

Healthier and more sustainable diets

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The need to change food systems

“Food systems have the potential to nurture human health and support environmental sustainability; however, they are currently threatening both.” EAT-Lancet Commission, 2019.

People

- 1 in 5 deaths are associated with a poor diet ⁽¹⁾
- Almost 2 billion adults are overweight/obese, while ~500 million are underweight ⁽²⁾
- Over two-thirds of men and 6 out of 10 women in England are living with overweight or obesity ⁽³⁾
- World hunger increased from 2019 to 2020 ⁽⁴⁾

Planet

Food production is the largest cause of global environmental change.

Up to a third of global greenhouse gas emissions from human activity*



~70% of freshwater withdrawals ⁽⁵⁾

~40% of global land use ⁽⁶⁾



Sources: ⁽¹⁾ Afshin et al (2019) The Lancet: 393, 1958-197. ⁽²⁾ FAO, 2021 <https://www.who.int/en/news-room/fact-sheets/detail/obesity-and-overweight> ⁽³⁾ Health Survey for England, NHS Digital ⁽⁴⁾ FAO 'State of Food Security and Nutrition in the World 2021' ⁽⁵⁾ Brauman et al (2016) Elementa: Science of the Anthropocene 4: 000083. ⁽⁶⁾ FAO (2020) <https://www.fao.org/sustainability/news/detail/en/c/1274219/>

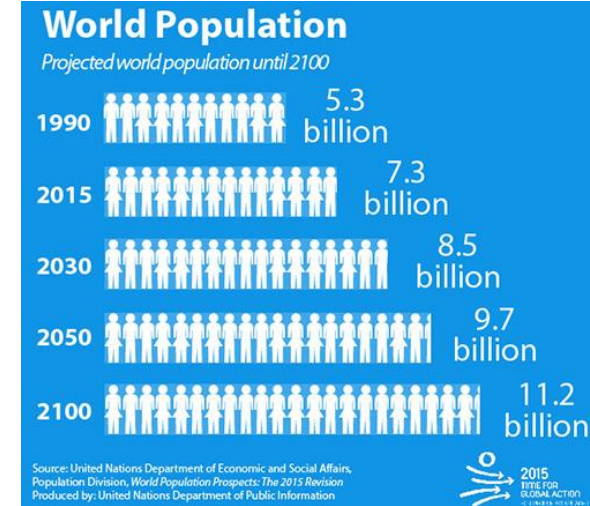
*Several estimates have been published, ranging from 19 to 37%



Feeding a growing population

- Global population expected to increase to 9.7 billion by 2050
- Worldwide food demand is expected to increase by more than 50% (1)
- Demand for animal-based foods estimated to increase almost 70% due to rising incomes in developing nations (2)
- On current trends, food production will need to increase by more than 50% (2)
- Nutrition and food security play a pivotal role in achieving all 17 of the UN's Sustainable Development Goals

How can we feed a growing population while reducing malnutrition and the environmental effects of our current food system?



Sources: (1) WHO population estimates (<https://www.un.org/en/sections/issues-depth/population/>)

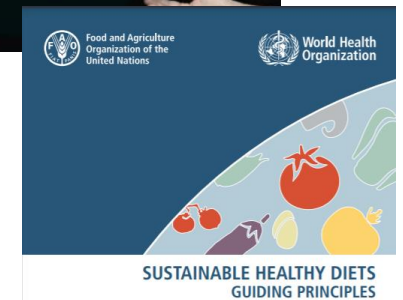
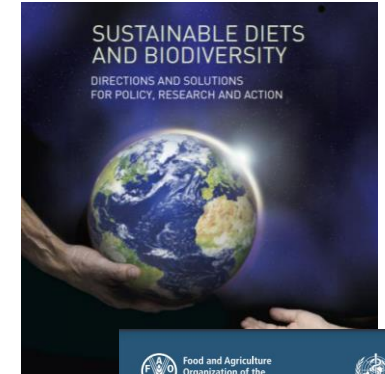
(2) World Resources Institute 'Creating a Sustainable Future' (<https://research.wri.org/wrr-food>)



What do we mean by a healthier and more sustainable diet?

