

Eating more sustainably

Fact sheet

In this fact sheet, you can learn more about sustainable food, an issue that's becoming increasingly important worldwide. That's because the food we eat has a major impact on the environment. Food production, for example, releases greenhouse gases and other substances, such as pesticides and ammonia, and uses up essential raw materials such as water, nitrogen and phosphates. This issue necessitates a change in our eating habits and in the way our food is produced.

The Netherlands Nutrition Centre gives consumers practical advice on how to eat in a more sustainable way. This fact sheet is designed to provide background information on this advice. Together with healthy and safe food, eating more sustainably is one of the three core themes on which the Nutrition Centre provides guidance. The Nutrition Centre bases its advice in this field on the recommendations of the Health Council of the Netherlands, among others, and has translated these recommendations into the Wheel of Five.

A diet based on the Wheel of Five can be good for your health as well as beneficial in terms of sustainability. Sustainable choices can be made within each of the five segments of the Wheel of Five, which is good for sustainability. Consider eating less meat, or no meat at all, and choosing seasonal products more often. Sustainable choices can also be made from foods that are not part of the Wheel of Five.¹

Generally speaking, the greatest environmental benefit can be achieved by:

- wasting less food;
- eating less meat and more sources of plant-based proteins, such as pulses and nuts;
- only eating what you need;
- replacing alcohol, fruit juices and soft drinks with tap water, tea and/or coffee.

This advice is in line with previous guidance from the Health Council on a sustainable, healthy diet.^{2,3}



In this fact sheet, we explore the issues around eating more sustainably, the impact it has, potential solutions and the vision of the Nutrition Centre for the future. We look at how you can eat more sustainably, both based on the Wheel of Five and otherwise, and the tools you can use to help you.

Who is it relevant to?

This fact sheet is relevant to professionals and policymakers who work in the field of healthy, sustainable food.

What are the current issues? Why eat more sustainably?

Food production is directly linked to sustainability factors such as land use, water use, depletion of resources, loss of biodiversity and greenhouse gas emissions.^{4,5} Food production also consumes large quantities of raw materials.⁶ In the Netherlands, food is responsible for 20-35% of the total greenhouse gas emissions caused by consumption.⁷⁻⁹ Half of these emissions come from livestock production.¹⁰ Worldwide, livestock production is responsible for around 14.5% of all greenhouse gas emissions, 80% of agricultural land use and 50% of agricultural water consumption, among other impacts.^{11,12} In the current food system, raw materials and resources are not being used as efficiently as they could be in the production and consumption of food.⁶

Global impact of food on the environment

Worldwide, the production and consumption of food is responsible for:

- 33% of soil degradation.
- overfishing of 29% of fish stocks.
- 60% of biodiversity loss on land.
- 80-85% of the fertilisers (nitrogen and phosphates) lost in the chain, which end up in the sea and result in a loss of marine biodiversity.
- 21-28% of greenhouse gas emissions.
- 70-80% of freshwater use.
- 80% of deforestation.
- 20% of all fossil fuel use.
- 38% of land use: 12% for agriculture.
- 26% (pasture land) for livestock production.^{5, 13-16}

Current diet is not yet sustainable

The current Dutch diet is not sustainable. The food we eat makes an impact on the environment in a number of different ways: we waste a huge amount of food, we consume a high proportion of animal products, we consume more energy (kcal) than is recommended and few of us choose to eat in a sustainable, healthy way.^{17,18} We can change this diet by throwing less food away (see our fact sheet on Food Waste), eating less, and choosing more sustainable (see this fact sheet) and healthier foods. We have to make this change as a matter of urgency, because for many environmental factors (loss of biodiversity, disruption of the nitrogen and phosphorus cycles, climate change, changes in land use), the planet's environmental boundaries have already been exceeded or are in the critical zone (see Figure).¹⁹ The environmental footprint of the average Dutch diet (1.6 global hectare) is almost twice as large as the area that is available on the planet for food production per person (0.9 global hectare).²⁰ As the world's population is growing rapidly, the demand for food up to 2050 will increase by around 60%, which will put even more pressure on the environment.²¹ In addition, climate change may jeopardise food production.

