



Course Companion

for WJEC GCSE Food and Nutrition:
Diet and Good Health

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Teacher's Introduction

This resource is designed to meet the Area 3: Diet and Good Health element of the WJEC GCSE Food Preparation and Nutrition qualification.

What it covers

The resource comprises three chapters covering the following:

Chapter 1: Diet and good health
<ul style="list-style-type: none">• Energy requirements of individuals• How to plan a balanced diet• The relationship between diet and health

How to use this resource

The resource covers all aspects of the Area 3: Diet and good health element, and is designed to increase knowledge of the topic and enable learners to test their understanding and skills through a variety of assessment methods.

Learning outcomes enable the learner to clearly see what they are expected to know at the end of each chapter.

The **Overview** provides a brief summary of what will be covered in the chapter and the **Key Terms** box provides information on key terms within the resource (key terms are emboldened within the chapter text).

Did you know	These boxes contain handy tips
Things to think about	These boxes provide learners with a chance to develop cognitive skills, do some research (books, Internet, people) and take part in a discussion
Apply	These boxes provide the learner with the opportunity to further their skills, either through cognitive or practical application
Qs	Test learners' knowledge and understanding through quick Y/N questions
Skills	Based on the 'suggested application of skills' section of the WJEC GCSE Food Preparation specification, these questions test learners' skills in food safety through practical application
Exam tip	Useful tips to help the learner concentrate on important aspects that may appear in the final assessment
Check your understanding	Multiple-choice, short-answer and extended-answer questions appear at the end of each section to test knowledge and develop understanding.
Answers	Answers to questions are provided at the end of the resource

M Golebiowska, March 2018

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* resulting from minor specification changes, suggestions from teachers and peer reviews, or occasional errors reported by customers

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Diet and good health

Overview

This chapter will help you understand what dietary guidelines are and what they are used for. You will learn how to assess people's nutritional needs and adjust meals to them. You will also discover how much energy a person needs and how to plan and modify recipes to meet those needs. Here you will also find information on how food affects human health.

Learning outcomes

After studying this chapter, you should be able to

- ☐ understand current guidelines for a healthy diet
- ☐ adjust meals and recipes to the needs of different people
- ☐ plan a balanced meal or modify recipes for special diets
- ☐ know what BMR is and what it is used for
- ☐ understand the relationship between diet, nutrition and health
- ☐ identify the main diet-related health conditions
- ☐ carry out nutritional analysis
- ☐ plan and adjust diets to specific diet-dependent health conditions

Key Terms

Atherosclerosis	A condition in which cholesterol and calcium accumulate in the walls of the blood vessels, causing them to stiffen and narrow.
BMI	Body mass index; a tool to assess whether body weight is healthy for a given person
BMR	Basal metabolic rate; the amount of energy needed to maintain basic functions such as heartbeat, breathing and maintaining body temperature
Coeliac disease	A serious, genetic condition caused by intolerance of gluten, a protein found in wheat, rye, barley and sometimes oats. It damages the intestines and impairing absorption of nutrients.
Coronary heart disease	A condition in which cholesterol plaque builds up inside the arteries that supply the heart with blood.
Family budget	The amount of money a family has to manage over a specific period of time, e.g. a week or month
Gluten	A protein found in wheat, rye, barley and sometimes oats. It is a major component of many grains.
Growth spurt	The process of active, rapid height increase in children and teenagers.
Hypertension	The condition usually caused by excess of sodium, leading to high blood pressure exceeding 140/90 mm Hg
Iron deficiency anaemia	The condition which is the effect of low iron intake leading to a low blood cell count / low haemoglobin levels in the blood
Lactose	A disaccharide found in milk, built of one glucose and one galactose molecule
Lactose intolerance	A condition in which milk sugar cannot be digested properly, leading to bloating, and diarrhoea; can be caused by genetic factors or acquired during life (most often)
Menstruation	The process of an adult female's monthly bleeding
Obesity	A condition in which BMI is greater than 30.0, often associated with many other health conditions
Osteoporosis	Brittle bone disease; a condition caused by lack of calcium and vitamin D, leading to weak, brittle, easy-to-break bones; occurs in adults and older people (common)
Overweight	A condition in which BMI is between 25.01 and 30.0
PAL	Physical activity level; the level of daily activity, which is used to estimate energy needs of a person
Rickets	A condition in children caused by calcium and vitamin D deficiency, leading to weak bones, improper body posture, impaired teeth and bone growth, and tooth loss
Type 2 diabetes	Disease caused by improperly working insulin or lack of insulin, a hormone produced by the pancreas

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Energy requirements of individuals

Energy balance means that the same amount of energy is being provided with the energy being used. Keeping the energy balance is very important in maintaining a healthy body weight. Eating more than required is likely to cause weight gain, and eating less than required can cause weight loss. Energy requirements vary depending on age, sex, weight, height, body composition, occupation, physical activity level and current state of health. In this chapter you will learn how to assess the energy requirements of individuals.

Basal metabolic rate and physical activity level

Basal metabolic rate (BMR) is the amount of energy a person needs to carry out the basic life processes throughout the day, such as breathing, heartbeat and maintaining stable body heat. Basal metabolic rate is different for every person and depends on various factors. On average, BMR equals one kilocalorie per kilogram body mass per hour.

$$\text{BMR} = 1 \text{ kcal/kg body mass} \times 24 \text{ hours}$$

There are four main factors that affect BMR:

1. **Weight** – because the more tissue there is to nourish, the bigger the need for energy and nutrients
2. **Height** – for the same reason
3. **Age** – because younger people usually have more lean muscle tissue than the elderly, and muscles need more energy than fat tissue
4. **Sex** – men usually have more muscle tissue than women and, therefore, need more energy

Factors influencing basal metabolic rate

age

Apply

Calculate your own BMR using the two equations provided on this page. Do they differ? Why / why not?

Another way of calculating one's BMR is to use the Harris–Benedict¹ equation.

Men	$\text{BMR} = (10 \times \text{weight in kg}) + (6.25 \times \text{height in cm}) - (5 \times \text{age}) + 5$
Women	$\text{BMR} = (10 \times \text{weight in kg}) + (6.25 \times \text{height in cm}) - (5 \times \text{age}) - 161$

Physical activity level (PAL) reflects the activity of a person during the day – that is, cleaning, walking, doing sport, shopping and even getting dressed. Occupation also affects energy requirements. Manual workers (e.g. builders) need more energy than people who work at a desk. Depending on how much we move during the day, PAL can be considered low, moderate or high.

Action	Energy expenditure (kcal per hour)
Sleeping	65
Knitting	111
Washing	144
Walking	200
Swimming	500
Running	570
Walking up the stairs	1100

Energy expenditure of different activities in kcal per hour

¹ Harris–Benedict equation revised by Mifflin et al. in 1990, Mifflin M D, St Jeor S T, Hill L A, Scott T F, Taubert A H, Berman M L, O (1990). 'A new predictive equation for resting energy expenditure in healthy individuals'. *Clinical Nutrition*. 51 (2): 241–247. PMID 2305711

As you can see in the table on the previous page, different actions require different energy requirements. Therefore, a person who leads a **sedentary lifestyle** will need less energy than a person who leads a more active lifestyle.

Lifestyle	PAL
Sedentary lifestyle	1.4–1.69
Moderately active	1.7–1.99
Very active	2.0–2.4

Apply

Using PAL values, calculate the energy needs of a family member who is moderately active.

How to use PAL? You need to assess how active a person is (what their job is, whether they ride a bike once a week or run five miles every day). The more active a person is, the higher their PAL will be. To calculate what the total energy expenditure (TEE) of a person is, you multiply their BMR by PAL.

$$\text{BMR} \times \text{PAL} = \text{TEE}$$

BMR and PAL are important in judging how much energy a person needs and how much they can expend. To maintain your weight, it is important to not exceed the TEE. It is also important to consider the energy comes from different sources. All of these factors determine how to plan a diet.

You may find that some sources refer to EAR. EAR stands for Estimated Average Requirement. It is calculated for an entire population (not an individual). EAR is an average value, so some of the population will need more energy and some of the population will need less energy.

Research

You can explore more information on PAL at zzed.co.uk/8256-energy-requirements.

Energy requirements differ for different life stages. In fact, infants and children have higher energy requirements than adults compared to their body size. For this reason, the equations discussed for adults are not used for calculating energy requirements of children. Instead you could use recommendations from the UK government, updated periodically by relevant authorities. The estimated energy requirements for children of different ages are shown in the table below.

Age	Boys	Girls	Age	
1 year	765	717	8 years	1740
2 years	1004	932	9 years	1840
3 years	1171	1076	10 years	2032
4 years	1386	1291	11 years	2120
5 years	1482	1362	12 years	2240
6 years	1577	1450	13 years	2410
7 years	1640	1530	14 years	2620

Source: British Nutrition Foundation 2016

Apply

Using the equation for BMR, calculate the energy needs of a moderately active 10-year-old of average height and weight. Compare the results with the requirements from the table above. Explain potential reasons for any differences.

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Sources of energy

A healthy, balanced diet should comprise carbohydrates, fats and proteins in the correct amounts. The latest recommendations indicate that a healthy diet should be based on carbohydrates, especially complex carbohydrates (starch). The recommended percentage of energy intake for a balanced diet is shown in the table below.

Did you know

- 1 gram of fats provides 9 kcal
- 1 gram of carbohydrates provides 4 kcal
- 1 gram of protein provides 4 kcal
- 1 gram of alcohol provides 7 kcal

When planning a diet, you can use this data to calculate how much of each ingredient you can use. For example, if you are planning that 50% of energy (1,000 kcal) should come from carbohydrates. Knowing that 1 g of carbohydrate provides 4 kcal, you are able to calculate that the diet should include approximately 267 g of carbohydrate.

	Percentage	Amount in grams
Protein	up to 15%	75
Fats	maximum 35%	78
of which saturated fats	maximum 11%	24
Carbohydrates	50%	267
of which starch	45%	240
of which sugars	5%	27
Fibre	-	up to 30 grams

Recommended percentage of energy intake for a balanced 2000 kcal diet

Apply

Plan a diet for a 16-year-old child and a 70-year-old person.

The composition of their diet may differ for different people depending on their lifestyle. For example, a marathon runner will need more carbohydrates, while a weightlifter will need more protein. For people suffering from certain diseases these proportions might not be appropriate. For example, people with cystic fibrosis it is recommended to provide a high-fat diet to compensate for the lack of fat in their diet. On the other hand, some people may require a lower intake of certain nutrients, e.g. people with phenylketonuria need to eat a low-protein diet throughout their life.

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How to maintain a healthy body weight

You already know that BMR and PAL are important for assessing one's energy needs. What does 'body weight' mean?

Scientists and dietitians around the world have designed multiple tools that help determine if your body weight is correct or not. One of the most popular indicators of this is the **body mass index (BMI)** for which you need body mass in kilograms and height in metres.

$$\text{BMI} = \text{weight in kilograms} / \text{height in metres}^2$$

Remember, that being underweight is just as dangerous as being overweight!

There is a number of rules to follow in order to maintain a healthy body weight – most of them are shown on the Eatwell Guide. Can you remember them?

BMI < 18.5
18.51–25.0
25.01–29.9
>30.0

The effects of weight loss

Weight loss may be caused by various factors, such as not eating enough (malnutrition), some genetic and metabolic disorders, and certain diseases.