*'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.**' (FAO, 2012)*

- ***Useful as a starting point, but how can we put this into practice?***
- ***A lot of debate exists around what a healthy and more sustainable diet should and (should not) contain.***



What is the role of animal-derived foods in healthier and more sustainable diets?

- Meat and dairy have attracted a lot of attention due their contribution to environmental impact of global food system
- Livestock accounts for 14.5% of global greenhouse emissions (direct and indirect emissions), mainly due to animal feed and methane produced by cattle
- Increasing public interest in eating a more 'plant-based diet'

However...

- *Environmental impact of animal-derived foods depends on where and how they are produced*
- *Need to consider the nutritional contribution of meat, dairy and other animal-derived foods within overall diet*
- *Also need to think about diets that are affordable and acceptable*



Nutritional contribution of animal-derived foods

Restricting or eliminating animal-based foods from the diet may make it more difficult to get adequate amounts of some nutrients **if not eating a diverse diet**

Nutrient	Dietary contribution of animal-based foods in UK diet*
Vitamin B12	Typically only found naturally in foods of animal origin
Iron	29%
Calcium	47%
Vitamin D	74%
Selenium	61%
Iodine	61%
Zinc	53%

*Total percentage contribution from 'Milk and milk products', 'Meat and meat products', 'Eggs and egg dishes', 'Fish and fish dishes' and 'Butter'. Source: National Diet and Nutrition Survey (NDNS; years 9 to 11)

- **Iron** – haem iron more bioavailable than non-haem iron from plant sources
- **Vitamin D** – vitamin D₃ supplements from sheep's wool (lanolin) raise vitamin D levels more effectively than vitamin D₂ supplements⁽¹⁾
- **Calcium** – some compounds (content can inhibit absorption (e.g. oxalic acid in spinach))
- **Iron and zinc** – phytic acid compounds in some plant foods may reduce absorption
- **Iodine** – milk and dairy products are the main contributors to UK intakes (all ages)⁽²⁾ but some milk alternatives are not fortified

Sources: (1) Tripkovic et al (2017) *American J Clin Nutr* 106:481-490 (2) *National Diet and Nutrition Survey*, years 9 to 11 (2016/2017 to 2018/2019)



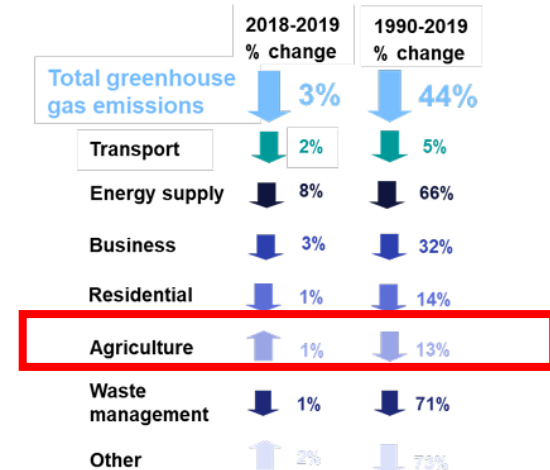
Environmental impacts of animal-derived foods vary widely

- Huge variation among both producers and products globally
- For example, top 10% most impactful beef (herd) vs. bottom 10% least impactful producers globally: **(1)**
 - 12 times greater greenhouse gas emissions
 - 50 times greater land use
- UK emissions from agriculture are ~10% of total territorial greenhouse gas emissions (decreased over last ~30 years)
- UK livestock (cattle, pigs, poultry) = 6.0% of total territorial emissions **(2)**
- Two-thirds EU average of 9.1% for livestock **(3)**
- **Important to distinguish between local and global figures for environmental impact**

Transport was the largest emitting sector in the UK in 2019, responsible for over a quarter of emissions



