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Plates, pyramids, planet

Developments in national healthy and sustainable dietary guidelines: a state of play assessment





Plates, pyramids and planets

Developments in national healthy and sustainable dietary guidelines: a state of play assessment

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Environmental Change Institute & The Oxford Martin Programme on the Future of Food,
The University of Oxford

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Foreword

On 1st April 2016, the United Nations General Assembly declared the period 2016–2025 as the Decade of Action on Nutrition.

The resolution expressed concern that nearly 800 million people are chronically undernourished and 159 million children under five years of age stunted. Micronutrient deficiencies affect about two billion people globally. Despite these grim undernutrition statistics, the other side of malnutrition, the incidence overweight and obesity, is increasing in all regions. About 1.9 billion adults are overweight of which 600 million are obese. Childhood overweight is also becoming a global concern.

Poor dietary habits and unhealthy diets underlie the current nutrition situation.

At the Second International Conference on Nutrition (ICN2), co-hosted by the Food and Agriculture Organization of the United Nations and by the World Health Organization in November 2014, the Rome Declaration on Nutrition was very clear in acknowledging that current food systems are being increasingly challenged to provide adequate, safe, diversified and nutrient-rich foods needed for healthy diets.

As an outcome of ICN2, Members and Member Countries committed to “enhance sustainable food systems by developing public policies from production to consumption and across relevant sectors to provide year-round access to food that meets peoples’ nutrition and promote safe and diversified healthy diets”.

Food-based Dietary Guidelines (FBDG) are a set of guidance given by the governments on how its citizens can eat well. FBDG are tools that can be used to promote healthy diets and can also serve as the basis for developing food and agriculture policies.

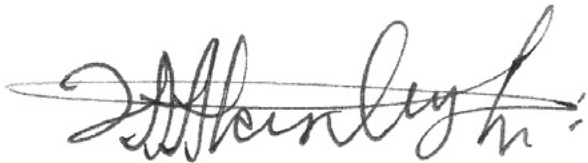
Many developed countries have FBDG, but for most developing countries they are lacking or, where present, need revision.

To assist countries in meeting their commitments on healthy diets, FAO is supporting countries, especially in Sub-Saharan Africa, to develop country FBDG. Our approach is strengthening capacities at country and regional levels.

Recently, issues of sustainability are being considered for FBDGs. This document is the result of a review of country FBDG. It explores if and how countries incorporate sustainability in their FBDG. Sustainability is at the heart of FAO’s work. One of its three main goals is the sustainable management and utilization of natural resources, including land, water, air, climate and genetic resources for the benefit of present and future generations. FAO’s other two goals are first, the eradication of hunger, food insecurity and malnutrition and second, the elimination of poverty while driving forward economic and social progress for all. Therefore, sustainability at FAO goes beyond the use of natural resources to include economic and social aspects. The

present review was motivated by the combination of these goals with the will to better support countries in the development, implementation, monitoring and evaluation of FBDGs.

We take this opportunity to thank the many people who supported our efforts in reviewing this document.

A handwritten signature in black ink, appearing to read 'Anna Lartey', with a horizontal line drawn through the middle of the signature.

Anna Lartey

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Executive Summary

Introduction

Current food systems jeopardize current and future food production and fail to nourish people adequately. The starting point for this report is the observation – founded on a growing body of research – that if we are to address the multiple social, health and environmental challenges caused by, and affecting food systems, global populations need to move towards dietary patterns that are both healthy and also respectful of environmental limits. As such, an integrated understanding of what such diets look like is needed, as is action to foster the necessary shifts in consumption.

There is increasingly robust evidence to suggest that dietary patterns that have low environmental impacts can also be consistent with good health – that win-wins are possible, if not inevitable. Such dietary patterns represent a substantial improvement on the way people currently eat, a point that is true both in countries where the main problems are those of overconsumption and non-communicable diseases, and in contexts where diets lack diversity and where hunger and underconsumption are of critical concern; one important feature of a sustainable diet is diversity. The broad characteristics of such diets are summarised in Box 1.

BOX 1. Characteristics of low environmental impact diets consistent with good health*

- Diversity – a wide variety of foods eaten.
- Balance achieved between energy intake and energy needs.
- Based around: minimally processed tubers and whole grains; legumes; fruits and vegetables – particularly those that are field grown, “robust” (less prone to spoilage) and less requiring of rapid and more energy-intensive transport modes. Meat, if eaten, in moderate quantities – and all animal parts consumed.
- Dairy products or alternatives (e.g. fortified milk substitutes and other foods rich in calcium and micronutrients) eaten in moderation.
- Unsalted seeds and nuts.
- Small quantities of fish and aquatic products sourced from certified fisheries.
- Very limited consumption of foods high in fat, sugar or salt and low in micronutrients e.g. crisps, confectionery, sugary drinks.
- Oils and fats with a beneficial Omega 3:6 ratio such as rapeseed and olive oil.
- Tap water in preference to other beverages – particularly soft drinks.

* Adapted from: Garnett, T. (2014). *Changing What We Eat: A Call for Research and Action on Widespread Adoption of Sustainable Healthy Eating*. Food Climate Research Network

However, despite the growing evidence base, government action is lagging behind. One important step that governments can take to signal their commitment to a more sustainable and healthy future, is to develop and disseminate food based dietary guidelines (FBDG) that embed health and sustainability objectives. These can then form the basis of policies seeking to foster such patterns.

The purpose of this report is to highlight instances of forward thinking governments who are taking the lead in developing integrated guidance; to examine what these guidelines say; identify common messages; and ascertain whether and how their approaches could be replicated elsewhere. We look both at successes and at failures – where attempts to provide integrated guidance have failed, and why. In addition to official guidelines we explore a range of ‘quasi-official’ integrated advice – defined here as advice produced by institutions that are recognised or accredited by Government but that do not sit within a ministerial department and whose recommendations do not constitute official policy. Additionally we include a few non-official guidelines produced by academic or non-governmental organisations that are founded on good scientific evidence and that illustrate interesting or helpful approaches to integrating sustainability and nutritional advice.

Approach

We undertook a web based review of national dietary guidelines worldwide, using publicly available information. These included the guidelines themselves, associated food guides and other supporting documents, press releases about their publication, and other relevant literature. We also interviewed people who were involved in, or who followed, the development of these guidelines. Interviewees include government employees, experts who provided formal advice and input, and external observers and commentators from, for example, civil society. We drew upon contact lists provided by the FAO and on subsequent recommendations of those we initially interviewed.

Findings

On food based dietary guidelines in general: Dietary guidelines are a key component of a coherent food policy. An essential first policy step, at their best, they provide a clear, context-appropriate steer on how people should be eating to maintain good nutritional health and provide the basis for the development of policies intended to shift consumption patterns in healthier directions.

However a key finding of this research is that not all countries have official FBDGs of any kind, sustainability oriented or otherwise. We identified just 83 countries with FBDGs out of a possible total of 215. Their absence is particularly apparent in low income countries – for example only five countries in Africa have guidelines. Even where guidelines exist, they are not always easy to find, and the intended audience and link with policy is not always clear. Monitoring and evaluation processes may not be in place, making it hard, if not impossible, to disentangle impacts of guidelines from other policies. Again, all these points particularly apply to low income countries.

Which countries have published official sustainable and healthy dietary guidelines? Despite the substantial and growing evidence base pointing to the need for integrated dietary approaches and the scope for aligning health and sustainability

objectives, only four countries have so far included sustainability in their FBDGs: Brazil, Sweden, Qatar and Germany. A few others discuss aspects of sustainability in accompanying supporting information. Two (USA and Australia) have seen attempts to incorporate environmental considerations reach an advanced stage but not achieve government endorsement. We also note a few of 'quasi-official' guidelines emerging (the UK, France, Netherlands, Estonia) that incorporate sustainability and these in turn could play a part in influencing official processes. We note too that even where sustainability is not mentioned in the guidelines, much of the advice offered in mainstream FBDGs – for example to increase consumption of fruits, vegetables and whole grains, to limit red and processed meat consumption and to maintain energy balance – is also likely to lead to reduced environmental impacts.

What do integrated guidelines say? All the countries who do provide guidance on sustainability say broadly similar things despite differences in emphasis and level of detail provided (Table 1). All highlight that a largely plant-based diet has advantages for health and for the environment. Sweden is notable in additionally providing more detailed advice on which plant based foods are to be preferred, recommending for example root vegetables over salad greens. Most guidelines that include sustainability talk about the high environmental impact of meat – with the exception of the Qatari guidelines – but the advice often lacks specificity, and where recommended maximum levels are given, these are in line with recommendations of solely health-oriented guidelines. The Brazilian guidelines are distinct in emphasising the social and economic aspects of sustainability, advising people to be wary of advertising, for example, and to avoid ultra-processed foods that are not only bad for health but are seen to undermine traditional food cultures. They stand in contrast to the largely environmental definition of sustainability adopted in the other guidelines.

Table 1: Summary of the main messages in the guidelines that include sustainability

| | Germany | Brazil | Sweden | Qatar |
|-----------------------------|---|--|---|--|
| Fruit and Vegetables | Choose mainly plant-based foods. Enjoy 5 portions of fruit and vegetables daily. | Eat foods mainly of plant origin. Chose seasonal and locally grown produce. | Eat lots of fruit and vegetables (at least 500g per day) Choose high fibre vegetables. | Eat vegetables with most meals, including snacks. Aim for 3-5 servings of vegetables and 2-4 of fruits every day. |
| Meat | Eat meat in moderation. White meat is healthier than red meat. | Try to restrict the amount of red meat | Eat less red and processed meat (no more than 500 grams of cooked meat a week). Only a small amount of this should be processed. | Choose lean cuts of meat. Limit red meat (500g per week) Avoid processed meats. |

| | | | | |
|---------------------------|---|--|---|---|
| Dairy | Consume milk and dairy products daily. Choose low fat. | Milk drinks and yogurts that have been sweetened, coloured and flavoured are ultra-processed foods, and as such should be avoided | Choose low-fat, unsweetened products enriched with vitamin D. | Consume milk and dairy products daily. Choose low fat. If you do not drink milk or eat dairy products, choose other calcium and vitamin D rich foods (e.g. fortified soy drinks, almonds, chickpeas). |
| Fish | Once to twice a week | -- | Eat fish and shellfish two to three times a week. Vary your intake of fatty and low-fat varieties and choose eco-labelled seafood. | At least twice a week. |
| Fat and oil | Fat and fatty foods in moderation. Choose fats and oils from vegetable origins. | In moderation. | Choose healthy oils when cooking, such as rapeseed oil or liquid fats made from rapeseed oil, and healthy sandwich spreads. | Avoid saturated fat and hydrogenated or trans fat. Use healthy vegetable oils such as olive, corn and sunflower in moderation. |
| Processed food | -- | Limit the consumption of processed foods and avoid ultra-processed foods. | -- | Eat less fast foods and processed foods. |
| Behavioural advice | Preferably cook foods on low heat, for a short time, using little amount of water and fat. Use fresh ingredients whenever possible (this helps to reduce unnecessary packaging waste). Take your time and enjoy eating. | Eat regularly and carefully in appropriate environments and, whenever possible, in company. Develop, exercise and share cooking skills. Plan your time to make food and eating important in your life. Be wary of food advertising and marketing. | Try to maintain energy balance by eating just the right amount. | Build and model healthy patterns for your family: <ul style="list-style-type: none"> • Keep regular hours for meals. • Eat at least one meal together daily with family. • Be a role model for your children when it comes to healthy eating and physical activity |

Fish is presented as the main area where health-environment trade-offs arise, but advice is nevertheless given to continue to consume in quantities consistent with health recommendations. Most guidelines that include sustainability mention milk and dairy products directly or indirectly but the nature of the advice is variable. Advice on food waste and energy efficient cooking is patchy and represent an area with scope for easy 'win wins.'

Who and what underpin the development of the sustainability guidelines? Although the details and processes differ widely, a commitment from government to integrate health and sustainability has in all cases proved crucial to the successful publication of such guidelines. The examples of Australia and the US illustrate what happens when government support is lacking or inadequate.

It is also notable that the development of dietary guidelines – both those that incorporate sustainability and those that do not – is led by the Ministry of Health (or its equivalent). Other Ministries are involved only in so far as guidelines impact upon their policies. Likewise most of the external experts involved tend to be drawn from the fields of nutrition and public health, even when the guidelines do incorporate sustainability concerns. One conclusion we would draw is that a far wider range of expertise needs to be drawn upon, spanning for example environmental life cycle assessment, the agricultural and environmental sciences, economics, sociology and animal welfare. And while coordination by a single Ministry – in this case health – is needed, others also need to be included in developing and implementing the guidelines.

Suggested ways forward

Our overarching suggestion is that countries that already have FBDGs should begin a process of incorporating sustainability into them. Those countries that do not have them are in a unique position to develop integrated guidelines from the outset. Specifically we would like to propose the following:

1. To have a real effect on food consumption, dietary guidelines need to:

- Be owned by the government – and supported by multiple departments within government.
- Be aimed at the general public, health professionals, consumer organisations and those working in the food sector (different versions will be needed).
- Have clear links to food policies that are actually implemented – e.g. school and hospital meals, public procurement, advertising regulations, industry standards etc.
- Be promoted – everybody should know about them.

2. The process to develop them needs:

- Clear championing by more than one government agency.
- To bring in a diverse range of academic expertise, that spans environmental aspects and broader sustainability concerns.

- To have two distinct and independent components:
 - A development based on the advice of scientists and professionals from both health and environmental fields.
 - A consultation process with civil society and industry.

3. To have a real effect on the environmental impact of diets, they need to:

- Be accompanied and underpinned by the information highlighting the links between health and sustainability so that:
 - People are informed about the relationships between food and sustainability and people are informed about the need for such dietary patterns.
- Be accessible but ambitious:
 - They should consider current consumption patterns and the cultural context, so they do not 'stretch' people unrealistically.
 - At the same time they should also promote a clear change in the consumption patterns needed to foster truly sustainable dietary patterns – this could be achieved by adopting and communicating a series of achievable step changes.
- Have clear guidance on:
 - Limiting meat consumption (not just maximum quantities but also suggestions for how to make changes that are appealing and accessible). This should be done in all cases. However advice needs to be appropriate to the particular context:
 - In high consuming (generally developed countries) there should be advice on reducing consumption.
 - In countries where per capita intakes are increasing, there should be guidance on 'moderating' consumption, to avoid the problems associated with consumption levels in high meat consuming countries.
 - In low income countries – where animal source food intakes are generally very low – the focus should be on advice to increase the diversity of diets, including more consumption of vegetables, fruits, legumes, nuts and some meat and dairy products.
 - The environmental benefits of limiting overconsumption of all foods.
 - Food waste reduction.
 - Which fruits and vegetables to seek out in preference to others.
 - Safe and energy efficient food preparation.
 - Shopping.
 - The place and value of food in our lives.

- Provide guidance for those who wish to adopt vegetarian or vegan diets – often this is lacking.

Areas for further research

More research is needed to fill knowledge gaps and help to navigate some of the major trade-offs. This calls for investment in interdisciplinary research and action on sustainable and healthy food production and consumption.

In particular, we identify five areas that need more attention:

- Sustainable fish production (both wild caught and aquaculture) and sustainable plant sources of omega 3s, as well as other options for addressing the trade off between the health benefits of fish consumption and the negative environmental impacts.
- Determining a sustainable level of meat consumption consistent with environmental and health objectives.
- Better understanding of the role and impact of dairy products in relation to health and sustainability and the nutritional and environmental costs and benefits of alternative foods.
- Better understanding of the environmental impacts of high sugar, high fat, high salt processed foods.
- Finally – and critically – as this report shows, most of the work has been done on environmental sustainability, and from the perspective of developed countries. We urgently need more research focusing on the broader social and economic dimensions of sustainable diets and on developing countries.

1. Introduction

1.1 Food, health and the environment

Our food system and consumption practices have, since prehistoric times, shaped and transformed our world and our societies. There have been enormous advances – in agricultural practice and in systems of storage, distribution and retailing – that have enabled population growth and improved diets for many.

But these developments have also carried severe costs.

Current food production is destroying the environment upon which present and future food production depends. It contributes to some 20–30% of anthropogenic greenhouse gas (GHG) emissions; is the leading cause of deforestation, land use change and biodiversity loss; accounts for 70% of all human water use; and is a major source of water pollution.^{1,2} Moving from land to sea, unsustainable fishing practices deplete stocks of species we consume and also cause wider disruption to the marine environment. At the same time, the impacts of climatic and environmental change are starting to make food production more difficult and unpredictable in many regions of the world. Although the whole food chain (from farming through to transport, cooking and waste disposal) contributes to these problems, it is at the agricultural stage where the greatest impacts occur. Both crop and livestock production generate environmental costs and recent years have seen the focus of attention falling in particular on the latter. The rearing of livestock for meat, eggs and milk generates some 14.5% of total global GHG emissions and utilises 70% of agricultural land (including a third of arable land, needed also for crop production). Grazing livestock, and less directly, the production of feed crops are together the main agricultural drivers of deforestation, biodiversity loss and land degradation.³

The primary function of agriculture is to produce food to feed our growing population. But although in aggregate our food system generates enough food energy for our population of over 7 billion, it does not ensure adequate and affordable nutrition for all. About half the global population is inadequately or inappropriately nourished once the combined burdens of hunger, micronutrient deficiencies and obesity are taken into account.^{4,5,6} And although the food chain contributes economic value both at a

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- ¹ Smith *et al.* (2014). Agriculture, Forestry and Other Land Use (AFOLU). In: *Climate Change 2014: Mitigation of Climate Change*. Contribution of Working Group III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change.
 - ² Johnson, J. A., Runge, C. F., Senauer, B., Foley, J., & Polasky, S. (2014). Global agriculture and carbon trade-offs. *Proceedings of the National Academy of Sciences*, 111(34), 12342-12347.
 - ³ Gerber, P. J., Steinfeld, H., Henderson, B., Mottet, A., Opio, C., Dijkman, J., & Tempio, G. (2013). *Tackling climate change through livestock: a global assessment of emissions and mitigation opportunities*. Food and Agriculture Organization of the United Nations (FAO).
 - ⁴ FAO (2015). *The State of Food Insecurity in the World*.
 - ⁵ WHO (2015) *World health statistics*
 - ⁶ Tulchinsky TH (2010). Micronutrient deficiency conditions: global health issues. *Public Health Reviews*; 32:243-255

national and international level, the distribution of that value is not even. Many of the world's 1.3 billion smallholders and landless agricultural workers live on or below the poverty line.

Without action, all these problems are set to become acute. As our global population grows and becomes wealthier and more urbanised, it demands more resource intensive foods – in particular, animal products. This has the potential to cause further damage to the environment and can exacerbate the problems of obesity and chronic diseases. Policy makers, NGOs and the business community all agree that – if we are to address our environmental problems, adapt to climate change and create a more food secure, nutrition enhancing food future – the current food system needs to change. There is less agreement on what, exactly, should be done.

From a policy and industry perspective most of the focus in the past few decades has been on improving the environmental efficiency of production: to produce more food with less impact. In recent years, an increasing number of analysts have challenged this perspective, arguing that while “production-side” approaches may be necessary, they are not sufficient. To address environmental concerns sufficiently and tackle the twin problems of dietary insufficiency and excess, three additional approaches have been suggested.⁷

First there is a need to address power imbalances in the food system: simply producing more food may not solve problems of affordability and access. Essential actions identified include efforts to address price and subsidy distortions, support and empower smallholder farmers and landless workers, agree better working conditions and fairer terms of trade, and improve transport and storage and market infrastructure.

Second, measures are needed to reduce the amount of food that is lost or wasted along the whole supply chain (one third of all food produced⁸) which not only undermines food security but represents a waste of land, water and other inputs and the generation of “unnecessary” emissions.

