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"Healthy eating by policy design? Individual health responsibility, diet-enhancing interventions and food environments in European health and nutrition policy – a qualitative policy study in Germany"

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1. Introduction

Diet-related diseases (NCDs[1]), obesity and overweight have increasingly become focal points of interest in public health policy, since the key drivers in developing these diseases - suboptimal diets[2] - and the resources that are required to go about them, have been found to drain health and economic systems throughout the European Union. As a result, (public health and health care) policies attempt to promote healthy diets and encourage the population to make "healthier choices" to effectively tackle the "triple burden of malnutrition"[3] (Bechthold et al., 2018; Stok et al., 2018; Béné et al., 2019; Djojosoeparto et al., 2021). Although dietary behaviour plays its part in illness and health of individuals, the extent to which people have *real* "choices" however, is seen as debatable (Caraher & Coveney, 2004). While the assumption, that we choose the way we eat freely, remains predominant in public and political discourse, research repeatedly shows that, these "choices" are substantially shaped by history, class, gender, income, ethnicity, local environment, early life exposure, household patterns, family and community norms, market issues of access, affordability, global supply patterns, commercial pressures, sociocultural perceptions of norms and status and prestige - suggesting that people rather *select* their food than *choose* it freely (Caraher & Coveney, 2004). Djojosoeparto et al. (2021) recently argued in a report on behalf of the *Policy Evaluation Network* that the way people eat is significantly affected by the *food environments* in which they live in:

> Food environments are the physical (food availability, quality, marketing), economic (food prices), policy (rules and food policies) and sociocultural (norms and beliefs) surroundings, opportunities and conditions that influence people's food choices and nutritional status. Food environments do not always ensure that the healthy food option is the easiest or default option. (p. 5)

[1]Non-Communicable Diseases such as Diabetes Type II (T2D), obesity, cardiovascular diseases (CVD) and various forms of cancer generally are long-lasting and progress slowly, thus also referred to as chronic diseases. Causes can include environmental exposures or genetically determined abnormalities, which may be evident already at birth or become apparent later in life (Britannica, 2021)

[2]According to Segal and Opie (2015) a healthy diet includes fruits, vegetables, whole-grains and fish, whereas, an "unhealthy" diet is high in fried foods, processed meats, refined grains and "extras" such as sugar-sweeten beverages (the background to these guidelines will be discussed later on in the thesis in chapter 2.2.). Schwingshackl et al. (2017) also use the term "suboptimal diet" which describes the linkages between diet-related disease and a certain nutrition style (for example an association between the increased risk of all-cause mortality and red and processed meats).

[3]Describes health related nutritional challenges: "under- nutrition, micro-nutrient deficiencies and overnutrition" (Béné et al., 2019, p. 117).

Nonetheless, strategies in public health policy on nutrition continue to emphasise individual "food choices" and their relation to diet-induced diseases and illnesses, rather than the structural conditions that determine food environments (Caraher & Coveney, 2004; BMJ, 2018). The capacities of policy-makers however, may reach far beyond "supporting and promoting a healthy food choice", as parts of the health prevention strategy in Germany suggest, for example (Hauner et al., 2012; DGE, 2017). Current policies often start at the assumption that individuals are solely responsible for their dietary and health behaviour, which endorses the instillation of behavioural intervention tools (Caraher & Coveney, 2004; BMJ, 2018). Extensive nutrition education and behavioural economic tools such as *nudging*[4] (Thaler, 2008; Prainsack, 2020) are particularly popular as part of the behavioural intervention toolbox, aiming to directly address individuals rather than wider structural determinants for diet and health (BMJ, 2018).

These current policy tactics neglect that people often do possess the skill-set and knowledge to eat healthily but lack necessary resources to put their intentions into actions. When it comes to the provision and distribution of healthcare in systems where a distinction between "healthy" and "unhealthy" lifestyles is made, this emphasis on individual responsibility can be problematic and reinforce health inequalities. In most Member States, "socioeconomic inequalities in obesity and dietary patterns are evident" already (Djojosoeparto et al., 2021, p. 5). In Germany for instance, incentives for "responsible health behaviour" are part of the *bonus system*[5] and thereby legitimise the withdrawal of services based on these evaluations (Buyx & Prainsack, 2012; Steinbrook, 2011).

Although recent academic approaches regarding policy on health and nutrition include the "realisation that feeding the world today and in the future" requires policies to evolve beyond traditional food security objectives, concerns remain centred around environmental issues, trade, equity and power (Caraher & Coveney, 2004, p. 596; Béné et al., 2019, p. 117). Additionally, the rhetoric to fight "the epidemic of overnutrition" (Chopra et al., 2002, p. 952) has gained momentum in health policy-making – the debates revolve around diet quality, the "production and distribution of food commodities" and their biomedical implications, as well as the health impacts of a food system that encourages processed, "cheap" foods, high in sugar, fat and calories (Caraher & Coveney, 2004, p. 591). Knowledge on how the European Union

[4]Nudging is the more or less subtle persuasion of an individual or group to change their behaviour long or short term. This behavioural intervention strategy institutes certain default modes such as product information or presentation of goods and can be used by corporations and governments to achieve changes in human practice (Thaler & Sunstein, 2010)

[5]Further explained and debated in chapter 4.

and national governments could improve policies in favour of healthy food environments, remains little. Against this backdrop, this thesis explores the manifold dynamics and implications playing a part in current and future policy-making on health and nutrition. The objective is to identify and examine the required components that determine low-threshold, inclusive, and non-toxic food environments, reaching beyond behavioural approaches that target individuals. The aim is to discuss and analyse values in policy that centre around the idea of *healthy* and *responsible* individuals. Dietary behaviour is a case-in point for the current predicament in health policy: the assumption of individual responsibility amidst the complexities of every single human life and policy-makers' responsibility to not only accommodate these complexities but support individuals through making use of their hand given in structural, environmental and institutional fields of action (Prainsack, 2020).

The present thesis reviews European policy instruments and measures on nutrition and looks more closely at the Member State Germany, where the qualitative part of the research takes place. The semi-structured interviews with people living in Germany tackle the topics *food practices and health* and follow the set of research questions below:

RQ1: How do past and current personal, domestic and institutional life experiences and conditions imprint dietary behaviour of people living in Germany?

RQ1 a) How do people design their day-to-day food practices?

RQ1 b) What part does "health" play in their food practices?

RQ2: What are the implications of diet-enhancing interventions in Germany for individuals and for policy-makers?

RQ2 a) Which capabilities have institutional diet-enhancing interventions such as comprehensive education and income support to improve people's dietary behaviour?

RQ2 b) Which effects have behavioural diet-enhancing interventions, such as nudging, on people's food practices and what are their wider implications for health policy?

RQ2 c) How can (health) policies beyond behavioural interventions create healthy food environments?

The question: *What are the implications of European and German health policy on nutrition through the lens of individual health-responsibility?* leads through the introductory chapters of the thesis (chapter 3.- 5.). Chapter 2.- 2.2. provides an outline of the nutrition policy field in which food regime approaches are introduced as entry points for public health and health care policy on nutrition. In chapters 2.2. - 3, current European public health policies,

initiatives and figures, followed by German health policy are discussed as well as the "dietary footprint" and food-based dietary guidelines (FBDGs) for Germany. Terminologies relevant to the research questions will be analysed along the process of exploring the predicament of individual responsibility in health policy (chapter 3.1. - 3.5.) as well as the concept "choice" which will be investigated in chapters 3.2. and 3.2.1. In the course of this, questions about lifestyle-related diseases, risk stratification and solidarity require the research's attention (chapter 3.5., 4.1.). Practice examples within European health policy shown by a comprehensive case study on diet-enhancing interventions and relevant results (chapter 5) conclude the introductory part of the thesis. In chapters 6.- 8., the empirical research design including data collection[6], analysis[7] and ethical aspects of the research regarding RQ1 will be introduced (6.1., 6.1.1.).

The presentation of the empirical data (chapter 7. - 7.3.) includes a summary of RQ1-RQb and provides an overview in the chapter "Lessons learned from the empirical research" (chapter 7.3.). Against the backdrop of prior research and in light of the empirical findings in the preceding chapters, the analysis of RQ2 and its sub-questions will find its place throughout the chapters 8. - 8.5. Findings from RQ2 - RQ2b will be briefly summarised in chapter 8.5. The last part of the thesis follows the final sub-question of RQ2 (RQ2c) and debates policy recommendations can be drawn to foster healthy food practices and food environments upon the research prior. As part of the conclusions, I will present my own model for a *healthy (food) environment* which visualises policy opportunities to create a healthy infrastructure beyond behavioural interventions, based upon findings in the respective literature and the experiences shared by the interviewees as part of the empirical research (Figure 2, chapter 10.). Further key findings will be illustrated in the wake of the conclusions in chapter 12. The outlook, limitations and opportunities for future policy studies will be touched upon in the chapters 13 - 14. The abbreviations in chapter 15., references in chapter 16. together with the appendix including "information sheet and data protection declaration", relevant figures and the abstract of the research (chapter 17.) will conclude the thesis.

[6]Semi-structured qualitative interviews via the platform *Zoom* were carried out between May and July 2021 with a number of eight participants

[7]Grounded Theory approaches by Ellis, Strauss & Corbin (1992)

2. Nutrition and health in policy

2.1. A brief historical outline of nutrition policy

Nutrition policy in context: global food regime theory as an entry point

In recent years, food system approaches have gained political momentum and have become a fundamental "body of research and subject of interest for policy-makers", in a number of scholarly disciplines (Béné et al., 2019, p. 117). Food system approaches have been identified as "entry points for action" in several nutrition and food security reports (in the *Global Panel Report on Agriculture and Food Systems for Nutrition in 2016 for example).* Concerns in these reports range from approaching "environmental, equity, power, trade and dietary and health issues" to "the realization that feeding the world today and in the future requires more than a simple 'more-food' approach" (Béné et al., 2019, p. 117). The quality of nutrition and the environmental *food-print* (which describes the ecological imprint of nutrition), the "production and distribution of food commodities" and the "socioeconomic imprints of supply chains" are topics in recent debates around the global food system and its policies. Béné et al. (2019) argue that scholars recently also came to realise that tackling diets and their healthiness by making "food systems more nutrition-sensitive and sustainable" require broader approaches, if the objective is to address the "triple burden of malnutrition"[8] (p. 117). Against this background, putting actions towards "food system governance" and the "actors and drivers" involved in food systems becomes crucial, as well as incorporating challenges emerging through globalisation and urbanisation into policy and aspire to ensure food availability, affordability, access and acceptable quality throughout populations (Béné et al., 2019, p. 117). However, food systems "work at different levels" that require to be addressed accordingly and at their concrete roles and responsibilities – this remains difficult given the broad scholarly cacophony emerging over the last decades according to Béné et al. (2019, p. 117).

To provide an understanding of nutrition and health in policy, a theoretically sophisticated, historically grounded approach towards the *global food system* and its policies, social actors, ecologies, complexities and contradictory relations is required. Such framework can be found in the *food regime* perspective from McMichael and Friedmann (2013). The *food regime theory* roots in political economy and "translates agriculture and food in relation to the development of capitalism on a global scale" and considers social change as the "outcome of

[8]Defined as "under- nutrition, micro-nutrient deficiencies and overnutrition" by Béné et al. (2019, p. 117)

struggles among social movements, capital and states" (Magnan, 2012, p. 374; Bernstein, 2015). *The food regime theory* originally intended to contextualise the restructuring of agriculture and food in the late 20th century. The theory helps to examine the term "food systems" and its relevance for decision-makers (Magnan, 2012). A *food regimes approach* can uncover spaces created by a more complex understanding of consumption dynamics, the politics of alternative systems such as commercialised and organic food, the politics of science in food relations, new forms of governance particularly in relation to neoliberalism and finally, the dynamics of the natural and social ecologies crucial to food relationships (Campbell & Dixon, 2009).

Nutrition policy in the three food regimes

Approaching nutrition policy alongside the *three food regimes*, defined by Friedmann and McMichael (1989), invites structure into exploring the policy field on nutrition - a field that has been discussed mostly peripherally alongside agricultural policy, health policy and consumer protection policy, rather than forming a policy field with its own history. Exploring nutrition in policy alongside the three food regimes allows a more structured contextualisation among discourses on capitalism and neoliberal globalisation and its drivers and consequences. *Food regime theory* links international relations of "food production and consumption to forms of accumulation" broadly distinguishing periods of "capitalist accumulation" throughout history in consideration of crisis and transition also fuelled by "social movements" and organises them into *three* main time periods (Magnan, 2012, p. 374; Bernstein, 2015, p. 3).

The *first food regime* marks the time period between 1870 and 1914 during British hegemony and the "international division of labour in food staples trading" (of cheap, "wage foods"), linking North America and Australasia to European imperial powers (Magnan, 2012, p. 376). During that time, nutrition policy mainly focused on the battle against hunger and malnutrition as a result of industrialisation and urbanisation. In the mid and towards the end of the 19th century, measures in nutrition policy aimed to improve the military and industrial performance capacity of people (Mühlich, 2008). The provision of food security[9] (availability of food to individuals without shortage and without fear of hunger) and food safety (the process of scientific organisation of prevention of food-borne disease to avoid any potential health

[9]*Food security* is "the availability at all times of adequate world food supplies of basic foodstuffs to sustain a steady expansion of food consumption and to offset fluctuations in production and prices" (United Nations, 1975, as cited in FAO, 2003; Patel, 2009).

risks) (Patel, 2009) was top on the agenda of nutrition policy during this era.[10] Although the end of the *first food regime* was defined by World War I, in a nutritional policy sense, the uncertainty in the 1920s and the depression of the 1930s exacerbated the focus on food security and food safety and continued throughout the *second food regime* (1945-1973), as described by Magnan (2012). During post war (post World War II) recovery between 1950 and 1960, the global North experienced rising incomes and growing "mass consumption" (Magnan, 2012, p. 377; Bernstein, 2015, p. 7). Transnational agribusiness and corporations developed and the plant and livestock production was industrialised, resulting in the "intensive meat/soy/maize complex" and "manufactured food complex" alongside subsidies for sugars, vegetable oils and sweeteners (Bernstein, 2015, p. 7).

European policies intended to reproduce the patterns of the United States to "re-nationalize domestic agriculture" (Friedmann & McMichael, 1989) that led to European countries becoming "surplus producers of grain and other products" which they "dumped" on international markets (Bernstein, 2015, p. 7). Main legacies of this regime are the dependence on food import of the global South through cheap food to "help fuel industrialisation" at the "cost of their domestic farming" (Bernstein, 2015, p. 7). Key feature of the *third* and current *food regime* (also "corporate food regime") (starting in 1980 until now) is the de-regulation of markets and privatisation of "formerly public functions and services at the core of neoliberal globalisation" (Bernstein, 2015, p. 14). Nation states became "subservient to (global) capital" in this regime, following the rules inflicted by "the ideology of the market" (McMichael, 2009, p. 153; Bernstein, 2015, p. 14). This notion also reflects on nutrition policy especially from a health policy perspective, as will be presented in the upcoming chapters.

Since the 1980s and during the *corporate food regime*, issues concerning "food distribution and consumption" as well as the "health effects" of food were put into the limelight, as Bernstein (2015) argues: "Effects include industrially produced foods with high levels of toxicity and other consequences of chemicalisation," which includes "fast foods", or the "nutritionalisation" of foods (p. 15). The latter describes the "(chemical) engineering of foods in the field (as GMOs)" in order to lift the "nutritional value" of food products (Bernstein, 2015, p. 15). These developments became central for policy-making on nutrition, especially in

[10] *Food security* defined by the FAO (2003) "implies the availability of adequate supplies at a global and national level; at the other end, the concern is with adequate nutrition and well-being" (p. 3). Food security also means "ensuring that all people at all times have both physical and economic access to the basic food that they need" and the "access of all people at all times to enough food for an active, healthy life" (FAO, 1983; 1986, as cited in FAO, 2003, p. 27). Current food security definitions include the incorporation of the dimension *Food safety* – also describing the process of treating, manufacturing and storing food to prevent food-borne health risks, illnesses and contaminants (FAO, 2003, p. 132; Magnan, 2012, p. 262; Patel, 2009).

light of rising overconsumption, coining the term *globesity*[12] and introducing nutrition and its implications for health to public health policy and healthcare policy. Since food security was achieved by then (at least in the global North) during the second food regime, policy measures and developments of nutrition policy were organised around the additional element of individual *dietary behaviour* in relation to health. Food *choices* thereby became the centre of strategies, with the main objective to tackle "poor diets" (especially those that result in obesity) and to encourage a healthy diet among populations. Mühlich (2008) argues that, in the context of emphasising individual dietary behaviour, it became equally important to policy-makers to also tackle the potential economic costs that societies may face due to poor dietary behaviours.

When it comes to scholarly approaches to nutrition in policy, the following research fields explore the implications of health and nutrition, individual food practices and food infrastructures: *Environmental policy* and international development and their interests of the modes of production of food as centre of the research, such as the "imperial mode of living" according to Wissen and Brand (2014). *Agricultural policy* as political ecology which analyse global commodity chains, their underlying power relations and the unequal distribution of power and benefits. *Consumer protection policy* through debates about (front/back) food labelling, food packaging and quality standards. (Public) *health policy* and healthcare policy, where main concerns organise around malnutrition (or other diet-related diseases and NCDs such as T2D and CVDs) and asymmetries in healthcare service distribution (Mühlich, 2008).

2.2. Public health policy and nutrition in the European Union

Trübswasser and Branca (2009) argue: "While successfully tackling the challenge of food security in Europe, the dramatic evolution of the food system since World War II has led to a well-recognized increase of nutrition-related diseases" (p. 295). By then, they continue, the food supply in the EU has exceeded the needs of the population by far, mostly due to production subsidies on animal source foods and influences from "supply and marketing of food performed by the food industry, the advertising and retail sector and the media" rather than by institutional recommendations for *healthy diets* (Trübswasser & Branca, 2009, p. 295). *Unhealthy diets* and a lack of physical activity were put on the agenda as "evidently related to overweight and

[12]"Globesity" describes the occurrence of obesity on a global scale. The term assumes an "epidemic of obesity" which associates overweight with chronic conditions including T2D, CVD, hypertension, dyslipidaemia, hypercholesterolemia, cancer as well as psychological disorders (Castelnuovo et al., 2015).

obesity" and presented as a "major risk factor for non-communicable diseases (NCDs)" (Trübswasser & Branca, 2009, p. 295). Currently, the European region is "the most NCD-afflicted" in the world, also facing "deficiencies in micronutrients such as Fe (iron), iodine, vitamin A and folate" according to the WHO (2002). This "burden of malnutrition" (as explained above) remains the centre of current coping strategies of nutrition policies and public health through focusing on prevention of diet-related non-communicable diseases, securing a "sustainable and safe food supply" and integrating "related risk factors" (Trübswasser & Branca, 2009, p. 295). Recent public health policy aims to reduce illness- and death probabilities in regard to nutrition and promote health and analyses epidemiological risks, causes of disease and coping strategies beyond individual illness (Trübswasser & Branca, 2009).

2.2.1. First policy action plans

The foundation of the "global development of nutrition policies" was stipulated through the *World Declaration on Nutrition* and the *Plan of Action on Nutrition* in 1992, which was followed by the implementation of the first WHO *Action Plan for Food and Nutrition Policy* of the EU in 2000 (Trübswasser & Branca, 2009, p. 295). It "encouraged Member States to develop food and nutrition policies combining nutrition, food safety and food security and sustainable development into an overarching, intersectoral policy" (WHO, 2000, as cited in Trübswasser & Branca, 2009, p. 295). In 2004, the WHO *Global Strategy on Diet, Physical Activity and Health* was stipulated to "strengthen existing national, regional and international efforts to prevent and control chronic diseases and their common risk factors" (WHO, 2004, as cited in Trübswasser & Branca, 2009, p. 295). In 2006, the WHO *European Charter on Counteracting Obesity* was implemented to address "region-wide action on the emerging public health challenge of obesity" (WHO, 2006, as cited in Trübswasser & Branca, 2009, p. 295). Based upon various reports, exposing malnutrition in the EU, a series of Council resolutions addressing nutrition were agreed upon in 1990, 2000, 2002 and 2005 in which the "importance of placing nutrition on the agenda" was pinpointed (Trübswasser & Branca, 2009, p. 296). In 2007, a *White Paper* by the European Commission: *A Strategy for Europe on Nutrition, Overweight and Obesity Related Health Issues*, was adopted to outline opportunities for the EU to wrestle these challenges (European Commission, 2007, as cited in Trübswasser & Branca, 2009, p. 296).

2.2.1.1. The formation of European dietary guidelines: the *Eurodiet* & FBDGs

Historically, public health policy on nutrition has centred around the prevention of nutritional deficiency states: undernutrition, vitamin and mineral deficiency diseases mainly in the form of food security and food safety laws. A transformational period in time to address diets in the EU is marked by the 1970s, when nutrition was acknowledged for playing a crucial role in the aetiology of chronic diseases, especially of cardiovascular nature (Kafatos & Codrington 1999, p. 327). This recognition went alongside the concept that, once dietary related risk factors of chronic diseases could be identified, they were also thought of being preventable. As Kafatos and Codrington (1999) described, it was then recognised that many health problems are promoted by "inappropriate dietary habits". These associations have been crucial to policy approaches revolving around enhancing nutrition and lifestyles in general as a cost minimising health prevention strategy.

The Eurodiet project

In the 1990s, European citizens were facing a multitude of information, claims and mixed messages about beneficial or harmful nutrients, foods, diets, additives, vitamins and minerals on health. This might be traced back to the rapid development of a body of scientific evidence from nutrition and food safety perspectives as well as in food supply and products (Kafatos & Codrington, 1999). During that time, aside from the establishment of food safety laws, Member State authorities formulated dietary and healthy food guidelines. These however, were not only of varying levels of sophistication but aimed towards different regional, national, European and international levels, while multilevel agencies worked on a way to "promote healthier lifestyles". As a result, these "confusing" messages from science, medicine, the food industry and policy makers were considered at fault for "poor consumer choices" in diets and nutrition (Kafatos & Codrington, 1999). The *Eurodiet* project was commissioned against this backdrop and led to the action plan for developing and implementing *dietary guidelines* in the European Member States which comprised the *four* key dimensions according to (Kafatos & Codrington, 1999, p. 328):

- Diet and lifestyles in health- and disease-patterns in Europe
- A framework for food-based dietary guidelines (FBDGs) in the EU
- A public health nutrition strategy in the EU to implement FBDGs
- Enhancement of lifestyles in policy, trade, economic and technological aspects of improving nutritional status and lifestyles in the EU

Food-based dietary guidelines (FBDGs) for European Member States

The FAO (2018, as cited in Bechthold et al., 2018) define FBDGs as follows:

> Food-based dietary guidelines are short, science-based, positive messages on healthy eating and lifestyles aimed at preventing all forms of malnutrition and keeping people well-nourished and healthy. They embody national nutrition recommendations and express the principles of nutrition education in terms of food. (p. 545)

As a significant "tool for nutrition policy and public health", the FBDGs "provide guidelines on healthy food consumption and are based on scientific evidence" (FAO, 2018, as cited in Bechthold et al., 2018, p. 544). To ensure adherence of the FBDGs and to achieve positive effects and improvements on nutrition throughout the population, nutrition policies also aim to address "school and hospital meals, public procurement, advertising regulations, industry standards" and further "health-promoting structures and living conditions", if the goal is to improve nutritional behaviour (Bechthold et al., 2018, p. 556). As shown above, "disease prevention and nutrient recommendations" were at the centre of previous establishing processes of the FBDGs. In light of scientific advances, Bechthold et al. (2018) argue that "social developments such as changing lifestyles, interest in personalized health, and concerns about sustainability require a reorientation of the creation of FBDGs to include a wider range of aspects of dietary behavior" (p. 544). Alongside their review of current FBDGs, they also identified and debated future challenges of population-wide dietary guidelines, resulting in a variety of crucial dimensions: *diet-health relations, nutrient supply, energy supply, dietary habits, sustainability, food-borne contaminants, target group segmentation, and individualization* (Bechthold et al., 2018). The first *four* were found to be widely met by the current FBDGs in 34 European Member States. The remaining four dimensions are yet to be considered in the ongoing process of developing future FBDGs (Bechthold et al., 2018, p. 544). In the following, the most relevant dimensions of current and future FBDGs - in regard to the research interest of the thesis - will be briefly discussed:

- *Diet-health relations*
- *Dietary habits and sociocultural preferences*
- *Target group segmentation* and
- *Individualisation*

Diet-health relations

Diet "is understood as a generic term for dietary patterns, food (groups) and nutrients", whereas *health* "stands for the risk of metabolic disorders (e.g. impaired fasting glucose, dyslipidemia) and NCDs (e.g. T2D, CVDs)" (Bechthold et al., 2018, p. 549). The dimension *Diet-health relations* is considered as the "starting point for the development" of the European FDBGs with the paradigmatic example " that, at the individual level, a healthy food choice has an impact on the risk of metabolic disorders and NCDs and at the population level on their occurrence" (Bechthold et al., 2018, p. 549). *Diet-health relations* are tackled through the "evidence of a causal link" according to which only those relations that were assigned with a "high evidence grade" are considered within FBDGs (Bechthold et al., 2018, p. 549). According to recommendations, the collective evidence on diet-health relations aims to follow a top-down approach that initially starts with examining "dietary patterns", followed by "single food groups" and ends with "nutrients" – this ensures a more accessible translation into public health policies and practises, since individuals "consume foods and not nutrients" (Bechthold et al., 2018, p. 549).

This is also underlined by the *Dietary Guidelines Advisory Committee* in 2015, which recommended the use of "dietary patterns" for the FBDGs instead of "individual nutrients or foods" (USDA, 2015). The framework for the EU-wide dietary guidelines are ultimately definitions of a "healthy diet" or, "nutritional behavior", which Bechthold et al. (2018) intends to achieve by considering "different dietary patterns, potentially accommodating varying individual needs and sociocultural preferences" (p. 550). To successfully achieve these objectives throughout EU-populations and long-term, to offer alternate "dietary pattern options" and adjust them to individual preferred diet styles, were put on the agenda in current debates (Bechthold et al., 2017; 2018, p. 550). Nonetheless, further research on "nutrient- and food-based relations" remain necessary to determine "causative agents and to enhance the mechanistic understanding of the effects or risk relations of food and whole diets," according to Bechthold et al. (2018, p. 550). As providing guidelines for a healthy diet also includes which diets, nutrients and foods are less favourable, extensive research, studies and analyses on nutrient-related disease risks resulted in the evidence of "twelve major food groups with

clinically relevant outcomes such as mortality,[13] T2D[14], hypertension, CVD[15] and colorectal cancer" (Bechthold et al., 2018, p. 550).

Dietary habits and sociocultural preferences

To ensure acceptance when implementing the FBDGs, Bechthold et al. (2018) argue that, *dietary habits* of target populations must be considered to avoid the risk of standing in "conflict between scientific evidence and acceptance as well as feasibility for adoption by target groups" (p. 551). FBDGs therefore aim to consider the "social, economic and cultural context" of individuals as impacts on nutritional behaviour, including "diverse foods and patterns that are consistent with personal, cultural, and religious preferences and are affordable and available anytime" (Bechthold et al., 2018, p. 551). As an example, the review by Bechthold et al. (2018) showed that Ireland takes *affordability* as the only Member State into account for their population guidelines. Interestingly, although processed foods are predominant in the "food supplies of high-income" and "middle- income countries", past and current FBDGs widely neglect the existence of processed foods and ready-to-consume products and are considered as *discretionary foods* (which are highly processed, high in energy, saturated fat, sugar, salt, alcohol). This approach does not remain free of critique, since neglecting certain food groups

[13]Schwingshackl et al. (2017a) investigated the relation of "the intakes of 12 major food groups including whole grains, refined grains, vegetables, fruits, nuts, legumes, eggs, dairy, fish, red meat, processed meat, and sugar-sweetened beverages (SSBs) with the risk of all-cause mortality" proving that specific food-intakes can lead to notable "change in the risk of premature death" with the following results: "increased intake of whole grains, vegetables, fruits, nuts, and fish", *decreased* all-cause mortality risk, whereas an increase in all-cause mortality coincides with an "increased intake of red and processed meat" (p.1462). *Nonlinearity* was found for the "relations between vegetables, fruits, nuts, and dairy and all-cause mortality"; "optimal consumption of risk-decreasing foods results in a 56% reduction of all-cause mortality", whereas consumption of "risk-increasing foods is associated with a twofold increased risk of all-cause mortality" (Schwingshackl et al., 2017a, p. 1462).

