

The Need for Sustainable Diets

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A top-down view of a light-colored ceramic bowl filled with a meal. The bowl contains white rice, yellow chickpeas, sliced red onions, and a green leafy garnish. Several chickpeas are scattered on the white surface around the bowl. A semi-transparent green rectangular box is overlaid on the bottom right of the bowl, containing a table of contents.

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1. Key messages

- A sustainable diet is a dietary pattern that provides us with the many nutrients we need for health, in appropriate amounts, but that is culturally acceptable, affordable and sustainable.
- All governments should be reflecting sustainability in their nutrition guidelines with specific recommendations for increasing the proportion of plant-based proteins within diets.
- Research from many countries demonstrate that diets aligned with national food based dietary guidelines reduce GHGe and land-use.
- Overall, in order to reduce ecological and human health impacts there is a need to reduce overconsumption of protein, reduce overconsumption of calories, reduce food waste and replace animal protein with plant protein.

2. What is a sustainable diet?

Put simply, a sustainable diet is a dietary pattern that provides us with the many nutrients we need for health, in appropriate amounts, but that is culturally acceptable, affordable and sustainable. It is one which we can produce and consume within planetary boundaries whilst feeding the growing global population.

The FAO provides a more formal definition for sustainable diets in 2010 stating that *'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.'*

There is an increasingly body of robust evidence, as highlighted within this review, to suggest that dietary patterns, focussed on a greater proportion of plants within diets, have lower environmental impacts and can improve health outcomes.⁶⁷ In the past

decade, **more and more countries have started to incorporate sustainability considerations into their food policies and consumer education programmes.** Recommendations that promote specific food practices and choices have been an obvious strategy for addressing sustainability, mainly in its nutrition and environment dimensions.

Many sustainable diets recommendations include for example:

- having a mostly plant-based diet
- focus on seasonal and local foods
- reduction of food waste
- consumption of fish from sustainable stocks only
- reduction of red and processed meats
- increased consumption of tap water
- reductions in sugars

Key elements to consider when defining a sustainable diet



Figure 11 - From FCRN, What is a sustainable healthy diet? ⁶⁸



WATCH the video of the EAT-Lancet
Commission Launch in Oslo

3. The EAT-Lancet Commission Report

Over the last few years a significant amount of new evidence has emerged which support the need, from a sustainability perspective, to transition towards plant-based diets. One of the most notable and influential of these is the EAT-Lancet Commission Report.⁶⁹ The report provides the first scientific targets for a healthy diet from a sustainable food production system that operates within planetary boundaries for food. It specifically recommends '*diets consisting of a variety of plant-based foods, with low amounts of animal-based foods, refined grains, highly processed foods, and added sugars, and with unsaturated rather than saturated fats*'. The authors highlight the need to reduce, by more than 50%, the global consumption of foods such as red meat and sugar and increase the consumption of

nuts, fruits, vegetables, and legumes by more than two-fold, with global targets being applied locally to reflect regional differences in needs.

Overall, they concluded that to stay within planetary boundaries, a combination of major dietary change, improved food production through enhanced agriculture and technology changes, and reduced food waste during all steps of the food chain from production to consumption (including farmers, processors, supermarkets, restaurants, and people at home) will be needed.

