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Sustainable Food Production and Consumption

Edited by
Ada Margarida Correia Nunes Da Rocha and
Belmira Almeida Ferreira Neto

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Article

Mapping Sustainable Diets: A Comparison of Sustainability References in Dietary Guidelines of Swiss Food Governance Actors

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Abstract: With the growing recognition of the food system for a transformation toward sustainability, there is a need for future guidance on food consumption and policy. In particular, dietary guidelines (DGs) have received increasing attention as potential tools for enabling transformative change. This paper analyzes how and to what extent different state and non-state actors in Switzerland incorporate sustainability aspects in their dietary guidelines. It examines how these DGs account for different dimensions at the basis of sustainability thinking, including the classic environmental, economic, and social dimensions as well as issues of health and governance. Our analysis shows the explicit inclusion of sustainability aspects in all DGs of the chosen actors in Switzerland, addressing at least one sustainability category predominantly. Through the analysis of the different stakeholders, different areas of focus become apparent, with each stakeholder covering specific niches of sustainability. On this basis, the transformative role of non-state actors in developing the concept of sustainable diets is discussed.

Keywords: sustainable diet; sustainable dietary guidelines; qualitative content analysis; sustainable food systems; food governance

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1. Introduction

Confronted with anthropogenic challenges, humanity urgently needs to begin operating within planetary boundaries—nine biological and physical thresholds that define the "safe operating space" for humanity [1]. By 2015, four of the planetary boundaries (climate change, biosphere integrity, biogeochemical flows, and land-system change) had already been exceeded or are at risk [2]. The current food system is key to this: Food system dynamics have adverse consequences on planetary and human health [3] and are responsible for 21–37% of total anthropogenic greenhouse gas (GHG) emissions [4]. Agriculture, in particular, is not only a significant contributor to climate change but also the greatest driver of transgressions of other planetary boundaries: biosphere integrity and biochemical flows (related to human-induced changes in global nitrogen and phosphorus cycles), along with land-system use, and freshwater use [5]. The unsustainability of the food system is also critical [6] as the world will face increasing food quality and food security challenges in the coming decades [7]. Consequently, improving human and planetary health, while ensuring food security, requires a shift to more sustainable food systems [8].

The challenge of a sustainability-oriented food system transformation concerns all phases of the food value chain from production through distribution to consumption [9]

and involves the engagement of multiple state and non-state actors [10–13]. Food consumption and, in particular, dietary patterns are increasingly seen as key levers for such a transformation and are increasingly moving into the focus of political and scientific attention [8,14,15]. For example, the EAT-Lancet Commission concludes that improvements in food production can reduce agricultural GHG emissions only by about 10%, while dietary shifts display a reduction potential of up to 80% [16]. According to the IPCC (Intergovernmental Panel on Climate Change), there is a climate change mitigation potential of up to 8.55 Gt CO2e in 2050 from dietary change and reduction of food waste, while only a maximum of 4.6 Gt CO2e can be achieved by supply-side interventions in agriculture [17]. Beyond being only of significance for the environment, changes in nutritional patterns can equally benefit human health and well-being.

While there is broad agreement on the need for more sustainable diets [3,6,8,18–20], the comprehensive definition of sustainable dietary recommendations, that are operational at the consumer level, is still at an early stage [21,22]. The often-cited definitions of sustainable diets are still very general, and not operational at the consumer level. FAO defines sustainable diets as those "with low environmental impacts which contribute to food and nutrition security and to healthy life for present and future generations [. . .] protective and respectful of biodiversity and ecosystems, culturally acceptable, accessible, economically fair and affordable; nutritionally adequate, safe and healthy; while optimizing natural and human resources" [23] (p. 83). This aspirational definition leaves room for different understandings in research and policy of what constitutes a "sustainable diet", resulting in varying approaches and recommendations for food system transformations. On the one hand, this has to do with the complex embeddedness of diets within the food system, the contestedness of the concept of sustainability itself or the way it is operationalized in food system research [7]. On the other hand, it reflects the increasing politicization of food and, among other things, the associated expansion of the food governance landscape. In addition to governments, other actors from health, business, and civil society are increasingly involved in shaping food governance. They not only play active roles in specific policy processes, but also engage in less tangible ways by developing and disseminating food-related norms and knowledge [24].

With the overall goal of elucidating the societal debate on "sustainable diets", this paper aims to empirically capture the different understandings of the concept held by different actors. Drawing on the example of the Swiss food governance landscape, the paper examines how different food governance actors refer to sustainability in their "dietary guidelines" (DGs). These are broadly defined as norms and knowledge about good nutrition practices that are publicly communicated by food governance actors in the form of recommendations or reports. In our focus are the core statements of the DGs of five actors–the Swiss government, Nestlé, the World Wildlife Fund (WWF), EAT-Lancet Commission, and Schweizer Verband Volksdienst (SV) Group Switzerland. We ask: How do different stakeholders in the Swiss food governance landscape conceptualize sustainable diets in their dietary guidelines? To answer the question, we employ a combination of qualitative and quantitative tools to capture content and to comparatively map it along five sustainability dimensions.

With this study, we make a twofold contribution to the study of sustainable diets. First, by broadening the view beyond official government DGs toward informal ones, we sharpen the understanding of differences and commonalities between interpretations of sustainable diets in a pluralized food supply landscape. Second, we assess sustainable diets from a multi-dimensional understanding, that adds health and governance to the three traditional dimensions of sustainability, namely environmental, social and economic. With this approach, we attempt to map the complexity of sustainability considerations in food systems.

Our argument unfolds as follows. In the next section, we briefly position the object of our analysis, dietary guidelines, by discussing their potential in sustainability-oriented food system governance. Section three presents our research materials and the methodological

approach we applied for studying sustainability in dietary guidelines. In the Results section, we outline the stakeholders' sustainability considerations at the category level, and then discuss the codes within the categories in more detail, highlighting similarities and differences between the stakeholders' approaches. We then discuss the implications of our findings for the governance of sustainability-oriented transformations of the food system. We conclude with perspectives for future research on the role of dietary guidelines for food system transformations.

2. Background: Dietary Guidelines in a Changing Food Governance Landscape

The literature about dietary guidelines (DGs), also called nutritional guidelines or food-based dietary guidelines (FBDGs), often refers to the official dietary recommendations released by country governments. While we build on these previous developments, we also will argue for expanding the research focus of dietary recommendations to those provided by nongovernmental food governance actors.