Some people may choose to intentionally limit the amount of food they are eating, we speak about *anorexia*. Anorexic people eat very little, and, therefore, their body lacks building material to repair and grow cells and tissues. In anorexia, we can observe:

- very thin, wrinkled skin – as the body lacks protein to build the cells, and vitamins
- tooth loss – lack of vitamin C causes the gums to recede, and lack of vitamin D causes decay; together, they cause tooth loss and trouble with eating
- weakness – in the face of sugar deficiency, the body breaks down muscles in order to get energy
- thin, brittle hair and nails – due to lack of minerals and vitamins to strengthen them
- lack of menstruation in women – as fat is needed to produce sex hormones, the hormonal cycle is arrested

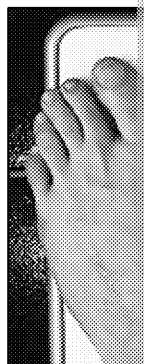
Treatment of anorexia usually requires medical attention and psychotherapy, as the body needs to be high in energy and protein, but the portions of food need to be very small.

The effects of weight gain

Weight gain can be an effect of an imbalanced diet, hormonal issues or certain diseases. Overweight and obese people are at an increased risk of many diseases, such as type 2 diabetes or coronary heart disease.

When planning a low-calorie diet for an obese person:

- calculate their BMR and PAL
- calculate their TEE
- subtract 500 kcal from the TEE to know how many calories they should consume every day



As you know, eating less than needed will cause weight loss, which is the desirable outcome. Eating 500 kcal less a day allows someone to lose approximately 0.5 kg of adipose tissue.

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Check your understanding: Energy requirements

1. Which of the following requires the most energy? (1 mark)

a. running	<input type="checkbox"/>	c. walking
b. swimming	<input type="checkbox"/>	d. walking up stairs

2. How much energy should be derived from carbohydrates in a balanced diet? (1 mark)

a. up to 35%	<input type="checkbox"/>	c. maximum 5%
b. up to 15%	<input type="checkbox"/>	d. around 50%

3. How much fibre should be provided with a balanced diet? (1 mark)

a. 20 g	<input type="checkbox"/>	c. 30 g
b. 20 mg	<input type="checkbox"/>	d. 30 mg

4. List four factors that directly affect BMR. (4 marks)

5. Explain how pregnancy and lactation affect the energy needs of a woman. (4 marks)

6. State three benefits for health of physical activity. (3 marks)

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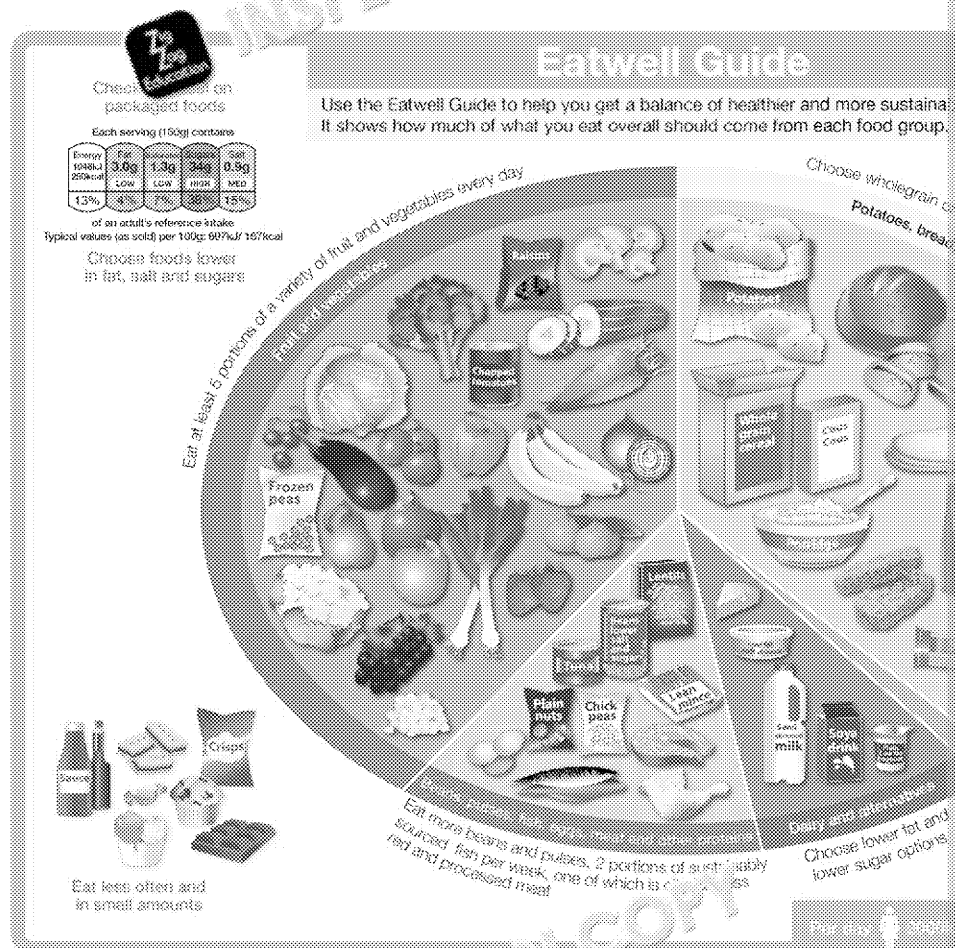


How to plan a balanced diet

You are what you eat. This truth was discovered in the nineteenth century and has stayed with us ever since. It is very true – your body uses all the macro- and micronutrients you provide through your diet to build its own cells, carry out processes, and allow you to breathe, move and think. Eating a balanced diet is necessary to maintain health, and, therefore, it is crucial to know how to actually balance it. Making informed choices is the first step – once you know how to choose the best ingredients, you will be able to mix and match them to provide your body with delicious, healthy meals.

The Eatwell Guide

The Eatwell Guide is a graphic representation of how to balance your meals through correct proportions between nutrients and gives some advice on food choices.



Source: Public Health England in association with the Welsh Government, Food Standards Scotland and the Department of Health © Crown copyright 2016

Notice that vegetables along with starchy foods make up the biggest part of the proper diet. These foods provide the most vitamins, minerals, fibre and carbohydrates to keep you healthy. Your diet should comprise up to 35% of vegetables and fruits and another 30% of bread, pasta, rice or potatoes.

Another 10% to 15% of your diet should be made up of protein sources, such as meat, fish, eggs, beans and pulses, to ensure proper growth, development and repair of the tissues and organs. Around 10% of your diet should be made up of milk and dairy products – that is to provide adequate amounts of calcium, phosphorus and protein.

Notice that oils and fats take up only around 2% of the plate – that is because these foods (such as meat, fish, milk and cheese), so there is no need to provide any more.

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There is also other important information contained in the Eatwell Guide. In the top left corner, it reminds you to cut down on sweets and snacks, which are usually high in sugar and trans fats. The top right corner is a reminder to drink water regularly – either in the form of juices, milk, tea or coffee. This is to ensure proper hydration / prevent dehydration. The bottom left corner also helps cut down on snacks. In the bottom right corner there is an estimated total energy intake for women and men – remember that all foods and drinks count.



Eat at least five portions of a variety of fruit and vegetables every day.



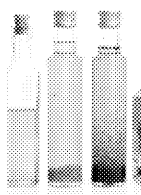
Base meals on bread, pasta and other carbohydrate-rich foods. Choose low-fat versions where possible.



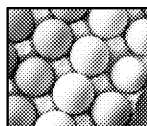
Include some dairy or dairy-free alternatives (such as soy drinks), choosing lower fat and lower sugar options.



Drink six to eight fluid a day.



Choose unsaturated oils and spreads and eat in small amounts.



Eat some meat and fish, two portions of which should be white meat or fish.

The Eatwell Guide in a nutshell

Apply

Write down all of the foods and drinks that you have consumed during the last 24 hours. Do you think you meet the Eatwell Guide criteria for a healthy, balanced diet?



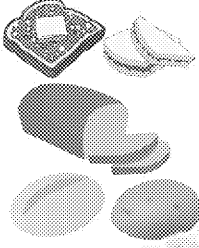
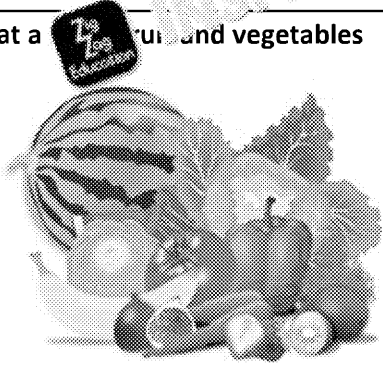
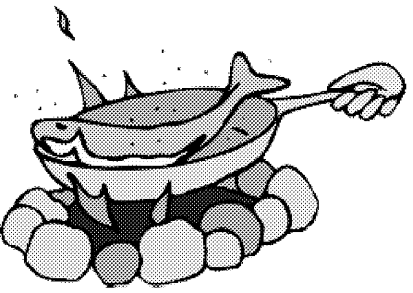

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The eight tips for healthy eating

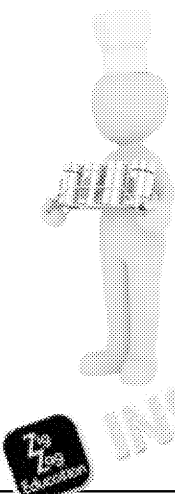
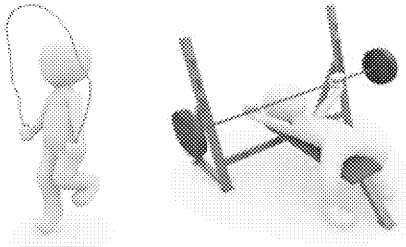

This is another guideline for making healthy food choices. It's a general list of do's and don'ts for a healthy diet.

Tip	Why is it important?
Base your meals on starchy foods 	<ul style="list-style-type: none"> This includes wholemeal bread, potatoes, and some vegetables. They are an important source of energy, fibre, group B vitamins and certain minerals like phosphorus. They bulk up the dish and provide a feeling of satiety for longer, so you don't end up craving sweets. Ideally, a starchy ingredient should be included in each meal.
Eat a variety of fruit and vegetables 	<ul style="list-style-type: none"> Vegetables are an important source of minerals, vitamins, dietary fibre, and antioxidants, which is one reason you should eat them regularly. Fruit, except for the nutrients listed, should be consumed in smaller portions than vegetables and should be fresh fruit rather than juices or processed fruit, which can contribute towards obesity and diabetes. A portion of fruit or veg equals around 80g. One large fruit such as an apple, or a small fruit such as plums, or a handful of berries.
Eat more fish 	<ul style="list-style-type: none"> Fish are a source of complete protein and omega-3 fatty acids, which are essential for heart health and vitamin D. They are indispensable for a healthy diet. It is ideal to eat at least one portion of fish per week (this includes salmon, mackerel, haddock, etc.). Lean fish, such as haddock or cod, are the best choice. When choosing your fish, remember: <ul style="list-style-type: none"> → deep-fried fish provide much more fat than grilled, steamed or baked fish. → canned and smoked fish are high in salt, so eat them less often.
Cut down on saturated fats and sugar 	<ul style="list-style-type: none"> Fat is important in maintaining health, but saturated fat is... a bad thing. Saturated fats increase cholesterol levels, which increases the risk of cardiovascular diseases. Sugar increases blood sugar levels, which can lead to diabetes and increasing the risk of type 2 diabetes. Both saturated fats and sugar consumption are one of the major diet-related problems in the UK. When choosing your food, opt for low-fat and low-sugar options. Exception: whole milk, which, as a source of vitamins A and D. Ideally, you should limit consumption of saturated fats to less than 10% of your daily calorie intake. For an average adult, this is about one small can of fizzy drink, or about one small portion of fatty meat. When shopping, pay attention to the 'traffic light' label, which indicates the product contains a high, medium or low amount of saturated fat or sugar.