[14]Schwingshackl et al. (2017c) investigated the relation between the 12 food-groups (as mentioned above) and the risk of diabetes type II, with results that show optimal food intakes can notably change risk of T2D: "six out of the 12 food-groups have a significant relation with risk of T2D, three of them a decrease of risk with increasing consumption (whole grains, fruits, and dairy), and three an increase of risk with increasing consumption (red meat, processed meat, and sugar-sweetened beverages)" (p. 363). *Nonlinearity* was found for the "relationship between fruits, vegetables, processed meat, whole grains, and sugar-sweetened drinks and T2D risk"; "optimal consumption of risk-decreasing foods resulted in a 42% reduction", whereas "consumption of risk-increasing foods was associated with a threefold T2D risk, compared to non-consumption" (Schwingshackl et al., 2017c, p. 363).

[15]Schwingshackl et al. (2017b, p. 793; Schwingshackl et al., 2017a, p. 1469) investigated the correlation between the 12 food-groups (as mentioned above) and hypertension, as well as the relation to cardiovascular diseases, coronary heart disease (CHD), stroke and heart failure (HF). They found "clear indications for non-linear dose-response relationships between whole grains, fruits, nuts, dairy, and red meat and CHD" and proved that an **"**optimal intake of whole grains, vegetables, fruits, nuts, legumes, dairy, fish, red and processed meat, eggs and sugar-sweetened beverages showed lower risk of CHD, stroke, and HF" (Schwingshackl et al., 2017b, p.800).

and products will not change the fact that people can select them in their current surroundings. Bechthold et al. (2018, p. 552) therefore call upon "a food classification system in which food processing is defined and focused on," especially against the background of objectives to better understand diet-related health impacts by "assessing and monitoring dietary patterns" to keep dietary guidelines up to date and curb unhelpful methods (Bechthold et al., 2018, p. 552).

Target group segmentation

If accommodating the individual, nutritional needs of the population, throughout EU Member States by providing FBDGs is the goal, an ongoing development and expansion of the dimensions is required, as Bechthold et al. (2018) argue. Recent approaches into this direction aim to incorporate targeting certain groups to achieve positive diet-related health outcomes. Strategies include a consideration of "personal preferences", "health status" and "sociocultural influences on lifestyle behaviors" of populations (Bechthold et al., 2018, p. 552). Addressing different groups requires a differentiation by groups, also in light of their different daily hurdles: for example, aspects such as age and/or sex. Currently, these aspects have not found consideration in the implementation process of the FBDGs. However, in tackling the objective mentioned above to assist individuals with "food allergies or intolerances, vegetarians, and athletes", will become crucial part in creating FBDGs (Bechthold et al., 2018, p. 552). Hence, calls for technological advances and the incorporation of data, molecular physiology or further nutritional knowledge that is available, to sub-group populations on a personal level, are put on the agenda (Bechthold et al., 2018, p. 552).

Individualisation in the FBDGs

To emphasise the individual by expanding and further developing FBDGs are already part of the current debate around EU- and nationwide dietary guidelines and considered as expandable. Regarding the research interest of the present thesis, this emphasis also bares interesting implications. Although the FBDGs aim to function as "general guidelines" based on cross-section data of the population, individuals are still different, in how these FBDGs can "apply to them" - for example, they can vary in *sex, anthropometric measurements, age, health condition* or based on their *personal preferences* and *diet styles* (Bechthold et al., 2018, p. 552). As a result, requests to accommodate "individual requirements" multiplied, also as part of the debate around opportunities of "communication technologies" for "change" dietary behaviour (Bechthold et al., 2018, p. 553; McGloin & Eslami, 2015). *Individualised recommendations* are based on the individual's (health) status and their preferences (for example restraining from

meat or animal products) as well as their individual living and working conditions or physical limitations. FBDGs based on different "metabolic conditions and genetic make-up" argue in favour of developing guidelines in consideration of *personalized nutrition* - a concept based on "interactions between diet, phenotype, and genes on health," in combination with "data on the genome, metabolome, and microbiota" (Magni et al., 2017; Gibney & Walsh, 2013, as cited in Bechthold et al., 2018, p. 553). These notions also presumably open possibilities for "personalized nutrition planning" according to Bechthold et al. (2018, p. 553). Experts in nutrigenetics point to the use of information on genotype class in combination with individual conditions to personalise dietary advice. Comprehensive knowledge about individual conditions linked to "phenotypic and/or genotypic information" could result in "designing (multiple) decision trees" for individualised dietary recommendations (Bechthold et al., 2018, p. 553).

The examination of the current FBDGs, how they come about, and which developments are expected in the future on the previous pages, served as a brief overview of the traditional European policy approaches to *diet and health relations*. In the following, German policy through the lens of dietary principles and values, as the Member State example of the thesis, will be debated and the nationwide dietary guidelines and recommendations stated.

2.3. Public health policy on nutrition in Germany

Public health policy in Germany consists of two pillars. Firstly, the promotion of health and secondly the prevention of diseases and high mortality rates among the population. To meet these objectives, policy follows the strategy to prevent (health risk) conditions and individual behaviour. The former is to provide conditions for German citizens in which they can embrace their *best health* through addressing societal and environmental circumstances for working and living. The latter intends to encourage citizens towards their *best health behaviour* through addressing high risk behaviour such as smoking, drug abuse and nutrition (Mühlich, 2008). These approaches are centred around the "enlightened consumer" who optimises their health goals (Köhler, 1990). A notable part of public health policy in Germany focuses on health risk behaviour in regard to diet and NCDs. As discussed above, diet – especially carbohydrate and fat intake – can be related to T2D, dyslipidaemia, hypertension, metabolic syndrome, coronary heart disease, forms of cancer and all-cause mortality (Schwingshackl et al., 2017a; 2017b; 2017c). The German Nutrition Society (DGE) therefore puts the intake of carbohydrates as a

potential factor in the primary disease prevention strategy, as well as high consumption in fats and sugar-sweetened beverages. These are considered as “increasing the risk of obesity” (and T2D) whereas a “high dietary fibre intake” (which the three-dimensional food pyramid should visually convey) mainly from whole-grains and fruits and vegetables are considered as reducing the risk of obesity, T2D, CVD and NCD and various forms of cancer (Hauner et al., 2012, p. 1). Additionally, malnutrition, ageing, leaving out full meals (especially breakfast among kids and adolescents) and food insecurity are on top of the agenda of public health strategies in Germany.

According to its constitution, the *German Nutrition Society* (DGE) “aims to improve the health of the general public by developing and communicating scientifically based nutritional recommendations which contribute to the primary prevention of nutrition-related diseases.” (Hauner et al., 2012, p. 2; DGE, 2017). In 2006 this intention manifested through a Guideline Commission and published (publicly available) evidence-based guidelines concerning “fat intake and prevention of nutrition-related diseases” (Hauner et al., 2012, p. 2; DGE, 2017). The approved and promoted healthy diet by the DGE translates into *10 guidelines for a wholesome diet*:

1. Diverse eating, which means a lot of wheat products and potatoes
2. Five daily portions of vegetables and fruits
3. Milk and dairy products
4. Once or twice per week fish
5. Meat, sausage and eggs (limited)
6. Limited fat, sugar and salt
7. Enough liquids but mostly water
8. The food should be cooked gently
9. Taking time for eating
10. Regular weight control and enough movement (DGE, 2017)

The most used visualisation of these guidelines in Germany is the three-dimensional food pyramid. Food-based dietary guidelines such as the three-dimensional food pyramid or the nutrition circle in Germany, as well as recommendations for a wholesome diet throughout Member States do not remain free of critique due to several reasons. As Montagnese et al. (2015) argue: “More emphasis should be given to minority ethnic communities; likewise some subgroups of the total population that today represent a clear prevention target such as adolescents, pregnant women, and the geriatric population” (p. 914). Moreover, current

approaches still lack an "accurate distinction" of food groups, especially between "fresh" and processed foods. Or as Smitasiri and Uauy (2007) argue: "Present knowledge of the biological basis of nutritional needs, in most cases, does not support genetic or ethnic specific nutritional recommendations, especially if we restrict genetic differences to those of public health relevance" (p. 150).

2.3.1. Food-based dietary guidelines in Germany

FBDGs in Germany find their manifestation in two graphical models to "implement nutrition recommendations to support health while considering the specific national nutritional situation" (Bechthold et al., 2018, p. 546). Firstly, the *Nutrition Circle* materialises *Dietary Reference Values (DRVs)* for desired nutrition "on the food level" and is based on results by "evidence-based guidelines" and literature reviews provided by the DGE (2017) and the *Dietary Reference Intake* (DRI) throughout the *D-A-CH* region (Germany, Austria and Switzerland). According to the DGE (2017) the goal is to prevent diet-related diseases and maximise performance capacity through adequate energy supply (see also Bechthold et al., 2018). The second, and most common visualisation of the FBDGs in Germany, materialises in the *three-dimensional food pyramid* which "combines quantitative and qualitative statements, reflected by ranking of foods on the basis of energy density and nutrient content as well as other nutritional-physiologic criteria and evidence with regard to the prevention of NCDs, in a single model" (Oberritter et al., 2013, as cited in Bechthold et al., 2018, p. 547).

2.3.2. The dietary footprint in Germany

Studies have shown that on average, people living in Germany do not meet the FBDGs regarding the recommended amount of vegetables and fruits, but exceed recommendations for meat and sausages (processed meat) as well as salt. Micro nutritional deficits are often found in iodine, folat, calcium and iron (Kroke, 2016).

Due to the prevalence rate of obesity in Germany, public health policy pays attention to supernutrition, overconsumption and health risks through health prevention and health interventions. Diseases such as CVD, T2D, various forms of cancer, hypertension, physical illnesses and obesity are the main concern of preventive approaches and are the centre of research in public health and plays a part in the German concept for "responsible health behaviour" (Kroke, 2016; Ernährungsbericht, 2014) where obesity is often referred to as "one of the most significant diet related health challenges that the country faces today" (Kroke, 2016, p. 173). Although Germany has funds to have access and the capability to provide food

throughout the population, poverty- endangered or stricken citizens are affected by a lack of nutrition that leads to reduced health or body function. Emergency aid and initiatives in the form of food banks[16] aim to tackle this food insecurity and provide meals for around 1,5 million people daily. Still, not only the unevenly distributed quantity of food which people have access to, but also the quality of foods strongly varies between population groups and represents a public health challenge in Germany (Kroke, 2016). Latter includes, as Kroke (2016) argues, the composition of the entire sum of foods ingested throughout the course of a life and their effects on physical and pathological processes potentially resulting in NCDs. In that respect, socio-cultural and psychological aspects play a significant part: nutrition is significantly tied to the culture people live and grow up in and therefore determines individual dietary behaviour. Hence, social inequality accompanied by health inequalities are both: cause for and result of nutrition-based circumstances and behaviours, as Kroke (2016) argues. Public health nutrition approaches in Germany currently face the challenge to adequately accommodate the variety of factors that are of social, psychological, societal, cultural, economic and ecologic nature, when tackling malnutrition or supernutrition (Kroke, 2016). Despite acknowledging nutrition related challenges and research that shows the circumstantial roots of diet based struggles, a lack of setting-based policies is still evident, according to Kroke (2016, pp. 172-173).

3. Dietary behaviour, "freedom" of health behaviour and toxic environment*:* relevant terminologies and implications for the ongoing research

3.1. Dietary behaviour and food practises

Dietary behaviour, diet, nutrition, eating behaviour, food choices and food practises are common terms used rather "inconsistently across different disciplines and research traditions" and imply a variety of understandings (Stok et al., 2018, p. 1). To counteract a lack of clarity in the use of terminologies throughout the thesis, it is necessary to provide a brief examination of the terms used henceforth. Considering the interest of the present research and in light of the upcoming empirical chapter, the terms *dietary behaviour* and *food practises* will be further derived in the following.

[16]"Die Tafel"

Dietary behaviour

The term, according to Stok et al. (2018) refers to "the beginning of the eating process" and "all the way through to terms regarding constituents of the food that has been ingested" (p. 6). Dietary behaviour includes the following *three* main categories:

Food choice: "Behaviors and other factors occurring before food actually reaches the mouth. This category is further broken down into seven distinct outcomes: *preferences, share of income spent on food, willingness-to-pay, frequency of purchase, product purchase, food preparation, and intentions.*" (Stok et al., 2018, p. 6)

Eating Behaviour: "All the outcomes related to the actual act of consumption. This category is further broken down into six distinct outcomes (…): *eating habits, eating occasions, portions, dieting, disordered eating symptoms, and neophobia/pickiness/fussiness*." (Stok et al., 2018, p. 6)

Dietary Intake/Nutrition: "All outcomes that break down the content of what exactly is being consumed. This category consists of four main outcomes (…): *dietary pattern, meal pattern, food intake, and food components."* (Stok et al., 2018, p. 6)

These definitions provide a more in-depth understanding in regard to the European FBDGs, with their main objective to "improve" *dietary behaviour*. Accordingly, the exact food compositions and intakes are targeted through dietary guidelines along the three-dimensional lines of the terminology *dietary behaviour* presented above. The relevant characteristics of the term *dietary behaviour* will be discussed in the later chapters of the thesis and as part of the empirical research, as the operationalisations made prior serve as framework for the questionnaire of the qualitative research (chapter 6.). At this point, it is crucial to mention the dissociation from the term *food choice* (which is part of the three-dimensional definition of the term dietary behaviour above). However, it suggests the economic use of the term that views individuals as consumers who choose products. This can restrict the research interest. The use of the broader term, especially in light of the empirical part of the thesis: *food practises*, is more beneficial to the research interest.

Food practises

The term describes how food is selected, cooked, served and eaten and also encompasses the use or restraint of certain foods as well as dining etiquettes (Goody & Drago, 2010). Since this definition is rather broad, dietary behaviour (according to Stok et al., 2018) and its variety of dimensions offered guidance for dimensions relevant to the research interest of the project at

hand. As a result, the understanding of the term *food practises* comprises the following categories, suggested by Stok et al. (2018, p. 6) and also shown in point 3.1. above:

Food choice: "(…) share of income spent on food, willingness-to-pay, frequency of purchase, product purchase, food preparation, and intentions"

*Eating behaviour: "*eating habits", "eating occasions"

*Intake/Nutrition: "*dietary pattern", "meal pattern" and "food intake"

3.2. Dietary behaviour beyond the term "choice"

As mentioned above (chapter 3.1), the discussion of the term *choice* plays a significant part for the present research. Since the definition of *dietary behaviour* includes the term *food choice*, more attention must be paid as it includes the implication that dietary behaviour is based solely on personal decisions. It is inevitable that the way people eat can - to a certain extent - be traced back to mere preferences. Still, as briefly illustrated above (chapter 3.1.) the process of individual nutrition is a complex accumulation of social, socio-cultural, psychological and economic conditions (Kroke, 2016). In fact, a number of factors determine the way people choose their food: social, cultural and socioeconomic background, current living conditions, the sex of a person and their ethnicity, the geographical location they live in, early life exposure, domestic environment, family and community practices and norms, access to food markets or restaurants and affordability and on a much larger scale, global supply chains, commercial pressure and status and prestige that coincides with the consumption of certain foods (BMJ, 2018). Against this backdrop, considering eating healthily an active choice and a mere personal responsibility - which terminologies as *food choice* suggest - can be restrictive given the variety of (social-) environmental conditions as part of the process. On the other hand, following the line of thought that presumes the allocation of health services based on the "freedom of health behaviour" (Buyx, 2008) can be an interesting entry-point in understanding policy-making on health and nutrition.

3.2.1. The "freedom" of health behaviour

As Buyx (2008) argues: "Much controversy surrounds the question of whether the state or a social institution such as the healthcare system is entitled to interfere with the private life of individuals by demanding personal responsibility for health" (p. 871) – personal responsibility however, can be used as a benchmark "for allocating scarce healthcare resources" (Buyx, 2008; Buyx & Prainsack, 2012; Prainsack & Buyx, 2015) depending on which "theory of justice" is

applied (Buyx, 2008, p. 871). To introduce responsibility for health in a just way, the aspect of "free choice" has to be considered as not falling into one of two dichotomous categories: either "freely chosen" or "not chosen at all". There are rather "degrees of freedom of choice" (Buyx, 2008, p. 872f). It is argued that often people are rightfully held accountable for "consequences of their behaviour only if they had control over it and chose it freely." (Buyx, 2008, p. 872) These *freely chosen* behaviours can include, for example, one's "freedom to exercise", or the independent choice one can make to follow a certain diet, or fitness regimen, or to consume alcohol or nicotine, or to choose one's "professional and recreational activities" (Buyx, 2008, p. 871). They can generally be regarded as a "central right" to individual freedom in the private sphere (Buyx, 2008, p. 871)[17] [18]. Here, a distinction between the *right to health* – which is enshrined in the *Universal Declaration of Human Rights*[19], as well as the *Charter of Fundamental Rights of the European Union*[20] and the *right to freedom of health behaviour* has to be made.[21] The former includes "the obligation of the state to support the health through the allocation of available resources" (WHO, 2017). The latter can be interpreted as the general exercise of individual rights and freedoms by citizens.[22]

Nonetheless, most "health-related behaviours are not uncontrollable impulses" (Buyx, 2008, p. 873) and are not entirely up to people to "choose" from (take a lack of time or money to exercise, for example, or the physical inability to recreate, or limited access to the labour market). Health-related behaviours rather stem from, and are shaped by several factors, as shown above (chapter 3.1., 3.1.).[23] If there is no differentiation made between the manifold determinants of behaviours related to health and the assumption that "every human practice is conscious and free", it can result in the harmful application of "causal responsibility" for health,

[17]Buyx (2008) explores this "right" to health behaviour through personal responsibility perspectives of theories of justice: *libertarian theory, communitarian* and *luck-egalitarians, liberal egalitarism* and *solidarity* (p. 871)
[18]State interference is justified to prevent individuals from harming others through their behaviour: as for example the implementation of non-smoking laws in public spaces (Taylor & Hawley, 2006)
[19]As part of the main economic, social and cultural rights (2nd generation human rights), Article 25: *Everyone has the right to a standard of living adequate for the health and well-being of himself and of his family, including food, clothing, housing and medical care and necessary social services, and the right to security in the event of unemployment, sickness, disability, widowhood, old age and other lack of livelihood in circumstances beyond his control. (UN General Assembly, 1948, art.25)*
[20]*Article 31,* Fair and just working conditions; *Article 34,* Social security and social assistance; *Article 35* Health care (European Union, 2012, art.31; art, 34; art, 35)
[21] "Understanding health as a human right creates a legal obligation on states to ensure access to timely, acceptable, and affordable health care of appropriate quality as well as to providing for the underlying determinants of health, such as safe and potable water, sanitation, food, housing, health-related information and education, and gender equality" (WHO, 2017)
[22]For example Article 22; Article 29 of the *Universal Declaration of Human Rights* (UN General Assembly, 1948), also see Taylor and Hawley (2006)
[23]According to Buyx (2008) the most significant ones are: "socioeconomic status, socialization and education, family influence, social and peer values, advertisement, addictions" (p.873).

which is an assumption that cannot withstands the complexities in developing a disease or an illness (Buyx, 2008, p. 873). Furthermore, there are several unhealthy behaviours which are "socially accepted" or "regarded as desirable" (consumption of alcohol, smoking, eating fast food) (Buyx, 2008, p. 873) and it has been shown that these are "inherent to modern societies" and create a *toxic environment* (Schwartz & Brownell, 2007, p. 79) in which unhealthy eating practices are reinforced.

3.3. Toxic food environments

The term *toxic environment* refers to the "several layers of the world around us that interact with key elements of our biology" (Schwartz & Brownell, 2007, p. 79). According to Schwartz and Brownell there currently is an imbalance between the biology of people and the environment they live in, which results in a *toxic environment* that reinforces overconsumption. Key drivers for overconsumption are considered as flavour, variety, large portions, visibility and proximity, or sensory specific satiety[24] which are interacting with the layers of current food environments in modern societies. Some of which are the omnipresence of food advertisements, overwhelming availability of "unhealthy" food products at a low price and sedentary-centred working and living conditions that require little regular physical activity. Calls to collectively decrease food intake[25] despite rich food infrastructures promoting products high in sugar, fat and salt underline this irregularity and therefore are at "odds with human biology" (Schwarz & Brownell, 2007, p. 79) or as they argue: "The human race evolved to survive famine, not stay thin when there is too much food" (Schwarz & Brownell, 2007, p. 79). Acknowledging the linkage between the conditions of the current food environment and human practice creates the opportunity to examine nutrition beyond individual behaviour in considering the direct environment people are exposed to and embeds it into a wider context of market dynamics, the food industry's role and socio-cultural changes of society.

"Toxic" aspects of our everyday environment

Schwartz and Brownell (2007) describe the crucial interaction points – the "layers of the world around" us - with the current toxic environment alongside a typical day (p. 79). When walking or driving down the road, a person sees several "drive through windows, fast food restaurants, billboards with advertisements for inexpensive" (but high-sugar and high-fat) snacks, soft

[24]The consumption of large amounts of one flavour that results in experiencing "sensory specific satiety" especially in foods high in fat, sugar, and salt (Schwartz & Brownell, 2007)

[25]Rhetoric in public and political discourse include appeals such as: "battle against obesity", collective challenge to fight the "epidemic obesity" (Mühlich, 2008)

drinks and sugar-sweetened beverages as well as alcohol (Schwartz & Brownell, 2007, p. 79). When stopping by a grocery store, the person finds shelfs after shelfs of snacks high in fat and sugar and convenience and ready-to-eat products which seem to be a practical alternative for time consuming homemade meals, especially if the person faces time pressure due to work or care duties. Besides the "omnipresence of unhealthful foods in our current environment" these products are also less expensive than healthy options (Schwartz & Brownell, 2007, p. 80). Moreover, portion sizes that exceed federal guidelines and a generally higher intake of calories, fat, fried foods, soft drinks and less fruits, vegetables and fibres, when a person decides to eat out, are also conditions of the current *toxic environment* (Schwartz & Brownell, 2007; Young & Nestle, 2002). While promoting calorie-dense, nutrient-poor foods, the environment for physical activity and working conditions simultaneously suggest sedentary behaviour for a large part of the population. Mechanisation and digitalisation of labour lead to the possibility to process information "without ever leaving our chairs" (Schwartz & Brownell, 2007). This does not only affect the adult population but also children: their daily routine often does not include walking to school and playing outside but sitting in front of computers, tablets or phones (Brownell & Horgen, 2004). These behavioural changes are the result of cultural and technological shifts as well as living conditions in communities where travelling by car or public transport are default modes (Schwartz & Brownell, 2007).

"Toxic" aspects of the global food market

"Economic forces" that reinforce the "consumption of unhealthy foods" within the toxic environment include the "promotion of unhealthy foods" by the food industry (Schwartz & Brownell, 2007, p. 80; Drewnowski & Darmon, 2005). Economic efficiency goals are met faster through low cost processed foods as opposed to "fresh" foods. If no quality obligations to fit standards such as organic or fair-trade labels are required, the production price can be held at a minimum - which results in foods and products with little to no nutritional value. This creates a paradox: the food industry follows the goal to sell more food to a population that is demanded to eat less or healthier (Nestle, 2002; Schwartz & Brownell, 2007). This coincides with strategies of the industry to gain brand loyal customers, also through targeting children (Schwartz & Brownell, 2007). Aspects that reinforce a toxic environment are also found in agricultural policies on government subsidies for specific crops (dairy and meat in the

European Union, see CAP reform 2021[27]). Subsidies determine production capacities and influence dynamics within the food industry. Corn as a heavily subsidised crop in the United States led to the inexpensive production of corn syrup that is high in fructose. High fructose corn syrup (HFCS) as a sugar replacement gained attention due to its health implications and its part in the prevalence of obesity (Jürgens et al., 2005). As Hawkes (2002) argues, the competitive forces as a result of global market integration can impact dietary behaviour long-lastingly (as described by the term coca-colonisation[28]) as well as it can induce the development of products in different niche markets. This duality of convergence-divergence raises concerns that global food dynamics will put high-income people into a better position, as they have access to a more dynamic marketplace (products without inexpensive substances with questionable health effects). Lower-income groups however, face convergence towards poor quality obesogenic diets in poor food environments (Hawkes, 2002).

3.4. Diet-related non-communicable chronic diseases (NCDs) and food environments

As shown in the chapters prior (see diet-health relations chapter 2.2.1.1.) foods, diets and nutritional status are determinants for diet-related non-communicable chronic diseases (NCDs) such as cardiovascular diseases, certain types of cancer and type II diabetes (Schwingshackl et al., 2017a; 2017b, 2017b). Overweight and obesity (which are mainly in the limelight when it comes to health policy on nutrition) are associated with increased blood pressure, blood cholesterol and resistance to the action of insulin. These are not only risk factors for NCDs but major causes of illness themselves (World Cancer Research Fund International, 2014, p. 1). For public health challenges such as diet-related diseases, the transition of the food environment globally and in the European Union over the past few years also plays its part: processed and convenience foods continue to be predominantly available at a smaller price than fibre-rich foods as described in the first chapters of the thesis 2 & 2.2. (also see toxic environment in chapter 3.3). This results in a nutrition transition, affecting the population's food practices and significantly impacting the development of NCDs. Currently, citizens are exposed to foods and diets that reinforce this dynamic. Moreover, people often live with the

[27]The *Common Agricultural Policy of the European Union* (CAP) continues subsidies for industrial farming in meat and dairy production and creates hurdles through property-based subsidies for small, non-industrial farms to survive on the food market (Global 2000, 2018)

[28]Describes the chronic disease epidemic that occurred concurrently with the modernization of lifestyle. The process was labelled by Arthur Koestler (also see: Zimmet, 2001)

consequences of an NCD for the rest of their lives, once they are affected by it: in 2010, NCDs contributed to 79% of illness in the world's population (World Cancer Research Fund International, 2014). "Overweight, obesity and diet-related non-communicable diseases (NCDs)", inflicted by poor diets are therefore viewed as a "major public health challenge", burdening "health and economic systems" throughout European Member States (Djojosoeparto et al., 2021, p. 5).

3.5. Lifestyle-related diseases, risk stratification and solidarity

As argued above (3.4.), a variety of foods and diets can increase risks of NCDs such as hypertension, CVD, T2D, chronic disease, obesity and several forms of cancer. However, not only dietary behaviour, but other *lifestyle* related practices increase the probability of said illnesses (lack of movement or smoking). These behaviours and the diseases that emerge through them are referred to as *lifestyle-related diseases*. In health policy, diet-related diseases are tackled as part of strategies to prevent lifestyle-related diseases and find their place under this umbrella term. This terminology suggests that the sum of certain behaviours, a *lifestyle,* leads to a certain health outcome and therein emphasizes individual responsibility for certain diseases.

Individual responsibility in regard to lifestyle-related diseases has played an important part in debates about the "fair allocation of increasingly scarce health-care resources" (Buyx & Prainsack, 2012, p. 79). Main argument in favour of considering individual responsibility when it comes to distributing health services is that "people with lifestyle-related illnesses can be held accountable" for their lifestyle *choices* (Buyx & Prainsack, 2012, p. 80). Therefore, their "access to fully or partially publicly funded health care" or insurance coverage can be adjusted accordingly, depending on their "lifestyle and health behaviour" (Buyx & Prainsack, 2012, pp. 79, 80). According to this train of thought, people who engage in certain unhealthy behaviours (smoking, overeating, not exercising) and therefore lead an unhealthy lifestyle have a higher likelihood to develop certain illnesses (lifestyle-related diseases) or have a generally higher risk of falling ill. This *risk* is tied to higher costs for society and the health care system, implying that a certain group of people puts more drain on the system than others (Buyx & Prainsack, 2012, p. 81). Apart from the presumption that, "the total costs of treating people with unhealthy lifestyles over a lifetime is less than the total for healthy people (because unhealthy people die younger)", the notion that, "on an annual basis unhealthy people use more medical services", is equally arguable (Buchanan, 2011, p. 19; Buyx & Prainsack, 2012, p. 84). This is a central

element of debates around whether people with unhealthy lifestyles should pay higher health insurance premiums (Buchanan, 2011). In the private insurance sector, this *risk-stratification* is no novelty, however it also has become a tool in public health insurance policies throughout the past years, especially in European countries.

