan across all product categories (published or unpublished) 7.5: Yes, with implementation plan across a selection of product categories (published or unpublished) 5: Yes, but with no specific implementation plan (published or unpublished) 0: No	*10*
Product and brand promotion	Does the company have an explicit policy to reduce the exposure of children to unhealthy food marketing on broadcast media (TV, radio)? (Note: check if the company supports the Belgian Pledge. If yes and no other comments, then Belgian pledge is scored)	Signatory to the Belgian Pledge, but not mentioned on company website. - Schweppes, GB Foods, Imperial Meat Products, Lotus Bakeries, Aldi, Carrefour, Colruyt, Lidl	10: Yes, national policy and noted on company website / annual reports 7.5: Yes, global policy and noted on company website / annual reports 5: Yes, national policy but not noted on company website / annual reports OR national policy and noted on industry association website 2.5: Yes, global policy but not noted on company website / annual reports 0: No policy/ no information available to the research team	*5*
Product accessibility	Does the company publish its policy position (in relation to government policy) on fiscal policies to make healthier foods relatively cheaper and unhealthy foods relatively more expensive?	"Fiscal instruments related to nutrition: In general, alongside healthy lifestyle education and more physical activity, we believe reformulating some of our products, widening and improving the nutritional composition of our portfolio, providing information to help consumers make healthier choices through nutritional labeling and following self-imposed marketing and advertising restrictions to protect children are far more effective ways we can help people achieve their dietary goals. Public policy measures should be designed in such a way as	10: Yes, on own website 5: Yes, on industry association website 0: Not publicly available	*10*

		to encourage companies to be active in these areas." - PepsiCo		
Relationships with other organisations	Does the company publish details of the nutrition education / healthy diet oriented programs it funds or supports?	"One of the core activities of Cultureghem supported by Nestlé is KOOKMET. This is an information and awareness programme on nutrition and the importance of vegetables in the diet. Children from neighbouring schools, their parents or pupils from other regions in Belgium learn to use local, simple ingredients within a limited budget. Buying ingredients at the local market, learning to cook together, being aware of the value of the prepared dishes (both in terms of money and nutrition), having fun, making contacts and having conversations and then eating together or with strangers." - Nestlé	10: Yes, information on national-level activity is publicly available (website or document) in a consolidated and cumulative form OR active declaration/policy stating no activity in this area (either publicly available or disclosed to INFORMAS team) 5: Yes, information is available, but is not consolidated and easy to locate OR information is available at the global level only OR comprehensive information about their activities in the area provided to the project team 0: No information available / provided	*10*

Annex 10. Overall median 'Business Impact assessment on Obesity and Population Nutrition' (BIA-Obesity) scores across countries where data were collected for food and beverage manufacturers, supermarkets and quick-service restaurants and companies had the opportunity to verify and complete the publicly available data (51,53,54).

Annex 10: Overview of the overall BIA-Obesity scores across countries where data were collected and scored for food and beverage manufacturers, supermarkets and quick-service restaurants.

Country	Total Score	Corporate strategy	Product formulation	Nutrition labelling	Product and brand promotion	Product accessibility	Relationships with other organisations	Response rate
Australia (2018)	41	55	40	54	36	5	44	47 %
New Zealand (2017)	38	55	34	47	35	0	38	48 %
Belgium (2019-2020)	35	57	37	32	36	8	33	56 %
France (2019-2020)	28	53	29	33	8	6	38	39%
Europe (2020)	21	57	29	14	18	4	28	/
Malaysia (2014-2017)	11	28	8	15	0	4	25	18%

Annex 11. An overview of the different companies included per food industry and BIA-Obesity study in Europe, Belgium and France.

