



Policy Strategies and Instruments for the Promotion of a Plant- Based Diet in Europe

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List of abbreviations

ADEME	The French Agency for Ecological Transition
AVP	The Portuguese Vegetarian Association
BLE	Bundesanstalt für Landwirtschaft und Ernährung (German Federal Office for Agriculture and Food)
BMBF	Bundesministerium für Bildung und Forschung (German Federal Ministry of Education and Research)
BMEL	Bundesministerium für Ernährung und Landwirtschaft (German Federal Ministry of Food and Agriculture)
BMUV	Bundesministerium für Umwelt, Naturschutz, Reaktorsicherheit und Verbraucherschutz (German Federal Ministry for the Environment, Nature Conservation, Nuclear Safety and Consumer Protection)
BUND	Bund für Umwelt- und Naturschutz Deutschland (German Federation for Environment and Nature Conservation)
CAP	EU Common Agricultural Policy
CBD	Convention on Biological Diversity
CH4	Methane
CO	Carbon monoxide
CO ₂	Carbon dioxide
COPLANT	COhort on PLANT-based Diets
DGE	Deutsche Gesellschaft für Ernährung (German Nutrition Society)
ELB	Europäische Lebensmittelbehörde (European Food Safety Authority)
EU	European Union
EVA	Ethical Vegetarian Alternative
FAO	Food and Agriculture Organization of the United Nations
FBDG	Food-based dietary guidelines
Food-EPI	Food Environment Policy Index
FSFS	Legislative Framework for Sustainable Food Systems
GDP	Gross Domestic Product
GHG	Greenhouse gases
GPA	Green Protein Alliance
GPP	Green Public Procurement
HDSFS	Coalition of Action on Healthy Diets from Sustainable Food Systems for Children and All
IPCC	International Panel on Climate Change
LCA	Life Cycle Assessment
NABU	Naturschutzbund Deutschland e.V. (Nature And Biodiversity Conservation Union)
NBSAP	National Biodiversity Strategies and Action Plans
NEMONIT	National nutrition monitoring
NVS II	Nationale Verzehrsstudie II (German National Nutrition Survey II)
OECD	Organisation for Economic Co-operation and Development
OSZE	Organisation für Sicherheit und Zusammenarbeit in Europa (Organisation for Security and Cooperation in Europe)
PHE	Public Health England
SDG	Sustainable Development Goals
THL	Nationales Institut für Gesundheit und Wohlfahrt (National Institute for Health and Welfare)
UBA	Umweltbundesamt (German Federal Environment Agency)
UN	United Nations
VAT	Value Added Tax
VO	Verordnung (Ordinance)

10 Recommendations for the promotion of plant-based diet and practical examples for policy makers

The ten most important policy recommendations from the report are summarised below. They are divided into recommendations for policy strategies and for policy instruments for the promotion of a plant-based diet. They are supplemented by existing practice examples in Europe. The colour gradation of the policy instruments symbolises the depth of intervention in the personal consumption choices of citizens (from a low intervention strength highlighted with a light colour to a high intervention strength highlighted with darker colours).

Recommendations for policy strategies for the promotion of a plant-based diet

1. The promotion of a plant-based diet should be included in policy strategies at the municipal, regional, national and international levels for topics such as nutrition, sustainability, the environment and health. Corresponding measures should be promoted in a targeted manner.
2. At all political levels, there are already strategies that can serve as models. The processes that played a role in the development of the strategies can also be instructive and serve as a blueprint. Learning from other stakeholders and implementing existing agreements (e.g. the Milan Urban Food Policy Pact, C40 Good Food Declaration) can help municipalities in particular to familiarise themselves with and implement tried-and-tested measures quickly and in a targeted manner.

Recommendations for policy instruments for the promotion of a plant-based diet

Recommendations	Examples
<p>Data collection and monitoring are essential foundations for the development of effective measures to promote plant-based nutrition. Relevant data includes nutritional status, nutritional knowledge, nutritional behaviour, nutritional environments, type of diets and diet-related diseases as well as social inequality and food poverty. They can be used for goal orientation, evaluation (e.g. of</p>	<p>Surveys on dietary behaviour have so far mainly been carried out in northern, southern, western and central European countries (examples; Finland, Norway, Germany, United Kingdom (Box 1). Some south-eastern and eastern European countries have no national surveys at all. The collected data often relates to dietary behaviour and dietary patterns; relevant information is rarely collected on a broad scale (see left column). For example a broad, extensive data analysis of the food system was carried out in England, as part of the development of the National Food Strategy. Another example from Denmark shows that</p>

	<p>undesirable social effects or substitution effects) and adaptation or abolition of measures as well as transparency.</p>
	<p>Information campaigns are a suitable instrument for increasing the acceptance of subsequent stricter measures. If information campaigns are combined with behavioural economic instruments such as nudging, they can have a stronger impact on consumer behaviour.</p>
	<p>Dietary guidelines and nutrition standards should recommend eating more plant-based foods to better protect both the population's health and the environment. This is based on the latest scientific findings.</p>
	<p>The promotion of dietary education plays a particularly important role in day-care centres and schools. Learning from peers is particularly beneficial. Training and further education on a plant-based diet for kitchen staff and related professional groups (medicine, nursing, catering, education, agriculture) should also be supported.</p> <p>To promote dietary education at a young age, cooking and nutrition is taught at school in Finland (Box 8). Other educational programmes at school, such as cooking activities or gardening (Box 9), especially in combination with good school meals, are proving to be effective.</p> <p>A training programme for chefs on menu planning of plant-based dishes in Denmark not only achieved a change in the use of food and new work processes, but also increased the chefs' well-being and professional skills (Box 10).</p> <p>One pioneering example from New York shows how the topic of plant-based nutrition is being introduced into the healthcare sector with the help of nutrition training for healthcare professionals (Box 11).</p>

	<p>Counselling services that are individually tailored to the target groups round off the educational offering (Box 12).</p>
<p>Advertising bans on products which harm the climate, unhealthy products or (cheap) meat should be used to restrict the advertising of animal-based foods. To be effective, such bans should include as many types of media as possible (e.g. television, internet, print and outdoor advertising, point-of-sale advertising, direct marketing, packaging advertising and advertising in kindergartens, schools, playgrounds and other sports and leisure facilities frequented by children).</p>	<p>There are known bans and plans in European countries that do or will prohibit the advertising of unhealthy foods to children, such as in Portugal, Norway, Sweden and Germany. However, advertising bans on animal products are less common: in the city of Haarlem in the Netherlands, a ban on advertising products that harm the climate, including meat from factory farming, has been adopted and is due to come into force beginning in 2024 (Box 16).</p> <p>A legal assessment shows that a ban on advertising, limited to cheap (underpriced) meat, is also permissible under European law. Economic-ecological effects are listed extensively in the report (Fischer et al., 2021).</p> <p>Voluntary commitments by the private food and catering industry can have a supportive effect (e.g. EU Pledge), but studies attest to the far greater effects of mandatory advertising restrictions.</p>
<p>Nudging should be used to shape food environments in such a way that a plant-based diet takes centre stage. This applies not only to community catering, but also to supermarkets, hospitals, events and other places or occasions.</p>	<p>In a survey following an industry campaign in the UK, 80% of caterers said they were offering less meat and more plant-based options and making some use of nudges (Box 17). Examples of the use of nudges in community catering include the expansion of plant-based options in cafeterias in England, informative nudges in the USA, the standardisation of vegetarian options in Sweden and Denmark, the minimum range of plant-based dishes in Copenhagen and Aalborg (Denmark) and appealing names for plant-based dishes (Box 17). Informative nudges and the targeted placement of meat substitutes are used in supermarkets in the UK (Box 18). The city of Altena in the Netherlands is an example of how nudging can create the environment for an increasingly plant-based diet at municipal level (Box 19). Participatory approaches, in which nudging is developed together with those affected, often prove to be more effective and better accepted than top-down approaches.</p>
<p>Financial incentives are a strong lever: plant-based foods can be promoted through subsidies, bonus programmes and investments/grant funding. Agricultural subsidies should be based on environmental performance and environmentally harmful subsidies should be</p>	<p>Bonus programmes in the UK show how people living on low income or living in disadvantaged areas can be encouraged to consume fruit and vegetables (Box 22). Across Europe, there are also various pioneering production-side subsidy measures, including support for the conversion of animal feed production to the production of plant-based food for human consumption in Denmark, support for the conversion of agricultural land use in Belgium and support for the transition from intensive livestock farming to extensive</p>

<p>ended. Taxes should be adjusted so that food prices reflect the impact on the environment, climate, health and animals. If taxes on animal-based foods are increased, it should be ensured that this is done in a socially just manner and that the revenue is used constructively to ensure acceptance by the population.</p>	<p>livestock farming in the Netherlands (Box 21). There are also a large number of subsidies for technical innovations, such as lab-grown meat (Box 23). Dairy products are still far too often subject to the reduced Value Added Tax (VAT) rate, while plant-based alternatives such as soya or oat drinks are taxed at a higher VAT rate. Some countries, such as Belgium, Denmark, Finland, France, Ireland, Portugal and the Netherlands, tax them at the same rate (Box 24). Other tax approaches include the announced CO₂ tax in Denmark (Box 25), the proposed animal welfare levy (“Tierwohlabgabe”) in Germany, the meat tax in the Netherlands (Box 26) and taxes on saturated fats in Denmark (Box 27).</p>
<p>Mandatory regulations and bans can be used to promote a plant-based diet, for example in community catering. Mandatory and controlled quality standards or laws can be used for this purpose. The criteria for public procurement can be used to make plant-based meals mandatory.</p>	<p>Many European countries have mandatory quality standards for mass catering, including France, the UK, Germany and Hungary for school catering (Box 29) and Northern Ireland for public health facilities (Box 28). These standards vary from country to country and include measures to promote plant-based diets such as maximum limits for animal-based foods, minimum offerings for vegan and vegetarian dishes, as well as specific requirements for fruit and vegetable content, portion sizes and diversification (Box 28). Portugal has passed a law requiring all mass catering establishments to provide vegan meals, while in France schools are required by law to offer one meat-free meal a week (Box 30). Some European cities in Belgium, Austria, Finland and Germany have introduced meat- and fish-free days in public catering facilities, with measures ranging from a weekly Veggie Day (Box 31) to the exclusive provision of vegetarian meals (Box 32).</p>

1 Introduction

A plant-based diet¹ is one of the greatest levers for transforming the food system. By increasing the amount of people who follow a plant-based diet and simultaneously reducing the consumption of animal products, as postulated by the Planetary Health Diet (Willett et al., 2019; EAT, n.d.), the planetary boundaries can be met.

In addition to the significant contribution of a plant-based diet to environmental and climate protection, the health benefits for humans have also been scientifically proven in detail (Springmann et al. 2016: 4147; Bryant 2022: 5 ff.; Willett et al., 2019: 454 ff., Hallström et al. 2015; Dinu et al., 2017: 3643 ff.). Promoting a plant-based diet is an effective tool for achieving several *Sustainable Development Goals* (SDGs) with one single lever.

The diverse potential of a plant-based diet for the environment, climate, people and animals, as well as for achieving the SDGs, is increasingly being recognised by policymakers. Across Europe, there are various approaches and strategies to promote a plant-based diet. This report looks at various developments and policy strategies at the international, national, regional and municipal levels and describes how they relate to the promotion of a plant-based diet.

This report also explains which different policy instruments are already being used in Europe to promote a plant-based diet and which are potentially suitable to have the same effect. In addition to active civil society and stakeholders from the private sector and research, what is needed above all is political support, guidance, and concrete implementation of measures. A set of rules for the organisation of food environments as well as inter-agency cooperation are needed. This report is therefore aimed at political decision-makers in the EU, at the national, regional and municipal levels. This report can support them in fulfilling their task of creating a policy framework that facilitates a sustainable food system for all stakeholders.

1.1 Structure

The first part of the report examines current developments and policy strategies to promote a plant-based diet at the international level (worldwide and in Europe) as well as at the national, regional and municipal levels in Europe. The second part covers food policy instruments for the promotion of a plant-based diet. These instruments are divided into data collection and monitoring, decision support, decision steering and decision restriction. The report ends with a conclusion.

1.2 Methods

Policy strategies at international, national, regional and municipal levels, as well as policy instruments and their examples, were researched using literature review and analysed with regard to their relationship to a plant-based diet. For this purpose, primarily online search engines (Google, Google Scholar, Google Books, Research Gate, Springer Link) and official websites of the European Commission as well as those of national ministries or public authorities were used. When researching policy instruments and their exemplary application in Europe, grey literature (brochures, project reports and websites, guidelines and news portals) aimed at promoting a plant-based diet or providing further information on the respective example was also included where necessary. Google Translate was used for websites that were not available in English or German.

¹ A plant-based diet consists mainly of plant-based foods such as whole grain products, vegetables, fruit, pulses, nuts and seeds. Consumption of animal products such as milk, eggs, meat or fish in small quantities is not ruled out.

2 Current developments and existing policy strategies for the promotion of a plant-based diet

The following section provides an overview of the various options for promoting a plant-based diet within the framework of policy strategies at the international, national, regional and local levels. In general, the promotion of a plant-based diet and the reduction of animal products are addressed within the framework of strategies for sustainable nutrition and for improving health. In some other strategies, the promotion of a plant-based diet is addressed directly or indirectly. Developments worldwide and in Europe are presented first, followed by national, regional and local developments.

2.1 International developments

The international policy level is particularly important in promoting a plant-based diet, as it can provide a coordinated and coherent global response to the challenges associated with our food systems. By working together at the international level, countries can set common goals and actions to promote the uptake of a plant-based diet in a timely manner and pave the way to a more sustainable future.

2.1.1 Developments worldwide

2.1.1.1 SDGs

The 17 *Sustainable Development Goals* (SDGs) of the United Nations (UN) are targets for sustainable development that are to be implemented by 2030 and were adopted by all UN member states in 2015 (United Nations, n.d.a). The SDGs cover a wide range of topics such as poverty, hunger, health, education, gender equality, clean water and sanitation, renewable energy, sustainable cities and communities and climate action. The promotion of a plant-based diet is indirectly included in numerous SDGs, in particular SDG Number 2 "End hunger, achieve food security and improved nutrition and promote sustainable agriculture", SDG Number 3 "Ensure healthy lives and promote well-being for all at all ages" and SDG Number 12 "Ensure sustainable consumption and production patterns". For example, promoting a switch to a more plant-based diet can lead to a reduction in greenhouse gas emissions and land use, thereby increasing global food security (SDG Numbers 2 and 12) (Tilman & Clark, 2014; Springmann et al., 2018). Improving population health also addresses the dietary shift towards a more plant-based diet by reducing the risk of diet-related diseases such as cardiovascular disease, cancer and type 2 diabetes (Tilman & Clark, 2014).

2.1.1.2 UN Food System Summit

The *UN Food System Summit* is an international initiative of the UN that aims to achieve the SDGs by 2030. The Summit brings together government representatives, experts, scientists, companies and other stakeholders to develop strategies and solutions. One focus of the 2021 Summit was also on the promotion of a plant-based diet, which is considered to be of particular relevance in achieving the SDGs (von Braun et al., 2021). In a discussion paper published in the run-up to the Summit, one bullet point on the desired outcomes reads:

"At the global level, and particularly with respect to more affluent populations, a reduction of excessive consumption of animal-sourced foods, especially red meat, and an increase in consumption of plant-rich diets." (United Nations, 2020: 3)

2.1.1.3 The Coalition of Action on Healthy Diets from Sustainable Food Systems for Children and All

The *Coalition of Action on Healthy Diets from Sustainable Food Systems for Children and All (HDSFS)* emerged from the UN Food System Summit. It brings together UN member states and agencies, civil society organisations, academic institutions and social movements. As a coalition of the willing, it is committed to promoting healthy nutrition and sustainable food systems for children and adults worldwide (World Health Organisation, n.d.). According to its goals, the Coalition is closely linked to the promotion of a plant-based diet, but due to its still very young age, it is difficult to make concrete statements about its starting points and measures. According to its own statement, the Coalition is guided by the Sustainable healthy diets - Guiding principles (FAO & WHO, 2019). These recommend a diet that includes whole grains, pulses, nuts and an abundance and variety of fruit and vegetables and only a small quantity of red meat and moderate amounts of eggs, dairy products, poultry and fish. In addition, compliance with the legal regulations on greenhouse gas emissions, water and land use and the application of nitrogen, phosphorus and chemical substances is recommended.

2.1.1.4 CFS Voluntary Guidelines on Food Systems and Nutrition

The objective of the *Voluntary Guidelines on Food Systems and Nutrition (VGFSyN)* is to support the development of coordinated, multi-sectoral national policies, laws, programmes and investment plans to enable safe and healthy diets through sustainable food systems. They are mentioned here, as they relate directly to legislative processes and policies. The Committee on World Food Security (CFS) adopted the guidelines in 2021.

One recommendation is the reduction of fats, especially saturated and trans fats, to promote a healthy diet (Committee on World Food Security, 2021: 4). Beyond that, the promotion of a plant-based diet is addressed only indirectly, as part of a healthy, environmentally friendly and sustainable diet that is to be implemented with the help of guidelines from governments and political decision-makers.

2.1.1.5 Convention on Biological Diversity (CBD)

The Convention on Biological Diversity (CBD) is an international agreement that came into effect in 1993 and has since been signed by 196 countries. The aim of the CBD is to conserve and sustainably utilise biological diversity. This involves the protection of animal and plant species and habitats, the conservation of genetic resources and the promotion of the sustainable use of biological resources (United Nations Environment Programme, 1992). In accordance with Article 6 of the CBD, countless National Biodiversity Strategies and Action Plans (NBSAPs) have been developed. Many of these strategies describe and recognise the connection between the food system and biodiversity (see, for example, Boletín Oficial del Estado, 2022; The Federal Council, 2012; National Assembly of the Republic of Slovenia, 2020). The extent to which individual strategies contain specific statements on the promotion of a plant-based diet cannot be determined within the scope of this analysis. All *National Biodiversity Strategies and Action Plans* are listed and filed on the website of the *Convention on Biological Diversity* (Secretariat of the Convention on Biological Diversity, 2023).

2.1.1.6 Global Strategy on Diet, Physical Activity and Health (WHO)

The WHO's *Global Strategy on Diet, Physical Activity and Health* has been available since 2004. It recommends increasing the consumption of fruit, vegetables, pulses, wholegrain products and nuts and reducing saturated fatty acids in particular in dietary recommendations for populations and individuals (World Health Organisation, 2004: 4). In addition, more information on a healthy diet should be disseminated, which includes an increased consumption of fruit and vegetables (ibid.: 12).

2.1.2 Developments in Europe

2.1.2.1 European Green Deal

The European *Green Deal* pursues the goals of zero net greenhouse gas emissions by 2050, decoupling growth from resource use and reducing pollution in order to protect human life and the animal and plant world (CEU. COMMU., 2019). In order to achieve these goals, the Commission is also focusing on measures in the area of agriculture (European Union, n.d.b). Although the climate and environmental impacts of (intensive) livestock farming are well known, the promotion of a plant-based diet is hardly or not at all included in measures such as the "Action Plan for the Promotion of Organic Production", the strengthening of farm animal welfare, nutrition labelling and promotion policy. The inclusion of the objectives in the *Common Agricultural Policy (CAP)* is mentioned as a further measure of the Green Deal. Compatibility under certain conditions was confirmed in an analysis by the European Commission in 2020 (European Commission, 2020a). Individual main CAP objectives such as environmental care, conservation of landscapes and biodiversity as well as climate protection measures are mentioned as similarities between the new CAP (valid since 2021) and the Green Deal.

2.1.2.2 Common Agricultural Policy (CAP)

The individual implementation of the CAP by means of the CAP strategic plans of the individual member states cannot be undertaken as part of this analysis due to their sheer number. The legal framework of the new CAP of 2 December 2021 includes the promotion of a plant-based diet indirectly at best. Although the importance and promotion of legumes/protein crops is addressed (para. 67, EU 2021/2115²), their use, whether as animal feed or not, is not discussed further. In the debate on the promotion of plant protein within the EU, its use as animal feed and independence from soya imports from third countries played a key role for a long time (Denanot, 2018).

A possible promotion of a plant-based diet can also be achieved only indirectly as part of the reduction in livestock numbers through the implementation of the corresponding eco-scheme in the national strategic plans. The link is not direct and the legal framework provides only for voluntary application of the eco-scheme by farmers. In addition, the member states themselves decide on the structure of the eco-schemes in their national strategy plans. Thus, while organic schemes can potentially significantly reduce greenhouse gas emissions (Scheffler & Wiegmann, 2020: 53) and contribute to the goal of "climate action", the leverage of promoting plant-based nutrition is not directly addressed in the CAP legal framework.

2.1.2.3 Farm-to-Fork Strategy

The EU's *Farm-to-Fork Strategy* is another core element of the *Green Deal* and, according to the European Commission, is intended to make the food system fair, healthy and environmentally friendly (European Commission, n.d.c). The aim is to achieve a food system that

- has a neutral or positive impact on the environment,
- contributes to the mitigation of climate change and adapts to its consequences,
- ensures food security and access to healthy, sustainable and safe food, and
- promotes fair returns while ensuring affordable prices, EU competitiveness and fair trade.

The CAP is also mentioned here as a key element "to support a just transition" (European Commission, n.d.c). Specifically, the promotion of a plant-based diet is addressed as part of the promotion of a healthy diet, which includes reducing red meat and increasing the proportion of plant-based foods (European Commission, 2020b: 14). In addition, advertising for meat at low prices is to be reduced or avoided in cooperation with food companies and organisations (European Commission, 2020b: 13). However, this point is no longer explicitly mentioned in the

² EU Regulation 2021/2115 of 2 December 2021.

associated Code of Conduct for Responsible Business and Marketing Practices, which has been in force since 5 July 2021 (European Commission, 2021)³. The obligation to recognise the Code of Conduct is voluntary.