Risk-stratification describes the "conceptual tool aiding those who argue for the exclusion of people with *high-risk* lifestyles from (some) public health care" (Buyx & Prainsack, 2012, p. 81). Especially in light of the "understanding of solidarity" (according to Buyx & Prainsack, 2012, p. 79), engaging or not engaging in *high-risk* behaviours and the "recognition of similarity with others in a relevant respect" can determine people's "willingness to carry costs" for others (Buyx & Prainsack, 2012, p. 81). Then, the question is, as Buyx and Prainsack (2012) further argue: "the kind of risk we are talking about that determines who, if anybody, will be excluded from the scope of people who deserve our solidarity" (p.81). The example of a person who never smoked in their life, but all of a sudden is stricken by lung cancer shows "a risk that most people recognise as their own" and which they may also suffer from (Buyx & Prainsack, 2012, p. 81). It is seen as a risk to which everybody equally is exposed to; we cannot protect ourselves from it, as it is if we are suffering from an accident. In contrast to these examples, or what Buyx and Prainsack (2012) describe as "the most basic vulnerability of our life as humans" is the narrative, that people who suffer a certain illness only are, because of a course of action "against better knowledge" (p.81). Thus, they are held liable for their conditions and are seen as "belonging to a group of people" with a "different risk profile" from one's own, the *innocen*t (Buyx & Prainsack, 2012, p. 81). Common examples are: "Smokers with emphysema or coronary heart disease, over-eaters with type 2 diabetes or those who drink too much alcohol and suffer from cirrhosis of the liver" (Buyx & Prainsack 2012, p. 81).

Let's assume we, on the other hand, spend a lot of "money, time and effort" to "undertake every possible preventive and predictive measure to learn about and decrease the existing risks", because we feel under pressure to do so in our "social and political environment" (Buyx & Prainsack, 2012, p. 81). We may feel like holding "a grudge against those who spend their time and money in more pleasurable ways" (drinking, smoking, overeating) and therefore, we think, "incur additional", maybe even unnecessary risks that ultimately result in additional costs (Buyx & Prainsack, 2012, p. 81). This can lead to not only being unable to "recognize similarity" towards them, but also to completely "resent them" for their lifestyle and can potentially make us feel as if we are in a "different risk *category* than those who *do not care* about protecting their health in the same diligent way that we do" (Buyx

& Prainsack, 2012, pp. 81-82). This might even go alongside a feeling of "entitlement to lower insurance premiums", since "we actively work towards decreasing our risks" (and costs for society); or we might have a feeling that "we don't have to contribute as much to solidaristic insurance arrangements because we already invest so much in our own, individual health" (Buyx & Prainsack, 2012, p. 82). This approach to health behaviour might even prevent us from feeling "bound to them by solidarity", if we only see people's practices that are "different from our own" (Buyx & Prainsack, 2012, p. 82). Including solidarity aspects in the debate on health and especially on dietary behaviour is twofold: firstly because it underlines understandings of who, and whose practises, we feel connected to and secondly, the lens through which we look at certain groups has significant impact on our judgement and what they should or should not be held accountable for. Depending on these values and judgement calls we question the policies that are being instated as time goes by, less and less (Buyx & Prainsack, 2012). These dynamics significantly mould social systems as a whole and can lead to exacerbating numerous already difficult living conditions.

4. Health care policy and individual responsibility in Germany: a two-tier system?

According to Meulen and Jotterand (2008) a trend towards individual responsibility along solidarity can be detected in various European health care systems. Policies implemented underlined early 1990s debates concerning a shift toward a two-tier health care system. Examples[29] show that the role of market forces in health care policies lead to a "marketization" and an emphasis on personal responsibility in the financing of healthcare. Suggesting a two-tiered system with a private tier financed by individual contributions. Individual responsibility has become the entry point for the introduction of market forces, as they are seen as more beneficial tools for organising health care rather than a top-down approach from the State. A competitive market environment suggests a more efficient use of allocating resources and reducing costs (Meulen & Jotterand, 2008). Markets, however, are not just instruments for more efficient delivery of services but they are also introduced to promote individual choice. Rather than financial control as an indirect consequence, individual responsibility has become

[29]Examples are the *Simons Reform Plan* of the Netherlands in 1991 (addressing healthcare costs and scarcity of resources), the health care reforms and the *National Health Services and Community Care Act of 1990* of Great Britain (emphasizing efficiency and accessibility) and the German Health Sector Act of 1992 (introduced competition and self-responsibility as part of healthcare philosophy).

an explicit element in government health policy in which patients are seen as consumers who are able and permitted to make rational choices on health insurance and health services and can be held responsible for those choices (Meulen & Jotterand, 2008). Moreover, healthcare providers are given the freedom to organise and finance the care as they see fit. This policy means, while giving individuals more control on the health care delivery, it also reinforces making individuals responsible for financial consequences of their unhealthy behaviour.[30]

In Germany, the personal responsibility for a healthy lifestyle has become an explicit policy of the government to manage costs in the form of a *bonus system* in health insurance through rewarding health-related behaviour (Meulen & Jotterand, 2008; Schmidt, 2008). These *bonuses* are "financial incentives to promote personal responsibility for health, to reduce the overall health expenditure, and to enable the competition between health care insurers (the *sickness funds*)" (Meulen & Jotterand, 2008, p. 193). Insurers have the permission to offer financial bonuses or other awards for individuals who take an active part in age-related check-up programs or health maintenance activities that are supported by the sickness funds such as dieting, smoking cessation programs or yoga classes.

Some insurance companies also reward for active memberships of sport clubs as evidence to maintain health (Schmidt, 2008). Individuals who suffer a NCD receive reductions in co-payments if they:

- attend counselling sessions "on the advantages and disadvantages of screenings for each disease no later than two years from the qualifying age" and
- in the case of a later disease, a doctor must issue a certificate annually that confirms that the patient fulfilled all required and agreed to treatment plans (Schmidt, 2008, p. 209; Meulen & Jotterand, 2008, p. 193)

The way in which the *bonus system* rewards *responsible* behaviour, can also be referred to as "responsibilization", a term used in personalised medicine. "A woman with a family history of breast cancer" for example, "who does not comply with the screening programme arrangements for her mammograms" or decides she doesn't want to take a "genetic test to see whether she carries a mutation" would not be included in this definition of *responsible* behaviour (Buyx & Prainsack, 2012, p. 85). Being *responsible* does not only mean to take additional precaution but also to "forgo susceptibility testing or other predictive testing which

[30]In Dutch government documents, Meulen & Jotterand (2008) note for example, "an increased emphasis on individual responsibility for health and healthy lifestyles as an important contribution to diminish the burden of disease in the coming decades and to keep the health system affordable" (p. 193).

is available to them" (Buyx & Prainsack, 2012, p. 81). Therefore, in the German health care system, a *responsible* person is who "actively seeks to learn about as many risks as possible" so they can "take precautions to prevent them from materialising" - hence, being responsible not only means to "merely avoid activities that are known as excessively dangerous, but it has become synonymous with taking precautions and actively engaging in prevention" (Buyx & Prainsack, 2012, p. 81). This approach can also, however more moderately, be found in policies on lifestyle-related diseases. For example, a responsibility approach for a lifestyle-disease tied to a poor diet such as obesity (or T2D, CVD, hypertension, chronic diseases or forms of cancer) denotes that "an obese person with a family history of obesity", who not only refrains from annual health checks but also refrains from "preventative measures" such as counselling sessions on diet or not having an active membership in a gym, can be held liable for the diseases they may suffer from since it would suggest a lacking "willingness to lead a healthy life, even if they do not succeed" in their attempts to better their conditions (Buyx & Prainsack, 2012, p. 81).

Buyx and Prainsack (2012) also call this "individualization of responsibility for risk" and find its roots in the idea of an "active welfare state", where citizens are expected to be "more than mere *passive* recipients of money and other support" but are called upon contributing *actively* to society through "saving money", for example by taking care of family members (p. 81). In regard to health this would mean sparing public funds and staying healthy for the common good. The pillars of the German health care policy, primary prevention and health promotion, attempt to decrease morbidity aiming towards reduced expenses in the health sector and in medical care also as part of the "social investment strategy" that aims to enhance the productivity potential of society (Gerlinger, 2018, p11f). However, this consumerist approach of the bonus system also raises concerns when it comes to equity and solidarity, due to the unlikeliness of the bonus system being available to all. Especially already vulnerable and disadvantaged groups face even bigger hurdles to meet their care needs than benefitting from it.[31] If patient choice means whether to have the money to buy private care or not, or whether one is an attractive individual for insurance companies and care providers, people who can't and aren't will be at a disadvantage. Even more so, if they are held accountable for financial- and lifestyle choices, which is to be expected in a market-based system (Meulen & Jotterand, 2008).

[31]Especially endangered groups of vulnerability are along the lines of four dimensions: 1. socioeconomic status (income, working conditions, living situations and education); 2.sex, age, ethnicity, people with disability; 3. vulnerable groups: migrants, sex workers, homeless people; 4. geographic location (Gerlinger, 2018, p. 11).

4.1. A solidarity perspective on policy-making in the realm of lifestyle-related diseases

The emphasis on "individual responsibility in organising access to healthcare" (as shown in German health policy) stem from a justification "appealing to solidarity" (Prainsack & Buyx, 2015, pp. 10, 17). Within this train of thought, "those engaging in certain unhealthy lifestyles" risk illness and induce "higher costs" on society and its health care system (Prainsack & Buyx, 2015, p. 10). Those are assumed to be *reckless* and blamed to drain public healthcare systems with the "costs of their self-chosen, *unnecessary* health issues on everyone else who is contributing to the system" (Prainsack & Buyx, 2015, p. 10). Hence, whether a person is excluded from *innocent* people who *deserve* solidarity is differentiated by which kind of risk they take or not take. If struck by an accident (or as shown above the non-smoker with lung cancer) they fall into the category of *brute luck* (something unforeseeable and unpreventable) (Buyx, 2009, p. 872). But if on the contrary a person suffers from an "illness as a result of allegedly deliberate actions", they are seen as a case of *option luck* and as a part of a completely different risk group than the *innocent* (Prainsack & Buyx, 2015, p. 10). Based on this delimitation between us (the *innocent*) and them (the *reckless*), corresponding calls for incentives or less involvement in solidaristic insurance arrangements are supported. This example shows a "frequent misunderstood application of solidarity to the public health and healthcare context" which is often based on a "narrow conception of the risks involved" throughout the course of a human life (Prainsack & Buyx, 2015, p. 11). Therefore, a much closer look is needed here: higher health risks due to *chosen* lifestyles wrongfully suggest causality.

As epidemiologic research shows, "behaviour is a major causal factor in many diseases", however, it is "typically impossible to determine exactly what led to a particular condition in any individual person" - most lifestyle-related diseases simply are "multi-factorial" and due to a "complex interaction of heritable and non-heritable factors", "social and natural environments" and lifestyles (Prainsack & Buyx, 2015, p. 11). Moreover, research in epigenetics has indicated that, "some environmental influences", pesticides, pollutants and toxins or "bad" nutrients (Chiapperino, 2018) can "change the way genes are switched on or off" which results in the "social effectively folding into the genetic, and vice versa" (Petronis, 2010, as cited in Prainsack & Buyx, 2015, p. 11). So, aspiring towards having a clear differentiation of what people can or cannot "be held accountable for", is de facto impossible, or as Buyx and Prainsack (2012, p. 82; Prainsack & Buyx, 2015, p. 11) call it, a "moving

target". Besides, debates on individual health responsibility overshadow underlying wider determinants of health that need to be tackled by policy makers (Schmidt, 2008). Furthermore, when debates neglect factors that potentially could interplay in our health conditions, systemic changes are easily thrown off the agenda or result in victim-blaming. Hence, Prainsack and Buyx (2015) draw the conclusion that based on their understanding of solidarity, there is no way to justify a differentiation between people based on their health risks they assumably expose themselves to.

5. Behavioural dietary interventions as a strategy to prevent chronic diseases

Diet-related challenges are almost exclusively tackled from a view that revolves around disease-prevention of chronic diseases caused by, or resulting in obesity, although nutrition can have several effects on health that are not based on overconsumption but root in a lack of a wholesome diet in general. Still, *globesity*[32] and the idea of a "battle against the epidemic overweight" as a "threat" to public health is predominant in public and political discourse. How overweight is framed however, is crucial to how it is addressed (Schwartz & Brownell, 2007). Here too, who and what is *responsible* is a major determinant of how obese individuals are perceived and treated by society and policy-makers and mirror in actions that are considered as appropriate for prevention and treatment. Evidently, there is an asymmetry between causes and perceived causes and truly preventative measures and perceptions of what should and could be done to prevent obesity. This can lead to inequities, weight bias (and to victim blaming) and sidetrack from necessary actions that could improve public health strategies or the food industry sector. The key dispute between public health experts and the food industry, as Schwartz and Brownell argue (2007) are their political supporters. Whereas the approach of the former includes addressing poor or toxic food environments, the food industry and in many cases governments focus on individuals to think about calorie intake and package labels to help make better *food choices*. Notions discussed prior attempted to outline the conditions, values and strategies in which policies around health and nutrition are currently assembled. The following overview of interventions to enhance dietary behaviour sheds light on the predominant attempts to tackle healthy nutrition that is expected to result in positive health outcomes.

[32]See definition in chapter 2.1., page 12

Diet-enhancing behavioural interventions: examples

Changing dietary behaviours to "prevent obesity and diet-related NCDs" (Djojosoeparto et al., 2021, p. 5) has been on the agenda of policy-makers in health policies for a number of years. Despite scientific consensus that dietary interventions also need to be followed through on a population-wide basis to achieve targets as preventing NCDs long-term, the support for approaches targeting individuals to improve their *choices* remains strong. A study conducted by Bowen and Beresford (2002) provides a broad overview to how these interventions are usually carried-out[33] and show what works "best" when it comes to reducing calorie, fat or sugar intake and boosting fibre-rich foods. Once identified, most successful interventions aim to be implemented as part of standard public health and health care practice.

Divided into channels through which interventions were delivered, most success was shown in the channels: targeting individuals or "individuals at risk for development of disease", family, providers, community organisations, worksite and point-of-purchase interventions and targeting entire communities with interventions (Bowen & Beresford, 2002, p. 257). Initiative showed promising outcomes when people were educated and informed on healthy diets and reduction of "high-risk" nutrients when the setting in which the adults received information was session-based and during (language) classes which led to avoidant behaviours and lowering of fat consumption[34]. Interventions to increase fruits and vegetable intake and reduce calorie intake among risk groups such as cancer information callers, through self-help material targeted at heart attack patients to lower fat intake, targeting newsletters towards elderly Medicare recipients, through providing low-fat snacks for people who said they were "snacking" in between meals[35]. Long-term improvements[36] when receiving "standard care or from a trained nurse on a regular basis" through "group intervention sessions and tailored letters", positive effects in the intake of fruits and vegetables and a reduction of fat were detected and through regular dietary counselling significant "long-term declines in serum cholesterol" shown (Bowen & Beresford, 2002, p. 270)[37]. The provision of nurses for brief behavioural counselling led to "decreases in dietary fat intake in individuals with coronary risk

[33]Key dietary habits in regards to NCD are fat- and fibre intake and consumption of fruits and vegetables. Most interventions focus on improvement or reduction targeting these nutrients (Bowen & Beresford, 2002).
[34]This was found among college students and in school classes of undergraduates.
[35]Fat consumption in their whole consumption decreased
[36]On dietary behaviour of participants, as the study shows among individuals with risk factors for chronic diseases. After two years, a better diet of the group was shown, which however was not proven after five years (Bowen & Beresford, 2002, p. 270).
[37]Found in the *Oslo Study* (Bowen & Beresford, 2002, p. 270)

factors" (Bowen & Beresford, 2002, p. 271). Moreover, positive outcomes were shown in calorie-reduction when interventions aimed at individuals with a chronic disease[38].

Interventions of the study also included aiming "low-income individuals" as part of governmental education programs targeting fat changes[39] which led to positive effects and fostered "low-fat behaviours". Participants of the *Expanded Food and Nutrition Education Program*[40] improved dietary habits because of a six-month "session-based intervention". Providing "fruit and vegetable coupons and education" were evaluated as *changing the dietary behaviours* of "supplemental food program recipients" and increased their fruits and vegetables consumption (Bowen & Beresford, 2002, p. 271). A "one-year intervention to increase fruit and vegetable consumption" focused on a *Special Supplemental Nutrition Program for Women, Infants, and Children*[41] where noteworthy increases in the participant's daily fruit and vegetable intakes were found. The individuals were part of a dietician-led, group session-based intervention and showed more positive results compared to "material and videotape intervention groups" (Bowen & Beresford, 2002, p. 271). A "community-wide screening and follow-up project" in low-socioeconomic neighbourhoods "produced significant changes in diet following group interventions compared with pamphlet intervention": where the most effective tool within communities were found in *peer educators* who delivered fruit and vegetable interventions to lower-socioeconomic and minority groups (Bowen & Beresford, 2002, p. 273). Information was delivered in *cliques*, or "naturally occurring groups of employees" in companies by "key members of each intervention clique" delivering "interpersonal intervention messages to other members" (Bowen & Beresford, 2002, p. 273)[42]. To motivate dietary changes, the tools presented in the study showed that feedback about risky behaviours, especially among "individuals in danger of developing a chronic disease" can lead to positive effects when combined with education on their situation (Bowen & Beresford, 2002, p. 271).[43] Community settings, as "grocery store interventions" showed "little evidence of

[38]Best results were achieved by "targeting women with coronary heart disease" which led to the reduction of "calories from fat and saturated fat", similar outcomes were found in "targeting women in menopause" (Bowen & Beresford, 2002, p. 271)

[39]In the *Expanded Food and Nutrition Education Program*

[40]Aims to assist limited-resource families gain the knowledge, skills, attitudes, and changed behaviour necessary to choose nutritionally sound diets and improve their well-being.

[41]The *Special Supplemental Nutrition Program for Women, Infants, and Children (WIC*) is a federal assistance program of the *Food and Nutrition Service* (FNS) of the *United States Department of Agriculture* (USDA) for healthcare and nutrition

[42]Intervention *cliques* were consuming half a serving of fruits and vegetables - this change was maintained for six months (Bowen & Beresford, 2002)

[43]"Blood cholesterol feedback plus an educational session", used to "reduce saturated fat intake in normal cholesterol subjects" was successful and "tailored sessions from nutritionists" increased "fibre consumption and

efficacy" in the study by Bowen & Beresford (2002, p. 274). However, they were the object to a variety of interventions and showed that regular consumers in supermarkets who were provided with audiotapes containing "skill-building information" and "nutritional knowledge tests to use at home" in combination with "public service announcements" (which were played in supermarkets and stores) increased the average consumption of fruits and vegetables, but also left positive imprints on studied shoppers and their "beliefs about fruit and vegetables" (Bowen & Beresford, 2002, p. 274). Moreover, decreasing prices of "low-fat snacks in vending machines" increased their purchase in a university and in worksites. Notable effects were found in individuals, education and worksite, where dietary assessments, monitoring and counselling were received by the participants, which resulted in a "significant fat reduction" (Bowen & Beresford, 2002, p. 274).

A "community-based intervention in worksites" to spike the intake of fruit and vegetables also involved studying "environmental components" (for example cafeteria changes), and "individual strategies" (for example self-help materials, etc.) and showed positive results. Even after the two-year follow-up, the average serving of fibre-rich foods was increased. A "newer multi-theoretical intervention" resulted in notable shifts in fruit and vegetable servings when "worksite, family, and employee strategies" were combined (Bowen & Beresford, 2002, p. 273). Worksite approaches that included "individual-level intervention strategies such as changes in cafeteria offerings, print materials, worksite-wide activities, and contests" showed **"**consistent changes in all nutritional variables" when "increased access to fruits and vegetables at work", more "access to nutrition information at work", and more "endorsement of normative beliefs related to healthy eating" were provided (Bowen & Beresford, 2002, p. 274). This positive trend however, was not proven after a two-year outcome assessment. Interventions which had no significant effects on lowering fat intake were motivational interviews, computer-tailored print feedback, physician visits as well as physician visits and screening in combination with self-help material. Weekly sessions within "families, including both parents and children" led to "consistent significant changes in eating habits to reduce fat" - nonetheless, the changes were found "mostly absent" in the 4-year follow-up (Bowen & Beresford, 2002, p. 272).

increased choices of high-fiber recommended foods", "tailored and non-tailored newsletters" produced "increases in fiber intake" (Bowen & Beresford, 2002, pp. 271-272).

Conclusions and limitations of the study

Bowen and Beresford (2002) emphasise that the study's participants were highly motivated and showed access to resources, which is restrictive in regard to large parts of the public who are not as well resourced. Moreover, it is argued that the positive outcomes of the undertaken studies most certainly led to the grand emphasis and support of individual targeted approaches to change dietary behaviours and include the realisation that they are not only possible but also most effective and efficient (Bowen & Beresford, 2002). Strategies that could be used and adapted by "broader segments of the population" were also identified in the broad report on diet-enhancing interventions and suggest digital approaches in use of computed education tools and digital feedback systems (Bowen & Beresford, 2002, p. 275). An already established instrument in that "toolbox of behavioural public policy" is *nudging* (Prainsack, 2020, p. 549), which according to its understanding stems its interventions from information that has been tested and aligned to evidence from behavioural research (as such by Bowen & Beresford, 2002) and will be discussed in more detail throughout the later chapters of the thesis.

5.1. Summary: health policy on nutrition and individual responsibility for health and disease

Opening the debate on nutrition and health policy alongside the food regimes throughout the first chapter attempts a contextualisation of the topic *nutrition* in policy. Simultaneously it should carve out entry-points for health policies on nutrition through a global and governmental priority shift: from food security and food safety to food quality and the aspect of health that developed alongside the rapid rise of (processed) food industry and evidence that dietary behaviour contributes to several chronic diseases (T2D, CVD, hypertension and various forms of cancer) that are associated with "draining" the health system in European Member States (Djojosoeparto et al., 2021). The policies emerged amidst attempts to tackle these "lifestyle-related diseases" and put questions about responsibility, risk stratification and solidarity in public health and health care policy into the limelight. To tackle these questions, terminologies and concepts such as the "freedom of healthy behaviour", ideas of food choice and toxic food environments had to be discussed beforehand. Finally, a comprehensive study of diet-enhancing interventions was examined.

6. Empirical research design: outline & research questions

6.1. Introducing the empirical research

In an attempt to tackle poor health conditions – and to prevent the costs for economies that emerge through them – profit oriented problem solutions are to enable people to make optimal choices versus poor lifestyle choices (in the form of choice architecture). In the wake of efficiency claims and the need to adjust to the technological developments societies undergo, has current approaches to health care delivery focus on Health Information Technology (HIT). However, the attempts to tackle poor health and "improve health care delivery" (the *supply side*), through approaches mentioned above, were considered as "inept at transforming the health as well as the health costs of crowds" by Piniewski et al. (2011, p. 7; Prainsack, 2020, p. 550). As they (2011) state, involving communities and individuals in co-creating knowledge for future engines to tackle health in policy will be crucial[44]. Yet, the main objective remains to "optimise human performance and lift our collective health talents" (Piniewski et al., 2011, p. 7). According to this train of thought, targeting the behaviour of individuals or communities (the *demand side*) to get the desired health outcomes legitimises inviting market economics into public policy. Although this rhetoric is well known in healthcare policy (as argued in chapter 4) , it is new to public health policy and run danger to defeat its very own purpose, if the assumption is that policies have the ability to intervene once markets have failed[45] (Prainsack, 2020).

When it comes to addressing diet-related health challenges, similar policy responses can be detected. Calls to target "poor food choices"[46], "suboptimal diets"[47] or the burden *globesity*[48] to improve health conditions are predominant part of the discourse in health and nutrtition policy. Against the backdrop of these dynamics and the predicaments discussed in the preceding chapters, the overarching question of this research project evoked. The attempt was to put profit-oriented, behavioural economic approaches to optimise health and nutrition

[44]The authors suggest here: a "provision of mundane health data through light instrumentation of the crowd, real time living epidemiology linked into advanced algorithms sorting the per unit co-occurrences into wellness or illness promoting event streams, simulated and actual nudging through persuasive technologies such as serious gaming to reward optimal behaviours and timely visualisation and reliable simulation to pre- evaluate and proactively direct public health investments in evidence-based ways" (Piniewski et al., 2011, p. 7)
[45]This will be discussed in more detail later on in the thesis, see chapters 9.4.2; 9.4.3
[46]Discussed in chapter 3.2.
[47]Debated in chapter 3.4.
[48]See definition in chapter 2.1., page 12

aside and put individuals and their experiences into the centre of attention instead. The following questions must be tackled in order to do so: what is it that people, need to live and eat healthily and in view of their daily living and working conditions? And where are the capabilities of policy-makers to support them in maintaining a healthy diet? My own research interest focuses on what policy-makers have to take into account when creating future policy tools for healthier diets. Against this backdrop, I formulated the following research questions:
RQ1: How do past and current personal, domestic and institutional life experiences and conditions imprint dietary behaviour of people living in Germany?

RQ1a) How do people design their day-to-day food practices?

RQ1b) What part does "health" play in their food practices?

6.2. Empirical research design

6.2.1. Introducing the method: a qualitative study on food practises and health in Germany

The methodological framework of the present study seeks in depth insights through interpretative research and analysis methods. Therefore, qualitative, semi-structured Interviews, that aim to provide these in-depth insights, were chosen (Weiss, 1995; Münch, 2016). This approach allows to collect the empirical data in an explorative manner. As shown above, much research in the field of health and nutrition is based on content analysis such as policy evaluations, or evaluations of behaviour focusing on economic efficiency using quantitative data. However, these top-down approaches neglect the element of human (inter)action which takes place at the heart of this research. Hence, the research focused on this human component by choosing qualitative interviews as one of the sources of data and as a starting point to tackle the research interest altogether through a bottom-up approach. Despite the attempt to pose questions rather openly to encourage people to speak as freely as possible, the semi-structure ensures that the participants are guided through the interviews and the researcher can follow the outline of the course of the operationalisations made prior. The operationalisations are based upon the definitions of *food practises*, *dietary behaviour* and indicators of the concept *toxic environment* from the respective literatures (chapter 3-4). Throughout the research project, new categories developed to the pre-appointed ones shown above.

6.2.2. Semi-structured interviews: structure and questions

The introductory questions of the interviews aimed to paint a picture of how the interviewees organise their daily food practices within their domestic, work and food environments. To gain these insights, the first question was posed:

> *How does your typical day - on a normal weekday - look like? What happens between getting up in the morning and going to bed at night? Maybe you can describe that for me a little bit along the lines of work, leisure time and everything else you can think of.*

Generally speaking, the participants mentioned their meals to add structure to their day, so the following question asked more detailed into their meals and what the meals consisted of, where their food is taken in, whether they cook or not, alone or with a partner/child etc, or which snacks they chose. The second set of questions was asking to find out how they go about it, when they run out of food, their way to the supermarket, why they choose this particular one and which products they get and if they are on a budget. The third part of the interview intended to gain insight into the childhood experiences and food practises through the question:

> *Can you remember how a typical day as a child looked like in regard to your meals? Which part did food play in your family?*

The participants had very in-depth insights when it came to their nutritional background, they were able to recall taboos, meal routines, specific dishes and dining etiquette, which they shared without specifically asking for this kind of information. When they were asked whether they can recall anything that they "learned" at home or in school or at the doctor's about food or nutrition, the stories were more limited, so the question:

> *Did you face or address the topic throughout the course of your life elsewhere?*

was posed and answered along the lines of varying dimensions such as personal interest, as major in their studies, in their job, due to a medical case or due to societal and aesthetical issues. This led to the aspect of health in their food practices and whether it played a certain part in their day-to-day lives, why and how. Finally, the last question asked specifically about (diet-enhancing) policy:

> *What do you think would support you in eating healthily or what would make it easier for you to maintain a healthy diet?*

In case they did not share any ideas of their own accord, dietary-interventions were mentioned as reference points. At the very end of the interview, sociodemographic details were asked and noted: age, sex, occupation, highest level of education and the location of residency.

6.3. Data collection

6.3.1. Sampling

To answer the research questions through the empirical research, the interviews attempted to gather comprehensive and in-depth insights into individual's daily practices and conditions of the food environment in Germany. Therefore, the sample consisted of eight people currently resident in Germany (henceforth P1-P8). The required minimum age was 18, the youngest participant was 22 years old and the oldest had the age of 64. The participants were found through snowballing (5) and through callbacks from posting the research project in social media forums (3). Prior to the interviews, a pre-test was conducted and considered in revising the questionnaire but was excluded from the final sample of the research. The sample ultimately contained five women and three men who are all currently resident in Germany and have been throughout their domestic upbringing and education. Diverse cultural backgrounds occurred unintentionally: participants with a family background from Greece, Bosnia/Marokko, Italy and Germany were the final sample. A less diverse spread was found in educational backgrounds and resulted in six participants with a university degree and two with a degree from an apprenticeship. However, distinct schools were attended throughout their educational course: grammar school and secondary school[49]. The occupations show a strong variety, as well as the geographical location the participants live(d): from rural areas (Black Forest) to provincial towns (Sindelfingen, Pforzheim) and urban areas (Frankfurt/Main, Munich, Stuttgart) were the places of residence. The occupations differentiated as well as in working hours (part- or full time), conditions (manual labour or sedentary work).