The great food transformation

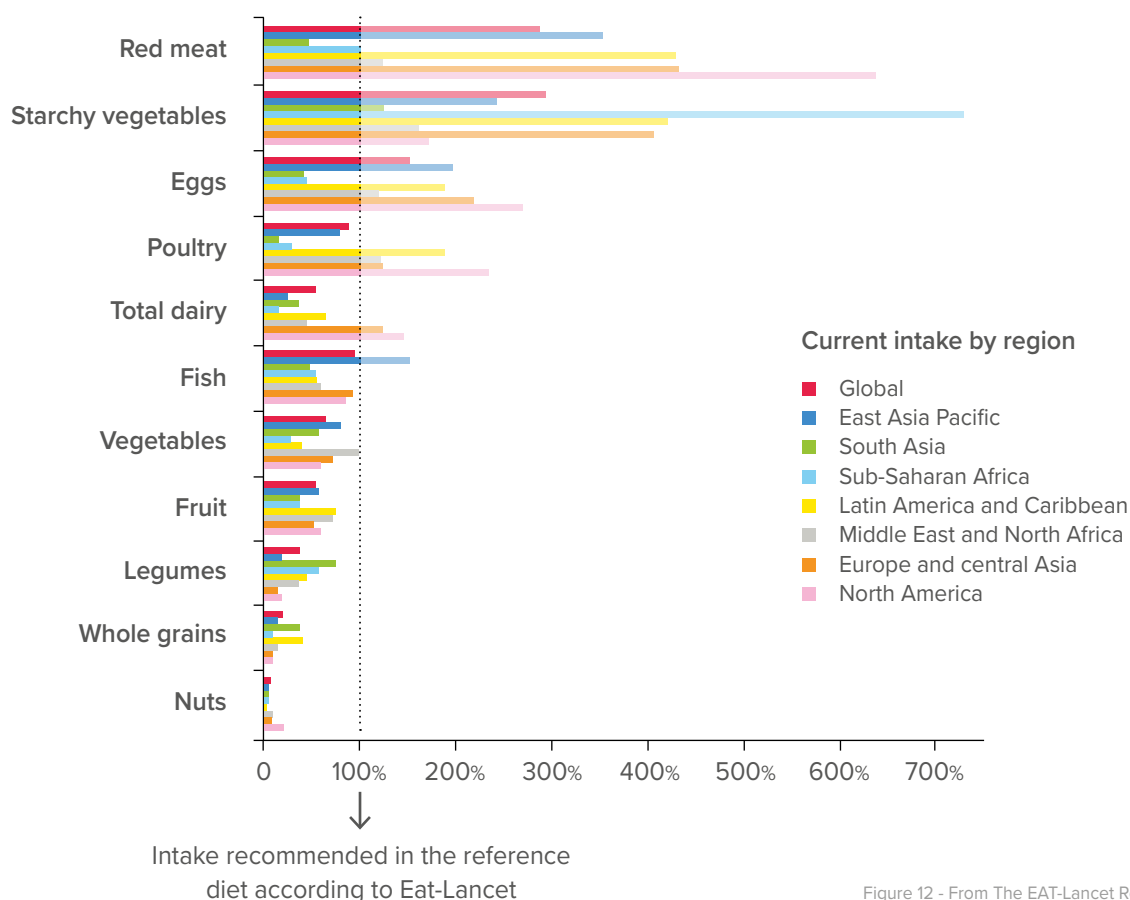


Figure 12 - From The EAT-Lancet Report ⁶⁹



For more information on
the work of the Nordic
Council of Ministers and their
Nordic Food Manifesto

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4. Sustainable diets in practice: best case examples

The Mediterranean diet is often highlighted as both healthy and sustainable.⁷⁰ It is characterised by high intake of fruits, vegetables, legumes, nuts, cereals, fish, and olive oil (coupled with low intake of saturated fats); low intake of meat and dairy products; low consumption of saturated fatty acids and high intake of fibre.⁷¹ This diet dated back to Roman times and was common place in the Mediterranean region until the 1960s. Over recent years there has been a decreasing adherence to such **traditional food patterns** which has resulted in diets of a lower nutritional quality.^{72,73} There is evidence that a Mediterranean diet can decrease the risk of diet-related chronic diseases, while also promoting living longer in good health and healthy aging.⁷⁴ One of the greatest attributes of a **Mediterranean diet** is that alongside the obvious health benefits, is its lower environmental impact (particularly with regards to GHGe) than typical Western diets.⁷⁵