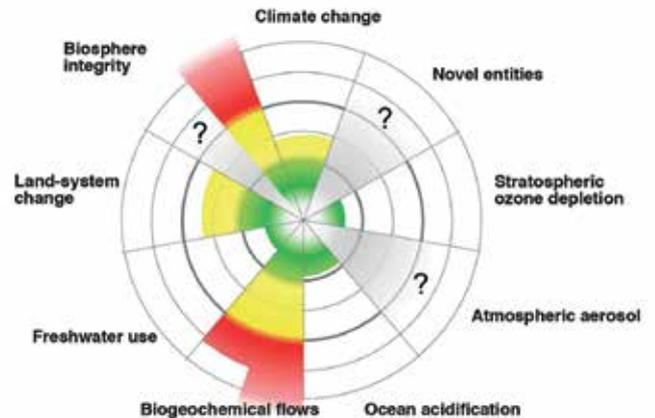


Figure 1: In the case of five environmental factors (loss of biodiversity, nitrogen cycle, phosphorus cycle, climate change, changes in land use), the planet's environmental boundaries have already been exceeded (red) or are in the critical zone (yellow).¹⁹

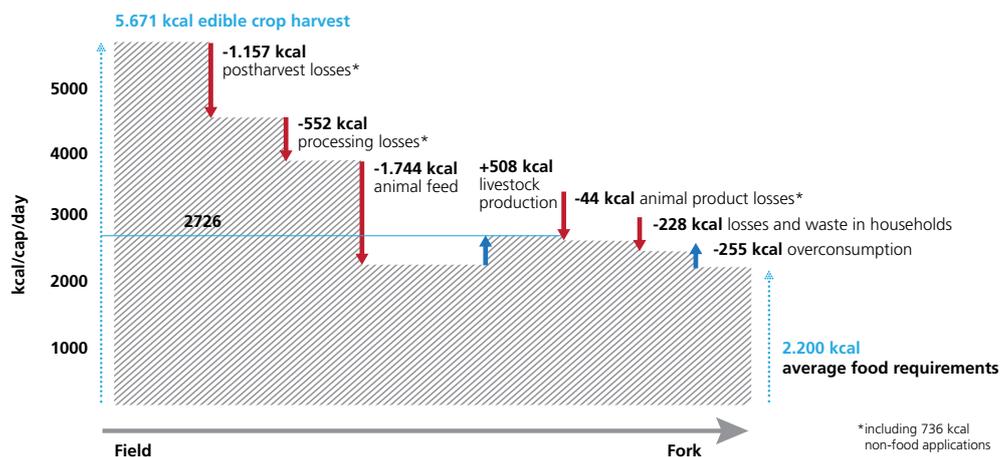


Figure 2: Loss of available calories per person in the chain between harvest and the consumer (from field to fork). Of the 5,671 kcal available globally, ultimately only 2,455 kcal is consumed (adapted from ²²).

Impact of the food chain

On paper, there is sufficient food available to feed the current global population.²² Figure 2 shows what happens to the available food in the food chain, expressed in terms of kilocalories.^{22, 23}

1. Food is wasted throughout the chain, from field to fork. Globally, more than half of the food we produce disappears from the chain.
2. A lot of food that could be eaten by humans is used to feed animals. Only a small proportion of it is converted into meat and dairy products.

What's more, the food that is ultimately available is not fairly distributed. Some people are starving, while others are obese.^{17, 24} In addition, food production consumes large amounts of fossil energy.²⁵

Solutions to combat waste and promote sustainable food are therefore needed throughout the chain: from field to fork. Three quarters of the environmental impact occurs in the production chain. About a quarter of the environmental impact is caused at the household level.⁷ If we are to shift towards a more circular food system (i.e. to use and reuse raw materials in the best possible way), we have to do three things:

- optimise the management and use of resources such as soil, water, biodiversity and minerals (nitrogen and phosphorus);
- stop wasting food;
- promote the utilisation of waste.⁶

What is the definition of eating more sustainably?