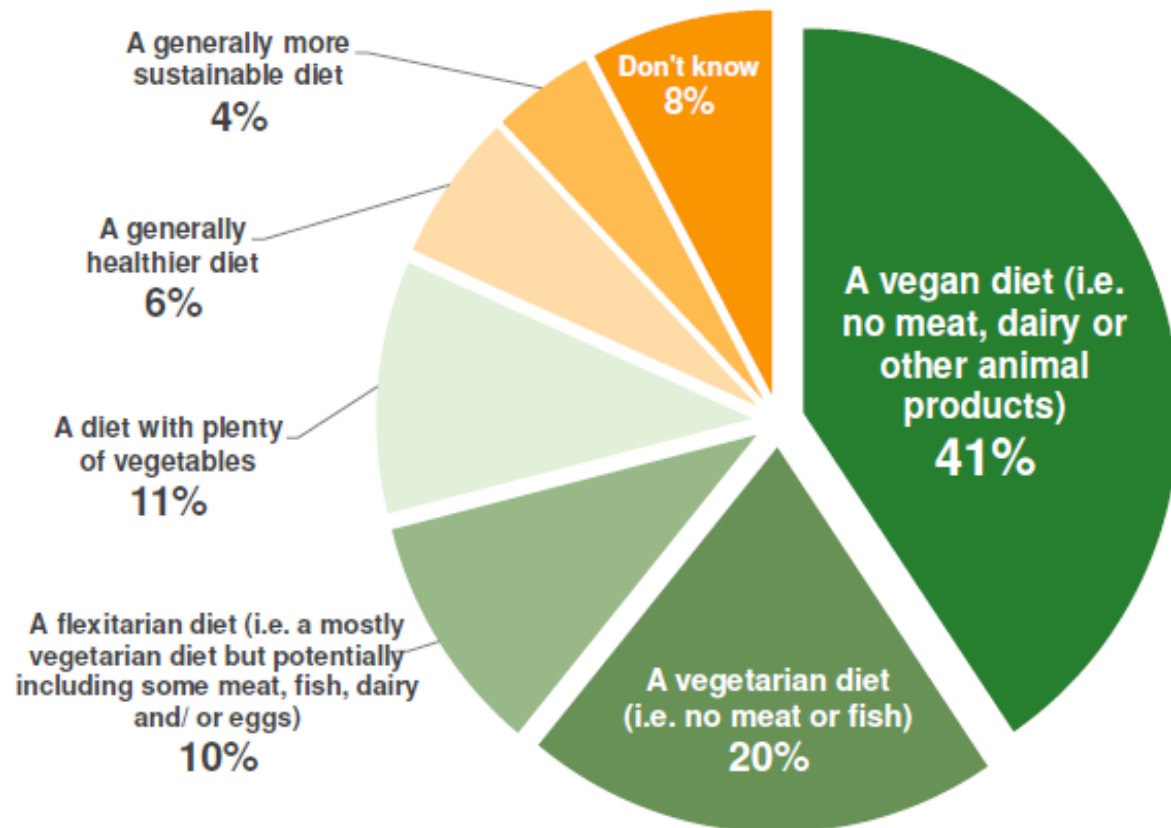
Energy supply delivered the largest reduction in emissions in the UK from 2018 to 2019, as power stations continued to reduce coal use



Sources: **(1)** Poore and Nemecek Science 360: 987-992. **(2)** UK Department for Business, Energy & Industrial Strategy 2020 - <https://www.gov.uk/government/statistics/final-uk-greenhouse-gas-emissions-national-statistics-1990-to-2018> **(3)** European Commission Joint Research Centre (2010). <https://op.europa.eu/en/publication-detail/-/publication/38abd8e0-9fe1-4870-81da-2455f9fd75ad>



What does the term 'plant-based diet' mean?



- 61% of respondents in total thought a 'plant-based diet' meant a vegan or vegetarian diet.
- 41% of respondents thought a 'plant-based diet' meant a vegan diet, 47% for females and 34% for males.
- 10% responded that a 'plant-based diet' is a flexitarian diet, this was 17% in the 18-24 years age group. Almost a quarter of full-time students (23%) responded with flexitarian, higher than any other 'working status'.

Source: BNF/YouGov survey (November 2020) of 2,018 adults from across Britain. Figures have been weighted and are representative of all GB adults (aged 18+)
<https://www.nutrition.org.uk/news/2020/majority-unlikely-to-go-plant-based-in-the-new-year-bnf-survey-reveals/>



Aims of the review

What does the recent scientific evidence suggest are the main features of a healthier and more sustainable diet?

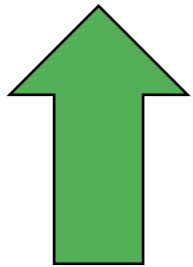
29 studies from high-income countries published within last 10 years

- Looked at **whole diets** and not just changes to specific food groups (e.g. meat and dairy)
- Studies included **at least one measure of environmental impact** as well as diet quality/nutrient content of diets
- Looked at a **range of approaches** to define a healthier and more sustainable diet
- What are the **synergies, differences and trade-offs?**



What are the features of a healthier and more sustainable diet?