Another diet that has gained increasing attention in recent years is the **traditional Nordic diet**. The Nordic diet is a way of eating that focuses on locally sourced foods in the Nordic countries - Norway, Denmark, Sweden, Finland, and Iceland. Compared to an average Western diet, it contains less sugar and fat but twice the fibre and seafood.⁷⁶ These diets have been shown to have good health and positive environmental impacts.⁷⁷ The New Nordic diet has shown improved dietary intake and nutrition content among children, and is associated with weight loss and blood pressure reduction in obese individuals, and it improves blood lipid profiles and insulin sensitivity.⁷⁸ It has been estimated that change towards New Nordic diets in Denmark would save 18,000 Disability-Adjusted Life Years (DALYs) per year by preventing non-communicable diseases.⁷⁹ As a diet, that contains 35% less meat than the average Danish Diet

(2019)⁸⁰, it uses fewer natural resources (such as water and fossil fuels) and create less pollution than meat-heavy diets. In addition, eating locally produced foods also reduces energy consumption and food waste.

Consensus is emerging that eating according to dietary guidelines is more sustainable than current dietary habits.^{81,82,83} All governments should be reflecting sustainability in their nutrition guidelines with specific recommendations for increasing the proportion of plant-based proteins within diets, as a key priority. Despite this need, only a few countries have explicitly considered environmental factors in their main messaging (Germany, Brazil, Sweden and Qatar, UK, Belgium, The Netherlands).⁸⁴

Within the European Union all countries have Food Based Dietary Guidelines (FBDGs), which are science-based recommendations in the form of guidelines for healthy eating.⁸⁵ Since country-specific nutrient intake levels, availability of food products, and cultural characteristics affect FBDG development, FBDGs are usually unique to the population or country that developed them. Many of these have similar characteristics including advice to eat less salt, eat a number of 'portions' of fruit and vegetables, consume a certain amount of fish, with a number recommending reducing and moderating levels of meat consumption, particularly with regards to red and processed meats. One study provided a comparison between the environmental impacts of average dietary intakes and a nation-specific recommended diet across 37 countries and found that **following a nationally recommended diet in high-income nations results in a reduction in GHGe by between 13% - 24.8%.**⁸⁶

There is an increasingly body of robust evidence to suggest that dietary patterns, focussed on a greater proportion of plants within diets, have lower environmental impacts and can improve health outcomes.

A recent study in The Lancet Planetary Health (2018)⁸⁷ highlighted the environmental footprint of three different diets recommended in the 2015–20 Dietary Guidelines for Americans. These included the healthy US-style, healthy Mediterranean-style, and healthy vegetarian dietary patterns. By assessing six categories of environmental impacts (climate change, land use, water depletion, freshwater eutrophication, marine water eutrophication, and particulate matter or respiratory inorganics), they established that the healthy vegetarian diet produced a 42–84% lower burden than the other two diets. As a result of this work the authors called for better incorporation of environmental sustainability aspects into future dietary guidelines with the US.

In the UK, a study commissioned by the Department for the Environment, Food and Farming (2018)⁸⁸ showed that achieving a national move to the Eatwell Guide (The UK governments dietary guidelines), which recommends more fruits, vegetables and fibre-rich starchy carbohydrates and fewer sugary foods and drinks, would have major environmental benefits in reducing emissions of GHG (14%), ammonia (28%), nitrate (12%) and acidifying gases (4%). The report also highlighted that a significant amount of land would be released (about 4.8 Mha of pastureland) with smaller increases in cropland requirements both in the UK (0.34 Mha) and overseas (0.48 Mha).

5. A review of studies evaluating environmental impact of plant-based diets

A systematic review of peer-reviewed journal articles assessing the GHG emissions and land use demand of in total 49 dietary scenarios⁸⁹ highlighted that dietary change, with an emphasis on more plants in diets, particularly in regions of the world where meat consumption is high, could play an important role in reaching environmental goals, with up to 50% potential to reduce GHG emissions and land use demand associated with the current diet.