Third, there is now growing emphasis on the need for dietary change. What, and how much we eat directly affects what, and how much is produced. The Intergovernmental Panel on Climate Change in its Fifth Assessment Report highlights the potential of demand side changes in reducing greenhouse gas emissions from the food system while a growing number of academics and civil society organisations are focusing on the role that widespread adoption of healthy and sustainable eating patterns can play in addressing both health and environmental challenges.

This report takes as its starting point this growing recognition of the global need to focus on consumption as well as production, and on the potential for aligning health and environmental goals in the process. While the tools and actions needed to achieve the necessary changes in diets are many, our analysis here specifically considers just one of them: the role of national level dietary guidelines in providing a steer on what dietary patterns that are both healthy and sustainable look like.

⁷ Garnett, T. (2014). *Changing what we eat A call for research & action on widespread adoption of sustainable healthy eating*. Food and Climate Research Network.

⁸ FAO (2011). *Global food losses and food waste – Extent, causes and prevention*.

1.2 What are sustainable diets?

While sustainability is a much used word, stakeholders differ in their understanding of what it means. For some, it merely refers to environmental objectives or to particular aspects of environmental concern, such as climate change. For others, it encompasses social and economic dimensions, where environment, economy and society (incorporating health and ethics) together constitute the three pillars of sustainability.⁹ At the 2010 International Scientific Symposium “Biodiversity and Sustainable Diets: United Against Hunger” organized jointly by FAO and Bioversity International, a definition of sustainable diets was agreed:¹⁰ Sustainable Diets are:

“those diets with low environmental impacts which contribute to food and nutrition security and to healthy life for present and future generations. Sustainable diets are 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.”

In this report we mostly refer to environmental aspects and in particular to greenhouse gas emissions, as these have hitherto received the most research attention and the evidence base is therefore most robust. We now have a fairly good idea of what lower environmental impact diets that are consistent with good health, look like. We do not yet know what diets that meet all the FAO’s criteria above look like, although we can be fairly sure that the details will vary from context to context and at times there may be trade offs between different sustainability objectives. It is essential that future research focuses attention on social, ethical and economic dimensions and their interface with health and the environment in order to achieve a more rounded understanding of sustainability in relation to eating patterns.

Advice on consuming sustainably – or rather in less environmentally harmful ways – is not new. In 1971, the bestseller *Diet for a Small Planet*,¹¹ argued that from a resource perspective, meat eating was highly inefficient and environmentally damaging, and a raft of other books were subsequently published with similar messages, including *Beyond Beef* in 1992.¹²

Consequently, the first proposals to introduce environmental considerations into official dietary guidelines date back to the mid-eighties, when Gussow and Clancy¹³ conducted a study on the environmental effects arising from the adoption of the U.S. dietary guidelines. In that article, they coined the term “sustainable diets”; to associate this concept with that of “sustainable agriculture”. The debate around food and sustainability has come a long way since those early days. A 2014 literature review¹⁴

⁹ Garnett, T. (2014). *What is a sustainable healthy diet?* Food and Climate Research Network.

¹⁰ FAO (2010). Sustainable diets and biodiversity: directions and solutions for policy, research and action. Proceedings of the International Scientific Symposium: Biodiversity and sustainable diets against hunger.

¹¹ Lappé, F. M. (2010). *Diet for a small planet*.

¹² Rifkin, J., & Wheelock, V. (1992). *Beyond beef: The rise and fall of the cattle culture*.

¹³ Gussow, J. D., & Clancy, K. L. (1986). Dietary guidelines for sustainability. *Journal of Nutrition Education*, 18(1), 1-5.

¹⁴ Garnett, T. (2014). *Changing What We Eat: A Call for Research and Action on Widespread Adoption of Sustainable Healthy Eating*. Food Climate Research Network

includes a summary of the general characteristics of healthier and less GHG- and land-intensive eating patterns:

- Diversity – a wide variety of foods eaten.
- Balance achieved between energy intake and energy needs.
- Based around: minimally processed tubers and whole grains; legumes; fruits and vegetables – particularly those that are field grown, “robust” (less prone to spoilage) and less requiring of rapid and more energy-intensive transport modes. Meat, if eaten, in moderate quantities – and all animal parts consumed.
- Dairy products or alternatives (e.g. fortified milk substitutes and other foods rich in calcium and micronutrients) eaten in moderation.
- Unsalted seeds and nuts.
- Small quantities of fish and aquatic products sourced from certified fisheries.
- Very limited consumption of foods high in fat, sugar or salt and low in micronutrients e.g. crisps, confectionery, sugary drinks.
- Oils and fats with a beneficial Omega 3:6 ratio such as rapeseed and olive oil.
- Tap water in preference to other beverages – particularly soft drinks.

Today, while a growing number of international organizations and governments have recognized that food policies should aim to integrate the dual objective of improving health for people and the environment, as this report will show, very few countries have taken this step.

1.3 Evolution of national dietary guidelines

Nutritional advice is continuously evolving in light of new evidence about the health effects of different food or nutrients and as diet-related concerns and public health objectives evolve. Nowadays, advice is given at two distinct levels: daily reference values for nutrients (based on extensive literature reviews, and mostly used by professionals) and food based dietary guidelines (based on the former and aimed at the general public). In many cases, the dietary guidelines are complemented by food guides and visual representations such as pyramids, plates or other diagrams that inform on the recommended relative contributions of different food groups to the diet. Food-based dietary guidelines are tailored to the specific nutritional, geographical, economic and cultural conditions within which they operate. Official government mandated and approved guidelines are intended to set out the dietary ‘vision’ for the country and establish the basis for public food and nutrition, health and agricultural policies and nutrition education programmes.

What led to the development of national dietary guidelines? At the 1992 International Conference on Nutrition convened by the Food and Agriculture Organisation and the World Health Organisation, a Plan for Action¹⁵ was adopted which called for the dissemination of nutrition information, giving priority to breastfeeding and “other

¹⁵ FAO/WHO (1992) Final report of the International Conference on Nutrition (ICN)

sustainable” food-based approaches that encourage dietary diversification through production and consumption of micronutrient-rich foods, including appropriate traditional foods. The Plan marked a change from policies driven by theoretical calculations regarding nutrient requirements to those driven by the actual public health concerns of the day. Note that “sustainable” in this context does not seem particularly to have any environmental connotations. A few years later, in 1995 the two organisations held an expert consultation on the preparation and use of food-based dietary guidelines (FBDG).¹⁶ The ensuing technical report provided both the rationale for FBDG and an overview of the steps involved in producing them, which remains the key reference work on the subject today.

Since then, FAO has supported numerous workshops for more than 95 participating countries, and WHO has promoted the concept of FBDG through its regional offices. Together the two UN agencies have trained nutritionists and sought to facilitate development of FBDG all over the world. These efforts have been reinvigorated following the Second International Conference on Nutrition (ICN2), held in November 2014. The ICN2 outcome document¹⁷ presents an updated framework for action and includes these two recommendations, to:

- Develop, adopt and adapt, where appropriate, international guidelines on healthy diets.
- Implement nutrition education and information interventions based on national dietary guidelines and coherent policies related to food and diets, through improved school curricula, nutrition education in the health, agriculture and social protection services, community interventions and point of sale information, including labelling.

Notably, mention of environmental objectives is lacking.

¹⁶ FAO/WHO (1998). *Preparation and Use of Food-Based Dietary Guidelines*.

¹⁷ FAO/WHO (2014). ICN2 Outcome document: Framework for Action. www.fao.org/3/a-mm215e.pdf

2. Aims and objectives

The starting point for this report is the growing weight of evidence concluding that the human population needs to move towards dietary patterns that are not just healthy but respectful of environmental limits and that diets that ‘win win’ on both fronts are broadly possible. One way in which governments can signal their commitment to a more sustainable and healthy future, is by developing and disseminating FBDG that manifest this integrated approach. Guidelines can and should then form the basis of policies seeking to foster such dietary patterns.

With this in mind, the aim of this report is to better understand which governments are already starting to develop and promote integrated guidelines, the processes underpinning their development, and what such guidelines actually say. Our goal is to ascertain whether and how the approaches these leading countries have adopted could be replicated elsewhere.

More specifically our objectives are to:

- Investigate the extent to which environmental considerations are being incorporated into healthy eating guidelines around the world.
- Understand the motivation and circumstances leading to their incorporation.
- Consider (where possible) whether any policy actions have arisen as a result.
- Provide suggestions on how such guidelines might be developed elsewhere.

3. Methodology

Our method was as follows. We undertook a web based review of national dietary guidelines worldwide, using publicly available information. These included the guidelines themselves, associated food guides and other supporting documents, press releases about their publication, and general literature on the topic including scientific papers and reports. We complemented this by interviewing people who have been involved in, or who have followed, the process of guidelines development. Interviewees include those who sit within the government departments responsible for the guidelines, experts who have provided formal advice and input to their development, and external observers and commentators from, for example, civil society. We drew upon contact lists provided by the FAO and on subsequent contact recommendations provided by those we initially interviewed.

Our broad approach was as follows. We 1) broadly analysed current dietary guidelines (both those that include environmental considerations and the majority that do not) so as to describe the state of play and identify common messages and key differences; 2) identified which countries have formally included environmental concerns, which countries have tried and failed, and where quasi-official guidelines are emerging; 3) described the processes behind these developments and analysed the reasons for success and failure; 4) considered whether sustainability guidelines are informing actual policies, such as public procurement standards. In light of this analysis, we 5) identified barriers and opportunities for the integration of environmental and nutritional advice in future dietary guidelines. Note that we look only at guidelines aimed at the general population rather than particular sub-groups (such as children or pregnant women) since the former define the general policy tone.

While our focus is mainly on official recommendations there are so few of these that we also consider 'quasi-official' recommendations. We define these as recommendations produced and disseminated by institutions that are recognised or accredited by Government but that do not sit within a ministerial department and whose recommendations do not constitute official policy. Additionally our analysis includes a few non-official guidelines produced by academic or non-governmental organisations that are founded on good scientific evidence and that illustrate interesting or helpful approaches to integrating sustainability and nutritional advice. We also believe their inclusion to be useful in that they underline growing academic and civil society interest in the issues.

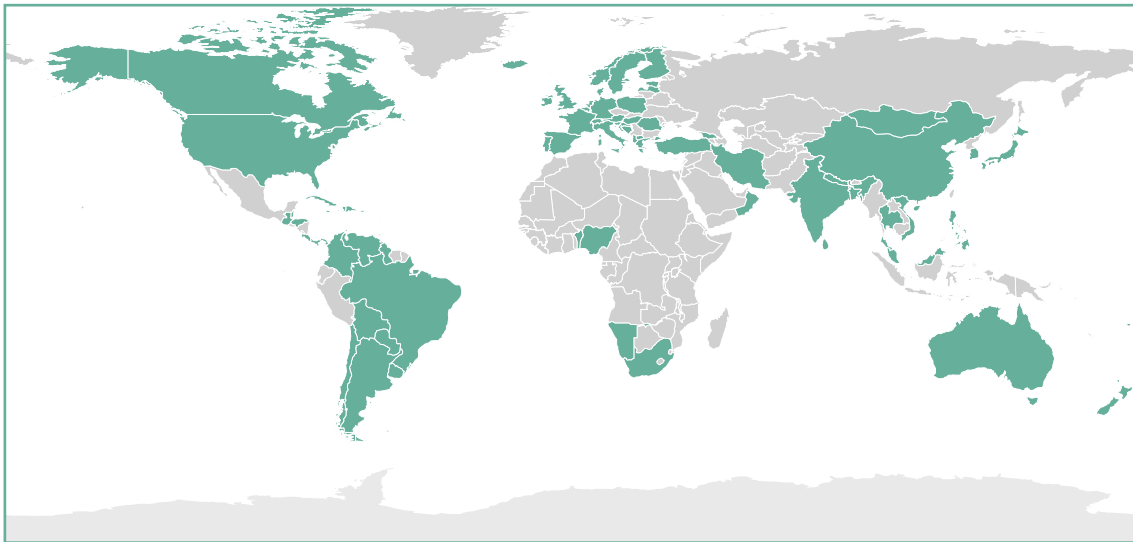
In carrying out this research we made use of local contacts for assistance and searched in the relevant country languages where we had the linguistic capacity (e.g. Spanish, French, German, Italian, Swedish, Estonian). Local contacts were however at times hard to locate and therefore language and cultural barriers made it difficult to look in depth at some of the guidelines. It follows from this observation that countries not represented in this study may indeed have guidelines which we did not find.

4. Results

4.1 General picture

Overall, we identified 83 countries with official dietary guidelines (see Figure 1 and Appendix 1). At the time of conducting this research, at least 13 of those countries were in the process of renewing their guidelines,¹⁸ and one country (Peru) was developing its first set.

Figure 1: Map showing (in green) the 83 countries with dietary guidelines included in this analysis.



It is noteworthy that finding guidelines for many countries was difficult, despite a series of extensive web searches and even though we knew they existed since, for example, we had seen references to them in other documents. This means that their effectiveness as a form of guidance either for health professionals or the general population is likely to be limited.

This said, the FAO, in its efforts to promote FBDG, has a website¹⁹ listing and cataloguing those that have been produced so far and summarising information about the main messages and how the guidelines have been developed. All the information is provided and approved by the member countries. This website provides a valuable resource for government officials who want to develop or update their own dietary guidelines and contributes more generally to raising policy level awareness about FBDG. However it is unlikely to help with the public dissemination of the specific guidelines inside each country.

¹⁸ Austria, China, Estonia, Guyana, Israel, Italy, Hungary, Malta, Mongolia, Netherlands, Republic of Korea, United Kingdom and Uruguay.

¹⁹ <http://www.fao.org/nutrition/education/food-dietary-guidelines/home/en/>

We found a clear relationship between a country's income – according to the World Bank classification – and the probability of it having dietary guidelines. While only two (out of 31) low income countries have guidelines (Benin and Nepal), 43 (out of 80) high income countries have them (Table 1).

Table 2: Classification of the countries with and without dietary guidelines, according to their income level (following the classification by the World Bank).

| | Total | With guidelines |
|-------------------------------|-------|-----------------|
| Low-income countries | 31 | 2 (6%) |
| Low-middle-income countries | 51 | 12 (24%) |
| Upper-middle-income countries | 53 | 26 (45%) |
| High-income countries | 80 | 43 (53%) |
| All countries | 215 | 83 (38%) |

4.2 Analysis of national dietary guidelines

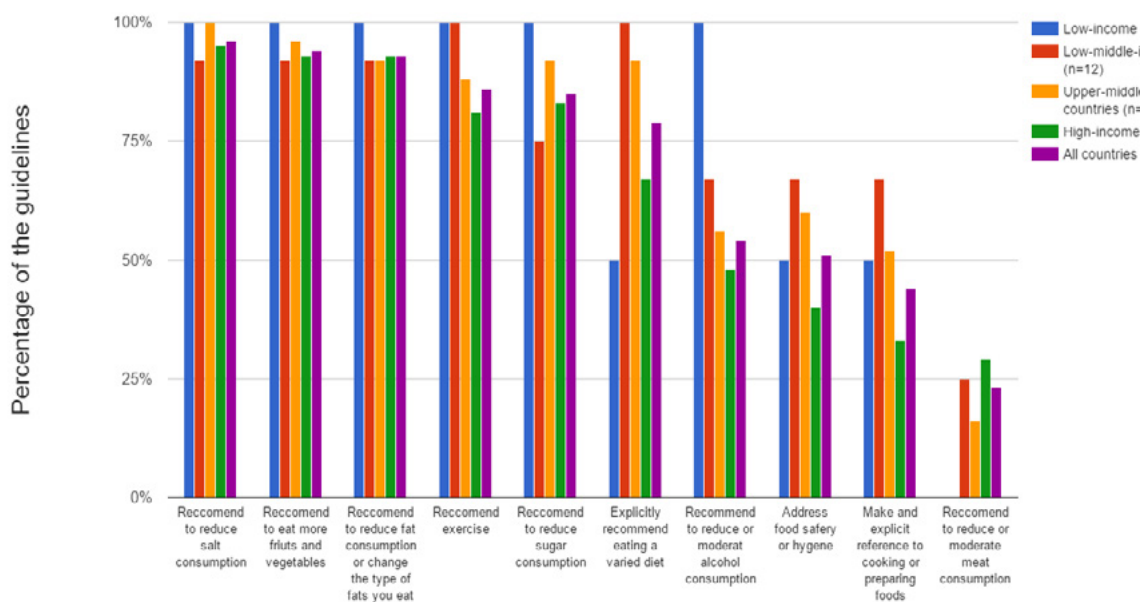
The presentation of the messages varies greatly. Some countries provide very short, simple and broad messages while others give detailed advice, including on specific quantities or the frequency with which each food should be eaten. Some countries only present a visual food guide, in some cases accompanied by some top level messages, whereas others accompany simple messaging with a report describing the process behind the guidelines and the evidence on which the recommendations are based upon.

The most common messages are on reducing salt intakes and increasing fruit and vegetable consumption (present in 96% and 94% of the guidelines, respectively). Ninety three percent of the guidelines advise people to cut down on fat or change the types of fats that they eat (e.g. replacing animal fat with vegetable fat). With increased concerns about sedentary lifestyles, physical activity messages are becoming more common, now appearing in 86% of the analysed guidelines. The need to reduce sugar intakes is explicitly mentioned in 86%. Finally, 80% of the guidelines mention the importance of a varied and balanced diet, and most guidelines that do explicitly mention it nevertheless show a variety of foods in the plate, pyramid, or chosen image that they provide (see Appendix 2).

There are also significant differences among FBDG. This is not surprising since FBDG speak to a country's specific health, behaviour, culture and economic conditions. Only 54% of the guidelines advise people to moderate alcohol consumption, and 51% make comments on food safety. Mention of these issues may reflect the prevalence of alcohol abuse and foodborne diseases in different countries or simply the way government departments are organised. Around 45% of the guidelines mention cooking or preparation techniques. Notably only 20 out of 83 guidelines (24%) recommend reducing or limiting meat intakes, with some of these distinguishing between red and processed meat. Mentions may include specifying a maximum frequency, recommending the inclusion of vegetarian dishes in the weekly menu, or simply advising moderation. In virtually all cases this advice is given based on

health recommendations²⁰. As to the four guidelines which incorporate sustainability considerations (see 4.3.1 “Official guidelines that include sustainability” below) only Sweden and Germany specifically advise moderating meat consumption on grounds of meat’s high environmental impact. The Brazilian guidelines discuss various negative aspects of meat (particularly industrial meat) production but in their summary messaging the emphasis is placed on eating more plants, rather than less meat (see further discussion below). For a summary of the most common messages, and their distributions among countries according to their national income levels, see Figure 2.

Figure 2: Summary of the most common messages in the guidelines by income level.



4.3 National dietary guidelines that incorporate sustainability

Of the 83 countries we identified who have official dietary guidelines, only four explicitly reference or take account of environmental factors in their main messaging (Germany, Brazil, Sweden and Qatar). This section takes a closer look at these four examples. It also examines instances where clear attempts to include them have been made, but have proved unsuccessful (Australia and the US).

This section also looks at quasi-official guidance that combines health and sustainability messaging. We define quasi-official guidelines as those that stem from government agencies or government funded entities – such guidelines were found in the Nordic countries, Netherlands, France, Estonia and the UK.