Interview tool and duration

The Interviews were carried out on the digital platform *Zoom* due to the geographical distance between the researcher and the interviewees (Austria and Germany). The time span of the interviews was between May 2021 and July 2021 and the interview duration was at a minimum

[49]Original German terms: „Gymnasium und Realschule"

of 24 minutes and at a maximum time of 56 minutes. Participants were informed about terms, content and data protection beforehand through an information sheet which was sent out to sign prior to the interview via email.

6.4. Data analysis

6.4.1. Grounded Theory & coding methods

Grounded Theory approaches by Ellis, Strauss and Corbin (1992) "object drawn theory formation" was applied after the conducted data was fully transcribed onto the CAQDAS programme "F4 Transkript". After importing the transcriptions into the CAQDAS "F4 Analyse", the texts were "preliminary jotted" (Saldana, 2009) before starting first cycle coding (affective coding method: initial coding[50] and evaluation coding[51]) through "splitting" which made it possible to carefully scrutinise social actions into data. During second cycle coding (focused coding[52]), the categories were reviewed and reanalysed which lead to reducing the number of codes and larger segments of text within code groups (Saldana, 2009, p. 20). A final compilation (see external attachment as *codebook*) shows a library of the codes, their content descriptions, and a brief data example for reference. During both cycles of coding, analytic memos were conducted through considering comments and field notes that eventually built the basis for the final analysis codes relevant beyond RQ1. In third cycle coding, special attention was paid to "wording". This process, "theoretical sampling", was not linear but intertwined (Glaser & Strauss, 1967).

6.5. Ethical aspects of the research & sample limitations

Although platforms such as *Zoom*, *Skype* or *Blue Button* have gained momentum and scientific acceptance during the conditions of the Covid-19 pandemic as a research tool for interviewing, restrictions of the instrument must be mentioned. Digital platforms and tools exclude two groups: people who do not have access to the technology, or who cannot apply the technology. This is on the one hand limiting in regard to questions posed later on in the thesis regarding socioeconomic conditions, since the sample therefore only includes "high(er)-income"

[50]Following Charmaz, 2006; Corbin & Strauss, 2008; Glaser, 1978; Glaser & Strauss, 1967; Strauss, 1987; Strauss & Corbin, 1998 (Saldana, 2009)
[51]Following Patton, 2002; Rallis & Rossman, 2003
[52]Following Charmaz, 2006

individuals with limitless technological access. This creates privileged views on a topic that could certainly benefit from people that do not dominate public and political discourse on nutrition related topics anyhow and whose views are not usually featured. This circumstance is unfortunate, but bears potential for further research through reaching out to organisations and either arrange interviews face to face or providing the technical prerequisites to hold digital interviews. On the other hand, people who are not familiarised with the technology are less likely to engage in an interview that requires using it. This circumstance showed through P3 who did not have *Zoom* on her computer and therefore almost cancelled. Gladly, P3 had the resources to have somebody show and help her how the tools are used. If this is not the case however, people fall through and their experiences are excluded.[53]

Finally, through the course of the pre-interview it became visible that *food* is a potentially vulnerable topic that people do not want to get into with a researcher. This can be twofold: firstly, food is often associated with social and societal pressure promoting a certain body image that is more or less accepted. Secondly, moral connotations that go alongside buying certain foods and choosing certain products over others can also contribute to the sensitivity of the topic. Studies showed that alongside (food) products entailing values such as environmental consciousness and sustainability, clear differentiations between us - who care about the environment and buy organic products, and them - who buy cheap, mass produced foods that damage the earth is reinforced through public narratives that places responsibility for climate reversal on individual behaviours and rates the commitment to sustainability based on lifestyle choices, most commonly expressed through the ecological footprint (also see Neckel et al., 2018). Understandably, people want to avoid sharing controversial practices as they may feel the pressure of feeling "judged" already on a variety of levels on a daily basis. Thus, questions answered according to social desirability have to be considered as a potential bias. In light of my research interest, similar dynamics were detected regarding health and nutrition, which will be discussed later on in the conclusions of the collected empirical data.

[53]These limitations of the sample did result in limited insight, when it came to the last question of the qualitative interviews that aimed to shed light on how individuals can be supported in order to maintain healthy diets, despite the difficult living and working conditions they may face. The participants of the sample did not need to stick to a budget, when it came to their food practices, which does not mirror current living conditions of many households in Germany. The participants spoke about not having to specifically calculate their nutritional expenses, they only did calculations when they shared a household with their partners. They did not share concerns or struggles in regard to accessibility or affordability to healthy food (see later chapters for in depth discussions on income, food and health relations).

7. Presentation and discussion of the empirical data

7.1. Discussing RQ1, RQ1a and RQ1b

7.1.1. Past and current personal, domestic and institutional experiences regarding nutrition

As a result of the data analysis through coding, codifications and memos emerged. In the following, the most relevant conclusions derived from the codifications - in consideration of the research questions - will be discussed. The core findings are represented by key memos, which are also the headers of the paragraphs below.

Upbringing as a significant milestone in developing food practises

Participants were asked to describe a typical day in their childhood regarding meals as well as the part nutrition generally played in their family growing up. The interviewees were able to recall several experiences from their upbringing which included the dining etiquette in their family, specific dishes they were given regularly as well as the food taboos and bans that were declared by their parents. These experiences were often put in relation to how it imprinted their current food practices: participant 1 drew the conclusion for herself to no longer follow the family meal plan and routine (Interview 1, paragraph 59). Participant 5 on the other hand talked about following the same cooking style as his dad who is a chef (Interview 5, paragraph 56). Participant 7 emphasised his connection to food finding its roots in how his family handled the matter and describes cooking together, going to the grocery store together and getting so inspired about many aspects of food, him and his sister even chose nutrition related career paths: “the part food played in our childhood was so significant that, it eventually lead to our aspired careers (...) that was destined in some way given our background, that’s not coincidental” (Interview 7, paragraph 32, minute 12:20f)[54]. Participant 6 looks back on a lot of experimenting together with her mother and inventing dishes together (Interview 6, paragraph 42). Participant 3 looks back on a rather difficult relationship with food in her family: since she grew up in the GRD[55], a time when food was in short supply, there was no real product selection the family had. She remembers the government having the say in how much milk, flour etc. the household was allowed to buy. She describes this experience as a very significant one: “maybe

[54]Original quote: „Also alles was mich so maßgeblich geprägt hat und was letztendlich auch zu unserem Berufswunsch geführt hat, also sowohl ich als auch meine Schwester haben jetzt einen Beruf, wo es um Essen und Trinken geht irgendwo, das wurde uns schon irgendwie so in die Wiege gelegt, das kommt ja nicht von ungefähr.”

[55]German Democratic Republic, (DDR, Deutsche Demokratische Republik)

this is why I just like to stock up when it comes to food, that surely stems from my childhood" (Interview 3, paragraph 76, minute 18:37)[56]. All of the interviewees describe their typical day growing up along the lines of the three meals: breakfast, lunch and dinner - a routine they still follow, depending on their occupation.

Social, cultural and geographical conditions and environments as additional imprints in developing current food practices

Participant 4 talked about the significance his siblings had/have on his understanding of food and diet styles. Since they are vegan and vegetarian he had to familiarise himself with different approaches to nutrition than what he has learned so far: "to me it was very interesting, where their decision came from, how meals are cooked without meat or any other animal products and seeing an entire different way of eating in general" (Interview 4, paragraph 51, minute 13:48)[57]. Participants 1, 2, 7 and 8 described their social setting in which they live in as a strong influence of what they practise: it is often a social event to cook together and think of new recipes and therefore get inspired to buy different food or cook in a different way as participant 1 talked about (Interview 1, paragraph 21). The geographical location the interviewees lived in also left an imprint on how they design their food practice: Participant 6 noticed a difference in which kind of food she had access to when she moved from one part of the city to another. When she moved away from the centre of the city to a more outlying district she talked about having had difficulties getting the food she wanted: "it was hard to find fresh vegetables or fruits, or food that wasn't packed in a lot of plastic since there is such a strong discounter infrastructure" (Interview 6, paragraph 106, minute 32:55f). Participant 1 and 8 emphasised that they noticed changes in their diets depending on the culture they lived in and referred to their experiences abroad and outside of Germany and concluded that they adopted several experiences into their current practice[58]. Participant 5 mentioned that he keeps on being inspired and finding new ideas and recipes to cook on the Social Media platform *Instagram* or *TikTok* or through Apps such as *Captain Cook* and he likes that he can just get a quick inspiration and then cook it in his own way (Interview 5, paragraph 61). Participant 5 talked

[56]Original quote: „In den Geschäften gab es nicht viel zu kaufen, deswegen ist das wahrscheinlich auch so, dass ich gern einiges da habe und Vorrat habe, das ist sicherlich auch durch meine Kindheit bedingt."
[57]Original quote: „Also meine zwei Schwestern sind einmal Veganer und einmal vegetarisch, da wird man dann schon damit konfrontiert woher die Entscheidung rührt, wie sie sich ernähren, weil es ja ein komplett anderer Ernährungsstil ist, an sich und ähm ja auch so generell, was man jetzt kochen kann, wenn man auf Fleisch und auf tierische Produkte komplett ausfallen, da wird man schon damit konfrontiert und finde das auch ganz interessant."
[58]Original quote: „Ich finde dadurch auch also wenn ich woanders war, dann fällt einem schon auf dass ein paar Sachen an Ernährung schon wichtig sind also ein leckeres Brot zum Frühstück und es das nicht überall gibt."

about documentaries that influence his diet to some extent but not on his day-to-day meal plan as Participant 7 says: he finds himself boycotting several food groups, since documentaries shed light on conditions in the food industry that he had no knowledge of before.

Knowledge about food is not tied to family or institutions but personal interests

When it came to learning experiences on nutrition, the participants did not associate their domestic background with gaining knowledge. They did not recall ever receiving any specific information about nutritional value or components of food from their parents. Participants said they learned about food in so far as to which meals can be prepared and how. They also emphasised the social aspect of eating as part of the family routine and bringing the family members together, rather than receiving information on nutrition, also regarding healthy nutrition[59]. The participants stated that their personal initiatives and curiosity rather led to their current food practices and style of diet than any other factors such as family or school education. Regarding the latter, participants described only a very brief encounter with nutrition through the course of their education. Interestingly, only participant 4 and 3, who attended a secondary school[60] recalled to have touched upon the topic quite extensively. As part of the syllabus, they had the opportunity to choose to attend subjects on nutrition and health. As opposed to experiences shared by the participants who attended grammar school in Germany[61] who did not have subjects on nutrition and/or health - as far as participants remembered. Participants rather tied information on nutrition to elementary and primary school (Interview 1, paragraph 78). Participants 6 and 8 emphasise that they do not remember having heard anything about nutrition through the course of their institutional education and that their knowledge mostly comes from their own personal interest in the topic.

Nutrition is rarely addressed outside of the personal and domestic sphere

Experiences related to learning about nutrition and/or receiving specific information on food practices in schools or even in a medical context were little to non-existent at all according to the interviewees. When they were asked if, or whether the topic was discussed in a medical

[59]Original quote: „(...)also nicht so wirklich über so Themen, die man jetzt halt so kennt, gesättigte Fettsäuren, nicht gesättigte Fettsäuren, das war bei mir eher nicht der Fall. Also es war schon immer klar was gesund ist und nicht gesund ist, aber auch nur so das obligatorisch gesunde und nicht obligatorisch gesunde und nicht obligatorisch gesunde also da war schon immer klar, was nicht vermeintlich gesund ist und wirklich gesund ist, also das würde ich mit meinem Kenntnisstand gleichsetzen, aber es war jetzt nicht viel Erklären dabei, ja." (Interview 4, paragraph 47)

[60]Realschule

[61]Gymnasium

context or from a physician at some point and time in their lives they all negated - even the participants that shared suffering from a diet-related disease. Participant 1 who suffers from a chronic bowel disease talked about bringing it up several times since she wanted to know what foods she should or should not eat and she was told to just try out what feels best for her, since it is impossible to accommodate the high variation range between patients. Participant 2 has not shared any experiences where she received information, consultation or guidance on nutrition despite suffering from lipoedema. However, participant 3 talked about her prescribed dietary consultation as she suffers from T2D. The other participants never talked about nutrition in a medical context. Participant 5 shared his experiences with annual "medical checks" he has to undergo as part of his occupation but they mainly focus on signs of abusive behaviour towards alcohol, drugs and other substances.

7.1.2. Day-to-day food practises and food environments of people living in Germany: discussing key findings regarding RQ1a

Food practises are organised around occupations and vice versa

All interviewees started their description of a "typical day during the week" with getting up in the morning followed by getting ready for the day which was determined by their occupation or meal routine. Depending on what the occupation of the participant entailed - whether they work from home, have to go to the office, do manual labour or sedentary work - the occupation plays a major part in how they structure their day and their meals throughout the day. Participants 1, 2 and 3 who work mostly from home structure their workload around their meals in the morning and at lunch and are usually done with their work by the time they have dinner. They talked about getting started in the morning with work and then taking their time to cook something for lunch. They snack throughout the day and in the evening they usually have a home cooked meal. Their day starts rather late but also finishes rather late if they do home office at the expense of a longer lunch break. During their lunch break they usually take their time to cook (Interview 1, paragraph 8f; Interview 2, paragraph 6f; Interview 3, paragraph 2f). Participants who mostly have to be physically present at their workplace, described their meal routine as being dependent on their work schedule, which included a traditional 8 hour workday among the interviewees. They, however, describe having breakfast and dinner - the snacks in between vary depending on whether their employers provide food in a staff cafeteria or they have to bring their own lunch and snacks. In that case they make use of that possibility for

lunch and cook their dinner themselves.[62] Staff cafeterias are often described as practical (for example by participant 8), since there is no need to think about the meals for the next workday. Nevertheless, as participant 8 said, the provision of food by the employer does not necessarily align with her nutritional needs. She detected a lack of vegetarian options and an overload of energy rich, hard to digest dishes that do not feel particularly wholesome to her. After these heavy cafeteria meals she often struggles with being productive and focused throughout the afternoon and the rest of her workday, an experience also shared by other participants (Interview 8, paragraph 56; Interview 4). The interviewees emphasised that they usually like to take their time to prepare their meals, even though they often face timely limits due to their working schedules. According to participants 2 and 3, there is little time to prepare meals and do grocery shopping during the week as their work schedule mostly interferes with supermarket opening hours[63]. Through planning meals ahead they do manage to incorporate their preferred practices into their daily routines. Dinner represents the meal for which they make an active effort to make room to cook for oneself or for their partners or friends.

Food selection processes include the dimensions: taste, price, moral values, aesthetics and their own understanding of "quality"

The participants were asked to describe their practice regarding replenishing food - alongside this process, they were encouraged to paint a precise picture of their physical food environments in which they select their food. The participants mostly buy their food in supermarkets nearby. The determinant to which grocery store they go to depends on whichever is the most convenient to access amidst their daily routines. The food environment of all participants includes being able to choose from a variety of grocery stores with different price ranges without major hurdles to access them, apart from participants living in rural parts of Germany who talked about requiring a car to get to a grocery store. When it comes to food selection, the participants follow their own set of values. The term "good quality" was often used by the interviewees. Interestingly, this term differs in its understanding depending on the speaker. Relations between "good quality" and food products were mostly made regarding the price of the product, where the product is coming from or which labels are printed on the packaging, the degree to which it is wrapped beautifully or whether it contains as few additives

[62]As mentioned in Interview 8, paragraph 15, minute 03:17; Interview 4, paragraph 14, minute 04:20; Interview 5, paragraph 18, minute 03:47; Interview 6, paragraph 7, minute 08:11; Interview 7, paragraph 17.
[63]Longer opening hours of grocery stores make it easier for the participants to be more flexible, minimise time pressure and avoid needing take out services or convenience food despite demanding work schedules as participant 2 shared (Interview 2, paragraph 13).

as possible. It was interesting to note that there seemed to be a collective understanding of what products are of "good quality" for the participants. Participant 6 for example explained that for her, the seasonal, regional and biological background of the product is the most crucial factor. Participant 8 emphasised the importance to know "who is doing what throughout the food production process" and includes information on fair production to her selection practice. Participants 7 and 1 navigate their aspiration towards quality through the price of the product. Accordingly, higher prices are considered to correspond with higher "quality".

7.1.3. Food and health relations in daily practices: discussing key findings of RQ1b

Health aspects in daily food practices are mostly associated with negative body feedback and weight

The interviewees 1, 2 and 3 talked about aspiring to eat healthily because they have suffered illnesses in the past and therefore have to pay attention to health aspects in their daily food practises. Whether it is avoiding foods high in sugar, fats or processed convenience products, participants keep their behaviours in check in order to avoid negative feedback, as participant 1 shared: if she is not following certain dietary guidelines she instantly receives negative body feedback exacerbated by her bowel disease.[64] Participant 2 also talked about having to make an effort to maintain a healthy diet, due to her lipoedema that otherwise causes her physical pain alongside aesthetic repercussions. She portrayed a clear set of favourable behaviours and should and should nots to keep the healthiness of her diet in check. Throughout the course of her day however, it is difficult for her to uphold the many restrictions set for herself: "In the morning I manage to do very well with a smoothie and fruits but in the afternoon it all goes down and there is a huge performance drop."[65] She is not the only participant who emphasised a clear set of favourable behaviours regarding the healthiness of a diet, constantly evaluating and judging one's own behaviour. Participant 4 for example, also emphasised attempts to make an active effort of eating healthily but not always being able to follow through[66]. His reasons

[64]Interview 1, paragraph 90

[65]Original quote: „Also ich würde sagen so morgens schaffe ich es noch voll gut entweder einen Obstsalat oder einen Smoothie zu trinken und da habe ich so eine Balance und da habe ich es mir mittlerweile antrainiert, dass es mir nicht schwer fällt aber danach geht es halt so voll den Bach runter." (Interview 2, paragraph 18, minute 07:07)

[66]Original quote: „(...) ich versuche es schon selbst zu richten auch viel für hier jetzt damit man halt ein bisschen Reglementieren kann, was man da rein macht, was man da dazu kocht und so weiter, aber würde ich nicht sagen, dass es mir voll und ganz gelungen ist, mich gesund zu ernähren." (Interview 4, paragraph 64, minute 16:50).

however are different ones: participant 2 expressed concerns of her aesthetic appearance, whereas participant 4 explained:

> *Since two of my grandparents died of a heart attack and their lifestyle was...let's just say rather conventional and their death, to some extent, can be traced back to nutrition as well, one can try and save a couple of years with a healthy diet.*[67]

Participant 3 also spoke of having to add the aspect of health in her daily food practices, because she suffers from T2D and struggles with feelings of shame or guilt around eating unhealthy foods. Feeling "guilty" for not following through with one's intention to eat healthily is commonly shared by the interviewees and has to be mentioned here. However, there were notable differences found on health and food relations between female and male interviewees. Female participants particularly expressed struggles around weight and aesthetic repercussions of an unhealthy diet. On the contrary, male participants did not express any concerns in that respect but were rather concerned about food in relation to life expectancy and made - based on their narrations - a more *forgiving* impression with their food practices than the female participants.

When it comes to the healthiness of their diets, although all interviewees emphasised it repeatedly throughout the interviews, the importance of the "right taste" also has to be mentioned here. A statement made by participant 5 can be insightful in that regard: "Generally speaking, if I cook it's mostly healthy, but the taste is always more important: like if the dish needs butter in order to taste better, I just add it."[68] Interestingly, as mentioned above, the participants frequently make the distinction between healthy food as a home cooked meal and unhealthy food as convenience food. This was also addressed when the interviewees were asked about their personal food and health relation, as participants 3, 5 and 7 stated: "Since I am cooking myself it automatically is healthier."[69] "It is very important to me to not eat any convenience food, it tastes better and is just much more healthy."[70]

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[67]Original quote: „Dadurch dass meine zwei Opas beide an einem Herzinfakt gestorben sind und die sich auch beide sehr konventionell sag ich jetzt mal ernährt haben, das lässt sich ja auch darauf zurückführen, dass man dann mit der Ernährung nochmal ein paar Jahre rausholt." (Interview 4, paragraph 68, minute 17:34)

[68]Original quote: „Wenn ich koche schon tendenziell gesund, aber trotzdem steht der Geschmack im Vordergrund, also wenn für mich geschmacklich da halt mal ein Stück Butter halt dazu gehört dann kommt es halt auch rein." (Interview 5, paragraph 77, minute 19:25).

[69]Original quote: „Also ich muss auch sagen, dadurch dass ich selber koche und wenig verarbeitete oder vorproduzierte Lebensmittel verwende ist es automatisch einfach gesünder." (Interview 5 , paragraph 86, minute 22:19),

[70]Original quote: „Erstmal keine Fertigprodukte, das schmeckt besser und dann ist es so zubereitet, wie ich mir das vorstelle, gesünder ja auch." (Interview 2, paragraph 43, minute 10:56)

Health aspects during upbringing mostly consisted of food bans and taboos - however, the reasons why were left unsaid

The interviewees consistently mentioned that food bans and taboos - especially sugary and fatty snacks, junk- and convenience food, as well as sugar-sweetened beverages and fast food (Coca Cola and McDonalds mentioned in particular) were part of their childhood[71]. The narrative they grew up with was that these foods were "bad" and therefore ought to be avoided. The participants did not recall any other, specific reasoning provided by their parents or other family members. Except participant 5, who did not recall any restrictions regarding food as a child: "we basically ate everything and were allowed to have anything we wanted"[72]. Participant 8 did not share experiences of food bans either:

> *Of course we had ice cream and chocolate sometimes but we also had a lot of fruit and veggie plates and they were just put there without any further ado so we just ended up whatever we felt like eating because there were no restrictions from our parents. I guess there just was no ground to go against since it was never a big issue that had to be discussed*[73]

The interviewee further noted that this approach - not having strict dos or don'ts but simply having a broad variety of healthy options to select from - resulted in what she calls a healthy relationship with food, since she did not experience the need to counterbalance bans from her childhood in her adult life. She continued: "It was like, just eat what you want, and it so happened that this was always automatically healthy."[74]

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[71]Interestingly, these mainly in Europe boycotted foods from Coca Cola or McDonalds coincided with the rise of the terminology "coca-colonisation" (as already touched upon in prior chapters discussing lifestyle-related diseases). The term includes a critical stance on globalisation, describing a cultural colonisation through the worldwide and far reaching import of western (US) goods and foods: hamburger, fast food, food to go and soft drinks as well as the appropriation of cultural values into domestic markets and into certain cultures and societies. The term is also used to describe characteristics of chronic diseases that follow these globalisation based lifestyle changes and associate an increase of incidence of chronic diseases such as T2D, or CVD and forms of cancer (also see: Zimmet, 2001).

[72]Original quote: „Nein wir haben eigentlich alles gegessen und alles dürfen." (Interview 5, paragraph 58, minute 14:21)

[73]Original quote: „Vielleicht erinnere ich mich auch nicht so sehr daran, also vielleicht ist das ein harmonisierender Rückblick in die Kindheit, aber tatsächlich ist das auch so bei allem was Ernährung so angeht, also mein Papa ist Vegetarier und hat uns aber auch manchmal eine Bolognese gekocht und da war nie so dieser, also dadurch musste man auch nicht gegen was angehen als Kind, also wenn er gesagt hätte aber esst das nicht, dann hätten wir es eher gemacht. Aber dadurch, dass es es zwischendurch gab, aber es nicht zum Thema gemacht wurde, hatte es eigentlich, also hatte ich eigentlich aus jetziger Perspektive bin ich immer noch so dass ich wenig Fleisch esse, also schon Süßes aber einfach bewusst und nicht irgendwie ständig. Das is wahrscheinlich also pädagogisch sinnvoll also es wurde einfach nie Druck ausgeübt." (Interview 8, paragraph 70-72, minute 28:54)

[74]Original quote: „Es war halt echt so hey iss halt, wo du Bock drauf hast, aber das waren eigentlich immer automatisch die Dinge, die gesund waren." (Interview 8, paragraph 79 - 80, minute 33:13)

Communication on guidelines for a wholesome diet mainly included the three-dimensional food pyramid

According to the experiences of the interviewees, communication on a healthy diet - on an institutional level - included only brief encounters in schools and at physicians, where the reduction of sweets and red meat were the predominant appeals. Encountering healthy nutrition in educational settings mostly involved learning about the *three-dimensional food pyramid* mentioned by participant 1, 3, and 5. Encounters with physicians regarding assistance on food and health relations mainly involved as participant 7 shared: "I mean doctors always persist on not eating too much meat and dentists preach not to eat too many sweets but it's never been more than that."[75]

7.2. Answering RQ1 and concluding the closing interview question: what do the intervewees need to maintain healthy food practises?

To begin with, the interviewees almost exclusively addressed aspects that would "help the collective to do better" in achieving healthy food practises, rather than what would personally support them. Interestingly, these statements were mainly directed towards the individual *demand side* which was highlighted through calls for comprehensive education on food, increased labelling or more transparency on food in order for individuals to make better food *choices*. Participants seemed to put a lot of emphasis on knowledge about food as one of the most important assets in eating healthily as well as experiencing healthy food practices from a young age. Concerns about the current rhetoric that centres around educating people to eat healthier were raised by participant 8.

If these narratives include a series of restrictions, should and should nots and bans, rather than simply better conditions, public and political discourses are at risk of being too paternalistic. In that respect, political messaging needs to be eye levelled to gain serious attention, according to participant 8, especially if these messages are targeted at young age groups. Improved guidance from health care providers alongside digital technologies that can be used on a mobile app were also welcomed by the interviewees. Participant 4 suggested improving quality standards of food and widening the selection-range for healthy food in

[75]Original quote: „Und bei den Ärzten kann ich jetzt nicht von sprechen, die Ärzte haben natürlich einem immer eingebläut, gut beim Zahnarzt wahrscheinlich man soll nicht so viel Süßigkeiten essen und so Geschichten, also das bringe ich eher mit Ärzten in Verbindung oder man soll nicht so viel Fleisch essen aber das war bei uns eh nie der Fall also kam das für uns auch nie in Frage." (Interview 7, paragraph 63, minute 24:47).

cafeterias and restaurants including vegan and vegetarian options. The participants 5, 6, 7, and 8 discussed the examples given by the researcher and concluded that interventions such as *mobile apps*, the *Nutri-Score or package labelling in general* and *funds for low-income households* would not support them effectively and long-term to eat healthily. Practicality played a major part in this since Apps are thought of not being able to withstand the hurdle of consistency. The Nutri-Score was considered unnecessary, since for the participants there is no need to know the quality of a processed food item, since they consider it as generally unhealthy.

Monetary aid, to ensure the ability to afford healthy food throughout socioeconomic circumstances was considered as not effective enough due to the assumption of general lack of knowledge on food and health among the respective groups. Food environmental reference points - access to supermarkets that have a healthy selection, farmers markets for fresh foods, or having several contexts where healthy food practices are encouraged: staff cafeteria, restaurants, vending machines etc. were either not discussed in detail or only mentioned briefly and against the backdrop of merely improving point of selection options, placing individual choice into the centre of the narrative once again. These suggestions not only pave the way for, but also reinforce approaches that structure policy strategies around behavioural interventions (as we shall see in the upcoming chapters of the research project).

7.3. Lessons learned from the empirical research

Based upon the experiences shared by the interviewees it can be concluded that their institutional experiences and learnings regarding their food practices were rather limited, as well as the information received on food and health relations. However, a much more significant role in their current knowledge and daily practice, was tied to their own personal interests and initiatives. The participants shared a variety of factors and life experiences, which according to them, left a significant imprint on their dietary behaviour such as their social, societal, cultural and geographical environments (friends, family, living in other cultures and communities). At a first glance, knowledge about food is not pinned to a specific event, such as regularly receiving information about food in a certain way from parents or siblings, or learning about the three-dimensional food pyramid in school but was rather described as an ongoing process, over time. This will become relevant later on in the thesis, when nutrition education tools and the provision of public information to improve diets are debated[76]. Yet

[76]See chapter 9.2.

practices stem from a detailed body of values which the participants shared in the interviews: they distinguish between high and low quality (whereas the term can bend between price, aesthetics and moral values) healthy and unhealthy and go about their own system when it comes to cooking and buying food (only use certain ingredients, buying their food at specific places due to their values: discounter or farmers market, stocking up or only buying food for a few days). Gaining knowledge ongoingly through nutrition related content on social media, apps and documentaries were mentioned as a key element in imprinting the participants' daily food practice. The former supports them to broaden their horizon and expand their skill-set, use of products and meal variety. The latter provides insights on the conditions of food production, which can also lead to a change of diet style and food bans - as participant 6 explained he no longer incorporates fish in his food practice, since the conditions of the industry no longer align with his moral values.