Dietary guidelines were originally created with the purpose of providing recommendations from the government to the population on what constitutes a healthy diet. DGs are the basis of health policy and nutrition education, aimed at promoting population health and preventing diet-related diseases [25]. Gradually, the guidelines have moved from nutrient intake recommendations to food-based recommendations, designed to be easily understood, often visual [25]. The idea of food-based dietary guidelines (FBDGs) was born at the Joint FAO/WHO consultation in 1995, with the aim of making dietary recommendations more accessible to the general public who think in terms of foods instead of nutrients [25]. Thereafter, FBDGs has become the common term when referring to country official DGs.

In recent years, the potential of DGs to address the multiple challenges of sustainability in food systems has attracted increasing interest [18,19]. A growing body of literature continues to call for expanding the scope of DGs to sustainability-oriented dietary recommendations as a potential tool to address the unsustainability of the food systems and eating habits [10,18,19,26,27]. In fact, several countries have incorporated sustainability aspects in their DGs [16,18]—beyond the original focus on health and nutrition only. However, the "sustainabilization" of dietary guidelines has faced some reluctance, and the number of countries that have done so remains limited to date [18,28,29]. Furthermore, findings suggest that policies to mitigate climate change and related international climate agreements are inconsistent with the official dietary recommendations of most countries [27].

In terms of impacts, empirical evidence has shown that adherence to official DGs is low in many countries, including Switzerland [30–32]. Switzerland, along with other countries such as Argentina, Australia, Greece, Honduras, Portugal, and the United Kingdom, is among the 28% of countries that fulfill none of the recommendations of their FBDGs. In view of the limited steering effect of DGs on the food consumption behavior of most individuals, it cannot be expected that the inclusion of sustainability aspects in the guidelines will automatically lead to sustainability-oriented change in population diets.

However, the role of DGs for food system transformation goes beyond their capacity to steer consumer behavior directly. On the one hand, DGs can influence government investment as food policies and programs are often required to be guided by official dietary guidelines. DGs have been found to influence policy and program implementation in different sectors and settings, from educational campaigns and food procurement for hospitals, schools' menus, and vending machines, to food security and agricultural programs aimed at encouraging farmers to grow foods recommended in official DGs [26]. At their full potential, they guide both the public and policy makers to develop health and agricultural policies and interventions, public procurement standards and regulations, food marketing and advertising, and labelling [26,28]. On the other hand, there is some evidence about the signaling function of a food policy change towards sustainability. When policy change is communicated to the public, for instance, it increases consumer acceptance of the eating

behavior that the new policy aims to promote [33]. Dietary guidelines have therefore proven as a key component of food policy—despite their limitations in regard to their direct impact on consumption behavior.

In light of recent developments in the food governance landscape, however, the focus on the role of official dietary guidelines for a sustainable transformation of the food system seems too narrow [34]. While food has long been considered an apolitical issue managed in closed circles by administrative experts and interest groups, we are witnessing a wave of politicization of food over the past two decades [35], accompanied by a growing pluralization of the food governance landscape [10–12]. An increasing number of non-state actors are attempting to shape food governance at all stages of the food system, from production to consumption [3]. In addition to already established major food companies and related organized interest groups [10], actors such as environmental NGOs, food movements, consumer networks, and research networks have entered the scene [10,36]. These actors play an increasingly important role not only in "hard" policy-making processes related to food issues, but also in "soft" shaping of food-related practices. They create and disseminate knowledge and norms on good food practices and behaviors into societal discourses and governance arrangements [37]. In doing so, they offer new potentials for strengthening sustainability aspects due to their heterogeneous interests and positioning in the food field. Particularly with regard to emerging discourses such as "sustainable diets", these actors can be expected to try to play a shaping role by contributing their own visions and ideas. To address this pluralization of food governance, we broaden the understanding of dietary guidelines to include all types of norms and knowledge about what, when, and how to eat that are given in recommendations and reports by different actors. Expanding the focus to include dietary recommendations from nongovernmental actors offers the potential to take a fresh look at the definition of "sustainable diets" and open up new entry points for shaping sustainability-oriented change in dietary habits and the food system as a whole.

3. Materials and Methods

3.1. Selection of Stakeholders and Dietary Guidelines

This study investigates the extent to which the DGs promoted by various actors in Switzerland relate to sustainability (see Appendix A for an overview of the data). In a first step, we identified relevant actors in the Swiss food landscape by using purposive sampling to capture a selection of information-rich cases from key theoretical constructs of food system governance. Switzerland is an interesting example for examining sustainability-oriented food system transformation given its clear commitment to the 2030 Agenda [38,39] and its international outreach. The country is the home of important international organizations shaping the food system, several large international food companies and one of the largest civil society conservation organizations. In the process, we attempted to cover a multitude of sectors within food system governance. Selection within each sector was based on the following criteria: First, we selected the stakeholder with the largest sphere of influence within a sector. After identification, it was examined whether the stakeholder provides dietary guidelines or recommendations in English or German that are accessible to the general public and are not older than 2015, except for the official FBDG of Switzerland, the current version of which was published in 2011. The selected guidelines contain a range of information and recommendations on nutrition and food, such as reference intake values and dietary suggestions. This indicates that stakeholders are involved in the creation and dissemination of norms and knowledge about food/eating behaviors. Two researchers independently reviewed the websites of the stakeholders. When a search function was available, we searched for the following keywords: "diets", "diet", "dietary guidelines", "recommendation", "dietary recommendation", "guide", "plate", and "food". Inconsistencies in inclusion were resolved by consensus, and an exchange with the various stakeholders took place in the form of interviews and/or correspondence on the selection of appropriate and representative guidelines. In cases where multiple recommendations from

a stakeholder met the inclusion criteria, all of these guidance documents were included in the analysis to provide the most comprehensive picture possible. On the basis of the preliminary data collection and data analysis results, we reviewed and revised our data and used the newly discovered information to make future guideline selections [40].

The final selection includes the Swiss government, Switzerland's largest nature conservation organization WWF, Switzerland's largest community catering company SV Group, the largest food and restaurant company worldwide Nestlé (according to a 2019 ranking), and the international research organization EAT-Lancet Commission that serves as a reference point for sustainability-driven dietary guidelines. Table 1 provides an overview of the guidelines origin, year of publication, language, and the sector to which the selected stakeholders belong.

Table 1. Selected dietary guidelines of stakeholders categorized by the food sector.