²⁰ Note that our analysis of the guidelines was undertaken before the WHO’s International Agency for Research on Cancer (IARC), released its statement on the links between processed – and possibly red – meat, and cancer and it may be that government health departments who are currently silent on the subject will update their guidance. The citation for the statement is: Bouvard, V., Loomis, D., Guyton, K. Z., Grosse, Y., El Ghissassi, F., Benbrahim-Tallaa, L., Guha, N., Mattock, H., Straif, K., on behalf of International Agency for Research on Cancer Monograph Working Group (2015). Carcinogenicity of consumption of red and processed meat, *The Lancet Oncology*, [http://dx.doi.org/10.1016/S1470-2045\(15\)00444-1](http://dx.doi.org/10.1016/S1470-2045(15)00444-1)

Finally, for this section, we examine good quality guidance produced by non-governmental organisations or academic bodies (Barilla Institute, WWF, Food Climate Research Network) since, as noted, they highlight the wealth of interest and activity in this field.

4.3.1 Official guidelines that include sustainability

4.3.1.1 Germany

10 guidelines of the German Nutrition Society (DGE) for a wholesome diet (Vollwertig essen und trinken nach den 10 Regeln der DGE) - www.dge.de/index.php?id=322

Overview

The German Nutrition Society (DGE)²¹ has been publishing the German dietary guidelines every seven years, since 1956. It released its ninth and most recent version in 2013. The guidelines are endorsed by the Federal Ministries of Food and Agriculture (BMEL) and Health (BMG).

The *10 guidelines of the German Nutrition Society (DGE) for a wholesome diet* are complemented by the three dimensional pyramid (Figure 3) and the DGE Nutrition circle.

Broad messages

The 10 guidelines of the German Nutrition Society (DGE) for a wholesome diet are as follows (NB: Explicit references to the environment and sustainability are italicised here for emphasis - but are not italicised in the original material)

Enjoy the diversity of foods available

A wholesome diet includes a variable choice, adequate quantities and an appropriate combination of high-nutrient and low-energy food. Choose mainly plant-based foods. They have a health-promoting effect and *foster a sustainable diet*.

Ample cereal products and potatoes

Bread, grain flakes, pasta, rice, preferably from whole grain, and potatoes contain plenty of vitamins, minerals and dietary fibre as well as phytochemicals. Consume these foods preferably with low-fat ingredients. At least 30 grams of dietary fibre daily, especially from whole-grain products, are recommended. A high intake lowers the risk of various nutrition-related diseases.

Fruit and vegetables - take '5 a day'

Enjoy 5 portions of fruit and vegetables daily, as fresh as possible, cook for a short time only, or occasionally, take 1 serving as a juice or smoothie - ideally with each main meal and also as a snack between meals: You profit by consuming plenty of vitamins, minerals, dietary fibre and phytochemicals and lower the risk of nutrition-related diseases. *Rather favour seasonal products*.

²¹ The German Nutrition Society (DGE) is an official professional society, and most of its funding comes from the Federal Ministry of Food and Agriculture (BMEL).

Milk and dairy products daily; fish once to twice a week; meat, sausages and eggs in moderation

These foods contain valuable nutrients, e.g. calcium in milk, iodine, selenium and n-3 fatty acids in saltwater fish. *Choose fish products from recognised sustainable sources.* As part of a wholesome diet, you should not eat more than 300–600 grams of meat and sausages per week [Report authors' note: current average per capita weekly consumption is around 570 grams for women and twice as much for men²²]. Meat contains minerals and vitamins B1, B6 and B12. From the health point of view, white meat (poultry) is more favourable than red meat (beef, pork). Rather choose low-fat products, especially with meat and dairy products.

Fat and fatty foods in moderation

Fat provides essential fatty acids and foods containing fat also comprise fat-soluble vitamins. Fat is particularly high in energy, therefore an increased intake of dietary fat can promote overweight. Too many saturated fatty acids increase the risk of dyslipidemia with the possible consequence of cardiovascular diseases. Rather favour vegetable oils and fats (e.g. canola oil, soybean oil and margarines produced therefrom). Be aware of hidden fat found in several meat and dairy products, pastry, sweets, fast food and convenience products. Overall, 60–80 grams of fat daily is sufficient.

Sugar and salt in moderation

Only occasionally consume sugar and food or beverages containing various kinds of sugar (e.g. glucose syrup). Be creative in flavouring with herbs and spices, but use little salt. Rather favour iodised and fluoridated table salt.

Plenty of fluid

Water is essential to life. Make sure your daily fluid intake is approximately 1½ litres. Rather choose water, carbonated or non-carbonated, and other beverages low in calories. Only rarely drink sugar sweetened beverages. They are high in energy, therefore an increased intake can promote overweight. Consume alcoholic drinks only occasionally and only in small amounts due to the health risks associated with them.

Prepare carefully cooked dishes

Preferably cook foods on low heat, if possible for a short time, using little amount of water and fat. This will preserve the natural taste, conserve the nutrients and avoid the formation of harmful substances in food. Use fresh ingredients whenever possible. *This helps to reduce unnecessary packaging waste.*

Take your time and enjoy eating

Take a break while you eat and do not eat in passing. Allow plenty of time for eating, this promotes your sense of satiation.

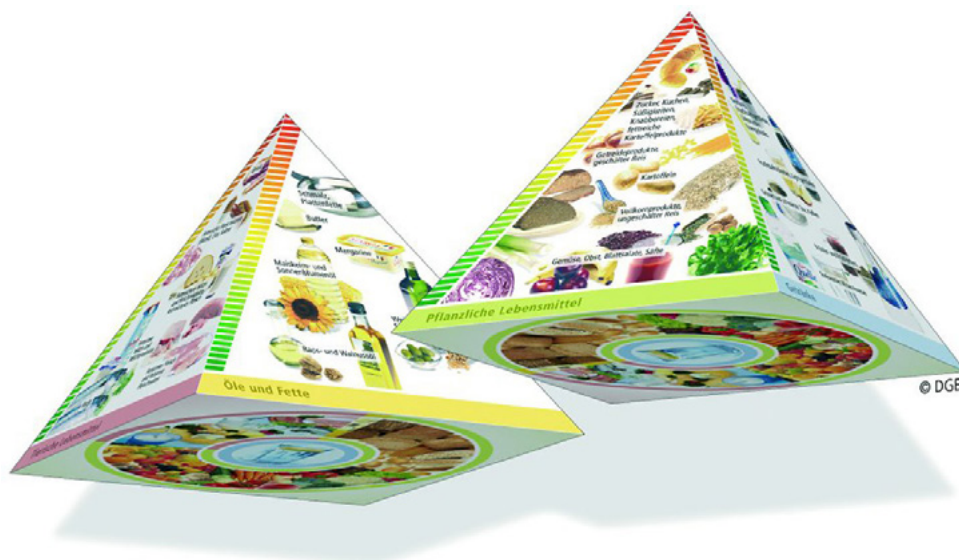
Watch your weight and stay active

Combine a wholesome diet along with plenty of physical exercise and sport (30–60 minutes daily). This will help you to control your weight. For example, *you can walk or take the bicycle from time to time. This protects the environment and promotes your health.*

²² German Nutrition Society. *The Nutrition Report 2012*

They complement the guidelines with an additional three dimensional pyramid (Figure 3). The base of the pyramid presents the DGE Nutrition Circle. Each side of the pyramid corresponds to one of four food groups: plant foods, animal foods, oils and fats, and drinks. In each side, more nutritionally desirable foods are closer to the base of the pyramid, whereas less desirable foods are at the top, indicating that only small quantities of these foods should be consumed.

Figure 3: Three dimensional pyramid of the German Nutrition Society (DGE).



What advice is given on sustainability?

Although sustainability was very prominent in the communication surrounding the launch of the current edition of the DGE guidelines²³, the actual text only provides some mention of environmental issues. As detailed in the previous section, each guideline is followed by a brief paragraph expanding on the particular issue. While there is no mention of sustainability in the top level messaging, some of the explanatory paragraphs do contain sentences that refer to sustainability or the environment (see italicised text in the previous section).

Evolution of process

In 2002, Germany, Switzerland and Austria issued common nutrient recommendations under the abbreviated name of DACH.²⁴ This document provided the main basis for the dietary guidelines of the three countries.

The three dimensional pyramid and the 10 guidelines were developed by the DGE following several workshops and consultations with the Federal Ministry of Food and Agriculture (BMEL) and the German Agency for Consumer Information (AID). AID, which is funded by BMEL, is an information service on research and practice in the fields of agriculture, consumer protection, nutrition and environment.

²³ For example, this press release announcing the launch (in German): <https://www.dge.de/presse/pm/10-regeln-der-dge-fuer-eine-vollwertige-ernaehrung-ueberarbeitet/>

²⁴ Wolfram, G. (2002, December). New reference values for nutrient intake in Germany, Austria and Switzerland (DACH-Reference Values). In *Forum of nutrition* (Vol. 56, pp. 95-97).

BOX 2. Other government-backed dietary guidelines in Germany

The German government has also supported the development of an additional set of guidelines to inform purchasing decisions. The Sustainable Shopping Basket is published by a quasi-governmental institution, the German Council for Sustainable Development (RNE). The RNE is appointed by the Federal Government and is formed of 15 representatives of diverse organisations, including universities, NGOs, industry and religious groups. It advises the government on its sustainable development policy and presents proposals for targets and indicators to advance the government's Sustainability Strategy. The German Council for Sustainable Development also has the mandate to foster social dialogue on sustainability.

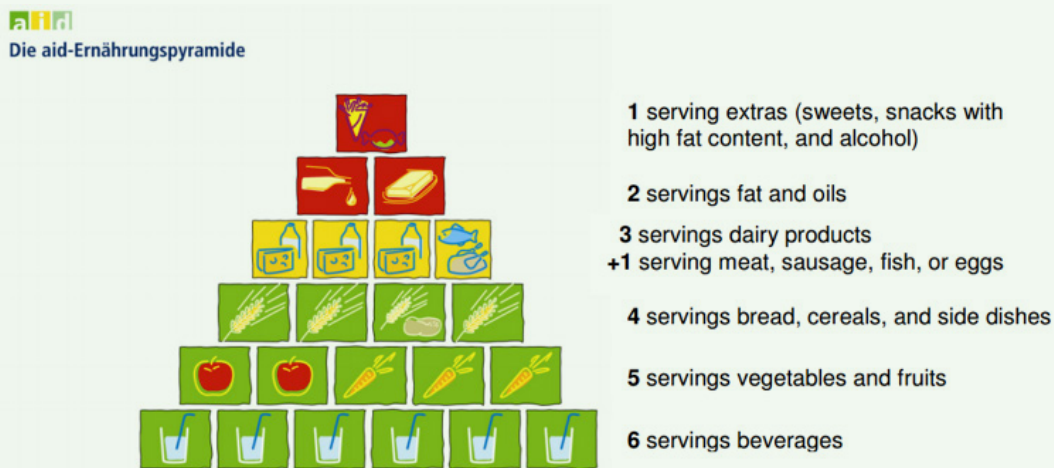
The fourth, and latest, completely revised edition of the Sustainable Shopping Basket was released in November 2013. Under the messages that "sustainable consumption is already possible today" and "sustainable consumption means buying more thoughtfully and buying less" it presents information about the environmental impact of different products and provides advice on consumption patterns to reduce our personal impact. The report – also available as a mobile app – covers a wide range of products, from textiles and cosmetics, to cars and financial investments, and includes a segment on food.

The main recommendations of the food segment are: eating less meat and fish, eating five servings of fruit and vegetables a day, eating seasonal and regional products, and buying organic and Fairtrade products and drinks in recyclable packaging. It provides a seasonal calendar for fruit and vegetables and explains the different labels and certification schemes that German consumers might find on the packaging of products they buy. It also highlights possible trade offs between products that have been produced sustainably, but may then be transported long distances.

The report adopts a broad definition of sustainability, encompassing environmental, social and animal welfare considerations – for example, it recommends the purchase of organic and Fairtrade products and advises choosing "meat from animals raised under species -appropriate conditions" and not to buy eggs from hens that have been kept in battery cages. The recommendations for reducing meat consumption (to between 300 and 600 g per week) and to consume 5 servings of fruit and vegetables every day are based on the DGE guidelines. However, the document directs readers interested in more information about healthy eating to the AID website and not to the DGE.

The AID information service (see main text above) has developed its own pyramid, originally aimed at children, and now expanded to adults. The adults pyramid is based on the DGE guidelines, but presents simplified food groups. The pyramid is formed of 22 blocks, each block representing one portion, arranged on six different levels. A specific number of daily servings is allocated to each level, following a 6-5-4-3-2-1 rule (Figure 4). Note that the guidance on protein-containing food (3 servings dairy products +1 serving meat, sausage, fish or eggs) does not suggest any non-animal based alternatives such as soy or legumes.

Figure 4: AID-Food Pyramid



copyright: AID, idea: S. Mannhardt

The AID website also has a section on Nutrition and Climate protection which provides the following advice:

1. Do not use the car to go shopping.
2. Eat less meat.
3. Reduce food waste by buying what you need.
4. Buy seasonal products.
5. Choose organic food. (The AID claims that organic products have lower CO₂ emissions than conventional products, a claim that is the subject of debate in the academic literature. Space does not allow for further discussion in this report).
6. Choose local and seasonal foods produced outside (i.e. not in a greenhouse).
7. Use climate-friendly kitchen appliances (Look at efficiency labels and choose green energy).

4.3.1.2 Brazil

Dietary Guidelines for the Brazilian Population 2014 (Guia alimentar para a população brasileira 2014)
dab.saude.gov.br/portaldab/biblioteca.php?conteudo=publicacoes/guia_alimentar2014

Overview

Brazil presented its first *Dietary Guidelines for the Brazilian Population* in 2006. The second and most recent version was published in 2014. The guidelines are an official publication of the Brazilian Ministry of Health and consist of five chapters and a self-contained summary. They are available online in three languages (English and Spanish, as well as the Portuguese version which is also printed). The main messages are also summarized in a video available in the three languages²⁵: The Guide features 10 steps to a healthy eating plan.

Broad messages

The first chapter, 'Principles', lists and explains five overarching principles that form the basis of the guidelines:

- Diet is more than intake of nutrients.
- Dietary recommendations need to be tuned to their times.
- Healthy diets derive from socially and environmentally sustainable food systems.
- Different sources of knowledge inform sound dietary advice.
- Dietary guidelines broaden autonomy in food choices.

The second chapter has the self-explanatory title of 'Choosing foods'. It includes the usual recommendations regarding the importance of eating vegetables and whole cereals, and of reducing consumption of foods rich in fats, salt and added sugars. But rather than follow the food groups-based format found in most guidelines, the Brazilian guidelines categorise food according to their level of processing. They state that more processing usually means more added fats, salts and sugar, and fewer whole foods, which undermines health objectives and it also generally entails more packaging and energy, which carries environmental costs.

Foods are seen as falling into one of four categories:

- **Natural foods** are "those obtained directly from plants or animals and purchased for consumption without having undergone any subsequent alteration" (e.g. fruits, or eggs and milk). Minimally processed foods are "natural foods which have been somewhat altered before being purchased" (e.g. grains that are dried, polished, or ground as grits or are cooled or frozen; and pasteurised milk).
- **Oils, fats, salt, and sugar** are "extracted from natural foods or from nature by processes such as pressing, grinding, crushing, pulverising, and refining".

²⁵ English version in youtu.be/JTk8NxESCUY

- **Processed foods** are those “that are manufactured essentially with the addition of salt or sugar to natural or minimally processed foods” (e.g. canned and bottled vegetables, cheeses, and breads).
- **Ultra-processed foods** are “products whose manufacture involves several stages and various processing techniques and ingredients, many of which are used exclusively by industry” (e.g. packaged salty oily snacks, confectionery, soft drinks, sweetened breakfast sticks, pre-prepared packaged pizzas, and instant noodles).

The third chapter, ‘From foods to meals’, discusses current and traditional dietary patterns in Brazil.

The fourth chapter is called ‘Modes of eating’. This chapter is about the context of eating. Three aspects are considered: the time and attention devoted to eating, the environment where it occurs, and the sharing of meals.

The fifth chapter is titled ‘Understanding and overcoming obstacles’. The report identifies six general obstacles to following the recommendations given in the other chapters: information, supply, cost, skills, time, and advertising. For each obstacle, a solution is proposed (Table 2 over).

Finally, “10 steps to healthy diets”, summarise the main messages:

- Make natural or minimally processed foods the basis of your diet.
- Use oils, fats, salt, and sugar in small amounts for seasoning and cooking foods and to create culinary preparations.
- Limit the use of processed foods, consuming them in small amounts as ingredients in culinary preparations or as part of meals based on natural or minimally processed foods.
- Avoid ultra-processed foods.
- Eat regularly and carefully in appropriate environments and, whenever possible, in company.
- Shop in places that offer a variety of natural or minimally processed foods.
- Develop, exercise and share cooking skills.
- Plan your time to make food and eating important in your life.
- Out of home, prefer places that serve freshly made meals.
- Be wary of food advertising and marketing.

Table 3: Obstacles to following the recommendations given in the Brazilian dietary guidelines and their solutions, as identified in the chapter “understanding and overcoming obstacles”.

| Obstacle | Problem | Solution |
|-----------------------|--|---|
| Information | There is a lot of information on diet and health, but there are few reliable sources | Use and disseminate these guidelines. |
| Supply | Ultra-processed foods are on sale everywhere, promoted by advertisements and discounts on all media. By contrast, natural or minimally processed foods get little publicity and some are not even available close to people's homes. | Be mindful when shopping for food and eating food away from home. |
| Cost | Some healthier foods are more expensive than ultra-processed foods. | Although some natural and minimally processed foods are not cheap, the total cost of diets based on natural or minimally processed foods is still lower in Brazil than the cost of diets based on ultra-processed foods. Buy seasonal products, from outlets where there are fewer intermediaries between farmer and consumer. |
| Cooking skills | Cooking and other culinary skills are no longer being shared between generations. This favours consumption of ultra-processed foods. | Learn and share culinary skills. |
| Time | The recommendations in these Guidelines are likely to take additional time | By improving your cooking techniques, you can greatly reduce the time spent on food preparation. Planning can also help in saving time |
| Advertising | The advertising of ultra-processed products dominates commercial advertising of food: it often conveys incorrect or incomplete information about diet and health and mainly affects children and youngsters. | The biggest concern here is advertising focused on children. Parents and educators must explain that the function of advertising is essentially to increase the sale of products, and not to inform or educate people. Limiting the amount of time children spend watching television and using computers is a way to reduce their exposure to advertisements, and at the same time, make them more active. |

What advice is given on sustainability?

Sustainability is a cross cutting theme in the guidelines if not always explicitly articulated. The third principle of the guidelines is: “healthy diets derive from socially and environmentally sustainable food systems”. Sustainability is understood in the broader sense, with a strong focus on social dimensions, and borrowing language and concepts from the food sovereignty movement (seeds and biodiversity, farm size, family farming). In their own words: “these guidelines consider the means by which food is produced, distributed, and sold, favouring those which are socially and environmentally sustainable”.

Each recommendation in the ‘Choosing foods’ chapter is followed by the rationale behind the recommendations, including health, environmental and social implications.

To support their recommendation to “base diets on many varieties of natural or minimally processed foods mainly of plant origin”, they present an extensive list of the environmental and societal impacts of animal based foods: “Reduced consumption and thus production of animal foods will reduce emissions of the greenhouse gases responsible for global warming, of deforestation caused by creation of new grazing areas for cattle, and of intensive use of water. It will also reduce the number of intensive animal production systems, which are particularly harmful to the environment. The crowding of animals, characteristic of these systems, stresses the animals, increases animal wastes, requires systematic use of antimicrobial drugs, pollutes and contaminates groundwater, reservoirs, lakes and rivers, and generates diseases in animals that can be transmitted to humans. Intensive production requires vast amounts of animal feed produced by monoculture systems producing soybeans and corn. Like all intensive agriculture, these also require intensive use of water, and of chemical pesticides and fertilisers that contaminate sources of water, degrade soil, increase pest resistance and reduce biodiversity.”