In general, diets with more...



Vegetables
Wholegrains
Nuts
Plant-based meat alternatives (lower in salt/saturated fat)

Fruit
Beans and other pulses
Seeds

...are likely to...



greenhouse gas emissions and land use

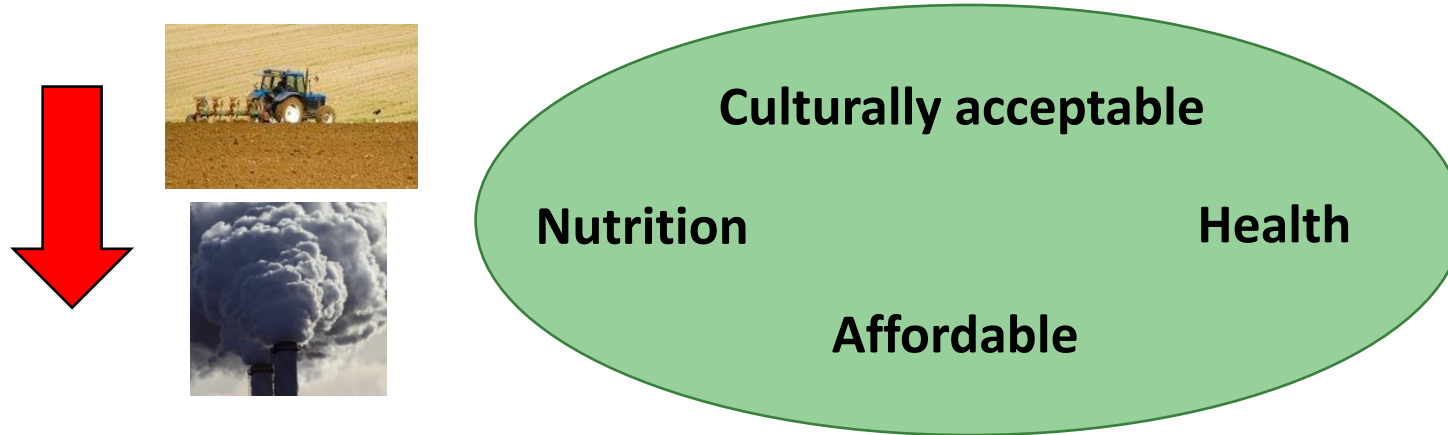


- **Moderate meat consumption can still have an important role in a healthier and more sustainable diet (e.g. providing essential nutrients such as iron)**
- **Dairy foods and eggs:** the suggested changes to intake in healthier and more sustainable diets were less consistent – might be due to high nutrient contribution of these foods relative to their environmental impact
- **Foods high in fat, salt and/or sugar and beverages (alcoholic/non-alcoholic)** made a substantial contribution to current dietary environmental footprints in some countries (e.g. the Netherlands and Australia) but are not included in many studies



How much can healthier diets improve environmental impact?