Annex 11: The companies selected for the BIA-Obesity studies and their respective market share per food industry and region/country. Green indicates companies only included in one of the studies. *Euromonitor data 2018.*

	Europe	Market share (%)		Belgium	Market share (%)	France	Market share (%)
		Western Europe	Eastern Europe				
Packaged food manufacturers	Mondelēz	2.4	2.4	Mondelēz	3.1	Lactalis	3.4
	Unilever Group	2	1.1	Unilever	2.5	Mondelēz	2.9
	Nestlé	1.8	2	Nestlé	2	Nestlé	2.6
	Lactalis	1.7	1.2	Danone	1.9	Ferrero	2.1
	Mars	1.4	1.8	FrieslandCampina	1.3	Fleury Michon	1.9
	Pepsico	0.9	2.9	PepsiCo	1.1	Danone	1.6
	Ferrero	1.6	1.5	Ter Beke	1.1	Unilever	1.3
	Danone	1.5	3.2	Ferrero	1	Savencia	1.3
	Kellogg	0.6	0.3	GB Foods (Previously Continental Foods)	1	Bel	1.2
	Dr. Oetker	0.5	0.2	Mars	0.9	Panzani	1
	Intersnack Knabber-Gebäck	0.5	0.3	Lotus Bakeries	0.9	Kellogg's	0.5
				Kellogg's	0.8	Bonduelle	0.6
				Iglo	0.7	Barilla	0.9
				Oetker	0.7	William Saurin	0.3
				Bonduelle	0.3		
				Imperial Meat Products	0.9		
				McCain	0.2		
	TOTAL MARKET SHARE	**14.9**	**16.9**		**20.4**		**21.6**
				+ Supermarkets	**23.3**	**+ Supermarkets**	**13.0**
	EUROPE	**Market share (%)**		**Belgium**	**Market share (%)**	**France**	**Market share (%)**
		Western Europe	**Eastern Europe**				
Non-alcoholic beverage manufacturers	Coca-Cola	20.5	17.6	Coca-Cola	35.4	Coca-Cola	17.2
	Pepsico	6.1	11.7	PepsiCo	3.2	PepsiCo	8.8
	Red Bull	3.1	1.8	Schweppes Suntory	3	Orangina Suntory	7.6
	Suntory	3.2	0.2			Eckes-Granini	3.9
	Britvic	1.6	/			Fruité Entreprises	4
	Eckes-Granini	2	0.6			Andros	2
	Maspex Wadowice	/	2.5				
	TOTAL MARKET SHARE	**36.5**	**34.4**		**41.6**		**43.5**
				+ Supermarkets	**8.8**	**+ Supermarkets**	**8.2**
	EUROPE	**Market share (%)**		**Belgium**	**Market share (%)**	**France**	**Market share (%)**
		Western Europe	**Eastern Europe**				
Quick-service restaurants	McDonald's	18.8	26.7	McDonald's	15.9	McDonald's	32.2
	KFC	2.6	12.1	Quick	15.6	KFC	4.1
	Burger King	4.6	7.5	Panos	6.3	Quick	3.9
	Subway	1.7	2.2	Pizza Hut	6.2	Burger King	2.9
	Domino's Pizza	2.4	0.8	Exki	3.8	Paul	2.6
	Pizza Hut	1	1.2	Domino's Pizza	2.5	La Brioche Dorée	2.1
				Paul	2.1	Domino's Pizza	1.9
	TOTAL MARKET SHARE	**31.1**	**50.5**		**52.4**		**49.7**
	EUROPE	**Market share (%)**		**Belgium**	**Market share (%)**	**France**	**Market share (%)**
		Western Europe	**Eastern Europe**				
Supermarkets	Lidl	4.9	3.6	Colruyt	17	E Leclerc	11.1
	Carrefour	2.6	0.7	Delhaize	12.4	Intermarché	9.8
	Auchan	1.8	1.8	Aldi	8.5	Carrefour	8.8
	Tesco	1.7	1.6	Carrefour	6	Auchan	8.2
	Spar	1.1	1.4	Lidl	5.5	Super U	5.2
	Maxima	0	0.8			Lidl	4.4
	Aldi	4.8	0.4				
	TOTAL MARKET SHARE	**16.9**	**10.3**		**49.4**		**47.5**

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