The guidelines also say that food supplies and dietary patterns based on rice, beans, corn, cassava, potatoes, vegetables and fruits encourage family farming and local economies, and living and producing in solidarity while promoting biodiversity and reducing the environmental impact of food production and distribution.

The impacts of ultra-processed foods on culture, social life and the environment are also highlighted. The guidelines state that aggressive marketing of these foods can negatively affect people’s perception of the local traditions and culture, including food culture. As ultra-processed foods are designed to be consumed quickly and anywhere, they promote social isolation. Finally, it is stated that “monocultures and farms producing for export and not for local consumption” generate negative environmental impacts related to intensive farming and long distance transport.

The guidelines also discuss the impact of disposable packaging and utensils on the environment and recommend the use of non-disposable utensils.

However, it is worth noting that the summary of main recommendations only briefly mentions environmental sustainability – someone who reads only the summary would not be exposed to the sustainability messaging found in the full report.

Evolution of process

The guidelines are a culmination of a 3-year process directed by the Ministry of Health (MS) in partnership with the Center for Epidemiological Research in Nutrition and Health of the University of São Paulo (NUPENS/USP) with the support of the Brazilian Pan American Health Organization Office (PAHO/Brazil) and the General Coordination of Food and Nutrition (CGAN).

The process began in November 2011 with a workshop involving professionals from health, education, social welfare and agriculture sectors; university professors; leaders of professional councils and professional associations; and members of public policy social control councils (see explanatory footnote),²⁶ and consumer protection organizations. There appears to have been no representation from the Ministry of Agriculture or from the food industry, nor any environmental representation, either academic or non-governmental – which is noteworthy given the report’s emphasis on sustainability.

Discussion focused on the following questions: what should a guide or a reference material contain in order to effectively contribute to better food choices by the population? Have you ever used the 2006 Dietary Guidelines for the Brazilian population? How? Do you consider the language and the proposed structure appropriate?

Guided by the results of the workshop, a team of representatives from CGAN, PAHO and NUPENS elaborated the first draft of the guidelines, which were completed in July 2013.

A second workshop was held a month later involving the same participants, to discuss the draft guidelines.

A subsequent version was then produced and a report finished in December 2013 which, after evaluation and approval from the Ministry of Health, was submitted to public consultation in February 2014. The consultation was complemented with another round of workshops (one in each one of the Brazilian states), and with meetings with regional nutritionist professional councils, local universities and other government agencies.

All in all 3125 responses were received from 436 individuals/institutions (including universities, public bodies, professional representative organizations, the private sector, unions, health professionals and members of the public).

The Health Ministry published a summary of the proposed changes, indicating whether they were accepted, partially accepted, or rejected, and providing their justification for doing so. The available record of the comments does not identify the author of each comment and so it is not possible to offer an analysis of the position of the different stakeholders. However, some of the people we interviewed for this report commented

²⁶ Brazilian “councils” were set up in the early 1980s, to help with the democratization process by encouraging the involvement of civil society in government. “Social control” means that society participates in monitoring and evaluation, in this case, of public policies.

that the main opposition came from representatives of the Association of Brazilian Food Industry (ABIA), and centred on the use of a classification based on processing levels. An overview of the comments seems to confirm this idea, as many mention issues with the classification. Furthermore, some of the changes to the text of the guidelines support the idea that it was a contentious issue. An earlier version of the guidelines utilized the term “ultra-processed products”. Interestingly ultra-pasteurized milk was originally classified as an ultra-processed food and was only later reclassified as minimally processed, following the comments received.

4.3.1.3 Sweden

Find your way to eat greener, not too much and be active! (Hitta ditt sätt att äta grönare, lagom mycket och röra på dig!)
www.livsmedelsverket.se/en/food-habits-health-and-environment/dietary-guidelines/vuxna/

Overview

The Swedish dietary guidelines are broadly based upon the *Nordic Nutrition Recommendations* (NNR – described in more detail in section 4.3.3.2 below). The guidelines are produced by the Swedish National Food Agency (NFA) (Livsmedelsverket), the administrative authority for issues relating to food and drinking water. The NFA has a government mandate to inform consumers, companies and other interested parties about food related rules, regulations and issues, and to provide dietary guidelines and other important issues in the food area.

The most recent version of the guidelines was published in April 2015. Entitled *Find your way to eat greener, not too much and be active!*, they are accompanied by a report that summarises their scientific basis and the considerations that led to the recommendations (Risk and benefit management report)²⁷. Both documents are available in Swedish and in English and can be downloaded from the NFA’s website.

Broad messages

The report begins with the same emphasis on whole diets that is found in the NNR 2012, but right at the outset it overtly embraces environmental considerations: “... what you eat isn’t just important to your own personal wellbeing; it’s important to the environment as well.”

The advice consists of nine recommendations, centering on the following themes; fruit and vegetables, fish and shellfish, exercise, wholegrain, fats, dairy, meat, salt, sugar, and balancing intake and expenditure (eating just enough). For each theme, the report presents the main recommended action (e.g. eat more vegetables), a set of recommendations on how to achieve it, the health implications and where relevant, the associated environmental impacts.

²⁷ Swedish National Food Agency. Report 5 2015. Swedish dietary guidelines – risk and benefit management report”.

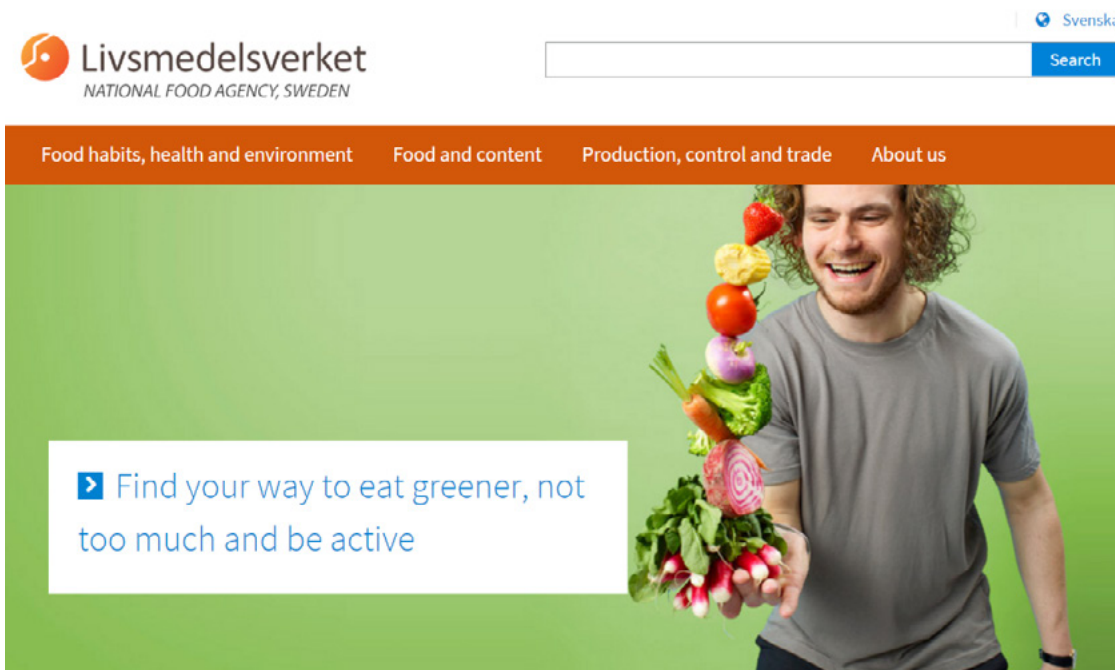
It also recommends the use of the Keyhole label (see section 4.3.3.2 on the Nordic Nutritional Guidelines for more information) to select products. The last part of the document provides “one-minute advice” that summarizes the nine recommendations:

- More vegetable and fruit.
 - At least 500 grams, ideally high fibre vegetables.
- More seafood.
 - Two or three times per week.
 - Use both fatty and low fat varieties.
- More exercise.
 - At least 30 minutes every day.
- Switch to wholemeal.
 - For pasta, bread, grain and rice.
- Switch to healthy fats.
 - Use rapeseed or olive oil instead of butter for cooking.
- Switch to low fat dairy products.
 - Also, unsweetened and enriched with vitamin D.
 - “Depending on what else you eat – cheese, for example – 2-5 decilitres of milk or fermented milk a day is all you need to make sure you get enough calcium.”
- Less red and processed meat.
 - Less than 500g (cooked) per week (“only a small amount of this should be processed”).
- Less salt.
 - Use salt with iodine when you use it.
- Less sugar.
 - Cut down sweet drinks in particular.
- Maintain a balance.
 - “Eat just the right amount.”

What advice is given on sustainability?

Sustainability is embedded throughout the guidelines – the document actually begins with a prologue entitled “Sustainable big picture”. And when entering the main website of the NFA: the first, highly visible subheading on the site is “Food habits, health and environment” (see Figure 5).

Figure 5: Extract of the home page of the Swedish National Food Agency website, showing the main headlines reflecting the strong focus on sustainability throughout the guidelines and its communication.



The document highlights a broad range of environmental concerns, from climate change, to pesticide use and the eutrophication of waterbodies. It touches too on broader sustainability issues, such as animal welfare and antibiotic use in farm animals. Unlike most of the other guidelines reviewed it also considers some of the complexities inherent in defining sustainability and provides the following nuancing pointers:

- High fibre vegetables have a lower environmental impact than salad greens. They tend to be grown outside (not in greenhouses). They are also more robust, which reduces waste due to damages during transport.
- Although people should consume more seafood for health, many wild fish stocks are endangered or are harvested unsustainably, while aquaculture also has its problems. People should therefore buy eco-labelled products. Mussels can help reduce marine eutrophication.
- One of the ways to increase physical activity is to use the stairs instead of the lift, and cycle or walk to work, and these behaviours can also reduce the environmental impact.
- Cereals have a relatively small climate impact. Due to the high GHG emissions associated with rice, other grains and potatoes are a better choice for the environment.
- Rapeseed oil and olive oil generally have a lower environmental impact than palm oil, but the relationship gets inverted when palm oil is produced without deforestation (e.g. in old plantations).
- Dairy products have high environmental impacts since dairy cows produce methane. However, grazing animals can help bring about a “rich

agricultural landscape and biodiversity”. Drinks made of oats and soya are eco-friendly, chose the ones enriched with vitamins and minerals.

- Reducing meat consumption can benefit both health and the environment. By cutting down on quantity people may be able to afford to buy meat produced more sustainably, with attention paid to the welfare of the animals. Different meat types have different climate impacts: poultry has the smallest impact on climate, followed by pork. On the other hand, free range beef and lamb can also have other positive environmental effects – animal grazing can help maintain diverse agricultural landscapes and support biodiversity.
- Sweets can also have a high environmental impact: a bag of jelly beans actually has as much of a climate footprint as a small portion of pork. These are referred to in the report as an “unnecessary environmental impact”.

Past attempts to include sustainability in the Swedish guidelines

The 2015 guidelines do not represent the first attempt in Sweden to incorporate environmental dimensions into the dietary guidelines. In 2009, the Swedish National Food Agency included the recommendation to choose locally produced foods, but was hindered by the EU Commission who objected on the grounds that this would give Swedish producers an unfair advantage. The guidance was reworded and updated to comply with EU requirements, but subsequently blocked by the Swedish government itself, based on warnings by the Swedish National Board of Trade that the advice risked undermining the principle of free trade. Although the ambition to formally launch new advice was scrapped, some of the material was nevertheless published on the Swedish National Food Agency web page as information on the environmental impact of food production.

Evolution of process

The Swedish dietary guidelines are usually updated every eight years, following the publication of the Nordic Nutrition Recommendations (see section 4.3.3.2 below). However, they can be updated more frequently in light of new evidence that could have an important effect on health.

The guidelines are based on the NNR (see 4.3.3.2 below), various reports by the Swedish National Food Agency,^{28,29,30,31} data from a national survey of the dietary habits of the Swedes (Riksmaten – Adults 2010–11) and information gathered from consumption statistics of the Swedish Board of Agriculture (Jordbruksverket).

The Swedish National Food Agency is supported by a reference group with representatives from other authorities, industry associations, and researchers,

²⁸ On the road to environmentally adjusted nutritional advice, report no. 9, 2008

²⁹ On the road to environmentally adjusted nutritional advice – subreport fish), report no. 10, 2008

³⁰ Environmental impact of animal-based products – meat, milk and eggs), report no. 17, 2013

³¹ How small can the climate impact of food consumption be in 2050?, jointly created by the Swedish Board of Agriculture (Jordbruksverket), the Swedish National Food Agency and the Environmental Protection Agency (Naturvårdsverket).

representing multiple fields (including health, consumers and the environment). The Swedish National Food Agency also liaises with the Public Health Agency (Folkhälsomyndigheten) and the Swedish Board of Agriculture. In November 2014 an open hearing was arranged, involving various professionals working to promote healthy dietary habits, and participants from the food industry, consumer organisations, patient representation groups, environmental organizations and other interested parties.

Following this hearing, drafts for the messages aimed at the general public and the risk and benefit management report were presented for an online open consultation. About fifty comments were received. Finally, the guidelines were tested on consumers via focus groups to assess how well the guidance was understood.

Most of the comments received were generally positive, including those from the meat industry, which accepts the health reasons to limit consumption. However, the dairy industry and associated organisations were initially critical. The dairy company Arla and LRF Dairy Sweden, the organisation representing Swedish dairy farmers, called the new advice 'unacceptable' and strongly questioned how recommended calcium levels could be achieved if liquid milk consumption was restricted to 0.2–0.5 litres per day. In response, the final version of the background material contains an appendix which shows how recommended calcium intake can be achieved by consuming a combination of dairy and other calcium-rich non-dairy products.

Additionally while in principle the dairy sector supported the ultimate goal of incorporating environmental sustainability into the advice, they argued that since research in this area is still in its infancy and since the Swedish National Food Agency does not have the necessary expertise, it was premature and inappropriate to offer such integrated advice. They also drew attention to the importance of grazing animals for biodiversity conservation in Swedish semi-natural pastures and the importance of milk as a food product that naturally contains many important nutrients, as opposed to fortified plant-based alternatives.

Notwithstanding these objections the published guidelines have generally been viewed favourably, although there were some complaints from the juice and smoothies industry, which were not happy that juice no longer counts as contributing to the recommended 500g of fruit and vegetables daily.

Sweden also has periodic national food surveys. The third took place in 2010–2011 and informed the development of the dietary recommendations. The next will take place in 2016 and 2017 and in principle it could offer some indications as to the impact of the guidelines by tracking consumption changes. This said, since the influences on consumption are so complex, it may be difficult, if not impossible, to establish a causal link between the guidelines and shifts in consumption.

4.3.1.4 Qatar

Qatar Dietary Guidelines (رطق ةلودل ةيذغت لل ةي دالذلال لئال دلل)
eservices.sch.gov.qa/qdgportal/home.jsp?lang=en

Overview

Qatar published its first national dietary guidelines in 2015 as part of its *National Health Strategy and Nutrition and Physical Activity Plan* to ‘reduce morbidity and mortality attributable to chronic non-communicable diseases in the State of Qatar’. They are published in Arabic and English.

Broad messages

The Qatar Dietary Guidelines are summarized in 8 main messages and key recommendations:

1. “Eat a variety of healthy choices from the 6 food groups” (vegetables; fruit; cereals and starchy vegetables; legumes; milk, dairy products and alternatives; and fish, poultry, meat and alternatives).
 - For each group, there is advice on general consumption levels, as well as particular recommendations about what foods to choose within each group.
2. “Maintain a Healthy Weight”.
3. “Limit Sugar, Salt and Fat”.
 - Limit sweetened foods. Avoid sweetened beverages such as carbonated, energy and fruit drinks.
 - Reduce intake of salty foods.
 - Eat fewer fast foods and processed foods.
 - Avoid saturated fat and hydrogenated or trans fats (e.g. ghee, partially hydrogenated vegetable oil) and foods made with these fats (French fries, commercially baked sweets).
 - Use healthy vegetable oils such as olive, corn and sunflower in moderation.
 - Read nutrition labels to choose foods low in sugar, salt and fat and high in nutrients.
 - Eat home-made food more often.
 - Explore healthy ways to prepare traditional foods.
4. “Be Physically Active”.
5. “Drink Plenty of Water”.
6. “Adopt Safe and Clean Food Preparation Methods”.
7. “Eat Healthy while Protecting the Environment”.
 - Emphasize a plant-based diet, including vegetables, fruit, whole grain cereals, legumes, nuts and seeds.

- Reduce leftovers and waste.
- When available, consume foods produced locally and regionally.
- Choose fresh, homemade foods over highly processed foods and fast foods.
- Conserve water in food preparation.

8. “Take Care of Your Family”

What advice do they give on sustainability?

The Qatar guidelines include “eat healthy while protecting the environment” as one of the eight guidelines. The section of the document dedicated to this guideline starts by justifying the inclusion of sustainability in the recommendations, describing some of the ways food is linked to the environment (land and water use, GHG emissions, solid waste disposal, depletion of fish stocks). Furthermore, the guidelines highlight that the Qatar National Development Strategy has identified shortages in water, low arable land, solid waste generation and depletion of fish stock as serious concerns.

That section also offers advice on how to eat sustainably. There are recommendations on how to plan meals and shop to reduce over consumption and food waste, and to aim for a plant-based diet, to consume fewer processed foods, and to pay attention to packaging.

Almost all references of sustainability are limited to this section. The only exception is in the section about fish, where the guidelines recommend looking in “online seafood guides” for information about the “healthiest and most environmentally friendly” products. Most notably, the section on meat and meat alternatives does not discuss the environmental impact of those products – although it does recommend eating at least one meatless meal per week, limiting red meat consumption to 500g per week and avoiding processed meats.

Evolution of process

The National Health Ministry³² led the development of the Qatar Dietary Guidelines in collaboration with the National Dietary Guidelines Task Force. The Task Force – established in 2012 – consisted mostly of nutritionists and public health personnel from a wide range of institutions, including: Qatar University; Qatar Foundation; Qatar Diabetes Association; Hamad Medical Corporation; Aspetar (orthopaedic and sports medicine hospital); SIDRA (medical and research centre); and Weill Cornell Medical College.

In January 2013, the Task Force organised a workshop to draft the guidelines, based on the nutritional needs of Qatar and a review of more than 10 dietary guidelines from across the region and the world. The Qatar Dietary Guidelines drew particularly on recommendations, guidance and evidence from dietary guidelines from Australia, Lebanon, Oman, and Canada, as well as the WHO Regional Office for Eastern Mediterranean, 2012 American Cancer Society Guidelines on nutrition and physical activity for cancer prevention, the state of Qatar national physical activity guidelines and the Arab Centre for Nutrition in Bahrain.

³² Supreme Council of Health, Health Promotion and Non-communicable Diseases.

In February 2013, a registered dietician specialized in Public Health was designated as coordinator to further the development of the guidelines. She proposed the inclusion of sustainability and, found some initial resistance on the grounds that “What does the environment have to do with nutrition?” Once the links were explained, the Task Force accepted her suggestion. According to one commentator, the key factors that contributed to the inclusion of sustainability were: national interest in environmental sustainability and food security (which were part of the national strategy plan), concern about food waste and overconsumption (supported by a strong adherence to Islamic religious law³³), the strong authority of the Supreme Council of Health (supported by an Emirate government), and the relatively small size of the domestic food industry.

The guideline messages were pilot tested in the autumn of 2013. Following the tests, some messages had to be diluted, as they were not clear to the public. For example, a recommendation to consume seasonal foods had to be shifted to a statement about local and regional foods (see the “Broad messages” section above), as seasonal foods are difficult to define in Qatar – due to low seasonal variations (the public does not have a strong grasp on “seasons”) and the fact that most food is imported. Products tend to be available all year round at the same price. The message “conserve water in food preparation” was included not because food preparation uses significant quantities of water, but because it highlights the importance of water conservation – clearly an issue in Qatar. A visual handout for the Qatar Dietary Guidelines was then designed that incorporated the feedback, and a lengthier booklet developed to complement the handout. The Guidelines were launched in 2015.