About 20% to 50% lower greenhouse gas emissions and land use



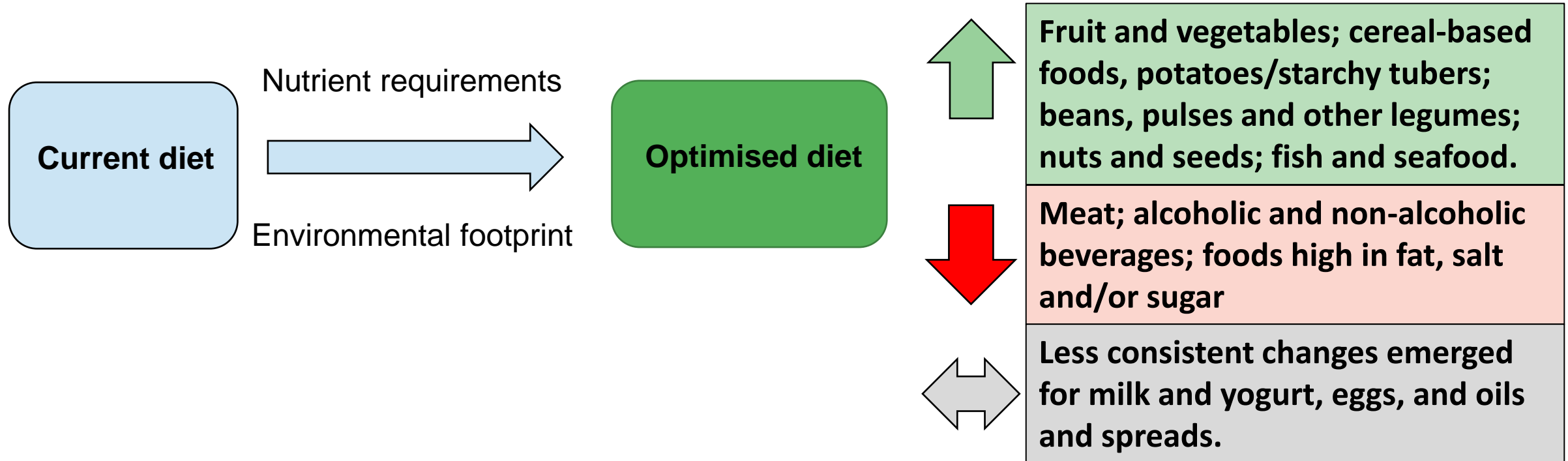
However...

- Lower water footprint may be more difficult to achieve through dietary changes alone
- Due to higher fruit, vegetables and nuts to meet recommendations?



Is it possible to ‘optimise’ our current diets?

- One approach considered in the review was dietary ‘optimisation’
- Optimisation is a modelling technique used to identify theoretical diets that meet nutritional recommendations, reduce environmental impact, while also minimising changes to the current diet needed to achieve this
- Across **52 scenarios** the general changes suggested were:



What about vegetarian and vegan diets?

- Could deliver large reductions in greenhouse gas emissions (e.g. up to 83% in one study) and less land use
- Potential health benefits



However...

- May slightly increase water footprint compared to current diets
- Unrealistic for many people – currently only 4% of people in the UK are vegetarian and 1% are vegan
- Could reduce intakes and/or ‘bioavailability’ (how well a nutrient is absorbed and used by the body) of some important nutrients, such as iron, zinc, iodine, vitamins A and B12
- Potential cause for concern for some groups with evidence of low nutrient intakes and/or status
- For example, almost 1 in 10 UK girls aged 11-18 years are thought to have iron deficiency and anaemia.



How can we eat a healthier and more sustainable diet?