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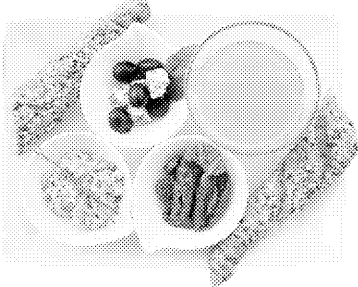



Tip	Why is it important?
<p>Try to eat less salt</p> 	<ul style="list-style-type: none"> • The UK government suggests that we should eat no more than 1,600 mg of sodium a day (this is equivalent to 4 g of salt). The World Health Organization recommends a maximum level to 6 g of salt a day. • Excess sodium consumption is related to high blood pressure, stroke, heart failure, kidney disease, cancer and many other conditions. • Salt comes from a variety of foods, but is most commonly found in unprocessed produce in order to preserve it. It is often hidden in processed foods, the most surprising sources being meat preserves and bread. • Over two thirds of adult Britons eat too much salt, which puts their health and well-being at risk. • To limit the amount of salt in the food you eat, reduce your foods at the end of cooking, and use herbs and spices.
<p>Get active and try to maintain a healthy weight</p> 	<ul style="list-style-type: none"> • Being underweight is just as bad as being overweight. In some cases, it is not a good idea to 'go on a diet' in order to lose a couple of kilograms. • It is best to increase physical activity and improve your body composition – your weight and health – that's because physical activity helps to burn calories, are, well, quite heavy. • Physical activity brings many health benefits: it improves your general condition and stamina, lowers the blood pressure, helps to improve your sleep, provides more oxygen to all of your organs, and you look and feel better. • Make sure you choose the kind of activity that suits you – for example, swimming puts less strain on your joints, while running might not be good for your knees, so might not be good for you. • Children and teenagers should exercise every day, and on three days a week adults should do activities for strong muscles and bones. • Adults should get at least 150 minutes of moderate activity every week (or 75 minutes of vigorous activity).
<p>Drink plenty of water</p> 	<p>Water is essential for life and good health. It helps to prevent heat stroke, prevents dehydration, and provides minerals.</p> <ul style="list-style-type: none"> • Ideally, adults should drink between 2-3 litres of water a day (or 30 ml per kilogram of body mass). In fact, many foods we eat also provide water.

Apply

Inspect the labels of different products and identify the words used to describe added salt.

² Department of Health, Dietary Reference Values for Food Energy and Nutrients for the United Kingdom

Tip	Why is it important?
<p>Don't skip breakfast</p>  <p>Did you know?</p> <p>The name breakfast literally means 'breaking the fast' of the night.</p> 	<p>Skipping meals puts your body in a catabolic state, which in fact causes you to gain weight rather than lose it. It is also considered by many to be the most important meal of the day. Here is why:</p> <ul style="list-style-type: none"> • it's the first meal after a long night's sleep, which is a very long time without food • it provides the energy needed to start the day • it provides the energy needed to concentrate at school or work <p>A healthy breakfast should ideally provide complex carbohydrates, dietary fibre and complete protein. It is usually OK to include little sugar, which will provide an immediate energy boost.</p> <p>Did you know?</p> <p>The old saying 'breakfast like a champion' is not just a saying.</p>

Apply

Following the eight tips for a healthy diet, plan a daily meal plan for a teenager. You can find more information on the Zig Zag Education website, go to [zzed.uk/8256-explore-food](https://www.zzed.uk/8256-explore-food)

Research

Other important information on how to eat and what to eat may be found on the following websites:

- National Health Service websites, such as [zzed.uk/8256-nhs](https://www.zzed.uk/8256-nhs)
- Public Health England [zzed.uk/8256-department-health](https://www.zzed.uk/8256-department-health)
- British Nutrition Foundation [zzed.uk/8256-nutrition](https://www.zzed.uk/8256-nutrition)



Things to think about

Discuss the differences and similarities between the two guidelines of the diet.



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Nutritional needs when selecting recipes for different groups of people

When selecting and modifying recipes for different groups of people, it is necessary to consider the following factors:

- their age and the nutritional requirements for their age group (to include particular nutrients)
- their state of health, to include diet-related diseases, and food allergies and intolerances (to include or exclude some ingredients and choose the correct cooking methods)
- their religion, and ethical and moral beliefs (also helps to filter the allowed ingredients)
- their personal preferences (as some people may feel a particular aversion to certain ingredients)

Calculating the nutritional value of food

To calculate the nutritional value of food, you might need to use food tables or apps. These often contain more or less complex information about the nutrients in a given food product. You can use this to calculate the amount of a chosen nutrient in a portion of food. By adding up the values for all the nutrients in the foods, you are able to calculate the nutritional value of a dish, meal and whole diet. It is important to take into account the individual needs of a person when calculating nutritional value accordingly.

Apply

Research a recipe for chicken curry. Then calculate its nutritional value using the data provided. Visit [zigzageducation.co.uk/8256-explore-food](https://www.zigzageducation.co.uk/8256-explore-food) for more information.

You can also attempt to calculate the nutritional value of food using the data provided in the table below.

	Per 100 g	Per portion (180 g)
Energy (kJ)	217	391
Energy (kcal)	51	92
Fat (g)	<0.5	<0.5
Saturates (g)	<0.1	<0.1
Carbohydrate (g)	13	23
Total sugars (g)	11	21
Fibre (g)	0.9	1.6
Protein (g)	0.8	1.4
Salt (g)	<0.01	<0.01

A large portion of food contains 180 g of food. This table provides information on the nutritional value of 100 g of food. How many times does 100 g fit into 180 g?

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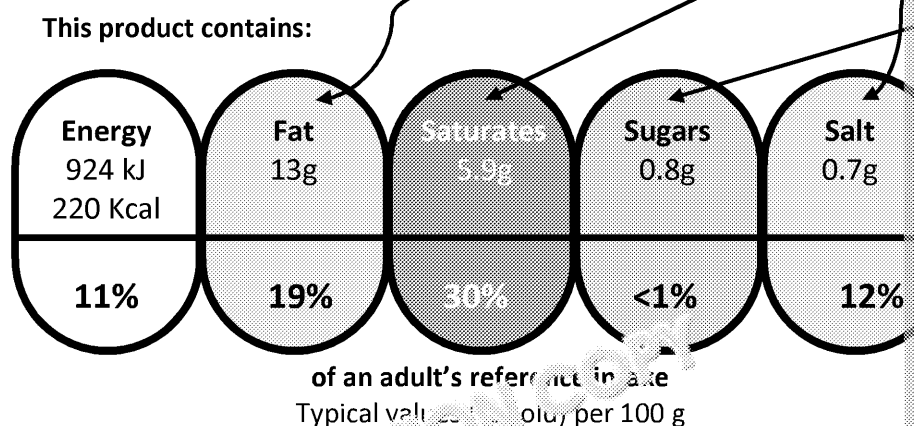
Nutrition Facts	
Serving Size Serving per Container	
Amount Per Serving	
Calories	Calories From Fat
% Daily Value *	
Total Fat	...g
Saturated Fat	...g
Cholesterol	...g
Sodium	...mg
Total Carbohydrate	...g
Dietary Fiber	...g
Sugar	...g
Protein	...g
<div> <div>Vitamin A</div> <div>Vitamin C</div> <div>Iron</div> </div>	

Amount (calories)
made 100

How
reference
portion

Some products have the same information presented in more graphical form, such as:

The colours represent whether the product provides a high, medium or low percentage of the daily reference intake for a given nutrient.



If there are
added, it is
amount a

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Apply

Assess the nutritional value of a traditional English breakfast consisting of:

2 fried eggs

1 sausage

50 g of baked beans in tomato sauce

1 slice of white toast with butter

2 hash browns

1 fried mushroom



Apply

Prepare a ham and cheese sandwich and check the information on the pack for energy and macronutrient content.

Apply

Check the labels of three different types of sausage and assess which is most appropriate for the elderly.

Modifying recipes

Not all recipes are suitable for everyone. Some people will not like the taste, other people will not be able to eat the dish due to food allergies or other reasons. For this reason, it may be necessary to modify the recipe so that it becomes suitable for a particular group of people. The modifications may include:

- changing the amount of an ingredient, e.g. using less fat to make the dish less fatty
- substituting an ingredient, e.g. cow's milk with plant milk, sugar with xylitol
- changing the cooking method, e.g. grilling instead of frying
- adding other ingredients, e.g. to increase the amount of fibre
- reducing the amount of a nutrient, e.g. sugar or salt



Things to think about

Discuss the health benefits of the modifications described above.

Some recipes must also be modified in order to remove or avoid food allergens. Food allergens – you can see them printed in **bold** when inspecting food labels. It is very important that someone who is allergic to a particular substance does not eat food containing it as this may lead to a condition called anaphylactic shock. For example, cow's milk might need to be substituted with a suitable substitute in a recipe. You will discover more about food labelling later in this course.

To adjust the food to the requirements of a consumer, it might also be necessary to

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Portion sizes

It is quite obvious that adults need more energy and, therefore, more food than children. This is reflected by the portion size. For example, a standard portion of yoghurt is 150 g for an adult, on average, as much calcium as two slices of Cheddar cheese (which is also one portion for an adult).

You will learn more about portion sizes when discussing food choices.

Research

You can explore more information on portion sizes on [bbc.com/health/food-drink/portion-sizes](https://www.bbc.com/health/food-drink/portion-sizes).

Apply

Assess and compare the nutritional value of two types of breakfast cereal (in 100 g portions). Which one is more appropriate for teenagers? Give reasons for your answer.

Case study

Claire is a 35-year-old office worker. With the height of 1.58 m and a weight of 67 kg, she is overweight and has recently noticed bloating and discomfort after drinking her favourite latte. She is very busy, as she works from 9am to 5pm and then goes swimming three times a week. She is a bit concerned about her health because her grandma was recently diagnosed with diverticulitis – Claire knows that having a sufferer in the family increases her risk of becoming ill too. Claire tries to follow a vegetarian diet, since she cares a lot about animal welfare.

To plan a balanced diet for Claire, you need to:

- check her age and sex – together with height and weight, these parameters will help you calculate how much energy Claire needs every day; you might use a Harris–Benedict equation (see previous section)
- check her physical activity – you can state that Claire is moderately active, since her BMI is around 1.7 (see previous section)
- check her state of health – Claire is above the ideal BMI range (26.84 kg/m²), she has lactose intolerance; she also is at risk of developing diverticulitis
- check her lifestyle – she is busy and probably has no time for cooking; she is a vegetarian

Thanks to this information, you are able to say that:

- Claire needs a low-calorie diet to lose some weight and regain a healthy body
- she might need extra protein and complex carbohydrate to give her energy to work and develop and maintain the muscle tissue
- she might need to eliminate milk and fermented dairy products from her diet
- as she's a vegetarian, she might need to use the protein complementation technique to increase the biological value protein in her diet
- Claire might need to follow a low-fibre diet to lower the risk of developing diverticulitis
- the recipes for her diet must be easy and quick to cook

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Check your understanding: How to plan

1. Excessive consumption of which nutrient can cause hypertension? (1 mark)
- | | | |
|--------------|--------------------------|--------------|
| a. calcium | <input type="checkbox"/> | c. sodium |
| b. vitamin K | <input type="checkbox"/> | d. vitamin A |

2. A risk factor for coronary heart disease is... (1 mark)
- | | | |
|------------------------------|--------------------------|--------------------------------|
| a. high saturated fat intake | <input type="checkbox"/> | c. high unsaturated fat intake |
| b. low saturated fat intake | <input type="checkbox"/> | d. not using fats |

3. Fish in a diet do NOT provide... (1 mark)
- | | | |
|--------------|--------------------------|------------------------|
| a. protein | <input type="checkbox"/> | c. omega-3 fatty acids |
| b. vitamin E | <input type="checkbox"/> | d. vitamin D |

4. Fruits and vegetables provide us with minerals and vitamins. Identify one mineral and one vitamin, and give one function of each in the body. (4 marks)

Mineral

Function

Vitamin

Function

5. Give two reasons why people should cut down on saturated fats. (2 marks)

1.