The action plan also envisages adapting the EU tax system to favour the purchase of sustainable and healthy food (European Commission, 2020b: 15). With the entry into force of EU Directive 2022/542 on 6 April 2022, tax exemption and taxation with less than 5% VAT was made possible for foodstuffs, among other products (Art. 1, para. 6, EU 2022/542⁴). The individual states have thus gained more tax policy options for promoting a plant-based diet

As part of the promotion of research, the focus should be on improving the availability of alternative proteins such as plant-based, microbial, marine and insect-based proteins as well as meat substitutes (European Commission, 2020b: 16).

It is not yet clear how many of the goals of the Farm-to-Fork Strategy will be implemented. A legal framework is currently being developed, which is currently available as a proposal (*Legislative Framework for Sustainable Food Systems (FSFS)*)⁵. In the public consultation on this, 88% of respondents (2,351 people) stated that they were in favour of promoting a diet that focuses more on whole grains, vegetables, fruit, pulses and nuts than on meat and foods high in fat, sugar and saturated fatty acids (European Commission, 2022: 7).

2.1.2.4 Food 2030

The *Farm-to-Fork Strategy* and the *European Green Deal* are supported by the EU Food 2030 research and innovation policy. Its objectives are to promote sustainable and healthy diets, the circular economy and resource efficiency, to establish sustainable food systems and to support innovation and community empowerment (European Commission. Directorate General for Research and Innovation, 2020b). Fields of action that are closely linked to a plant-based diet are "Governance and systems change", "Urban food system transformation", "Alternative proteins and dietary shift" and "Healthy, sustainable and personalised nutrition".

2.1.2.5 Horizon Europe

The *Horizon Europe* research and innovation programme also provides funding to promote plant-based nutrition. The programme has a total budget of 95.5 billion euros. 8,952 million euros are available for the area of "Food, Bioeconomy, Natural Resources, Agriculture and Environment" (European Commission. Directorate General for Research and Innovation, 2021: 3). The call for "Fair, healthy and environmentally-friendly food systems from primary production to consumption" includes the topics "Cultured meat and cultured seafood - state of play and future prospects in the EU", "Microbiome for flavour and texture in the organoleptic dietary shift" and "Impact of the development of novel foods based on alternative sources of proteins", all of which are aimed at improving the provision of plant-based foods, alternative protein sources and meat substitutes (European Commission, n.d.a).

2.1.2.6 Biodiversity Strategy

The EU *Biodiversity Strategy* is dedicated to the recovery and protection of biodiversity (European Commission, 2023). It contains commitments and measures that are to be implemented by 2030. It identifies farms as a decisive factor in the production and conservation of biodiversity (European Commission, Directorate-General for Environment, 2020a). Goals such as "Addressing land take and restoring soil ecosystems" and "Bringing nature back to

³ The wording here is: "Application of responsible practices in food marketing and advertising" (European Commission, 2021: 13).

⁴ EU Directive 2022/542 of 5 April 5, 2022.

⁵ The public consultation has been completed. A summary of the results is available: https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/13174-Sustainable-EU-food-system-new-initiative/public-consultation_en.

agricultural land" (European Commission, 2020e) are directly linked to agriculture. The promotion of a plant-based diet is addressed indirectly at best, for example by reducing the over-fertilisation of soils with nitrogenous fertilisers, which in turn is linked to livestock numbers. The establishment of protected areas could also have an indirect effect on the reduction of fish consumption. Thirty percent of marine areas in the EU are to be declared protected areas, at least a third of which are to be strictly protected (ibid.).

In addition, efforts are to be made to reduce the trade and consumption of wild animals. The promotion of a plant-based diet is not a primary goal here.

2.1.2.7 Green Public Procurement (GPP)

The goal of the EU's *Green Public Procurement* (GPP) programme is to make public procurement an instrument for sustainable development. The use of voluntary GPP criteria is intended to promote the use of environmentally friendly products and services by the public sector. The aim is to improve environmental protection and sustainability. The criteria include the use of products and services with lower energy consumption, the use of renewable energies, the reduction of waste and emissions and the promotion of environmentally friendly means of transport.

The EU *green public procurement criteria for food, catering services and vending machines* describe increasing the range of plant-based dishes on offer and promoting the use of environmentally friendly vegetable fats as possible solutions for more sustainable practice. Accordingly, the following criterion, which is effective in promoting a plant-based diet, is proposed: "Menus offered must include choices to increase the consumption of pulses, vegetables, fruits, wholegrains and nuts while having the same recommended nutrient intake for the clients" (European Commission, 2019: 20).

The design of the criterion is left to the discretion of the client. Recommended values to fulfil the core criteria are as follows: one vegetarian or plant-based day per week and the supplementation of meat dishes with beans, grains or vegetables (40%) (ibid.: 49). It is also recommended that half of the meals offered daily should be vegetarian or plant-based. It is again noted that the exact percentage is determined by the awarding authority itself. For authorities with more ambitious ecological and innovative goals, it is suggested that two vegetarian or plant-based dishes per week should be offered. Any meal containing meat should contain 60 % beans, grains or vegetables. It is also recommended that more than half of the dishes on offer and the dish of the day should be vegetarian or plant-based (ibid.: 38). The purchaser can select from the proposed measures and use self-imposed values. In addition, the wording "vegetarian or plant-based" still allows the choice of animal products, which tend to be more harmful to the environment and climate. Together with the voluntary applicability, the potential for promoting a plant-based diet through GPP can currently be assessed as rather low.

Various political institutions operating at regional and local level, NGOs and non-profit companies have joined forces for a *Buy Better Food* advocacy campaign in favour of sustainable public procurement. They are calling on the European Commission to promote a sustainable, healthy and fair food supply in the European Union by, among other means, setting minimum requirements for public procurement and stipulating that nutritional measures should be based on the Planetary Health Diet (in particular more plant-based and less meat). The aim of the campaign work is to persuade political decision-makers to commit to sustainable public food procurement (Buy Better Food., n.d.).

2.1.2.8 Other strategies at the EU level

Other EU strategies directly or indirectly address the promotion of a plant-based diet. These include the [Zero Pollution Action Plan](#), the [Fit for 55](#) package, the [Bioeconomy Strategy](#), the [Strategy on nutrition, overweight and obesity-related health issues](#) and the [EU-Soil Strategy for 2030](#) to restore soils and prevent soil degradation.

The [EU school scheme](#) aims to improve the distribution of milk, fruit and vegetables to schools in Europe. The programme is to be evaluated as part of the Farm-to-Fork Strategy.

2.2 National developments

At the national level, aspects relating to the promotion of a plant-based diet are often embedded in strategies that go beyond plant-based nutrition, as national food systems are for example to be made healthier or more sustainable overall. In Germany, for example, plant-based nutrition can be found in the *Concept for the Promotion of Sustainable Nutrition*, the *National Programme for Sustainable Consumption* and the *National Bioeconomy Strategy*. This also applies to other nation states.

2.2.1 National food and nutrition strategies

One currently widespread form of influence on the transformation of food systems by nation states is the introduction of food and nutrition strategies. These can take different forms. The promotion of a plant-based diet does not necessarily have to be a component of these strategies.

Denmark - Handlingsplan for plantebaserede fødevarer (action plan for a plant-based diet)

In Denmark, the world's first national action plan to promote a plant-based diet was published by the government in October 2023 (Ministeriet for Fødevarer, Landbrug og Fiskeri, 2023a). The aim is to promote the spread of healthy and climate-friendly food in Denmark and to increase the production of plant-based food in Denmark. Two analyses were carried out as part of the development of the action plan; 30 interest groups participated in the development of the action plan (ibid.).

The action plan provides for the strengthening of a plant-based diet across the entire value chain (Ministeriet for Landbrug, Fødevarer og Fiskeri, 2023b). The measures listed in the action plan include, for example, the introduction of a state climate label for food (ibid.:16), the adaptation of public procurement requirements, which are to be increasingly geared towards organic and plant-based food (ibid.: 18), and investment in the development and research of plant-based food in cooperation with other nations (ibid. 24).

The action plan is now to be translated into English due to the great international interest in it (De Lorenzo, 2023). Denmark's initiative is considered unique (Berthold, 2023).

Sweden – En livsmedelsstrategi för Sverige – fler jobb och hållbar tillväxt i hela landet

In 2017, the Swedish government presented the government proposal *En livsmedelsstrategi för Sverige – fler jobb och hållbar tillväxt i hela landet* (A food strategy for Sweden - more jobs and sustainable growth across the country), the aim of which is to develop a sustainable and competitive food system (Prop. 2016/17, 2017: 104). The cultivation of plant-based foods is seen as an important component of sustainable consumption (ibid.: 44). Animal husbandry is said to have a significant impact on the climate. However, there are no plans to reduce livestock numbers. Instead, the environmental impact of animal production is to be reduced by increasing productivity, among other measures (ibid.: 58). Consumers' knowledge of sustainable and environmentally friendly diets is to be promoted, as is nutritional/dietary education in schools (ibid.: 65 f.). The promotion of a plant-based diet is indirectly affected by this, but is not directly addressed. This also applies to the plan to take greater account of ecological aspects in public procurement (ibid.: 66). The government proposal was approved. In 2023, the Swedish government is set to begin work on a new edition of the food strategy (Regeringskansliet, 2023).

Switzerland – Eating well and staying healthy

The current Swiss Nutrition Strategy 2017-2024 *Eating well and staying healthy* has been available since 2017 (Bundesamt für Lebensmittelsicherheit und Veterinärwesen BLV, 2017).

Its objectives are, in particular, to prevent diet-related diseases and to provide nutritional education and skills so that people can choose a responsible and healthy lifestyle. Four fields of action are mentioned: "Information and education", "Framework conditions", "Coordination and cooperation" and "Monitoring and research". The nutrition strategy contains specific recommendations for reducing the consumption of animal fats, dairy products, meat and meat products, as well as recommendations for increasing the consumption of vegetables, fruit, cereal products, potatoes and pulses (ibid.: 9). The action plan belonging to the nutrition strategy provides for more or less concrete measures within the four fields of action mentioned in the nutrition strategy, including the provision of nutrition-related information and voluntary measures by the food industry (Bundesamt für Lebensmittelsicherheit und Veterinärwesen BLV, n.d.).

France - National Food Programme 2019-2023: territoires en action (Regions in action)

The French food programme *territoires en action (Regions in action)* has three priorities (Ministère de l'Agriculture et de la Souveraineté alimentaire, 2019): Establishing social justice in access to food and food information, combating food waste and nutrition education. According to its own information, the programme is based on the recommendations of the World Health Organization and the Food and Agriculture Organization of the United Nations (ibid.: 5). Concrete steps associated with the promotion of a plant-based diet are the dissemination of the EU's school fruit, school vegetable and school milk programme (ibid.: 25) and the promotion of plant proteins in communal catering (ibid.: 28 f.).

Germany - Gutes Essen für Deutschland (Good Food for Germany)

The *Gutes Essen für Deutschland* food and nutrition strategy was presented by the German government in January 2024. It recognises that animal-based foods have a particularly large ecological footprint and that the production of animal-based foods takes up around 80 % of global agricultural land (Bundesregierung 2024: 5f). From this, it is concluded that a more sustainable and plant-centred diet is an important aspect of the transformation to a resource- and climate-friendly and sustainable economy (ibid.: 6). Part of the vision of the food and nutrition strategy is a more plant-centred diet (ibid. 9). To achieve this, the population's diet is to be aligned with planetary boundaries and scientific findings on healthy diets. Six strategic goals are formulated, one of them titled "Mehr Gemüse, Obst und Hülsenfrüchte – pflanzenbetonte Ernährung stärken" (More vegetables, fruits and pulses - strengthen plant-orientated diets, ibid.: 10). The goal further states that people should be supported in consuming animal-based foods in a healthy and sustainable way. The standards of the German Nutrition Society should be made mandatory in communal catering. Plant-based options should be promoted. The BMEL is also supporting a project that aims to improve the acceptance of a plant-based diet and supports daycare centres, schools and universities in its implementation (ibid.: 20). A focus on researching alternative protein sources is to be developed as part of the "Plant-based alternatives to animal foods" cluster. In addition, the innovation of alternative plant-based products is to be promoted (ibid.: 26). The key points for the food and nutrition strategy were drawn up in a participatory process. Representatives from administration, science, business, the health sector, environmental protection and civil society were involved, as were consumers. The participatory process was carried out by the BMEL over a period of nine months in 2022 and 2023.

Nordic Food Policy Lab

The *Nordic Food Policy Lab*, a *Nordic co-operation* project and one of six *Nordic Solutions to Global Challenges* projects, has identified the need to adjust the population's diet to one that is adaptable to climate change as a focus area for policy (Halloran et al., 2017: 1). Foods with a

long tradition such as cabbage, seaweed, wild plants and insects are seen as particularly sustainable. The consumption of meat should be debated and access to meat alternatives made easier.

2.2.2 National health strategies

Sometimes the promotion of a plant-based diet is mentioned as part of strategies to improve population health, as a meat-heavy or unbalanced diet is associated with obesity and disease. Below are two examples that focus on plant-based diets. Other examples can be found in other European countries, including those that aim to do so (for example: IN FORM in Germany).

Nordic co-operation – Nordic Plan of Action on better health and quality of life through diet and physical activity

One example of such a health strategy is the *Nordic Plan of Action on better health and quality of life through diet and physical activity* from 2006 by the *Nordic Council of Ministers* (Nordic Council of Ministers, 2007). Based on the *Nordic Nutrition Recommendations*, the aim is to increase the consumption of fruit and vegetables and their availability in schools and day-care centres, as well as to reduce the consumption of fats, saturated fatty acids and trans fatty acids (ibid.: 33, 39).

France – Programme national nutrition santé (PNNS) (National nutrition health programme)

The aim of the current French Nutrition and Health Programme 2019-2023 is to improve the nutritional quality of the population (Ministère de la Santé et de la Prévention, n.d.). The proportion of saturated fatty acids is to be reduced in favour of increasing the proportion of fruit, vegetables and pulses (ibid.: 23). Vegetable fats should make up at least 50% of the total fats consumed (ibid.: 86).

2.2.3 National sustainability and climate strategies

Denmark - Climate agreement for the agriculture and food sector

In 2021, an agreement was signed in Denmark to transform agriculture towards greater climate and environmental protection (Ertmann, 2021). This includes measures to promote plant-based diet, including a commitment to develop an action plan for a plant-based food, the establishment of a fund for plant-based food to investigate development, cultivation, export promotion and knowledge transfer, financial support for farmers who grow plants for human consumption and not as animal feed, and investment support for machinery, e.g. for processing plant-based proteins (ibid.).

Germany - Implementing sustainability in administrative action

As part of the further development of the *Sustainability Action Programme (Maßnahmenprogramm Nachhaltigkeit)*, the German government decided that public canteens and other public catering facilities in Germany should have an increasing proportion of plant-based foods on their menus and that pulses, nuts and oilseeds can be used as alternative sources of protein (Die Bundesregierung, 2021: 20). In addition, at least one nutritious vegetarian dish should be on offer, in which animal components should be offered separately where possible so that a vegan alternative can be chosen. The range of lunchtime dishes with meat/sausage products should be gradually reduced in line with DGE standards (ibid.).

2.2.4 Other strategies

Finland – Food Research and Innovation Strategy for Finland 2021–2035

The *Finnish Food Research and Innovation Strategy* has been available since 2021. It describes how the Finnish population eats too little fruit and vegetables and too much red and processed meat (Sözer et al., 2021: 8). The same section also discusses the positive climate effects that

a one-third reduction in meat consumption would have. It is assumed that the consumption of dairy products will be reduced by 10 to 15 % by 2035.

Four sub-goals are described in the strategy. These include the goal of making a safe, healthy and sustainable diet accessible to all residents (ibid.: 14 f.). In this context, the health effects of meat substitutes are to be researched. There is also a need for research into education, decision-making structures and communication measures that increase awareness and accessibility to nutritionally superior and environmentally friendly foods and diets.

A further goal is to make the Finnish food system sustainable, competitive and resilient (ibid.: 15 f.). In this context, research is to be conducted into what makes plants and algae more resilient as food and feedstuffs.

Sweden – Strategy for Sweden’s global development cooperation on sustainable economic development 2022–2026

Sweden's strategy for international cooperation also includes the promotion of sustainable food systems (Ministry for Foreign Affairs, 2022: 5): Sustainable agriculture should be promoted; measures should take into account the strengthening of the sustainable use of resources and the protection of biodiversity. However, the promotion of a plant-based diet is not directly mentioned.

Germany - Protein crop strategy

The German protein crop strategy was devised to expand the cultivation and increased utilisation of pulses and to improve the competitiveness of legumes produced in Germany (BLE, n.d.). In addition to supply, demand is also to be strengthened (BMEL & BLE, 2020: 4)⁶.

2.3 Regional developments

The regional political level also plays an important role in promoting a plant-based diet. Regional governments can develop their own food policies and strategies that target the specific needs and challenges of the regional population. These strategies may include guidelines and recommendations to promote a plant-based diet, such as encouraging the consumption of fruit, vegetables, whole grains and plant-based protein sources. Responsibility for school meals often lies at regional level. Policy makers can introduce guidelines to promote a plant-based diet in schools or childcare centres. Public institutions and canteens can also be influenced by policies and laws at the regional level. This also applies to financial support for farmers.

2.3.1 Regional food and nutrition strategies

In addition to national strategies, food and nutrition strategies can also be localised at regional level.

England – Government food strategy

Since June 2022, the United Kingdom government has published the *Government Food Strategy*. It has been available as a policy paper valid for England⁷, which is sometimes discussed with a view to the entire United Kingdom (Government Food Strategy, 2022). It was preceded by a comprehensive analysis of the food system across the entire food chain and the resulting recommendations for the production of healthy, safe and affordable food. These were published in 2020 and 2021 as *The National Food Strategy. Part one* (Dimbleby, 2020) and the *National Food Strategy. Independent Review. THE PLAN* (Dimbleby, 2021). It contains numerous statements on the climate and environmental impact of animal husbandry and meat production

⁶ Consumers should also be informed about the importance of a plant-based protein-rich diet as part of the European Soya Declaration (BMEL, 2020: 15).

⁷ England is a part of the United Kingdom and covers around two thirds of the area of Great Britain. Scotland, Wales and Northern Ireland are not part of England.

as well as specific recommendations for reducing meat-based diets, increasing the consumption of fruit and vegetables, promoting plant-based protein sources and improving nutritional/dietary education (ibid.). The *Government Food Strategy* (Crown, 2022), which was subsequently published, was criticised from various sides for not taking up the ambitious goals of the report (Horton et al., 2022) and not taking the necessary steps to combat climate change (Gayle, 2022) or the spread of obesity (Walker, 2022). Although it emphasises that the climate and environmental impact of the food system should be reduced in order to be in line with the net zero commitments and biodiversity targets (Crown, 2022: 14), hardly any measures are mentioned in the further course. With regard to the food strategy, the *Net Zero Strategy* mentions that measures to reduce emissions from food production will be explored, innovations in the food sector will be supported and incentives for changing land use to sequester more carbon will be created (Crown, 2021: 177).

The *Food Strategy* also recognises a link between overweight/obesity and a poor diet with insufficient fruit and vegetables, a problem that the strategy aims to address (ibid.: 21 f.). The success of the "Eat Them To Defeat Them" campaign is also recognised (ibid.: 6) (3.2.1.2 Information campaigns). These findings remain virtually inconsequential; there is no mention of a reduction in animal populations or a reduction in the consumption of animal products. Instead, the foreword mentions technical innovations to reduce methane emissions, among other measures, as solutions to ecological challenges (ibid.). Research into the use of feed additives and materials in order to reduce the greenhouse gas emissions associated with animal husbandry is also mentioned in the strategy (ibid.: 10).

Germany - Food and Nutrition strategies in the federal states

With regard to Germany, four food and nutrition strategies (in Baden-Württemberg, Berlin, Hesse and Lower Saxony) were presented at federal state level in a report by Ecologic Institute (Wunder & Jägle, 2022: 26 ff.).

The promotion of a plant-based diet is particularly well planned in Lower Saxony. The trend towards vegan and vegetarian diets in Germany is recognised (Niedersächsisches Ministerium für Ernährung, 2021: 13), as is the fact that too few plant-based foods (especially vegetables and pulses) and too many animal-based foods (especially meat and sausage products) (ibid.: 16) are consumed in Lower Saxony, taking into account the recommendations of the German Nutrition Society (DGE). Therefore, the promotion of a plant-orientated diet in accordance with the DGE is one of the implementation goals of the Lower Saxony Food Strategy (ibid.: 24). To achieve this, among other strategies, the cultivation of plant-based protein sources in Lower Saxony is to be increased (ibid.: 69).

The aim of Berlin's food strategy is to promote regionality, sustainability, fairness and healthy eating (Senatsverwaltung für Justiz und Verbraucherschutz, 2023). Although a plant-based diet is indirectly addressed in fields of action 1: Community catering as a role model, 3: Promoting a sustainable food system, and 7: Public administration as a role model, the promotion of a plant-based diet is not explicitly mentioned.

