

# Land, water and bees – don't take us for granted:

## More to explore – Land and water

### Background notes

#### The water you use

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All living things on Earth need water to grow and survive. The cells that make up the bodies of animals and plants need it for vital chemical reactions to take place and whole organisms need it for activities such as keeping clean and cool.

The human body is about two-thirds water. We cannot survive for more than a few days without it, as it is needed for many metabolic processes. The European Food Safety Authority (EFSA) recommends that men drink 2.5 litres a day and women 2 litres a day.

In the UK we have access to plentiful clean water that is safe for drinking. This is called potable water. It has been filtered and treated with safe chemicals to make it acceptable for us to drink.

The Waterwise website has lots of information on saving water: [www.waterwise.org.uk/pages/indoors.html](http://www.waterwise.org.uk/pages/indoors.html)

#### Diet and weight

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You probably know that the World Health Organisation takes action about the health of some groups of people in the developing world who are malnourished as a result of poverty. But the WHO has also expressed concern about the health of young people in the developed world. For example, the WHO has started a campaign to ban smoking in films, because their scientists think that these images can encourage young people to smoke. They are also seriously concerned about weight issues in young people.

The causes of overweight:

- high-fat and high-sugar foods (sugar and fat may be 'hidden' in 'junk' and convenience foods)
- sugary fizzy drinks and fruit drinks
- lack of exercise in daily life
- lack of participation in sports (replaced by sedentary activities such as playing computer games)

The problems related to overweight:

- diabetes
- joint problems and arthritis
- social isolation or bullying
- heart disease
- increased incidence of cancer.

#### Body mass index

In the UK we have a national child measuring programme in which around a million schoolchildren have their height and weight measured each year. In 2014–15 the programme found that 19.1 % of children aged 10–11 are obese and 14.2 % are overweight.



A quick definition of overweight and obesity is given by the body mass index (BMI). Measure the person's height in metres and their mass in kilograms and use the following formula to work out their BMI:

$$\text{BMI} = \text{mass}/(\text{height} \times \text{height})$$

For adults, BMI values are:

- < 18.5: underweight
- 18.5–24.9: ideal
- 25–29.9 overweight
- 30–39.9 obese
- 40+ severely obese.

Optimal BMI ranges for children vary depending on their age.

Elite athletes, who have an unusually high proportion of dense muscle tissue, sometimes appear overweight or obese when judged solely by BMI, so it should be used only as an approximate indicator.

Waist measurements are also used to indicate excess fat: adult men with waist measurements of 94 cm+ and women with 80 cm+ are more likely to develop obesity-related health problems.

## Fat – not all bad

Fats are essential for good health. They aid in energy production, cell building, oxygen transport, blood clotting and the production of some hormones. The healthiest fats are those supplied by plants in our diet.

Different dietary fats have different chemical structures, which affect their behaviour. You have probably heard the terms saturated, polyunsaturated, and monounsaturated. Our bodies can produce both monounsaturated and saturated fats. Polyunsaturated fats, or essential fatty acids, cannot be produced in the body and must come from the diet.

- Fat is mostly stored in the body's adipose (fat) cells but is also found in blood plasma and other body cells.
- Fat insulates your body, cushions vital organs, and can be converted into energy.
- Fat is used to build new cells and is critical for normal brain development and nerve function.
- Fat is needed to carry and help absorb fat-soluble vitamins, such as vitamins A, D, E, and K, and carotenoids.

## Further reading on all topics

Tim Benton, University of Leeds, global food security: [www.foodsecurity.ac.uk](http://www.foodsecurity.ac.uk)

Wellcome Trust *Big Picture*: [bigpictureeducation.com/eating-animals-meaty-problem](http://bigpictureeducation.com/eating-animals-meaty-problem)

Wellcome Trust *Big Picture*: [bigpictureeducation.com/health-and-climate-change](http://bigpictureeducation.com/health-and-climate-change)

Download the *Big Picture* on Health and Climate Change at:

[bigpictureeducation.com/sites/default/files/bp\\_files/health%20and%20climate%20change/wtdv026026~1.pdf](http://bigpictureeducation.com/sites/default/files/bp_files/health%20and%20climate%20change/wtdv026026~1.pdf)

Wellcome Trust *Big Picture* on Food and Diet: [bigpictureeducation.com/food](http://bigpictureeducation.com/food)

Download the *Big Picture* on Food and Diet at:

[bigpictureeducation.com/sites/default/files/bp\\_files/food%20and%20diet/wtdv031680~2.pdf](http://bigpictureeducation.com/sites/default/files/bp_files/food%20and%20diet/wtdv031680~2.pdf)

Running totals of population, water use, CO<sub>2</sub> emissions, ...: [www.worldometers.info/](http://www.worldometers.info/)

Agricultural technologies – low & high tech solutions are important: [futurefood2050.com/futurist-ramez-naam-forecasts-mix-of-high-low-tech-ag-solutions/](http://futurefood2050.com/futurist-ramez-naam-forecasts-mix-of-high-low-tech-ag-solutions/)

Farming and countryside education: [www.face-online.org.uk/](http://www.face-online.org.uk/)



future food: [futurefood2050.com/](http://futurefood2050.com/)

Water security research at the University of East Anglia: [www.uea.ac.uk/watersecurity](http://www.uea.ac.uk/watersecurity)

United Nations water and food security: [www.unwater.org/topics/water-and-food/en/](http://www.unwater.org/topics/water-and-food/en/)