2.

6. Discuss how and why starchy foods are included in the current dietary guide and the eight tips for healthy eating. (5 marks)

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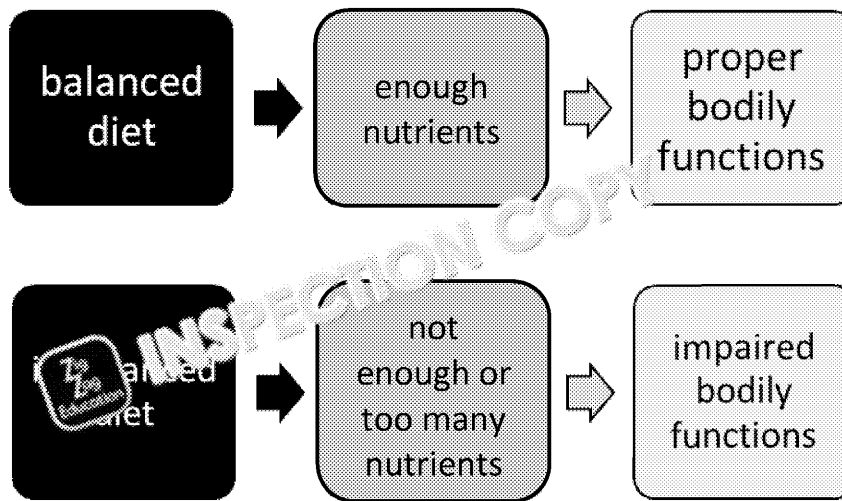
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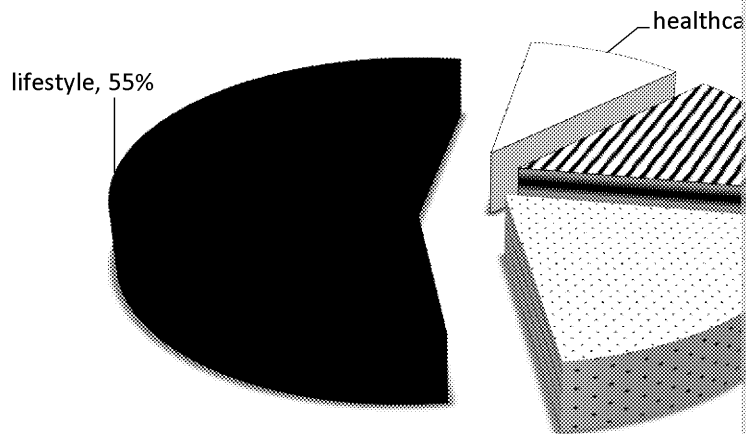


The relationship between diet and health

Diet is an important factor which can both protect from and cause certain diseases. The body needs a balance of nutrients, which are necessary to carry out all of the bodily functions. If the body does not get enough nutrients provided, the body remains healthy. Both excess and deficiency can lead to health problems.



According to Marc Lalonde's 'health field' concept, there are four major factors that influence health: lifestyle, healthcare, environment, and heredity.



Marc Lalonde's health field concept (<http://www.phac-aspc.gc.ca/ph-sp/pdf/p11-01-eng.pdf>)

According to the idea, as much as 55% of our health depends on our lifestyle – which is the largest segment of the health field. Thus, it is extremely important to lead a healthy lifestyle to maintain health and prevent disease.

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Nutritional and dietary needs of different life stages

The nutritional needs of a person change with age, sex, physical activity, state of health, and can also be affected by other factors, such as ethical and moral beliefs. Different people have different needs and these have to be taken into account when planning diets for them. A healthy diet is one that all the nutrients are provided in the correct amounts, and helps to decrease the risk of disease. In this section we will discover how the nutritional requirements differ depending on the needs of different people.

During different life stages, people have different nutritional needs – either due to changes in development, or in order to avoid diseases.

Babies – from birth to the first birthday

There is no question that the best possible food for babies is *milk*. Ideally, every baby should be breastfed, but on certain occasions, bottle formulas are just as good. Babies don't need much – everything they need is already in the milk: proteins, sugars, fats, vitamins, and even antibodies that protect them before they can develop their own immune system. Sometimes babies are given vitamin D and vitamin K supplements to allow proper growth and blood clotting, and to prevent certain diseases. At the sixth month of life, they should be introduced to simple foods such as carrots, pumpkin or mashed potato. In this way they can adjust their digestive tract and their taste buds to the universe of food. The latest guidelines also state that babies should not drink fruit juice or any sweetened beverages until their first birthday. Their nutritional needs will start to grow once they begin moving, which usually happens around their first birthday.

Toddlers (from one to three years old)

Toddlers are little children who are just beginning to walk. This means that their bodies need energy to move their muscles. Also, the need for protein, calcium and iron increases as they undergo their first **growth spurt**. According to guidelines, toddlers should eat five to six portions of fruit and vegetables, three portions of dairy products and two to three portions of protein-rich foods (vegetarian toddlers should eat three portions of protein-rich foods to ensure they have enough complete protein). When planning meals, remember that these portions are relatively small and should be adjusted to the age and size of the child – generally, a portion should fit into their hand. A toddler's diet should be as varied as possible – toddlers may be picky and lack appetite, but it is worth introducing new foods at least a few times so that their taste buds can adjust to the new flavours and textures. The texture of food also should be gradually adjusted, as at this time children grow their teeth – first introduce mushy, puréed foods, then introduce soft foods cut into small cubes, and, at the end, introduce tougher foods that need biting and chewing, such as raw carrot. Drinks should still include pure water, milk, and some diluted fruit juice. This is because fruit juice contains almost no fibre but is rich in sugars, and so children might prefer it to plain juice, to the exclusion of the more important foods.

Appetite

Protein
or
yoghurt

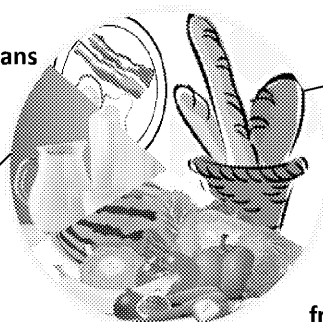
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Diet for toddlers
general



protein rich foods
2 portions (for vegetarians
3 portions)

milk and dairy
3 portions

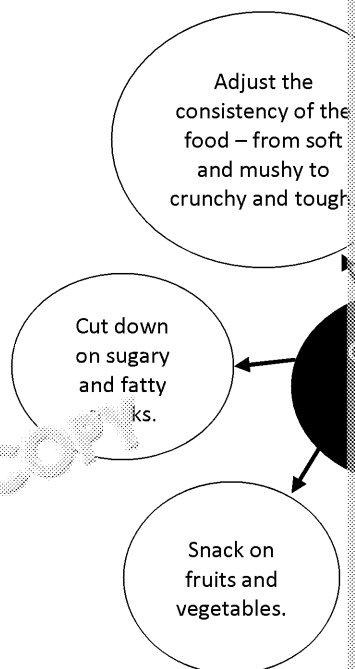


fruit and vegetables
5 portions



School-age children (four to 11 years old)

During the next couple of years, children discover the surrounding world. That also includes food – every time you prepare a meal for children, try to introduce new ingredients. This will pay off in the future and allow a very diverse, balanced diet. Another advantage is that early introduction of foods helps reduce the risk of **food allergies**. At this stage children also learn how to use cutlery and are especially eager to learn, so be the role model. Children should eat five meals a day – that includes breakfast, lunch, dinner and two snacks in between. A cup of milk before sleep is also acceptable. The diet should be as varied as possible and rich in vitamins and protein. Avoid fatty, sugary snacks and drinks. Instead give the child a bottle of water and fresh fruits and vegetables. It is also advisable to encourage children to eat fish, milk and dairy products to avoid rickets and tooth decay.



Apply

Go to [zzed.co.uk/8256-healthy-lunchbox](https://www.zzed.co.uk/8256-healthy-lunchbox) and create your own healthy lunchbox. How could you improve it to meet the guidelines for a healthy diet for school children?

At school, children need a lot of energy to focus on lessons. They also meet a lot of new people that they are exposed to many new microorganisms and their immune system needs to be strong. Children of this age are often influenced by their peers and the media (e.g. television, the Internet).

Many parents prepare lunch boxes for their children, but it might be worth considering if this helps to introduce a greater variety of products into the diet. The diet for school children should generally be based on the Eatwell Guide, with the portion sizes adjusted.

Children should be encouraged to be physically active (PE lessons are often not enough). If the peer group is larger, the child might refuse to eat certain foods (e.g. vegetables) or drink (e.g. fizzy drinks). Try to introduce low-sugar or sugar-free foods to provide the sweet taste without the extra body weight or tooth health.

Remember that breakfast is the most important meal of the day – it should provide energy, dietary fibre, complete protein, and little fat. An example of this is oatmeal with milk and fruit.

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Teenagers

During adolescence, girls and boys face a period of rapid growth that is called **growth spurt**. To meet all of the needs of their developing bodies, they should pay attention to their diet and nutrient intake.

Increase the amount of protein	To allow proper growth
Choose sources of fats wisely and adjust the amount	Fats are necessary to produce hormones) but excess may lead to obesity
Drink milk and eat dairy, and other calcium-rich products	To avoid rickets and tooth decay
Choose whole grains	To avoid overweight and obesity, and to keep the blood sugar stable
Eat iron-rich foods	Iron is especially important for teenagers at this stage of life; remember to eat vitamin C to prevent iron-deficiency
Eat five portions of vegetables and fruits daily	To boost your health and immune system

During adolescence, it is important to provide the body with the energy it needs, which is significantly more than those for younger children. To increase the variety of food, encourage them to eat lunch in school instead of taking lunchboxes with them. School lunches are usually prepared in accordance with national dietary guidelines, which assures their quality.

Apply

Think of ways of including five portions of fruit and vegetables a day in a diet for teenagers.

Adults (19 years and over)

Adults are fully grown and developed and, therefore, their need for certain nutrients is lower. They are also usually less active (no weekly PE lessons) so their energy need is also smaller. It is important to focus on preventing certain diseases, which might develop as an effect of age in life.

Ensure proper intake of calcium and vitamin D to prevent osteoporosis

Choose iron-rich foods or supplement iron to avoid iron-deficiency

Cut down on sugar and fat to avoid obesity, type 2 diabetes and heart disease

Cut down on salt to prevent high blood pressure

Be active to prevent osteoporosis, lean muscle tissue loss and heart disease

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Pregnant and lactating women

Pregnancy is a natural state during which a foetus is formed inside the woman's body. As the foetus is dependent on its mother, she has to provide it with the energy and nutrients needed for the development of body organs. You might have heard that pregnant women need to eat more, but it is not only in terms of quality of the food, not the quantity. In fact, the woman only needs to eat more in the last months of the pregnancy! Nevertheless, pregnant women need to pay attention to the impact on the growing foetus (it is called *nutritional programming* and it is believed that diet during pregnancy and breastfeeding affect the entire life of the child).

So how do the nutritional needs change during pregnancy and lactation?