The participants collectively expressed dissent and antipathy towards processed, convenience and "cheap" foods as well as grocery discounters. Interestingly, there seemed to be a collective understanding of certain food taboos (also based on their upbringing). Transparency on the food production process and values such as organic farming, seasonality, regionality and fair working conditions for farmers were mentioned as factors that contribute to their set of conditions for selecting food products, but were not viewed as important as the "taste" of food. Nutritional value and taste were not always considered the same thing by the interviewees, home cooked meals, a balanced diet and "fresh" foods were considered healthy whereas convenience food, fast food, sugary drinks (especially Coca Cola and McDonalds) were referred to as unhealthy. Preventative reasons for a healthy diet were to prolong life, avoid diet related diseases or negative body feedback in general: if there was no negative feedback noticed by the participants, there was a less strong urge to start a healthy diet: 'since I feel good there is no need for me to change anything in my diet'[77]. When the interviewees were asked to describe which part the aspect of "health" plays in their daily food practices, a variety of personal guidelines, principles and efforts to eat healthily were shared. However, experiences had a different tone if the participant described to suffer from a diet-related disease, a chronic disease, difficult body image or other related struggles than those who were feeling physically well (no problematic physical health condition). For the latter, the aspiration for a healthy diet was not as particularly mentioned as for the former who talked about following certain

[77]Original quote: „Also dadurch, dass es mir gut geht und ich mich gut fühle sehe ich keine Notwendigkeit das so zu verändern." (Interview 8, paragraph 99, minute 39:15)

guidelines to keep their body conditions in check as a physical necessity to avoid negative feedback.

The observation was made that the participants often tended to worsen their behaviour around food. When it came to taking the researcher through their daily meal routine, they consistently emphasised that they "could eat way healthier" and that they attempt to, but end up failing (Interview 8, Interview 4, Interview 2, Interview 3, Interview 5, Interview 7). This dynamic was very interesting, especially given that participants repeatedly underlined their awareness to provide a wholesome diet for themselves. Another interesting conclusion can be drawn based on gender-specific-differences among the experiences of the sample: negative associations with food related to body image issues occurred in female narratives as opposed to the male one. They seemed to take the topic more "lightly"[78] and seemed more forgiving with themselves and aspired to a healthy diet, wanting to prolong life and not to fit into a certain body image accepted by society, as mentioned by the female interviewees.

[78]Which was noted during Third Cycle Coding (Saldana, 2009).

8. Implications of diet-enhancing interventions by health policy on nutrition throughout the EU and in Germany

8.1. Approaching RQ2, RQ2a, RQ2b and RQ2c

In the following, the second set of research questions are tackled through contextualising the conducted empirical data into current research approaches and respective literature. Firstly, the capabilities and consequences of diet-enhancing interventions for individuals and policy-makers are briefly explored on an institutional level. Secondly, behavioural interventions and the implications of tools such as nudging are explored. Finally, conclusions drawn in RQ1 and RQ2a,b contribute to the discussion of RQ2c, the last research question that leads to final conclusions and the formation of a *healthy (food) environment model*. In the course of the second part of the thesis, the following research questions are intended to be answered:

RQ2: What are the implications of diet-enhancing interventions in Germany for individuals and for policy-makers?

> *RQ2 a) Which capabilities have institutional diet-enhancing interventions such as comprehensive education and income support to improve people's dietary behaviour?*
> *RQ2 b) Which effects have behavioural diet-enhancing interventions, such as nudging, on people's food practices and what are their wider implications for health policy?*
> *RQ2 c) How can (health) policies beyond behavioural interventions create healthy food environments?*

8.2. Institutional diet-enhancing interventions: a brief overview of educational and income-related interventions in Germany

8.2.1. Early age education on nutrition: initiatives in schools and day-care centres

In 2020, the European Union introduced the *Dairy, vegetables and fruits programme* that funds healthy nutrition in schools aiming to encourage Member States to foster local, regional or organic food, short supply chains, ecological purpose and quality of agricultural goods in school meals (European Commission, 2020). Regarding school subjects on nutrition, the *Federal Ministry of Food and Agriculture* (BMEL) evaluated current subjects and found several shortcomings[79]. Although a major pillar of BMEL-policies centre around healthy and sustainable nutrition, shortcomings were found in:

- the scientific approaches to food and nutrition as opposed to encouraging practical knowledge about background and use of food and groceries as well as eating culture and regional varieties of food and drinks;
- subjects such as home economics, everyday culture, nutrition, social and consumer education, which are optional. Students are not reached unless they are specifically interested in the topic;
- the education for educators, that lacks knowledge in the field due to a shortage in education centres for federal state specific subjects on nutrition. Educators are therefore also mostly unqualified and opportunities for further training are not enough to compensate for their shortcomings;
- the textbooks, as about 70 percent show technical deficiencies (BMEL, 2019).

Some of these shortcomings align with experiences shared from participants. Participant 4 noted the same point as in the second shortcoming shown above. He said he didn't choose the subject, not because he wasn't interested but the other option was a technical subject which happened to make more sense given his future career[80]. Other participants talked about not having had this option at all (Interview 2, 6, 3, 8). Based on the study's results, the BMEL

[79]Assigned study in 2019 by the BMEL to the University Paderborn (BMEL, 2019).
[80]Interview 4, paragraph 53, minute 14:39

initiative in cooperation with the Federal Ministry Centre for Nutrition (BZfE) was formed with the aim to

- improving teaching materials, documents and textbooks
- educating and providing further training for educators, also via digital platforms
- cooperating with initiatives such as IN FORM and its *food driver's licence* for primary school children which is also used by health insurance companies in regards to their prevention projects.

Through a legally binding initiative[81] that ensures high quality meals for day-care centres and school cafeterias it is possible to implement further measures, as the BMEL stated in recent publications (BMEL, 2019a).

8.2.2. Adult education on nutrition: initiatives by healthcare providers

As a preventative measure, German health insurance companies offer primary prevention classes with several areas of action, to provide opportunities for insured to stay "motivated" and take active action in maintaining health. Individuals are expected to gain new knowledge and skills regularly and they should incorporate it into their lives going forward. The action field "nutrition" aims to avoid malnutrition and poor diets and counteract and reduce overweight (GKV, 2022).

The case study on diet-enhancing measures to prevent chronic diseases discussed above (see chapter 5) showed, if information was provided by physicians or in a healthcare context (also in regard to disease prevention), people are more likely to change their food practices (reduce fat or sugar intake). Based on the received information through dietary counselling, newsletters and tailored sessions from nutritionists, increased fibre consumption and choices of high-fibre recommended foods were observed (Bowen & Beresford, 2002). This overlaps with experiences from participant 3, who was ordered to attend dietary counselling as a preventative measure for her T2D. She found it very helpful to have clarity and then have grounds to act on it since she faced struggles with being overweight since she was a child[82]. Health care providers have often served as delivering interventions in the study of Bowen and Beresford (2002, p. 272) and showed that "self-help materials delivered through primary care practises found significant decreases in dietary fat-related behaviors and increases in fibre-

[81]"Gute-Kita Gesetz", implemented by the BMEL and the Federal Centre for Nutrition in Day care centres and Schools
[82]Interview 3, paragraph 95

related behaviors". These findings to some extent align with strategies by healthcare providers in Germany (GKV, 2022).

8.2.3. Income-related education on nutrition: initiatives of governments and food programs for low(er)-income households

Whether socioeconomic status correlates with healthy or unhealthy diets has been shown in a study by the independent German Health Consulting Collective (UGB) in 2007. According to these results, low(er) income households eat more convenience food, drink more soft drinks, eat more meat and sugars and processed foods and therefore have a lower score in nutrients as high(er)-income households. The respective data has shown that to exclusively buy organic products for example, fresh vegetables, fruits and whole grain bread instead of tins, wheat bread and products from conventional farming, the Hartz-4 rate in Germany currently is not enough (UGB, 2007) to meet the expectations of a wholesome diet. However, the social stigma of poverty (stricken or endangered) families face, plays a significant part in the kind of food that is bought: to not appear outwardly poor, famous branded sweets and candy bars are packed into school lunch bags for example, as a study from the UGB shows (2007). If families from a low-income household do manage to maintain a wholesome diet based on fresh fruit and vegetables, the study shows, it is mostly due to the social background of women leading these households, where extensive knowledge and skills on food practices was passed on to them. Growing up in a family who manages to have a wholesome diet despite a low income was found to be crucial in developing the ability to incorporate these skills later on in life. This puts emphasis on the importance of family-food relations, when it comes to developing food practices whether healthy or unhealthy (UGB, 2007)

These findings are underlined by the shared experiences from the empirical research. Although noting that there was not a lot of information received about nutrition from their families, the interviewees observed that there was a manifold set of practices passed on, for instance, the kind of dishes that can be cooked (whether they involve a lot of meat, sugar, fat or convenience products such as tins and precooked ones) with what kind of ingredients (differentiating in brands, organic, non-organic) bought from where (supermarkets, farmers markets, discounters). Among the sample, only participant 3 recalled her family facing hurdles to provide food in her childhood and drew a conclusion tied to it: she did not have proper access due to the political conditions in the GRD when she was growing up, she said. So, now she likes to store food as a precautionary measure. In contrast, participants 7 and 8 were participating in their family routines of going to farmers markets and organic supermarkets on

a regular basis. Income-related interventions as part of government programs were also reviewed in the study of Bowen and Beresford (2002) (chapter 5). Participants of session based interventions in which coupons accompanied education were rated as showing improvement in nutrient intake and fat reduction. “Fruit and vegetable coupons in combination with education on healthy nutrition” resulted in “positive changes in fruit and vegetable consumption”, as opposed to education interventions alone (Bowen & Beresford, 2002, p. 271). Dietician-led interventions among participants in governmental emergency aid, food-programs showed a notable reduction in intake of fats and cholesterol, compared to groups who received education through digital content. Moreover, a “community-wide screening and follow-up project” in low(er)-socioeconomic neighbourhoods produced dietary changes through following interventions in groups lead by *peer educators* (Bowen & Beresford, 2002, p. 273).

8.3. Lessons learned: concluding the implications of education- and income-based diet-enhancing interventions

8.3.1. Indicators for consistent, long-lasting education on nutrition throughout all age groups

Calls for comprehensive education on nutrition starting early in the lives of children was not only emphasised by the empirical research’s participants but also align with current strategies of the BMEL (revising and improving textbooks, subjects and educators) and the European Union (“vegetables and fruits for schools and day-care centres”) to put healthy eating into the limelight for children within educational institutions. Essential however, is to show best practice examples throughout and ensure that practices learnt at school are taken home, or as participant 6 said, the goal is to embed an understanding of what is healthy or unhealthy food in children so they tell their parents: “No, I don’t want to eat that, we want to eat something healthy!”[83] It is a lot to ask from educators, let alone from children, to be this autonomous, but this can have a positive effect on their parents' diet too, especially if they grew up with different nutrition-related hurdles. In that regard, best practice examples could encompass learning how to grow and cook food starting from kindergarten. As participant 7 observed, the kids at his son’s kindergarten felt more comfortable eating ready-to-eat (chocolate) bars, since there is often little to no knowledge on how fruit and vegetables are eaten: does one eat it with or

[83]Interview 6, paragraph 119, minute 36:33

without the peel or does it need cooking first? This also applies to adults in some way: participant 2 emphasised how important it is for her to know what to do with the food products, its practicability. If that is missing, she just doesn't buy it, healthy or not. To avoid falling short of a healthy diet as soon as the educational system is left, approaching young people in a non-paternalistic, eye-levelled way through digital technologies could provide adequate information. Through experiences shared by participant 8, the importance of a non-paternalistic way becomes clear: growing up, she remembered no pressure and restrictions around the topic food, but rather having a large variety of fruits and vegetables ready from which she and her siblings could always select from: "It looked so delicious, we never had to be forced to eat them".[84]

Providing eye-levelled and non-paternalistic information for young age groups beyond institutional settings have to consider age-appropriate technologies and social media. Participant 5, who considers social media as a significant influence on what he cooks, supports this view. For him, it is seeing alternatives to his usual patterns that motivate him to cook healthier. Data found by Bowen and Beresford (2002) also showed that, if people have received information about healthy alternatives in combination with the means to follow them, they are more likely to implement new healthy practises. Moreover, as participant 8 continues: "Growing up with no restrictions, only a lot of selection and alternatives didn't make us go against anything, so we just ate healthily without even noticing it."[85] Showing alternatives as part of long-term educational interventions could therefore be more efficient for individuals as well as policy-makers. To pejorative processed and convenience foods - which all the participants did to different extents, make people *go against something* (paternalistic interventions of the state of what is healthy or not healthy, good or bad) easier. If alternatives instead of denominations are a starting point, the perception of the topic of *healthy diet* might not suffer this paternalistic bias people want to refrain from. As participant 8 noted, life involves enough stressors that people are regularly reminded of as is, eating should not be another one of them.[86] These pressure points are related to the current environmental challenges society faces and their surrounding narrative: appeals to individuals to change their lifestyles in order to navigate global warming also involves changing their style of food practice. These narratives are accompanied by adding pressure on individuals and putting their behaviour into the limelight of global challenges, as mentioned in chapter 7.5.

[84]Interview 8, paragraph 74, minute 30:08
[85]Interview 8, paragraph 74
[86]Interview 8, paragraph 113

8.3.2. Indicators for effective, income-related support for poverty-stricken and endangered households and communities

Besides healthy food simply not being the biggest concern of poverty- stricken and endangered individuals and families, since they have to overcome a variety of hurdles on a daily basis, the implications of respective interventions are manifold (UGB, 2007). It has to be noted that certain prerequisites are necessary to buy, store and prepare fresh ingredients such as vegetables and fruits as opposed to convenience food.

Firstly, as addressed in Schwartz and Brownell's *toxic environment* (2007), it is high-fat, sugary and processed foods that are simply cheaper and offered at any given moment throughout our daily lives: vending machines, gas stations, next to the waiting line at the cash desk. The exposure to unhealthy snacks at workplaces, schools and day-care centres are inevitable. These conditions are further concentrated in low(er)-income neighbourhoods, as also participant 6 noticed. She observed that having a healthy or unhealthy food infrastructure was highly dependent on the socioeconomic conditions of the neighbourhoods she lived in. In low(er)-income areas, there was (and is) a tendency to have more discounters, which offer a different variety of foods - mainly higher in fat and sugar. This circumstance suggests that there, generally unhealthier foods are predominant in the infrastructure than in supermarkets with a wide range including fruits, vegetables and whole grain products with specific quality labels. This asymmetry based on the overall income status of communities and parts of town often lead to health inequalities[87].

The second hurdle is to store food adequately with limited resources. The prerequisites in order to do so are often missing: functioning freezers and fridges, cold and dark food pantries, the necessary equipment or proper kitchen space. Yet, income support to ensure a healthy diet would not change these environmental circumstances. Moreover, more money would not solve the limited time people have to cook or to gain knowledge on how to improve their diet - let alone the headspace due to often precarious living and working conditions. Or as participants 2, 4, and 7 shared, that they require a lot of time in order to properly cook for themselves and this does not usually match work schedules. Interventions that include coupons in combination with education, as shown above, lack this very component, but could set practical support in regards to providing healthy alternatives (Bowen & Beresford, 2002).

[87]This was shown by a study of the NHS (2018): people living in the poorest areas have double the rate of illness or early death than people in wealthiest areas.

Regardless, none of the interventions aim to tackle a broader scale. Schwartz and Brownell (2007) provide evidence for the *toxic environment* of a country as the "prime causal agent" for "driving body weight", also in relation to the development of chronic diseases (p. 80).[88] As an example, the physical conditions of siblings (twins) were monitored, who changed their direct environments by moving to a different country: one remained in their native country whereas the other moved to another: the sibling moving away showed a significant increase in their BMI[89]. Evidence[90] by the NHS (2018) shows nearly a third of early deaths and ill health could be avoided if the whole population had the same life circumstances as people who live in the wealthiest areas. This suggests the conclusion that small-scaled diet-enhancing interventions, specifically targeted at low(er)-income individuals, only restrictively show the ability to change food practices long-term and in an inclusive way, if the goal is to create equal health-opportunities throughout the population.

8.4. Behavioural diet-enhancing interventions: nudging people into healthy diets?

Interventions based on "individual counselling" to "change dietary behaviour" were the most common type of intervention that showed "successful" behavioural change, which was measured in either: reduction of unhealthy (high in sugar or fat) food intake, or increase in healthy (fibre-rich) food intake in a study by Bowen and Beresford (2002, p. 256f). Interventions aiming to *change* behaviours of citizens have gained specific momentum in health policy and caught the attention of policy-makers due to their opportunities to effectively tackle public health goals such as "reducing lifestyle-related NCDs" in a non cost-intensive way involving low implementation thresholds. When it comes to measuring approaches in "effectiveness" the most promising results were detected in individual counselling, feedback systems and computed education that can "positively" affect individual dietary behaviours (Bowen & Beresford, 2002). All of these three components combined, result in the already established, evidence-based, behavioural instrument *nudging*. Thaler and Sunstein (2008)

[88]It is important to note that overweight is not used synonymously with being unhealthy in this regard but is contextualised with the determinants of toxic, unhealthy food conditions and environments that involve exposure to high in fat, sugary and salty processed foods (Schwartz & Brownell, 2007)
[89]Siblings who remained in their native country India had average BMIs of 22.9 (men) and 22.7 (women), while the siblings who migrated to West London had average BMIs of 26.8 (men) and 27.4 (women) (NHS, 2018).
[90]Regarding living conditions in Scotland

describe *nudging* as: “Any aspect of the choice architecture that alters people’s behaviour in a predictable way without forbidding any options or significantly changing their economic incentives. To count as a mere nudge, the intervention must be easy and cheap to avoid (Thaler & Sunstein, 2008, p.6; also see Prainsack, 2020, p. 549).

According to proponents, this way, people receive “help” to do “what is good for them” while they can still choose “freely” (Thaler & Sunstein, 2008, p. 6). Important components of the examination of the term *nudging* are rhetoric including “individual freedom and choice”: nudging can also be referred to as “libertarian paternalism” and “choice architecture” (Prainsack, 2020, p. 549; Hansen & Jespersen, 2013; Thaler & Sunstein, 2008; 2012). The latter describes the way in which decisions are influenced based on the presentation of choices within certain environments. The terminology is explained through comparing the process of a choice within a “meal environment” - the room, the people, the food, the atmosphere and the management system in which certain foods are provided. Moreover, it suggests the modifiability of these environments into whichever outcome is favourable, healthy dietary behaviour, weight changes, or generally promoting healthier food choices (Prainsack, 2020; Hansen & Jespersen, 2013). A frequent example is how food is displayed in cafeterias, where different positions - at the beginning of the line or at eye level - can contribute to which foods are chosen, healthy or unhealthy. Thus, Thaler and Sunstein (2012) argue that depending on which objectives the creator of a meal environment follows, it can be manipulated in favour of the desired outcomes[92]. Consequently the question is: based on these insights, which abilities should the curator of the meal environment make use of? These are the considerable options according to Thaler & Sunstein (2012):

1. Arrange the food to make the students best off, all things considered.
2. Choose the food order at random.
3. Try to arrange the food to get the kids to pick the same foods they would choose on their own.
4. Maximize the sales of the items from the suppliers that are willing to offer the largest bribes.
5. Maximize profits, period. (p. 428)

[92]Thaler and Sunstein (2012) present the example of a “director of food services for a large city school system” as the “curator", also “choice architect” of a certain meal environment (pp. 428-429). Based on the placement of the food products the children made their food choices: “Foods displayed at the beginning or end of the line are more likely to be eaten than items in the middle, and foods at eye level are more likely to be consumed than those in less salient locations.” (Thaler & Sunstein, 2012, p. 428)

In public policy, nudges seem, besides addressing the *demand side* of the problems rather than the *supply side*, as very attractive (Prainsack, 2020). Especially if the subjects of interest are on the *demand side*, focusing on individual behaviours, policy-makers view nudging tools as particularly promising (Bucher et al., 2016).

When it comes to public health policy on nutrition, altering the choice architecture of citizens would involve modifying their direct meal environments in the form of product placement, package labelling or applying changes to their physical food environment such as improving the current default modes (Bucher et al., 2016). Furthermore, changing the size of the dishware in order to size down portions, leading to reduced food intake is another example of this particular toolbox or, improved food package labelling which is already widely applied (see in the following point 9.4.1)[93].

8.4.1. Modifying the choice architecture through the Nutri-Score: implications of behavioural tools

The recently developed *Nutri-Score* implemented in the EU as a front-package label shows a case example of behavioural intervention. The recent application of the Nutri-Score in Germany should "help consumers to make better food choices" and is promoted as an easy incentive to make dietary behaviour healthier. It is calculated based on the *Nutri-Score* formula consisting of the relation between healthy and unhealthy ingredients that a product consists of. Negative points are counted as high levels in energy, saturated fatty acids, sugar and natrium and therefore rated as unhealthy. Positive points are received for high levels in fruits, vegetables, nuts, olive- rapeseed and nut oils, fibre and protein which result in ratings as healthy (EREN, 2013). The Nutri-Score was invented as part of a "proposal for new impulses for the French health- and nutrition policy as part of the public health policy strategy" by a research team in nutritional epidemiology (EREN, 2013)[94]. Main objective of the Nutri-Score was to implement the traffic-light based visualisation of nutritional value as a front-package label in order to compare them easily (EREN, 2013; Santé Publique France, 2019). However, the Nutri-Score does not remain free of critique: the interviewees of the empirical research expressed their concern related to the practicality of the rating scheme. According to them, it only shows which food product is the "lesser evil" among generally unhealthy products. Despite the fact

[93]Improving food labels and packaging coincides with studies that show people are particularly "responsive" to information on packages (Bowen & Beresford, 2002).
[94]The research is based on the *Food Standard Agency* (FSA) from *Comprehension and use of UK nutrition signpost, labelling schemes Great Britain*

that it can potentially be helpful to know "which gummy bears are the least unhealthy" as participant 4 stated, an "A" rating (symbolised by the green traffic light) leads to believe that the product is healthier than it actually is (EREN, 2013; Santé Publique France, 2019).
Although European Member States have agreed upon implementing the Nutri-Score, corporations are not legally obliged to use the labelling. Whereas it is widely accepted and used in France since 2016 (around thousand food brands included) in Germany only 236 brands make use of the label so far (Handelsblatt, 2021; Lebensmittelverband Deutschland, 2022). As of yet, the most important labels using the Nutri-Score in Germany are Alpro, Bofrost, Bonduelle, Danone, Harry Brot, Iglo, McCain, Mestemacher, Nestlé und Rewe (VZHH, 2022). Proponents of the Nutri-Score argue that the label entails opportunities for improvement in product production towards manufacturing healthier food and lift up the healthiness of the food industry altogether. However, since there is no legally binding requirement for corporations, mainly established companies might make use of the given opportunity and can result in excluding (smaller, less established) producers. Still, if transnational food corporations are pressured into joining, product quality can be positively affected.

In Germany, the most important corporations mentioned also play a significant part in the global food market. Further concerns centre around the fact that food package labelling in general runs the danger of exclusively appealing to already "more educated" groups (Hawkes, 2006). These point-of-purchase interventions may raise awareness**,** but ultimately have limited effects on health outcomes related to dietary behaviours (Bowen & Beresford, 2002). This coincides with statements by the interviewees of the empirical research of the thesis: Participants 3, 5, 6, and 7 noted that guidelines on food packaging does not really support them in maintaining a healthy diet, since buying convenience food does not mirror their food practises in the first place. Recent evidence (conducted in Germany in 2020) shows otherwise. The Nutri-Score was evaluated as "the most effective and low-threshold way to encourage healthy nutrition" (Food Watch, 2020).

8.4.2. Behavioural interventions applied: consider worthy implications of nudges for individuals and policy-makers

In public health policy, the application of behavioural interventions follows the assumption that collective objectives (such as healthier nutrition to reduce chronic disease as a matter of cost efficiency) can be reached through targeting the individual practice of citizens. To reach

health goals, nudges are particularly welcomed due to their presumed ability to be "value-free" and supporting individuals to reach their "health talents" (Piniewski et al., 2011, p. 9) without "policy makers imposing their own views and values" on them from a "top-down" point of view (Prainsack, 2020, p. 549; Piniewski et al., 2011). According to this train of thought, crucial implications are overseen by policy-makers (Prainsack, 2020, p. 549f).

As debated above[95], every attempt to rationalise human behaviours that complies with reason and morality proves to be restrictive, when it comes to health conditions. If, for instance, a mobile app provided by a healthcare company tracks the dietary behaviour through counting calories of the app user, only to reward or penalise them later, might not solve difficult relationships with food. However, this is what the policy intervention suggests: at a first glance it may look as if an overeating person receives help, but at the same time, the person who overeats is seen as a cost-burden for society if they "end up in poor health" (Prainsack, 2020, p. 549). Thus, there is no "value-free" nudging instrument: "every nudge is part of a larger system of values" where actions or omissions are assessed as "sub-optimal according to societal values or standards that are seen as politically and morally acceptable" (Prainsack, 2020, p. 549).

Secondly, nudges express judgments on the appropriateness of policy tools. While in a way, this is something inherent to every policy, nudging differs in so far as it treats "the human subject as a target of correctional re-rationalisation" (Prainsack, 2020, p. 549; Whitehead et al., 2012, p. 305). As a result, calls to move public health policy from the *demand* to the *supply side* are fuelled. This dynamic coincides with policy shifts towards information technologies, with the purpose to optimise human performance and "lift collective health talents" (Piniewski, Codagnone & Osimo, 2011, p. 9). This rhetoric places responsibility on individuals and communities rather than policy-makers and institutions (see also page 45, 80). Moreover, it incorporates market rhetoric into public health policy in an attempt to "do more with less", which can "prevent public policy from producing good outcomes" overall (Prainsack, 2020, p. 550). Not only are individuals affected by the way nudges shape policy-making, but also institutions. Recent concerns range from "what a nudge does or does not do to a nudge" to "whether the adoption of nudging as a policy impacts institutional structures" (Lepenies & Małecka, 2015, p. 428; Prainsack, 2020, p. 550). As for the use of nudges related to health policies that intend to *nudge* people into adopting healthier, more effective or altogether "better

[95]See point 3.2.1. "freedom of health behaviour" and point 3.5. "Lifestyle-related diseases, risk-stratification and solidarity"

lifestyles" the way how things were done up until now are changed: in policy-making and society. Thus, this will also gradually change the understanding of "how things should be done", as Prainsack argues (2020, p. 549f).

8.4.3. Personalised healthcare data and Behavioural Insights Units

Research on behavioural intervention showed (Bowen & Beresford, 2002) that education on nutrition is most positively received if the messages promoting a healthy diet are targeted at specific groups (target groups are people affected by chronic disease or in danger of developing one). This knowledge plays a significant part in societies, where the use of health data and personalised medicine gains momentum (Prainsack, 2017). Once the use of health data is normalised, policy-makers are less likely to shy away from utilising this data to apply market strategies (providing tailored information for target groups) and navigate the behaviours of citizens in an individualised, personalised way (Prainsack, 2017). Though, governments and policy-makers are required to invest in research, if they want to utilise personal data which, recent evidence shows, they are eager to. These so-called *Behavioural Insights Units* already exist in the United Kingdom, the Netherlands or Australia with the purpose to "support policy-makers" with the right "evidence and tools from behavioural research and practice" (Prainsack, 2020, p. 549). Interestingly, these "nudge units" not only intend to get citizens to lead healthier diets and lives, but also to get them to "submit their taxes on time, or behave in ways that incurs less costs for the collective" (Prainsack, 2020, p. 549).