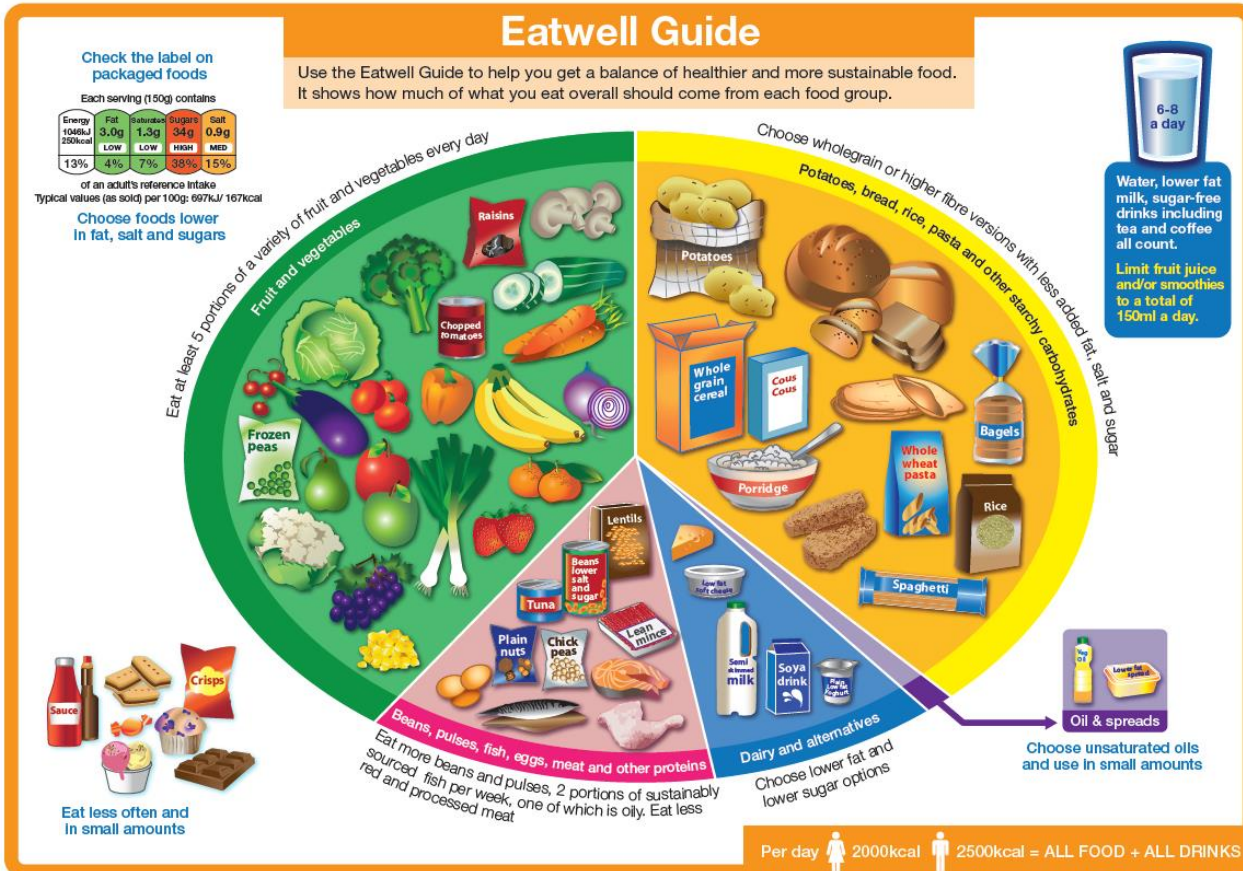
There is no 'one-size-fits-all' solution to such a complex problem...

...but there are some actions we can all take to benefit our own health and that of the planet

1. Follow the Eatwell Guide to eat a plant-rich diet with more fibre
2. Eat more fruit and vegetables
3. Diversify and shift the balance of protein foods in our diet to include more plant-based sources
4. Limit foods high in fat, salt and/or sugar
5. Choose sustainable sources of fish and seafood
6. Waste less food and drinks



1. Follow the Eatwell Guide to eat a plant-rich diet with more fibre



Source: Public Health England in association with the Welsh Government, Food Standards Scotland and the Food Standards Agency in Northern Ireland

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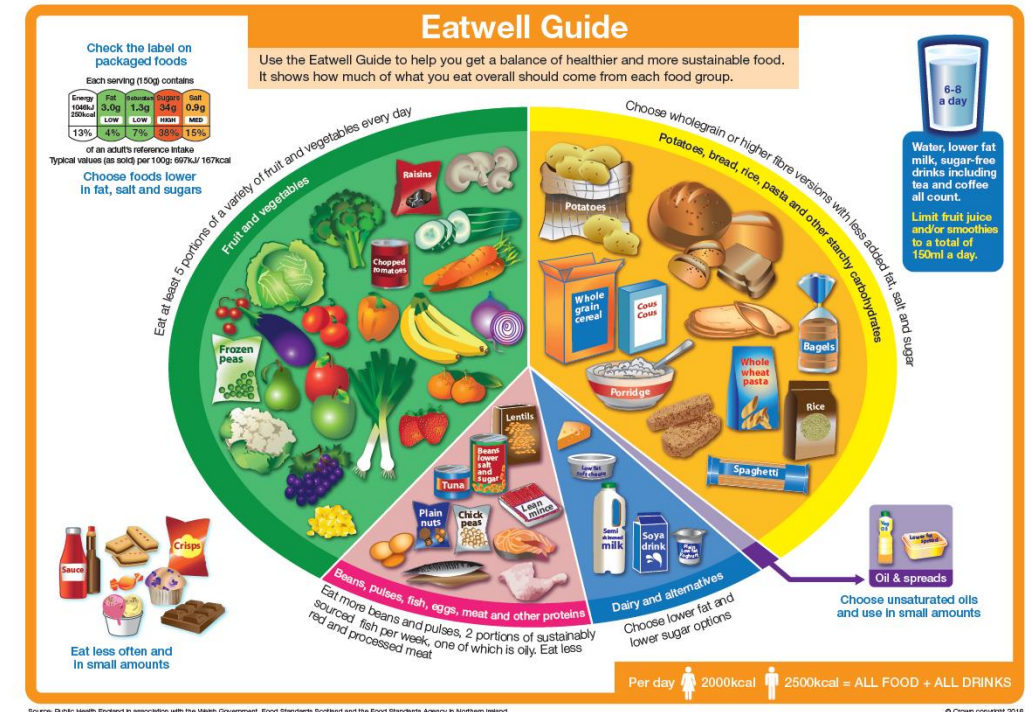
Following Eatwell Guide recommendations more closely would deliver environmental and health benefits for the UK: **(1)**