Stakeholder	Sector	Guideline	Language	Year
Swiss Government	Government	Eating well and staying Healthy Swiss Nutrition Policy 2017–2024	English	2017
		Swiss Food Pyramid	English	2011
		Der optimale Teller	German	2018
Nestlé Switzerland/ International	Private Sector (Food Company)	Nestlé's Net Zero Roadmap	English	2020
		Nestlé in der Schweiz	German	2019
		The Balanced Plate–day by day	English	2017
WWF Switzerland/ International	Civil Society	Bending the Curve: The Restorative Power of Planet-Based Diets (WWF International)	English	2020
		Factsheet–Umweltgerechtes Essen–der Erde zuliebe (WWF Schweiz)	German	2019
SV Group Switzerland	Private Sector (Community Catering)	Nachhaltigkeitsbericht (extended online version)	German	2020
		SV Restaurant Kundenbroschüre	German	2018
EAT-Lancet Commission	International Organization	Diets for a better Future: Rebooting and Reimagining Healthy and Sustainable Food Systems in the G20	English	2020
		Healthy Diets from Sustainable Food Systems–Food Planet Health	English	2020

3.2. Measuring Sustainability in Dietary Guidelines

We followed a three-step approach for the generation of the code book (Table 2) to assess the DGs for its sensitivity in different dimensions of sustainability. First, we identified various interpretations and definitions of sustainable diets in relevant literature, official reports, guidelines, and various forms of documents from private, academic, and public institutions on nutrition, food systems, and sustainability. Search criteria included publications up to 2021. The following keywords inspired our search: "food system(s)", "sustainable diet(s)", "sustainability" or "sustainable", "food-based dietary guideline(s)", "dietary guideline(s)", "nutritional guideline(s)".

In the next step, we used inductive reasoning to develop overarching categories for sustainable diets. This categorization enabled us to summarize the data to illustrate the most critical points within the texts [40]. The inductive proceeding revealed two other categories, governance and health, which are closely related to the food system [7,41–44] —in addition to the generally accepted categories of economics, social, and environment which were deduced from the sustainability literature. The first three categories represent Brundtland's triangular model for sustainable development that integrates social, economic, and environmental dimensions [44]. Despite illuminating the essence of sustainability thinking, they fail to address the other aspects—health and governance—that are central

to diet since food consumption has direct health impacts and is embedded in a complex governance landscape [15].

We then divided these five overarching categories into subcategories [45], which are referred to as codes in this analysis. Codes were created during the process in line with the inductive study design [46–48]. As this is an interpretative act, the coding process was repeated several times equally by both researchers—the two first authors—until saturat ion was reached [49]. By use of the software Dedoose (v. 8.3.41; University of California, Los Angeles, CA, USA), all pertinent excerpts were marked, labeled with codes, and assigned scores. The excerpts were generated in the form of words, phrases, and sentences [49], and the codes applied were based on frequency. We did not differentiate between word forms, e.g., "educate" and "education" were coded the same. In addition, we coded implicit and explicit mentions of codes in the text passages. This is illustrated in Appendix B, where the code is applied first to the statement and then the code's level of presence is scored. Quantification by scoring was used as an instrumental step towards visualization of the different profiles (Table 3). Quantification condensed the data into a visually instructive form and rendered the content of guidelines comparable in the context of new players entering the food landscape. Ultimately, each category was combined into a single value, resulting in spider-webs.

The analytical framework and the methods proposed can be easily applied as a screening tool to assess the sustainability quality of DGs in other contexts beyond Switzerland.

Table 2. The code book for sustainable diet assessment.

Category	1. Environment	2. Social	3. Economics	4. Health	5. Governance
Definition	Denotes living within the carrying capacity of supporting ecosystems while meeting human needs [50].	Driving forward social progress for all with socio-economic conditions that are fair and affordable; nutritionally adequate, safe, culturally acceptable, and accessible while empowering animal welfare and gender equality [4].	Practice that reinforces social and environmental objectives considered in relation to trade, industry, and the creation of wealth [4].	Comprises the essential food groups for growth and good health as well as being of complete physical, mental, and social well-being [4]	Denotes the totality of instruments and mechanisms available to steer a society collectively [51].
Code	1.1 Climate Change	2.1 Community	3.1 Affordability	4.1 Well-being	5.1 Certifications and Standards
	1.2 Biodiversity	2.2 Culture	3.2 Cost	4.2 Fruits and Vegetables	5.2 Transparency
	1.3 Land use	2.3 Pleasure	3.3 Labor Rights	4.3 Animal-based Protein	5.3 Regulation
	1.4 Water use	2.4 Animal Welfare	3.4 Sustainable Production Patterns	4.4 Plant-based Protein	5.4 Food Security
	1.5 Soil	2.5 Ethical Buying	3.5 Technology and Innovation	4.5 Tubers or Starchy Vegetables	5.5 Justice
	1.6 Animal Agriculture	2.6 Gender Equality		4.6 Whole Grains	5.6 Education
	1.7 Origin			4.7 Liquid (Unsweetened Drinks)	5.7 Directives
	1.8 Food Waste			4.8 Sweets, Salty, Snacks and Alcoholic Drinks	5.8 Science
	1.9 Energy use			4.9 Dairy Products	
	1.10. Aquatic Ecosystem				

Table 3. Scoring system.

Scale	Definition
0 = not mentioned	Absence of the code.
1 = briefly mentioned	The code is only vaguely mentioned in the text, with only a word or short phrase referring to the feature.
2 = well expressed	The statement consists of a clear clarification of the code that is explained or elaborated within the excerpt and is substantiated with figures, graphs, facts or details.

4. Results

4.1. Overview of the Sustainability Profiles of Dietary Guidelines

The following section unravels how sustainability is captured in different dietary recommendations by different stakeholders. We use these sustainability references as a proxy for understanding sustainable diets. Our method does not assign distinct weights to our proposed five dimensions of sustainability. However, this does not necessarily imply a normative stand about the need to include each aspect of diet sustainability in equal proportions within DGs. Therefore, our visualizations should be interpreted as descriptive tools to illustrate how stakeholders compare to each other and not as a normative tool to show how they compare to an ideal, balanced version of sustainable DGs. The majority of stakeholders communicate a one- or two-dimensional view of sustainability (Figure 1). There are distinct aspects of sustainability associated with each stakeholder's DGs, each with niche-specific considerations. The Swiss government places a strong focus on the health aspect of dietary recommendations (Figure 2), which accounts for 62% of the total coded content. Next in line is governance, at 27%, which leaves little room for the other three categories, all below 10%. The government does not focus on environmental considerations within their recommendations. In contrast, Nestlé's guidelines are dominated by the category environment, amounting to 54%; the following categories are economics with 20% of coded content and governance with 17% (Figure 3). Half of the WWF guidelines' content focuses on the environmental implications of dietary choices. Governance accounts for close to a quarter of the coded content, while health has slightly lower coverage with 18%. The economics and social categories are briefly addressed with short substantiation (Figure 4).