Sustainability is a broad concept, so it's important to explain which definitions we use and how we measure sustainability. The term 'sustainability' was coined by the UN's Brundtland Report from 1987. From this report, the Food and Agriculture Organization FAO has derived a helpful definition of sustainability in terms of 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.²⁸

The Dutch government reflects this definition in its policy:

The government is working on a comprehensive food policy based on public health, environmental sustainability and resilience, which will ensure that sufficient, safe, healthy and sustainably produced food is available in the long term to a rapidly growing global population. In this context, consumers should be encouraged to eat more healthily and more sustainably.²⁹

Guaranteeing an adequate supply of food in the long term is known as 'food security'. When measuring sustainable consumption, the Dutch government takes into account not only the environmental impact but also such production and processing that is subject to environmental, animal welfare and/or social requirements which exceed legal obligations.³⁰

Underconsumption vs Overconsumption

A sustainable food supply involves ensuring that there will be sufficient, safe and healthy food for each and every person globally in the long term.²⁶ Currently however, 868 million people worldwide are going hungry and around 2 billion more are lacking in micronutrients. At the same time, 1.4 billion people worldwide are overweight or obese.²⁷

Objectives for food, climate and agriculture

- Through its Food Agenda, the government is working, among other things, towards a more environmentally sustainable food system. This system stipulates that the quality of soil, water and air is protected, biodiversity is maintained and, at the same time, emissions of greenhouse gas are reduced. Food must be produced with a minimum of greenhouse gas emissions and as few pesticides and antibiotics as possible.
- Under the Paris climate agreement, an arrangement was made to keep global warming below 2 °C. The EU, and as a result the Dutch government, has set a target of reducing greenhouse gas emissions in agriculture by 36% in 2030 as compared with 2005, in order to prevent further global warming.³¹
- Through its 'Government-wide programme for a circular economy', in which food is a priority, the government aims to achieve a circular economy by 2050. The interim objective is to reduce the use of primary raw materials (minerals, fossil sources and metals) by 50% by 2030.

If these targets are to be achieved, a change in diet will be required.³²

How do you measure sustainability?

The environmental impact of diets can be measured using a number of different indicators. The choice of indicator depends on the level you are looking at. You can look at individual or national diets, for example, or at the product level. The most studied and most commonly used indicators at the national level are the ecological footprint, carbon footprint, water footprint and energy footprint.³³ The Netherlands Nutrition Centre uses the ecological footprint as a metric for individual diet when communicating with consumers (Food footprint tool 'Voedselafdruk'). At the product level, the Nutrition Centre uses life cycle analysis indicators such as greenhouse gas emissions.

Life cycle assessment

A life cycle assessment (LCA) can be used to calculate various indicators of environmental impact at the product level, including:

1. Climate change*
2. Ozone depletion
3. Acidification*
4. Eutrophication*
5. Toxicity
6. Particulate matter
7. Ionising radiation
8. Land use (and land use change)*
9. Freshwater use*
10. Depletion of mineral resources
11. Fossil fuel depletion

An LCA calculates the environmental impact of a product for each stage in the chain (from raw material to waste). The key indicators (as indicated by an *) were identified in an expert workshop run by the National Institute for Public health and the Environment (RIVM), while soil degradation was added to these indicators. When calculating the environmental impact of diets, the following indicators are often used: greenhouse gas emissions, land use, energy consumption and water consumption. Greenhouse gas emissions are far and away the most commonly used indicator.³⁴ Since there is a strong correlation between greenhouse gas emissions and other indicators, this figure can be used as a representative indicator.^{35, 36} At the product level, the Nutrition Centre therefore mainly uses the greenhouse gas emissions indicator.



Ecological footprint

The Global Footprint Network's ecological footprint demonstrates the environmental impact of diets.³⁷ It appears to be an effective indicator for monitoring the effectiveness of policy³⁸ and for raising awareness among consumers.³⁹ When calculating the food footprint, account is taken of the amount of land that is required for food production and for offsetting the CO₂ emissions. This calculation can be compared with the maximum production capacity or biocapacity of the land.³⁷ There is currently a debate on how to make this method more accurate and how it relates to other indicators.⁴⁰

Product level: greatest impact comes from animal products

In the Dutch diet, meat is responsible for easily the largest proportion of greenhouse gas emissions (see Table 1)⁴¹ and land use.¹⁸ For men (19-30 years), the largest contribution comes from red meat, milk and dairy products, non-alcoholic drinks, alcoholic drinks and cheese. For women (19-30 years) as well, red meat, milk and dairy products, non-alcoholic drinks and cheese make the largest contribution to greenhouse gases. Together, all animal product groups are responsible for almost 60% of greenhouse gas emissions.¹

Product group	Men (19-30 years)	Women (19-30 years)
Red meat	31%	29%
Milk/dairy products	12%	13%
Drinks (non-alcoholic)	7%	14%
Drinks (alcoholic)	6%	1%
Cheese	6%	7%
White meat	5%	7%