- **30% lower greenhouse gas emissions**
- **4% lower water use**
- **7% lower mortality risk**



1. Follow the Eatwell Guide to eat a plant-rich diet with more fibre

- Eating pattern familiar in the UK and includes nutrient-rich animal-derived foods in moderation
- About 30% of adults and children (over 5 years) already achieve at least 5 out of 9 recommendations but there is room for improvement (only 0.1% achieve all 9 recommendations) ⁽¹⁾
- More fruit, vegetables, wholegrains and higher-fibre starchy foods, beans and other pulses would increase fibre intakes
- Fewer than 1 in 5 children (4-10 years) and fewer than 1 in 10 adolescents (11-18 years) and adults currently meet the age-specific fibre recommendations ⁽²⁾

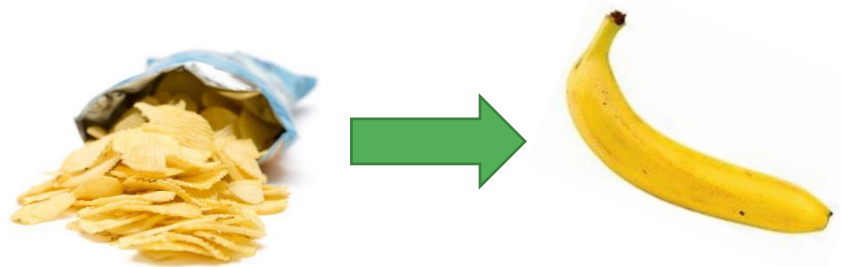


2. Eat more fruit and vegetables

- Source of essential vitamins, minerals and fibre
- **At least 5 portions a day** can reduce risk of heart disease, stroke and some cancers
- One portion = 80 grams (150 ml fruit/veg juice or smoothie is one portion maximum)
- Variety is important to provide different essential nutrients
- **Only a third** of UK adults and fewer than 1 in 8 adolescents (11-18 years) get their **5 A DAY** at the moment



Snack swaps



Add fresh, frozen or canned vegetables to recipes



Add fruit to breakfast cereal or porridge



3. Expand and shift the balance of protein foods in our diet to include more plant-based sources

- **Rebalance** in favour of more plant-based protein sources, including beans and other pulses, nuts, seeds, and plant-based meat alternatives (not high in saturated fat/salt), alongside some meat, fish, dairy products, and eggs
- **It's not just about protein** – need to think about overall nutrient composition of plant-based alternatives, including essential nutrients typically provided by animal-based foods in a readily absorbed form (iron, zinc, calcium, iodine, vitamin B12).
- Beans and other pulses, nuts, and seeds can also provide dietary fibre



Add canned beans or chickpeas to dishes



Have a small handful of nuts or seeds as a snack

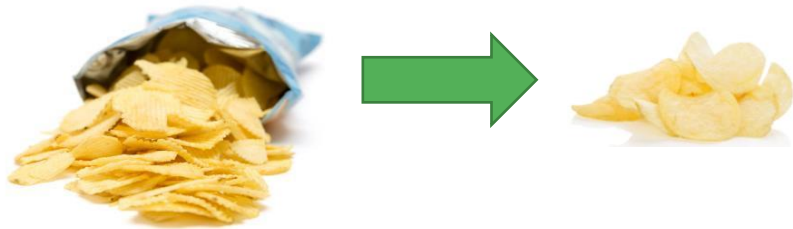


4. Limit foods high in fat, salt and/or sugar

- We all know foods such as cakes, biscuits, pies and pastries are not the healthiest choices
- These foods can also contribute to the greenhouse gases, land and water use associated with our diets