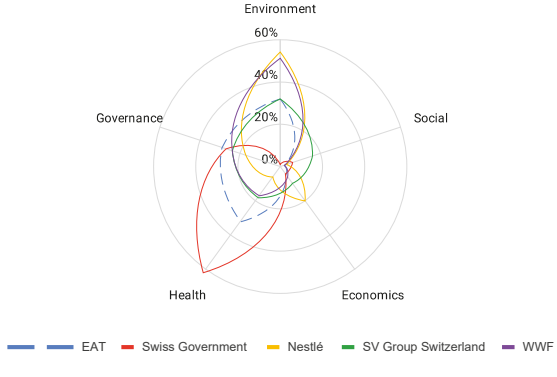

Figure 1. Profiles overview.

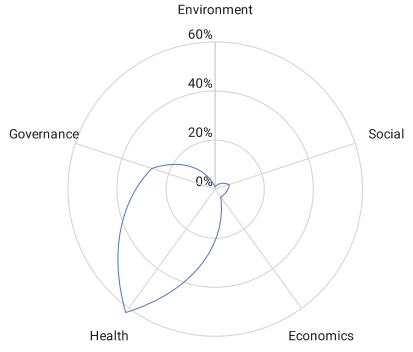

Figure 2. Swiss government profile.

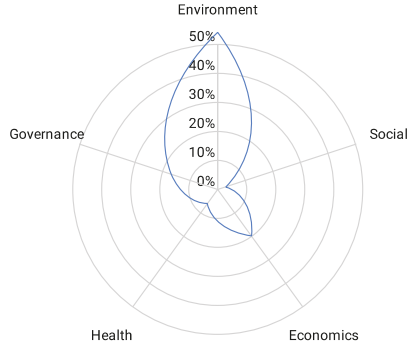

Figure 3. Nestlé profile.

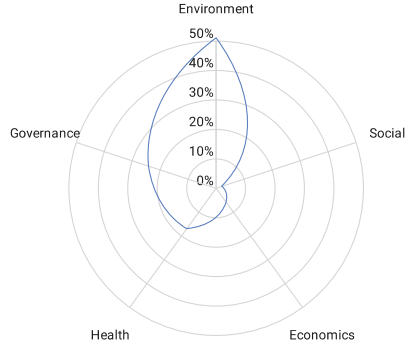

Figure 4. WWF profile.

SV Group Switzerland primarily focuses on the environment category with 32%, accompanied by governance with 24% and health with 18%. Overall, SV Group's profile is fairly balanced, covering all five categories with at least 10%, which differentiates it from the other stakeholders (Figure 5). Finally, the analysis of EAT-Lancet Commission's guidelines show that the categories environment and health are equally covered by 32% of the coded content. Governance follows them slightly behind with 29%. Social and economics categories together account for only 7% of the content (Figure 6).

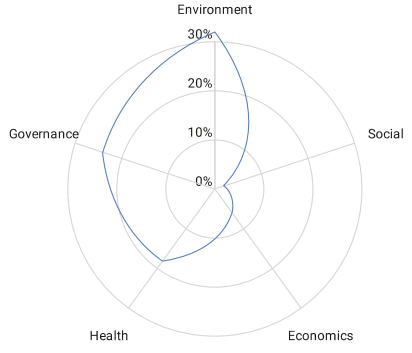

Figure 5. SV Group profile.

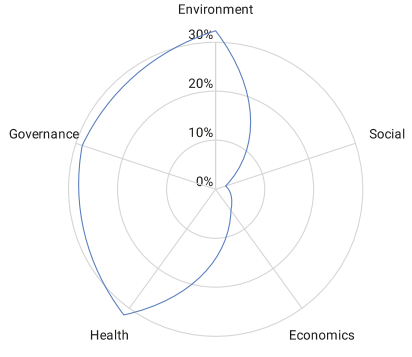

Figure 6. EAT-Lancet Commission profile.

4.2. Similarities and Differences of Sustainability References in the Dietary Guidelines

Overall, dietary recommendations are predominantly framed in reference to health, environmental, and governance considerations, while relatively little attention is paid to social or economic aspects (Figure 7).

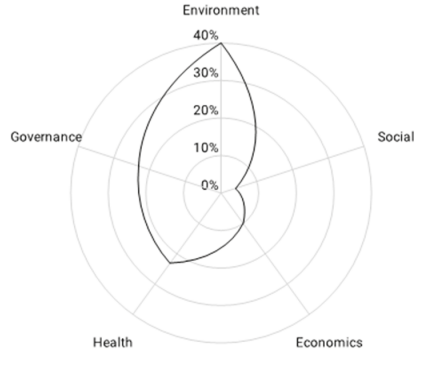

Figure 7. Sustainable diet framework, accumulated score of all documents reviewed (n = 12).

The analysis reveals that the environment category is the top coded category (40%) of the guidelines overall (Figure 7). The focus of stakeholders in the environmental category depends on the food sector they operate in, resulting in them emphasizing different aspects in their sustainability approach in terms of environment (Table 4). The stakeholders cover a multitude of codes, except for the government. While the Swiss government and SV Group Switzerland emphasize consumer-side recommendations, such as choosing regional and seasonal food, Nestlé and WWF focus on production aspects such as land use. As Nestlé is a food production company and WWF a nature conservation organization, this focus on land use is connected to their respective activities. In the guidelines addressed explicitly to Switzerland, there is a pattern of including the environmental impact of food origin that is absent when aiming for an international audience (e.g., Nestle's Net Zero Roadmap or EAT-Lancet Commission's Food Planet Health). Guidelines directed at an international audience focus on the supply chain and logistics of food distribution. All the stakeholders stress the food system's role regarding climate change besides the Swiss government. The actors communicate climate change as a target variable mainly to reduce GHG, while other environmental codes are largely communicated as an influencing variable to achieve this target.

Table 4. Three most frequently coded codes within each category ordered by stakeholder and their approach to the topic within the analyzed guidelines.