2.3.2 Food Policy Councils

Food policy councils are now widespread internationally. As society organisations for shaping sustainable local nutrition, they have been spreading since the late 1970s, initially in the USA (Clancy et al., 2008: 122 f.). There are now also numerous food councils in Europe. They can be active at local and regional level. Their activities include, for example, policy advice, educational work, mediation between the numerous stakeholders in local food systems, monitoring and evaluating the performance of local food systems and promoting research on food issues (ibid.: 126). Among other measures, the Berlin Food Council is in favour of reducing the consumption of meat and animal-based foods as well as reducing the amount of animal husbandry in the interests of a sustainable food system (Ernährungsrat Berlin, 2021: 55).

Food councils can support regions and municipalities, for example, in the development of food strategies as part of a participatory process. They can bring in a multi-stakeholder perspective.

2.4 Strategies at the municipal level

Cities and municipalities are important players in the promotion of a plant-based diet. They are not only responsible for public institutions such as schools and daycare centres that provide food for children and young people, but also contribute to the transformation themselves in the role of consumers. They can take on a pioneering role and serve as role models.

"They can exploit their institutional power to drive innovation in food systems thanks to their direct competences, with municipal bodies and urban actors being involved in all stages of the food system" (European Commission. Directorate General for Research and Innovation., 2019: 19)

2.4.1 Urban food strategies

The term "urban food strategy" can be used to summarise a variety of different approaches that describe how municipalities imagine the future of their food systems and what steps they (want to) take to implement these visions (Moragues et al., 2013: 6). They sometimes pursue the goals of promoting "health and well-being" and "environmental protection" as well as other goals (ibid.: 7) that are directly or indirectly linked to the promotion of a plant-based diet.

Malmö

The City of Malmö is working to minimise the negative environmental impact of food and reduce greenhouse gas emissions. To achieve these goals, among other strategies, the municipality is focussing on reducing meat consumption and replacing meat with pulses (City of Malmö, n.d.: 17).

Vienna

The Vienna Food Action Plan *Wien isst G.U.T.* ("Vienna eats WELL") addresses the promotion of a plant-based diet and the reduction of animal products, for example, as part of the strengthening of nutritional competence and the sustainable procurement programme *ÖkoKauf Wien* (Stadt Wien – Umweltschutz, 2022: 4 f.). Clear formulations can also be found in connection with the goal of promoting animal welfare: "Die beste Maßnahme für das Tierwohl ist eine vegane, vegetarische, bzw. eine deutlich fleischreduzierte Ernährung" (The best measure for animal welfare is a vegan, vegetarian or significantly reduced meat diet) (ibid.: 7).

Copenhagen

The city of Copenhagen has been working on improving its community catering for decades. Having already achieved a 90% share of organic food in the city's catering, the city's current food strategy focuses on a sustainable diet that combines taste, health and climate-friendliness (City of Copenhagen, n.d.). To achieve climate-friendliness, meat is to be increasingly replaced by plant-based protein sources. Consumers should be motivated to opt for vegetarian or vegan dishes.

London

Although there is a food strategy for England at regional level, there are other food strategies at municipal level. These include the City of London's food strategy, whose implementation plan covers the years 2018 to 2023 (Greater London Authority, 2018a; Greater London Authority, 2018b). The promotion of plant-based food is addressed in several of the strategy's objectives. Goal 1 *Good Food at Home, and Reducing Food Insecurity* provides for the promotion of healthy eating and the strengthening of nutritional/dietary education. Goal 2 *Good Food Economy, Shopping and Eating Out* includes declaring London a *Veg City* and supporting the *Peas Please* campaign of the organisation *Food Foundation* (Greater London Authority, 2018a: 27). The focus is on spreading and strengthening the production, availability and consumption of plant-based foods (Greater London Authority, 2018b: 7). Goal 5: *Good Food Growing, Community*

Gardening and Urban Farming includes motivating children to consume more fruit and vegetables, as well as increasing medical prescriptions for fruit and vegetables (Greater London Authority, 2018a: 44 ff.).

Brighton and Hove

The city district of Brighton and Hove has had a *Food Strategy Action Plan* since 2006, which was last updated in 2018 (Brighton and Hove. Food Strategy Action Plan 2018-2023, n.d.). Objectives that indirectly address the strengthening of a plant-based diet are, in particular, the promotion of healthy and sustainable food, the promotion of a sustainable food economy and the anchoring of healthy, sustainable and fair food in policy and planning (ibid.: 15 ff.). Brighton and Hove are also committed to the goals of *Peas Please* and *Veg City* and support the population in consuming more vegetables. Numerous measures have been taken in this regard (ibid.: 12).

Oxfordshire

Oxfordshire's food strategy was developed in collaboration with numerous stakeholders such as district and county councils, community groups, local producers and other stakeholders. The aim is to create a vibrant and sustainable food system for the city that addresses health, wellbeing, climate change, biodiversity loss as well as fair wages and working conditions (Good Food Oxfordshire, 2022: 3). Increasing the consumption of vegetables and reducing meat consumption is seen as an important part of reducing emissions, promoting sustainable agricultural practices and improving animal welfare (ibid.: 13).

Brussels

In 2015, the Minister for the Environment, Quality of Life and Agriculture of the Brussels Capital Region presented the *Good Food Strategy*, which aims to promote the availability of healthy, high-quality and locally produced food with short supply chains (Ronmans, n.d.: 3). In the context of supporting families in changing their eating habits, excessive consumption of meat and insufficient consumption of fruit and vegetables are described as detrimental to health (ibid.: 26). Vegetables also play a role in the nutrition education of children, e.g. in the establishment of school gardens (ibid.: 27).

Zurich

The City of Zurich lists its food strategy as part of the *Environmental Strategy*. Sustainable nutrition includes aspects of the environment, health, economic efficiency and social justice (Stadt Zürich, 2019: 4). The city sees the strengthening of a balanced diet as a priority. In this context, an increased consumption of fruit, vegetables, nuts and vegetable fats as well as the moderate consumption of meat, a reduced consumption of animal fats and the replacement of meat with plant-based products are clearly stated (ibid.: 12).

Groningen

The Groningen food strategy *Gezond en duurzaam voedsel voor iedereen* aims to promote a plant-based diet through information campaigns in order to improve the health of city residents and the sustainability of their diet (Gemeente Groningen, 2021: 26). By adjusting the catering contracts in the company restaurants of the municipality of Groningen, the current offer of 60% animal and 40% plant-based products is to be reversed to 60% plant-based and 40% animal-based products (ibid.: 27). The measures also include promoting information dissemination in the city districts and in school lessons in order to support residents and pupils in developing a more sustainable and healthier diet with less animal and more plant-based proteins (ibid.: 28).

Wageningen

One of the goals of the Wageningen food strategy *Wageningen Eet Duurzaam, Gezond En Samen* also states that residents should eat more plant-based foods (Sibbing et al., 2021: 20 f.). Three packages of measures are planned to achieve this goal: Raising awareness and dialog about

the importance of a plant-based diet, increasing the visibility of plant-based food initiatives and regional cooperation to promote the protein transition. The individual measures have short- (less than three years) and medium-term (three to five years) deadlines.

Milan

In 2014, the city of Milan signed an agreement on food policy, the *Food Policy di Milano*. In close cooperation with one of the main players in the community catering sector and with the support of the Cool Food Pledge⁸, school catering was made more sustainable. The *Food Policy di Milano* aims to reduce red meat and increase the use of plant-based ingredients and choose meat varieties with a lower environmental footprint. This has enabled the city to reduce emissions from school meals by 20% in five years (Food Policy di Milano, n.d.).

Other food and nutrition strategies, some of which deal with the promotion of a plant-based diet, or recommendations for food and nutrition strategies from civil society are available for other cities such as [Lyon](#), [Ghent](#), [Cologne](#) and [Turin](#).

2.4.2 Diet(s) as an aspect of other community-level strategies

Other strategies at community level can include aspects of promoting a plant-based diet.

Amsterdam: Circular Strategy 2020–2025

Amsterdam is also addressing the topic of food as part of the *Circular Strategy 2020-2025*, which is concerned with promoting a sustainable circular economy (City of Amsterdam, 2020: 34 ff.). The objectives stated in the strategy are short food chains, healthy and sustainable food consumption and the high-quality processing of organic waste. In this context, the city wants to initiate a switch from the consumption of animal proteins to plant-based proteins. The consumption of regional and plant-based foods is to be increased. The consumption of animal products should also be reduced in order to minimise greenhouse gases, soil degradation and biodiversity loss. By providing information, advice and educational work, the city hopes to influence the eating habits of the population (ibid.: 41).

Bristol: One City Plan

Bristol City Council has *One City Plan 2021*, the main objective of which is to transform Bristol into a fair, healthy and sustainable city by 2050. A high popularity of vegan and vegetarian meals is one of numerous environmental goals (Bristol City Council, n.d.: 36 ff.⁹): "Local, regional, sustainable and fair-trade food is available citywide and affordable vegetarian, vegan and locally sourced meals are a popular choice" (ibid.). Further explanations on this point are not included.

Netherlands: City Deal Voedsel op de Stedelijke Agenda

In the Netherlands, a number of cities¹⁰ have signed the *City Deal Voedsel op de Stedelijke Agenda (Putting Food on the Urban Agenda)* as part of the Dutch Urban Development Strategy. The objectives are to promote innovation in administration, strengthen ecologically and economically sustainable cities and regional food systems and fair, short supply chains around cities, and improve nutrition education, health and social inclusion (Ministerie van Economische Zaken, 2017). To achieve these goals, the restriction of meat consumption in connection with the regional cultivation and marketing of protein crops is also mentioned. Indirectly, the

⁸ The World Resources Institute's initiative supports organisations in tracking and reducing the climate impact of meals. The initiative also includes other cities, restaurants, hospitals, company canteens and universities (Coolfood, n.d.)

⁹ Page number not indicated, between pages 36 and 38.

¹⁰ The Hague, Ede, Groningen, Leeuwarden, Den Bosch, Venlo, Helmond, Utrecht, Oss, Rotterdam, Amsterdam, Almere (Ministry of Economic Affairs, 2017).

promotion of a plant-based diet is addressed with the aim of improving nutritional literacy and strengthening public health.

Netherlands: City Deal Gezonde en Duurzame Voedselomgeving

The City Deal *Gezonde en Duurzame Voedselomgeving* (*Healthy and Sustainable Food Environment*), which goes back to the City Deal Putting Food on the Urban Agenda described above, also indirectly addresses the provision and distribution of plant-based foods (Ministerie van Binnenlandse Zaken en Koninkrijksrelaties, n.d.). To combat diet-related diseases such as obesity, the city of Amsterdam wants to increase the proportion of plant-based foods in the diet of its residents from the current 39% to 60% by 2040 as part of this City Deal (Hielkema & Obdeijn, 2021). The City Deal is currently still being drafted.

2.4.3 Policy instruments for cities and municipalities

In addition to the strategies described above, there are many approaches and initiatives that provide political decision-makers with a framework for legislation for greater sustainability, environmental or climate protection. These include agreements that can be signed by cities and municipalities on a voluntary basis.

Milan Urban Food Policy Pact

The *Milan Urban Food Policy Pact* was launched by the city of Milan in 2015. The aim is to develop sustainable, resilient, safe, inclusive and diverse food systems in municipalities to provide people with healthy and affordable food (MUFPP Secretariat, 2023). The exchange between cities and the orientation and dissemination of best practice examples should be promoted. By 2023, 260 cities with a total of 450 million inhabitants had already signed the pact. It comprises 37 recommendations for action, which are assigned to six categories.

A direct reference to a plant-based diet can be found in action 8: "Address non-communicable diseases associated with unbalanced diets and obesity where appropriate, with a particular focus on reducing the intake of sugar, salt, trans-fatty acids, meat and dairy products and increasing the consumption of fruit, vegetables and non-processed foods" (Mailänder Abkommen über städtische Ernährungspolitik, 2015: 4). As the promotion of sustainable diets is included in numerous other measures, the increase in a plant-based diet also plays a role in other parts of the pact. Some cities, such as Zurich, refer to the *Milan Urban Food Policy Pact* as part of their food strategies and their theoretical foundations.

C40 Good Food Declaration

The *C40 Good Food Declaration* is an agreement launched by the *C40 Cities Climate Leadership Group*. *C40 Cities* is a network of major cities around the world working together to combat climate change and promote sustainable development. The *C40 Good Food Declaration* focuses specifically on the area of food systems and advocates for more sustainable, healthier and fairer food production and consumption in cities. By 2030, the signatory cities agree to align food procurement with the *Planetary Health Diet* (Willett et al., 2019; EAT, n.d.) and to support an increase in the consumption of healthy and plant-based foods in cities (C40 Cities Climate Leadership Group, n.d.a). The cities that have signed the declaration so far include Barcelona, Copenhagen, London, Milan, Oslo, Paris and Stockholm (ibid.).

With the *C40 Knowledge Hub*, the network offers resources to support cities in the practical implementation of and compliance with their targets (C40 Cities Climate Leadership Group, n.d.b).

The Barcelona Challenge for Good Food and Climate

The *Barcelona Challenge for Good Food and Climate* is an initiative that also focuses on promoting sustainable food systems. It was launched by the city of Barcelona and is part of the global effort to reduce the impact of food on the climate and promote more resilient, climate-friendly and healthier diets. It is based on the *C40 Good Food Declaration* and the *Milan Urban*

Food Policy Pact (The Barcelona Challenge for Good Food and Climate, n.d.a). In addition to Barcelona itself, the signatory cities include other cities in Spain, France and Italy as well as outside Europe (The Barcelona Challenge for Good Food and Climate, n.d. b). The initiative's website presents innovative food policies that can serve as a model and support for political decision-makers (The Barcelona Challenge for Good Food and Climate, 2022).

Essbare Städte ("Edible Cities")

The Edible Cities Network is funded by the EU as part of *Horizon 2020* and connects cities worldwide to make them more liveable with sustainable urban food production, distribution and use, neighbourhood gardens, etc. The project implements innovations in the field of urban planning and urban nutrition (Edible City Network, 2019). A plant-based diet is also important in this context, as measures such as the cultivation of fruit and vegetables in publicly accessible areas and for free use by residents are used. This is partly intended to improve access to sustainable food.

United Nations - New urban agenda

"Habitat 3" refers to the third United Nations Conference on Housing and Sustainable Urban Development, which took place in 2016. The official name of the conference is the "United Nations Conference on Housing and Sustainable Urban Development". The meeting took place in Quito and brought together government representatives, experts and stakeholders from around the world to discuss urban development issues, housing problems and sustainable urban planning. In the resulting *New Urban Agenda*, an ecologically sustainable and healthy way of life in harmony with nature is named as one of the principles (United Nations, n.d.b: 11). Sustainable consumption and production patterns as well as urban resilience are to be promoted (ibid.). Urban food security and the urban population's diet should be improved (ibid.: 24). However, a plant-based diet is not mentioned directly.

2.5 Summary of policy strategies

The plant-based diet is finding its way into countless political strategies at municipal, regional, national and international level. The focus does not necessarily have to be on nutrition, but can also be on promoting health, improving sustainability, protecting the soil or other aspects. At the EU level, it is remarkable that the targeted promotion of a plant-based diet is almost never directly addressed, despite repeated commitments to climate, species and environmental protection. This reluctance is surprising given the fact that the environmental and nature conservation benefits of a plant-based diet are well known and recognized. It is unclear to what extent the farm-to-fork strategy will result in measures to directly promote a plant-based diet. Even at the regional and national levels, the direct and comprehensive promotion of a plant-based diet is only sporadically reflected in the strategies. The process of creating the food strategy of England can serve as an example to other countries: The employed complex process of analysing the food system of the entire United Kingdom and the development of recommendations by a large team of experts played a big part in the approach. What is remarkable in the case of England, however, is that the recommended measures to reduce the consumption of animal-based foods and to promote a plant-based diet have hardly found their way into the government's food strategy. This unsuccessful attempt to root the promotion of a plant-based diet in the food strategy leads to the assumption that a different approach is necessary. Recommendations for the process design of a food strategy at national level are available from the Ecologic Institute (Wunder & Jägle, 2022: 55 ff.). It can be observed that municipal strategies for the regional supply of sustainable, environmentally friendly and healthy food often take a holistic approach. Sometimes they have comparatively ambitious goals with regard to the promotion of a plant-based diet. In particular, the fact that sustainable food systems require local and regional structures means that political decision-makers at municipal and regional levels have a special role to play. In this context, the extensive resources,

instruments and frameworks such as the *Milan Urban Food Policy Pact* can be helpful in supporting decision-makers in developing strategies and implementing measures.

3 Food policy instruments to promote plant-based nutrition with examples from Europe

Following the presentation and analysis of current developments and political strategies at the international, national and sub-national levels in the previous chapter, this chapter takes a closer look at the specific political instruments for promoting a plant-based diet. The instruments are presented by dividing them into the different categories of *Data collection and monitoring*, *Decision support*, *Decision steering* and *Decision restriction*.

The promotion of a plant-based diet can be achieved through a well-coordinated mix of instruments. In the following, an extensive set of food policy instruments is presented from which policy makers can choose the instruments that are suitable for their context.

There are various approaches to categorising policy instruments. For this report the "ladder of food policy interventions" was chosen (Spiller et al., 2017c, 270 ff.; Jebb et al., 2013: 45; Nuffield Council on Bioethics, 2007: 41 f.). It establishes a tiered order of increasing influence on the personal consumption choices of citizens (Jebb, Aveyard, and Hawkes, 2013).

The ladder of food policy interventions, originally called the "intervention ladder" (Nuffield Council on Bioethics 2007: 41 f.), was initially developed for the classification of policy instruments for the public health sector. Since then, it has also been applied several times to the food sector (Spiller et al., 2017a: 148; WBAE 2020: 385 f.). In this report, the interventions on the top of the ladder have no to little influence on the personal consumption choice, hence their intervention strength is low. The strength of intervention increases from data collection and monitoring to decision support, decision steering and decision restriction. That means, with each lower rung of the ladder (or with each darker colour gradation in the recommendation listed on page 6 the choice of consumption is increasingly limited or forces a change in behaviour of the citizen (Spiller et al., 2017a: 148). Policy decision-makers are increasingly intervening in the freedom of the population as they go down on the ladder of interventions. Consequently, the justification for such interventions must be stronger, and there is generally less expectation of acceptance (Diepeveen et al., 2013: 2 f.). A policy initiative that interferes more strongly with the citizens' privacy will probably be accepted by the public only if it is clear that it will achieve the desired effect. Additionally, it must be demonstrated that the benefits can be weighed against the resulting loss of freedom (Nuffield Council on Bioethics 2007: 41 f.). This categorization provides a relative ranking. It should not be used to make absolute judgments.

It is generally advisable to prepare instruments with a stronger influence, such as tax increases (further down the intervention ladder), with upstream measures or instruments such as information campaigns (rungs further up the intervention ladder). This can create a basis of information and an understanding of major interventions in consumers' choices so that these interventions can be more widely accepted. The category of *Data collection and monitoring* was also added. Spiller et al. (2017c: 270) assigned it to the category of *Decision support*. In the context of this report, it was included as a separate category, as it is not an instrument that has a direct impact on consumers' decisions. Rather, it is seen as a preparatory step for the selection and monitoring of instruments and measures.

First, a theoretical insight is provided for each category. The assigned instruments for promoting a plant-based diet are then presented in detail. For each instrument, examples of implementation from Europe¹¹ are listed. Information such as the type of instrument, actor,

¹¹ There are exceptions. Occasionally, examples from outside Europe are presented if they are considered beneficial for this collection of instruments and application examples. No claim is made to list all application examples from outside Europe.

location, time and, where possible, empirical values in the form of evaluations or studies are presented.

3.1 Data collection and monitoring

Data collection and monitoring represents an instrument with low intervention strength (Spiller et al., 2017c: 270). This does not intervene in any way in the consumer decision choices. Nevertheless, important developments and differentiations can be observed and evaluated through data collection and the monitoring of relevant key figures.

As part of the analyses of the Food Environment Policy Index (Food-EPI), Philipsborn et al. (2021: 4.18) and Pineda et al. (2022: 17) recommend that the federal and state governments use monitoring to collect the following data and evaluate them using scientifically sound methods: a) the nutritional status, including body weight, shopping and preparation behaviour, food culture and nutritional competence, b) data on nutritional knowledge, c) nutritional behaviour and d) nutritional environments, which means monitoring of the nutritional composition of processed foods, the extent of food advertising, food prices and the food supply in selected settings - including kindergartens, schools, universities, company canteens, hospitals, rehabilitation clinics, retirement homes, meals on wheels, food banks.

Data on social inequality and food poverty should also be collected and evaluated in a targeted manner (Philipsborn et al. 2021: 18; WBAE 2020: xv). Furthermore, the connection to health aspects should be addressed by collecting data on diets and diet-related diseases (Philipsborn et al., 2021: 18; Spiller et al., 2017c, 270). In order to be able to conduct these regular, comprehensive, representative surveys, sufficient budgeted financial resources are required (Philipsborn et al. 2021: 18). Further data surveys on differentiated consumer demand by different consumer groups, behavioural changes, sustainability aspects, food waste and the proportion of plant-based and regionally produced food products in the diet can also be useful.

Box 1

National FinDiet2017 and National FINRISK Study, National Monitoring, Finland

In Finland, surveys on dietary habits and nutrient intakes have been conducted by the National Institute for Health and Welfare (THL), which reports to the Ministry of Social Affairs and Health, since 1982 - most recently in 2017. There was no specific focus on a plant-based diet, but it was found that the intake of vegetables, fruits, red and processed meat was closer to the dietary guidelines for women than for men (Valsta et al., 2018: 9). In addition, surveys on risk factors for chronic diseases have been conducted every five years since 1972. As part of the FinRisk2012 survey in 2012, questions on special diets (including lactose-free diets or vegetarian diets) were asked in addition to questions on health status (Finnish Institute for Health and Welfare, n.d.).