Apply

After birth, women rarely have time for cooking. Find five quick-to-make meals with all of the necessary nutrients.

	Protein	Vit. B1	Vit. B2	Niacin	Vit. B12	Folate	Vit. C
Pregnancy	+6 g / day	+0.1 mg	+0.3 mg	-	-	+100 mcg	+10 mg
Lactation	+8–11 g / day	+0.2 mg	+0.5 mg	+2 mg	+0.5 mcg	+60 mcg	+30 mg

Source: British Nutrition Foundation 2016

Pregnant women should also:

- eat regular meals, ideally five meals a day (some women may require more meals, e.g. six or seven, due to complications such as gestational diabetes)
- eat plenty of vegetables and fruit to prevent constipation and to boost immunity (infections during pregnancy may be dangerous)
- avoid dairy products made of unpasteurised milk (in order to prevent food poisoning)
- avoid eating offal (because it is rich in vitamin A, which, in excess, may be harmful)
- avoid raw or undercooked meat and eggs (to avoid food poisoning)
- avoid eating shark, swordfish or marlin, and limit the consumption of tuna (due to mercury levels)

The diet should be as varied as possible, as this is believed to lower the risk of food allergies. During lactation, the woman also should eat a balanced diet – all types of food. If a woman feels unwell or suffers from food allergies or intolerances. It is also advised to drink plenty of water to enable the production of milk.



What to think about

Discuss why women need more folate during pregnancy, but less during lactation.

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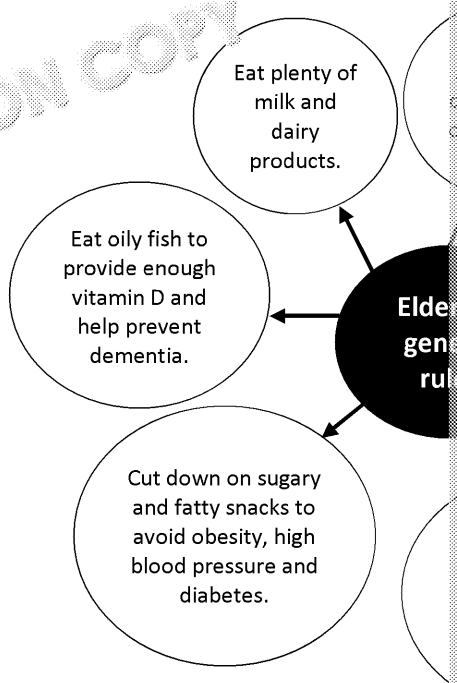
Elderly (over 65 years old)

Ageing is an unstoppable process that makes our bodies less active and less full of energy as people age. The elderly usually have significantly less lean muscle tissue than younger people, and therefore, need less energy. Unfortunately, their digestive tract ages as well – the lining of the stomach can become thinner, causing ulcers or heartburn, their teeth begin to fall out, and even the bowel does not move as quickly.

For those reasons, it is important to adjust the diet to the needs of the ageing body. The elderly are at a higher risk of developing certain conditions, such as **osteoporosis**, **hypertension**, **type 2 diabetes**, **obesity** or **coronary heart disease**. It is important to ensure that lifestyle helps slow down the progression of these conditions or, ideally, prevent them.

A few rules are worth remembering:

- a high amount of fibre helps prevent bowel cancer, but it is also necessary to drink plenty of water to avoid constipation (and dehydration), which can be a problem for the elderly.
- adjust the consistency of food to meet the needs of those who have lost their teeth
- limit the amount of salt to prevent **hypertension**
- make sure the diet provides a sufficient amount of calcium to prevent **osteoporosis** – if not from milk (lactose intolerance is common among adults), then from other sources such as pilchards or almonds



Elderly people are also at more risk of developing anaemia, usually associated with a lack of red blood cells, which can be caused from interfering medication, other chronic illnesses, or a lack of iron and vitamins. Alternatively, anaemia can result from increased bleeding from chronic illnesses such as stomach ulcers. As a result, it is important that the elderly consume more iron, vitamin C and vitamin B12 in their diet to reduce the effects of this condition.

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Dietary needs of specific dietary groups

There are different reasons behind food choices, which need to be taken into account. These can include ethical or philosophical beliefs and health conditions that require specific dietary needs.

Ethical and philosophical factors behind food choices

Various life experiences, ethical views and knowledge cause people to revise their food choices. It is more and more common to see vegetarian and vegan eateries across the country.

Vegetarianism can be divided into several of subgroups, including:

- lacto-ovo vegetarianism – which allows consumption of milk, dairy products, eggs and meat
- lacto vegetarianism – which allows consumption of milk and dairy products, but not eggs or meat
- ovo vegetarianism – which allows consumption of eggs, but not milk or dairy products

Veganism is a kind of vegetarianism that excludes consumption of fruits and vegetables that may hurt any living organism. This means that vegans cannot eat milk, dairy, eggs, large quantities of meat or any animal products. There are strict variations of veganism such as strict veganism and ethical veganism.

Vegetarian and vegan diets have many benefits, but they may also be controversial. A vegetarian or vegan diet for people who suffer numerous food allergies, for example, will be seriously narrowed. Some people also claim that these diets are more costly, but this might be true, since vegetarians and vegans often choose fairtrade, organic food, which is more expensive than their common equivalents. Dietitians may also find it not suitable for pregnant women since their bodies have special needs. The advantages and disadvantages of vegetarianism and veganism are shown in the table below.

	+ (advantages)	
Vegetarianism	<ul style="list-style-type: none"> + Rich in vitamins + Rich in fibre + Usually provides enough protein + Very varied diet + Usually suitable for children and pregnant women 	<ul style="list-style-type: none"> - Costly - Sometimes difficult to follow
Veganism	<ul style="list-style-type: none"> + Rich in water-soluble vitamins + Rich in fibre + Varied and colourful + Promotes weight loss 	<ul style="list-style-type: none"> - Very costly - Difficult to follow - May lead to deficiencies of fat-soluble vitamins - May lead to iron deficiency as this only found in meat origin - May lead to anaemia - Time-consuming - Not suitable for pregnant women

Benefits and drawbacks of vegetarianism and veganism

Since vegetarians and vegans do not eat meat, it is necessary to pay special attention to this reason, vegetarian and vegan diets are usually rich in legumes, nuts and seeds. Protein intake and protein complementation to avoid deficiencies.

You can learn more about protein complementation and sources of vitamins in the following chapters – Principles of nutrition.

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Health conditions that require special treatment

There are some conditions that force people to avoid certain foods. These include coeliac disease and lactose intolerance, as well as food allergies.

Coeliac disease is a condition in which **gluten** (the protein in wheat, rye, barley and some other grains) is not processed properly in the small intestine. Eating gluten may lead to inflammation of the villi, impaired absorption, painful bloating and diarrhoea. Since villi are being damaged, malabsorption may occur. People suffering from coeliac disease have to follow a strict gluten-free diet to avoid these issues.

Allowed	Not Allowed
<ul style="list-style-type: none"> Rice, millet, quinoa, buckwheat, corn starch, potatoes Any product made with the use of the above Any other food – vegetables, fruit, meat, fish, eggs, milk, etc. Oats – only if certified as gluten-free 	<ul style="list-style-type: none"> Wheat, rye, barley Any product made with these grains (such as flour, bread, cakes, sauces and soups) Breaded products such as breaded ham

Products allowed and not allowed in a gluten-free diet

When planning a meal for someone suffering from coeliac disease, it is crucial to avoid unallowable products may be harmful.

Research

Find out other foods which can and cannot be eaten by coeliacs. Visit [zzed.uk](http://www.zzed.uk) to look for on a food label when shopping for a coeliac.

Lactose intolerance is another health condition that has specific dietary requirements. Lactose intolerance may occur in childhood, but most often it is diagnosed in adults. Eating anything that contains **lactose** (or milk sugar) may cause stomach ache, painful bloating, diarrhoea and other issues. To avoid these problems, it is highly recommended to avoid any food that contains lactose – that includes milk and some dairy products. If the intolerance causes only mild symptoms, a person can try to eat yoghurt or cheese, since the lactose in them is already processed by the bacteria.

During fermentation, yoghurt and cheese products contain lactic acid.

To balance a lactose-free diet and ensure proper intake of calcium and vitamin D (especially oily sea fish) and other calcium-rich products such as broccoli, kale, legumes.

Allowed	Not Allowed
<ul style="list-style-type: none"> Any product labelled as 'lactose-free' Any vegetables, fruits and eggs Butter Sometimes yoghurt or cheese if the symptoms are very mild Fish Chicken Yoghurt Other fermented dairy products* 	<ul style="list-style-type: none"> Milk Cream cheese Cottage cheese Buttermilk Cream Pancakes Ice creams Some sauces, condiments, meats and cold cuts Sweets, biscuits and cakes Read the label to see if lactose powder added. Some medicines

Products allowed and not allowed in lactose intolerance

*During fermentation, lactose is transformed by probiotic bacteria into lactic acid, and, therefore, fish and cheese can usually be eaten in small amounts by lactose intolerant people.

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There are more and more **food allergies**, and it is extremely important to avoid contact with allergens if you are diagnosed. Food allergies usually develop in the childhood, but sometimes they can develop in adulthood. People who suffer from allergies have to avoid the allergen for their entire life – but some people can grow out of the condition.

When preparing food, it is important to avoid cross-contamination – it is best to use separate tools and use dedicated tools when preparing and cooking them. The unintentional consumption of allergens can cause various symptoms, from mild (e.g. skin rash), through medium (e.g. swelling), to severe (anaphylactic shock). The most common allergens have to be indicated on a food label. Always check the label if you or a person you're cooking for suffers from an allergy.

Allergens that have to be indicated on a food label by law			
Celery (stalks, seeds, leaves and roots)	Cereals containing gluten (wheat, barley, rye)	Crustaceans (crabs, lobster, scampi, prawns)	Molluscs (oysters, snails, mussels, squid)
Eggs	Eggs (flour and seeds are often found in bread)	Milk	Mustard (liquid, powdered, etc.)
Peanuts	Tree nuts (almonds, Brazil nuts, pecans, cashews, hazelnuts, walnuts)	Sesame seeds	Soya

Research

Research how peanuts are grown to see why they are listed separately from tree nuts.

Apply

Find a recipe for a fish pie and modify it to meet the requirements of:

- a person who is allergic to milk
- a coeliac



Research

Research how to avoid allergens in recipes that contain eggs.

Did you know?

A nut allergy is among the most common allergies in the UK – approximately 1% of the population has a nut allergy. From an allergy to peanuts, and around 0.5% suffer from an allergy to tree nuts. Some people grow out of the allergy and can safely eat tree nuts and peanuts during adulthood.

When preparing, cooking and serving dishes for people with nut allergies, you must always check the label, as even a small amount of nuts can cause anaphylactic shock. Remember:

- peanut butter, almond butter or any type of nut butter
- walnut oil, almond oil or any type of nut oil
- spreads such as Nutella®
- some biscuits, ice creams, chocolate, cereal bars and breakfast cereals
- Chinese, Indonesian and Thai dishes, as they are often made using peanut (groundnut) oil
- certain sausages, e.g. mortadella
- bread and other baked goods

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High-fibre diet

Dietary fibre is an important part of a healthy balanced diet. It can be applied to reduce the risk of bowel cancer, atherosclerosis, diverticulitis, type 2 diabetes and is recommended to increase the intake of fibre on low-calorie, weight-loss diets.

Dietary fibre can be divided into two groups – soluble and insoluble fibre.