8.5. Lessons learned: implications and conclusions of behavioural interventions

When it comes to behavioural interventions in health policy, policy-makers risk neglecting crucial implications: firstly, the assumption that human practice is an active *choice* suggests that people make their decisions detached from their social, cultural and political environments. Based on the prior research, the conclusion can be drawn on the opposite side of this spectrum: policy-makers (nudgers) have to consider the every-day living conditions and environments of individuals, even if their objective is to change, improve or correct only a mere fraction of these conditions. Moreover, attempting to *nudge* individual *choices* into the "right" direction in order to achieve desired (health) outcomes, affects individuals as well as institutions: it changes how policies are made. Policy-makers and governments who centre solution strategies around

behavioural interventions, run the risk of putting big amounts of money and resources into behavioural research (*Behavioural Insights Units*) and follow a market rhetoric of cost-efficiency. Merely placing the emphasis on the demand side of things neglects opportunities to seek change on an institutional level (on the *supply side*).

Finally, although nudging can bring political, societal and individual values closer together, it can also have the opposite effect: through installing nudges, the appropriateness of certain behaviours are also installed which modifies individual values to those of the authorities, the *nudgers* (Prainsack, 2020). It is argued that, if calls for actions are placed on the conditions for human practice instead of the practice of individual people itself, it would change the paradigm that policy-makers have based their practises on for the past decades (Prainsack, 2020). Nonetheless, to simply villainize nudging as a political tool is restrictive: it is only then problematic, if policy-makers neglect the idea of individual environments of citizens and the hurdles they have to face due to it such as the institutional settings and larger political economy (Nobel, 2009; Prainsack, 2020). The resources that go into behavioural interventions are then argued to be counterproductive.

8.5.1. Implications of diet-enhancing nudging tools

The behavioural research from Bowen and Beresford (2002) shows a "positive correlation between intensity of the goal presented in the intervention and the effect size produced by the intervention". If policy-makers believe that applying these findings to change dietary behaviour and go as far as to tie their objectives to an incentive, the second fallacy of a nudge occurs: it not only neglects structural and institutional factors that shape dietary behaviour, but their underlying values, and the fact that they often are the source of the problem in the first place. An instance for diet- and lifestyle enhancing health interventions described by Prainsack (2020) can illustrate that:

> Take, for example, a mobile app that collects data about the diet, exercise levels, and alcohol and nicotine intake of people who eat, drink, or smoke too much and provides positive reinforcement and rewards for "good" behaviour. Even if, with the help of the app, the target group makes small positive changes in their lifestyle, this does not change the reasons why people overeat and smoke too much–especially if these reasons include high levels of stress, worries about money, and a lack of hope for a more positive future. (p. 554)

Furthermore, this incentive-based, rational-choice approach to human practice would also start at the assumption that people are committed to log their every move (diet- and health related) onto an app and neglect the fact that people already face numerous pressure points on a daily basis (as also mentioned by interviewee 8). Even if people manage to follow the requirements of the mobile app, whether they would do so consistently or not, raises questions about practicality and longevity. As for now, German health policy on nutrition has not made use of nudging tools so far. Although subject to the 2015 working group which was tasked to advise the federal government on the use of nudging and other behavioural interventions in policy-making as part of the prevention strategy, concrete interventions have only limitedly materialised so far[96]. Besides an ongoing, lively public debate, most recent scientific concerns on the implications of nudging tools centre around the use of healthcare data and personalised medicine. Now when these concerns meet debates about diet-enhancing interventions, the questions are raised: what if future technology does not require people to log their daily behaviours into a mobile app, but the app does it for them? And what if their individual health- and real world data were available for nudges to be used? This would stretch behavioural interventions beyond their definition, as well as their implications.

Further concerns that coincide with utilising nudges on dietary behaviour includes on which basis "target groups" are selected. Studies (Bowen & Beresford, 2002) show that target groups of behavioural health interventions - these are mostly people in danger of developing a chronic disease, or people already suffering from one - are more likely to achieve better outcomes. If policy-makers take that into consideration, the question arises: who will get to decide which groups are "targets" when it comes to "correcting" health and dietary behaviour? Especially sensitive would be a selection based on the measuring unit *Body-Mass-Index*, which would mean relying on a unit that has been highly criticised for its lacking consideration of body-variation and would not withstand objectives such as value-freeness. The fallacy of value-freeness is especially problematic when it comes to health questions. A mobile app cannot measure *why* people eat or behave in an unhealthy way. It also does not intend to do so. It merely seeks to "fix" a malfunction in human behaviour that causes societal costs, or as behavioural economists phrase it: "People act irrationally, with nudging people should gently

[96]In 2015, the German government established a *working group* with the task of advising the federal government on the "use of nudging and other behavioural interventions in policy-making" through following the example of the United States and the United Kingdom, which resulted in a lively public and political debate, although there would be "numerous opportunities for the use of nudging in primary prevention and health promotion in Germany", as Krisam et al. (2017) argue in their review on nudging in German health policy.

be pushed towards better decision-making" (Wansink et al., 2009, p. 165). Since they do not ask, nudging tools cannot grasp the larger structural conditions that shape human practice, let alone find solutions for the challenges caused by negligent health behaviours. Whether it is printing "health" labels on food packages, or providing mobile apps that count people's calories, these interventions merely focus on modifying the choice architecture within meal environments instead of seeking to change food environments altogether, although policy- and decision makers would certainly have a say in it.

8.6. Lessons learned from the literature reviewed policy instruments: nutrition education, income support and nudging

The review of policy tools in the respective literature showed that education on nutrition in German schools and day-care centres currently undergoes a revision process towards better qualified educators, better textbooks for schools, higher budgets for healthy cafeteria food and improving nutrition subjects including quality of food, organic agriculture and practical approaches to diet (point 8.2.1). Education on nutrition throughout all age groups includes initiatives by German health insurance companies (GKV, 2022) which offer training on "how to maintain a healthy lifestyle" as part of the *prevention strategy* (8.2.2.). Through these initiatives, crucial points such as teaching practical knowledge: healthy diet on a budget, how to cook food, how to grow food and cultural aspects of food are neglected nonetheless, which was argued to be specifically relevant for households with limited resources in point 8.2.3 of the thesis.

Income support for low(er)-income households seem to have - at a first glance - the capability to encourage a healthy diet since various studies suggest a correlation between low income and unhealthy eating behaviour. These studies often fail to grasp additional stressors coming into play: poor living conditions, lack of time and knowledge, increased stress levels due to existential worries and struggles, physical exposure to pollution and other health problems. Offering an additional payment for "healthier" food without improving living and working conditions altogether is argued to be more restrictive than *real* support. Based on these findings in the literature prior, another conclusion can be drawn. To improve dietary behaviour in particular consideration of socioeconomic conditions, assistance on a much bigger economic

and societal scale (for example universal basic services and universal basic income, debated later on in chapter 10.) can be argued to also have positive effects.

Behavioural interventions (behavioural economics, choice architecture and nudging) have gained the attention of policy makers, since they promise relatively "easy" implementation processes, especially if that includes mobile apps or utilising other digital technologies. Regardless, various biases have to be carefully examined before implementation: by whom is a software provided and written, who owns the data, who has access and can further use it, are only a few questions surrounding algorithmic bias in behavioural interventions using Health Information Technology (HIT) (argued in point 8.6.). Data bias that lead to harmful consequences for some groups and ultimately exacerbate health inequity must also be considered. This also concerns debates about health inequalities based on unjust social causes and require to acknowledge unhealthy behaviours as "bad diets" as a result of deprivation rather than a lack of willpower or a moral deficiency (Pot et al., 2021). Behavioural interventions in the form of nudging tools also imply an emphasis on the *demand side* of things and focus on addressing individuals instead of larger circumstances and environments that contribute to shaping behaviours.

The data gathered through the qualitative interviews underline – to some extent – the arguments above: family, friends, work, education, geographics and personal interests are some of the factors that all shape food practices in a way (see point 7.1.1.). Arguments that were made in point 8.6, led to the conclusion that behavioural interventions to "fix" health- and dietary behaviours, only conceal the greater responsibility politics have in creating not merely a healthier food environment but a healthier social system altogether.

9. Discussing policies beyond behavioural interventions: towards a *healthy (food) environment*

9.1. From behavioural interventions to a healthy living, working and food environment or, sending the responsibility back to the supply side

Conclusions drawn from the research question 2c[97] shed light on the manifold implications that have to be considered in policy-making on dietary - and health behaviour. Within the empirical research of the thesis it was interesting to learn that the participants continuously emphasised "failed" attempts to eat healthily and that they are aware they "should do better". When participants were asked what they thought could support them to eat healthy, a very interesting dynamic revealed itself throughout all participants: when they referred to themselves, they assumed it was simply their own lack of discipline that hinders them to eat healthily. But when spoken about supporting systems from a collective perspective - which they automatically slided into - there was an emphasis on teaching people (starting at a young age) about healthy food, communication strategies to spread this knowledge and stronger support from health practitioners, to help people make *better choices*. This narrative resembles rhetoric that supports behavioural interventions, specifically nudging. Interestingly, even though the interviews were aimed to have a very narrative setting that should have encouraged the participants to speak as freely as they wished, it seemed as though they thought they were "tested" on how much knowledge and effort they put into (healthy) eating, by underlining their endeavours. To some extent, this resembles the performance pressure people face around the topics of health and nutrition (as discussed in points prior: 6.5. & 8.3.1.) alongside a strong sense of responsibility for their own health conditions. This mirrors current public health policy approaches that call to "optimise human performance" and "lift collective health talents" (Piniewski et al., 2011) through paying attention to the *demand side*. This market-economic approach also mirrors the paradigm shift from the *supply side* to the *demand side*, suggesting that individuals are not only responsible for their own health, but also for the knowledge and evidence that they require to base future policies on by applying health data (Piniewski et al.,

[97] *How can (health) policies beyond behavioural interventions create healthy food environments?*

2011; Prainsack, 2020). Against this backdrop, the final question of was not to ask "which tools do policy-makers have to apply to receive desired health outcomes" but to understand what people need to eat healthily and what policy-makers can and must do to assist in the best possible way. This question requires to shift the attention from individual-focused behavioural interventions towards structural conditions and food environments and sends the responsibility right back to the *supply side*.

9.1.1. The "Healthy Food Environment Policy Index" (Food-EPI) of the European Union

The "Healthy Food Environment Policy Index" (Food-EPI) is an assessment by the *Policy Evaluation Network* of "EU-level policies influencing food environments" in Member States and presents future "priority actions" that should "create healthy food environments" (Djojosoeparto et al., 2021, p. 2). The report provided an outline of policies that have "direct or indirect (potential) influence on food environments;" assessed the strengths of "EU-level policies and infrastructure support" (see two pillars below) and shed light on "implementation gaps" (Djojosoeparto et al., 2021, p. 5). The extent to which policy can implement effective measures on food environments that have an influence on the nutrition at the population level in European Member States is subject of the Food-EPI methodology (Djojosoeparto et al., 2021). Through the process, information on political conditions, measures and regulations that have an influence on the food environments were collected and organised into two pillars.

The first pillar includes ***policies***:

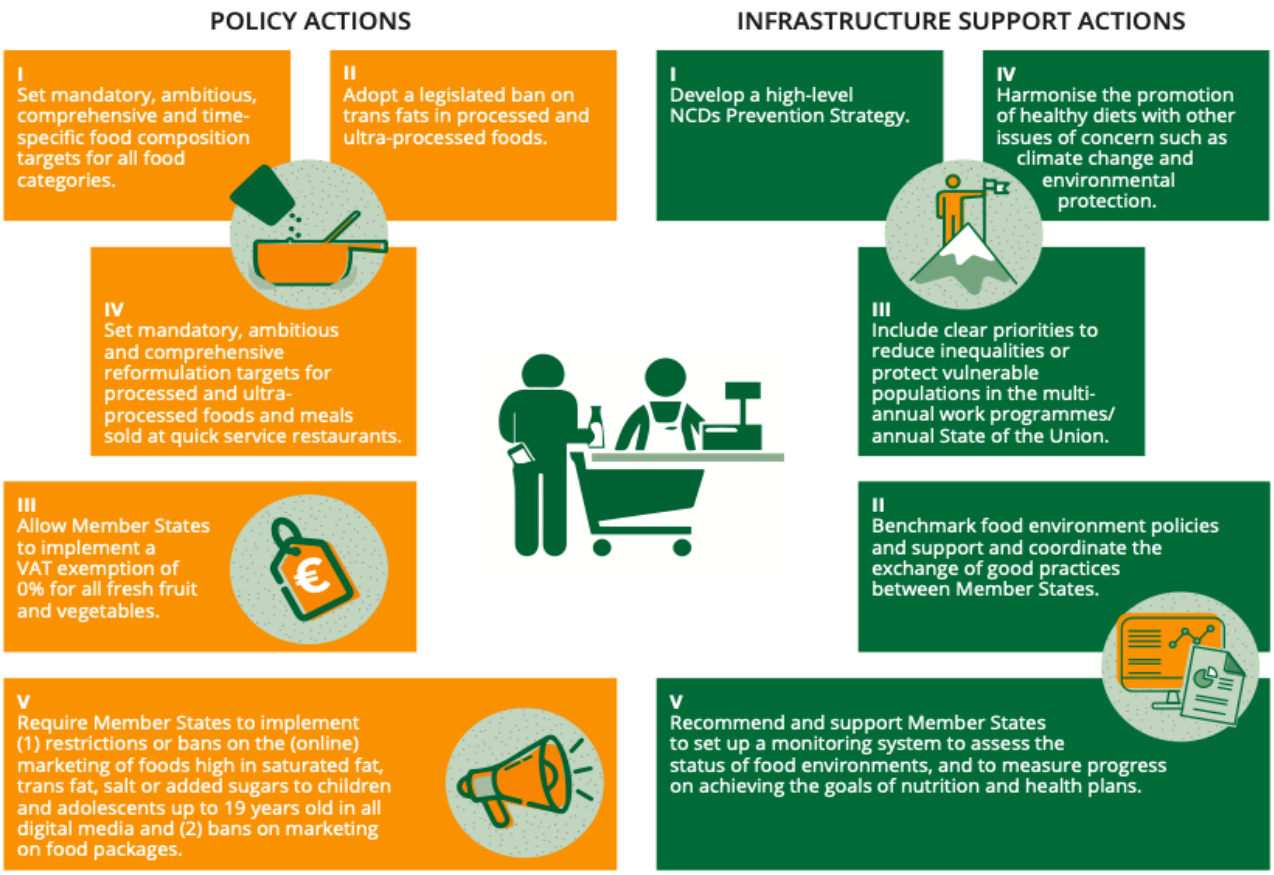
- Product composition (COMP)
- Product labelling (LABEL);
- Promotion and marketing (PROMO);
- Pricing (PRICE);
- Public Institutions (PROV);
- Retail sector (RETAIL);
- International Trade and capital expenditure (TRADE) (Djojosoeparto et al., 2021, p. 14)

The second pillar includes ***overarching infrastructural conditions***:

- Political leadership (LEAD);
- Governance and government leadership (GOVER);
- Data- collection and use (MONIT);
- Financing and allocation of resources (FUND);
- Platforms to interplay with civil society,
- Industrial sector and science (PLAT);
- Cross-sector approaches (HIAP) (Djojosoeparto et al., 2021, p. 15; Philipsborn et al., 2020, p. 8)

The effectiveness of concrete policies in the domains above is shown through the "Expert's rating of the strength of EU-level policies and infrastructure support influencing food environments in the EU" and is enclosed in the appendix (chapter 17.2., Figure 3 & 4). Current policies in place were thereby rated as a "weak" to "strong" policy by Djojosoeparto et al. (2021). The report also included the presentation of objectives and required actions for future policies derived from these evaluations (see *figure 1* below):

***Figure 1**: Illustration of "Priority policy and infrastructure support actions to create healthy food environments in the EU" by Djojosoeparto et al. (2021, p. 8)*



9.1.2. The "Food Environment Policy Index" (Food-EPI) in Germany

The report on the Food-EPI in Germany, as part of the European wide project provided country specific evaluations of the German (health) policies on nutrition[98]. The results of the report coincide with recent calls[99] from the *German Society for Nutrition and Medicine* (DGEM) and follow the question: how can healthy nutrition be fostered in Germany? (Philipsborn et al., 2020).

Suggestions include the application of a policy mix consisting of a) *Legal and Regulatory Instruments* (banning snack aisles by the cash-desk, reducing advertising for

[98]The research was carried out by the by the *Ludwig-Maximilians-University* in 2021
[99]The DGEM (2021) suggest that "banning snack aisles by the cash-desk, reducing advertising for processed foods high in fat and sugar, reducing the overwhelming information on food products in general, and adjusting pricing of healthy food" would counteract current unfavourable aspects of the food infrastructure and environment in Germany.

processed foods high in fat and sugar, reducing overwhelming information on food products in general and adjusting (lowering) pricing of healthy foods), b) *Rights-Based Instruments* and *Customary Norms* (Introducing quality labels: Nutri-Score), c) *Economic and Financial Instruments* (tax reform, subsidies for food providers) and d) *Social and Cultural Instruments* (comprehensive nutrition education) (Philipsborn et al., 2020; Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services, IPBES, 2021). Behavioural interventions as nudging on the other hand, count to the policy toolbox of *Self-Commitment Instruments* (Nutri-Score, Mobile Apps or programs for weight control, calorie reduction), which are argued to have capabilities to shift towards healthier diets, if used among a mix of policy instruments including information-based, market-based and regulatory-based instruments (Reisch et al., 2013)[100].

Currently however, the food environment in Germany creates – according to the DGE (2021) and the Food-EPI report on Germany – barriers for people to maintain a healthy diet: "Even if somebody wants to eat healthily, the food environment with all its temptations and hurdles hinders them to do so" (DGE, 2021). Moreover, the societal and political conditions in Germany suggest that a "health turn" in nutrition is nowhere in sight (DGEM, 2021). According to the PEN evaluation (Djojosoeparto et al., 2021), severe policy shortcomings are found in the policy domains regarding price of food products, variety on the market in supermarkets and restaurants and food marketing and show that a significant part of the German food environment is the overexposure of "cheap", unhealthy foods rich in fat, calorie and sugar. As well as income-related inequity to access healthy foods, which leads to calls to no longer base food product prices on market forces but rather on nutritional health value (DGEM, 2021). Measures towards this direction (on a European level) include the implementation of a *value added tax* (VAT) that strips healthy foods from VAT completely, as well as implementing a *sugar tax for fabricators* (sugar level staggered) on soft drinks and regulating food marketing targeted at kids (on a federal level) (Djojosoeparto et al., 2021; Philipsborn et al., 2020; PEN, 2021). Adjusting meals in public bodies such as clinics, schools and care institutions in a legally binding manner, as well as quality standards to serve exclusively healthy food would be concrete actions on a state and municipal level (Philipsborn et al., 2020).

[100]Also see Reisch et al. (2013) for a framework of policy instruments to promote sustainable food systems (which include addressing health issues)

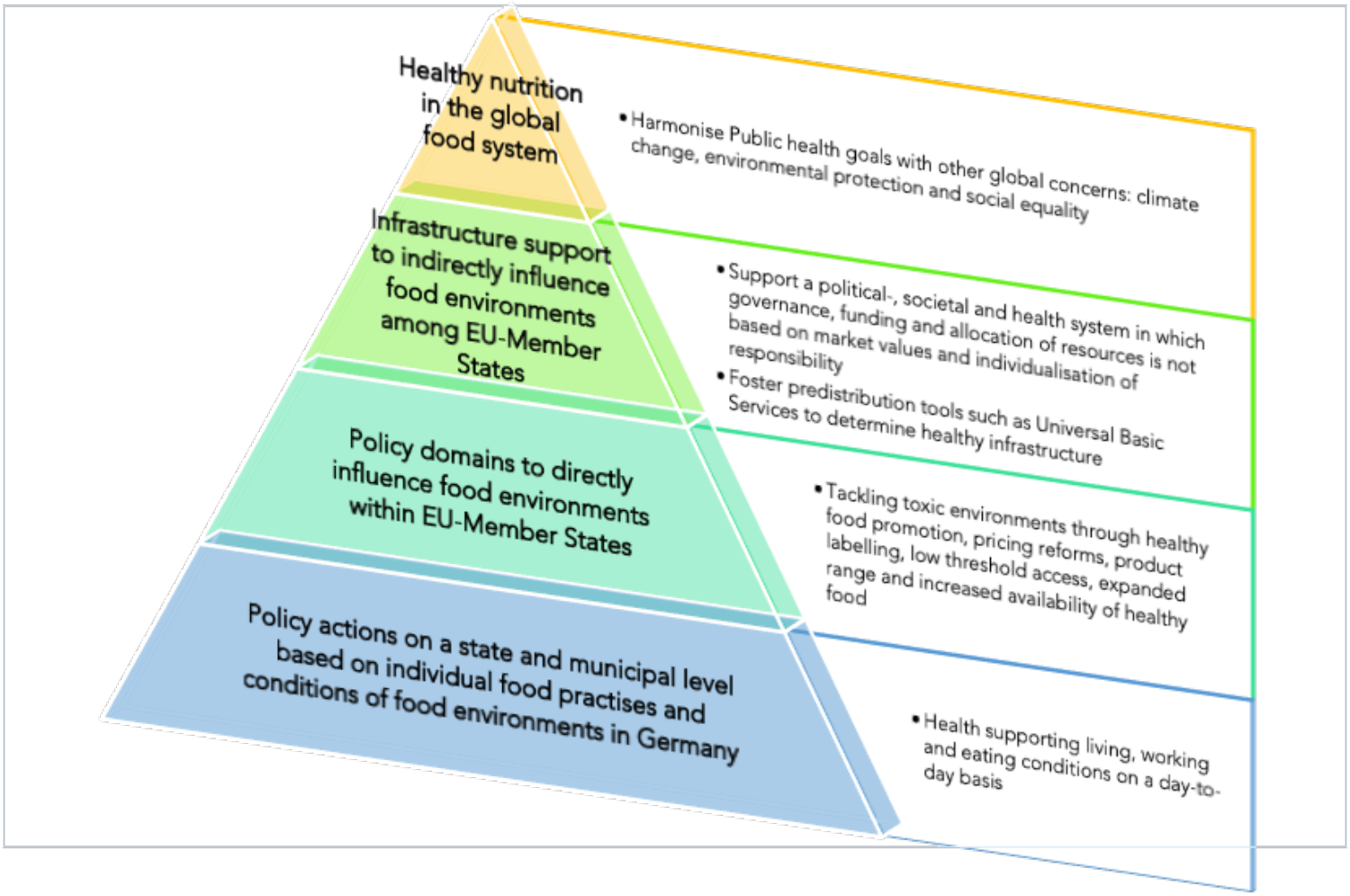
10. A healthy (food) environment model

When it comes to the healthiness of food environments, several dimensions play a part, as presented by the European Food-EPI (see point 9.1.1 and 9.1.2). Alongside this evaluation process, current policy shortcomings throughout the dimensions were detected and presented by Djojosoeparto et al. (2021) and resulted in a concrete action plan in two policy pillars (see Figure 1).

Through reviewing the report findings in light of the research gathered throughout the thesis, the following observation was made: the shortcomings coincide with the determinants of a *toxic environment* by Schwartz and Brownell (2007) (see point 3.3.) which include conditions that reinforce unhealthy food practices, also in relation to diet-related diseases (T2D, CVD, NCDs). Against this backdrop and given the learnings from the (empirical) research prior – suggesting that people's food practices are imprinted by their direct and indirect surroundings[101] – efforts were made to create my own model, which puts key findings into a comprehensive overview. As a result, the *healthy (food) environment model* (see figure 2) was developed. The pyramid-model consists of four levels and organises the prerequisites to ensure healthy food practices in relation to political action fields. The intention is to present a model that visualises the core arguments of the thesis at a glance. The four levels will be illustrated in the following:

[101]The former includes family, culture, geographical location, and the latter: food system, political system within a country

***Figure 2**: Visualisation of key policy actions ensuring healthy food practices based upon findings of the thesis: a healthy (food) environment model (own figure)*



***Level 1:** Policy actions on a state and municipal level:*

Individual food practices and conditions of current food environments in Germany as a starting point

The first layer of the *healthy (food) environment* comprises the conclusions that were drawn in regard to the empirical findings of the thesis. The experiences shared by the eight interviewees – their past and current food practices and the conditions of their current food environments – build the foundation of the model. Key findings include that the participants' upbringing was imprinted by their families' approach to how they navigate the capacities to provide meals (time and money resources) and pass on knowledge about food and health. The interviewees were either very involved in the process[102] (to select, prepare and participate in a meal routine), or rather detached from the process[103] (experiences revolve around certain meals being served,

[102]Participant 6, 7 and 8
[103]Participant 1, 2, 3, 4 and 5

certain foods being banned and a three-meal-a-day routine). If families have limited resources, state policy on health and nutrition can create support through institutional interventions that aim to provide healthy meals in schools, day-care centres or at universities and workplaces (see point 8.2). Policy on a municipal level can include incorporating spatial planning in favour of a healthy food infrastructure throughout neighbourhoods, regardless of their socioeconomic status. Fostering a variety of points of access for healthy food products: farmers markets, small organic grocery stores or farm-to-fork based concepts can create lower thresholds to maintain healthier practices on a day-to-day basis.

Level 2: *Policy actions that directly affect the healthiness of food environments (within European Member States)*

The second layer of the pyramid collects determinants that reinforce the *toxicity* of environments based on the PEN-reviewed (Djojosoeparto et al., 2021) policy dimensions and juxtaposes them to the findings made throughout the thesis. The policy domains that can "create healthier food environments in EU Member States" according to the Food-EPI involve *healthy food promotion*, *pricing reforms*, *product labelling*, *low threshold access*, *expanded range* and an *increased availability of healthy food* (Djojosoeparto et al., 2021). In order to detect the capabilities of policy-makers to design a healthy food environment, the shortcomings of current policies directly influencing food environments are examined and debated. Policy domains - evaluated as *very weak* or *weak* by the PEN (2020) - are examined below, alongside domain specific action plans to bridge current shortcomings:

- *Food promotion* (restrictions for "unhealthy food promotion to children on packaging")[104]
- *Food prices* ("increasing taxes or levies on unhealthy foods and subsidies to favour healthy foods")
- *Food retail* ("zoning laws and policies" encouraging outlets for fruit and vegetables)
- *Food composition* (incorporating composition targets into meals provided by "food service outlets")

[104]Current policy actions aim to reduce the *exposure of children to unhealthy foods* in the media through the AVMD-guideline (broadcasting child-appropriate food-content), the EU-pledge (no advertisements of unhealthy foods targeted at children under the age of 12) or the German advertising Standards Board (evaluating whether advertisements align with public health recommendations on nutrition for children). As well as restrictions on advertisements for energy drinks (which are already in place as part of the reduction strategy) (Philipsborn et al., 2020).

- *Food labelling* (front-of-pack labels)[105]
- *Food promotion* ("restricting unhealthy food promotion to children, broadcast media, online and social media")
- *Food provision* (involving other public sectors "to provide and promote healthy food" and provide "supporting and training systems") (Djojosoeparto et al., 2021, p. 4; Philipsborn et al., 2020)

Food promotion

As found by Schwartz and Brownell (2007) a heavily used strategy by the food industry is to create product "loyalty". Since people's food practices are significantly imprinted by upbringing, the food industry particularly targets children through targeted food marketing and packaging. Despite policy efforts to educate children on healthy products and diets from an early age on (8.2.1.), they often fail to leverage market forces (point 3.3.).

Food prices

Increased "taxes and levies on unhealthy foods" (sugary drinks, foods high in fat, calorie, sugar or other "critical" ingredients) aim to "drive up their retail price" to lower their consumption rate (Philipsborn et al., 2020, p. 24f). The profits made based on these charges can then be put towards health prevention measures. Reducing "taxes or levies on healthy foods" are initiatives within that toolbox, as well as introducing low or no VAT and import duty on vegetables and fruits (Philipsborn et al., 2020, p. 24f). More than 40 countries have already incorporated increased taxes on sugary drinks[106], whereas in Germany, taxes on foods are not dependent on their health value (Djojosoeparto et al., 2021). The government has repeatedly expressed their oppositional stance on health related food taxes. So far, recommendations by the BMEL have been made regarding livestock farming and animal welfare[107] which suggests incorporating welfare levies in the form of price increase on meat, dairy, eggs, cheese, butter and dairy powder with the objective to reduce the consumption of red meat and animal products in order to manage related health problems (Philipsborn et al., 2020). An "international best-case example" in the PEN report shows that it is also possible to remove tax on staple foods (fruits and vegetables) completely, as seen in Australia (Djojosoeparto et al., 2021). Subsidies to

[105]As explored in point 8.4.1., current policy actions also encompass front-of-pack labelling such as the Nutri-Score or other traffic light labels with the objective to provide information on nutrients for consumers on the front of a product in order to see the "health value" of a product (Philipsborn et al., 2020, p. 23).
[106]In the UK, France, Belgium, Ireland, Estland, Portugal, Hungary, Norway, Finland (Philipsborn et al., 2020).
[107]In 2020 the BMEL advised on new standards for livestock farming: "Kompetenznetz Nutztierhaltung"

favour healthy foods and a healthy infrastructure, as well as (financially) supporting the research needed to foster healthy foods instead of unhealthy ones, could result in subsidising vegetables and fruits in order to ensure lower prices in stores, as also suggested in the PEN report.