A number of other analyses have highlighted the environmental benefits of reducing the fraction of animal-sourced foods in our diets including easing pressure on land use⁹⁰ and reducing GHG emissions.⁹¹ Many of these have concluded that changing diets may be more effective than technological mitigation options for avoiding climate change⁹² and may be essential to avoid negative environmental impacts such as major agricultural expansion and global warming of more than 1.5°C.

Recent work by the World Resources Institute (WRI)⁹³ considered the need for three interconnected diet shifts including:

1. reduction in overconsumption of calories
2. reductions in the overconsumption of protein by reducing consumption of animal-based foods
3. reductions in beef consumption specifically

For each shift they quantify the land use and GHG consequences of different foods, and then analyze the per person and global effects of the three diet shifts on agricultural land needs and GHGe. They found that these shifts, if implemented at a large scale can substantially reduce GHG emissions and land use by half (see figure 13).

Reducing consumption of animal-based foods reduces the agricultural land use and GHGe associated with the average US Diet by up to half per capita values 2009

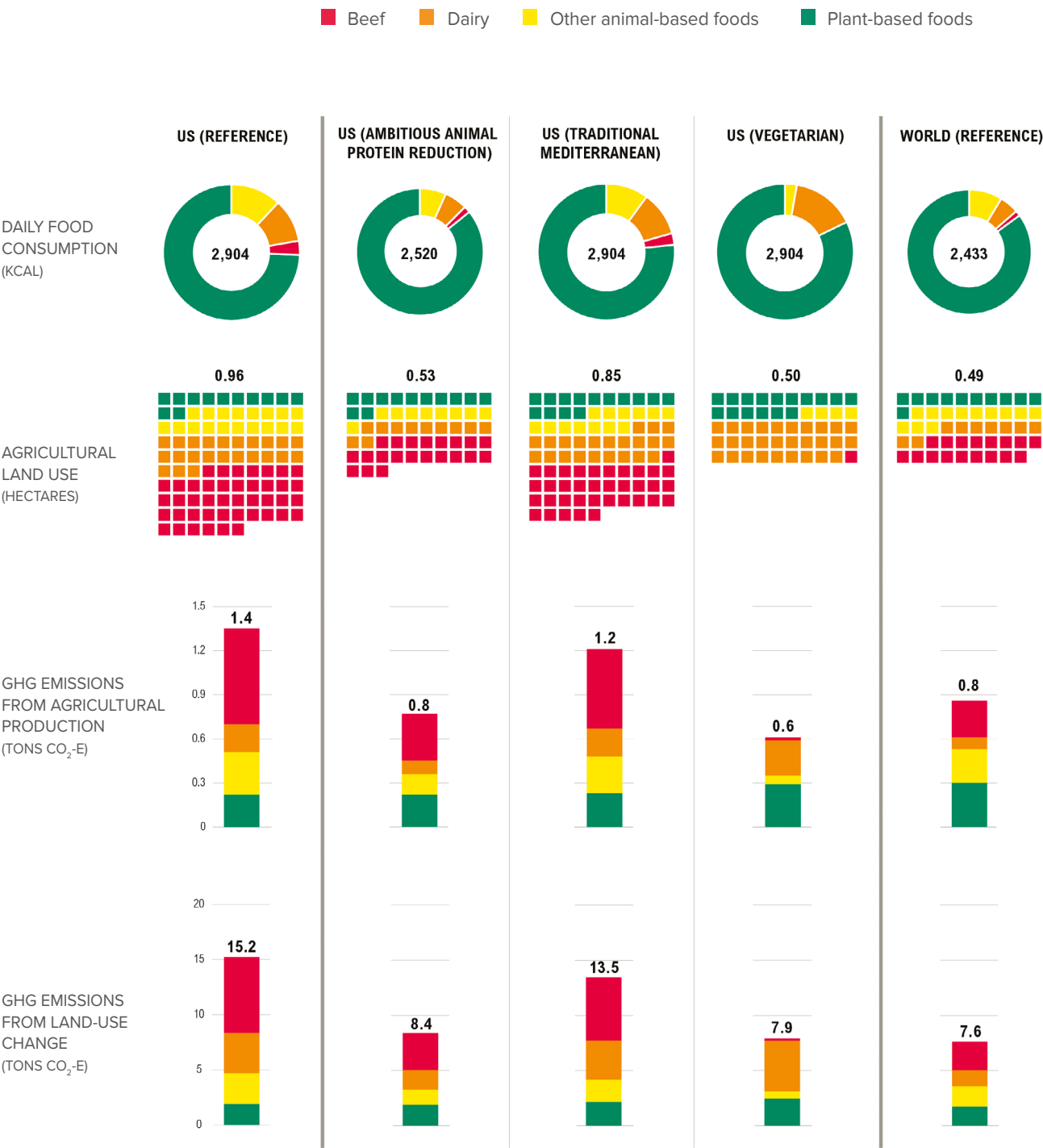


Figure 13 - From WRI 2016 ⁹³

Alexander et al. (2017)⁹⁴ quantified the amount of food lost by overconsumption and leading to obesity. Rather shockingly, they found that it even surpassed the amount of food discarded in the household (which is about a third of food purchased). Subsequently, Aiking & De Boer (2019)^{95,96} developed a priority list to improve current Western dietary patterns (in descending order of magnitude):

1. reducing overconsumption of protein
2. reducing overconsumption of calories
3. reducing food waste in the household
4. replacing animal protein with plant protein (analogues and/or whole foods)

This list not only resembles the above WRI transitions, but these authors explicitly mention the proposal to shift the current Dutch animal protein: plant protein consumption ratio of 60:40 to 50:50 by 2025 and to 40:60 by 2050, as proposed by the Green Protein Alliance, and backed by the Dutch government.

Springmann et al. (2017)²² analysed several options for reducing the environmental effects of the food system, including dietary changes towards healthier, more plant-based diets, improvements in technologies and management, and reductions in food loss and waste. As illustrated in figure 14, they found no single measure is enough to keep these effects within all planetary boundaries simultaneously, and that **a synergistic combination of measures will be needed to sufficiently mitigate the projected increase in environmental pressures.**