Stakeholder	Environment	Social	Economics	Health	Governance
Swiss Government	Origin (67%): Regional and seasonal food. Food Waste (33%): Avoid food waste.	Pleasure (73%): Enjoyment of eating. Community (13%): Social contact. Ethical Buying (7%): Fair trade products.	Cost (50%): Health care costs related to diet and wellness. Affordability (30%): Affordable food. Technology and Innovation (20%): Promote innovation.	Well-being (18%): Ensure physical and mental well-being. Plant-based Protein (15%): Specific alternatives to animal products are offered. Fruits and Vegetables (13%): Recommended to eat vegetarian several days a week.	Directives (25%): Networking nutritional stakeholders, utilizing synergy and coordinating activities. Education (25%): Strengthen nutrition literacy (put knowledge into practice). Regulation (22%): Political focus on improvement of health and well-being.
Nestlé	Climate Change (33%): Reach net-zero by 2050. Land Use (16%): Regenerative agriculture and reforestation. Origin (16%): Source sustainable ingredients, supply chain perspective.	Gender Equality (41%): 30% women in top management positions by 2022. Community (24%): Local farming communities. Animal Welfare (12%): Improving animal welfare.	Sustainable Production Patterns (52%): Cleaner logistics. Technology and Innovation (40%): R&D investments. Cost (5%): Economically viable practices.	Dairy Products (49%): Climate friendly milk pilot project. Sweets, Salty and Alcoholic Drinks (11%): Brief practical guideline on how to eat. Fruits and Vegetables (8%): Brief practical guidelines how to eat.	Certifications and Standards (28%): Accountability towards consumers. Transparency (25%): Transparent to consumers. Regulation (15%): Call for appropriate ground rules from the government side.

Table 4. *Cont.*

Stakeholder	Environment	Social	Economics	Health	Governance
WWF	Land Use (22%): All action items have direct link to land use. Climate Change (19%): Role of the food system in connection to climate change. Biodiversity (13%): Connection of the food system to biodiversity loss.	Culture (58%): National context needs to be considered. Animal Welfare (33%): Species-appropriate animal husbandry. Ethical Buying (8%): Support of fair trade.	Sustainable Production Patterns (77%): Food production. Technology and Innovation (13%): Technological progress as part of the solution. Cost (5%): Briefly mentioned.	Animal-based Protein (28%): Reduction of animal-based proteins to achieve planet-based diet. Well-being (26%): Planet-based diet benefits human health. Dairy Products (19%): Reduction of dairy products to achieve planet-based diet.	Directives (35%): Translate global recommendations for healthier and more sustainable diets to individual countries. Science (21%): Use scientific basis for decision making. Food Security (19%): Feed humanity on existing cropland.
SV Group Switzerland	Origin (40%): Regional and seasonal buying play a significant role. Climate Change (20%): Overarching umbrella in their guidelines (ONE TWO WE Program). Energy Use (9%): Energy saving practices and alternative energy sources.	Animal Welfare (48%): Concrete measures and examples for improving animal welfare (BTS, RAUS). Pleasure (20%): Sustainable produced food needs to taste good and be balanced. Community (14%): Eating brings people together.	Sustainable Production patterns (33%): Resource bundling along the value chain. Technology and Innovation (33%): Process optimization with sound analyses. Labor Rights (15%): Fair trade products and support of labor rights in developing countries are important.	Animal-based Protein (29%): Reduction of meat consumption in order to reduce GHG. Fruits and Vegetables (29%): Increased fruits and vegetables consumption, vegan and vegetarian menus. Dairy Products (17%): Reduction of dairy products.	Certifications and Standards (38%): Labels play a central role. Directives (21%): SDGs as important guidance. Education (14%): Education as essential tool for dietary change.
EAT-Lancet Commission	Climate Change (36%): Overarching umbrella for environmental indicators. Food Waste (13%): At least halve food losses and waste. Land Use (12%): Reorient agricultural priorities.	Culture (89%): Critical not to neglect the reality of cultural diversity and regional differences. Animal Welfare (11%): Explicitly mentioned that this issue is foregone in their guidelines.	Sustainable Production Patterns (57%): Intensify food production sustainably, increase high quality output. Technology and Innovation (39%): Fertilizer and water use efficiency, recycling of phosphorus. Affordability (4%): Little specification.	Animal-based Protein (18%): Reduced meat intake to achieve planetary health diet. Well-being (17%): Optimize health within environmental limits. Fruits and Vegetables (16%): Increased fruits and vegetable intake to achieve planetary health diet.	Directives (41%): FBDGs as central element for changing diets and the global food system; SDGs, Paris Agreement. Science (22%): Development of first universal scientific goals for healthy and sustainable diet. Food Security (20%): Planetary health diet as framework to feed nearly ten billion by 2050.

Within the social category, the stakeholders tend to focus on a single feature rather than addressing diversity. Animal welfare as a social concern is strongly addressed, especially by representatives of the private sector and the nature conservation organization. The analysis shows that the economics category focuses more on technological progress (e.g., sustainable production patterns or technology and innovation) than on employee relations.

However, in the private sector, the topic of labor rights is thematized alongside certification and standards. There is either a focus on the monetary cost of food or on affordability to afford an item, but not both aspects at once, although they are closely linked. Among all parties, only the Swiss government discusses health costs concerning diets and well-being. Table 5 presents previously discussed similarities and differences arising from different categories within the reviewed dietary guidelines.

Table 5. Similarities and differences between the various stakeholders' dietary guidelines.

Category	Similarities	Differences
Environment	All stakeholders, except the Swiss government, emphasize the role of food systems in relation to climate change. Climate change stated as target variable, influencing variables are land use, biodiversity and soil to achieve GHG reduction target. Swiss government and SV Group Switzerland place more emphasis on consumer-side recommendations, such as choosing regional and seasonal food. Nestlé and WWF converge around production-related aspects such as land use.	Guidelines aimed at an international or domestic audience differ in terms of food origin aspects. Seasonality and regionality are highlighted by guidelines specific to the Switzerland, supply chain aspects by international guidelines. Environmental aspects are almost absent in Swiss government guidelines.
Social	There is little coverage overall. When included, there is a focus on one single feature, rarely touch on several social aspects. With exception of the Swiss government, all the other stakeholders recognize animal welfare as a social issue within their dietary guidelines.	Swiss government and SV Group Switzerland emphasize the pleasure of eating and sharing food.
Economics	There is little coverage overall. All stakeholders converge on technological innovation. Focus more on technical production side (e.g., sustainable production patterns, technology and innovation) rather than consumer or worker realities.	Cost and affordability aspects are varied. Either cost or affordability considerations are usually at the forefront, not both simultaneously. Swiss government is the only stakeholder that focuses on economic aspects at the consumer end (health care costs and affordability) while all the others, including EAT-Lancet Commission, focus more on the production side. Private sector (Nestlé and SV Group Switzerland) includes labor rights consistent with certifications and standards.
Health	Reduction of animal-based protein, especially meat. Increase fruits and vegetables as well as plant-based protein.	Decisive reasons for reducing the consumption of animal-based protein are health and/or environmental aspects. Food groups are highlighted differently depending on their sphere of influence within the food system. WWF and SV Group Switzerland, similarly to the EAT-Lancet Commission international benchmark, suggest reduction in animal-based proteins. The Swiss government does not suggest reduction but rather present plant-based alternatives. Nestlé makes no mention to reduction of animal-based proteins.
Governance	Consistently addressed through all profiles. The governance approach focuses on either directives or regulations.	Food security is raised only by international organization (EAT-Lancet Commission) and civil society (WWF), while neglected by the others. Transparency only recognized by private sector (Nestlé and SV Group Switzerland), link to certifications and standards. Only the Swiss government and the SV Group Switzerland mention education as a tool for dietary change.