4.3.2 Other countries where the inclusion of sustainability on the official guidelines was discussed

4.3.2.1 Australia

Australian Dietary Guidelines (2013)
www.nhmrc.gov.au/guidelines-publications/n55

Australia published its first dietary guidelines in 1999, aimed at “Older Australians”. Versions for “Adults” and “Children and Adolescents” were released in 2003, and a policy was established of renewing guidelines every five years. In 2008, the National Health and Medical Research Council (NHMRC) undertook to update and combine the three age-specific documents in one.

A Dietary Guidelines Working Committee was tasked with developing the new guidelines. The Committee was composed of experts in nutrition and public health

³³ Islamic doctrine discourages overconsumption and suggests that one eats in thirds: 1/3 (of stomach) for food, 1/3 for water and 1/3 for air (in order to breathe comfortably). Seed, B. (2014). Sustainability in the Qatar national dietary guidelines, among the first to incorporate sustainability principles. *Ecosystems*, 12, 14.

from Australian universities, plus representatives from Food Standards Australia New Zealand³⁴ and the Australian Food and Grocery Council (AFGC).³⁵

In developing the Guidelines, NHMRC drew upon the following sources of evidence:

- The previous series of dietary guidelines and their supporting documentation.
- **The Evidence Report**³⁶
The Working Committee conducted a series of literature reviews to address targeted questions on food, diet and disease/health relationships. The data extracted was categorized according to strength of evidence, size of effect and relevance. Evidence statements were then produced. Finally, the NHMRC commissioned an external methodologist to ensure that review activities had been undertaken in a transparent, accurate, consistent and unbiased manner.
- **The Nutrient Reference Values (NRVs) Document**³⁷
The NRVs document outlines the intake levels of essential nutrients considered adequate to meet the known nutritional needs of the vast majority of healthy people. It was developed by the Australian National Health and Medical Research Council (NHMRC) and the New Zealand Ministry of Health (MoH).
- **The Food Modelling System**³⁸
The Food Modelling System was commissioned by the NHMRC between 2008 and 2010. It determines a range of combinations of amounts and types of foods that can be consumed to meet nutritional needs – as set in the NRV document – with the least amount of energy for the smallest and least active people within an age and sex group. To ensure that the final models were realistic and practical (by considering issues such as social diversity, the food supply, food culture and environmental sustainability), the parameter range was assessed to ensure consistency with the Australian context.
- **Key authoritative government reports and additional literature.**
During the development of the guidelines, there was a strong public campaign in the media opposing the incorporation of sustainability in the guidelines. The campaign was championed by the food industry, farmers and fisheries groups, and the main argument was that “the environment is out of the mandate of the dietary guidelines”. After much debate these interests held sway; sustainability guidance was included in an appendix in the final version of the “Australian Dietary Guidelines”, published in 2013.

³⁴ A bi-national government agency that develops and administers the Australia New Zealand Food Standards Code

³⁵ An entity that represents Australia’s food, drink and grocery manufacturing industry.

³⁶ Williams, P., Allman-Farrinelli, M., Collins, C., Gifford, J., & Byron, A. (2011). A review of the evidence to address targeted questions to inform the revision of the Australian dietary guidelines 2009: Process Manual. *Dietitians Association of Australia*.

³⁷ National Health and Medical Research Council, Australian Government Department of Health and Ageing, New Zealand Ministry of Health. (2006). *Nutrient reference values for Australia and New Zealand including recommended dietary intakes*. Canberra: Commonwealth of Australia.

³⁸ National Health and Medical Research Council. (2011). *A modelling system to inform the revision of the Australian Guide to Healthy Eating*. Canberra: Commonwealth of Australia.

4.3.2.2 United States

Every five years the United States Departments of Agriculture (USDA) and Health and Human Services (HHS) jointly update and publish the *Dietary Guidelines for Americans* (DGAs). The guidelines are based upon the report of an appointed scientific panel known as the Dietary Guidelines Advisory Committee (DGAC) and produced through an 18-month systematic review process, supported by the Nutrition Evidence Library (NEL). Importantly, the USDA and HHS are not legally required to follow the recommendations of the DGAC's report and so have considerable discretion over the inclusion of information that is not directly on focused nutrition.

The NEL was set up by the USDA's Center for Nutrition Policy to comply with the Data Quality Act by specializing in the production of systematic reviews to inform nutritional policy and programmes, conducted in collaboration with stakeholders and leading scientists. The DGAC is formed of 14 experts in human health and nutrition from US universities and research institutions and this year was assisted by 3 external consultants with expertise in sustainable food systems, agriculture and the environment, and in health promotion and disease prevention through changes in diet and physical activity. The Committee held seven public meetings to share their findings and elicit comments.

In January 2015, the DGAC published its advisory report,³⁹ which, for the first time, argued that government guidelines should promote the food security of Americans and that a substantial and growing body of evidence showed that a healthy food-secure future required the establishment of sustainable food consumption patterns. In order to describe the common characteristics of healthy diets, the DGAC modelled three dietary patterns⁴⁰ and analysed their nutritional adequacy and environmental impact, comparing them with the current US diet. The three dietary patterns were higher in plant-based foods and lower in calories and animal-based foods than the current average American diet. The DGAC found that these patterns were also more health promoting and associated with less environmental impact, as regards greenhouse gas emissions, land use, water use, and energy use. The DGAC therefore concluded that:

'linking health, dietary guidance, and the environment will promote human health and the sustainability of natural resources and ensure current and long-term food security' promoting sustainability as an additional way to promote the adoption of healthy eating patterns in the US".

The report's publication caused considerable reaction from both industry and civil society organizations, most strongly in relation to animal-foods. The media coverage and the public response were also unprecedented. Civil society organizations in the US and in other countries embarked upon a process of active public campaigning to support the science behind the sustainability recommendations and to advocate for their inclusion in the final guidelines. On the other side, industry and civil society groups who sought to overturn recommendations regarding saturated fat criticized the health recommendations and scientific credibility of the DGAC process. Furthermore,

³⁹ Scientific Report of the 2015 Dietary Guidelines Advisory Committee. Advisory Report to the Secretary of Health and Human Services and the Secretary of Agriculture. <http://health.gov/dietaryguidelines/2015-scientific-report/>

⁴⁰ The Healthy U.S.-style Pattern, the Healthy Mediterranean-style Pattern, and the Healthy Vegetarian Pattern

industry groups – primarily representing meat producers – focused significant resources on lobbying and argued that sustainability matters should be ruled outside the scope of the guideline’s legal mandate. This argument was accepted and publically endorsed by the US Secretary of Agriculture shortly after the publication of the DGAC’s report and was ultimately the basis on which sustainability was ruled out of the 2015 DGAs. Importantly, the actual research showing the link between dietary patterns and environmental impacts was never significantly contested by industry.

A legal analysis⁴¹ has shown that nothing in the mandating act specifically precludes inclusion of sustainability in the guidelines, and indeed, that physical activity and food safety issues that are currently included have an equivalent legal basis. So, although it would have been legally possible to include sustainability, both Secretaries made a political decision to rule the 2015 DGAs an “[in]appropriate vehicle for this important policy conversation about sustainability” – instead choosing to highlight USDA’s work on sustainable food production.

4.3.3 Quasi-official guidelines

This section reviews national guidelines that are not ‘official policy’ but that consider the environmental impact of diets and have been produced by institutions or processes that receive some kind of support or sanction from Government. These could be an important step in the process towards including sustainability in the official guidelines.

4.3.3.1 Netherlands

Guidelines for a healthy diet 2006 (Richtlijnen goede voeding 2006)

www.gezondheidsraad.nl/en/publications/gezonde-voeding/guidelines-for-a-healthy-diet-2006

Guidelines for a healthy diet: the ecological perspective (Richtlijnen goede voeding ecologisch belicht)

www.gezondheidsraad.nl/en/publications/gezonde-voeding/guidelines-for-a-healthy-diet-the-ecological-perspective

The first edition of the Dutch *Guidelines for a healthy diet* was published in 1986. That publication formed the basis for subsequent food policy and for initiatives in the fields of food production and the dissemination of food-related information to the public.

Over the years, the guidelines have been updated several times in light of scientific developments. Guidance on fat consumption has for example shifted from advice aimed at moderating total fat intake to that of specifically moderating saturated fat intake. In addition, newer versions place greater emphasis on the consumption of oily fish (i.e. fish rich in n-3 fatty acids) than the first one.

41 Simon, M. (2015). *Statutory Authority for Sustainability in the Dietary Guidelines for Americans: a Legal Analysis*. http://www.eatdrinkpolitics.com/wp-content/uploads/DGA_Legal_Analysis.pdf

In 2006 the Health Council of the Netherlands⁴² produced a new version of the guidelines, developed by a committee of 10 specialists in nutrition and public health. The main basis for the guidelines was a series of reports that the Health Council had produced over the years^{43,44,45,46,47,48,49} complemented by background studies covering issues such as physical activity, alcohol, dietary cholesterol, glycaemic index and n-3 fatty acids from fish. Workshops were also held involving relevant experts.

The 2006 guidelines not only drew upon new evidence but also articulate in the introductory text the ways in which they differ from earlier versions – particularly in that they include recommendations for those who are overweight, and emphasise the importance of focusing on diets as a whole rather than individual foods or nutrients.

In 2011, the Minister of Agriculture, Nature and Food Quality requested the Health Council of the Netherlands to prepare an addendum to the 2006 guidelines, which considered whether a healthy diet is also eco-friendly as regards land use, greenhouse gas emissions, and biodiversity.

The ensuing report, *Guidelines for a healthy diet: the ecological perspective*,⁵⁰ examines the 2006 Dutch dietary guidelines, and classifies them according to their potential synergies or conflicts with environmental objectives. The study identifies recommendations with a positive impact both on health and for the environment (i.e. a plant based diet and eating less food, in particular discretionary foods or ‘snacks’), the cases in which nutritional goals are at odds with the environment (i.e. eating more fish), and those recommendations which may be positive for the environment, but neutral for health (i.e. reduction of food waste NB – we note that although in some contexts, reducing food waste might benefit health by enhancing food security). The report also identifies a number of factors influencing the ecological impact of human food production and consumption habits that remain the subject of debate (i.e. replacing beef with pork or chicken, and those related to cultivation methods, transport and storage and to where food is produced or prepared). See Box 2 for more details.

⁴² The Health Council of the Netherlands, established in 1902, is an independent scientific advisory body. Its remit is “to advise the government and Parliament on the current level of knowledge with respect to public health issues...” (Section 22, Health Act).

⁴³ Health Council of the Netherlands. Calcium, vitamin D, thiamin, riboflavin, niacin, pantothenic acid and biotin. 2000/12. 2000.

⁴⁴ Health Council of the Netherlands. Energy, proteins, fats and digestible carbohydrates. 2001/19. 2001.

⁴⁵ Health Council of the Netherlands. Guidelines on Dietary Fibre Intake. 2006/03. 2006.

⁴⁶ Health Council of the Netherlands. Salt and Blood Pressure. 2000/13. 2000.

⁴⁷ Health Council of the Netherlands. Significant Trends in Food Consumption in the Netherlands. 2002/12. 2002.

⁴⁸ Health Council of the Netherlands. Overweight and obesity. 2003/07. 2003.

⁴⁹ Health Council of the Netherlands. Risks of Alcohol Consumption related to Conception, Pregnancy and Breastfeeding. 2004/22. 2004.

⁵⁰ Health Council of the Netherlands. (2011). *Guidelines for a healthy diet: the ecological perspective*. The Hague: Health Council of the Netherlands; publication no. 2011/08E. <http://www.gezondheidsraad.nl/sites/default/files/201108E.pdf>

Box 3: Guidelines for a healthy diet: the ecological perspective (an environmental analysis of the 2006 Dutch guidelines for a healthy diet)

The Health Council of the Netherlands reviewed the 2006 Guidelines for a healthy diet in relation to environmental considerations.

Two ‘win-win’ guidelines, which deliver both health and ecological benefits (as regards land use and greenhouse gas emissions) are identified:

- Plant based diets (with fewer meat and dairy products) are “associated with a lowered risk of cardiovascular disease and also have a smaller ecological impact”. The report also identified contraindications for a diet containing no animal products: “In children, such a diet has been linked with a raised risk of growth retardation”. From an ecological viewpoint, it notes that some grasslands can only be used for grazing, and that waste material from the food production industry is used as food for pigs and chickens. A diet entirely devoid of animal products would mean that this capacity for enhancing resource efficiency would be unused.
- Reduced energy intakes for those who are overweight, achieved by “eating fewer non-basic foods, such as sugary drinks, sweets, cakes and snacks. A healthy body weight is associated with a reduced risk of diabetes, cardiovascular disease, and certain forms of cancer. Lower energy intakes also reduce the demand for foods, which lowers production and consequently reduces the ecological impact.”

One ‘win-lose’ guideline is identified – here health benefits may come at a cost to the environment:

- “Eat two fish portions a week, at least one portion of which is oily fish. Even though the indications are that a single portion of oily fish per week is enough to lower the risk of cardiovascular disease, this recommendation is ecologically detrimental because this level of fish consumption is higher than current levels in the Netherlands. From an ecological perspective it is advisable to emphasise the use of those fish species that are not currently being overfished or those that are being farmed in an environmentally friendly way.”

A guideline which yields ecological benefits while having neutral health effects:

- “Reduce food waste. In the Netherlands, consumers throw away 8-16 % of the edible food they purchase.”

Box 3: Continued**The report also notes a number of factors that influence the ecological impact of human food production and consumption habits but that remain the subject of debate:**

While stakeholders may have strong views about the merits of different production methods or about local sourcing, the report points out that the scientific evidence is somewhat equivocal. For instance, locally-produced food is not necessarily more eco-friendly than food produced at a distance, and products produced in an environmentally motivated way (e.g. organic) do not necessarily score higher in terms of land use and greenhouse gas emissions than do products made by conventional means, because of the lower yields per hectare of land. They do, however, generally score better on other sustainability dimensions such as animal welfare and landscape value. Finally, while the transport of fruit and vegetables by air is associated with large greenhouse gas emissions, only a small proportion of fruit and vegetables is transported in this way, so the contribution that this makes to the overall food-related emission of greenhouse gases is relatively small

Shifts in animal protein sources. Replacing beef with pork or chicken can reduce climate and land use impacts, but the consequences for human health are uncertain. This is because different meat products from different species can have very different nutritional values and therefore health effects. Moreover, such shift could have detrimental impacts on animal welfare.

At the time of going to press with this report, the Health Council of the Netherlands published its most recent set of dietary guidelines and these will be published as formal dietary guidelines in due course. The new recommendations emphasise the importance of a more plant and less animal based diet. Specific recommendations include limiting red and especially processed meat consumption, and to consume fish (especially oily fish) once a week.⁵¹ However the focus of the report is entirely on health – sustainability considerations are not mentioned.

4.3.3.2 Nordic Nutrition Recommendations

Nordic Nutrition Recommendations
www.norden.org/en/theme/nordic-nutrition-recommendation

Overview

Nordic Council of Ministers is an official inter-governmental body for co-operation in the Nordic Region. It is composed of representatives of the governments of Denmark,

⁵¹ Health Council of the Netherlands. Gezondheidsraad – Richtlijnen goede voeding 2015, 2015, Den Haag: Gezondheidsraad, 2015; publicatienr. 2015/24 http://www.erasmusage.com/wp-content/uploads/2015/11/201524_richtlijnen_goede_voeding_2015.pdf

Finland, Iceland, Norway and Sweden (plus Greenland, the Faroe Islands and Åland). Among its many tasks, the council publishes *The Nordic Nutrition Recommendations* (NNR).

The NNR give reference values for adequate intake of and balance between individual nutrients. They are not official food based dietary guidelines per se, but they form the basis of the national dietary recommendations issued by governments in the Nordic countries, as well as the Nordic “Keyhole” label, which is used in the Nordic countries to highlight products that align with the nutritional recommendations. The fifth edition of the Nordic Nutrition Recommendations (NNR 2012⁵²) was published in 2014.

This version has shaped the latest dietary guidelines of Denmark, Finland, Iceland, Norway, Sweden and Estonia. Note that Estonia is not part of the Nordic Council, but has a strong cultural attachment to the Nordic countries.

Broad messages

Previous editions of the NNR mainly focused on setting dietary reference values for various population groups. The current edition, however, places more emphasis on the role of whole diets and specific food groups in the prevention of the major diet-related chronic diseases.

The report begins by highlighting the importance of focusing on whole diets rather than individual nutrients, and observing that plant-based diets are associated with a lower risk of most chronic diseases than classic Western-type dietary patterns where animal products feature prominently. They also recommend a set of changes that could promote health and wellbeing in the Nordic populations (Table 3).

Table 4: Dietary changes that potentially promote energy balance and health in Nordic populations (Extracted from NNR 12).

| Increase | Exchange | Limit |
|-----------------------|--|--|
| Vegetables Pulses | Refined cereals - Wholegrain cereals | Processed meat Red meat |
| Fruits and berries | Butter - Vegetable oils Butter based spreads - Vegetable oil based fat spreads | Beverages and foods with added sugar |
| Fish and seafood | High-fat dairy - Low-fat dairy | Salt |
| Nuts and seeds | | Alcohol |

⁵² Nordic Council of Ministers. Nordic Nutrition Recommendations 2012(2014),5(11):1 (DOI: 10.6027/Nord2014-002)

What advice do they give on sustainability?

For the first time, the NNR 2012 has a whole chapter on the interrelationships between food, health, and environmental protection, highlighting both the benefits of a lower environmental impact diet and the possible trade-offs between environmental and nutritional goals. The chapter is mainly focused on GHG emissions: while recognising that climate change is only one aspect of environmental sustainability, the report notes that there is currently insufficient research to inform guidance in relation to other issues.

Table 5: Climate impact from primary production of food: Low, Medium, and High CO₂e values per kg edible weight.

*NB Palm oil can in principle have a low climate impact due to the high efficiency of its production. However, the rise of demand for palm oil has been associated with deforestation, which affects biodiversity and raises the climate impact of palm oil.

| Low < 1 kg CO ₂ e/kg | Medium 1-4 kg CO ₂ e/kg | High > 4 kg CO ₂ e/kg |
|--|---|---|
| Field vegetables | Poultry | Beef |
| Root vegetables | Greenhouse vegetables (heated with fossil fuels) | Lamb |
| Greenhouse vegetables (heated with renewable resources) | Rice | Pork |
| Potatoes | Fish | Cheese |
| Beans, peas, lentils | Vegetable oil (olive, rape) | Tropical fruits and vegetables transported by air |
| Cereals | Sweets | Butter |
| Pasta | Snacks | |
| Bread | Fruits (bananas, melons) | |
| Fruits, local (apples, pears) | Vegetables imported from a far distance | |
| Vegetable oil (palm*, coconut) | Wine | |
| Sugar | Eggs | |
| | Milk, yoghurt | |

Titled *Sustainable food consumption – Environmental issues*, the chapter starts by asking the question ‘Is it possible to eat a nutritionally adequate diet in a sustainable way?’. It introduces the concepts of planetary boundaries, greenhouse gas emissions, food waste and highlights the complex connections between food production and consumption and environmental concerns. It describes how items in the same food group can have very different environmental impacts, and how different production methods also give rise to different impacts. The report includes a table that classifies foods according to their associated carbon emissions (Table 5).