Food retail

To create healthier food environments, "policy action on food retail" can include according to Djojosoeparto et al. (2021): a) "zoning laws and policies to limit quick service restaurants or other outlets selling mainly unhealthy foods," b) "zoning laws and policies to encourage outlets selling fruit and vegetables," c) "supporting systems to promote and encourage the relative availability of healthy foods in-store" and d) "supporting systems to promote and encourage the relative availability healthy foods in foods service outlets" (p. 22; also see Philipsborn et al., 2020, p. 33; overview illustrated in appendix chapter 17). So far, governmental interventions revolve around navigating opening hours, regional planning and urban planning in order to manage the frequency, localisation and access to services that mainly offer "unhealthy foods such as fast food restaurants" (a) (Philipsborn et al., 2020, p. 33f).[108] According to the Food-EPI on Germany (Philipsborn et al., 2020) the healthy- or unhealthiness of food service providers (supermarkets, fast food restaurants etc.) are not taken into account, also in regards to spatial planning (see footnote 84; level1). This also applies to retailers that mainly offer healthy foods (b). As examples show, to foster the access to healthy food could be achieved through financial incentives, also related to urban planning. In various federal states of the USA, for instance, vegetable and fruit shops are funded and supported by incentives related to spatial planning (Philipsborn et al., 2020, p. 33f). In-store measures to foster access to healthy foods and products (c, d) and limit the access to unhealthy foods could be supported by subsidies and funds directly given to food retailers[109].

Food composition

As well as for processed foods[110] governments provide a set of threshold values for problematic components in products (sugar, salt, saturated and trans fats). This includes legally binding

[108]In some cities of the UK restrictions have been implemented for fast food restaurants within a 400 metre radius around schools and youth centres (Philipsborn et al., 2020, p. 33).
[109]Food retailers that partake in the *Supplemental Nutrition Assistance Program* (SNAP) and the *Special Supplemental Nutrition Program for Women, Infants, and Children* in the USA have to provide a minimum of healthy food (Djojosoeparto et al., 2021).
[110]In several Member States (Portugal, Netherlands), legally binding thresholds for problematic components of products - often salt - are in place (Philipsborn et al., 2020).

thresholds on the use of trans fats in food provided by food service outlets. In Germany, no particular strategy to reduce said components is currently in place. As part of the reduction strategy however, the objectives are to reduce salt, fats and sugar in industrially processed food.

Food provision

Governments throughout Member States have the ability to directly influence food environments through quality standards and the provision of food in the public sector. This encompasses cafeterias, vending machines and other food selling points throughout public institutions. In Germany, the quality standards for workplace cafeterias, hospitals, rehabilitation centres and homes for seniors are provided by the DGE, also as part of the nationwide initiative *IN FORM*. The initiative, however non legally binding, should support small and mid-size companies in providing healthy food options. Interestingly, although a larger number of initiatives were shown by the PEN report (Djojosoeparto et al., 2021), little to no interventions were found to be legally binding. These gaps could be bridged through getting public institutions to commit to quality standards that consider FBDGs as well as health values regarding food composition.

***Level 3**: Infrastructure actions that indirectly affect the healthiness of food environments (throughout European Member States)*

The third layer of the pyramid drafts the determinants that have an indirect effect on food environments throughout Member States. If the goal is to design healthy food environments beyond behavioural interventions (RQ2c), wider structural determinants of food practices have to be considered. Although a few of the PEN-suggested dimensions were taken into account in the formation process, the structural determinants for "healthy living, working and eating conditions" are at the heart of the third layer of the model. As a result, the following conclusions regarding the objective to: "support a political-, societal and health system in which governance, funding and allocation of resources is not based on market values and individualisation of responsibility" (see figure 2) can be drawn: creating "platforms between government and the commercial food sector", as well as between the "government and civil society" (Djojosoeparto et al., 2021, pp. 21, 23, 53) is crucial - not only to ensure consistent policies on nutrition, but to ensure consistent policies throughout a variety of policies that determine health in one way or another. So far, although efforts to maintain a lively exchange between policy, civil society, economy and science are made, they still face severe interaction shortages. Especially the involvement of civil societies in exchange units is argued to be very

limited (Philipsborn et al., 2020)[111]. Thus, paying attention to the aspect of "health in all policies" is inevitable, when it comes to creating healthier environments for societies. According to the Food-EPI by Djojosoeparto et al. (2021) "assessing and considering public health impacts of food-related policies" as well as the "impacts of non-food policies" is therefore crucial (p. 21).

Current attempts to navigate public health goals in consideration of coherence and consistency among a variety of policy fields include strategically addressing social- and health-related inequality, agriculture policy and education policy. According to the PEN report on food environments in the EU - in which the domain "health in all policies" (HIAP) was a reference point for the alignment of public health goals and current policies – public health goals have not been put on the agenda of recent policy strategies enough, as the ratings as "no" or "weak policy" prevail (Djojosoeparto et al., 2021, pp. 22-23).[112]

An evaluation by the BMEL in 2018 has shown that despite the inevitable implications of agricultural policy on health, current health, nutrition and agricultural policy are not nearly enough synchronised. The controversy around the Common Agricultural Policy Reform (CAP) in 2021 heightened these frictions (Philipsborn et al., 2020). Furthermore, reports[113] show that health policy-makers generally lack knowledge and resources to incorporate health impacts into planning and cross-linking processes into other policy resorts. However important, the "health impacts of policy measures and processes" throughout a variety of action fields (*economy*, *labour market*, *income*, *urban development*, *social, educational, living and transportational policy*) are neglected and handled as "single case studies" (Philipsborn et al., 2020, p. 62).

Universal Basic Services as part of a strategy towards a healthy (food) environment

In an attempt to overcome the hurdles that accompany efforts to synchronise policy fields in favour of public health goals, comprehensive instruments - in particular Universal Basic Services (UBS) - are briefly examined in the following. Pre-distribution tools include measures that distribute wealth and capital among citizens before they accumulate among certain groups or individuals due to high income or heritage (Prainsack, 2020b). The toolbox of pre-

[111]In 2019, when the reduction strategy was debated in Germany, which was a cooperation between the BMEL and scientific representatives. However, it was "highly criticised for widely disregarding the recommendations provided by the scientific representatives", also for "not involving a broader spectrum of experts in the process" such as civil societies (Philipsborn et al., 2020, p. 269, 278).
[112]See expert's ratings in the appendix (chapter 17.2.)
[113]Public Health Report: "*Zukunftsforum*" in Germany

distribution includes minimum wages, public housing, public education, affordable higher education, high quality but affordable health care and prevention, regulation of capital market, state secured job guarantees as well as tools to provide free food to vulnerable groups[114]. These tools intend to cover the needs of citizens for the public benefit, to be universal and accessible for everybody. Thus, they can also support tackling wider structural determinants of health. Since it includes payments in kind and provision of services, not only individuals and households benefit from UBS tools, but society as a whole. Applied to the *healthy (food) environment model*, it can improve every-day-live conditions of citizens throughout a variety of policy fields. Difficult living, working and eating conditions cause negative impacts on health, causing individuals to turn to coping behaviours which result in negative health outcomes. Ultimately, paying attention to *toxic environments* does not only challenge policy-makers to work on improving the food infrastructure for people, but also the political conditions for citizens.

Level 4: *Healthy nutrition in the global food system*

The fourth layer of the *healthy (food) environment model* embeds core findings from the preceding levels of the pyramid into a global context. Thereby, the concept of "food sovereignty" was briefly examined, as an approach towards creating healthy food environments globally. As far as public health strategies are concerned, besides emphasising the importance of healthy and sustainable nutrition for consumers in everyday life, governments proclaim to also prioritise nutrition-related global challenges. Therefore, FBDGs find widespread acceptance, as well as the *Sustainable Development Goals* (SDGs) and objectives to end global hunger, "ensure food security", reach "better" nutrition and encourage sustainable agriculture. Specific goals regarding the future of the global food system include safe, healthy and environmentally friendly produced, processed and distributed products for a balanced diet (Ernährungsbericht, 2020; Philipsborn et al., 2020, p. 37). In order to do so, current policy efforts range from strengthening the cooperation between health and agricultural policy, harmonising environmental objectives with public health goals or restricting commercial interests of Transnational Food Corporations and lobbying activities (Djojosoeparto et al., 2021, p. 43). Still, the majority of political conditions reinforce food systems and their power struggles (between food corporations, food manufacturers, farmers and citizens as consumers).

[114]In the form of "freedom passes" in the United Kingdom (Prainsack, 2020b)

Thus, current calls by civil societies (particularly *La Via Campesina*[115] and *ATTAC*[116]) include concerns with the CAP, its subsidiary and funding system[117]. A shift from food security approaches towards food sovereignty[118] have to be part of future policy-making in order to create healthy conditions for humans, nature and animals altogether (Bohrn Mena, 2020, p. 174). These calls align with strategies suggested by the Food-EPI (Djojosoeparto et al., 2021) to "harmonise policies with social and environmental aims" (also see Figure 1, point 9.1.1.).

11. Lessons learned from the Food-EPI & the *healthy (food) environment model*

Capabilities of policy beyond behavioural interventions have been presented in the "Food Environment Policy Index" (Food-EPI), a EU report on behalf of the PEN by Djojosoeparto et al. (2021) and Philipsborn et al. (2020) reviewing the German Food-EPI. The Index provides a "methodological framework for the systematic collection, analysis and international comparison of policy frameworks that influence nutrition at the population level" (PEN, 2021). The "determinants for a healthy food environment" according to the Food-EPI of the PEN report captures many areas and domains addressed in this thesis in their figure of "*Expert's rating of the strength of EU-level policies and infrastructure support influencing food environments in the EU*" (Djojosoeparto et al., 2021, pp. 22-23) (see figure 3). The fields of action were structured into policy domains and infrastructure support domains, whereas the former regards pricing, labelling and retail of food products and the latter overarching conditions such as political leadership, governance, industrial condition and information and technology regarding healthy nutrition. Overall, the "assessment of EU-level policies and infrastructure support" sheds light on the manifold domains in which the EU could/should take action in order to influence food environments sustainably. To sum up the policy measures in

[115]*La Via Campesina* "grassroots mass movement whose vitality and legitimacy comes from peasants" organisations at the grassroots", based on the "decentralisation of power between all its regions" and its "international secretariat rotates according to the collective decision made every four years by the International Conference" (La Via Campesina, 2021)

[116]ATTAC is an international organisation involved in the alter-globalisation movement that opposes neo-liberal globalisation and develops social, ecological, and democratic alternatives so as to guarantee fundamental rights for all

[117]Main concerns are asymmetries between subsidies for small scale farms in comparison to large, industrial farming in the European Union that caused and continuously causes the extinction of small farms (Masuch, 2012)

[118]Food sovereignty demands an ecologically, socially fair and healthy agriculture and describes the call for peoples' rights to shape and craft food policy, and is a precondition to genuine food security.

percentages, 12% of the policy domains in the first pillar were evaluated as “moderate”, 65% of policy indicators were “weak” and 23% “very weak”. Among the indicators of the infrastructure support domains of the second pillar, 63% were rated as “moderate” and 33% as “weak”. Only 4% were rated as “strong” and included just one indicator: “Public access to nutrition information” (Djojosoeparto et al., 2021, p. 6).[120]

As a last step of the research, the identified shortcomings by the PEN-report in addition to my findings on toxic environments and empirical insights from the interviews led to the development of my own model. The *healthy (food) environment model* is a visualisation of the key learnings and findings of the thesis, illustrating actions needed to create the opportunity for healthy food practices as a four-level pyramid (see *figure 2*, chapter 10).

[120]See appendix chapter 17.3. for list of rated policies presented in the PEN report by Djojosoeparto et al. (2021)

12. Conclusions

The majority of people living in Germany aspire to maintain a healthy diet (Philipsborn et al., 2020), the numbers, in turn, show that malnutrition, obesity, cardiovascular diseases and diabetes type II are on the rise (in Germany and throughout European Member States). Policy-makers in Germany, and around the world, perceive these circumstances as creating high costs for societies and health systems and often presume poor health behaviours to be at the very core of the problem. In this context, *poor* and *unfavourable* food practices - or *dietary behaviours* (Stok et al., 2018, p. 6) in general - have caught the attention of policy-makers. But as the 2020 conducted report by the *Policy Evaluation Network* (PEN) (Djojosoeparto et al., 2021) shows, the reasons for *unhealthy* food practices are also found in societal and political conditions that are creating critical environments for people to maintain healthy (food) practices. So despite the evidence that dietary behaviour is impacted by physical and social factors that affect individual nutrition through composition, availability, presentation and access to food as well as pricing and advertising (Djojosoeparto et al., 2021; Caraher & Coveney, 2004), policy approaches are not always designed to address such structural factors.

Over the past few years, governments and policy-makers have been eager to turn to *Behavioural Insights Units* to gain information on citizens' (health) behaviours and strategise policies around these results[121]. The categories influencing food practices found by the PEN report (Djojosoeparto et al., 2021) however, also comply with the empirical findings of the thesis and suggest the necessity to move beyond the assumption of "consumer choices" addressed through behavioural interventions, but to restructure approaches around food environments. Especially against the backdrop of evidence that shows the notable imprints on the food environments by the political setting, undertaken food-related and non-related measures, and regulations in European Member States, as debated throughout the thesis.

To grapple dynamics of the relevant EU-policies and in Germany as a Member State example, nutrition in policy was followed from its beginnings within the first chapter of the thesis. As part of early nutrition policy, food security and food safety were top on the agenda and further developed within the three food regimes (chapter 2.1.) into most recent concerns of (public) health and healthcare policy on nutrition: overconsumption, *unhealthy* lifestyles and chronic diseases (chapter 2.2.-2.3.). Alongside the rapid rise of (processed) food industry in the

[121]These *Behavioural Insights Units* currently exist in the United Kingdom, the Netherlands and Australia

corporate food regime, evidence grew that a certain type of diet can lead to several chronic diseases (diabetes type II, cardiovascular diseases, hypertension and various forms of cancer). As a problem solution, policy prioritised behavioural research, health promotion and lifestyle interventions through transferring knowledge and skills on healthy diets. The repercussions, however, were a multitude of information, claims and mixed messages about beneficial or harmful nutrients, foods, diets, additives, vitamins and minerals which was viewed as being at fault for "poor consumer choices" (Kafatos & Codrington, 1999; Trübswasser & Branca, 2009; Bechthold et al., 2018.; Stok et al., 2018). The *Eurodiet project* in the 1990s by the EU was commissioned against this backdrop and led to the formation of food-based dietary guidelines (FBDGs) for the Member States (chapter 2.3.1.). Addressing structural determinants of unfavourable lifestyles and diets on the other hand, fell behind (Caraher & Coveny, 2004). In this context, the umbrella-terminology "lifestyle-related diseases" subsumed approaches around diets and diet-related challenges in public health- and health-care policy (Bowen & Beresford, 2002; Piniewski et al., 2011; Buyx & Prainsack, 2012). Questions about responsibility, risk stratification and solidarity came into the limelight of the debate (chapter 3.-3.5) and were also central to the introductory chapters of the thesis, following the question: what are the implications of European and German health policy on nutrition through the lens of (individual) health-responsibility?

As Buyx (2008) notes: "Much controversy surrounds the question of whether the state, a social institution or a healthcare system is entitled to interfere with the private life of individuals by demanding personal responsibility for health" (p. 871).[122] While people have the "general right" and "freedom[123] to exercise", or to make "independent choices about diet and the consumption of nicotine or alcohol", most health-related behaviours are "not uncontrollable impulses" but stem from several factors (Buyx, 2008, p. 871) (chapter 3.2.) and are created and reinforced by a *toxic environment* (Schwartz & Brownell, 2007; chapter 3.3.) that is assumed to be inherent to modern societies. Thus, *free choice*, when it comes to dietary behaviour, does not fall into "one of two dichotomous categories," either "freely chosen" or "not chosen at all," but there are rather *degrees of freedom of choice* (Buyx, 2008, p. 872) (chapter 3.2.1.) which have to be carefully considered when installing responsibility-based allocation systems for healthcare services (Buyx & Prainsack, 2012; Prainsack & Buyx, 2015).

[122]A number of scholars contribute to this debate: Savulescu, 2018; Schmidt, 2019; Traina et al., 2019; Albertsen, 2020; Davies, & Savulescu, 2020; Cappeleen et al., 2020; Prainsack & Van Hoyweghen, 2020; Björk et al., 2021
[123]Also see in chapter 3.2.1. where these rights and freedoms are enshrined and the distinction between the "right to health" and the right to freedom of personal health behaviour

In Germany, the personal responsibility for a healthy lifestyle has become an "explicit policy" of the government to control costs in the form of a *bonus system* in health insurance through rewarding health-related behaviour (Schmidt, 2008; chapter 4.). These bonuses are financial incentives to promote personal responsibility for health, reduce overall health expenditure and enable competition between healthcare insurers ("the sickness funds"). Insurers offer financial bonuses or other rewards for individuals who take an "active part" in age-related check-up programs or in particular health maintenance activities that are supported by the sickness funds such as dieting, smoking cessation programs or yoga classes (Meulen & Jotterand, 2008; Schmidt, 2008) (chapter 4.). The way in which the bonus system rewards *responsible* behaviour, can also be referred to as "responsibilization", a term used in personalised medicine (Buyx & Prainsack, 2012, p. 85) (chapter 8.4.3).

According to this train of thought, people who have a certain (unhealthy) behaviour (smoking, overeating, not exercising) and are therefore seen as having an "unhealthy lifestyle" altogether, are also expected to develop certain illnesses more easily or generally have a higher risk of falling ill. Risk tied to higher costs for society includes the implication that a certain group of people - the so-called *reckless* - are putting more drain through higher costs on the system than others - the *innocent* (Buyx & Prainsack, 2012, p. 81). This can reinforce the "frequent misunderstood application of solidarity to the public health and health care context" (Prainsack & Buyx, 2015, p. 11) (chapter 4.1.). Whether a person is excluded from the *innocent* people, who "deserve solidarity" is differentiated by which **"**kind of risk" they take or not take: if a person suffers from an illness as a result of "deliberate actions", they are seen in the light of "option luck" and are part of a different risk group than the *innocent*, who put *active* effort into staying healthy (Buyx & Prainsack, 2012, p. 81; Prainsack & Buyx, 2015, p. 10).[124]

The "application of solidarity" in the context of individual health behaviour and risk stratification (chapter 3.5.) wrongfully suggests "causality" between *lifestyle choice* and disease. Even though, in fact, it is "impossible" to determine what ultimately led to particular health issues - most lifestyle-related diseases simply are "multifactorial and due to a complex interaction of heritable and non-heritable factors, (social) environment and lifestyle" (Prainsack & Buyx, 2015) as well as induced by epigenetics (Chiapperino, 2018; Petronis, 2010). Nevertheless, enhancing dietary behaviours to prevent chronic diseases has been on the agenda of policy-makers in health policies for a number of years. Despite evidence (as shown above)

[124]The example commonly referred to is a smoker who suffers lung cancer and is perceived as more *reckless* than a responsible person who never smoked a day in their lives, yet suffers from lung cancer (chapter 4.1.)

and scientific consensus that dietary interventions need to be followed through on a population-wide level to comprehensively tackle disease preventative measures, strategies to improve *dietary choices* remain strong (chapter 5.). These approaches often imply market rhetoric, suggesting that people - who are consumers rather than citizens - need to be "targeted" and *nudged* towards making the "right choice", as they are buying certain products that ultimately determine their health (Thaler & Sunstein, 2008; 2012; Prainsack, 2020).

Findings in the literature, illustrating a variety of tools that intend to enhance dietary behaviour[125] and debates surrounding health and responsibility aspects led to the first research question of the thesis. (chapter 6.). The attempt was to look beyond the assumption of a "right way" for a healthy diet, standardised and aspired by policy and engage with people directly to learn from their experiences within the current food environment and their overall living realities. The qualitative semi-structured online-interviews conducted in Germany in 2021 provided insights into people's past and current eating practices and environments. The sample consisted of three male and five female participants between the age of 22 and 64 years and took place via the platform *Zoom* from May until July 2021.

In the following, the drawn conclusions from research question 1, 1a and 1b are presented[126]:

Past and current personal, domestic and institutional life experiences and their imprint on food practices

Based on the experiences shared by the interviewees, the conclusion can be drawn that food practices and knowledge on nutrition are mainly ascribed to personal experiences (social and cultural scenery), family background (parents and siblings) and individual initiatives (personal interest) rather than to encounters in school or health care providers (chapter 7.1.1.). Gaining information about nutrition is not something the participants tie to their domestic background. They did not recall specific information on nutritional value or composition of food being passed on to them by their parents. Participants were convinced to have learned about food in their family in so far as to which meals can be prepared and how. Yet, the social aspect: daily meals bringing the family together, outpaced memories of nutritional knowledge by far. Food bans were central to the participant's experiences in childhood, reasons for certain taboos however, were barely disclosed to them (chapter 7.1.3.). Their encounters with healthy

[125] As shown in chapter 5: tools tested for effectivity include provision of information by physicians or health care professionals, targeting individuals with diet-related health issues, peer based education and classes; provision of healthy cafeteria food or healthier snacks in vending machines; coupons for fruit and vegetables.

[126] *RQ1: How do past and current personal, domestic and institutional life experiences and conditions imprint dietary behaviour of people living in Germany?*

nutrition in schools and learning facilities were mostly recalled as learning about the *three-dimensional food pyramid* (see chapter 2.3.). Ultimately, interviewees concluded that their personal initiatives and curiosity led to their style of food practice.

Day-to-day food practices

Findings of RQ1a[127] showed that the day-to-day food practices of the participants were strongly dependent on the kind of occupation they have: whether they follow sedentary work, manual labour or work from home determines when and how they eat (chapter 7.1.2.). If provided, participants make use of staff cafeterias, which were rated poorly due to an overload of hard to digest, fatty and sugary foods. "Snacking" during the day (vending machines, supermarkets, pre-cooked meals) were also mentioned as part of the daily routine as well as taking the time to properly prepare a nutrient rich dinner after returning home from work. Selecting food products in preferred supermarkets underlies a certain set of values which individually determine a presumed "high" or "low" quality of foods. None of the interviewees disclosed financial constraints regarding their access to food and therefore had wide opportunities to select their preferred foods in-store as well as their preferred food retailers (see limitations of this sample in chapter 6.5.).

"Health" aspects in daily food practices

Overall, the aspect of *health* in daily food practices (RQ2b[128]) was a predominant part of the narrative for participants suffering from diet-related struggles (body image, weight, disease) in comparison to those who did not utter any negative body feedback due to nutrition. For the latter, the aspiration for a healthy diet was not as actively mentioned as by the former who said they follow certain guidelines or food bans in order to keep their body conditions and negative feedback in check. Preventative reasons to eat healthily were phrased as: prolonging life, avoiding diet-related diseases or negative body feedback. No negative feedback meant no desire to start a healthier diet (chapter 7.1.3.). Interestingly, the participants seemed to collectively categorise food into "healthy" and "unhealthy" and supported certain food bans and taboos: convenience, processed and fast foods were considered as such (chapter 7.1.3). Every single participant emphasised their awareness of what they cook and eat on a daily basis, as well as their active attempt to have a wholesome diet with home-cooked meals. These personal "guidelines" resemble the recommendations formulated as part of the *Eurodiet project*

[127] *RQ1a) How do people design their day-to-day food practices?*
[128] *RQ1b) What part does "health" play in their food practices?*

(Food-Based Dietary Guidelines introduced in chapter 2.3.1.). These guidelines however, are not free of critique as they often exclude those exact foods (convenience, processed and ready-to-eat foods) and categorises them into "discretionary foods" (debated in chapter 2.2.1.1.) (Bechthold et al., 2018). This might be justified in a strictly nutritional sense, it does not mirror the reality of European food environments correctly, where processed foods are a significant part of the landscape and even "overexposed" (Schwartz & Brownell, 2007). Although this note may seem rather little, this could play a notable part in the participants' tendencies to worsen their own eating behaviour - besides general performance pressures of society (chapter 7.3.). Participants repeatedly emphasised that they *could* eat way healthier throughout the interviews and that they attempt to do so, but often fail. That this circumstance is something that could potentially be traced back to their physical and social surroundings as well as their working and living conditions are not taken into account but rather seen as a lack of "personal discipline". As discussed above, the current public and political discourses can play a significant part in reinforcing this idea, as individuals are familiar with the narrative that they are solely responsible, and therefore held accountable for their own lifestyle- and food- choices (chapter 6.5.; 7.3).

Diet-enhancing interventions

In the second set of research questions[129] diet-enhancing policy interventions and their capabilities, pitfalls and consequences were examined. Firstly, current diet-related policy initiatives in the European Union and Germany as a Member State example were identified and revolved around comprehensive nutrition education in schools and day-care centres (chapter 8.2.1). On an EU-level, the *dairy, vegetables and fruits programme* falls into this category which provides funding for healthy meals in schools and aims to foster local, regional or organic food, short supply chains, ecological purpose throughout Member States. On a State level, strategies to revise current curriculums in schools, the government funded *IN FORM* project and its food driver's licence were found. Secondly, education-based tools by healthcare providers were discussed (chapter 8.2.2.). For example, prevention classes offered by health insurance companies are part of the primary prevention strategy in Germany, where several

[129]*RQ2: How can health policy interventions enhance dietary behaviour? RQ2 a) Which capabilities have institutional diet-enhancing interventions such as comprehensive education and income support to improve people's dietary behaviour? RQ2 b) Which effects have behavioural diet-enhancing interventions, such as nudging, on people's food practices and what are their wider implications for health policy?*

areas of action are addressed[130]. Main objective is to provide opportunities for citizens to stay "motivated" and take *active* action in maintaining health. Individuals are expected to gain new knowledge and skills and incorporate these into their lives going forward. This aligns with the notion in German health policy, that individuals are an *active* member of the healthcare system and "expects" *responsible* health behaviour as part of the disease prevention strategy. In regards to dietary behaviour, that includes goals to tackle malnutrition, "poor diets" and counteract overweight (GKV, 2022).

Moreover, "poor diets", obesity and chronic diseases are repeatedly associated with lower-income individuals and households (chapter 8.2.3.) - a circumstance that has been mainly addressed through provision of information or governmental food programs and emergency assistance[131] in Germany. A study by the independent German Health Consulting Collective (UGB) in 2007 showed that in low(er)-income households more convenience food, soft drinks, meat, sugars and processed foods are consumed and therefore have a lower score in nutrients as high-income households. However, it has been found that it is high-fat and sugary processed foods that are simply cheaper, overwhelmingly on display, offered at any given moment and are particularly dependent on the socioeconomic infrastructure of the neighbourhood people live in (as Schwartz and Brownell, 2007, argue and observations by the interviewees suggest).

Evidently, there is a tendency towards a higher number of discounters, which offer a different or only limited variety of foods in lower-income neighbourhoods. This asymmetry between income status of communities can ultimately lead to health inequalities as discussed in chapter 8.3.2. (Kroke, 2016). Studies show that early deaths or illnesses could be avoided if the whole population had the same life circumstances as people who live in the wealthiest areas (NHS, 2018). Income-related interventions often neglect these structural determinants for human practises, as well as the fact that poverty-stricken individuals and households battle with far greater concerns than the *healthiness* of their nutrition (chapter 8.3.2.). Furthermore, educational interventions for low-income households (chapter 5.) face limitations if they are not combined with the *right* assistance to apply the information learned (for example providing coupons for vegetables and fruits after training) (chapter 5.). With limited resources, a variety of hurdles to maintain a healthy diet would remain, even if financial incentives or emergency

[130]The pillars of the German health care policy, primary prevention and health promotion, attempt to decrease morbidity aiming towards reduced expenses in the health sector and in medical care also as part of the "social investment strategy" that aims to enhance the productivity potential of a society (Gerlinger, 2018, p.11).
[131]"Die Tafel"

aid is provided. For example, a lack of appropriate conditions to store healthy products and a lack of time to prepare home cooked meals at all.