A National Nutrition Council has been monitoring the diet of the Finnish population since 1954. It is a committee of experts appointed by the Ministry of Agriculture and Forestry. Its members are nominated by state authorities, universities, research centres and independent stakeholders (Finnish Food Authority, 2021).

Norkost 4, National Monitoring, Norway

For the fourth time in 2021/2022, approximately 6300 adults from Norway were asked about their dietary behaviour as part of a national nutrition survey. It was conducted by the Norwegian Institute of Public Health, a government agency under the Ministry of Health and Care Services, and the University of Oslo with the aim of finding out more about eating habits

and the links between diet and health. Previous surveys were conducted in 2010/11, 1997 and 1993/94 (University of Oslo, 2023).

A special survey on a plant-based diet was not conducted by the government, but by the Oslo Metropolitan University in 2022. In this study, 800 people who follow a vegan, vegetarian or pescatarian¹² diet were asked about their eating habits (Groufh-Jacobsen et al., 2022).

Coordination group, Norway

In Norway, an agreement was reached in 2016 between the Norwegian Health Authority and the food industry to promote a healthier diet. This includes targets for increasing the consumption of fruit, vegetables, wholemeal products and fish. The aim of the partnership is to ensure that more people eat a balanced diet in line with the dietary guidelines. As part of the partnership, a coordination group has been created, which includes representatives from industry associations as well as representatives from the Norwegian Directorate of Health (Norwegian Directorate of Health, 2022).

National nutrition monitoring, Germany

In Germany, the Max Rubner Institute, a research and advisory organisation under the Federal Ministry of Food and Agriculture, conducted food consumption surveys as part of a national nutrition monitoring programme from 2005 to 2007 (designated NVS II) and 2008 to 2014 (designated NEMONIT). The surveys collected representative data on food consumption, nutrient intake and dietary behaviour. The National Food Consumption Survey III, which was to be carried out by 2025, was postponed due to the COVID-19 pandemic. The results of the surveys were evaluated on the basis of recommendations such as those of the German Nutrition Society (DGE). Other aspects, such as vegetarian or vegan diets of the participants, were also analysed (Max Rubner-Institut, n.d.).

From 2023, the COPLANT study, the largest cohort study to date on plant-based nutrition in German-speaking countries, is being conducted. The Max Rubner Institute and the Federal Institute for Risk Assessment as well as other university institutions want to gain new insights into the advantages and disadvantages as well as the ecological, social and economic effects of a plant-based diet and enable evidence-based dietary recommendations (Bundesinstitut für Risikobewertung, n.d.).

National Diet and Nutrition Survey, United Kingdom

In the UK, the National Nutrition Survey records and assesses the nutritional status of the UK population to provide detailed information on food consumption, nutrient intake and consequent nutritional problems such as nutrient deficiencies. The ongoing survey was funded by Public Health England (PHE)¹³, a government agency under the Department of Health, and the Food Standards Agency, a non-ministerial government department.

The data from the National Diet and Nutritional Status Survey allowed a study to be conducted for the first time in 2021 to analyse the plant-based diet and the consumption of plant-based alternatives. The study found that consumption of these products doubled from 6.7% to 13.1% between 2008-2011 and 2017-2019 (Public Health England, 2021).

Further surveys on dietary behaviour were conducted primarily in northern, southern, western and central European countries. Some south-eastern and eastern European countries do not have any national surveys.¹⁴

¹² A pescatarian diet includes fish and seafood as well as milk and eggs.

¹³ In 2021, PHE became part of the UK Health Security Agency.

¹⁴ Countries with representative surveys on energy and nutrient intake after 2000 are: Andorra, Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary,

Government monitoring can also be used to support measures in the longer term and observe their effects. For example, it is possible to monitor more precisely whether the reduction in animal products leads to undesirable substitution effects in order to take countermeasures at an early stage (Grethe et al., 2020: 25; WBAE, 2020: xiii). The aforementioned monitoring of data on people with low incomes can also be used to evaluate how the measures specifically affect these population groups (WBAE 2020: xv), thus ensuring the social cushioning of such measures. If it is determined that there is no impact, the measures should be abolished or fundamentally revised (Wunder & Jägle, 2022: 32).

Regular reporting on these developments and the publication of monitoring data from public research institutions ensure transparency (WBAE 2020: xxi). Broad, solid data collection can also be used as part of a national prevention policy to develop specific, measurable targets for preventive measures for healthy food consumption and fewer diet-related diseases (Pineda et al. 2022: 17). An Oxford study from 2016 concluded regarding the connection with health factors that a diet with less meat and more plant-based foods could reduce global mortality by 6-10% (Springmann et al. 2016: 4147). The economic gain would also be 1-31 trillion US dollars (ibid.: 4148). The profit increases with a higher number of the population following a plant-based diet (ibid.).

Box 2

Calculation of the economic benefits of a healthy diet, Denmark

The Danish government has carried out a calculation to determine the economic benefits of the population following the Danish dietary guidelines.

It was calculated that the economic benefit would amount to over 20 billion euros per year. This was attributed in particular to the reduced consumption of meat, saturated fatty acids and salt (Jensen, 2020: 36). The result was disseminated in the media and used by political actors to promote a plant-based diet (Dänischer Vegetarierverband, n.d.a: 2).

Pineda et al. (2022:18) propose the development of a tool for reporting on the availability of food in supermarkets, shops, fast-food restaurants and catering outlets. This is intended to show the proportion of healthy food in the total range of foods. The monitoring and reporting should be carried out in binding agreement with the other parties involved (local authorities, schools, hospitals, food manufacturers, etc.). Examples of this in practice are not yet known. It would also be conceivable to record the proportion of plant-based foods and regionally produced foods.

Particularly with regard to the creation of a national food strategy, the Food Foundation recommends a broad, comprehensive data analysis of the food system, its economic profit streams and differentiation and classification of the population according to similar diets based on the experience with the food strategy in England (The Food Foundation 2022: 6). In England, this process of data collection and analysis took more than one year (ibid.).

Ireland, Israel, Italy, Kazakhstan, Latvia, Lithuania, Netherlands, Norway, Poland, Portugal, Romania, Russia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Macedonia, Turkey and UK. It is not known whether the surveys also analyse plant-based diets. Countries that do not have national surveys include: Azerbaijan, Belarus, Croatia, Georgia, Kyrgyzstan, Luxembourg, Malta, Monaco, Montenegro, Moldova, San Marino, Serbia, Tajikistan, Turkmenistan, Ukraine, Uzbekistan (Rippin et al., 2018).

3.2 Decision support

Instruments in this category have a "supportive" effect on the consumer's choice. Their goal is to offer information, knowledge, tools, and protection against misinformation, enabling consumers to make informed product decisions without exerting influence on those choices. The instruments of decision support are divided into nutrition information, dietary education, market transparency as well as advertising restrictions and bans. As advertising restrictions and bans also restrict only information, but do not directly restrict consumers' purchasing decisions, they are also categorised as decision-support instruments.

3.2.1 Nutrition information

Nutrition information in the form of the provision of information can contribute to changing, increasing and consolidating nutrition knowledge, on the basis of which decisions can be made. The intervention in the consumption decisions themselves is therefore only minor. General information services, information campaigns and dietary guidelines to promote a plant-based diet are presented.

3.2.1.1 Provision of information

There is a wide range of nutrition information available. Countries often have a publicly funded centre or association that centrally provides general nutrition information through various media.

Box 3

Netherlands Nutrition Centre, provision of information, Netherlands

The website of the Voedingscentrum (Nutrition Centre), an organisation funded by the Dutch Ministry of Economic Affairs and the Ministry of Public Health, Welfare and Sport, provides information on all aspects of nutrition. The organisation was founded in 1998. Its aim is to encourage consumers to develop healthy and more sustainable eating habits. Following the keyword "sustainable nutrition" readers will find detailed tips on how to reduce their own meat consumption. The website also offers suitable vegetarian and vegan recipes. The vegan diet is also explained and a 26-page document with background information on the plant-based diet is available for free download. The online platform has 17 million visitors per year (Voedingscentrum, n.d.a).

"Eating and learning together – recommendations for school meals", provision of information, Finland

In 2017, the Finnish National Food Council, the Finnish National Agency for Education¹⁵ and the National Institute for Health and Welfare published a brochure containing numerous recommendations for eating together in schools. The brochure is aimed at schools and those responsible for school catering, as well as parents and pupils. It also includes specific examples of the composition of vegetarian and vegan dishes (National Nutrition Council, 2017).

In Denmark, a knowledge centre with a special focus on a plant-based diet was founded in 2020, which grew out of a civil society association that receives public funding.

¹⁵ The committees report to the Ministry of Education and Culture and the Ministry of Health.

Plant-Based Knowledge Centre, Denmark

The Plant-Based Knowledge Centre was founded in 2020 by the Vegetarian Society of Denmark and Organic Denmark (Økologisk Landsforening). Its aim is to impart knowledge, present research projects and studies and strengthen cooperation with other stakeholders involved in plant-based and organically produced food in order to promote the transition to a sustainable food system (Plantebaseret Videnscenter, n.d.).

Following the establishment of the knowledge centre, a funding pot of 5.1 million euros was created in 2021, from which other stakeholders in addition to the knowledge centre can also benefit (Dänischer Vegetarierverband, n.d.b: 7).

In 2022 two institutions were set up in Denmark by private-sector companies for close cooperation between various stakeholders in the field of plant-based food ¹⁶.

3.2.1.2 Information campaigns

Information campaigns are defined by Rice and Atkin (2013: 3) as targeted attempts to inform large target groups within a certain period of time or to influence their behaviour. A range of communication activities and messages are used to achieve a non-commercial benefit for individuals and society (ibid.).

When dividing the objectives of information campaigns into three sub-objectives - increasing knowledge, changing attitudes and changing behaviour - Rice and Atkin (2013: 13 f.) come to the conclusion that the potential of information campaigns to contribute to increasing knowledge is high. In contrast, their potential to bring about attitude change is considered low and their potential to contribute to behavioural change is considered very low (Hirschnitz-Garbers & Langsdorf 2015: 26; Spiller et al., 2017c: 270). Various reviews have found that information campaigns aimed at increasing fruit and vegetable consumption achieved only temporary or modest improvements (Afshin et al. 2015: 3; Aloia et al. 2016: 3; Capacci & Mazzocchi 2011). In a study from the United Kingdom, however, ten years after the start of a "5 a day" information campaign, consistently positive effects on the consumption of fruit and vegetables and a reduction in meat consumption were observed (Castiglione & Mazzocchi 2019: 185 ff.).

Supplementing information campaigns with other instruments, in particular behavioural economic instruments such as nudging, are effective (Hirschnitz-Garbers & Langsdorf 2015: 2699). Various studies also point to advantages in influencing behaviour through the combination of different strategies; these include, for example, educational components (Aloia et al. 2016: 3), daily text messages (Carfora et al. 2019: 1) or a comprehensive mix of instruments with didactic units such as the use of apps and tastings as well as a focus on children (Struempler et al. 2014: 286; Rekhy & McConchi 2014: 113). Campaigns can also use social norms to encourage people to adopt certain behaviour, for example by showing that peers, influencers, celebrities, athletes, chefs, etc. eat a plant-based diet (Mozaffarian et al., 2018: 3; Wunder & Jägle, 2022: 53). According to Rekhy and McConchi (2014: 113), the success

¹⁶ IFF (International Flavors & Fragrances) has opened a *Culinary Design Centre* in Denmark in 2022, specialising in plant-based foods and enabling chefs worldwide to work with companies to develop new products to meet the growing demand for plant-based alternatives. The centre has a high-end pilot production facility that supports the rapid development and market launch of new products, as well as a studio for live streaming and conducting sensory evaluations (Innovationsfood, 2022). Since 2022, researchers and companies have been working together on the new *Plant2Food* platform and sharing their knowledge to accelerate the development of plant-based foods. The Novo Nordisk Foundation is supporting the platform for five years with up to DKK 200 million (Kerrn-Jespersen, 2022).

of the measure is greater when industry, government and government-related organisations work together to implement it.

Several European countries are running national campaigns to increase fruit and vegetable consumption, particularly among children. These include Denmark, Germany, Hungary, Spain, the Netherlands, France, Belgium and Ireland (see box 5). In some cases, state actors are involved. In many countries, the campaigns are part of a larger promotional or educational programme that includes other activities in the area of nutrition and dietary education.

Box 5

"6 a day" campaign, Denmark

"6 a day" is a campaign launched in 1999 by Danish governmental and non-governmental organisations and the fruit and vegetable industry to motivate the population to eat fruit and vegetables at least six times a day or in the total amount of 600 grams. A study in 2002 showed that fruit and vegetable consumption increased significantly in the participating schools and company canteens (Pederson & Flyger, 2016: 2).

Other national initiatives and campaigns aimed at promoting fruit and vegetable consumption included "SchoolGruiten" (Netherlands)¹⁷, "5 am Tag" (Germany)¹⁸, "3x3" (Hungary)¹⁹, "5 al dia" (Spain)²⁰, "Un fruit pour la récré" (France)²¹, "Fruit 4 U" (Italy)²² and "Food Dudes" (Ireland)²³. These campaigns targeted the general population, but also specific population groups such as children (EUFIC, 2012; Fulponi, 2009).

Some campaign examples also go beyond the traditional 5 a day message and benefit from broad civil society and private sector support.

Box 6

"Eat them to defeat them" campaign, United Kingdom

In 2018, a campaign was launched for schoolchildren to increase their consumption of plant-based foods. The campaign uses a creative advertising concept tailored to children, which they find fun and motivating and which moves away from the traditional 5 a day message. The campaign organiser VegPower partnered with ITV, a British TV channel. The campaign was supported by celebrities, the government, catering companies and other media channels. Retailers such as *TESCO*, *ALDI* and *LIDL* are among the sponsors. A total of 3.850 schools took part in the school programme in 2022. Over half of the parents whose children took part in the campaign say that their children eat more vegetables. The website provides evaluation reports from recent years (VegPower, n.d.).

¹⁷ schoolgruiten.kennisnet.nl/.

¹⁸ <http://www.5amtag.de/>.

¹⁹ www.3x3.hu/.

²⁰ <https://www.5aldia.org/es>.

²¹ <https://agriculture.gouv.fr/le-programme-europeen-fruits-et-legumes-lecole-et-lait-et-produits-laitiers-lecole>.

²² <https://www.eesc.europa.eu/sites/default/files/resources/docs/the-food-4u-project-2011.pdf>

²³ <https://www.fooddudes.ie/>.

"National Week without Meat and Dairy Products" campaign (*Nationale Week Zonder Vlees & Zuivel*), Netherlands

Since 2018, the "Nationale Week Zonder Vlees & Zuivel" campaign has been motivating the Dutch population to eat meat-free for one week in March, and since 2022 the campaign includes a call to eat dairy-free as well. Interested parties can register as participants on the website and receive information and recipe inspiration for plant-based dishes. According to the website [weekzondervlees.nl](https://www.weekzondervlees.nl), close to 20% of the Dutch population, six municipalities, seven ministries, five healthcare institutions, 52 schools and 14 catering establishments took part in the national meat-free week in 2022. A total of 80 partners from the food industry supported the campaign. Sales of meat substitutes increased by 108% during the campaign week compared to an average week. Sales of meat products were down by 8% (Week Zonder Vlees, n.d.).

Thanks to funding from the European Union (see 2.1.2.5 Horizon Europe), the "National Week without Meat and Dairy Products" can now also be introduced in other European countries. Belgium will be the first country to organise the campaign in 2023. Others are set to follow (Week Zonder Vlees, 2022). The campaign has civil society origins, but can also be organised at a local or national level.

"There's more than meat" campaign, Netherlands

In 2018, a campaign by the National Nutrition Centre in the Netherlands (see chapter 3.2.1.1 Provision of information) aimed to motivate the population to replace meat more often and to opt for alternatives such as pulses, nuts and eggs more frequently. The campaign was publicised through posters at train stations and posts on social media, among other things. The nutrition centre also sold and gave away T-shirts with slogans such as "Never Bean so Happy" and "It's PeaNuts". The aim was to sensitise men in particular to the issue. Influencers supported the campaign on their own channels. The campaign website²⁴ provided recipes for inspiration and highlighted important issues surrounding a plant-based diet (Voedingscentrum, 2018).

"Eat A Whole Lot More Plants" campaign, New York City (not Europe))

The New York City Council and the Department of Health have launched an extensive campaign to promote a plant-based diet in 2023. It uses various forms of media such as television, radio, underground and digital channels as well as outdoor advertising in neighbourhoods with socio-economic inequalities and emphasises the health benefits of a plant-based diet. Its goal is to encourage New York City residents to eat a plant-based diet and strive for a healthy, balanced diet. The city provides practical tips and information to increase the consumption of plant-based products. In addition, culturally diverse recipes focussing on plant-based products are presented. The city wants to play an active role in educating and promoting healthy eating and serve as a role model for other cities (NYC Health, 2023).

Information campaigns can focus on a wide variety of topics and be presented in a variety of ways. From information about the background and benefits of a healthy, plant-based diet for people, animals, the climate and the environment to practical suggestions for and examples of a plant-based diet (in the form of recipes), the range is wide. A target group-specific approach and appropriately selected media are important, particularly with regard to social milieus, gender equality and different life cultures.

²⁴ <https://www.voedingscentrum.nl/nl/thema/meer-dan-vlees.aspx>.

3.2.1.3 Food-based dietary guidelines

Food-based dietary guidelines (FBDG) are drawn up by scientific institutions or professional organisations, sometimes with the involvement of state stakeholders, and made available by them. The guidelines offer guidance in the area of nutrition to citizens as well as health and nutrition experts. They aim to raise awareness and provide the public with nutritional and, in some cases, lifestyle information as well as specific dietary recommendations in easily understandable vocabulary (Erve et al., 2017: 2; Wijesinha-Bettoni et al. 2021). The FBDGs of some countries also contain recommendations on meals, eating habits, food safety, hygiene and physical activity (Wijesinha-Bettoni et al. 2021). The extent to which the recommendations ultimately influence eating behaviour has not yet been investigated (Erve et al., 2017: 2, Keller & Lang 2008: 868 ff.). However, studies have confirmed the health potential of following dietary guidelines by reducing the risk of a large number of chronic diseases (Schwingshakl et al. 2015: 1293 ff.; Liese et al. 2015: 395 ff.; Chiuve et al. 2012: 1014 ff.; Hosseini-Esfahani et al., 2010; McCullough et al. 2012: 1265 ff.). They also form the basis for the development of national health and agricultural policies (Fischer and Garnett, 2016: v).

Dietary guidelines should be based on a comprehensive scientific literature review and regularly updated. Recent work concludes that these processes need to become more systematic and transparent to ensure that they are based on current evidence and relevant contextual factors, that conflicts of interest are better managed and that stakeholder participation is improved (Wijesinha-Bettoni et al. 2021; Zeraatkar et al., 2019). They can also be adapted to national health- and nutrition-related dominant diseases, dietary habits and food preferences (Erve et al., 2017: 2). The FAO and WHO recommend promoting a shift towards a more plant-based diet for health and environmental reasons, including with the help of dietary guidelines (FAO & WHO, 2019: 18 f.). The FAO provides an overview of the nutritional standards of individual countries (FAO, 2023).

A comparative study of national dietary guidelines by Klapp et al. (2022: 7) found that 45% of 95 international dietary standards mention plant-based alternatives to meat or animal milk and that 40% hold a position on vegetarian diets. Most of the countries that do not have a position on this are in Latin America and the Caribbean.

Of the total of 38 national guidelines that took a position on vegetarian diets, most contained neutral recommendations on covering certain nutrients through plant sources. Some guidelines, for example from the European countries of the United Kingdom, Belgium (Flanders) and Malta, pointed out that a vegetarian diet and also a vegan diet with a combination of different foods and an adequate calorie intake can cover all nutrients needed. The Netherlands, the Nordic Council (see Box 7 on Nordic Nutrition Recommendation), Norway and Portugal, among others, emphasised the health benefits of a vegetarian diet, stating that it is healthy and nutritionally appropriate (ibid.: 7 ff.).

"A well-planned vegetarian diet is healthy, appropriate and can have a positive effect on health, especially in the prevention and treatment of some diseases." (A roda dos alimentos, 2003, translated from Portuguese)

Eight nutritional standards (including those from Denmark, Finland, the Netherlands, Sweden and the Nordic Council) indicate that plant-based diets are more environmentally sustainable than diets high in animal-based foods and that sustainability is an important dietary aspect (Klapp et al., 2022: 8 f.).

"Vegan diets generally lead to the greatest reduction in the climate footprint, followed by vegetarian diets and plant-rich diets with less meat and dairy products." (Altomkost, 2021, translated from Danish)

"What you eat is not only important for your own health, but also for the environment. The production and consumption of food is responsible for a large proportion of Norway's greenhouse gas emissions. Less food waste and a more plant-based diet help to reduce the impact on the environment." (Helsedirektoratet, 2014: 26)

Box 7

Nordic Nutrition Recommendations

The Nordic Nutrition Recommendations 2012 were developed by the countries of Denmark, Finland, Iceland, Norway, Sweden, the Faroe Islands, Greenland and Åland as part of the Nordic co-operation. In order to promote a healthy diet and prevent diseases such as type 2 diabetes, an increased consumption of plant-based products with a simultaneous reduction in processed and red meat is recommended (Nordic Council of Ministers, 2014: 20 ff.). After a long revision period, the Nordic Nutrition Recommendations were published in June 2023 (Norden, n.d.).