The health category presents a heterogeneous picture, but among the most frequently communicated codes within the category, four food groups are mentioned particularly often, as is well-being (Table 4). The focus on specific food groups is indicative of the food sector in which stakeholders are active. For example, the private company Nestlé shows a strong focus on dairy products (49%), reflecting this also in its efforts to draw attention to its climate-friendly milk pilot project. As a civil society organization, WWF focuses on reducing animal-based proteins (28%) as a means of promoting a "planet-based diet" [52]. Most profiles emphasize the adverse effects of animal-based foods on individual well-being and climate change. All actors, besides Nestlé, emphasize the intake of more plant- based foods and fewer animal-based foods regularly. In particular, EAT-Lancet Commission, WWF, and SV Group Switzerland are explicit about the required transition from animal-based to plant-based foods. A key component of this shift is a firm emphasis on the consumer demand side, but the reasons for this emphasis are divided. In addition to its health benefits, EAT-Lancet Commission, WWF, and SV Group Switzerland point out its environmental benefits. Despite this acknowledgment, recommendations differ on what constitutes a reduced intake of animal products.

The governance category is consistently addressed through all the profiles (Figure 1), indicating that the importance of this category is recognized by the food system representatives. The stakeholders set a different focus in terms of governing acts: directives or regulations. While EAT-Lancet Commission, WWF, SV Group Switzerland, and the Swiss government choose to highlight international policies such as the SDGs, Nestlé chooses to call for policy action to transform industries with mandatory rules. A contrasting point appears in the inclusion of transparency. The Swiss government, WWF, and the EAT-Lancet Commission have not indicated this feature, whereas private sector representatives Nestlé and SV Group Switzerland point it out in their statements. International organizations and civil society emphasize food security and the importance of feeding almost ten billion people by 2050 on existing farmland. The two organizations, EAT-Lancet Commission and WWF, thus present a broader perspective than one that focuses exclusively on Switzerland. Through strengthening nutrition literacy, education is recognized only by the government and the catering company as an essential tool for dietary change. Similar to the previous categories, the covered aspects depend on the sector of the food system in which the representative stakeholder operates.

5. Discussion

DGs have received increasing attention among state and non-state actors in recent years as potential tools for addressing sustainability in the food system [10,27,53,54]. Our findings on actors in the Swiss food governance landscape warrant this attention. We found that all considered actors include sustainability aspects in their DGs, addressing at least one sustainability dimension—with health, environment and governance being the most predominant. The different DGs do account for the notion of sustainability in diverse ways, assigning different weight to their five pillars and attaching diverse meanings to it. These differences reflect the complexity and ambiguity of sustainability considerations in food systems research in general [4] and of understanding what constitutes a sustainable diet in particular. The pluralistic map of the food governance landscape outlined in this paper provides an overview of different paths to sustainable diets where potential compatibilities and tensions arise. While different stakeholders cover niche-specific aspects of sustainability, we identified recurrent gaps in economic and social sustainability content: The economic sustainability aspect is almost absent, which is surprising given the significance of markets and neoliberal forms of governance for food system transformation at local and global scale [55–57]. Similarly, social aspects of sustainable diets are scarce, what seems problematic given the food system being embedded in and shaped by society in complex ways [6,53]: Consumption choices influence the food system; cultural aspects influence consumer choices. In order to shape the food system in a more sustainable direction, social and economic aspects must therefore be considered [6].

The focus of the Swiss government's recommendations is predominantly on health aspects without embedding them in a broader sustainability context. This confirms the general focus of governments on health concerns and their reluctance to include (extended) sustainability aspects in DGs [27]. Furthermore, it demonstrates a significant inconsistency between the government's DGs and its broader sustainability policy inspired by the SDGs and the Paris Agreement. DGs from non-state actors in contrast go beyond the classic thematization of health aspects and address other sustainability dimensions as well. However, actors focus mainly on aspects that reflect the position they occupy in the food governance system [18]: The private sector player Nestlé is the largest dairy company in the world [58] and is heavily involved in the climate impact of dairy products in Switzerland. The catering company SV Group Switzerland focuses on consumer participation and individual agency by providing transparent information about its supply chain. WWF as a civil society organization actively promotes nature conservation and creates a framework that emphasizes this goal, a "planet-based diet" [52]. As an exception, the international organization EAT-Lancet Commission provides rather comprehensive scientific goals for healthy diets from sustainable food systems that will feed nearly 10 billion people by 2050. The references of these state and non-state actors to individual sustainability dimensions require further analysis as it can reflect both a genuine commitment to sustainable transformation as well as a legitimation or marketing strategy.

Differences between the stakeholders' DGs manifest not only in the weighting of different sustainability dimensions, but also in the way these dimensions are framed. For example, the social dimension, which is only marginally considered overall, is addressed in different ways by the various actors: Nestlé brings forward gender equality (41%), which is quite significant as gender equality is a foundation for progress in achieving multiple factors towards sustainable development [59]. In contrast, SV Group Switzerland rather elaborates on animal welfare (48%), strongly related to animal health and therefore of substantial interest to farmers and their productivity [6]. There are also divergent recommendations relative to common topics, such as reducing animal-based products. Some recommendations still include a relatively high intake of animal protein compared to the internationally accepted threshold of 25–58 g/day [14] for consumption of animal products, weighing their environmental impact. For example, Swiss government guidelines recommend an intake of 100–120 g/day [60] of animal protein or an alternative protein source.

Apart from these differences, the stakeholders share common features. For example, all actors communicate an increase in the intake of fruits and vegetables and plant-based protein and most a reduction of animal-based protein, despite varying benchmarks. This reduction or increased intake is cited from a health and environmental perspective, indicating a belief in positive synergy between the two dimensions.