The chapter concludes that on the whole, a diet that follows nutritional guidelines has a lower environmental impact than current average Nordic dietary patterns. It also finds that a diet with lower environmental impacts could have associated health benefits. A shift from animal to plant proteins would reduce GHG emissions, land use, and saturated fat intakes. Replacing animal protein with dried legumes would also increase the intake of dietary fibre, folate, carbohydrates, and several other nutrients. The report recognises that red meat is a source of iron, and that iron deficiency is the most common cause of anaemia, but highlights that “a balanced diet, that includes a variety of foods containing iron... is more important than focusing primarily on iron from meat sources”. In other words, the relationship between health and environment

is broadly bidirectional: healthier diets can carry lower environmental impacts, while diets with low environmental impacts can deliver health benefits. Moving from specific foods to overall intakes, the report suggests that obesity per se incurs environmental costs, due to the extra food necessary to sustain and the extra energy required to transport a heavier population. Therefore measures to reduce overconsumption can generate both health and environmental benefits.

The report also notes some trade-offs. For example vegetables are good for health but those grown in heated greenhouses have a higher climate impact. It is, however, positive about the scope for new developments that could lower this impact, such as using residual heat use from nearby industries and the use of renewable energy sources (e.g. in Iceland, a substantial portion of the tomatoes consumed comes from greenhouses heated by geothermal power).

Overall the report recognizes three substantive sources of potential conflict concerning dietary recommendations and sustainability: fish, butter consumption, and iodine intakes.

The guidelines recommend an increase in fish consumption, but 80% of wild fish populations are currently fully- or over-exploited. Aquaculture is steadily substituting for wild fish, but introduces another set of environmental issues which it highlights. It also notes that some populations of wild fish, such as herring, are abundant – but they are also contaminated and thus from a health point of view their consumption needs to be restricted.

The guidelines advise a reduction in butter on health grounds (and note that a reduction in animal production would also lower butter availability). Palm oil is often used as a substitute for butter in food products. Since palm oil yields per hectare are higher than for most oil crops, if sustainably farmed this oil can be environmentally efficient. However much of the palm oil produced is growing in regions where it is a significant driver of deforestation and associated biodiversity loss. Thus, the authors recommend other fat sources and where it is used, encourage sourcing of more sustainably produced palm oil. They do not go into further detail on this complex issue.

Finally, in Nordic countries, milk and milk products contribute substantially to the intake of iodine (iodine is added to cow feed).⁵³ Over half of people's average iodine intake comes from the consumption of milk and milk products in Norway, while milk contributes 40% of daily intakes in Finnish adults. The report voices concern about the impact of a lower intake of dairy products on iodine intakes. It states that increased consumption of fish and shellfish could compensate and would be in line with the guidelines (but see the issues around fish raised above). It also says that other options, including fortification, could be considered.

⁵³ Before 1950, there was endemic iodine deficiency in Norway, with goiter prevalence as high as 80% in certain inland areas. Since then, iodine has been added to cow fodder, resulting in a relatively high concentration of iodine in milk and dairy products. Combined with a high consumption of milk and other dairy products, this led to eradication of endemic goiter. Other countries introduced national iodization programs by adding iodine to salt. Brantsæter AL, Abel MH, Haugen M, Meltzer HM. Risk of Suboptimal Iodine Intake in Pregnant Norwegian Women. *Nutrients*. 2013;5(2):424-440. doi:10.3390/nu5020424.

Evolution of process

The *Nordic Nutrition Recommendations* have been published by the Nordic Council of Ministers every eight years since 1980.

The fifth edition, *NNR 2012*⁵⁴ (published in 2014) was produced by a working group nominated by the Working Group on Food, Diet and Toxicology (NKMT) under the auspices of the Nordic Committee of Senior Officials for Food Issues (ÅK-FJLS Livsmedel). The NNR 2012 working group, comprising 11 experts from the five Nordic countries, was established in 2009.

This working group, assisted by more than 100 scientific experts, reviewed the existing scientific evidence for setting dietary reference values (DRVs). It conducted systematic reviews (SR) for key nutrients and topics⁵⁵ for which new data was made available since the 4th edition (2004), and less stringent updates of the reference values for other nutrients and topics.⁵⁶

All the systematic reviews and updates were peer reviewed by external groups and the whole process was observed and reviewed by a reference group consisting of senior nutrition experts both within and outside the Nordic countries.

Finally, all chapters were subject to public consultations from October 2012 to September 2013. In the interests of transparency, the responses to the comments by the NNR working group are published separately.⁵⁷ The consultations received a combined total of 274 comments, and the two chapters that received the highest number were Chapter 5 (in which they present a summary of all the recommendations) and Chapter 6 (which deals with food sustainability). The comments on Chapter 6 mostly welcomed the inclusion of sustainability, the only exceptions coming from the food industry, who argued that there was high uncertainty in evaluation of environmental impacts which limited comparative studies. There were also some comments criticising the overrepresentation of GHG emissions in the debate, to which the authors responded by acknowledging this, and explaining it was due to the bias in the existing literature.

⁵⁴ Nordic Council of Ministers. *Nordic Nutrition Recommendations 2012*(2014),5(11):1 (DOI: 10.6027/Nord2014-002)

⁵⁵ Calcium, Carbohydrates (including sugars and fibre), elderly, fat and fatty acids, folate, food based dietary guidelines, infants and children, iodine, iron, overweight and obesity, pregnancy and lactation, protein, vitamin D.

⁵⁶ Alcohol, fluid and water balance, vitamin B6 and B12, thiamin, riboflavin, niacin, biotin, pantothenic acid, vitamin K, dietary antioxidants vitamin A, vitamin E, vitamin C, phosphorus, magnesium, zinc, manganese, chromium, molybdenum, copper, sodium, selenium, fluoride, physical activities, energy, population groups in dietary transition, use of NNR and sustainable food consumption.

⁵⁷ Nordic Council of Ministers. *NNR 2012: Responses from hearing process* (DOI: 10.6027/NA2014-913)

4.3.3.3 Estonia

Estonian food and nutrition recommendations (Eesti toitumis- ja toidusoovitused) toitumine.ee/trukised/toitumissoovitused-erinevatele-sihtruhmadele

Principles for a healthy diet (Tervisliku toitumise põhimõtted) toitumine.ee/kuidas-tervislikult-toituda

Estonia published its first set of dietary guidelines in 1995, followed by a second version in 2006. A third version is being prepared, based on the updated NNR 2012. The *Estonian food and nutrition recommendations* are developed by the Estonian Society of Nutritional Science and the National Institute for Health Development and endorsed by the Ministry of Social Affairs. A range of institutions were also consulted, including universities, other governmental institutions, and various public health and nutrition professionals.

Besides the dietary guidelines, the Estonian government produced a series of documents aimed at communicating specific points made in the guidelines to the general public⁵⁸ (the guidelines and all documents are only available in Estonian). These documents can be updated more frequently than the guidelines, as they are developed unilaterally, without major consultation. Some of these documents focus on one food group (e.g. salt, sugar or fats) and others look at issues such as physical activity or cardiovascular health. One such document establishes the “principles for healthy eating” (‘Tervisliku toitumise põhimõtted’).

In their current version, neither the guidelines nor the principles mention sustainability. However, the same website that hosts the guidelines and the other documents – toitumine.ee/ (toitumine means diet in Estonian) – presents an updated version of the principles.⁵⁹ The updated version establishes that a healthy diet is based on the following principles:

1. Eat as needed (balancing intake and expenditure).
2. Eat a balanced diet (all macronutrients are important).
3. You can eat everything, in moderation (there is no need to eliminate an item of the diet).
4. Eat a diverse diet (to ensure you get all the nutrients you need).
5. Eat in an environmentally conscious way (this includes: 1) plant based, 2) biologically diverse and species rich, 3) local, seasonal and traditional, and 4) produced sustainably.

The main difference in this new version is the inclusion of the fifth principle. Although not yet reflected in any official documents (other than the website itself), this seems to indicate that the next version of the principles and the guidelines may include sustainability, particularly since the new guidelines will be based on the NNR 12 which, as noted highlights health-environmental synergies.

⁵⁸ The documents can be found at <http://toitumine.ee/trukised/brosuurid>

⁵⁹ <http://toitumine.ee/kuidas-tervislikult-toituda>

4.3.3.4 United Kingdom

The eatwell plate

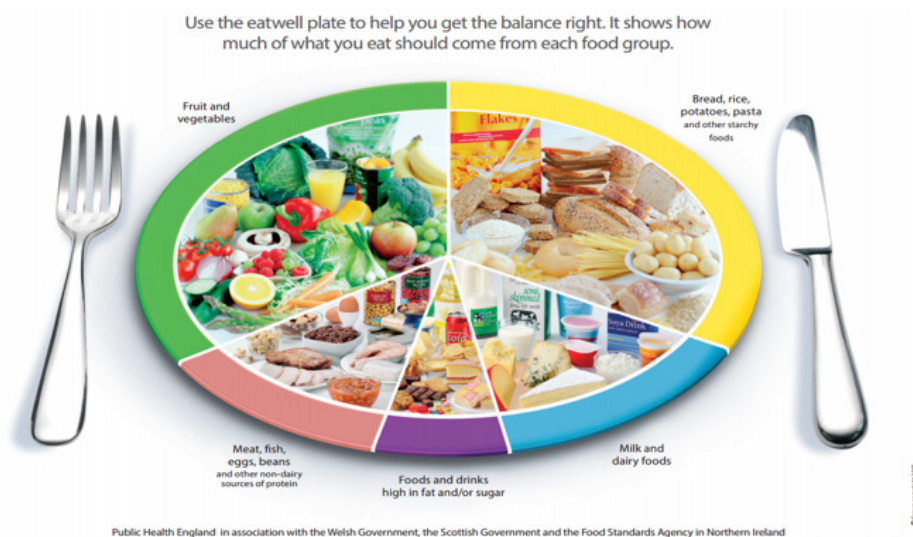
www.gov.uk/government/publications/the-eatwell-plate-how-to-use-it-in-promotional-material/the-eatwell-plate-how-to-use-it-in-promotional-material

The principles of healthy and sustainable eating patterns

www.foodsecurity.ac.uk/assets/pdfs/healthy-sustainable-eating-patterns-report.pdf

The United Kingdom published its first set of dietary guidelines in 1994, under the name *The Balance of Good Health*. In 2007, the third and latest version of the guidelines was published and renamed 'The Eatwell plate' (Figure 6). The visual plate is supported and supplemented by the 'Eight tips for healthy eating'. Until 2013, the development of the guidelines was the responsibility of the Food Standards Agency. This responsibility now falls within the remit of Public Health England (PHE),⁶⁰ an executive agency of the Department of Health. PHE is currently working on a new version of the Eatwell plate, due to be published in early 2016.

Figure 6: Eatwell plate



Although the current official guidelines do not mention sustainability, sustainable healthy diets have been the focus of considerable attention in the UK over the years. However, progress has been intermittent and there has been a lack of continuity related to changes in government.

In 2008, the government established a Council of Food Policy Advisers whose membership included experts representing producers, retailers, consumer organisations and academics. Its remit was to advise government on food affordability, security of supply and the environmental impact of food production, and to contribute to development of a policy on food security and supply. The Council's first report⁶¹ identified three priority areas for government action:

⁶⁰ www.gov.uk/government/organisations/public-health-england

⁶¹ First Report from the Council of Food Policy Advisers. September 2009.

1. Defining a low impact (sustainable) healthy diet;
2. Government to exemplify best practice in health and sustainability through public food procurement; and
3. A strategy for increasing consumption and domestic production of fruit and vegetables. It also identified future priority areas: water, skills, research and development, poverty, eating patterns and food security.

The second report⁶² focused on the long term issues for Government to address in delivering a successful and sustainable food strategy. This report highlighted the role of consumers in driving change towards healthy and sustainable diets and recommended that Government to facilitate and encourage this change. The report also called for the need to open the debate on how land and other resources are best used in order to maximize the efficiency and minimize the impact (in the UK and overseas). Finally, the report focused on the need of better coordination between the different stakeholders dealing with food (both foreign and domestic).

Another organisation – the Sustainable Development Commission (SDC) was also set up by the UK Government in 2000 – to provide independent advice on sustainable development. In 2009, the SDC published a report called *Setting the Table: Advice to Government on priority elements of sustainable diets*. That report assessed the environmental and health impacts of changing patterns of food consumption. It concluded that consuming only fish from sustainable stocks, eating more seasonal food, cutting out bottled water, shopping on foot or over the internet and consuming more wildlife-friendly, organic foods would contribute towards a more healthy sustainable diet. However, the most significant health and environmental benefits were from reducing meat and dairy, cutting food and drink of low nutritional value – including fatty and sugary foods – and reducing food waste.

Both the Council of Food Policy Advisors and the SDC were dissolved soon after the introduction of a new Government in the UK in 2010. In 2011, under the new Government, the Department for Environment, Food & Rural Affairs (DEFRA) published *The Natural Choice: securing the value of nature* the first White Paper from the UK government on the natural environment for over 20 years. One of its commitments was to examine how the twin challenges of increasing food production and improving the environment could be aligned and any tensions reconciled. An initiative known as the Green Food Project was set up to address this question. Its project steering group involved representatives from academia, the food and farming industry and government while working groups were also established to focus on a few particular issues: research and technology, knowledge exchange, the future workforce, investment, building effective structures, valuing ecosystem services, land management, consumption and waste. The project conclusions, as well as the reports of the working group were published in 2012. One overall conclusion to emerge from this process, and detailed in the main report, was that follow-on work was required to enable a broader and more sophisticated debate around the roles that diet and consumption play in fostering the sustainability of the whole food system. It was agreed that this work should, as with the original Green Food Project, involve a wide range of stakeholders.

⁶² Food: a recipe for a healthy, sustainable and successful future. Second Report of the Council of Food Policy Advisors. March 2010

A “Follow-Up to the Green Food Project” was subsequently initiated, that focused on three main themes “Principles of a healthy and sustainable diet”, “Consumer behaviour”, and “Sustainable consumption and growth”. A multi stakeholder workshop was held and working groups for each of the themes constituted. Participants from the workshop were invited to join these according to interest and each was chaired by one industry and one non-governmental, non-industry representative. The group working on the principles of sustainable and healthy eating patterns comprised representatives of one academic institution, three government institutions, six industry bodies and six civil society organisations (focusing on the environment, animal welfare, consumers and diets). The group was chaired by Tara Garnett (academic from the Food Climate Research Network) and Maureen Strong (a dietician from for the Pork Board of the Agriculture and Horticulture Development Board⁶³).

Each working group met three times over two months and was tasked with producing a report to feed into the overall Sustainable Consumption Report, which was published in Autumn 2013. That report included a draft version of *The principles of healthy and sustainable eating patterns* (see below). A major subject of discussion during those meetings was around the messaging of the advice on meat, with debates around the use of the word ‘reduce’ as opposed to ‘moderate’ and whether advice should focus just on red meat or on meat of all types.

Note that although the draft principles appeared in a report on a government website (DEFRA) they were not owned or endorsed as such by Government. Government saw its role as an enabler of the multistakeholder process rather than as the ‘owner’, of the principles.

Nevertheless, following meetings held between the heads of all three working groups on sustainable consumption, staff from DEFRA and the then Minister for Agriculture, it was agreed that a final version of the guidelines should be published – following a process of peer review -that on the website of the Global Food Security Programme.⁶⁴ This is a multi-agency programme bringing together the interests of, and supported by the relevant Research Councils, Executive Agencies and Government Departments.

The final version of the *Principles of healthy and sustainable eating patterns* consists of eight principles. Each principle is communicated by a short headline message (see Box 3), followed by a brief explanation of the message and the rationale behind it, relevant qualifiers and caveats to the advice provided and a list of the literature sources to support of each recommendation.

⁶³ The AHDB is a statutory levy board, funded by farmers, growers and others in the supply chain.

⁶⁴ www.foodsecurity.ac.uk/assets/pdfs/healthy-sustainable-eating-patterns-report.pdf

BOX 4 – Principles of healthy and sustainable eating patterns (UK) – Headline messages

1. Eat a varied balanced diet to maintain a healthy body weight.
2. Eat more plant based foods, including at least five portions of fruit and vegetables a day.
3. Value your food. Ask about where it comes from and how it is produced. Don't waste it.
4. Choose fish sourced from sustainable stocks, taking seasonality and capture methods into consideration.
5. Moderate your meat consumption, and enjoy more peas, beans and pulses, tofu, nuts, and other plant sources of protein.
6. Include milk and dairy products in your diet and/or seek out plant based alternatives, including those that are fortified with additional vitamins and minerals.
7. Drink tap water.
8. Eat fewer foods high in fat, sugar and salt.

Following the advice to eat more plant based foods, the report explains that although these foods generally require less energy and fewer resources than animal products, there is large variability in the environmental impact of different plant products. It points out that the evidence showing that local food production is better for the environment is not conclusive, and that sometimes environmental and international development goals can clash. On one hand, air freighted foods are associated with high GHG emissions, but on the other they support economic development in low income countries. The report also highlights issues with food labelling, caused by a lack of universal definition of sustainability and by the lack of reliable and impartial sourcing information. Instead of opting for the common recommendation to “eat more fish”, the UK principles focus the headline message on choosing sustainably sourced fish.

The message with the longest “Qualifiers and caveats” section is the one referencing meat – reflecting the intensity of the debate within the working group. The section discusses the varying impacts of different animal products. Beef and lamb have higher GHG emissions than pork and poultry but ruminants can eat grass and utilize land unsuitable for other uses, while pork and poultry are usually fed grains that require a lot of water to grow. They also indicate that, although there are clear nutritional benefits from eating meat, it is possible to fulfil nutritional requirements with a plant based diet – although vegans need to take care and choose fortified products or supplements to get the required vitamin B12 that is only found in animal source foods. The report provides brief advice on how to moderate meat consumption: enjoying some meat free meals, using smaller portions of meat, and ‘bulking out’ meals with alternative sources of protein.

In its introduction, the report emphasised that the guidelines are not intended to replace but rather to complement the Eatwell plate. However it notes that it might be “necessary and useful to develop a new version of Eatwell that incorporates environmental sustainability advice”. It is still not clear if the new plate will include sustainability messaging or if this will be included in the complementary information, such as on the website.

4.3.3.5 France

The 9 benchmarks (Les 9 repères)

www.mangerbouger.fr/bien-manger/que-veut-dire-bien-manger-127/les-9-reperes/

Mes Achats: Alimentation (My purchases: Food)

www.ademe.fr/particuliers-eco-citoyens/achats/alimentation

The French official dietary guidelines are published under the National Nutrition and Health Program (PNNS, which was set up by the Ministry of Health and the National Institute for Prevention and Health Education (INPES). The most recent version was published in 2002, after a series of meetings involving nutrition and public health experts and field workers, as well as representation from the Ministries of Health (DS), Agriculture (DGAL) and Economy (DGCCRF). In 2010, the French government created the Agency for Food, Environmental and Occupational Health and Safety (ANSES) and since then, this agency is responsible for developing the guidelines.

The French dietary guidelines do not discuss environmental concerns. However the French Agency for the Environment and Energy (ADEME)⁶⁵ – which works for the implementation of public policy in the areas of the environment, energy and sustainable development – has produced a set of recommendations aimed at individuals and “eco-citizens” to promote sustainable shopping habits. A section of their website called “Mes Achats”⁶⁶ (My purchases) provides three main messages: to promote seasonal products, to ‘adopt diets that combine health, environment and fun’ (i.e. replace a meat dish by one based on grains or legumes once a week), ‘buy products with environmental labels’, and limit food waste.

4.3.4 Non-official guidelines

This subsection considers three non-official guidelines. They are included here because they reflect the state of discussions within the academic community and civil society organisations, many of whom are also engaging with policy makers. These guidelines are all focused on developed country contexts, exposing the current lack of research

⁶⁵ Industrial and commercial public institution placed under the joint authority of the Ministry for Ecology, Energy, Sustainable Development and the Sea and the Ministry of Higher Education and research.