The Nordic Council is the official institution for cooperation between the Nordic countries. In the first version of the Nordic Nutrition Recommendations, the Nordic Council emphasised that a plant-based diet can halve the climate impact of our diet and that no other food group has as great an impact on the environment as meat and dairy products (ibid.; Helsedirektoratet, 2023).

New food-based dietary guidelines, Denmark

The Danish Veterinary and Food Administration published the official dietary guidelines in 2021. In addition to recommendations for a healthier diet, they also explain for the first time what a more climate-friendly diet looks like, namely with plenty of plant-based ingredients, more vegetables and fruit and less meat, being replaced by pulses and fish. The development of the guidelines was based on the Nordic Nutrition Recommendations (NNR) and evidence reports from the DTU Fødevareinstituttet²⁵, the National Institute of Nutrition at the Technical University of Denmark. The process for developing the new guidelines included communication initiatives with exhibitions, a new dietary guidelines circle and guidelines for special population groups (including vegetarians, pregnant and breastfeeding women and people over 65), new labels, educational material and guidelines for educational institutions as well as minimum criteria for sustainable public procurement. Foods with a balanced nutritional value are labelled with a keyhole symbol. This is intended to make it easier for consumers to choose healthier foods (Altomkost, 2023). In order to implement the new nutritional recommendations in Denmark and the SDGs in public procurement, the University of Copenhagen helped to define a "climate weight" for food. This takes into account the climate impact and sustainability of food in procurement and indirectly promotes plant-based foods more strongly, as they are less harmful to the climate than animal products such as meat (Bergmann Madsen, 2022).

New food-based dietary guidelines, Netherlands

In 2015, the Health Council of the Netherlands (HCNL), an independent advisory body that advises ministers and parliament in the field of public health, developed new dietary guidelines that are aimed at both a healthy but also explicitly environmentally sustainable diet. Based on an optimisation model, information on eating habits and expert knowledge, new guidelines were developed for various target groups. The impact of food on the environment (in particular greenhouse gas emissions) was included in the calculation in line with the

²⁵See <https://altomkost.dk/raad-og-anbefalinger/de-officielle-kostraad>.

recommendations of the Planetary Health Diet (Willett et al., 2019; EAT, n.d.) and maximum values were set for certain food groups such as meat or dairy products. The development process of the guidelines was described transparently in a report. The *Wheel of Five* was used to visualise the guidelines in an easily understandable way. The aim of these guidelines is to encourage consumers to eat more fruit and vegetables, reduce meat and eat more plant-based dishes. Additional recommendations were developed for vegetarians (Brink, 2019; Health Council of the Netherlands, n.d.).

According to the study by Klapp et al, some countries (including Germany, Italy, Luxembourg, Slovenia and Turkey) emphasised the risks of a plant-based diet in their dietary guidelines, particularly in relation to vitamin B12 deficiency. Only four countries worldwide were against recommending a vegan diet, including France, Germany, Italy and Switzerland. The main reason given here was a varied diet that should always contain animal products (Klapp et al., 2022: 10).

The study also concluded that recommendations in favour of a plant-based diet correlate positively with national ecological efforts, while they correlate negatively with the national economic importance of animal products (ibid.: 16). The study emphasises the considerable lack of information in current nutritional standards worldwide (ibid.).

The recommendations should be flanked by appropriate public education measures, especially for marginalised subgroups, for whom they show smaller effects (Mozaffarian et al., 2018: 3).

3.2.2 Dietary education

In addition to nutrition information, the instrument of dietary education also has a low level of intervention. However, it goes one step further than the instrument of nutrition information: the goal of dietary education is to build consumers' knowledge and skills for responsible consumption decisions, both for their own personal health and from a socio-ecological perspective (Spiller et al., 2017c: 271).

According to the review by Vaitkeviciute et al. (2015: 649), there is a slightly positive trend between dietary education and health-oriented behaviour. Combinations of action-orientated education (e.g. in school kitchens) (Contento, 2008: 178) and good school meals are particularly promising (Spiller et al. 2017a: 149). According to a review, learning from peers of the same age is particularly beneficial (Yip et al., 2015: 92).

Formal education programmes include dietary and consumer education in schools, daycare centres and universities (Wunder et al., 2022: 52 f.). Non-formal education includes adult education and dietary education in companies, youth centres and sports clubs, etc. (Bender, 2020: 22; Wunder et al., 2022: 52 f.).

These programmes can take different formats, e.g. integrating nutrition and diet into the curriculum, cooking courses, seminars, workshops, creation of a school garden, information evenings, special meals, school competitions and school and company excursions to regional organic farms (Philipsborn et al., 2021: 15; Wunder et al., 2022: 52 f.). As mentioned above, positive role models have a supportive effect; social media can be useful and influencers and bloggers can also play a role.

In general, daycare centres and schools play a major role in dietary education, as they can reach different milieus, children can potentially pass the information on to their families and long-term knowledge can be established at an early age (Brombach & Duensing, 2021: 47 f.; Quendt et al., 2020: 21). In this way, school catering plays an important role: as a place of learning and for the opportunity for integration and social participation as well as as an offer of health-promoting meals (Brombach & Duensing, 2021: 47 f.).

Dietary education in schools for pupils, Finland

In Finland, nutrition has been taught at school for decades. In home economics, topics such as nutritional recommendations, healthy food, food safety and quality, preparation methods and meal planning are covered. In addition, content on food cultures and traditions is discussed. Since 2001, health education has also been carried out in schools, where children learn key factors for promoting health and the causes of illness. They reflect on their personal choices in relation to their health. This includes topics such as nutritional requirements, food allergies and special diets as well as balanced food consumption in everyday life. At the same time, meals that correspond to the nutritional recommendations - which are also taught in class - are offered at schools (Sarlio-Lähteenkorva & Manninen, 2010: 173).

Moreover, dietary/nutritional education in schools is not always just a question of the curriculum; the school, school management and teachers can also help shape it (Quendt et al., 2020: 21). Parents and guardians can also be involved.

Linked to this are the possible joint cooking, eating or gardening activities in schools. A review that analysed twelve studies on the impact of school gardens on the consumption of fruit and vegetables shows that school gardens are a successful measure and that pupils consume more fruit and vegetables (Berezowitz, 2015: 508). In another review, Chan et al. (2022: 30) conclude that school garden programmes, which also included school garden activities, cooking lessons and dietary education, showed positive effects on children's nutrition knowledge, their acceptance of fruit and vegetables and their eating habits.

School garden, Berkeley, California (not Europe)

The *Edible Schoolyard Project* was founded in 1995 by chef and author Alice Waters at Dr Martin Luther King Jr. Middle School and now serves as a demonstration site for *Edible Education*.

Together with pupils, teachers, families, farmers, cooks and artists, a school garden with a kitchen was created.

The curriculum aims to promote cooking and gardening skills that allow children to look critically at the food system and develop ideas for change in their own lives and living environment (The Edible Schoolyard Project, 2020). The website offers extensive information material for imparting knowledge about gardening and cooking. It also provides a world map of school gardens in other countries that have joined the Edible Schoolyard network²⁶. There are numerous examples of school gardens in European countries that were founded based on the principles of the *Edible Schoolyard Project*, among others.

A similar programme, *l'école comestible* ("the edible school"), was founded in France in 2019 and teaches children practical and theoretical knowledge about gardening (L'école comestible, n.d.).

A 2019 meta-study concluded that cooking classes are not only associated with improved attitudes, self-efficacy and healthy food intake, but that they were particularly effective when combined with additional components such as physical activity or gardening (Hasan et al., 2019: 1).

²⁶ <https://edibleschoolyard.org/network>.

The interventions should be designed for specific target groups according to the social milieus. Language barriers, accessibility, gender equality and low-income socio-economic groups should also be taken into account.

3.2.2.1 Training and further education

Kitchen managers, meal planners and nutritionists can be re-trained in plant-based cooking or benefit from further training. It cannot always be assumed that they have had the education or training to prepare plant-based meals in an appealing way. The dishes may be more complex, contain more ingredients and may require new and unusual cooking techniques. It is also important that the dishes are visually (and in terms of naming) appealing and flavourful.

Box 10

Training programme for chefs, Denmark

As part of the Danish Organic Action Plan 2020, a training programme was carried out with kitchen staff in public canteens in 2013. The training included menu planning using plant-based dishes with regional and seasonal products from organic farming, using more pulses instead of meat and preparing meals with fresh ingredients instead of convenience products. The aim was to train the kitchen staff in such a way that (the proposed) public procurement of organic food is possible with the same budget, even if this means more work for the kitchen staff (Sørensen et al., 2016: 323).

A survey of Danish kitchen staff after the training revealed that, despite the challenges posed by new work processes, staff were more satisfied and motivated after the training programme. The training in practical skills appeared to increase professional competences and well-being. The training programme increased the proportion of organic food and freshly prepared dishes used (ibid.: 326 f.).

Education on a plant-based diet could also play a greater role for closely linked professional groups. These include medicine, nursing, catering, education and agriculture (Philipsborn et al., 2021: 18; Wunder & Jägle, 2022: 53). This training content can be promoted in various formats such as additional training, electives, lectures, lessons at vocational schools, internships, final theses and courses on the cultivation of protein crops in agricultural schools (ibid.).

Box 11

Nutrition education for healthcare workers, New York City, USA (not Europe)

Doctors and other healthcare professionals in New York City have been receiving free introductory training on plant-based food and nutrition since 2023. This is possible thanks to a partnership between the Mayor of New York City and the American College of Lifestyle Medicine. With an investment of 44 million dollars, a total of up to 200,000 people will receive further training. It is the largest nutritional training programme of its kind in the world with a focus on a plant-based diet. The training consists of 5.5 hours of online training and aims to ensure that healthcare workers integrate evidence-based content into their daily work (Office of the mayor, 2022).

3.2.2.2 Counselling

Compared to dietary and nutrition education, nutrition counselling is more individually tailored to those seeking advice (Wunder & Jägle, 2022: 54). Target groups range from consumers and patients to kitchen managers, meal planners and nutritionists to institutions such as schools, hospitals and businesses.

Nutritional or medical counselling can be offered to consumers or patients, for example, in the form of personal action plans or nutrition recommendations for everyday routines (Wunder et al. 2022: 53). They can address the areas of skills (knowledge, practical competence, self-regulation), motivation (intention, routines) and opportunities (influencing factor time). Jobs for nutritionists and dieticians in the public health sector can be created (Pineda et al., 2022:18).

For professionals in canteens and kitchens in institutions such as schools, hospitals, etc., there is a wide range of opportunities for professional advice and support to increase the proportion of plant-based food in the catering offer. Agricultural businesses can also benefit from advisory services (knowledge, skills, access to improved practices/technologies, new market opportunities, etc.) (Gerber et al., 2013: 83 f.).

Box 12

Counselling for schools, Netherlands

In the Netherlands, the National Institute for Nutrition has been offering schools various support services since 2003 with *The Healthy School Canteen*, including decision-making aids, a checklist for a more sustainable organisation of canteen processes, individual advice on menu design, videos on how to integrate more vegetables into the menu, but also educational material for pupils on healthy eating. Examples from other schools are also presented (Voedingscentrum, n.d.b).

Counselling, Copenhagen, Denmark

The *House of Food* is an institution established by the City of Copenhagen in 2017 that supports and accompanies the process of switching to more organic food in public canteens with training and expertise (The Copenhagen House of Food, n.d.).²⁷

Such an institution like the *House of Food* would also be suitable for offering counselling services for switching to a more plant-based diet.

3.2.3 Market transparency

By increasing market transparency, consumers are provided with more relevant information, allowing them to make informed choices which in turn enable them to make sustainable consumption decisions in line with their preferences (Spiller et al. 2017c: 271).

An important basis for market transparency is provided by product names. This practice has recently led to regulatory restrictions on plant-based meat substitutes, which has been criticised accordingly²⁸.

²⁷ Counselling for the increased use of organically produced food has an indirect benefit for the promotion of a plant-based diet. The proposed sustainability concept, which also includes the increased use of organic food, aims to reduce meat consumption. By introducing more organic food, the groundwork for a diet that increasingly favours plant-based products is laid simultaneously.

²⁸ People should not be misled by product names or images. Milk and dairy products are protected terms. According to a decision by the European Commission, the terms milk and dairy products may be used only for certain products that are defined by the countries, such as peanut butter or coconut milk (European Commission, 2010: 1 f.; Pabel et al., 2017). There is no labelling protection for meat products and no uniform regulation across Europe. Some countries have now planned restrictions on the labelling of meat substitutes; Belgium and France are examples for such restrictions. In the case of a restriction vegetarian products would no longer be allowed to be labelled as "steak" or "sausage" (Légifrance, 2022).

Various methods to increase market transparency include food labelling in the form of product labels, apps and other digital applications that also provide information to customers when making purchasing decisions for food products.

3.2.3.1 Labels

Food labelling generally aims to support informed purchasing decisions and avoid misleading information (Philipsborn et al., 2020: 13). There are now a large number of different labels. They range from mandatory labels (examples: ingredient lists and nutritional value declarations - which, however, require a certain amount of prior training to understand) to voluntary labels (example: organic) to labels on a state basis (example: GMO-free) as well as labels on a private sector basis (example: fair trade) (Spiller et al., 2017a: 150 f.).

Labels are usually found on the packaging of industrially processed foods. However, they can also be found on supermarket shelves and on menus (Philipsborn et al., 2021: 16). They can have both a descriptive function (example: salt content) and an evaluation function regarding health and sustainability (example: keyhole symbol) (ibid.). They can be presented in the form of a simple seal, multi-level (example: animal welfare), metric (example: carbon footprint), as verbal statements, signs or images (ibid.).

While Afshin et al. (2015) come to a sceptical conclusion, Cecchini & Warin (2016: 201) conclude in a meta-analysis that the usage of labels increases the number of people who choose a healthier food option by 18% (Spiller et al., 2017a: 150 f.). In a systematic review of 76 environmental labelling measures from 2021, Potter et al. (2022: 14 f.) also conclude that ecolabels are effective in promoting the selection, purchase and consumption of food across a wide range of formats and content. However, due to the abundance of (advertising) information on the market, smaller changes are to be expected, which are more noticeable among interested consumers (Spiller et al., 2017a: 151 based on Alston et al., 2016). In addition, labels need a certain amount of time to grow out of their niche, as the examples of the *Fairtrade label* and *Organic label* show.

There are various approaches to promoting a plant-based diet through labelling. One of these is labelling based on the CO₂ emissions associated with animal products (Gerber et al., 2013: 85), climate labels (WBAE, 2020: xiii) or warning labels for products that are particularly harmful to the climate (Spiller et al., 2017c: 271). There are also various approaches to improving and further developing animal welfare labels, such as mandatory labelling at EU level (WBAE, 2020: 27 f.).

While the meat-producing industry welcomes this step and points to information transparency, several non-governmental organisations criticise this approach as it contradicts European sustainability efforts and makes it more difficult to switch to sustainable and plant-based products (ProVeg International, 2022a and 2022b). A survey in the Netherlands found that 96% of respondents knew that vegetarian sausage does not contain meat (Radar Avotros, 2020). The implementation of the decree in France was suspended in 2022 due to legal concerns (Vegconomist, 2022).

Voluntary climate labelling for food, Denmark

The Danish Ministry of Food, Agriculture and Fisheries has announced that it will fund the development of a state-controlled climate label for food in 2022. The voluntary label indicates the carbon footprint and is intended to increase transparency. It is also intended to promote climate-friendly food production and help consumers buy sustainable food. A labelling proposal is being drawn up under the leadership of the *Danish Veterinary and Food Administration* and with the help of the Danish Plant-Based Association (Kjølberg, 2022).

Development and testing of labels with environmental score, France

As a result of various experiments in France, two environmental rating systems were created in 2021, the Ecoscore and the Planet Score. The Ecoscore was developed by an initiative of business organisations, companies in the industrial food sector and the French Agency for the Environment and Energy (ADEME). It is based on a Life Cycle Assessment (LCA) database with over 2800 typical foods (Agribalyse database). Products are labelled with the letters A (good rating, in green) to E (poor rating, in red). The Planet Score was developed by French consumer protection and environmental organisations. In addition to the overall score, other categories such as pesticides, biodiversity and climate are also included in the assessment. France wants to implement the environmental labels on frequently consumed foods in 2023 and continue to work on improvements such as expanding the LCA database. As plant-based products usually have a lower environmental impact than animal-based products, such labels support a plant-based diet (Institut du Commerce, 2022: 2 f.).

Studies in France indicate that the Ecoscore label influences consumer behaviour. One online retailer that introduced the Ecoscore on its products reported that the market share of products labelled "A" increased slightly (Héraud: 2022). An analysis of studies on various carbon labels and footprints suggests that such labelling can change consumer decisions and that colour-coded traffic light labelling in particular is more effective than purely quantitative information (Soler et al., 2021: 87 ff.).

Vegan²⁹ label, various countries

To date, there is no obligation in Europe to label purely plant-based products with a vegan label. Many countries have now established labels that characterise vegan or vegetarian products. The best known in Europe is the *V-label*, which was first used by the organisation SwissVeg and is now supported by the *European Vegetarian Union*. It is internationally protected and is awarded by interest groups or local contact persons in the respective country (V-label, 2022.).

Other vegan labels are developed by civil society organisations or producers, e.g. *Vegane Gesellschaft Deutschland*, *The Vegan Society* in the UK, *VEGANOK* Association in Italy and *Viva!* in Poland (vegan-labels, n.d.). The *Stockfree Organic* label was created in the United Kingdom for products from biovegan agriculture (Stockfree Organic, n.d.). In Germany, the

²⁹ While the term "vegan" is clearly understood and recognised by stakeholders (producers and consumers), an analysis of studies showed that the term "plant-based" is preferred by some consumer groups, as "vegan" has some negative connotations. At the same time, "plant-based" is understood differently, as it is not defined whether a product contains ingredients of animal origin (The Vegan Society, 2022: 8 ff.).

Biocyclic Vegan Agriculture label was developed and is used throughout Europe (*biocyclic-vegan*, n.d.).

3.2.3.2 Apps and digital applications

Apps and other digital applications can provide useful support for consumers when making purchasing decisions. They can provide detailed information about products including ingredients, nutritional information, origin and sustainability aspects such as ethical manufacturing processes and climate and environmental impact. They help consumers to make informed choices that are in line with their sustainability values and take into account their needs and preferences.

As of June 2023, the research has not revealed any apps to promote a plant-based diet that have been developed by state institutions in Europe. However, there are state-operated apps that provide information on healthy eating, such as in the United Kingdom (see Box 15). In contrast, there are a large number of apps from the civil and private sectors that promote a plant-based diet and lifestyle³⁰.

Box 15

Change4life App, United Kingdom

The National Health Service has developed an app for a healthy lifestyle, especially for families. In addition to tips for activities for children and adults, there are many balanced recipes for dinner, snacks or children's lunchboxes, including many vegan and vegetarian recipes (National Health Service, 2021).

A two-week study conducted with Italian students in 2017 showed that a daily text message asking them to monitor their own meat consumption and to pay attention to the recommended maximum amount led to a reduction in the consumption of meat and meat products. This indicates that even small daily text messages via smartphone can be an effective strategy to encourage people to reduce their consumption of processed meat (Carfora, 2017).

"If-then plans" are a promising strategy that can contribute to long-term habit change by bridging intention-behaviour gaps (the gap between motivation to change behaviour and actual behaviour change) (Sheeran, 2002). They are aimed at people who already intend to reduce their meat consumption and are designed to help them establish new habits. The "if-then" plans take potential obstacles into account by determining in advance where, when and how the intended change is to be implemented³¹. In their 2016 study, Loy et al. (2016: 5 f.) found that this approach is successful in helping people reduce their meat consumption. The plans can be used in the form of paper-based and digital food diaries as well as in the form of apps and other digital applications.

3.2.4 Advertising restrictions and bans

The instruments of advertising restrictions and bans build on the previous instrument category of market transparency but go one step further. A distinction is made between two sub-categories. One is the spatial or temporal ban on advertising animal products. The second is the restriction of unfair advertising that makes claims on nutrition and health to the customer without these claims having been scientifically proven.

³⁰ A list of apps that provide information about or support a vegan or vegetarian lifestyle can be found on the following websites, for example <https://cleangreensimple.com/article/best-vegan-apps/> or <https://www.veggly.net/top-9-free-vegan-apps-plant-based-lifestyle/>.

³¹ "If I experience situation X, I will perform behaviour Y" (Loy, 2016: 2).

Food advertising has a proven significant influence on consumption and eating behaviour, especially among children (Norman et al. 2018: 5 ff.; Halford et al. 2008: 900 ff.; Halford et al. 2004). If this advertising corresponded to the recommendations for a healthy, plant-based diet, this would not be problematic, especially for people and the climate. However, a closer look reveals that the majority of the marketing budget is spent on advertising unhealthy foods: In 2017, 870 million euros in Germany were invested in advertising confectionery, while only 17 million euros were spent on advertising fruit and vegetables. In the same year, advertising for meat and fish products received an amount of 81.9 million euros (Philipsborn et al., 2020; Wunder & Jägle: 2022: 52; Statista 2020). In general, companies in the confectionery, soft drinks and fast food industries are among the most heavily advertised sectors of the economy (Spiller et al., 2017a: 151). The consequences of this are unhealthy diets and diet-related diseases in the population (Norman et al. 2018: 5 ff.). Government intervention is needed here to regulate the unhealthy, profit-oriented market behaviour of private-sector players.