Table 1: contribution of products to the total greenhouse gas emissions of the Dutch diet, in terms of percentage.¹

Solutions

Eating less meat and more plant-based foods, and replacing alcoholic and sugary drinks with water, tea and coffee, would reduce greenhouse gas emissions by 15-35%.^{35, 42} Consumers can also opt for a more sustainable diet by selecting more sustainable products within food groups (e.g. vegetables). The type of meat, vegetables, cheese, fruit, fish and nuts selected is particularly important in this context. The effects within most product groups are not huge in absolute terms but, when taken together, they can significantly reduce greenhouse gas emissions.¹ Ultimately, the overall diet of consumers determines how sustainably they eat.

Diet: sustainable diet based on the Wheel of Five

Many Dutch people have a diet that results in high greenhouse gas emissions. Generally speaking, they consume a lot of saturated fat, alcohol and animal protein but little dietary fibre and plant-based protein and few carbohydrate.⁴¹ The environmental impact of current consumption, expressed in terms of greenhouse gas emissions, is higher for men than for women. This is partly due to a higher consumption of energy, meat and alcoholic drinks.

Greater health benefits, lower environmental impact

A diet based on the Wheel of Five rather than the current diet could result in health benefits for all. For men (19-50 years), such a diet would also result in a reduced environmental impact (by 13%). For women, the environmental impact would remain roughly the same.¹ Those who make more sustainable choices within the Wheel of Five can achieve even greater environmental benefits.

Effects of making more sustainable choices within the Wheel of Five include the following:

- If you eat 400 grams of meat a week rather than the recommended maximum of 500 grams, this would result in a reduction in greenhouse gas emissions of 9% (for men) and 10% (for women).
- If you stop eating meat and replace it with pulses, nuts and eggs, this would result in a reduction in greenhouse gas emissions of 35% (for men) and 37% (for women).
- If you choose from all categories the products with the lowest environmental impact, such as chicken, mackerel and fresh cheeses, this would result in a reduction in greenhouse gas emissions of 30% (for men) and 34% (for women).
- If you choose the most sustainable products in all categories and stop eating meat, this would result in a reduction in greenhouse gas emissions of 47% (for men) and 49% (for women).

People who eat in accordance with the Wheel of Five Guidelines also consume less energy from products that are not part of the Wheel of Five. Consuming fewer non-Wheel of Five products than the norm, e.g. cakes and biscuits, sweets and snacks (on average 12% of the environmental impact) will reduce the impact on the environment. Consumers can also reduce their environmental impact by making daily or weekly choices that emit fewer greenhouse gases.¹ Your diet will also be more sustainable if you eat fewer processed products. That's because processing also generates non-circular residues and waste, resulting in the loss of valuable nutrients.⁶



No meat at all?

People who eat less meat and fewer dairy products have a lower impact on the environment. However, not all diets that excludes all meat or dairy products are optimally sustainable. A diet that includes a small amount of meat (around once a week) requires less agricultural land, for example, than a totally meat-free diet.⁴³ This is because animals can convert some plant-based substances which are inedible to humans into edible proteins. Pigs, for example, can be fed waste from the food industry, such as sugar beet pulp, potato peelings and molasses (soya not included).⁴⁴ In addition, some Dutch agricultural land is better suited to use as pasture land than it is to growing crops or to horticulture. Around a sixth of Dutch dairy cattle graze on such peat bog pastures. A part of Dutch beef comes from slaughtered cows that no longer produce milk. As a result, a small amount of meat is available anyway. However, this amount is far lower than current consumption.^{44, 45}

More sustainable choices and nutrients

Generally speaking, people who make the most sustainable choices within the product groups of the Wheel of Five also consume sufficient nutrients. Consumers can check this requirement at the individual level by completing the Nutrition Centre's Diet Diary (Eetmeter).¹

Labelling: how do you make sustainability obvious?