	Function	Source
Soluble fibre (pectin)	Lowers blood sugar level, prevents diabetes and hyperglycaemia, gives the feeling of fullness	Most fruits, vegetables, apples, bananas, carrots) and beans and lentils
Insoluble fibre (cellulose)	Increases regular bowel movements, cleans the bowel from the inside, protects from toxins, prevents constipation, lowers the risk of bowel and breast cancer	Whole grains, nuts, seeds, other dried vegetables, root vegetables, fruits

The function and source of soluble and insoluble dietary fibre

To avoid unpleasant effects, such as bloating, wind or constipation, it is necessary to drink plenty of water when eating a high-fibre diet. To remain healthy, teenagers and adults should consume around 30 grams of fibre a day. Unfortunately, many people do not meet these requirements.

It is also recommended to be physically active to promote healthy bowel movements and remain healthy and maintain proper body weight.

Apply

Choose a main dish recipe and adjust it to the dietary requirements of: vegetarians, the elderly and diabetics. Justify your choice and list the ingredients that require replacement.



High-energy needs

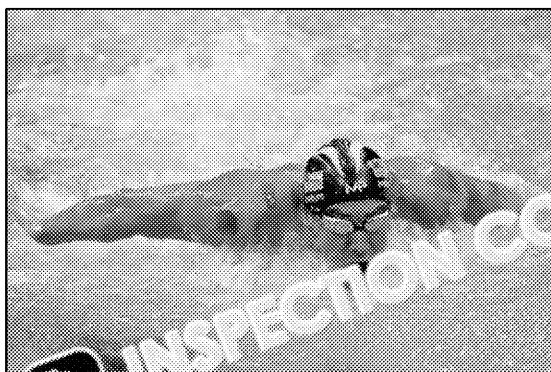
Some people may require more energy due to their occupation or very high levels of physical activity. When planning diets for them, it is important to know the cause of their increased requirements.

In athletes, such as marathon runners, high energy needs are caused by high aerobic physical activity. Marathon runners need a lot of energy to last the distance required. The diet for marathon runners is high in carbohydrates, as they are most easily used by the body and provide energy throughout the whole run. Lack of carbohydrates can lead to production of lactic acid in the muscles, which, in turn, would lower their effectiveness and stamina. When preparing for a run, a marathon runner should provide between 60% and 70% of their total energy intake from carbohydrates. As a result, the liver and muscles can accumulate a sufficient amount of glycogen to be used during the run. Proteins are important, as they are necessary to repair muscles damaged during the run. A marathon runner should eat up to 1.8 g of protein per kilogram of body mass a day.

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In professional swimmers, high energy expenditure is the effect of low water temperature. They must compensate and produce a huge amount of energy to keep their body temperature stable. Their diet is usually based on carbohydrates and must be easy to digest – a large amount of fat would overburden the stomach and cause health issues, such as indigestion or heartburn. They also need protein to repair and build the muscles, and polyunsaturated fatty acids to provide insulation and thermogenesis (production of warmth).



Did you know?

The diet of the Olympic swimmer Michael Phelps provides a good example of a high-energy diet.

In weightlifting, muscle activity is short, but very intense – they must lift very heavy objects in a matter of seconds. For this reason, their muscles need to be strong and be able to regenerate quickly. In fact, the energy is derived from ATP and phosphocreatine, which can provide energy even faster than glucose. Their muscles also must remain highly reactive for nervous impulses, and for this reason it is important to maintain high levels of substances which increase their reaction time (e.g. caffeine). As the muscles are exposed to heavy weights, they can be damaged easily – for this reason, weightlifters must provide with their diet substances which will support regeneration. A weightlifter's diet is, therefore, very high in protein (up to 2 g per kilogram of body mass) and carbohydrates.

Also, some diseases can require a higher calorie intake due to the pathological process they induce. For example, high-calorie diets are recommended for people with anorexia nervosa, cystic fibrosis, pancreatitis and certain forms of cancer.

Religious beliefs

Different religions affect people's food choices in different ways. They usually have a number of occasions which are celebrated in a specific way. Many religions state rules for their followers – in the past, this was often dictated by the climate and health. For example, meat was not eaten as it could carry parasites (little worms which can cause diseases). Today, many of these rules have been established a long time ago.

So, how can religion affect people's food choices?

- It can state a list of allowed and forbidden foods.
- It can establish holidays during which certain food is eaten.
- It can dictate fasting periods.
- It can determine the time of meals.

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The table below shows how dietary rules differ in Hinduism, Islam and Judaism.

	Allowed and forbidden foods	Holidays	Fasting periods
Hinduism	<ul style="list-style-type: none"> Beef cannot be eaten Many Hindus are vegetarian In certain types of Hinduism, consumption of eggs is also forbidden Also, onion, garlic and alcohol are forbidden 	Holi, Diwali	<p>In different varieties, Hinduism people fast on either Mondays, Thursdays or Saturdays.</p> <p>nine days of fasting take place during Navaratri.</p>
Islam	<ul style="list-style-type: none"> Only halal foods can be eaten Animals have to be slaughtered in a special way Pork and alcohol are strictly forbidden Also, blood cannot be eaten – during slaughter, blood is completely drained from the carcass 	Eid al-Fitr (feast celebrating the end of Ramadan), Tashriq	<p>Ramadan is a month long fasting period when, during the day, Muslims cannot eat or drink or generally anything in their mouth.</p> <p>Muslims can also choose to fast on Mondays and Thursdays every week of the year.</p>
Judaism	<ul style="list-style-type: none"> Only kosher foods can be eaten Animals are killed in a special ritual Pork and shellfish are forbidden meat and dairy cannot be eaten, or even stored, together 	Rosh Hashanah, Passover	<p>Yom Kippur – involves fasting for 25 hours (from dawn to dusk the next day)</p> <p>Tisha B'Av</p>

As you can see, the dietary requirements of a religion differ more or less significantly from a meal or a diet for Muslim, Jew or Hindu. When you need to take into account the food you are shopping, you also need to take into account the religion to whether the food was produced in an appropriate way. For Muslims it has to be labelled as halal and for Jews it needs to be kosher.

Apply

Look up a traditional Scottish breakfast and decide if it is suitable for Hindus, Muslims and Jews.

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Check your understanding: Nutritional and different groups of people

- Which one of the following has to be avoided by a coeliac? (1 mark)
 - rice ☐
 - barley ☐
 - amaranth ☐
 - buckwheat ☐
- Which one of the following has to be supplemented by a weight lifter?
 - carbohydrates ☐
 - fats ☐
 - protein ☐
 - sugars ☐
- Prevention of rickets in children involves (1 mark)
 - high consumption of vitamin D and magnesium ☐
 - high consumption of vitamin D and calcium ☐
 - limited consumption of vitamin D and magnesium ☐
 - limited consumption of vitamin D and calcium ☐
- List 5 nutrients required by teenagers in higher amounts, and give one reason for each.

Nutrient	

- Explain two changes in a diet for adults to prevent diet-related diseases.

-
.....
.....
-
.....
.....

- Evaluate the impact of a vegan diet on health. (6 marks)

-

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Major diet-related health issues

An imbalanced diet can cause many different health conditions. Some of them are related to diet only, while some are more serious and might require medical attention. In this section, we will look at the current biggest public health issues in the UK, and how to modify the diet to help alleviate symptoms.

Obesity

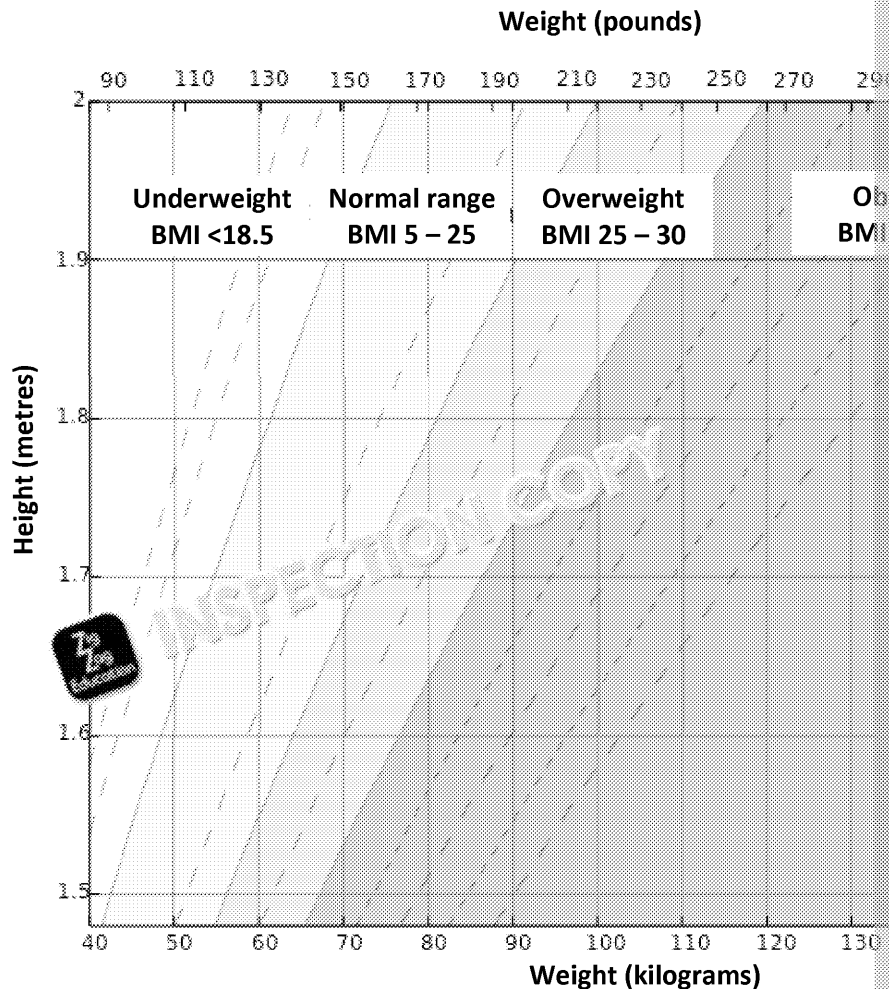
Obesity and overweight are the most common conditions in British society. Sadly, more and more people are suffering from obesity, and the number is still growing – it is predicted that over 70% of the population will be overweight or obese by 2034. Nearly 32% of children suffer from either overweight or obesity (NHS, 2015). Childhood obesity is a special concern since it is known that obese children become obese adults.

Overweight and obesity can be easily judged using the body mass index.

Body mass index = body mass in kilograms / height in metres

BMI < 18.5	Underweight
18.51–25.0	Normal body weight
25.01–29.9	Overweight
>30.0	Obese

You can also observe how the BMI is shaped for people of different height and weight.

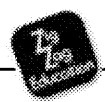


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What are the causes?	<ul style="list-style-type: none"> eating too much little or no physical activity hormonal disorders some medication
What are the effects?	<ul style="list-style-type: none"> increased risk of developing glucose intolerance, insulin type 2 diabetes increased risk of heart failure and other cardiovascular diseases increased blood cholesterol levels joint and back pains depression, social isolation
How do nutritional needs change?	<ul style="list-style-type: none"> decrease in energy intake increase in micronutrient intake increase in physical activity increase in dietary fibre

Apply



Modify the recipe for traditional fish and chips to meet the needs of an obese person. Amend both the ingredients and the cooking methods.

Cardiovascular health

Nutrition has a huge impact on the proper performance of cardiovascular system. Lack of physical activity, increases the risk of atherosclerosis, heart attack or stroke.