Based on a generic five-dimensional understanding of sustainability, we show in our analysis how different actors occupy this common framework in different ways. Combining the numerous individual aspects put forward by the actors, the potential for a comprehensive understanding of sustainable diets becomes apparent. At the same time, however, the synopsis also reveals potential differences and tensions. While addressing all five sustainability dimensions in one way or another will be pivotal for a sustainable transformation of the food system, it remains debatable to what degree coherence between different DGs in regard to their understanding of sustainability is a necessity to this. On the one hand, similar references to sustainability dimensions in the guidelines of different actors offer a potential for the formation of actor coalitions. Indeed, the multifaceted challenges of a sustainability-oriented food system transformation require a broader fundamental understanding of human health in the context of planetary health. It forms the core of what Patterson et al. called a shared "transformative agenda" for a sustainable food system [61] (p. 4). It is known from other fields that actor coalitions form around similar cognitive and normative orientations [62]. Assuming that DGs reflect the normative and cognitive belief systems, mapping sustainability can thus reveal opportunities for cooperation, launch mutual exchange and promote learning among actors.

On the other hand, a certain degree of incoherence in dietary recommendations might be inevitable or even necessary for a sustainable transformation to advance. As discussed above, the reviewed DGs reflect different normative understandings of what constitutes a sustainable diet and thus address different target groups. In more general terms, it might be the very complexity of the food system that demands for the coexistence and cooperation of various approaches as no one-size-fits-all will provide the 'solution'. Allowing incoherence to exist, or even proliferate also means to account for an increasingly differentiated food governance landscape in food system transformation towards sustainability. In this vein, converging and diverging DGs can all potentially contribute to incremental change at different nodes within a complex food system. It entails to acknowledge the different actors with their respective priorities and frames in the design of sustainability-oriented transformations [16]. The interdisciplinary operationalization of sustainable diets and the concept of sustainability then require constant negotiation and debate [61]. The framework and empirical analysis we outline in this paper thus contribute to such a debate.

The selected guidelines represent only a snapshot; we acknowledge that the results may differ if other guidelines were considered. However, given the number of guidelines from these stakeholders, it was necessary to place topics outside the scope of the analysis.

6. Conclusions

This paper contributes to the discussion on sustainability-oriented transformations of the food system in three specific ways. First, it provides the methodological and analytical tools for studying and comparing different understandings of sustainable diet, for instance by focusing on how different actors make reference to sustainability in their dietary guidelines. We have done so by moving beyond their original focus of health in favor of a multi-dimensional understanding of what constitutes a sustainable diet. Second, it offers insights into an empirical example, DGs in Switzerland, revealing how different actors in the food system refer to sustainability in their dietary guidelines and making apparent context specific differences and commonalities. To do so allows to identify systematic gaps in the sustainability content of dietary guidelines and to lay the basis for the respective political negotiations about it. Third, it provides a basis for further theoretical reflection on the role of dietary guidelines for a sustainability-oriented transformation of the food system in the context of an increasingly diversified food governance. Multi-stakeholder engagement in food system governance offers a promising new area of focus for bringing about profound changes in sustainable diets and consumer and producer behaviors. An array of possibilities are opened up for non-state actors, emphasizing their transformative role in changing the dialogue around sustainable diets. Given that the food system's unsustainability cannot be solved by the government, market relations, or consumers alone, we acknowledge the importance of multi-stakeholder involvement in defining sustainable diets. This in turn requires opening up space for cooperation around converging and diverging understandings of what might constitute a sustainable diet. To that end, this paper offers a multi-dimensional sustainability framework for developing "*a strategy of incremental change with a transformative agenda*" [61] (p. 4) for diet sustainability, the food system and its sustainable transformation. However, at what specific nodes within the food system the harmonization of different actors' DGs is necessary for capitalizing on potential synergies and counteract trade-offs will require further analytical scrutiny. It requires integrative research that goes beyond the study of content presented in this paper, for instance on how DGs influence behavior change and on how different DGs interact in this process. It requires context-specific empirical analysis of the synergies and tradeoffs between different DGs and how they influence consumer and producer behavior. Finally, it also requires an analysis of the way consumption and production are mediated by converging and diverging notions of what might constitute a sustainable diet.

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Data Availability Statement: The data presented in this study are available in (Appendix A).

Conflicts of Interest: The authors declare no conflict of interest.

Appendix A

Table A1. Qualitative content analysis results overview.

Categories/Codes	EAT			Swiss Government			Nestlé			SV Group Switzerland			WWF Schweiz			Total		
	Count	Sum	Percent	Count	Sum	Percent	Count	Sum	Percent	Count	Sum	Percentage	Count	Sum	Percentage	Count	Sum	Percentage
Economics	20	23	5.3%	7	10	3.8%	84	119	19.6%	23	27	10.0%	34	39	5.9%	168	218	9.7%
Affordability	1	1	4.3%	3	3	30.0%	0	0	0.0%	1	1	3.7%	1	1	2.6%	6	6	2.8%
Cost	0	0	0.0%	2	5	50.0%	5	6	5.0%	4	4	14.8%	2	2	5.1%	13	17	7.80%
Labor Rights	0	0	0.0%	0	0	0.0%	3	3	2.5%	3	4	14.8%	1	1	2.6%	7	8	3.7%
Sustainable Production Patterns	11	13	56.5%	0	0	0.0%	43	62	52.1%	8	9	33.3%	26	30	76.9%	88	114	52.3%
Technology and Innovation	8	9	39.1%	2	2	20.0%	33	48	40.3%	7	9	33.3%	4	5	12.8%	54	73	33.5%
Environment	98	141	32.3%	2	3	1.1%	241	330	54.5%	60	85	31.5%	239	340	51.3%	640	899	40.1%
Animal Agriculture	6	8	5.7%	0	0	0.0%	16	19	5.8%	3	4	4.7%	23	32	9.4%	48	63	7.0%
Aquatic Ecosystem	3	3	2.1%	0	0	0.0%	3	4	1.2%	4	7	8.2%	16	23	6.8%	26	37	4.1%
Biodiversity	12	16	11.3%	0	0	0.0%	8	8	2.4%	2	3	3.5%	33	44	12.9%	55	71	7.9%
Climate Change	31	51	36.2%	0	0	0.0%	80	108	32.7%	12	17	20.0%	46	64	18.8%	169	240	26.7%
Food Waste	15	19	13.5%	1	1	33.3%	3	4	1.2%	3	4	4.7%	17	19	5.6%	39	47	5.2%
Land Use	12	17	12.1%	0	0	0.0%	35	52	15.8%	3	4	4.7%	47	75	22.1%	97	148	16.5%
Origin	2	2	1.4%	2	2	66.7%	38	54	16.4%	25	34	40.0%	9	14	4.1%	76	106	11.8%
Renewable Energy	1	1	0.7%	0	0	0.0%	37	49	14.8%	5	8	9.4%	5	7	2.1%	48	65	7.2%
Soil	10	16	11.3%	0	0	0.0%	14	22	6.7%	3	4	4.7%	31	43	12.6%	58	85	9.5%
Water Use	6	8	5.7%	0	0	0.0%	7	10	3.0%	0	0	0.0%	12	19	5.6%	25	37	4.1%
Governance	93	125	28.6%	58	72	27.3%	79	103	17.0%	48	66	24.4%	113	156	23.5%	391	522	23.3%
Certifications and Standards	0	0	0.0%	1	1	1.4%	20	29	28.2%	18	25	37.9%	2	3	1.9%	41	58	11.1%
Directives	36	51	40.8%	12	18	25.0%	3	4	3.9%	12	14	21.2%	34	54	34.6%	97	141	27.0%
Education	3	5	4.0%	15	18	25.0%	8	12	11.7%	6	9	13.6%	3	3	1.9%	35	47	9.0%
Food Security	21	25	20.0%	2	3	4.2%	1	1	1.0%	0	0	0.0%	24	30	19.2%	48	59	11.3%
Justice	6	10	8.0%	1	1	1.4%	3	3	2.9%	2	4	6.1%	11	17	10.9%	23	35	6.7%
Regulation	6	7	5.6%	14	16	22.2%	13	15	14.6%	1	2	3.0%	14	17	10.9%	48	57	10.9%