Reduction in environmental impacts when measures are combined

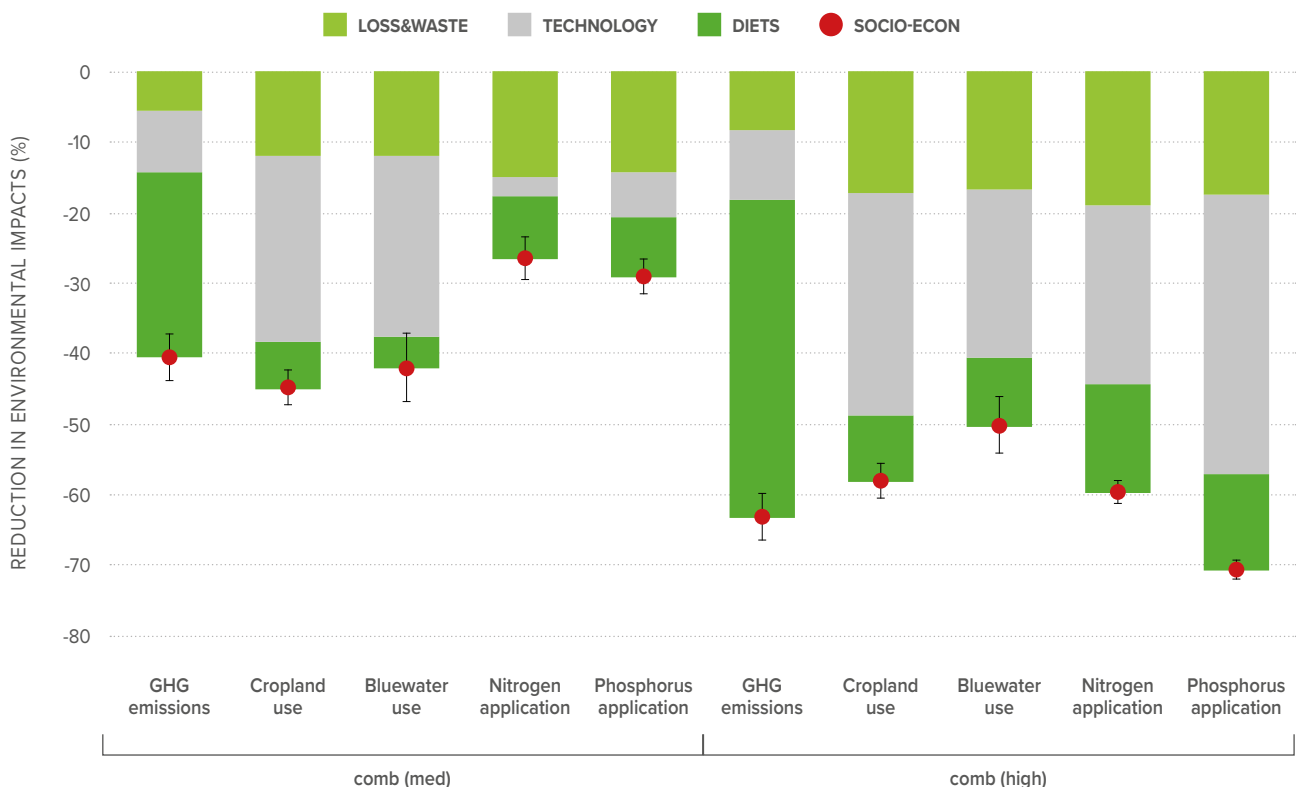


Figure 14 - From Nature, Options for keeping the food system within environmental limits (2017)²²



6. A review of studies evaluating the health impacts of sustainable diets

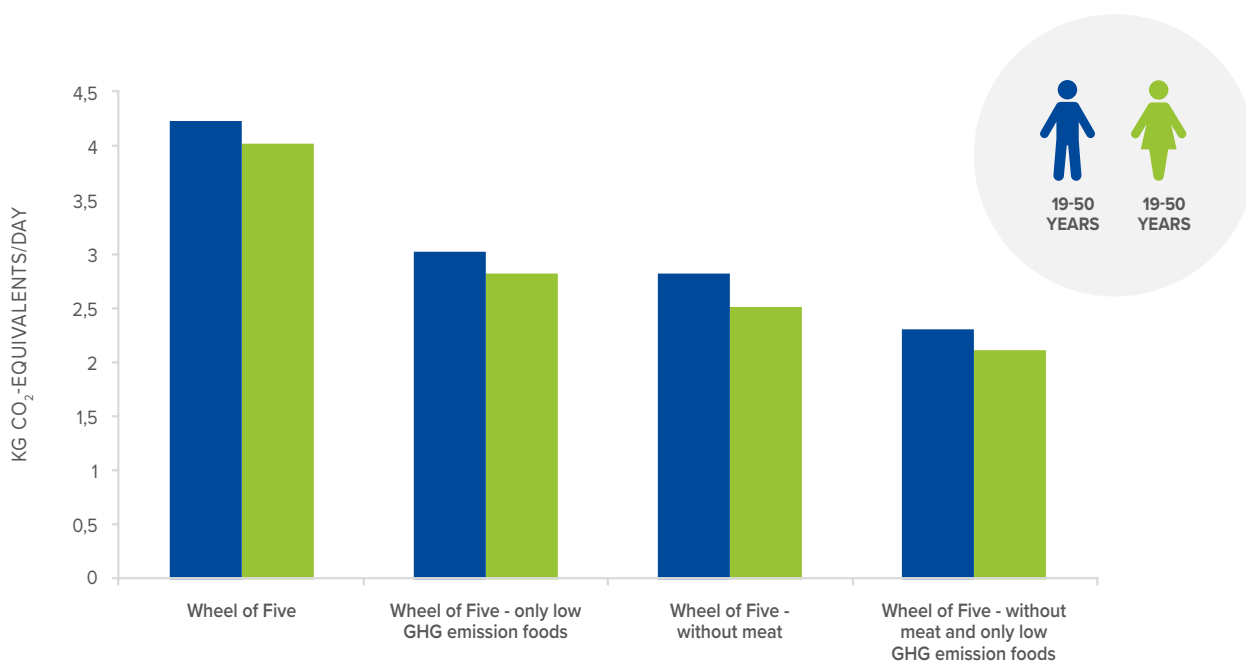
In recent years a number of studies have emerged which look at the interplay and effects of a sustainable diet on both health and sustainability. One recent study, published in the Lancet (October 2018) by Springmann et al.⁹⁷, used an integrated health and environmental modelling framework for more than 150 countries, and examined three different approaches to sustainable diets motivated by environmental, food security, and public health objectives.