People are more accepting of state regulatory intervention when it comes to protecting certain groups of people, such as children (Spiller et al. 2017c: 269). As children perceive visual images more intensively and are less able to categorise the consequences of their diet, they are particularly in need of protection. Television advertising plays a major role (Halford et al. 2008). Increasingly, advertising via the internet or social media is also playing a role, which in combination with the television advertisement further intensifies these effects (Norman et al. 2018: 7).

These major unfavourable effects of the marketing of unhealthy foods counteract the efforts of parents, educators and teachers and in some cases nullify them. They also have a particular impact on vulnerable social groups, which often have little access to other state instruments, such as dietary information and education. Regulating the marketing industry is a major lever for protecting children, the population as a whole and the climate.

3.2.4.1 Prohibition of advertising products that are harmful to health or the environment

The private food and catering industry can also exert a sustainable influence, for example by making voluntary commitments to more advertising for plant-based products and less advertising for unhealthy products. One example of this is the EU Pledge. This is a voluntary initiative launched by major food and drink manufacturers in Europe in 2012 to combat childhood obesity and promote responsible marketing practices. Participating companies pledge not to advertise unhealthy food and drink products to children under the age of 12 (Philipsborn et al., 2020: 18). This includes advertising in broadcast media, on the internet, in social media, in other media and in places where children and young people congregate.

State institutions at regional and local level (e.g. state governments) should fulfil their duty of care for example by taking preventive measures. One possibility is to impose advertising restrictions or advertising bans on climate-damaging products, as shown in the example from Haarlem in the Netherlands.

Box 16

Ban on meat advertising, Haarlem, Netherlands

In the city of Haarlem, Netherlands, advertising for climate-harmful products in future will no longer be visible in public spaces. The proposal for the ban was submitted by the *GroenLinks* Party in 2022. The advertising ban, which came into force in 2024, relates to cars with combustion engines and holiday flights, as well as meat from factory farming, as these products and services are associated with high greenhouse gas emissions.

The argument made for the ban was that the city cannot draw attention to the climate crisis on the one hand, but then earn money with advertising that encourages climate-damaging behaviour (GroenLinks Haarlem, 2022; Hanneke, 2022).

A legal assessment shows that an advertising ban limited to cheap meat is also permissible under European law (Fischer et al., 2021: 157).³² In order to be able to differentiate "cheap meat" when implementing the advertising ban, the administrative establishment of state animal husbandry labels and the corresponding labelling obligation on meat products would be required (ibid.: 159). This would ensure greater transparency and quality assurance and prevent bait-and-switch offers (goods offered at prices below cost price in order to lure customers into the shop and make more profit in other price segments) (ibid.: 160). However, according to Gawel (2021: 18), retailers would be expected to respond with sales promotion measures, such as promotional prices or references to other attractive offers, in order to compensate for a ban on advertising (for cheap meat). Furthermore, a ban on advertising would not change the sales price. However, the latter is the strongest economic signal to consumers. For this reason, Gawel is cautious about the chances of consumers buying higher-quality meat products as a result of an advertising ban on cheap meat. At the same time, however, it has a symbolic value (Gawel, 2021: 18, 60).

There are other known bans or plans in Europe that prohibit the advertising of unhealthy foods to children, such as in Portugal, Norway, Sweden and Germany (Spiller et al., 2017a: 152). As the impact of marketing on food preferences and diet has been proven, such bans should include as many media forms as possible in order to be effective (Mozaffarian et al., 2018: 4). This can include television, internet, print and outdoor advertising, point-of-sale advertising, direct marketing, packaging advertising and advertising in kindergartens, schools, playgrounds and other sports and leisure facilities frequented by children (Philipsborn et al., 2021: 14).

3.2.4.2 Restriction of unfair advertising/transparency of product information in advertising

The restriction of unfair advertising serves to protect consumers and aims to ensure that consumers receive correct and reliable information so that they can make informed decisions. Misleading, inaccurate or unethical advertising practices should be restricted or prevented.

Various legal and regulatory measures are available to restrict unfair advertising. These include the enforcement of laws and regulations by governments and authorities, the development of codes of conduct and guidelines for advertisers, and the monitoring and penalisation of violations of applicable advertising regulations.

At the EU level, the EU Health Claims Regulation (Regulation [EU] No. 1169/2011) has aimed to protect consumers from misleading advertising and to ensure that the stated health-related benefits of foods are based on sound scientific evidence since 2006 (Kenning et al., 2021: 220 f.).

The EU Health Claims Regulation can benefit the promotion of a plant-based diet in various ways. For a start, it can reduce the likelihood of health benefit claims on animal products that do not reflect the current state of scientific knowledge. Ultimately, the regulation can increase consumer confidence in health claims made on products, which can lead to healthier consumption choices that include plant-based products. The regulation can also incentivise companies to conduct research and development to develop and market plant-based options that have proven health benefits.

The introduction of the Health Claims Regulation meant that many previously used claims could no longer be used (Spiller et al., 2017a: 152). An evaluation of the regulation came to the conclusion that not all objectives had been achieved (European Commission, 2020d; de Boer,

³² "Cheap meat" is defined here as meat and meat products that are sold below cost price plus a reasonable profit and that are not following a husbandry label in at least one specific way (Fischer et al., 2021: 155 f.).

2021: 10).

Consumer perception of information and product judgement, for example of sustainability properties, can also be affected by visual representations (e.g. cows on pasture for dairy products) (Underwood & Klein, 2002: 58). These have been little analysed to date (Spiller et al. 2017a: 152 f.).

In general, voluntary commitments by the food and catering industry to refrain from misleading advertising can also have a supportive effect (as in the examples of the EU Pledge and the rules of conduct of the German Advertising Council ZAW). However, the German Advisory Council on Agricultural Policy, Food and Consumer Health Protection (WBAE), among others, attests to the insufficient effectiveness of voluntary self-regulation in child-related marketing („unzureichender Effektivität freiwilliger Selbstkontrollen beim kinderbezogenen Marketing“, WBAE, 2020: 552). According to a study on the effect of various forms of advertising restrictions on junk food over the period from 2002 to 2006, countries with mandatory advertising restrictions showed a decline in consumption of 8.9%, while in countries where restrictions took the form of only voluntary commitments, there was an increase of 1.7% over the same period (Kovic et al., 2018: 24; WBAE, 2020: 548).

3.3 Decision steering

Following on from instruments for data collection and monitoring as well as decision support, the next topic will be instruments that can be categorised as decision steering. Compared to the previous instrument categories, these instruments generally intervene more strongly in the consumption choices of the population or the options of agricultural producers and companies. Due to the steering of individual decisions, there could be less acceptance on the part of the population. However, the effects that can be achieved are higher (Diepeveen et al., 2013).

The aim is no longer just to provide information and support services, but to "steer" consumption choices and behaviour towards healthier and more sustainable consumption and business decisions through nudging and financial incentives.

3.3.1 Nudging

In the area of nutrition and a healthy diet, nudging refers to various measures that gently encourage people to adopt a desired behaviour in relation to their diet without restricting their freedom of choice. These are not bans on less sustainable options and no economic incentives are used (Graaf et al., 2021: 221). In decision-making situations in which people often act non-rationally because they are subject to automated thought processes, the environment is deliberately designed in such a way that the more sustainable and healthier option is the more attractive one (Hansen et al., (2021: 392 f.). Nudges are to be understood as subtle decision-making aids of which people are only partially aware³³ (Kompetenzzentrum für Ernährung, n.d.). Put simply, they are intended to "Make the healthiest choice the easiest choice" and support people in their decisions.

Nudging as a political measure for healthier behaviour is sometimes criticised for deliberately manipulating people's behaviour. However, people are exposed to many stimuli and influences in everyday life even without targeted or intended nudges (Nys et al., 2017: 207). Another argument in favour of nudging as a political measure for healthier behaviour is that these nudges support the choice to do things that are of interest to people themselves and society, such as better (public) health (ibid., 200 ff.).

As traditional instruments such as consumer information and education have reached their limits over the last two decades due to an information society flooded with stimuli (Boos et al.,

³³ The theory of nudging was explained in 2008 by Thaler and Sunstein in their book "Nudge: Improving Decisions About Health, Wealth, and Happiness" (Thaler & Sunstein, 2008).

2019: 253 f.), nudging plays an important role in complementing softer and harder measures by increasing their effects (ibid.: 254).

Typical examples of nudges are listed below (Spiller et al., 2017c: 271 f.; Wunder & Jägle, 2022: 51; Graaf et al. 2021: 221; Vinnari & Vinnari, 2014: 389).

In community catering:

- Increasing the selection of plant-based dishes,
- Offering plant-based dishes as a standard option,
- Steering perception towards plant-based dishes,
- Smaller proportion of meat and larger proportion of vegetables,
- Appealing names for vegetarian dishes,
- Providing nutritional education (e.g. displaying information on vegetarian food on the menu)
- Placing a meat-free alternative at the top of the menu or in a prominent position on the buffet

In the supermarket:

- Placement of a meat-free alternative (e.g. next to sausage in the supermarket; at eye/handle height) or prominent placement of fruit and vegetables in the supermarket
- Increasing the selection of plant-based products by expanding the product range
- Steering perception towards plant-based products
- Plant-based or healthy products in the checkout area
- Shopping trolley inserts

The locations for nudges are not limited. Butchers, bakeries, restaurants, cafés, etc. can also introduce nudging measures.

A systematic evaluation of studies that investigated the effectiveness of changes to the microenvironment to reduce the demand for meat found that smaller meat portions and the provision of meat alternatives with supporting educational material were effective interventions (Bianchi et al., 2018: 387 ff.). Positioning dishes containing meat after vegetarian dishes on menus or online booking systems led to a reduced demand for meat (ibid.). In a study setting evidence was found that emphasising the animal suffering associated with meat production, for example by showing a picture of a pork roast with the pig's head still attached, led to a greater demand for plant-based alternatives (ibid.). If appealing vegetarian elements are shown on the menu, this also leads to a lower demand for meat. The positioning of meat products at the back of a buffet was associated with a reduction in demand (ibid.).

As many consumption situations regularly occur in the canteens and cafeterias of daycare centres, schools, hospitals, universities, etc., where people can be supported in a desired behaviour through simple and effective nudges, community catering is ideal for nudging measures (Freitag-Ziegler, 2019; Kenning et al. 2021: 222)³⁴. Below are some examples of nudges in community catering that have been implemented as a result of decisions at local authority level or as part of scientific experiments on the topic of nudging.

³⁴ In mass catering facilities, guests cannot choose from a random pool of meals as there is only a limited choice. It is therefore important to offer any choice at all and to design it in such a way that people can opt for sustainable and healthy meals.

Various nudges, United Kingdom

In a 2021 survey of almost 90 caterers, who supply over 5,000 schools, universities and healthcare facilities, 80% said they were reducing the amount of meat they serve. This was achieved through smaller meat portions, fewer meat dishes in the menu selection and meat-free days. At the same time, over 83% of caterers reported that they had increased the quantity of pulses by up to 20% and 60% reported using more meat substitutes. Over half of the participants have also re-organised the menu so that the meat-free dish is more prominently placed. This was preceded by an education and awareness-raising campaign aimed at industry and companies to reduce meat and increase plant-based products (Eating Better, 2021: 2 ff.).

As part of the *Green Challenge* at the University of Cambridge, the catering service introduced a variety of measures in 2016 to increase sustainability in the catering area, including reducing the consumption of dairy products, eliminating meat from ruminants, reducing other types of meat and promoting the consumption of plant-based dishes so that they make up the majority of the offer (Badshah, 2023).

Increase in the number of vegetarian dishes on the menu, England

A 2017 study in three English cafeterias showed a significant increase in the number of vegetarian dishes sold when the choice was doubled (from one vegetarian dish in four to two vegetarian dishes) (Garnett et al., 2019).

Informative nudges, USA

Studies by Sparkman et al. 2017 and 2018 have shown that informative messages on the menus about vegetarian dishes can change the behaviour of canteen guests in a university cafeteria towards ordering less meat. During the period when the message ("Our meatless burgers are on the rise") was displayed on the menu, orders for vegetarian dishes increased (Sparkman et al., 2020: 5).

Vegetarian option as standard, Sweden

A four-week experiment in a Swedish restaurant in 2016, in which a vegetarian instead of a meat-based option was offered on the menu as a standard lunch dish and the meat-based option was only offered on request, resulted in a significantly higher demand for the vegetarian dish (Gravert & Kurz, 2021: 9).

Vegetarian option as standard, Denmark

At three conferences in Denmark between 2017 and 2019, the effect of the standard option (vegetarian or non-vegetarian) of a buffet was investigated when the alternative option had to be actively chosen. It was found that the majority of guests opted for vegetarian buffets when this was the standard buffet (Hansen et al., 2021: 395).

Plant-based meals as standard, nudging in communal catering, Copenhagen and Aalborg, Denmark

In 2022, a proposal was adopted by the City Council of Aalborg Municipality and the Copenhagen City Council to allow citizens to choose a plant-based dish in municipal canteens and catering facilities. Guidelines for communal catering are to be drawn up so that this

choice can be implemented for canteen guests (Overgaard, 2022; Københavns Kommune, 2022).

Appealing names for plant-based dishes, various cities

A study of different names of plant-based dishes in workplace cafeterias in Chicago, Sydney, São Paulo and Singapore found that appealing names increased the amount of food consumed (in English-speaking countries) and that this was a cost-effective and easily scalable strategy for the catering industry to increase the consumption of plant-based and sustainable dishes (Gavrieli et al., 2022: 8).

Appealing names for plant-based dishes, USA

In a university cafeteria, various names for plant-based dishes were analysed in 2017. Vegetable components labelled as tasty and exciting ("Sweet sizzlin' green beans and crispy shallots") were chosen more frequently than those with normal ("Green beans") or health-related names ("Light 'n' low-carb green beans and shallots"), even though the components were produced in the same way (Turnwald et al., 2017: 1217). This shows that creative labelling can increase the quantity of plant-based products in demand.

Appealing naming, United Kingdom

In 2019, the consumption of vegetarian dishes with pleasurable ("Field-grown", "Cumberland-spiced"), general ("Meat-free") or positive labelling ("Feel Good") was investigated in an English café chain. The field experiment showed significantly higher sales when the dishes were labelled in an appealing way - highlighting the flavour or origin - on the menu (Bacon et al. 2019:10 f.).

In addition to communal catering, supermarkets are a particularly suitable place for nudging measures. Two examples are presented below. One uses nutrition education content, and one uses the positioning of meat substitutes to achieve the set goal of increasing plant-based consumption.

Box 18

Replacing meat with alternatives, informative nudges, Oxford, United Kingdom

A study conducted over four weeks in Oxford in 2018 showed a significant reduction in meat consumption and a more positive attitude towards a diet containing less meat after the participants received information on the benefits of eating less meat, suitable recipes and meat substitutes from the supermarket (Bianchi et al., 2022: 1359 f.).

Positioning of meat substitutes, United Kingdom

In a study conducted in supermarkets in 2019, the effect of moving meat substitutes from the vegetarian section to the meat section was tested. Sales of meat substitutes increased by over 30% compared to control supermarkets in which the meat substitutes remained in the vegetarian section (Piernas et al., 2021: 10 f.).

An increase in sales of plant-based substitute products was also achieved in another experiment in supermarkets where meat substitutes were more visible, available and affordable for a period of time (Trewern et al., 2022: 3211 f.). In both studies, there were no changes in meat sales.

Initiatives at municipal level can also be organised by the local government alongside other stakeholders.

Box 19

Various nudges, Altena, Netherlands

At the beginning of 2023, the city of Altena launched an initiative to encourage residents to consume more plant-based proteins. The 'Plant-based together' initiative is being implemented in cooperation with the *Green Protein Alliance* (GPA) and its members, the municipality of Altena, the province of Noord-Brabant and Wageningen University. A producer of plant-based meat substitutes is also heavily involved. In addition to interventions in schools, the initiative implemented information boards and taste tests of plant-based products in supermarkets and restaurants. Well-known athletes support the initiative with their favourite recipes. The GPA has launched a website with the hashtag *zo kan het ook* ("This is how it can be done"), which lists many plant-based recipes and provides information on a plant-based diet. The city is analysing supermarket sales figures to measure whether the initiative has a longer-term incentive effect (Vegconomist, 2023).

Responsible nudging should be transparent, contextualised and respectful. Participatory approaches in which nudging is developed together with those affected are often more effective and better accepted than top-down approaches (Boos et al., 2019: 255).

3.3.2 Financial incentives

Financial incentives are a classic political control instrument that can be used to "steer" the decisions and behaviour of for example consumers and agricultural businesses, but also to influence economic processes and promote research and innovation. Positive financial incentives include subsidies, bonus programmes and investments/promotion, while negative financial incentives can be set through increased taxation.

In terms of guiding consumption decisions, the aim of positive financial incentives is to make the consumption of certain products, in this case sustainable and plant-based foods more attractive (Spiller et al., 2017c: 271). In contrast, negative financial incentives are intended to make undesirable foods more expensive and thus make them less attractive (ibid.).

Positive financial incentives are generally better received by the population than negative financial incentives (Spiller et al., 2017c: 271). This is due to the psychological effect of loss aversion (people perceive a loss more seriously than a gain of the same amount). Positive financial incentives are therefore politically more feasible as an instrument than negative financial incentives, but they cost more (ibid.). Economic incentives can have a fundamentally unequal effect on different population groups according to their financial means. Therefore, these instruments should always be cushioned in a socially just manner.

Studies show that financial incentives are effective in guiding food choices (Andreyeva et al, 2010: 218 ff.; Powell & Chaloupka, 2009: 249; Effertz & Adams, 2015: 5; Niebylski et al, 2015; Philipsborn, 2021: 3; Beerman et al, 2020: 58 ff.). Recommendations suggest that financial incentives should be used by political institutions to adjust food prices to their actual social costs and to include external environmental and health costs (IPCC 2022; Umweltbundesamt, 2017; Philipsborn et al, 2021: 3; WBAE, 2020: 26; Graaf et al. 2021: 13; Wunder et al., 2022: 56).

3.3.2.1 Positive financial incentives

Positive financial incentives include, for example, subsidising the consumption (and production) of plant-based products, bonus programmes and the investment and promotion of activities to increase a plant-based diet.

3.3.2.1.1 Subsidies

Subsidies are "financial government grants that are not tied to a direct consideration" (Buhr, 2021: 896). They are paid to states, companies or private households and can be paid directly in the form of financial aid or indirectly in the form of tax concessions (*ibid.*).

Various studies have addressed the question of what effects subsidies have in the area of plant and animal products and what measures can be taken to promote a more sustainable and healthier diet (Waterlander et al., 2013; Säll, 2018; Niebyski et al., 2015). One important finding is that subsidies for healthy foods such as fruit and vegetables can have positive effects (Waterlander et al., 2013: 890; Thow et al., 2014: 554; Niebyski et al., 2015). They help to increase the consumption of these products (Thow et al., 2014: 554) and thus improve the health of the population. The World Health Organisation (WHO) considers subsidies for fresh fruit and vegetables that reduce prices by 10-30% to be appropriate in order to effectively increase fruit and vegetable consumption (World Health Organization, 2016: 9). Such subsidies can be expensive for the state but are better accepted by the population than tax increases (Spiller et al., 2017b: 206) and can have a positive impact on the costs of the healthcare system by improving the health of the population. Considering the psychological reactions of consumers to subsidies compared to price changes, as described in the introduction, rising prices can tempt consumers to react with reactance (Just & Hanks, 2015: 1387). Subsidies are therefore more likely to bring about a change in purchasing behaviour (Spiller et al., 2017b: 205).

Subsidies for school and nursery meals are a widespread form of subsidisation. They can compensate for families' financial disadvantages and promote access to sustainable and healthy food.

Box 20

EU school scheme

The European Union's school scheme aims to give children and young people easy access to healthy foods such as fruit, vegetables and milk. An annual budget of 150 million euros is made available for fruit and vegetables. The scheme also includes accompanying educational measures such as teaching units or farm visits, as well as addressing the topics of food waste, regional production and organic farming. How these measures are implemented is left to the participating countries (Vertretung in Deutschland, Europäische Kommission, 2023).

One study has shown that children continue to consume more fruit and vegetables even after several years, but that this trend stops in the long term. In order to maintain consumption in the long term, motivation and skills should be combined with regular opportunities to eat fruit and vegetables. As the framework conditions, especially parents, also influence children's motivation and skills, these aspects should be taken into account in the EU programme (Zolfaghari, 2022: iv, 110 f.). Another study showed that EU school schemes increase the frequency of children's fruit and vegetable consumption by 30 to 50%. This is attributed to better availability, exposure and increased awareness rather than actual changes in preferences when choosing snacks (Staudigel, 2019).

Subsidising the cultivation of vegetables, fruit and pulses is another instrument for promoting a plant-based diet. In addition to increasing subsidies for healthy, plant-based foods, subsidies

for animal products must be reduced. This includes not only subsidies in the area of consumption, but also those in the area of agricultural production. Subsidies such as area-based direct payments to promote livestock farming, particularly for the production of animal feed, or indirect subsidies are subsidised both by the CAP and by national agricultural subsidies in Europe. The reduction of these environmentally harmful subsidies can lead to a reduction in government spending and a reduction in environmental and health problems (Graaf et al., 2021: 13; Schröde, 2014: 25). This can fulfil the claim that, among other things, "public money is used for public services" in agricultural subsidies. This means that farming that promises positive environmental and health benefits for the population should be promoted. This could be achieved by linking agricultural subsidies to certain ecological thresholds or by promoting the production of alternatives to animal protein. In particular, agricultural subsidies that offer economic incentives to switch production from animal products to plant-based foods in a socially just manner are favourable. For example, the switch can mean a reduction in livestock numbers as well as a reduction in the export of meat and dairy products and live animals. This can include compensation payments, conversion premiums and career and retraining programmes (Graaf et al., 2021: 14). There should also be support available for the period after conversion that is equivalent to the subsidies previously received from the CAP.