Be portion wise



Place a smaller amount of crisps in a bowl or buy smaller multi-packs

Plan ahead with healthier snack options



Lower-sugar wholewheat cereal and milk or fortified milk alternative

Wholemeal toast and peanut butter



Fat free, no added sugar yogurt and berries

5. Choose sustainable sources of fish and seafood

- Fish provides a good source of protein, vitamins and minerals, and long-chain omega-3 fats (EPA and DHA) that may benefit heart health
- Government recommends at least two 140g portions of fish a week, at least one should be an oily fish (e.g. mackerel, sardines, salmon)
- However, a third of global fish stocks are considered ‘overfished’
- Need to find out more information about where seafood comes from and choose more sustainable options

Experiment with a wider seafood variety outside the ‘Big 5’ (cod, haddock, tuna, salmon, prawns)

Look out for eco-labels



Use the Good Fish Guide

Cod



Levels of cod in UK waters are low

Good choice

Cod from Iceland

Swap it for...



European hake



6. Waste less food and drinks

- FAO estimates about of a third food is lost (in supply chain) or wasted globally ⁽¹⁾
- Responsible for up to 10% of overall GHG emissions according to IPCC
- UK has made good progress in reducing food waste in recent years (see opposite)
- However, less than a third of UK adults recognise link between food waste and climate change ⁽²⁾
- **WRAP first Food Waste Action Week in 2021**



<https://www.wrap.org.uk/content/courtauld-commitment-2025-milestone-progress-report>

Sources: ⁽¹⁾ FAO, 2011 estimate <https://www.fao.org/food-loss-and-food-waste/flw-data> ⁽²⁾ WRAP Food Waste Trends Survey 2019 - <https://wrap.org.uk/resources/report/food-waste-trends-survey-2019>

**Use information on food labels
(e.g. best before, how to store)**



Plan meals before shopping



Set your fridge correctly (0-5°C)



Key messages

1. Healthier and more sustainable diets need to consider a range of factors including environmental impact and nutrition, but also health, cost, acceptability and others
2. More sustainable dietary patterns contain more plant-based foods, but can also include moderate amounts of meat, milk, fish and eggs
3. Vegetarian and vegan diets may have large environmental benefits, but could compromise intakes of some important essential nutrients typically provided by animal-derived foods (e.g. iron, zinc, iodine)
4. The Eatwell Guide provides a familiar plant-rich dietary pattern that is higher in fibre
5. Following the Eatwell Guide more closely can deliver health and environmental benefits, but only about 30% of people (aged 5+ years) meet at least 5 out of 9 recommendations at the moment
6. We need to find ways to **increase our intake of fruit, vegetables, sustainably sourced fish and plant-based protein sources**, while **limiting less healthy foods high in fat, salt and/or sugar, and reducing the amount of food and drinks we waste**



Thank you!

- Visit www.nutrition.org.uk for more information on healthier and more sustainable diets

Healthy living: Healthier and more sustainable diets

How can we all eat a diet that is healthy, affordable and accessible for everyone, and also has a lower impact on the environment? How can we produce more food to feed a growing population at the same time as using fewer resources, such as land and water, and energy? These are some of the issues discussed in this article, which provides information on what is meant by a healthy and sustainable diet and includes some tips on how we can make more sustainable food and drink choices.

How does the food we eat affect the environment?

The balance of foods that we consume is not only important for our own health, but also the health of our planet. At present, one in five deaths worldwide are linked to consuming a poor quality diet. Food production also has a big impact on the environment. At present, our global food system is responsible for:

- Between a fifth to one-third of all greenhouse gases (e.g. methane and carbon dioxide) released by human activities, which contribute to climate change
- Over two-thirds of global freshwater use
- Over a third of global land area



- Register via our website for our Annual Day conference on 23 November ***“HEALTHIER PEOPLE ON A HEALTHIER PLANET – the perfect outcome of a transformed food system”***

Healthier and more sustainable diets: What changes are needed in high-income countries? is available open access on the Nutrition Bulletin website <https://doi.org/10.1111/nbu.12518>