⁶⁶ www.ademe.fr/particuliers-eco-citoyens/achats

and activity on these issues in relation to developing countries (although we note that there at least one project is underway that seeks to fill this gap).⁶⁷

4.3.4.1 LiveWell

Livewell 2020 (UK)

www.wwf.org.uk/what_we_do/changing_the_way_we_live/food/livewell_2020/

Livewell for life (EU)

livewellforlife.eu/

In January 2009 the environmental organisation WWF-UK launched its One Planet Food programme, which aims to reduce the environmental and social impacts of food consumption in the UK. WWF commissioned the Rowett Institute of Nutrition and Health at the University of Aberdeen to develop diets that conformed to the government's nutritional advice (the EatWell plate and nutrient based recommendations) and also achieved reductions in absolute food related emissions of 25% by 2020 and 70% by 2050. In both cases, they assumed that ~56% of the reduction will be achieved through dietary changes and the remainder from improvements in the efficiency of production.

The dietary needs of an average UK woman was chosen as the basis for the modelling since average requirements for iron are higher than in men, showing that care was taken in this study to address the possibility that reductions in meat would risk an increase in prevalence of iron deficiency anaemia. Using linear programming, the LiveWell team found that it is possible to achieve the GHG reduction target for 2020 – adhering to nutritional recommendations and cultural norms – by rebalancing the UK diet in line with the Eatwell plate. The overall sizes of each segment of the plate remained the same but within the segment of the plate entitled “meat, fish, eggs and alternatives there were reductions in the contribution of meat-based proteins – plant alternatives were more prominent. However, meeting the 2050 target (a 70% cut) would require a radical shift in diets.

The project and its approach was subsequently extended to Sweden, France and Spain under the name Livewell for LIFE. Each country was chosen for a different reason: Sweden had a government open to this way of thinking, France is considered to be a country with a strong culinary identity, while Spain has the highest per capita consumption of meat, fish, nuts and fruits, and one of the lowest intakes of vegetables in western Europe. The reasoning was that if it was possible to identify lower GHG impact, healthy and culturally appropriate diets for these countries, it would be possible elsewhere.

The Livewell for LIFE project began by analysing current dietary patterns, associated emissions and specific diet-related health concerns in each country. It then applied the same linear programming approach used in the UK. It was found that a nationally-appropriate Livewell diet could reduce GHG emissions by around 25% in all three countries. Furthermore, this reduction could be achieved with no increase in cost and in two cases would lead to a saving.

⁶⁷ <http://sustaininghealth.lshtm.ac.uk/sahdi/>

Based on the experiences gained, WWF now promotes the “6 Livewell Principles”:

1. Eat more plants;
2. Eat a variety of foods;
3. Waste less food;
4. Moderate your meat consumption, both red and white;
5. Buy food that meet a credible certified standard; and
6. Eat fewer foods high in fat, salt and sugar.

Although it has no official status, LiveWell has been instrumental in introducing sustainable diets into the European political agenda. The project has developed a series of recommendations for governments, including: the revision of national food guidelines with the integration of the concept of environmental sustainability and lower greenhouse gas emissions, the need to update agricultural and food policies to address sustainability, the need to support education in healthy and sustainable eating habits, strengthening preventive measures on diseases related to nutrition, and promoting local-global synergies.

4.3.4.2 Barilla double pyramid

Double Pyramid 2015: Recommendations for a sustainable diet

www.barillacfn.com/en/position-paper/pp-double-pyramid-2015-recommendations-for-a-sustainable-diet/

The Barilla Center for Food and Nutrition (BCFN) is a charitable foundation that conducts research on nutrition. It was created by but is independent of the Italian food manufacturing company, the Barilla Group. In 2009, the BCFN developed the Double Pyramid model, to illustrate the relationship between a healthy diet and one with a lower environmental impact. The model presents two pyramids. The first is the familiar food pyramid – in this case, based on the principles of the Mediterranean diet. The second is inverted and reclassifies foods according to their environmental impact, with most damaging foods placed at the top.

The ‘desirable’ order of foods in each pyramid broadly mirrors one another (Figure 7). In other words, foods that are to be consumed abundantly for health are those that generate the lowest environmental impacts while those to be consumed sparingly for health should also be limited for environmental reasons. The relationship is not always perfect, however. For example, legumes and olive oil are higher on the environmental pyramid than the nutrition one. Eggs, milk and poultry show a better performance in the environmental pyramid than on the food pyramid.

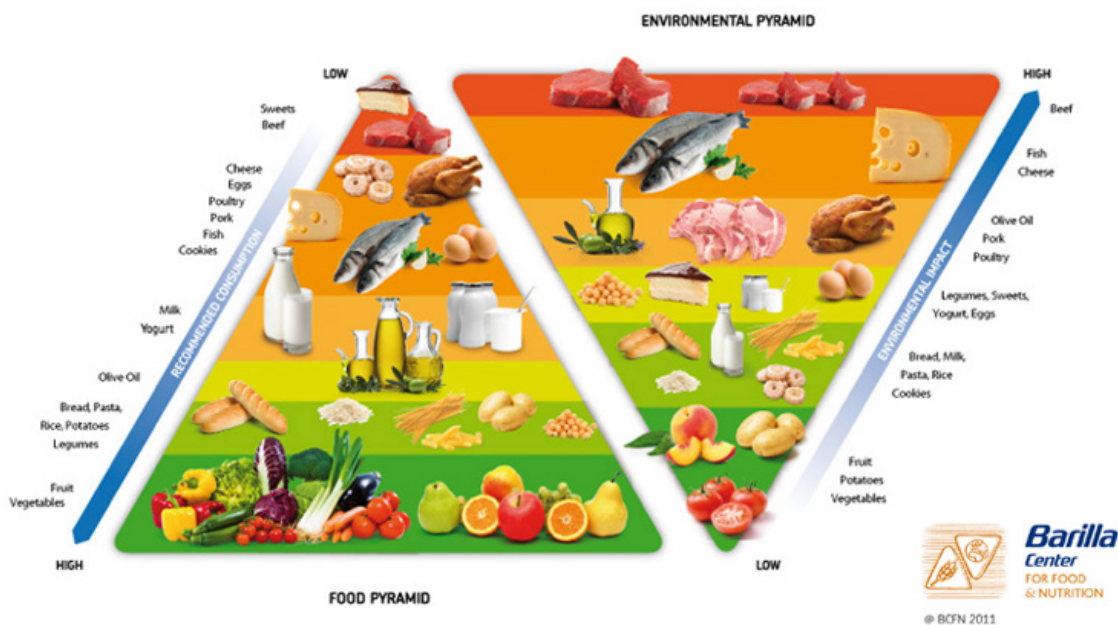
The food pyramid was constructed using the same recommended daily intake for each food type as the official Italian guidelines – *Guidelines for healthy Italian food habits*, or *Linee guida per una sana alimentazione italiana* – published in 2003 by the Italian

Center for Research on Foods and Nutrition (CRA-NUT),⁶⁸ a research body under the supervision of the Ministry of Agriculture, Food and Forestry.⁶⁹

The environmental pyramid is based on the Ecological Footprinting approach.⁷⁰ The BCFN also estimates the environmental impact of each food using two other methods: carbon footprinting and water footprinting. All three indicators are based in Life Cycle Assessment (LCA) using publicly available information, and the BCFN has made the entire database available to the public.⁷¹

The Double Pyramid has been updated several times since 2009 in light of new evidence and it also considers other dietary patterns (e.g. that of the US). In 2015, the BCFN published the sixth version of the model (Figure 7).

Figure 7: Double Pyramid model (2015), from the Barilla Center for Food and Nutrition (BCFN)



⁶⁸ Called “The Italian National Research Institute on Food and Nutrition (INRAN, Istituto Nazionale di Ricerca per gli Alimenti e la Nutrizione)”, until 2013.

⁶⁹ In turn, the Italian dietary guidelines are based on the Italian recommended dietary allowances published in 1996 (LARN, Livelli di Assunzione giornalieri Raccomandati di Energia e Nutrienti per la popolazione italiana). A new version of the RDAs will be published at the end of 2015 and the dietary guidelines will be revised accordingly.

⁷⁰ Ecological footprint is a composite indicator. Expressed in units of area, it is calculated as the sum of all the cropland, grazing land, forest, and fishing grounds required to (i) produce the food and energy required for human activities; (ii) absorb all wastes emitted; and (iii) provide sufficient space for infrastructure.

⁷¹ Ruini, L. F., Ciati, R., Pratesi, C. A., Marino, M., Principato, L., & Vannuzzi, E. (2015). Working toward Healthy and Sustainable Diets: The “Double Pyramid Model” Developed by the Barilla Center for Food and Nutrition to Raise Awareness about the Environmental and Nutritional Impact of Foods. *Frontiers in nutrition*, 2.

4.3.4.3 Changing what we eat - FCRN

Changing what we eat: A call for research & action on widespread adoption of sustainable healthy eating

www.fcrn.org.uk/fcrn-publications/reports/changing-what-we-eat-call-research-action-widespread-adoption-sustainable

The Food Climate Research Network (FCRN) is an interdisciplinary, intersectoral and international network focused on food systems, climate and sustainability. In 2008, the FCRN published *Cooking up a storm: Food, greenhouse gas emissions and our changing climate*⁷² which included a chapter entitled “Food, GHG emissions and the relationship with health.” It addressed whether a healthier diet is compatible with one that is more sustainable.

In April 2014, the FCRN organized a workshop to discuss the multiple environmental, health and societal challenges caused by, and facing the food system. This event, supported by the Wellcome Trust and the UK’s multi-agency Global Food Security Programme, brought together 34 stakeholders, including academic researchers from diverse disciplines, and representatives from the business and NGO communities, to help shape a policy relevant research agenda for action on sustainable healthy eating. The discussions arising were summarised in a report entitled *Changing what we eat - A call for research & action on widespread adoption of sustainable healthy eating*.⁷³

The report begins by making the case for sustainable healthy diets. It then summarises the knowledge state of play as regards diets compatible with good health and lower GHG and land use impacts. It notes the lack of research focusing on low income contexts, and emphasises the need to include broader sustainability considerations that will also specific to particular cultures, income levels and geographies. The general principles of sustainable healthy diets in the report were listed in 1.2 above.

The report also proposes areas where more research is needed. It emphasises the need for policy leadership to connect and harness the expertise of stakeholders, to set the direction of travel, to invest in policy relevant research and to support appropriate initiatives.

⁷² Garnett, T. (2008). *Cooking up a storm: Food, greenhouse gas emissions and our changing climate*. Food Climate Research Network. http://www.fcrn.org.uk/sites/default/files/CuaS_web.pdf

⁷³ Garnett, T. (2014). *Changing What We Eat: A Call for Research and Action on Widespread Adoption of Sustainable Healthy Eating*. Food Climate Research Network, http://www.fcrn.org.uk/sites/default/files/fcrn_wellcome_gfs_changing_consumption_report_final.pdf

5. Discussion

This section begins with general observations on our findings about official dietary guidelines. It then moves on to discuss more specifically those guidelines where sustainability is included. Finally, it offers recommendations on how we could move to a situation where guidelines for sustainable healthy diets are the norm, and not the exception.

5.1 General points about official dietary guidelines and their impact.

5.1.1 On the guidelines and their visibility

We begin by repeating the point made at the outset: a large number of countries do not have official dietary guidelines. Higher-income countries are more likely than lower-income countries to have guidelines. This likely reflects a lack of capacity and resources and the fact that wealthier countries are able to focus more time and resources on consumption and food choices, having addressed immediate problems of food availability and supply.

However the picture is changing. While absolute hunger is still a problem affecting just under 800 million people worldwide – mainly in Sub Saharan Africa and South Asia – diets are transitioning. Developing countries are starting to experience many of the same diet related problems traditionally associated with high income countries. Guidelines in low and middle income countries are needed that are mindful of these trends and steer a dietary course that avoids the major health and sustainability problems experienced in the developed world.

The lack of dietary guidelines is especially evident in Africa – only 5 countries have them. However, this situation could change soon, as FAO will be holding a training workshop on the development and promotion of FBDG for 10–12 African countries in 2016, upon request and as a follow up on the ICN2 Framework for Action. The workshop will be interdisciplinary with participants from the health and agricultural sectors, including academic representatives. The goal is to assist countries in strengthening their capacities to establish national dietary guidelines as a basis for delivering more effective nutrition education programmes for the public and also to guide policy makers.

It is worth noting that even when we knew the guidelines existed, they were not always easy to find using a google search from the perspective of an ‘ordinary’ citizen. If the guidelines are hard to find, their impact is likely to be limited. This observation underlines the importance not just of having guidelines but of effective national strategies for communication and dissemination.

New media and internet communications have also led to a proliferation and redundancy of information, including past versions of the official guidelines, other official advice from the government (from different agencies, and intended for different audiences) and unofficial advice, which is sometimes based on the official guidelines of the same country and sometimes based on the guidelines of another

country, or on non-official guidelines. This makes it difficult to know what the latest and most 'official' advice actually is. Once again this underlines the point that guidelines need to be clearly visible, signposted and communicated.

5.1.2 Audience

Although we could not ascertain the intended audience for all guidelines, most do not seem to be aimed at the general public, but rather to health practitioners. We base this conclusion partly on the tone of the messaging, but mainly on the fact that they are generally not easy to find for the average individual. If we found it difficult, it is unlikely that a member of the general public will come across them. This calls for a communication strategy that includes very simple messaging aimed at the general public, backed up by more detailed information for those who choose to learn more and disseminated through a variety of traditional and new media outlets.

5.1.3 Translation into policy

Due to the time and resources available we were not able to conduct an in depth analysis of the impact of dietary guidelines on other policies and implementation strategies in all countries. However, what was evident from our overview was that links between the dietary guidelines and other policies are not readily apparent. Even professionals working in the countries in question – including those working in the institutions involved in developing the guidelines – were not sure about the nature of this relationship.

We found some instances where the guidelines were formally connected to school meal programmes (e.g. Sweden and the US). In others we found school meal programs that were certainly compliant with the national guidelines – but the link between them was not apparent.

An analysis carried out by FAO⁷⁴ in Latin America and the Caribbean found that 14 out of 24 countries included in the analysis had used the guidelines to define national policy, plans or programmes (e.g. embedding the guidelines in education and nutrition programmes) suggesting that while progress has been made there is still some way to go. Overall however, further research is needed in order to understand the relationship between dietary guidelines and other policies such as public procurement and school meal standards, and to identify how the link can be strengthened and made more explicit.

5.1.4 Monitoring and evaluation

As emphasised by FAO and WHO,⁷⁵ it is essential that monitoring processes to evaluate the impact of the guidelines are in place. Many countries invest considerable efforts in developing dietary guidelines but pay less attention to implementing monitoring and evaluation processes. Of those that do, one common monitoring practice is via national food consumption surveys that are undertaken in many

⁷⁴ FAO (2014) El estado de las alimentarias basadas en alimentos en América Latina y el Caribe (in Spanish).

⁷⁵ FAO/WHO (1998) Preparation and Use of Food-Based Dietary Guidelines.

countries (although generally not in low income countries). These surveys are important in giving an indication of current dietary patterns. This informs what kind of dietary recommendations are needed. Some countries also try to estimate the reach of the guidelines, by performing surveys on how much people know about the guidelines and their messaging. However, because of the multitude of influences on people's consumption patterns it is not possible to definitively attribute any changes in consumption to the guidelines. It is not yet possible to ascertain the impacts of the guidelines that do incorporate sustainability, as they are still very new.

5.1.5 The role of dietary guidelines

Despite all the limitations and shortcomings described here, dietary guidelines are still a key component of a coherent food policy. At their best they provide an official, accessible and easy to understand steer on how people should eat and the direction of travel needed. For them to fulfil their potential they need to be evidence based and widely communicated to the general public and to health professionals. Critically they also need to underpin and be linked to the development of policies and interventions, including but not limited to school meals provision, public procurement standards and regulations on food marketing and advertising.

5.2 Sustainable and healthy dietary guidelines

5.2.1 Most of the impetus comes from civil society and academia in high income countries

Globally there is a growing interest in the scope for developing guidelines that advise on dietary patterns that align health and environmental goals. Much of this interest comes from the civil society and academic sectors and has given rise not only to a plethora of initiatives such as Livewell, the FCRN guidelines and to the Barilla Double pyramid but also to a growing body of academic research (listed in Appendix 3).

Two points however are critical to note. First is that 'sustainability' is often used as a synonym for specific environmental concerns, commonly greenhouse gas emissions, land use and water. Social and economic aspects of sustainability tend to receive less attention. And second, the perspective adopted is very developed country oriented – that is, they take as their starting point the reality that in the developed world overconsumption is more of a problem than absolute hunger, and that animal source foods are available in abundance, at relatively low cost, and constitute an important part of the diet. Research to establish what dietary patterns are appropriate to the nutritional and socio-economic conditions of people in low income countries, but that also have low environmental impacts, is needed.

5.2.2 Official guidelines on sustainable and healthy diets are the exception, not the norm.

Despite the substantial and growing evidence base pointing to the need for integrated dietary approaches and the scope that exists to align health and sustainability objectives, only four countries have so far included sustainability in their guidelines.

This said, although sustainability may not feature in the main messaging of many guidelines, a number of countries do discuss aspects of sustainability in accompanying supporting information – including on websites, in brochures, and in other products developed to aid the communication and dissemination. In this report, we included instances of such messaging where we found them but note that they can be even more difficult to find and identify than the actual guidelines.

It is also worth noting that even where there is no mention of sustainability in the guidelines, this does not necessarily mean that the advice itself is not in line with sustainability. Many of the common recommendations aimed at improving health – for example to increase consumption of fruits, vegetables and whole grains – are also likely to lead to reduced environmental impacts in so far as they alter the balance of intakes of animal versus plant based foods.

5.2.3 How is sustainability presented in the guidelines?

Since there are so few official guidelines that include environmental considerations it is not really possible to make generalisations about which processes are more successful than others. Moreover in each of the cases where sustainability has been incorporated, the rationale for its adoption and the processes adopted have been very different.

5.2.3.1 Definitions of sustainability and level of integration of the messaging.

There was a notable variation on the quality and quantity of environmental advice offered among the official guidelines.

The German guidelines raise sustainability concerns, but only as second level points and they are not truly embedded throughout the guidelines. The guidelines simply highlight some cases where environmental outcomes are aligned with health advice, the only exception that they note being the recommendation to eat fish from sustainable sources.

Brazil – unlike any of the other countries reviewed – adopts a holistic definition of sustainability, with a strong focus on social issues and justice. These guidelines call for a systemic change in the way people eat, in that they focus on the context of consumption and – unusually – advise people to be wary of advertisements and marketing. The emphasis is as much on changing our relationship with food as on which specific foods to eat or avoid. Interestingly, while environmental concerns are mentioned, there is in fact little detailed discussion of the environmental impact of different foods.

The Swedish guidelines focus very strongly on environmental dimensions, reflecting a long history of environmental engagement and a tradition of environmentally oriented policies and actions. The inclusion of sustainability in the NNR 2012, together with the lessons learned in the previous attempt to include sustainability in the Swedish guidelines resulted in a relatively easy integration of sustainability in the guidelines. Furthermore, the risk and benefit management report included a detailed description of the strong evidence base supporting the recommendations. This made it very difficult to oppose the guidelines, even for pressure groups that represent interests affected by the guidelines (e.g. the dairy industry).

The Qatar example is different again. The impetus for including sustainability in this case came from one individual who acted as coordinator for the process. There was some initial resistance but this reflected a lack of understanding rather than an inherent opposition. Arguably it was also easier for Qatar to include environmental considerations because there is very little food production in Qatar, and so the recommendations did not affect national industry. Additionally, the recommendations are aligned with Islamic doctrine (see the section on the guidelines for more details). In this case then it would seem that sustainability was included because an external advisor proposed it, it was easy to do so, and did not present a high political risk. It is also worth noting that sustainability is hardly mentioned in the materials produced for the presentation and dissemination of the guidelines.