Table A1. *Cont.*

Categories/Codes	EAT			Swiss Government			Nestlé			SV Group Switzerland			WWF Schweiz			Total		
	Count	Sum	Percent	Count	Sum	Percent	Count	Sum	Percent	Count	Sum	Percentage	Count	Sum	Percentage	Count	Sum	Percentage
Science	21	27	21.6%	13	15	20.8%	9	13	12.6%	4	4	6.1%	25	32	20.5%	72	91	17.4%
Transparency	0	0	0.0%	0	0	0.0%	22	26	25.2%	5	8	12.1%	0	0	0.0%	27	34	6.5%
Health	100	139	31.8%	127	164	62.1%	24	37	6.1%	37	48	17.8%	86	116	17.5%	374	504	22.5%
Animal-based Protein	20	25	18.0%	12	15	9.1%	1	2	5.4%	11	14	29.2%	24	33	28.4%	68	89	17.7%
Dairy Products	12	18	12.9%	15	20	12.2%	12	18	48.6%	7	8	16.7%	16	22	19.0%	62	86	17.1%
Fruits and Vegetables	15	22	15.8%	17	21	12.8%	2	3	8.1%	10	14	29.2%	9	12	10.3%	53	72	14.3%
Liquids (Unsweetened Drinks)	2	3	2.2%	8	12	7.3%	1	2	5.4%	2	2	4.2%	1	2	1.7%	14	21	4.2%
Plant-based Protein	11	16	11.5%	16	24	14.6%	1	2	5.4%	3	5	10.4%	7	10	8.6%	38	57	11.3%
Sweets, Salty Snacks and Alcoholic Drinks	11	13	9.4%	19	22	13.4%	2	4	10.8%	1	1	2.1%	2	2	1.7%	35	42	8.3%
Tubers or starchy vegetables	5	8	5.8%	5	8	4.9%	1	2	5.4%	1	2	4.2%	0	0	0.0%	12	20	4.0%
Well-being	16	23	16.5%	24	29	17.7%	3	3	8.1%	2	2	4.2%	24	30	25.9%	69	87	17.3%
Whole grains	8	11	7.9%	11	13	7.9%	1	1	2.7%	0	0	0.0%	3	5	4.3%	23	30	6.0%
Social	7	9	2.1%	12	15	5.7%	14	17	2.8%	32	44	16.3%	10	12	1.8%	75	97	4.3%
Animal Welfare	1	1	11.1%	1	1	6.7%	2	2	11.8%	14	21	47.7%	3	4	33.3%	21	29	29.9%
Community	0	0	0.0%	2	2	13.3%	5	4	23.5%	5	6	13.6%	0	0	0.0%	12	12	12.4%
Culture	6	8	88.9%	0	0	0.0%	0	0	0.0%	1	1	2.3%	6	7	58.3%	13	16	16.5%
Ethical Buying	0	0	0.0%	1	1	6.7%	1	2	11.8%	3	5	11.4%	1	1	8.3%	6	9	9.3%
Gender Equality	0	0	0.0%	0	0	0.0%	4	7	41.2%	1	2	4.5%	0	0	0.0%	5	9	9.3%
Pleasure	0	0	0.0%	8	11	73.3%	2	2	11.8%	8	9	20.5%	0	0	0.0%	18	22	22.7%

Appendix B

Table A2. Selected examples to illustrate the process from raw data to weighted results.

Excerpt	Category/Applied Code	Code Definition	Scaling	Justification
"In this section we use these results to draw insights on the global implications of current food consumption patterns in G20 countries and how the 5 Gt CO2eq food budget may need to be more equitably distributed to achieve healthy diets for all."	Environment/Climate Change	Global warming, GHG emissions, Carbon Storage Ecological Footprint, Carbon Budget, Temperature, Precipitation	1	based on the following text passage: " . . . 5 Gt CO2eq food budget . . . " Carbon Budget. A single word or short phrase that refers to the feature and is not further explained or elaborated within the excerpt.
	Governance/Justice	Democratic Values, Intergenerational Justice, Food Distribution, Fair Economic Conditions, Equal Opportunities	1	based on the following text passage: "...equitably distributed to achieve healthy diets for all." Equal Opportunities and Food Distribution. A single word or short phrase that refers to the feature and is not further explained or elaborated within the excerpt.
"Mealtimes are not just about the intake of energy and nutrients; they are also about pleasure, relaxation and social contact. Taking time, switching off and eating and drinking in peace and quiet help to promote the enjoyment of eating."	Social/Community	Alone/Together, Sharing, Eating Modes, Farming/Local Communities Support, Team Spirit, Cohesion Exchange	1	based on the following text passage: "... social contact." Social Contact elaborates on togetherness and eating modes. A single word or short phrase that refers to the feature and is not further explained or elaborated within the excerpt.
	Social/Pleasure	Taste, Aesthetics, Mindful Eating, Time, Comfort, Cordiality, Enjoyment of Eating	2	based on the following text passage: "...pleasure, relaxation and social contact. Taking time, switching off and eating and drinking in peace and quiet help to promote the enjoyment of eating." Within the excerpt, the statement is substantiated. Rationale for the significance of the characteristic is elaborated and the excerpt refers to concrete actions.

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