Box 21

Agricultural subsidies for the conversion of production, Denmark

Farmers who want to grow plant-based food for human consumption instead of using it as animal feed will receive a bonus from the Danish government. In 2021 it was announced that thanks to a new initiative DKK 580 million will be made available over five years from EU agricultural funding (Repræsentation i Danmark, Europa-Kommissionen, 2021).

Support for the conversion of agricultural land, Belgium

Farmers who convert their previous land use to organic or natural utilisation receive support from the Belgian government. Half of the costs are covered. If the land is converted into a forest area, two thirds of the costs are covered. In 2022, the Flemish government set up an annual fund of 100 million euros for this purpose. The funds come from a climate fund (Steffens, 2022).

Support for the conversion of animal husbandry, Netherlands

In 2020, the Dutch government announced that it would provide financial support to farmers to make their farms more sustainable and innovative. Farmers close to certain protected areas will receive funding to switch from intensive to extensive livestock farming. Livestock farmers who stop production completely also receive money. In 2021, the coalition agreement presented the Rural Areas Programme, which aims to significantly reduce livestock numbers in the country. A total of 25 billion euros will be made available by 2035. The aim is to reduce livestock numbers by a third and, in particular, reduce nitrogen pollution (Ministerie van Algemene Zaken, 2020; Tweede Kamer, 2021:11).

3.3.2.1.2 Bonus programmes

Examples of bonus programmes include income-based or otherwise conditional food vouchers or cash transfers, school meals and supplementary programmes (Mozaffarian et al., 2018: 3). Bonus programmes are used as part of government nutrition support programmes, among others. These programmes aim to improve the purchasing power and access of low-income population groups and thus counteract inequalities. In this way, disparities can be combated.

They also utilise existing systems to improve nutrition and harmonise poverty reduction with health promotion and health policy (ibid.: 3).

However, there are also limitations to these bonus programmes. Often there are only limited guidelines or standards regarding the quality of nutrition and health. Government institutions may view them as costly social programmes without assessing short and long-term health benefits, health costs and productivity.

Mozaffarian et al. (2018: 3) recommend that all government food aid programmes should have mechanisms, standards and incentives for healthy, nutritious and culturally appropriate choices. These measures could improve the quality of the diet and promote the health of the population.

One study with test subjects from Spain points out that food vouchers for healthy food alone do not necessarily lead to a healthier diet and suggests combining them with medium-term dietary education (Miguel-Berges et al., 2022: 13). A study in France was able to show that an inadequate diet could be significantly improved through vouchers for fruit and vegetables for families in disadvantaged neighbourhoods (Buscail et al., 2019: 6).

Box 22

Healthy food support programme, United Kingdom

The National Health Service's *Healthy Start Programme* helps people on lower incomes, families with children under four and pregnant women to eat healthily. People receive a credit card that can be used to buy fruits, vegetables, pulses and milk, among other products. The credit is transferred to the card every four weeks (Healthy Start, 2023).

Support programme for fruit and vegetables, London, United Kingdom

In 2022, the UK government introduced a 3-year pilot project as part of the *Community Eatwell* scheme, which allows doctors to prescribe vouchers for fruit and vegetables as well as cooking classes and dietary education for people on low incomes. The project is being run in partnership with two charities in two London boroughs with high rates of chronic disease. Participants are prescribed vouchers worth between £6 and £8 per week, which they can redeem in supermarkets. The scheme was introduced as part of the food strategy on the recommendation of Henry Dimbleby. It has already shown good effects in other countries (HM Government, 2022: 205; Jarrett, 2022).

In addition, there are numerous programmes of this kind around the world that subsidise fruit and vegetables so that people with diet-related illnesses or people in remote areas have access to healthy food (Galloway, 2017; Galloway, 2014; DC Greens, n.d.).

3.3.2.1.3 Investments/Grant Funding

Investments and funding can be decisive in influencing the consumption of sustainable alternative products.

An analysis of the relevant factors has shown that the introduction of innovative alternative products correlates strongly with a reduction in animal products.

Government policies that support the research and dissemination of alternative products can also promote technical innovations in order to significantly increase the likelihood of a change in consumer behaviour (Jantke et al., 2016: 295).

(EU) Support of cultured meat, Spain

In 2020, a research project on cultured meat (in-vitro meat) was funded by the EU for the first time. As part of the *Horizon 2020* programme for research and innovation, the Spanish company BioTech Foods received funding of 2.7 million euros (Cordis, European Commission, n.d.).

Promotion of innovations, Netherlands

In 2022 the production of cultured meat was driven forward with government research support in the Netherlands. The Dutch government provided a total of 60 million euros from the National Growth Fund for this sector. The investment will be used to promote innovation, staff training and education. Alongside university professors, NGOs, start-ups and other stakeholders from the sector, the *Cellular Agriculture Netherlands* consortium was created and submitted the funding proposal (Cellulaireagricultuur, 2022).

Promotion of innovations, United Kingdom

In 2021 *Roslin Technologies*, a Scottish biotechnology company, has received a £1 million investment from the Transforming Food Production programme and the British Innovation Fund. The aim is to support the development and commercialisation of stem cell lines and help other food companies to produce cultured meat. The programme aims to reduce emissions from food production to net zero by 2040. This will be done by making production more sustainable and efficient (UK Research and Innovation, 2023; Glover, 2021).

Promotion of innovations, Sweden

In 2021, *Vinnova*, a government agency of the Swedish Ministry of Climate and Business, invested in innovations and new solutions aimed at increasing the competitiveness of the Swedish food sector and the ability to utilise resources sustainably. A total of 17 local and innovative projects are being funded by Vinnova, focussing on plant-based raw materials, in particular various legumes such as field beans, cereals, hemp, algae and mushrooms (Vinnova, 2021; Vinnova 2023).

For some animal products such as milk, yoghurt, cream cheese, cream, butter, sausages or minced meat, there are already established alternatives made from processed plant-based protein products. Alternatives for eggs or fish are less common (Alcorta et al., 2021: 2). Nevertheless, there is great potential to drive forward the innovation of sustainable food products, for example by optimising the sensory properties or nutritional value of alternative products (ibid.: 8).

Policymakers can support targeted research efforts in this area, for example through funding programmes and financial resources. As described above, the *Horizon Europe* research programme currently supports research into substitute products and cultured meat.

Research into and development of criteria for measuring the sustainability and environmental performance of agricultural production can also be helpful in order to subsequently align funding programmes with this assessment.

In their systematic review on plant-based innovations, Krzywonos et al. (2022: 15) emphasise the need for collaboration between companies and universities as well as the promotion of this collaboration.

To encourage innovation, establishing networks among niche pioneers and facilitating exchange can be beneficial. (Graaf et al., 2021: 11). In addition, niche assessments should be

carried out in order to record environmental, social and fiscal consequences and ensure long-term political support (*ibid*).

Finally, it should be mentioned that the promotion of civil society initiatives such as food councils or educational projects can also contribute to innovation and a change in awareness among the population (Graaf et al., 2021: 66).

3.3.2.2 Negative financial incentives

Negative financial incentives can be created through increased Value Added Tax and other levies.

3.3.2.2.1 Value Added Tax

Similar to subsidisation in the form of tax concessions, higher taxes on certain foods can be used to motivate consumers to opt out of purchasing these products (Spiller et al., 2017b: 221). These price policy measures, such as higher tax rates for animal-based foods and lower tax rates for plant-based foods, can encourage consumers to buy more plant-based foods. However, rebound effects can occur if consumers opt for lower-quality (and therefore cheaper) animal products. It is therefore recommended that the price of organically produced meat should not be burdened with taxes (Gawel, 2021: 41).

As part of the Farm-to-Fork strategy published in 2020, the EU Commission is writing about tax incentives to encourage consumers to opt for a sustainable diet. By adapting the VAT system, for example, member states can be enabled to promote fruit and vegetables from organic farming. In addition, food prices should take into account the actual costs of using finite resources or environmental pollution (European Commission, 2020c). The Commission submitted a proposal to set the VAT rate for (organically produced) fruit and vegetables at 0%. In October 2021, a majority of the EU Parliament voted in favour of the Commission's proposal. The member states are responsible for implementing the VAT adjustment. Compared to other negative financial incentives, a national change to the VAT rate can be implemented with comparatively little administration (Förster et al., 2021: 31)³⁵.

In Europe there are significant differences in the taxation of animal food products compared to plant-based food products. For example, in some European countries, animal products are taxed at a reduced rate compared to plant-based alternatives, such as plant-based drinks having a higher tax rate than cow's milk. Due to the health benefits of fruit, vegetables, pulses, etc., these products should be taxed at the lowest possible rate (in the best case, exemption from VAT) and animal food products should be taxed at the highest possible rate (German Environment Agency, 2017; Philipsborn et al., 2021: 3; WBAE, 2020: 26; Wunder et al., 2022: 56). Some countries, such as Italy or Germany, which have a reduced tax rate on meat and other animal products, should raise these tax rates to the regular rate and make plant-based meat and dairy alternatives more favourable by reducing taxes (German Environment Agency, 2017; Philipsborn et al., 2021: 3; WBAE, 2020: 25). For example, if the tax rate for meat and other animal products were to be raised from 7% to 19% in Germany, conservative estimates assume a decline in the consumption of animal products of around 2% to 3%, while other estimates predict a drop in demand of around 10% (Korteland et al., 2023: 28). If other foods such as fruits, vegetables and cereal products were to become cheaper at the same time, this effect would be even stronger (Umweltbundesamt, 2017; WBAE, 2020: 459, Förster et al., 2021: 35).

³⁵ Nevertheless, it is essential to note that regulations targeting domestic consumption impact only domestic consumption and imports, not exports. In contrast, regulation aimed at domestic production affects both domestic consumption of domestic products and exports, but not imported goods. A mix of measures that takes into account production as well as consumption and the cross-border movement of goods is therefore required (Gawel, 2021: 10).

Taxation of plant-based drinks and cow's milk, EU countries

While dairy products often fall under the reduced VAT rate and therefore receive indirect subsidies, cow's milk alternatives such as soya or oat drinks are taxed at a higher VAT rate in European countries. The country with the greatest difference in VAT rates is Italy with 4% for cow's milk and 22% for plant-based alternatives. Countries where plant-based drinks and cow's milk have the same tax rate include Belgium with 6% (Global VAT Compliance, 2022), Denmark with 25% (Avalara, n.d.), Finland with 14% (Vero Skatt, 2020), France with 5.5% (VATupdate, 2021), Ireland with 0% (Revenue, 2023), the Netherlands with 9% and Portugal with 0% (Bruxo, 2023).

It should be considered that in income- and wealth-unequal societies, financially disadvantaged population groups are disproportionately more affected by price policy measures. While high-income households can continue to buy the more expensive products after the tax increase, this is much more difficult for low-income households. This can lead to lower acceptance of these measures. Therefore tax increases sometimes come under scrutiny when considering social justice aspects. They should thus be supported by suitable social policy measures (e.g. sustainability premiums, increase in state transfer payments, subject support) (WBAE, 2020: 25 f.; 580). Government revenue from tax increases on animal products can be used for this purpose (IPCC 2022: 46). The sustainability premium in the form of a flat-rate refund to low-income population groups could increase the acceptance of the tax increase on animal products (WBAE, 2020: 580). The simultaneous tax concessions for healthy foods can cushion the unequal treatment through incentivising the purchase of healthy, cost-effective, attractive alternatives (WBAE, 2020: xiv).

3.3.2.2.2 Other taxes

There are other approaches for using negative financial incentives to reduce the consumption of animal-based foods and increase the consumption of plant-based products. In particular, a CO₂ tax, an animal welfare levy or a tax on saturated fats in food products are being discussed more intensively (Strnad, 2004: 1322; Broeks et al., 2020: 5 ff.; Caro et al., 2017; Gawel, 2021: 25 ff.)³⁶. It has been suggested that an increase in animal welfare and environmental protection standards can also indirectly lead to an increase in the price of end products. This suggestion has led to a debate as to whether the price increase should be borne by the production or consumption side, or by both (Leite Pinto, 2021:109 ff.).

One way of promoting plant-based products through pricing policies is the incorporation of environmental impacts by use of a CO₂ tax. The approach putting a price on CO₂ emissions in agriculture is based on the *polluter pays* principle. The aim is to create incentives for producers to adopt more environmentally friendly practices and minimise the environmental impact of their activities.

³⁶ Just like special levies, the taxes listed here fall under the generic term public-law levies (Fischer et al., 2021: 96). In this case, the "animal welfare levy" (in Germany "Tierwohlabgabe") does not refer to a special levy, but is technically and substantively designed as an excise duty, but is erroneously labelled "animal welfare levy". The text goes on to explain that this designation is intended to increase acceptance among the population.

CO₂ tax in agriculture, Denmark

Denmark's Prime Minister announced the CO₂ tax in the agricultural sector at the beginning of 2023 (Statsministeriet, 2023). This is justified by the need to meet the agreed upon climate targets. According to a report by the Danish Climate Council, a CO₂ tax could support the agricultural transition to more climate-friendly production methods (Klimaraadet, 2023: 4 f.). The tax would have a strong impact on cattle farming - as it is comparatively associated with high greenhouse gas emissions - and would promote the switch to pig farming or the cultivation of plant-based foods such as cereals (ibid.: 5). Outside of Europe, the New Zealand government also plans to put a price on agricultural emissions in order to reduce the country's emissions (New Zealand Government, 2022: 254).

In addition, a consumption tax is being discussed in which the environmental impact of food, such as CO₂ emissions, is paid for by consumers. Various global and national studies have analysed the possible effects of a CO₂ tax and come to positive conclusions: CO₂ emissions can be reduced, the quality of nutrition improved, the mortality rate lowered and healthcare improved (Leite Pinto, 2021:123; Broeks et al., 2020: 5 ff.; Caro et al., 2017).

If tax increases are implemented by taking into account the environmental impact of food, it is important to consider potential price substitution effects following in their wake. An example of this would be the following: A tax rate increase on beef (due to the comparatively higher environmental impact) results in people switching to cheaper chicken meat and therefore consuming the same amount of meat overall (see Spiller et al., 2017b: 205). These effects particularly affect people with low incomes or people in less affluent countries due to their limited economic room for manoeuvre. One solution to this unwanted result is to increase the tax of similarly unfavourable substitutes

Although the price elasticities are higher in this measure (a comparatively high effect is achieved with small tax increases), this can lead to unequal treatment of people with low incomes and to price substitution effects.

One example of an excise duty that emphasises animal welfare aspects is the so-called animal welfare levy³⁸, which is intended, among other things, to improve husbandry conditions and increase animal welfare.

Tax on meat, Netherlands

According to a survey conducted by the *True Animal Protein Price (TAPP) Coalition* in 2023, 59% of the more than 1.000 Dutch participants support the proposal to increase the price of meat by at least one euro per kilogramme of meat (True Animal Protein Price Coalition, 2023: 10). A proposal (based on a similar proposal by the *TAPP Coalition*) for fair pricing of meat (and cheaper fruit and vegetables) was submitted to the Dutch parliament by the Minister of Finance in 2020. It also included the calculation of costs and the impact on the environment (True Animal Protein Price Coalition, 2020a).

Animal welfare levy, Germany

In Germany, an "animal welfare levy" ("Tierwohlabgabe") was proposed in 2020 by the Competence Network for Livestock Farming, an expert commission set up by the Federal Ministry of Food and Agriculture (BMEL). The proposal called for an excise tax on every kilogram of meat sold. The revenue is intended to support farmers in improving husbandry

conditions. One of the proposals for financing this was to abolish the reduced VAT rate on animal products (Perino & Schwickert, 2023: 160; Kompetenznetzwerk Nutztierhaltung, 2020). A feasibility study commissioned by the BMEL confirmed the fundamental feasibility of this proposal. In 2022, the Competence Network for Livestock Farming reminded the Federal Government of its recommendation and gave an update on the topics of remuneration and financing of animal welfare, as there were no signs of implementation to date (Kompetenznetzwerk Nutztierhaltung, 2022). A proposal from the Ministry of Agriculture to increase the reduced taxation of animal products to the normal tax rate of 19% and to reduce the tax rate for plant-based foods such as fruits, vegetables and pulses to 0% was rejected in 2022 (Kapalschinski, 2022). A survey conducted in Germany in early 2023 showed that the majority of respondents (61.9%) would be in favour of a price increase of at least 10 cents per 100 g of meat (True Animal Protein Price Coalition, 2023: 10).³⁷

Another approach is to increase taxes on food products containing saturated fats.

Box 27

Taxes on saturated fats, Denmark

A tax on fatty foods was introduced in Denmark in October 2011. The tax was applied to foods containing more than 2.3 g of saturated fat per 100 g. This included meat and dairy products, animal fats such as butter, but also vegetable oils and fats such as margarine. The aim of the tax was to reduce the consumption of saturated fat to help reduce the prevalence of diet-related diseases. Following criticism regarding its controllability and the difficulty of ensuring non-discrimination between Danish and imported products, the abolition of the tax was announced in November 2012 (World Health Organisation 2015: 15 f.). An analysis showed that fat consumption fell by 10-15 %. It should be noted that due to the short data period, that interpretation should be made with care (Jensen 2013; Leite Pinto, 2021:109). Another study showed a reduction in sales of butter mixes, margarine, fat, cheese, sour cream and biscuits of 0.2-8.4% compared to the same period during the previous year. However, sales of butter, oil, cream, crisps and snacks increased by 0.1-11.7%. Overall, the total volume of the twelve food groups sold fell by 0.9% (Bødker, 2015).

Research has shown that certain policy features can increase public support for measures. These features include, for example, avoiding the labelling of a public levy as a "tax", constructive use of tax revenues, progressive taxation and a clear explanation of the intended effects of the measure (Carattini et al., 2018: 11; Klenert et al., 2018; Perino & Schwickert, 2023: 161). This is also the case in Germany: Perino and Schwickert (2023: 163) showed that a meat tax would be more likely to be accepted in Germany if it were called an *animal welfare tax*³⁶.

In general, it should be noted that higher taxes and other negative financial incentives can be met not only with a reaction from the population, but also with strong resistance and lobbying from industry (Mozaffarian et al., 2018: 3).

³⁷ A study by the Forum Ökologisch-Soziale Marktwirtschaft (FÖS) found that the introduction of a levy on red and processed meat, which would be collected directly from slaughterhouses or dairies, would have positive health effects and could lead to a reduction in meat consumption. The levies would be channelled into a fund that would be used to provide financial support for animal welfare measures on farms (Beerman et al., 2020: 59 ff.).

In an impact assessment of three different scenarios (VAT adjustment, animal welfare levy and climate cost surcharge³⁸) for Germany, Förster et al. (2021) concluded that, if the price signals are set correspondingly high, they contribute to reducing the proportion of animal products in the diet (Förster et al. 2021: 35; Gawel, 2021: 50). People on low incomes are expected to have the greatest reduction in the consumption of animal-based foods compared to their previous consumption (ibid.: 20, 23; Gawel, 2021: 41 f.). If the tax rate for plant-based foods is also reduced, a corresponding increase in the consumption of plant-based foods is to be expected.³⁹ A VAT reform would be the easiest measure to implement from an administrative point of view. However, a quantity-based animal welfare levy would be more administratively complex and would tax high-quality products in the same way as low-quality products (ibid.: 31). Such a consumption tax should be levied on consumers so that the costs would not simply be passed on to producers (ibid.: 35)⁴⁰. However, all scenarios conclude that the consumption of animal-based foods would still exceed the recommendations of the Lancet Commission after such a reform (ibid.: 18, 35). According to Gawel (2021), taxes borne by consumers would not have a direct impact on the production side, which is why a mix of instruments with an impact on both sides is required (Gawel, 2021: 10, 62).

It can be summarised that tax increases on animal foods should be accompanied by strong tax reductions on healthy foods (fruits, vegetables, pulses). This approach reduces financial regressivity and resistance from the population and industry and maximises the health effect. It also increases the acceptance of the measures, as subsidies for healthy foods are politically more feasible due to the reduction in loss aversion. Tax adjustments should be prepared in detail through the inclusion of information campaigns which emphasise the health and economic benefits of the tax adjustment. Tax increases must be cushioned by social policy measures. In the best-case scenario, tax savings can be used for this purpose and to subsidise fruits, vegetables and pulses.

3.4 Decision restriction

Decision restriction instruments are at the top of the "intervention ladder" (Spiller et al., 2017c, 270 ff.). Decision-making and consumption options are "restricted" in this scenario by adjusting the offer of the restaurant and catering sector as well as the retail sector. The level of intervention in the population's options for action is correspondingly high. This is where measures can be expected to have the greatest impact (Gillespie et al., 2015: 8 ff.) and, at the same time, comparatively lower acceptance by the population. The instruments can be divided into mandatory standards and bans

3.4.1 Mandatory regulations

Mandatory regulations can define certain requirements or quality standards in the form of laws, specific guidelines or standards. They are usually legally binding and can be linked to sanctions

³⁸ A tax levied on income in the form of an income tax is not analysed further, as a steering effect is not to be expected, as the price of animal-based foods is not increased (Förster et al. 2021: 32).