Too much cholesterol	Atherosclerosis, Coronary Heart Disease
Too much salt	High blood pressure (hypertension)
Too little vitamins	Weak blood vessels, bruises and varicose veins

Examples of how food affects cardiovascular system

Atherosclerosis is a condition where cholesterol plaque accumulates on blood vessel walls, making them stiffen and narrow. In advanced atherosclerosis the plaque can close the vessels. The most dangerous are those in the brain and heart, because they may irreversibly damage the organs and lead to sudden death.

Arteriosclerotic Vascular Disease (Atherosclerosis)

1 Healthy artery with normal blood flow.

2 Atheroma: Intracellular lipid accumulation.

3 Fibroatheroma: Multiple lipid cores.

4 Thrombosis: Arterial surface defect. Likely haematoma-haemorrhage.

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If the plaque mostly accumulates in the veins of the heart, it may cause chest pain. This condition is called **coronary heart disease (CHD)** and is a serious condition that is more common in men than women, and in people over 50 than younger people. Since every year in the UK alone, it is best to closely monitor and treat it as soon as possible with daily aspirin intake and changing diet.

Increase	Decrease
Physical activity	Amount of total fat, saturated fat and trans fat consumed
Amount of fibre consumed	Amount of energy consumed
Amount of polysaccharides & whole grains consumed	Amount of sugars consumed
Amount of antioxidants consumed	Stop or give up smoking
Omega-3 fatty acids (from fish and fish oil)	Lose weight

Changes in diet to reduce atherosclerosis and coronary heart disease

Another condition that affects the cardiovascular system is high blood pressure. It is caused by too much of sodium in the diet, either from improper diet or kidney issues. A normal person's blood pressure is around 120/80 mm Hg – the lower number being an indicator of blood pressure when the heart is relaxed and the higher when it is contracted. If these numbers are higher than 140/90 mm Hg, it is considered high blood pressure. Untreated hypertension can trigger an avalanche of health issues:

- damage to the heart, brain, kidneys and eyes
- increased risk of heart failure and stroke
- can lead to kidney failure
- can lead to premature death

The main symptoms of hypertension include sweatiness, dizziness, trouble breathing, ringing or high pitched noises in your ear), speedy heartbeat and problems sleeping. Changes in diet can help to undo the negative effects of hypertension.

Increase	Decrease
Vitamin C, calcium- and potassium-rich foods	Salt
Amount of garlic consumed	Salty snacks, meats and processed foods
Fresh food	Ready-to-eat foods and processed foods
Whole grains and fibre-rich food	Coffee and alcohol
Physical activity	Processed food

Changes in diet to reduce hypertension



Things to think about

Discuss the different ways of lowering fat and salt intake in a diet.

It may be worth remembering that omega-3 fatty acids and phytosterols (substances that are similar to cholesterol and are naturally present in some plant foods) may help to lower cholesterol levels, decrease the levels of low-density cholesterol (LDL), increase the levels of high-density lipoprotein (HDL) to minimise the risk of cardiovascular disease.

You can learn more about omega-3 fatty acids in the Course Companion for Area 4 – Where food comes from and about phytosterols in the Course Companion for Area 5 – Where food comes from.

Research

Find three foods which provide omega-3 fatty acids and phytosterols in a diet.

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Type 2 diabetes

Diabetes mellitus, or **type 2 diabetes**, is one of the most common chronic diseases. It affects nearly 60 million people in Europe, and is rapidly growing. Diabetes is primarily a result of the poor performance of a hormone produced by the pancreas – insulin. Insulin helps transport glucose into the cells. If it works incorrectly, or there is not enough insulin, the blood sugar level grows too high. This can damage the blood and attack cells and tissues, not knowing how to enter them. This has a true impact on the body organs.

What are the causes?

- improper performance or amount of insulin
- obesity and overweight
- lack of physical activity
- unbalanced, high sugar and high-fat diet
- lack of fibre

What are the effects?

- blindness (diabetic retinopathy) – sugar damages the blood vessels in the eyes
- heart attack
- kidney failure (diabetic nephropathy) – sugar damages the blood vessels in the kidneys
- stroke
- limb amputations (diabetic neuropathy) – sugar damages the nerves in the limbs, leading to lesions, which, if untreated, may lead to serious conditions that require a limb amputation
- pregnancy complications –for both the mother and the baby

How do nutritional needs change?

- a balanced diet has to be provided
- five or six meals a day
- limited amount of sugar (ideally none)
- weight loss
- increase physical activity

Research

Find out more about diabetes on zzed.uk/8256-idf

Apply



Plan a daily menu for a 65-year-old woman suffering from obesity and type 2 diabetes.

List the products that should not be used.

List the rules that the menu should follow. These can include cooking techniques, choice of ingredients or dietary supplements.

Apply

Plan a daily menu for a man suffering from hypertension.

List the products that should not be used.

List at least three rules that the menu should follow. These can include cooking techniques, choice of ingredients or dietary supplements.

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Bone health

Bones require calcium, phosphorus and vitamin D to remain healthy and strong. Lack of any of these micronutrients can lead to either **rickets** (in children) or **osteoporosis** (in adults). These diseases are characterised by soft, easy-to-break bones, which also heal slowly and don't grow properly, and this affects body posture and ability to move.

What are the causes?	<ul style="list-style-type: none"> • too little vitamin D • too little calcium • too little phosphorus
What are the effects?	<ul style="list-style-type: none"> • soft and brittle bones • breaks and fractures of the bones • prolonged healing of the fractures • improper growth of the bones • improper body posture • impaired ability to move
How do nutritional needs change?	<ul style="list-style-type: none"> • increase in vitamin D • increase in calcium • increased consumption of milk, dairy, nuts and fish • decreased need for phosphorus (because it improves bone density)

Did you know?

Many adults suffer from lactose intolerance, and for that reason the calcium in their diet cannot be provided by milk or dairy products.



Apply

Using the source provided, plan two calcium-rich meals that are dairy-free.

Apply

The latest recommendations for free sugar intake state that it should provide less than 10% of total energy intake. Plan a daily diet for a teenager to meet these recommendations.

Research

Find out about non-dairy, calcium-rich foods at [zzed.uk/8256-calcium](https://www.zzed.uk/8256-calcium)

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Dental caries

Teeth, just like bones, need calcium, phosphorus and vitamin D to grow properly and strengthen the enamel, which protects the teeth from bacteria and acids.

Bacteria in the mouth accumulate on teeth and form plaque. They then transform into acids which damage the enamel and cause tooth decay and premature tooth loss. To protect their teeth at least twice a day, and use mouthwash and dental floss. Yearly check-ups are also recommended to ensure that everything is okay or to spot and treat any problems before they avoid further damage.

Remember that too much fluoride is also harmful, as it causes the tooth enamel to become brittle and damage.

<p>What are the causes of dental caries?</p>	<p>lack of adequate vitamin D, calcium and phosphorus</p> <ul style="list-style-type: none"> • too little or too much fluoride • too much sugar in the diet • improper dental hygiene
<p>What are the effects?</p>	<ul style="list-style-type: none"> • tooth decay • tooth loss • brittle, fragile enamel
<p>How do nutritional needs change?</p>	<ul style="list-style-type: none"> • increase consumption of milk, dairy, nuts and fish • carry out a proper dental hygiene routine • avoid sugar and sugary foods and beverages

Apply

Plan a daily meal plan for a six-year-old to support their dental health. Remember to consider the age of your consumers.



Advanced dental plaque and dental caries

Did you know?

According to the NHS, 50% of five-year-olds have decayed teeth.

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Iron deficiency anaemia

Iron plays a crucial role in building haemoglobin – the colourful compound of red blood cells that carries oxygen to the tissues all around the body. If there is not enough iron, red blood cells cannot be made properly, leading to **anaemia** (literally ‘lack of blood’). Iron deficiency isn’t usually dangerous, but may affect your quality of life. Untreated anaemia can lead to loss of immunity and higher susceptibility to infections. It can also increase the risk of certain complications during and after birth in pregnant women.

Iron occurs in foods in two forms: haem iron (in animal-derived foods) and non-haem iron (in plant-derived foods). Haem iron is absorbed the same way as the iron in our bodies, and, therefore, it is absorbed more easily than non-haem iron. Nevertheless, iron absorption can be increased by vitamin C. For example, meat served with a salad!

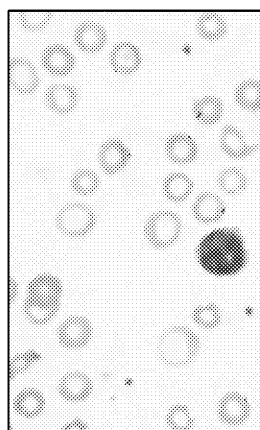
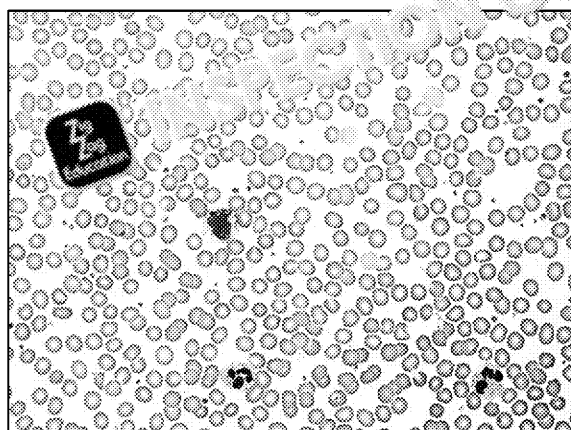
<p>What are the causes?</p>	<p>• not eating enough iron-rich foods • not taking enough iron supplements • too little vitamin C</p>
<p>What are the effects?</p>	<ul style="list-style-type: none"> • pale complexion (skin colour) • tiredness • speedy, accelerated heartbeat • shortness (lack) of breath • hair loss
<p>How do nutritional needs change?</p>	<ul style="list-style-type: none"> • increase consumption of iron-rich foods such as meat, fish and eggs • eat more leafy green vegetables such as spinach • choose iron-fortified products such as cereals, flour and bread • eat more fruits and vegetables to improve iron absorption

Did you know?

Teenage girls and women of childbearing age are at higher risk of developing iron deficiency anaemia due to blood loss caused by menstruation and childbirth.

Apply

Plan a diet for a teenage girl that will help her maintain the iron levels in her body.



You can see that in anaemia (right) there are fewer red blood cells in the blood than in a healthy person (left).

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[illegible]

1. Inability of the digestive system to digest certain foods, e.g. lactose. (11)
2. Macronutrient supplemented in a diet for weightlifters to support muscle repair. (12)
3. High levels of this substance can cause atherosclerosis. (11)
4. A child aged between one and three years old. (7)
5. A condition caused by an inadequate or unbalanced diet. (12)
6. Health condition caused by iron deficiency. (7)
7. Macronutrient that constitutes up to 70% of a marathon runner's diet. (13)
8. Condition in which blood sugar levels are elevated. (8)
9. Brittle bone disease often associated with the elderly. (2)
10. Cardiovascular condition caused by high sodium intake. (12)
11. A person who doesn't eat any products of animal origin. (5)
12. A month-long fasting period in a religion. (7)
13. A term given when BMI is higher than 30 kg/m². (7)
14. A reaction of the immune system to a food or other factor, e.g. nuts. (7)



Answers – Diet and good health

Energy requirements of individuals

Check your understanding

1) D 2) D 3) C (1 mark for each correct, max. 3 marks)

4) 1 mark for each correct from: (1 mark for each correct, max. 4 marks)

- height
- weight
- age
- sex

Do NOT accept 'gender' instead of 'sex', as these are different categories and should not be confused.

5) Indicative content: (1 mark for the correct statement, 1 mark for a relevant explanation)

- **Statement:** The energy needs do not change in the last three months of the pregnancy during breastfeeding.
- **Explanation:** This is because the woman needs to provide the energy both for herself and the baby. During breastfeeding, the woman needs more energy because she is producing a large amount of milk for the baby.