In the US and Australia, a rigorously evidence based case for sustainability was made but the focus was substantially on environmental rather than social dimensions. In both cases, the decision to leave it out was related to political decisions.

It is more difficult to make a similar comparison among the non-official and quasi-official guidelines as they were all created explicitly to cover sustainability. Furthermore, there is a great variability among this group.

5.2.3.2 What do healthy and sustainable diet guidelines say?

All the countries who provide guidance on sustainability have said broadly similar things (Table 5). However, there are some differences in emphasis.

All of them highlight that a plant based diet has advantages for health and for the environment. Sweden is notable among official guidelines in that it additionally provides more detailed advice on which plant based foods are to be preferred, recommending for example root vegetables over salad greens, due to their robustness and lower environmental impact.

Most guidelines that include sustainability talk about the high environmental impact of meat – with the exception of the Qatari guidelines. This said, the advice given on meat often lacks specificity. Only Sweden and Qatar advise on maximum levels of consumption (the Qatari ones on health grounds), setting this at no more than 500 grams of red and processed meat per week^{76,77} – this is the same limit adopted by many other guidelines that only talk about health implications and in fact is not very different from average per capita intakes in these countries. The lack of specificity regarding how much meat people should eat for environmental reasons not only reflects a lack of good evidence as to what that level should be but also recognition that meat is an important – and well liked – component of most people’s diets. Meat and dairy foods are central to people’s diets in many cultures, and can be a valuable source of many micronutrients, particularly in low income contexts where diets are largely grain or tuber based and lack diversity. Thus, diets low in animal products need to include a diverse range of foods that collectively provide the same quantity and range of nutrients. At the same time, the addition of small quantities of meat to the diet can help to avoid nutrient deficiencies.

⁷⁶ Colorectal cancer-incidence in relation to consumption of red and processed meat, Report 3, 2014.

⁷⁷ Consumption of red and processed meat in relation to colorectal cancer – risk och benefit management. Rapport 20, 2014.

Some would argue that the recommendation to eat more vegetables by definition implies reduced meat intakes – that is, that more fruit and vegetables are eaten as substitutes for meat. However, this should not be assumed and given its high environmental impacts, more explicit guidance on meat is arguably warranted.

Many guidelines also mention the need to moderate consumption of foods high in fat, salt and sugar. However, the Brazilian guidelines are distinct in strongly emphasising the need to avoid ultra processed foods, which tend to be high in these nutrients. While the health evidence regarding these foods is robust their environmental impacts are less clear. On one hand, food processing requires energy and as such generates environmental impacts. On the other, processed food can utilise raw materials that would otherwise be discarded (e.g. less appealing parts of the animal) and as such can be seen as a route to improving resource efficiency. More research is needed in this area.

Table 6: Summary of the main messages in the guidelines that include sustainability

| | Germany | Brazil | Sweden | Qatar |
|-----------------------------|--|---|---|--|
| Fruit and Vegetables | Choose mainly plant-based foods. Enjoy five portions of fruit and vegetables daily. | Eat foods mainly of plant origin. Chose seasonal and locally grown produce. | Eat lots of fruit and vegetables (at least 500g per day) Choose high fibre vegetables. | Eat vegetables with most meals, including snacks. Aim for 3–5 servings of vegetables and 2–4 of fruits every day. |
| Meat | Eat meat in moderation. White meat is healthier than red meat. | Try to restrict the amount of red meat | Eat less red and processed meat (no more than 500 grams of cooked meat a week). Only a small amount of this should be processed. | Choose lean cuts of meat. Limit red meat (500g per week) Avoid processed meats. |
| Dairy | Consume milk and dairy products daily. Choose low fat. | Milk drinks and yogurts that have been sweetened, coloured and flavoured are ultra-processed foods, and as such should be avoided | Choose low-fat, unsweetened products enriched with vitamin D. | Consume milk and dairy products daily. Choose low fat. If you do not drink milk or eat dairy products, choose other calcium and vitamin D rich foods (e.g. fortified soy drinks, almonds, chickpeas). |

Table 5 continued.

| | Germany | Brazil | Sweden | Qatar |
|---------------------------|---|--|---|---|
| Fish | Once to twice a week | -- | Eat fish and shellfish two to three times a week. Vary your intake of fatty and low-fat varieties and choose eco-labelled seafood. | At least twice a week. |
| Fat and oil | Fat and fatty foods in moderation. Chose fats and oils from vegetable origins. | In moderation. | Choose healthy oils when cooking, such as rapeseed oil or liquid fats made from rapeseed oil, and healthy sandwich spreads. | Avoid saturated fat and hydrogenated or trans fat. Use healthy vegetable oils such as olive, corn and sunflower in moderation |
| Processed food | -- | Limit the consumption of processed foods and avoid ultra-processed foods. | -- | Eat less fast foods and processed foods. |
| Behavioural advice | Preferably cook foods on low heat, for a short time, using little amount of water and fat. Use fresh ingredients whenever possible (this helps to reduce unnecessary packaging waste). Take your time and enjoy eating. | Eat regularly and carefully in appropriate environments and, whenever possible, in company. Develop, exercise and share cooking skills. Plan your time to make food and eating important in your life. Be wary of food advertising and marketing. | Try to maintain energy balance by eating just the right amount. | Build and model healthy patterns for your family: <ul style="list-style-type: none"> • Keep regular hours for meals. • Eat at least one meal together daily with family. • Be a role model for your children when it comes to healthy eating and physical activity |

Fish is presented as the main trade off between health and the environment. Many – although not all – of the guidelines that incorporate sustainability mention the critical state of wild fisheries and the sometimes negative impacts of aquaculture. But they nevertheless continue to recommend consuming fish in quantities consistent with health recommendations. This is a trade off that will not go away and needs

addressing. As noted in the UK's 'Principles' (see 4.3.3.4 above) there is a need for more research and action to advance sustainable wild fish capture and aquaculture production and into sustainable feed sources for farmed aquatic species. Also needed is investment in research into plant based sources of long chain omega-3 fatty acids, drawing both upon wild and neglected species and modern plant breeding techniques.

Most guidelines that include sustainability mention milk and dairy products directly or indirectly. However, the nature of the advice is variable. Some guidelines recommend a minimum number of portions every day, others call for a shift towards low fat products, and very few mention dairy alternatives. Although some mention the environmental impacts associated with milk production, only the Swedish guidelines and the UK *Principles* suggest the possibility of substituting milk with micronutrient rich alternatives – and even in those cases, the recommendations lack specificity. This reflects the importance of dairy products in Western diets and as contributors to calcium intakes. There is a need for more research to understand the role of dairy in a sustainable diet and the scope for increasing uptake of nutrient rich alternatives.

It was notable that most of the official guidelines do not mention food waste (with the exception of Qatar), whereas all the quasi- and non-official guidelines did (except Estonia). On the other hand, while all four official sustainability-including guidelines mention cooking and food preparation, Barilla is the only one of the quasi- and non-official guidelines that mentions it. There is scope for health-environment synergies here. Different cooking techniques have different relative energy efficiencies that could affect the environmental impact of a household and short cooking times can also be a way of preserving nutrients in food. Pressure cookers, for instance, are not only energy efficient but speed up the cooking of nutrient rich, low environmental impact beans and pulses. Advice on food waste prevention not only helps reduce the environmental impacts associated with food waste but can also help households save money, which potentially can be used to 'trade up' by buying higher quality products.

5.2.4 Stakeholders involved in the development of the sustainability guidelines

Although the details and processes differ widely, a commitment from government to support the integration of health and sustainability (and to protect against any opposition from the food industry and other interests) was crucial for Brazil, Sweden, and Qatar (although in the latter case industry opposition was not an issue). The examples of Australia and the US illustrate what happens when government support is lacking – or where government prioritises other concerns. In both these cases efforts to include sustainability into dietary guidelines failed. However, for all the countries listed here, Government financially supported the extensive literature reviews and multiple meetings needed to develop the guidelines.

In virtually all cases development of the guidelines (both those that include sustainability and those that do not) falls within the remit of the Ministry or Department of Health. Other Ministries tend to become involved only in so far as guidelines impact upon their policies or activities. Likewise most of the academics and professionals participating in the development of the official guidelines are drawn from the fields of nutrition and public health, even when the guidelines do cover some environmental issues. When looking at the teams behind the quasi-official and non-official guidelines, we find a much broader range of expertise.

One conclusion we draw from this is that robust guidance on diets that are both healthy and sustainable needs to draw upon the expertise of a much wider range of disciplines, including environmental life cycle assessment, the agricultural and environmental sciences, economics and sociology among others. Furthermore while coordination by a single Ministry – in this case health – is needed, other departments also need to be included in the development and the application of the guidelines.

5.2.5 One final comment

Our overall observations then are that not only do very few countries incorporate sustainability messaging into their guidelines, but those that do are fairly cautious in the advice they offer and tend not to stipulate ‘maximum’ limits to high impact foods. We do not yet know if following the broad eating patterns indicated by these guidelines would enable us to achieve sufficiently meaningful reductions in GHG emissions and other environmental impacts, given the scale of the environmental problems society faces. Depending on our progress in other areas of life and society, it may become necessary to consider how much nutrition we can ‘afford’, environmentally speaking.

5.3 Suggested ways forward

National official dietary guidelines are essential. Such guidelines provide a clear sense of how people should be eating in order to maintain good nutritional health. They are – or should be – the basis for the development of policies intended to shift consumption patterns in healthier directions.

However, an increasingly robust body of research now finds that a focus on health alone, while necessary, is not sufficient since current food systems jeopardize current and future food production. Diets consistent with good health today can undermine the wellbeing of future generations and their ability to access and consume healthy food. Thus it is essential to incorporate environmental and other societal considerations into the definition of a desirable dietary pattern.

What is also clear is that win wins are possible: it is possible to identify dietary patterns that are broadly lower in environmental impact and also consistent with good health – and indeed represent a substantial improvement on the way people currently eat. This is the case both in countries where the main problems are those of overconsumption and non-communicable diseases and in contexts where hunger and underconsumption are of critical concern, since one important element of any definition of a sustainable diet is diversity. Our knowledge of broader social and ethical dimensions and how they fit into our understanding of what a sustainable diet looks like is, however, less clear and warrants further research.

Our overarching suggestion therefore is that countries that already have dietary guidelines should begin to consider a process of incorporating sustainability into them, and those countries that do not have them are in a unique position to develop integrated guidelines from the outset.

Based on our analysis above our specific suggestions for developing dietary guidelines that incorporate sustainability are as follows:

1. To have a real effect on food consumption, dietary guidelines need to:

- Be owned by the government – and supported by multiple departments within government.
- Be aimed at the general public, health professionals, consumer organisations and those working in the food sector (different versions will be needed).
- Have clear links to food policies that are actually implemented – e.g. school and hospital meals, public procurement, advertising regulations, industry standards etc.
- Be promoted – everybody should know about them.

2. If dietary guidelines are to integrate sustainability and nutrition, the process to develop them needs:

- Clear championing by more than one government agency.
- To bring in a diverse range of academic expertise, the spans environmental aspects and broader sustainability concerns.
- To have two distinct and independent components:
 - A development based on the advice of scientists and professionals from both health and environmental fields.
 - A consultation process with civil society and industry.

3. To have a real effect on the environmental impact of diets, they need to:

- Be accompanied and underpinned by the information highlighting the links between health and sustainability so that:
 - People are informed about the relationships between food and sustainability.
 - People are informed about the need for such dietary patterns.
- Be accessible but ambitious.
 - They should consider current consumption patterns and the cultural context, so they do not ‘stretch’ people unrealistically.
 - At the same time they should also promote a clear change in the consumption patterns needed to foster truly sustainable dietary patterns – this could be achieved by adopting and communicating a series of achievable step changes.
- Have clear guidance on:
 - Limiting meat consumption (not just maximum quantities but also suggestions for how to make change that are appealing and accessible) This should be done in all cases. However advice needs to be appropriate to the particular context:

- In high consuming (generally developed countries) there should be advice on reducing consumption.
- In countries where per capita intakes are increasing, there should be guidance on 'moderating' consumption, to avoid the problems associated with consumption levels in high meat consuming countries.
- In low income countries – where animal source food intakes are generally very low – the focus should be on advice to increase the diversity of diets, including more consumption of vegetables, fruits, legumes, nuts and some meat and dairy products.
- The environmental benefits of limiting overconsumption of all foods.
- Food waste reduction.
- Which fruits and vegetables to seek out in preference to others.
- Safe and energy efficient food preparation.
- Shopping.
- The place and value of food in our lives.
- Provide guidance for those who wish to adopt vegetarian or vegan diets – often this is lacking.

5.4 Areas for further research

Finally, more research is needed to fill knowledge gaps and help to navigate some of the biggest trade offs. This calls for investment in interdisciplinary research and action on sustainable and healthy food production and consumption.

In particular, we have identified five areas that need more attention:

- Sustainable fish production (both wild caught and aquaculture) and sustainable plant sources of omega 3s, as well as other options for addressing the trade off between the health benefits of fish consumption and the negative environmental impacts.
- Determining a sustainable level of meat consumption consistent with environmental and health objectives.
- Better understanding of the role and impact of dairy products in relation to health and sustainability and the nutritional and environmental costs and benefits of alternative foods.
- Better understanding of the environmental impacts of high sugar, high fat, high salt processed foods.
- Finally – and critically – as this report shows, most of the work has been done on environmental sustainability, and from the perspective of developed countries. We urgently need more research focusing on the broader social and economic dimensions of sustainable diets and on developing countries.

Appendix 1:

Countries with official dietary guidelines, classified by income level.

Low-income countries

Benin
Nepal

Low-middle-income

Bangladesh
Bolivia (Plurinational State of)
El Salvador
Georgia
Guatemala
Guyana
Honduras
India
Nigeria
Philippines
Sri Lanka
Viet Nam

Upper-middle-income countries

Albania
Belize
Bosnia and Herzegovina
Brazil
China
Colombia
Costa Rica
Cuba
Dominica
Dominican Republic
Fiji
Grenada
Iran (Islamic Republic of)
Malaysia
Mongolia
Namibia
Panama
Paraguay
Romania
Saint Lucia
Saint Vincent and the Grenadines
South Africa
Thailand
The former Yugoslav Republic of
Macedonia
Turkey

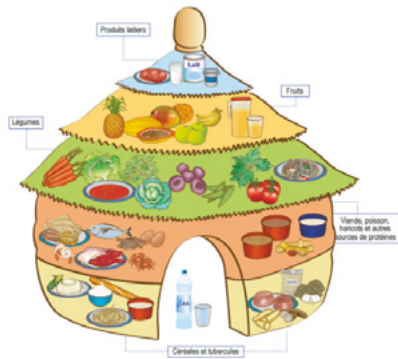
High-income countries

Antigua and Barbuda
Argentina
Australia
Austria
Bahamas
Barbados
Belgium
Canada
Chile
Croatia
Cyprus
Denmark
Estonia
Finland
France
Germany
Greece
Hungary
Iceland
Ireland
Israel
Italy
Japan
Latvia
Malta
Netherlands
New Zealand
Norway
Oman
Poland
Portugal
Qatar
Republic of Korea
Saint Kitts and Nevis
Seychelles
Spain
Sweden
Switzerland
United Kingdom of Great Britain
and Northern Ireland
United States of America
Uruguay
Venezuela (Bolivarian Republic of)

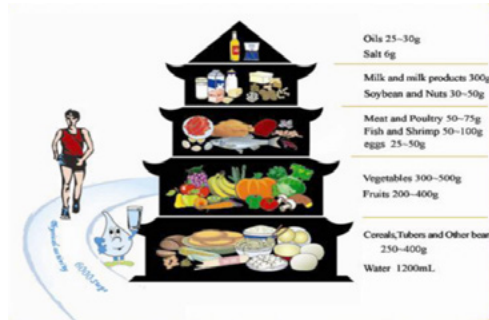
Appendix 2:

Examples of visual food guides from different countries.

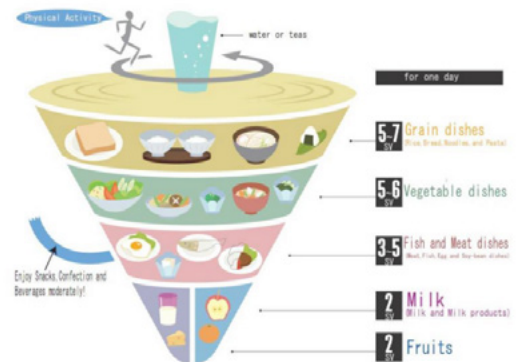
Benin - Traditional round house



China - Food pagoda



Japan - Spinning top



Honduras - pot



South Africa



Ireland - Pyramid



Appendix 3:

Academic research on healthy and sustainable diets.

This is a non exhaustive list of some of the recent academic literature that focuses on the relationship between diet, health and the environment.

Brunner E., Jones P., Friel S. & Bartley M. (2009). Fish, human health and marine ecosystem health: policies in collision. *International Journal of Epidemiology*; 38: 93-100

Friel S. *et al.* (2009), Public health benefits of strategies to reduce greenhouse-gas emissions: food and agriculture *The Lancet*, 374: 2016-25.

Stehfest *et al.* (2009) Climate benefits of changing diet. *Climatic Change*, 95, 1-2.

Aston *et al.* (2012). Impact of a reduced red and processed meat dietary pattern on disease risks and greenhouse gas emissions in the UK: a modelling study. *BMJ Open*; 2 (5): e001072 DOI: 10.1136/bmjopen-2012-001072

Smith *et al.* (2013), How much land-based greenhouse gas mitigation can be achieved without compromising food security and environmental goals?. *Global Change Biology*, 19: 2285-2302. doi: 10.1111/gcb.12160

Van Dooren C. & Kramer G. (2012). Food patterns and dietary recommendations in Spain, France and Sweden, www.livewellforlife.eu

Vieux *et al.* (2013). High nutritional quality is not associated with low greenhouse gas emissions in self-selected diets of French adults, *Am J Clin Nutr*; 97: 569-83

Vanham D., Hoekstra A.Y. & Bidoglio G. (2013). Potential water saving through changes in European diets. *Environment International* 6145-56

Briggs *et al.* (2013). Assessing the impact on chronic disease of incorporating the societal cost of greenhouse gases into the price of food: an econometric and comparative risk assessment modelling study, *BMJ Open*.

Pairotti *et al.* (2014) Energy consumption and GHG emission of the Mediterranean diet: a systemic assessment using a hybrid LCA-IO method. *Journal of Cleaner Production* xxx 1e10

Van Kernebeek *et al.* (2014). The effect of nutritional quality on comparing environmental impacts of human diets, *Journal of Cleaner Production* xxx 1e-12

Westhoek *et al.* (2014). Food choices, health and environment: Effects of cutting Europe's meat and dairy intake, *Global Environmental Change*

Saxe H. (2014). The New Nordic Diet is an effective tool in environmental protection: it reduces the associated socioeconomic cost of diet, *Am J Clin Nutr* doi:10.3945/ajcn.113.066746.

Biesbroek S. *et al.* (2014). Reducing our environmental footprint and improving our health: greenhouse gas emission and land use of usual diet and mortality in EPIC-NL: a prospective cohort study. *Environmental Health*, 13:27

Vieux F., Soler L.-G., Touazi D. & Darmon N. (2013). High nutritional quality is not associated with low greenhouse gas emissions in self-selected diets of French adults, *Am J Clin Nutr*; 97: 569-83

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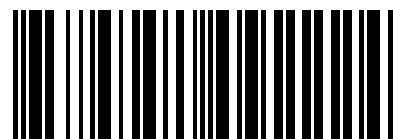
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