The Nutrition Centre advises consumers on how to eat more sustainably. The sustainability of our food can be indicated in various ways. Producers, for example, include labels on their products. Certifications for food can help people to make more sustainable choices within a particular product group. At the product level, we look at the impact of food production on the environment (environment); the impact of the way animals are kept on animal welfare (animal); and the impact of the production method on working conditions (people). Reliable, independent certifications are available for this purpose. The Nutrition Centre bases its advice on the criteria of the environmental organisation Milieu Centraal⁴⁶ and advises consumers to look out for the following certifications:

- For people and the environment: Fairtrade, UTZ Certified and Rainforest Alliance.
- For animal welfare: Biologisch (Organic), Beter Leven, EKO, Demeter and Milieukeur.
- For nature and the environment: ASC (Aquaculture Stewardship Council), MSC (Marine Stewardship Council), Biologisch (Organic), EKO, Demeter, Milieukeur and RSPO Certified Sustainable Palm Oil.



The majority of the requirements in terms of people, animals and the environment under sustainability certifications are not incompatible with the environmental impact. There may, however, be a conflict of interest between animal welfare and environmental impact.⁴⁷ This dilemma applies to animal products only. Choosing organic products can also increase the environmental impact for certain environmental factors.⁴⁸⁻⁵⁰ Some animals and plants have a longer life span and grow more slowly, while some organic production has a lower yield per hectare, which means that more land is required. On the other hand, organic farming scores better on environmental factors such as energy use, soil quality and biodiversity.⁵¹

There are two recommendations for overcoming this dilemma:

1. For producers and suppliers: Make a specific level of animal welfare a prerequisite, e.g. 'Beter Leven (Better living) 1 or 2 stars'. Products with a lower environmental impact can then be developed within these limitations.⁵²
2. For consumers: Opt for a less animal-based and more plant-based diet. This will automatically reduce your environmental impact. The leeway you create as a result can be filled in part by products with a certification for sustainability. This is known as the 'less is more' principle. For example, you eat less meat but the meat you do eat has a certification for animal welfare.

Seven rules for a more sustainable diet

The findings in this fact sheet can be presented to the consumer in the form of seven simple rules.

1. Waste as little food as possible by buying and cooking only what you need.
2. Eat less red and processed meat. Instead, eat pulses, unsalted nuts and fish from sustainable sources.
3. Limit your intake of dairy products to no more than the recommended quantity.
4. Don't overeat. In particular, avoid eating products that are not a part of the Wheel of Five, such as snacks.
5. Drink as few sugary drinks and as little alcohol as possible; choose tap water, tea and/or coffee instead.
6. Eat plenty of wholegrain products, fruit and vegetables.
7. Choose environmentally friendly varieties of fruit and vegetables by checking the origin and season of the products.

Many of these more sustainable choices are also healthier choices.

Future outlook

If consumers are to select what they eat in a well-informed way, they need reliable information. Not all production processes and chains are sufficiently transparent to enable people to make a carefully considered choice. It is therefore important that certifications are further refined. If reliable information on the environmental impact of food products is to be obtained, we need databases that contain sufficient environmental data on products and a consensus on the use and selection of indicators.

Tools for sustainable food choices

The Nutrition Centre developed the following tools in particular to enable people to make more sustainable choices: the Food Footprint, animal welfare tables, sustainability information in recipes and certification information in the encyclopaedia.

The Nutrition Centre also uses the following useful tools produced by other organisations: the VIS-wijzer (Fish checklist, Stichting De Noordzee MWWF), the Fruits & Vegetable Calendar (Groente- en Fruitkalender, Milieu Centraal) and the 'keurmerken-wijzer' (sustainability certification checklist, Milieu Centraal).

When it comes to informing consumers, it is important that the themes of health, safety and sustainability are more closely integrated. Where there is synergy between them, a uniform message must be presented. The new Wheel of Five and the Health Council's guidelines are a good example of this synergy. If consumers are to be encouraged to eat a less animal-based and more plant-based diet based on these guidelines, and the consumption of foodstuffs such as fruit, pulses and nuts is to be increased, a better understanding of people's behaviour will be required. The Nutrition Centre uses a number of different tools to promote sustainability. In future, we want to incorporate the integrated message of sustainable, healthy and safe food in all our tools.

The Nutrition Centre is keen to act as an authority on sustainable eating for consumers, particularly since food security is further decreasing worldwide and the achievement of environmental targets is becoming increasingly urgent. The challenge is to make sufficient, healthy and safe food accessible, affordable and available to all.⁵³

The issue of food waste is discussed in the fact sheet Food Waste by Consumers. Additional information can be found in the following fact sheets: Food Poisoning & Hygiene, Wheel of Five and Pesticides.

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