OR

- **Statement:** The energy needs do not change during the first six months of pregnancy.
- **Explanation:** This is because the requirements of the foetus are very small and are covered by a healthy, balanced diet without the need to increase energy intake.

6) Any three from: (1 mark for each correct, with or without description, max. 3 marks)

- Physical activity helps to increase the amount of muscle tissue in the body. As muscle weight can increase due to the larger amount of muscle tissue in the body.
- Physical activity helps to use the energy stored in the adipose (fatty) tissue, leading to weight loss.
- Physical activity can lead to a change in body composition – there will be more muscle tissue.
- Physical activity lowers the risk of cardiovascular disease / hypertension / stroke.
- Physical activity lowers the risk of obesity/overweight.
- Physical activity lowers the risk of type 2 diabetes.
- Or any other relevant answer.

How to plan balanced diet

Things to think about (p. 12)

There are a few common points between the two guidelines.

Similarities:

- both stress the importance of starchy foods, vegetables and fruit in the diet
- both underline the role of hydration in maintaining health
- both point out the importance of food labelling, e.g. in the form of traffic light systems

Differences:

- the eight tips for healthy eating do not include guidance on physical activity, which is a key part of a healthy lifestyle
- the eight tips also underline the importance of fish for a healthy diet
- the eight tips also pay attention to breakfast as the most important meal of the day

In general, students should note that the Eatwell Guide refers mainly to the five groups of food, which are more general and apply to other aspects of nutrition.

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Things to think about (p. 15)

- Lowering the amount of fat can help to prevent overweight and obesity, and to decrease the risk of coronary heart disease, type 2 diabetes, and even digestive issues (e.g. stomach and liver).
- Substituting sugar with xylitol helps to lower the risk of obesity and type 2 diabetes.
- Substituting whole milk with skimmed milk lowers the total fat intake in the diet.
- Grilling can help to lower the total calorie/fat intake.
- Increasing the amount of fibre helps to prevent constipation, diarrhoea, diverticular disease, and lowers the risk of type 2 diabetes and obesity.
- Lowering the amount of salt helps to reduce the risk of hypertension.

Check your understanding

1) C 2) A 3) B (1 mark for each correct, max. 3 marks)

- 4) 1 mark for each correctly identified mineral and vitamin (max. 2 marks)
 1 mark for each correctly identified function for these mineral/vitamin (max. 2 marks)
 Students MUST identify one mineral and one vitamin. Only one function for each.

	Name	Function
Vitamins	Vitamin A (retinol)	Functions include supporting healthy eyesight.
	Vitamin B1 (thiamine)	Functions include helping to release energy from food and supporting the nervous system.
	Vitamin B2 (riboflavin)	Functions include helping to release energy from food and supporting the mucous membranes and the nervous system.
	Vitamin B3 (niacin)	Functions include helping to release energy from food and improve blood circulation and alleviate inflammation.
	Vitamin B9 (folic acid)	Functions include supporting production of red blood cells and preventing spina bifida disease in newborns.
	Vitamin C (ascorbic acid)	Functions include improving absorption of iron from food, supporting tissue and boosting immunity.
Minerals	Iron (non-haem)	Functions include building haemoglobin and transporting oxygen in the blood.
	Potassium	Functions include maintaining a healthy blood pressure and supporting nerve function.
	Phosphorus	Functions include building healthy bones and teeth and supporting energy production.
	Fluoride (depending on the soil quality)	Functions include strengthening the teeth, helping to prevent dental caries.
	Calcium	Functions include building healthy bones and teeth, supporting blood pressure, and sending impulses in the muscles.

Other suitable answers may be accepted.

- 5) Any two from: (1 mark for each correct, max. 2 marks)
- To lower the risk of coronary heart disease
 - To lower the risk of obesity
 - To lower the risk of type 2 diabetes
 - To reduce the risk of atherosclerosis
 - To reduce the risk of stroke
 - To reduce the risk of heart failure
 - Or any other suitable answer.
- 6) Any five from: (1 mark for each correct, max. 5 marks)
- Starchy foods are a source of complex carbohydrates.
 - Both dietary guidelines (the Eatwell Guide and the eight tips for healthy eating) state that starchy foods should be a basic component of a healthy diet.
 - Starchy foods should provide around 30% of a healthy, balanced diet; complex carbohydrates should provide around 50% of daily energy requirements.
 - Complex carbohydrates are broken down in the digestive system into glucose, which means that they are slowly released into the bloodstream and don't provide satiety for longer.
 - Starchy foods are also a source of dietary fibre.
 - Dietary fibre is necessary for a number of reasons: it helps to regulate bowel function, prevent constipation and diarrhoea, and helps to prevent bowel cancer and diverticular disease.
 - Dietary fibre also helps to lower the blood sugar and cholesterol levels, help to prevent atherosclerosis / coronary heart disease.
 - Starchy foods provide group B vitamins, especially thiamine, riboflavin, niacin, which are necessary for releasing energy from foods in the cells.
 - Or any other suitable answer.

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The relationship between diet and health

Nutritional and dietary needs of different groups of people

Things to think about (p. 22)

Folic acid (folate) is necessary to prevent spinal cord defects in the foetus (spina bifida), form the skin and tissues of the foetus, excess vitamin A can be harmful for the baby, and in the early stages of pregnancy. For this reason, vitamin A consumption needs to be controlled.

Check your understanding:

- 1) B 2) C 3) B (1 mark for each correct, max. 3 marks)
- 4) Any two from: (1 mark for each correct row, max. 2 marks); only one source for each nutrient

Nutrient	Source
Calcium	Milk and dairy, leafy green vegetables, almonds and other nuts, cereals, fish eaten with the bones
Vitamin D	Milk and dairy, egg yolk, oily fish and fish oil, fortified fat spreads
Dietary fibre	Vegetables and fruit, cereals, wholemeal products
Iron	Red meat, poultry, liver, egg yolk, leafy green vegetables, dairy products and cereals
Protein	Meat, poultry, fish, eggs, soya, quinoa, Quorn™, textured vegetable protein. Protein can be complemented by combining various plant foods such as chickpeas with beans, etc.

Other suitable answers may be accepted.

- 5) Any two from: (1 mark for each change suggested, 1 mark for a relevant explanation)

Dietary change	Explanation
Limiting the energy/calorie content of food	Adults need less energy than younger people, and their level of physical activity is lower, so the energy content of food helps to avoid overeating and diseases related to them.
Limiting consumption of sugars	This can help to reduce the risk of developing obesity and type 2 diabetes.
Limiting consumption of salt	This can help to reduce the risk of developing high blood pressure and diseases (e.g. stroke).
Increasing consumption of milk and dairy, and oily fish	Milk, dairy products and fish are a source of calcium and vitamin D, which help to prevent osteoporosis in the elderly.
Increasing consumption of iron-rich foods such as red meat, offal, eggs, leafy green vegetables, fortified foods	This may help to prevent iron deficiency anaemia, especially in childbearing age.
Limiting consumption of saturated fats and trans fats, e.g. from fast foods, sweets, cakes, crisps, etc.	This may help to reduce the risk of obesity, coronary heart disease, heart attack and stroke.

Other suitable answers may be accepted.

- 6) The answer includes a reference to the health consequences of a vegan diet: (2 marks for each point described, 4 marks for each description/simple statement, max. 8 marks)

- Vegans cannot eat any product of animal origin, e.g. meat, fish, milk, eggs, dairy products, lard. For this reason, a vegan diet can be low in complete protein (unless it is supplemented), iron (iron from plant foods is absorbed less well than from animal sources), vitamin B12 (it only occurs in animal foods), vitamin D (unless high exposure to sunlight is achieved), and omega-3 fatty acids.
- A vegan diet is very rich in vegetables and fruit. Vegetables and fruit are a source of fibre, vitamins, vitamin C, beta carotene, vitamin K and vitamin E.
- High consumption of dietary fibre is generally positive, as it helps to control appetite, prevents satiety, and prevents obesity, type 2 diabetes and high blood cholesterol levels.
- However, if not enough water is drunk, high levels of fibre can lead to constipation.
- An unbalanced vegan diet can have various health consequences, such as iron deficiency anaemia, osteoporosis, pernicious anaemia and general malnutrition.
- On the other hand, a properly balanced vegan diet can bring various health benefits.

Other suitable answers may be accepted.

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Major diet-related health issues

Things to think about (p. 33)

- Fat intake can be lowered by adjusting cooking methods (e.g. steaming, boiling, baking or deep-frying). Fat intake can also be lowered by choosing lean meat, low-fat dairy products, e.g. baked potato crisps instead of fried ones.
- Salt intake can be lowered, e.g. by preparing food at home, using fresh ingredients, limiting the use of tinned and canned foods, adding salt to food only at the end of cooking, with herbs and spices, etc.

Check your understanding

- 1) D 2) C 3) D (1 mark for each correct, max. 3 marks)

- 4) Any two from: (1 mark for each correct row, max. 2 marks) the answer only needs to be correct for each nutrient.

Nutrient	Source
Calcium	Milk and dairy products, almonds and other nuts, seeds, fortified cereals, fortified bread and cereals
Fluoride	Toothpaste and mouthwash, black tea, fluoridised water (if the soil is fluoride-rich), fish
Vitamin D	Oily fish and fish oil, egg yolk, milk and dairy, fortified cereals, as a result of exposure to sunshine
Phosphorus	Milk and dairy, cereals, nuts and seeds, meat, fish

- 5) Any two from: (1 mark for each correct, max. 2 marks)
- glucose intolerance
 - insulin resistance
 - hyperglycaemia
 - type 2 diabetes
 - heart failure
 - cardiovascular disease
 - stroke
 - coronary heart disease
 - hypertension
 - heart attack
 - increased blood cholesterol
 - joint and back pain
 - depression
 - or any other suitable answer

- 6) The answer includes a reference to six from: (1 mark for each correct, max. 6 marks)
- Diet provides nutrients, which are necessary to stay alive and maintain health.
 - Malnutrition can lead to many health complications, to include underweight and obesity.
 - If a person does not eat enough, he/she is likely to lose weight and develop a metabolic disorder, feeling weak, feeling cold and loss of fertility.
 - If a person eats too much food in general, he/she is likely to gain weight and become obese.
 - Eating too much total fat / saturated fat / trans fat is a risk factor for cardiovascular disease and hypertension.
 - Eating too few omega-3 fatty acids affects the heart, while eating the correct amount protects the heart.
 - Eating too much sugar can lead to obesity, type 2 diabetes and tooth decay.
 - High intake of saturated fat and sugar means that there is an energy excess which will be stored as fat. This will also increase the amount of cholesterol in the blood.
 - Cholesterol in the blood can bind with calcium and other substances and form plaques that accumulate on blood vessel walls.
 - Cholesterol plaque in the arteries is called atherosclerosis and causes the blood vessels to narrow. If left untreated, this can cause heart attack or stroke.
 - High consumption of salt leads to hypertension. Hypertension can also lead to heart disease.
 - Heart disease is one of the major causes of death in the British population. It can be prevented by a healthy, balanced diet and increasing physical activity.

Other correct examples can be accepted.

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Quiz-ine

1. Intolerance
2. Protein
3. Cholesterol
4. Toddler
5. Malnutrition
6. Anaemia
7. Carbohydrates
8. Diabetes
9. Osteoporosis
10. Hypertension
11. Vegan
12. Ramadan
13. Obesity
14. Allergy

The shaded squares reveal the following conditions: **celiac disease**



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