³⁹ In an example calculation for Germany, Förster et al. (2021) come to the conclusion that the reduced tax revenue from the tax reduction for plant-based products (from 7 % or in some cases, such as soya milk, 19 % to 5 %) could be less than the additional revenue from the simultaneous tax increase for animal products (7 % to 19 %) (Förster et al. 2021: 32; Postpischil et al., 2021: 6). Such a reform would therefore increase tax revenues by at least EUR 2-3 billion per year. It is important that the revenue is used constructively to increase public acceptance of the measure.

Various studies have come to the conclusion that the financial requirement to promote animal welfare in Germany, for example, is between 3.6 and 4.6 billion euros per year (in 2040) (Förster et al., 2021: 30).

⁴⁰ Gawel (2021) explains that export products would not be affected by a tax increase. Producers could therefore compensate for a decline in demand with increased exports (Gawel 2021: 44).

in the event of non-compliance. The offer of the restaurant and catering sector (including communal catering) and retail should be designed in such a way that it meets the increasing demand for plant-based food. This includes, for example, mandatory nutrition and quality standards in communal catering and maximum levels of certain ingredients or reformulation strategies.

Mandatory quality standards in communal catering can be introduced by state institutions with the aim of providing healthy food (Philipsborn et al. 2021: 27). The target areas differ from country to country, as does the nationwide obligation. They can relate to healthcare facilities, schools, kindergartens, educational institutions, canteens, events, vending machines and other points of sale. Public communal catering facilities are suitable for influencing the healthy diet of many people in a cost-effective and sustainable manner (Mozaffarian et al. 2018: 4). The favourable cost-benefit ratio and long-term effects are assumed but have not yet been sufficiently proven.

Many European countries have mandatory/regulatory quality standards for mass catering. In France, the UK (Department for Education, 2019), Germany and Hungary, there are mandatory quality standards for school catering or for food offered in schools (Philipsborn et al., 2021: 27). Additional programmes and measures such as *Farm to School* or school gardens can be used as a supplement (Mozaffarian et al. 2018: 4). Micha et al. (2018: 5 ff.) conclude in a meta-study that school meal standards increase the amount of fruit consumed. A more plant-based diet can be specifically promoted here in various ways (including a maximum limit for the amount of animal-based foods in meals, minimum offerings for vegan and vegetarian meals or the proportion of fruits and vegetables in meals, portion sizes and diversification) (Philipsborn et al. 2021: 17).

Box 28

Nutritional standards, Northern Ireland

In Northern Ireland, mandatory nutritional standards for employees and visitors to public healthcare facilities have been developed based on the *Eatwell Guide*. It stipulates that a vegetarian option with a protein source must be offered for every main meal. In addition, the portion size of processed meat is limited to 70 g (Food Standards Agency, 2023: 10; Philipsborn et al., 2020: 30).

Sustainable school catering, reduction of meat, Ghent, Belgium

The city of Ghent bases its school catering on sustainable criteria. It should consist of organic ingredients and seasonal products while respecting people, animals and the environment. Food waste and the welfare of humans and animals are also taken into account. On Thursdays, all meals are vegetarian, while on other days so-called *flex-meals* are served, in which the proportion of animal protein is limited to a maximum of 50% of the total protein content. Sustainable school meals are served to 4,500 pupils in schools and daycare centres in Ghent, amounting to 775,883 meals per year (Stad Gent, n.d.).

To achieve a greater effect, the federal, state and local authorities should also make the implementation of quality standards mandatory. It should also be ensured that all children are exempt from paying fees for daycare and school meals. This requires the provision of public funds, regular inspections, professional support and training programmes (Philipsborn et al. 2021: 14).

Quality standard, Germany

In Germany, the DGE quality standard for school meals is mandatory in the following federal states: Berlin, Bremen, Hamburg, Saarland and Thuringia (Nationales Qualitätszentrum für Ernährung in Kita und Schule, n.d.). In the quality standard for schools, one criterion for health-promoting and sustainable catering is the daily availability of an ovo-lacto-vegetarian⁴¹ option for all meals (Deutsche Gesellschaft für Ernährung, 2022a). This criterion also applies to the quality standard for company catering (Deutsche Gesellschaft für Ernährung, 2022b). Implementation of the quality standard has been mandatory in federal canteens since 2011 (Deutsche Gesellschaft für Ernährung, n.d.: 4).

Another option for promoting a plant-based diet in the restaurant and catering sector is a minimum requirement for vegetarian or vegan food options in communal catering that is regulated by ordinance or law, as is the case in Portugal and France. In particular, school catering plays a central role as a place of learning and an opportunity for integration and social participation.

Law leads to vegan food options in public (educational) institutions, Portugal

Public canteens in Portugal are required to offer a vegan food option due to a law having passed in 2017. This obligation applies to schools, universities, hospitals, prisons and other public buildings. Preceding the law, the Portuguese Vegetarian Society (AVP) launched a petition based on the approach of non-discrimination and equal treatment of citizens. To achieve this goal, it was beneficial to their approach that three stakeholders worked together over a period of almost two years: AVP, political parties and the Ministry of Health (specifically the Directorate General of Health). The Ministry of Health (DGS) published three guides recognising that a vegan lifestyle is safe and healthy. These guides were crucial for the law to be passed because the government could not deny that the vegan lifestyle is healthy (Alvim 2020; Assembleia da República, 2017).

Law on one meat-free meal per week in schools, France

The *EGalim* law, which was introduced in 2019 as a result of the French National Nutrition Conference, aims to improve the balance of trade relations and includes measures in favour of a healthy, sustainable and accessible diet for the population. It requires schools in France to offer a vegetarian (i.e. meat-free or fish-free) meal once a week. It is up to the school canteens to decide whether the dish is vegan or vegetarian. In addition, educational institutions with over 200 places must submit a multi-year plan for the diversification of the protein supply (including plant-based protein alternatives) to their committees (Laffineur-Pauchet, 2019; L'Assemblée nationale, 2023).

As mentioned above, maximum limits for the proportion of animal-based foods in the food on offer or in the overall offer can increase the relative proportion of plant-based products in public catering. According to Graaf et al. (2021: 16), maximum limits are a comparatively feasible political instrument.

There are examples of product reformulation strategies (changes to recipes) for trans fats and salt across the EU (European Commission, 2016: 1 ff.; Kloss et al., 2015: 17). Voluntary

⁴¹ In an ovo-lacto-vegetarian diet, milk and eggs are consumed alongside plant-based foods.

reformulation strategies by companies can also be beneficial. In Germany, some discounters and supermarkets have introduced a hybrid meat, a mixture of meat and plant-based ingredients, which, depending on the product, consists of up to 50% plant-based ingredients (Verbraucherzentrale, 2023; Eßer, 2022). However, Masset et al. (2016: 4 ff.) recommend a compulsory framework, as voluntary commitments have their limitations.

Furthermore, specifications on the area commitment of animal husbandry (livestock unit per hectare of land) are also among the requirements that favour a plant-based diet (Graaf et al., 2021: 16, 55-58).

3.4.2 Bans

In addition to mandatory regulations, bans are also measures that restrict decision-making. Compared to the other instruments, they represent the most far-reaching intervention in the population's choices and decision-making options and are not widely accepted, particularly in liberal democracies (Spiller et al., 2017b: 206; Jantke et al., 2016: 294 f.). Bans can include, for example, mandatory *veggie days*⁴² and bans on certain foodstuffs in schools (Pineda et al., 2022: 8; Kenning et al., 2021: 222).

Studies show that prohibitions have substantial and lasting effects (Fichtenberg, 2002: 2). There is a risk of reactance effects (the prohibited behaviour is compensated with other "harmful" behaviour) (Ungar et al., 2015: 253 f.; Taber et al., 2014: 3 f.; Taber, 2012; 256). However, these consequences do not inevitably occur, diminish over time and can be addressed through appropriate communication (Spiller et al., 2017b: 206).

One example of such a regulatory instrument are veggie days in the restaurant and catering sector. They can be introduced by government or institutional guidelines (Kenning et al., 2021: 222). In some countries, cities or institutions, a veggie day has already been introduced as a measure to promote a more sustainable diet.

Box 31

Veggie Day, Ghent, Belgium

The city council of Ghent has introduced Thursday as a vegetarian day for public canteens and extended it to primary school and kindergarten canteens. The campaign was launched in 2009 together with the Belgian vegetarian organisation (*Ethical Vegetarian Alternative, EVA*). Its aim is to motivate the population not to eat meat or fish at least one day a week for the benefit of their own health and that of the planet. The campaign was supported by the Council of Mayors and the entire city administration. During a public event in May 2009, Thursday was declared *Veggie Day*. The decision was justified by the fact that the implementation of a veggie day is in line with the city's climate and health policy and contributes to achieving the city's climate goals.

Following the launch of *Veggie Day* in Ghent, other Belgian cities followed suit, including Hasselt, Mechelen, Eupen and Brussels. *Veggie Day* has now also been implemented in cities in other countries, such as Freiburg, Bremen and Constance (Germany) and Graz (Austria). There are also *Meat-free Mondays* in São Paulo (Brazil) and Buenos Aires (Argentina) (Stad Gent, 2011; Unión Vegana Argentina, 2021; Tautscher, n.d.).

Compulsory Veggie Day in schools, Finland

As part of a study, a mandatory vegetarian day per week was introduced in 33 school canteens in Helsinki. Short-term negative effects were observed, such as a decrease in the

⁴² If a certain day is declared *Veggie Day* it means that certain foods or meals are not available on this day or only limited options are available (such as in canteens), this can be perceived as a kind of ban.

number of pupils participating in the school meals and a higher amount of waste on the plates. However, in the long term, the vegetarian day seemed to meet with acceptance, as the amount of waste decreased. In addition, the demand for vegetarian dishes increased on the days when meat or fish was also served (Lombardini & Lankoski, 2013: 160 f.).

There are similar initiatives and resolutions at city and federal level in Europe, even though they do not use the name Veggie Day.

Box 32

Meat and fish one day a week in schools, Tübingen, Germany

Following the hiring of a new tender for school lunches by the city of Tübingen, schools now serve meat or fish only once a week. In doing so, the city is following the recommendations of the German Nutrition Society. The aim is to offer children healthy and sustainable meals and to reduce CO₂ emissions (Tübingen Universitätsstadt, 2021).

Vegetarian meals at daycare centres and primary schools, Freiburg, Germany

In 2022, the majority of Freiburg's municipal council decided to exclusively provide vegetarian meals in daycare centres and primary schools. One of the arguments put forward was that meat is a cost driver. Vegetarian meals could reduce the financial burden on parents. The state Ministry of Food, Rural Areas and Consumer Protection criticised the decision, arguing that a balanced diet should also include meat (ZDF, 2022; Soldt, 2022).

Meat-free dishes and *Planet Friendly Menus*, Leeds, United Kingdom

Leeds City Council is campaigning for more sustainability in school catering. Meat-free meals are offered two days a week in 182 schools. There are also *Planet Friendly Menus*, which contain more plant-based protein and less meat and dairy products. The city helped develop the new menus with the involvement of the pupils. According to a survey, the meat-free days have been met with acceptance (Eating Better, 2022).

Purely plant-based food at events, city councils of various cities, United Kingdom

Councillors from various cities in the UK have decided that only plant-based foods will be offered at internal (council) events. They want to serve as best practice. Participating are councils in the cities or districts of Exeter, Lewisham, Faversham, Hythe, Oxford and Oxfordshire (as of 2023). Other councils have spoken out in favour of promoting a plant-based diet by offering vegan or vegetarian dishes at public events (Oxfordshire County Council, 2022; Munro, 2023).

No meat or fish at official events organised by the Federal Ministry for the Environment, Nature Conservation, Nuclear Safety and Consumer Protection, Germany

As part of the *Federal Government's sustainability action programme* (2.2.3 National sustainability and climate strategies), the German Federal Government published *Guidelines for the sustainable organisation of events* in 2015, which organisers of official events can use as a guide. The guidelines were revised in 2020. According to the current version, vegetarian and vegan products should be used for catering. The Federal Ministry for the Environment,

Nature Conservation, Nuclear Safety and Consumer Protection⁴³ has already implemented this since 2017 and has refrained from using meat and fish (BMU, 2020: 33; Spiegel, 2017).

In addition to bans on the supply of animal products in meals served by public institutions, there are also bans aimed at restricting the production of meat.

Box 33

Closure of high-emission farms, Belgium

In order to reduce nitrogen pollution, the Flemish government decided in 2022 that forty farms with particularly high nitrogen emissions would have to close by 2025. The companies will receive compensation. Other pig and poultry farms must reduce their emissions by 60% by 2030.

The government's goal is to reduce the pig population by a third by 2030 (Steffens, 2022).

3.5 Summary of policy instruments

This chapter presented a variety of policy instruments to promote a plant-based diet which can be implemented at EU, national and municipal level. Examples of implementation from Europe were listed. The examples show the immense potential of the political measures and instruments and prove that implementation hurdles can be overcome.

Data collection and monitoring as well as educational and informative support services for the population form the basis for policy interventions. Information campaigns sensitise people to the importance of the issue and thus to subsequent more far-reaching measures. This facilitates the acceptance of tougher measures afterwards. The combination of information campaigns with behavioural economic instruments (e.g. nudging), educational components, didactic instruments and inclusion of the social norm brings greater benefits. Food-based dietary guidelines should correspond to the current state of scientific knowledge, hence they should also include climate protection measures and be aligned with the Planetary Health Diet. Support services for many different stakeholders, from consumers and patients to nutritionists and professionals in canteens and kitchens in institutions such as schools, hospitals and businesses, make it possible to switch to a more plant-based diet: this includes dietary education, training and further education, nutrition counselling, apps and labels. Bans on the advertising of unhealthy and climate-damaging animal-based foods and the restriction of unfair advertising ensure transparency and better-informed decisions. Preparing food environments through nudging helps to move consumers in the direction of healthier and more sustainable food with a greater plant-based content. The health and environmental impact of food should be reflected in its price. To this end, there are a number of options for positive and negative financial incentives to promote the consumption of plant-based foods. Agricultural subsidies should be based on environmental performance. The promotion of environmentally harmful subsidies should be ended. Tax increases for animal-based foods should also be socially cushioned. Regulatory interventions in the form of mandatory regulations and bans, such as nutrition standards/quality standards and the regulated minimum supply of plant-based foods as well as a maximum supply of animal-based foods in communal catering will ultimately have a relatively high effect and should be well prepared by prior awareness-raising measures.

⁴³ Until December 2021: Federal Ministry for the Environment, Nature Conservation and Nuclear Safety, thereafter Federal Ministry for the Environment, Nature Conservation, Nuclear Safety and Consumer Protection (Bundeskanzler, 2021: 2).

Policy makers can select from the range of instruments available those instruments that best fit their context and objectives, and use a well-coordinated mix of instruments to create a favourable framework for a plant-based diet among the population. A successful shift towards a more plant-based diet also requires active cooperation between political decision-makers and actors from civil society, agriculture, the private sector and research.

4 Conclusions

The scientific evidence and data show that a plant-based diet can make a significant contribution both to human health and to reducing greenhouse gas emissions as well as ease the pressure on natural resources. The aim of this paper was to present policy strategies and instruments to promote a plant-based diet in Europe.

Policy strategies and instruments at the municipal, regional, national and supranational level in European countries show that there is a growing interest and awareness of the importance of sustainable and healthy diets. Although the concrete implementation and degree of promotion of a plant-based diet vary in this context, the diversity of measures indicates that policy makers have recognised that a plant-based diet can make a decisive contribution to overcoming challenges such as climate change, biodiversity loss and lack of health promotion.

At the international level, particularly in the European Union, there is still a reluctance to mention a plant-based diet by name in policies, but the Farm-to-Fork strategy could potentially bring positive change. It is important that the promotion of a plant-based diet is included in the policy discourse at the EU level to ensure a coherent and effective strategy to achieve sustainability goals.

At the national level, some countries have developed food and nutrition policy strategies that sometimes still leave room for greater integration of measures to reduce the consumption of animal-based foods and promote a plant-based diet. Individual strategies or processes that have led to the creation of these strategies can serve as models for other nations.

Strategies at the regional and municipal levels are particularly promising: These strategies for the regional supply of sustainable, environmentally friendly and healthy food often take a holistic approach and take into account local and regional structures. The strategies include more ambitious goals and have the potential to serve as models for other regions. Resources such as the *Milan Urban Food Policy Pact* can help decision-makers to develop and implement effective measures. It is critical that policymakers at all levels work together using the scientific data to drive coordinated and evidence-based policymaking.

The promotion of a plant-based diet also requires a coherent mix of instruments. A wide range of measures can be chosen from, depending on the country of implementation and level of government. Data collection, monitoring and informative support services form the basis for food policy interventions. Information campaigns sensitise the population to the topic of plant-based food and facilitate the acceptance of further measures. Food-based dietary guidelines should take into account the state of scientific knowledge and climate protection. Support services such as dietary education, training and further education, nutrition counselling, labels and apps make it easier to switch to a plant-based diet. Advertising bans on unhealthy and climate-damaging animal products, the restriction of unfair advertising as well as targeted nudging in food environments steers consumers towards healthier and more sustainable options. Agricultural subsidies should be based on environmental impact and the promotion of environmentally harmful subsidies should be ended. Food pricing should take health and environmental impacts into account and financially incentivise toward the consumption of plant-based products. Regulatory interventions such as nutrition standards and minimum and maximum food offerings in communal catering have a high impact and should be supported by prior awareness-raising measures.

To summarise, it can be said that policy strategies and instruments at the municipal, regional, national and supranational levels in European countries offer promising approaches and ways to promote a plant-based diet. Their implementation requires political will and decisive action. Experiences demonstrate that obstacles can be overcome, leading to significant progress in nourishing the population. The examples of applications listed in this report can serve as a guide

for new strategies and measures and still leave room for further development and greater promotion of a plant-based diet. More intensive co-operation and pan-European exchange can be beneficial.

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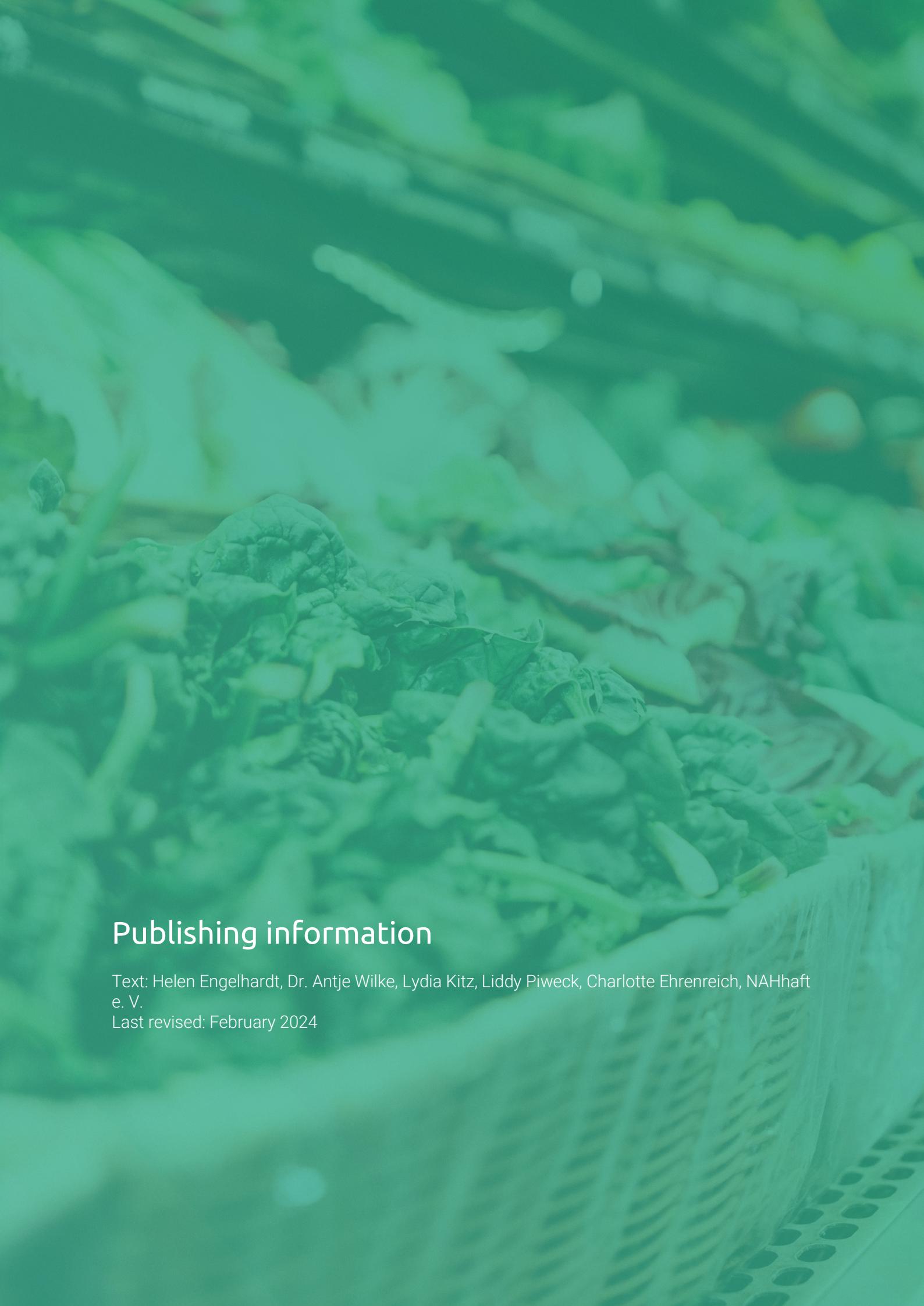
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