Apart from that, the aspiration to generally live and eat healthily do not necessarily require solutions dependent on socioeconomic conditions. As Case and Deaton (2020) argue, more and more people no longer have any motivation to stay healthy or fit, and engage in coping mechanisms (doing drugs, drinking alcohol and eating too much) as a "reaction to stress and a way of self-soothing in the face of life's difficulties and disappointments" (Case & Deaton, p. 44). These stressors are underpinned by the incorporation of market rhetoric in health policy interventions, suggesting that people's behaviours should be "corrected" (chapter 8.4.2., 8.5.).

Diet-enhancing behavioural interventions: implications of nudging

Self-correcting policy measures to enhance diets in health policy aim to address individuals strategically to "fight the obesity epidemic" and reduce chronic diseases by *changing behaviours* and *lifestyle choices* for the "better". This translation of larger societal defects into self-correcting individual responsibility finds its embodiment in the policy intervention *nudging* also referred to as libertarian paternalism, behavioural economics or choice architecture[132] (chapters 8.4.-9.). Nudging applied in health policy, mainly appears as addressing the *demand side* (individuals and certain groups) instead of the *supply side* (institutions and structural conditions as well as EU and State policies) as it is presumed to be a more efficient solution to "lift collective health talents" (Piniewski et al., 2011, as cited in Prainsack, 2020) (chapter 8.4.).

Diet-enhancing nudging tools, whether they intend to modify the choice architecture (through health-value food-package-labels *Nutri-Score* as discussed in chapter 8.4.1) or correct behaviour through a mobile app that claims to help consumers make healthier *choices* (as debated in chapter 8.6.), they start at the assumption that human practice is based on rational behaviour that complies with reason and morality. This evidence and the conclusion that nudges view behaviour as detangled from social, cultural and political environments represent a common fallacy, as debated in chapter 8.5 and 9. Moreover, there is no *value-freeness* when it comes to nudges: every single nudge is part of a broader set of values, in which "actions or omissions" are assessed as "sub-optimal" according to societal values (Prainsack, 2020, p.

[132]Thaler and Sunstein (2008) define a nudge as "any aspect of the choice architecture that alters people's behavior in a predictable way without forbidding any options or significantly changing their economic incentives" (p.6).

549). Through installing nudges, the "appropriateness" of certain behaviours is installed along with it and adapts "individual values to those of the authorities" (Prainsack, 2020, p. 554). Since they do not ask, nudging tools cannot grasp the larger structural conditions that "shape human practice", let alone find solutions for the challenges they cause (Prainsack, 2020, p. 547). Ultimately, the resolution of behavioural policy interventions is if people are led to believe that they are the ones who simply have to "do better", policy-makers are freed from their responsibility to tackle wider, structural determinants for health, disease and wellbeing in general, although they might be able to do so (Prainsack, 2020). Against this backdrop, the final chapters of the thesis (10.-14.) debated the manifold determinants and policy action fields that can create healthy food environments beyond behavioural interventions.

Diet-enhancing policies beyond behavioural interventions

The exit question, interviewees were asked as part of the empirical research, intended to grasp their ideas of an adequate support system to maintain a healthy diet (chapter 7.2.). Interestingly, the participants widely suggested collective, educational approaches to *improve food choices*. Only one participant pointed out that in order to eat healthier, he would like to have adequate surroundings in the form of minimum quality standards and a wider selection of healthy food, also in restaurants (chapter 7.2.). These narratives were found to disclose an underlying body of values regarding the interviewees' dietary behaviour: whether they manage to eat healthily or not is presumed to be their own responsibility, as they refer to as a lack of discipline and will-power on their own account. As a result, a wrongful use of solidarity can be provoked, also when it comes to the question of *what people need to eat healthily*: a differentiation between *us* who already eat healthily versus *those* who need to be informed and taught how to do so is made. This leads to not putting demands on policy-makers to create healthier food environments but increases pressure on fellow citizens to act more *responsibly* (chapter 4.1.). However, whether food environments are healthy or toxic is to a significant extent created by a multitude of policies around nutrition. Simultaneously, individuals have found to be denounced for their "poor" behaviour in the public and political debate, even though it is "poor" food environments that would need this attention.

A healthy (food) environment model

Based upon the findings through the reviewed literature throughout the thesis and the qualitative insights of the interviews, my model for a *healthy (food) environment* was created and presented in the last chapter of the thesis (chapter 10, figure 2). It provides an overview of

political actions that can create healthy food environments beyond behavioural interventions, as part of tackling the final research question (RQ2c[133]). The model organises the prerequisites to maintain healthy food practices in relation to political action fields and visualises the core findings of the thesis at a glance. Levels include societal, socio-political and socio-economic policy efforts necessary to provide equal opportunities to lead a healthy life and eat well. This setting approach focused on people and their living, learning, working and consuming conditions and symbolises the counterpart of interventions centring around individual behaviour. My *healthy (food) environment model* intends to take into account that health and health related issues are the result of intertwining relations between economic, social and organisational environments as well as every individual lifeworld (Bachmann & Hoppler, 2021.)

The first level of the model addressed "Policy actions on a state and municipal level" in considering individual food practices and conditions of current food environments in Germany based on the empirical research. Policy actions that were found to have the potential to create healthy food conditions on a municipal level included incorporating spatial planning in favour of a healthy food infrastructure throughout neighbourhoods, regardless of their socioeconomic status. Moreover, a variety of points of access for healthy food products such as farmers markets, small organic grocery stores or farm-to-fork based concepts can also create lower thresholds to maintain healthier practices on a day-to-day basis (chapter 10, level 1).

The second level tackled "Policy actions that directly affect the healthiness of food environments (within European Member States)". The policy domains that can serve in the favour of healthier food environments in Member States were found in: *healthy food promotion, pricing reforms, product labelling, low threshold access*, *expanded range* and an *increased availability of healthy food*, as also suggested by the PEN report of Djojosoeparto et al. (2021) and the report on Germany by Philipsborn et al. (2020). Policy actions on this level involve adjusting food prices according to their *health value* such as "increasing taxes or levies on unhealthy foods" and providing subsidies in favour of healthy foods (chapter 10, level 2).

The third level: "Infrastructure supporting actions that indirectly affect the healthiness of food environments (throughout European Member States)" centred the debate around actions that encourage societal and political systems that allocate resources aside from market values and individualisation of responsibility. Hence, implications of pre-distribution tools (universal basic services: public housing, public education, job safety, regulation of the capital

[133] *RQ2 c) How can (health) policies beyond behavioural interventions create healthy food environments?*

market and universal basic income) were debated (chapter 10, level 3). Concrete policy actions that can support infrastructural conditions of food environments include building platforms and alliances between governments and the commercial food sector, as well as between governments and civil societies (Djojosoeparto et al., 2021). To ensure consistent policies on nutrition and a variety of policies that impact health in one way or another, including pre-distribution tools (UBS) in the *healthy (food) environment model* was found to bridge current difficulties to tackle these health conditions throughout several policy fields.

The fourth level of the model embedded core findings from the preceding levels of the pyramid into a global context and created the overarching dimension: "Healthy nutrition in the global food system" in which recent policy efforts to harmonise public health goals with other global concerns: climate change, environmental protection and social equality were discussed. Next to introducing the concept of "food sovereignty" as a way towards achieving these objectives, further calls for action were debated such as strengthening the cooperation between health and agricultural policy, synchronising environmental objectives with public health goals and restricting commercial interests of transnational food corporations and lobbying activities (Djojosoeparto et al., 2021; chapter 10, level 4).

The questions tackled throughout the thesis attempted to explore consequences and capabilities of current interventions in health policy on nutrition. As part of this process, it was found to be crucial to embed these implications into the overarching conditions of the food system in which food practices take place. This also underlined the relation between agricultural policy and health impacts, particularly in regards to diet-related diseases. The lessons learned throughout the thesis were concluded in the *healthy (food) environment model* which should express the importance of aligning a variety of action fields with public health goals and the cooperation between them, if the goal is to create healthy conditions for humans, nature and animals altogether (Bohrn Mena, 2020; chapter 10, level 4). Despite acknowledging the multitude of challenges that policy-makers face, whether it is effectively identifying and addressing healthy diets in an inclusive and comprehensive way, or to adequately evaluate policy measures already taken, the final conclusion of the thesis remains: people should no longer be put into toxic environments to live, work and eat in and be penalised for behaviours that stem from it. Ultimately, policy-makers throughout the European Union and Member State governments will not only have to tackle current negligent policies on nutrition, but are required to detect a number of policy fields that directly or indirectly affect the *healthiness* of food environments.

13. Outlook

Policy on nutrition carries the responsibility to ensure the "access and availability to healthy foods" throughout the entire population, regardless of varying socio-economic conditions, infrastructures and lifestyles[134]. Fields of actions that should ensure these objectives were identified throughout the thesis (and also by the PEN report provided by Djojosoeparto et al., 2021 and Philipsborn et al., 2020). To meet these objectives, future policy-making has to install measures on several levels. On an European Union level, these include VAT tax reforms and laws if the goal is to provide tax free access to fruit and vegetables and limit access to unhealthy food through tax raises. Nationwide actions require the "expansion of programs in schools and day-care centres" based on "funds raised through taxes for manufacturers on sugary drinks" for instance (Philipsborn et al., 2020, p. 24). In that favour, debates on "VAT reforms" have to be put on the agenda of public and political discourse. Moreover, marketing targeted at children needs further restriction as well as a comprehensive approach to legally binding quality standards in health care centres, federal agencies and all other public institutions will be required. On a municipal level, this will also include the obligatory "provision of healthy meals" in kindergartens, schools, clinics and other public entities (Philipsborn et al., 2020).

Despite the fact that these policy actions could pave the way towards making food environments more nutrition-sensitive and more sustainable, major challenges, especially regarding public health and nutrition remain. Current measures are not enough to comprehensively approach the "triple burden of malnutrition", as Béné et al. (2019) state and point out that attention must be paid to "food system governance" and the actors and drivers involved (p. 117). Furthermore, entirely new disputes around functions and obligations of public and private bodies will come to light, including new ways, instruments and interventions to tackle the challenges that food systems face, if the goal is to make them *healthier*. Next to making sure that "food remains available, affordable, accessible and acceptable to the different segments of the population" (Bene et al., 2019, p. 117) throughout the EU, policy-makers have to invest resources and pay special interest to finding solutions through policy action (Philipsborn et al., 2020). Against this backdrop, spatial planning becomes as equally relevant as a comprehensive food-related tax reform.

[134]This is enshrined in several European treaties: *Treaty on the Functioning of the European Union, The European Commission's Directorate-General for Health and Food Safety* (DG SANTE), or the *WHO European Food and Nutrition Action Plan 2015-2020*, as illustrated by Djojosoeparto et al. (2021, p. 11).

So far, in Germany, no measures are taken in this direction, despite the capability to take action in several fields and significantly restructure the food environment, at least on a national level. Concrete actions as such could involve re-organising retailers in food infrastructures including hurdle-minimising measures for small organic, regional markets to counterbalance a monopoly of food distributors in which transnational corporations are main profiteers. Still the main predicament of policy-approaches to nutrition and health remains: there is only limited knowledge and willingness on helping decision-makers to "influence the system and drive it towards more sustainable and higher diet quality outcomes" (Béné et al., 2019, p. 117). Additionally, future measures in (public) health (care) policy are also required to re-create alternate concepts to the current *benefit system* in Germany. Yet, the challenge will not be to install "better" policies to improve the healthiness of behaviours and environments, but to create policies that encourage balanced lifestyles that do not require people to overcompensate stress, anxiety and pressure with "risk behaviours" such as overeating, alcohol or drug consumption, or material overconsumption and broadly discourage practices that are harmful for people as well as the environment.

14. Limitations & further research

The conducted interviews as part of the empirical research of the thesis, however intended to play a "bigger" part in the arguments made throughout, resulted in providing supporting insights rather than building the central source of data. Even though the findings were still insightful and interesting, without including further (empirical) research (methodologically approached as a literature review) the interviews would not have provided material to build the entire thesis on. Although the experiences shared by the interviewees also served as little side notes throughout the second part of the thesis, it was necessary to put them into relation to the respective literature in order to highlight their relevance. Overall, the attempt to create a consistent linkage between the micro-level (individual food practices) with the macro-level (overarching food system) in regards to *health aspects* did not go as hoped, also due to methodological fallacies. Interviews with experts or the incorporation of the Food-EPI (chapter 9.1.1.) from the very beginning would have made it possible to study policies with more consistent, in-depth results. The research project ultimately takes stock of several *action fields* rather than exclusively examining concrete policy instruments, which results in an overview that foreshadows the research that is yet to be done.

15. Abbreviations

CVD	Cardiovascular disease
DRV	Dietary Reference Value
FBDG	Food-based dietary guideline
NCD	Non-communicable chronic diseases
T2D	Type II Diabetes
PEN	Policy Evaluation Network
FOOD-EPI	Healthy Food Environment Policy Index
UBS	Universal Basic Services
UBI	Universal Basic Income
DGE	German Society for Nutrition
BMEL	Federal Ministry of Food and Agriculture
BZfE	Federal Ministry Centre for Nutrition

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17. Appendix

17.1. Information sheet and data protection declaration

Universität Wien
Institut für Politikwissenschaft
Masterarbeit unter Betreuung von Univ.-Prof. Dr. Barbara Prainsack
Durchführung der Erhebung: Christina Mayr, Bakk. phil.
Forschungstitel:

Healthy Eating by Policy Design?
Eine Policy Studie zur Ernährungs- und Gesundheitspolitik in Deutschland

Im Folgenden werden Ihnen Fragen über Ihre Alltagserfahrungen in Hinblick auf Ernährung gestellt. Konkret geht es darum, einen Eindruck zu erlangen, welche Rolle Ernährung in Ihrem Alltag spielt, wie Sie Ihre Ernährung gestalten und in welcher Ernährungsinfrastruktur Sie leben. Vielen Dank, dass Sie an der Erhebung teilnehmen.

Zusicherung der Anonymität der Aufzeichnungen - Information für die Befragten

Die Durchführung des Interviews geschieht auf der Grundlage der Bestimmungen des Datenschutzgesetzes. Ich, Christina Mayr, unterliege der Schweigepflicht und bin auf das Datengeheimnis verpflichtet. Die Arbeit dient allein wissenschaftlichen Zwecken. Der Datenschutz verlangt darüber hinaus, dass ich Sie über mein Vorgehen informiere und Ihre ausdrückliche Genehmigung einhole, um das Interview verwenden zu können. Antworten können bei einzelnen Fragen verweigert werden.
Ich sichere Ihnen folgendes Verfahren zu, damit Angaben nicht mit Ihrer Person in Verbindung gebracht werden können:

- Ich gehe sorgfältig mit dem Erzählten um: das Gespräch wird aufgenommen und verschriftlicht. Diese Abschrift wird nicht veröffentlicht und ist nur für die projektbezogene Auswertung zugänglich. Ausschnitte werden nur zitiert, insofern eine Identifikation der Person ausgeschlossen ist.
- Ich anonymisiere, d.h. alle Personen-, Orts-, Straßennamen.

- Sofern ich Namen erfahren habe, werden diese Angaben in meinen Unterlagen gelöscht, so dass lediglich das anonymisierten Transkript existiert. Die von Ihnen unterschriebenen Erklärung zur Einwilligung in die Auswertung dient einzig und allein dazu um nachweisen zu können, dass Sie mit der Auswertung einverstanden sind. Sie können mit Ihrer Teilhabe an dem Projekt nicht mehr in Verbindung gebracht werden.

Wien, Juni 2021

Einverständniserklärung

Ich bin über das datenschutzrechtliche Vorgehen informiert worden: die Abschriften gelangen nicht an die Öffentlichkeit, Anonymisierung bei der Abschrift, Löschung von eventuell vorhandenen Namen, Aufbewahrung der Einwilligungserklärung nur im Zusammenhang mit dem Nachweis des Datenschutzes und nicht zusammenführbar mit dem Interview.
Unter diesen Bedingungen erkläre ich mich bereit, dass die geführten Gespräche aufgenommen sowie verschriftet werden und für die Auswertung im Rahmen des Forschungsprojekts *„Healthy Eating Behaviour by Policy Design?*“ verwendet werden darf.
Die Verschriftungen dürfen in diesem Zusammenhang unter Beschränkung auf kleine Ausschnitte auch für wissenschaftliche Publikationszwecke (Forschungsbericht, Aufsätze zum Forschungsprojekt) verwendet werden. Mir wurde zugesichert, dass dabei alle persönlichen Daten, die Rückschlüsse auf mich zulassen, gelöscht oder anonymisiert werden.
Ein Widerruf meiner Einverständniserklärung ist jederzeit möglich.

Ort, Datum **Unterschrift:**

17.2. ***Figure 3.*** *Overview of "Expert's rating of the strength of EU-level policies influencing food environments in the EU" according to Djojosoeparto et al. (2021, p. 22)*

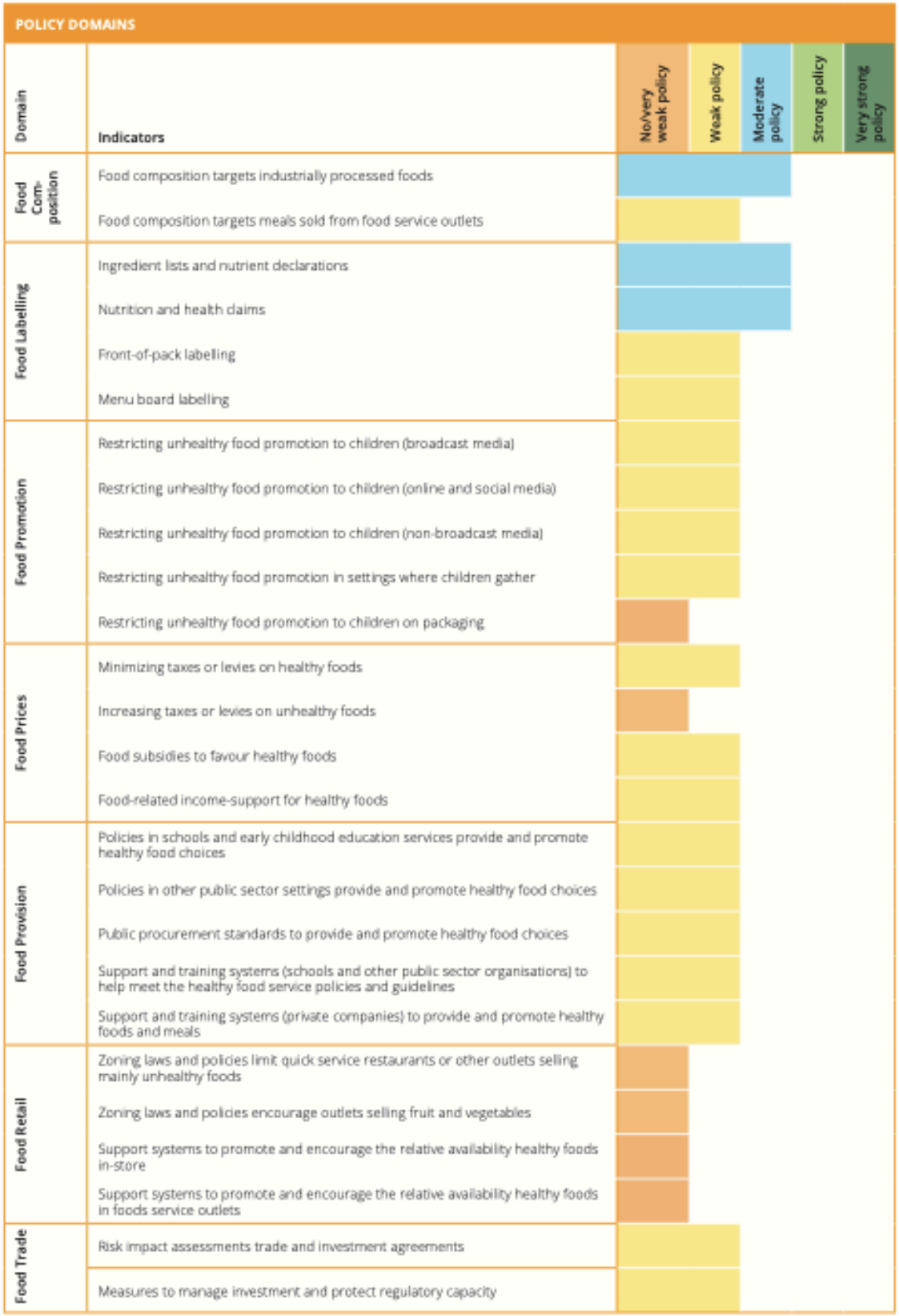
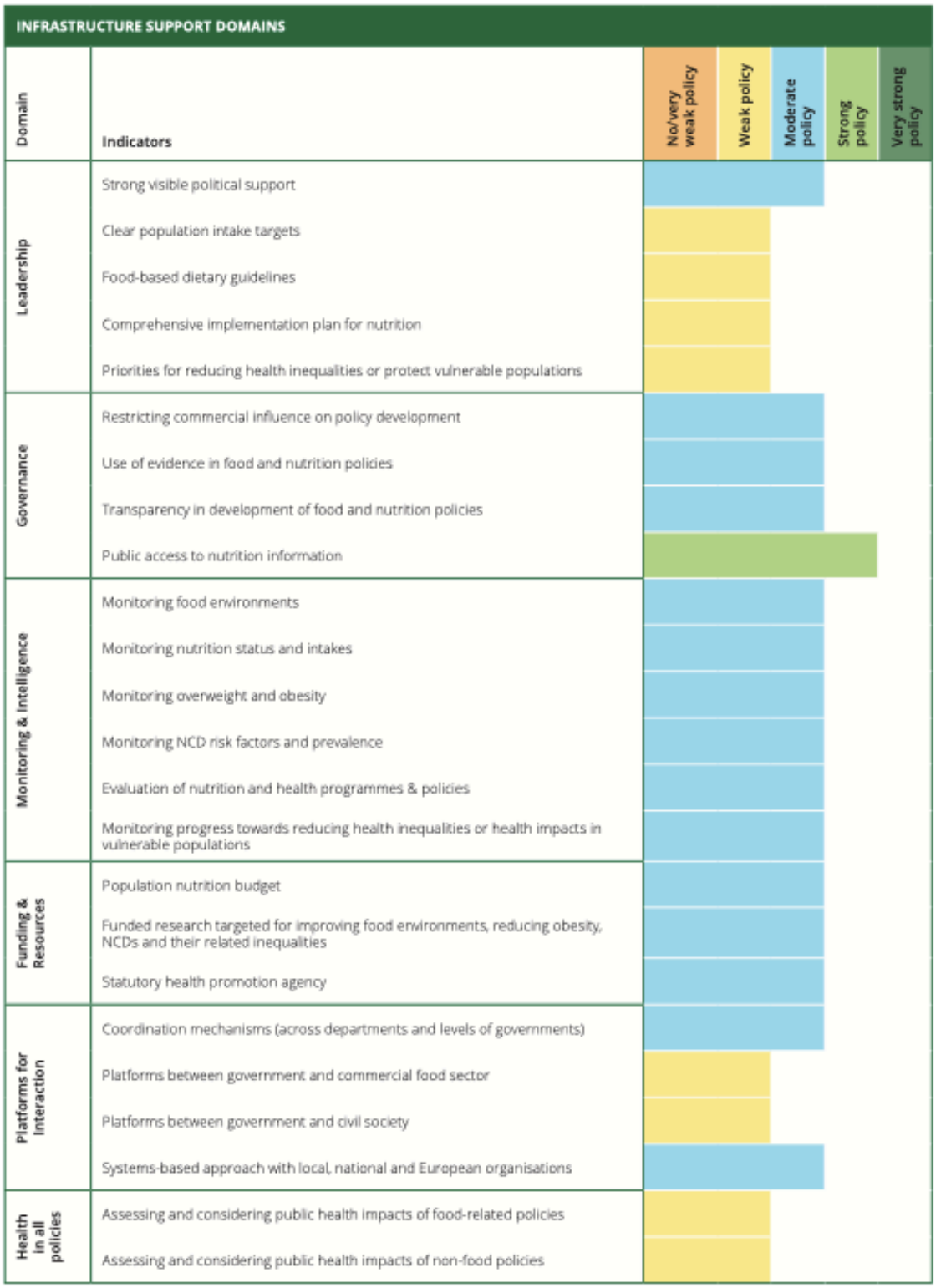


Figure 4: *Overview of "Expert's rating of the strength of EU-level infrastructure support influencing food environments in the EU" according to Djojosoeparto et al. (2021, p. 23)*



17.3. Abstract

Healthy eating has been part of the public debate rather consistently. Alongside the increase of non-communicable chronic diseases - often viewed as induced by "poor lifestyle- and dietary-choices" - questions of how these behaviours can be improved and the costs emerging through them reduced, have also become part of European health policy concerns. In this master's thesis I examine European diet-enhancing policy instruments under the consideration of current processes in health policy: individual health-responsibility, risk-stratisfaction and solidarity. A review of two policy approaches: institutional and behavioural interventions leads to the investigation of concrete instruments including comprehensive education on nutrition, income support and *nudging*. Thereby, the implications of these interventions and of nudging- tools in particular, are debated in light of the distribution of health services based on rewarding *responsible* health behaviours as found in the German "benefit system".

At the core of the thesis, the qualitative research (semi-structured Interviews) conducted in Germany in 2021, is presented and the insights on past and current eating practices and environments are discussed. Through putting these learnings into the prior debates of the thesis, I answer the research question: "Which policy instruments and measures - beyond behavioural interventions - create healthy (food) environments?" and illustrate the key findings in my own model of a *healthy (food) environment*. The model shows policy-opportunities for healthier living and eating conditions that reach from re- and pre-distribution tools to universally cover basic needs, to tax reforms and subsidies in favour of vegetables and fruits and spatial planning towards healthy food infrastructures throughout neighbourhoods, regardless of their socioeconomic conditions. Finally, the research of the thesis shows, meeting public health goals in the wake of other, equally pressing social and ecological challenges, also requires building alliances between policy fields and involving civil society.

17.4. Zusammenfassung

Gesunde Ernährung ist bereits seit geraumer Zeit ein Bestandteil der öffentlichen Debatte. Mit dem Anstieg von nicht übertragbaren, chronischen Krankheiten, deren Ursache „nachlässigen" Lebens- und Ernährungsstilen zugeordnet wird, ist die Frage, wie sich Ernährung verbessern - und sich die Kosten senken lassen, die durch ernährungsbedingte Krankheiten entstehen - nun auch Teil der Europäischen Gesundheitspolitik. In der vorliegenden Masterarbeit untersuche ich - unter den Gesichtspunkten aktueller gesundheitspolitischer Prozesse: individuelle Verantwortung für Gesundheit, Risikostratifizierung und Solidarität - ernährungsverbessernde europäische Politikinstrumente. Dabei wird zwischen den unterschiedlichen Zielrichtungen unterschieden: institutioneller- und verhaltensbezogener Interventionen. Erstere beinhalten alters -spezifische und -übergreifende Ernährungsbildung, Einkommensunterstützung oder Subventionsmittel. Letztere sind so genannte „*nudging*-tools", die beispielsweise Konsument:innen durch verhaltensökonomische Modifizierungen des Ernährungsumfeldes in die gesündere Produktwahl „stupsen" sollten.

Der methodische Kern der Arbeit ist eine qualitative Erhebung, die in Deutschland, 2021 durchgeführt wurde. Die Ergebnisse der semi-strukturierten Interviews bieten Einblicke in die Lebens- und Ernährungsrealitäten und Infrastrukturen der teilgenommenen Personen und ermöglichen durch die Einbettung in vorangehende Debatten, die Diskussion der Frage: „Welche Politikinstrumente und Maßnahmen - über verhaltenskorrigierende Interventionen hinaus - fördern gesunde (Ernährungs-) Umfelder?" Schlussfolgerungen dieser Untersuchung beinhaltet das von mir erstellte Modell für ein „gesundes (Ernährungs-) Umfeld", welches die Chancen für positive Effekte auf das Ernährungsverhalten durch strukturelle Politikinstrumente und damit die zentralen Ergebnisse der Masterabeit illustriert. Zu diesen zählen beispielsweise Re- und Pre- Distributionsinstrumente, um eine universelle Deckung von Grundbedürfnissen sicherzustellen, Lebensmittelsteuerreformen und Subventionen zu Gunsten von Obst und Gemüse sowie Raumplanung, die eine gesunde Ernährungsinfrastruktur in Nachbarschaften, unabhängig von den sozioökonomischen Bedingungen, gewährleistet. Abschließend diskutiere ich die Bildung von Allianzen zwischen Politikfeldern und Zivilgesellschaften, die es erfordert, um Public Health Ziele einhergehend mit aktuellen, sozialen und ökologischen Herausforderungen bewältigen zu können.