Following **environmental objectives** by replacing animal-source foods with plant-based ones was particularly effective in high-income countries for improving nutrient levels, lowering premature mortality (reduction of up to 12% [95% CI 10-13] with complete replacement), and reducing some environmental impacts, in particular GHGe (reductions of up to 84%). However, it also increased freshwater use (increases of up to 16%) and had little effectiveness in countries with low or moderate consumption of animal-source foods. Following **public health objectives** by adopting

energy-balanced, low-meat dietary patterns that are in line with available evidence on healthy eating led to an adequate nutrient supply for most nutrients, and large reductions in premature mortality (reduction of 19% for the flexitarian diet to 22% for the vegan diet. It also markedly reduced environmental impacts globally (reducing GHGe by 54-87%, nitrogen application by 23-25%, phosphorus application by 18-21%, cropland use by 8-11%, and freshwater use by 2-11%) and in most regions, except for some environmental domains (cropland use, freshwater use, and phosphorus application) in low-income countries.

In another recent Dutch study⁹⁸, a research team looked at differences in environmental impact and nutrient content of the current Dutch diet and **four simulations of healthy diets aimed at lowering GHGe**. They found that replacing meat in this diet and/or consuming only foods with relatively low GHG emissions resulted in average GHG emission reductions varying from 28-46%. In the scenarios in which only foods with relatively

GHGe associated with food consumption according to the Dutch Wheel of Five*



* food based dietary guidelines covering around 85% of estimated average energy requirements

Figure 15 - From Food Research International ⁹⁸

low GHG emissions are consumed, fewer dietary reference intakes (DRIs)⁹⁹ were met than in the other healthy diet scenarios. However, in all healthy diet scenarios the number of DRIs being met was equal to or higher than that in the current diet.

Temme et al.¹⁰⁰ assessed the environmental (land use) as well as the nutritional (intakes of saturated fatty acids and iron) characteristics of individual food consumption in 398 young Dutch women. Meat was identified as the most important contributor to diet-related land use in this population (contributing 39% to land use). The authors **simulated the effects of replacing meat and dairy foods with plant-based products** on land use and intakes of saturated fatty acids and iron. In their scenarios, meat and dairy products were replaced by the same amount of a plant-based dairy- or meat-replacing food that had a usage similar to that of the food being replaced. When all meat and dairy foods were replaced by plant-based products, land use was halved, estimated saturated fatty acids intake decreased by 4% of total energy, and total iron intake increased by 2.5 mg/d compared with the observed diet.

Another Dutch study based on dietary intake of 3 818 individuals (7-69 years) participating in the Dutch National Food Consumption Survey 2007-2010¹⁰¹, evaluated the GHGEs of diets in girls, boys, women, and men separately and explored associations with diet composition, total food and energy intake, and macronutrient intakes. They found that reducing energy intakes, especially from animal-based foods and sugar- and alcohol-containing drinks, will help reduce the environmental impact of diets.

Following public health objectives by adopting energy-balanced, low-meat dietary patterns led to a large reductions in premature mortality and markedly reduced environmental impacts globally.

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This review is fully supported by the Scientific Advisory Committee of the Alpro Foundation.

Date: July 2019

