



Section 1: Diet

• What is a healthy diet?

Your diet is made up of everything you eat. In order to stay healthy it is important to eat different types of food because they supply us with the nutrients and energy we need to stay alive. A healthy diet will contain a mix of carbohydrates, proteins, fats, vitamins, minerals, fibre and water.

- Carbohydrates and fats provide us with our daily energy needs. Carbohydrates are found in foods like bread, rice and pasta, while fats are found in foods like butter, meat and cheese.
- Protein is important for our growth and for repair to damaged tissues. Protein is found in meat, fish and pulses.
- Fruit and vegetables contain vitamins and minerals that keep our bodies functioning properly. A lack of fruit and vegetables in your diet can lead to conditions such as anaemia (low blood cell levels) or scurvy (bleeding gums and internal bleeding).
- Fibre (roughage) is essential for keeping the intestines working properly, as it bulks out food as it passes through. It prevents the development of constipation.
- Water makes up two thirds of your body mass and is essential for cell function, as well as helping to get rid of waste and regulating body temperature. If you eat a healthy diet, around 20% of your water intake will come via food.

• Suggested Films

- **Balanced Diet**
- **Healthy Beauty**

• What are the five major food groups?

All the food we eat can be placed into one of five groups. These five groups should be eaten in different proportions to ensure a healthy, balanced diet.

A third of your diet should contain:

- Starchy foods – these contain carbohydrates, fibre, and some vitamins and minerals. They are found in bread, rice, potatoes and pasta. Choosing wholegrain or wholemeal provides more fibre, vitamins and minerals than white or 'refined' types.
- Fruit and vegetables – these are an essential source of vitamins and minerals. Eating at least five portions of fruit and vegetables a day is linked to a lowered risk of heart disease, stroke and some cancers.

A fifth of your diet should contain:

- Dairy foods – these include milk, cheese and yoghurt, and contain proteins and the mineral calcium which helps keep bones healthy. They also contain fats, some of which are saturated. Eating too much saturated fat is linked to increased cholesterol and risk of heart disease, so it is better to use low-fat dairy products.

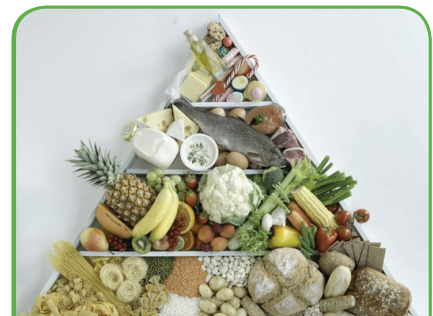


A healthy diet consists of different types of food and the right amount of nutrients

Extension Question

Q1. Are all fats bad?

Fat is an important and necessary part of a healthy diet, but you should think about which fat you eat, as well as how much. Animal fats such as butter contain saturated fats, which raise cholesterol in the blood and should be eaten in moderation. Plant oils, such as olive oil, contain unsaturated fats which tend to lower cholesterol in the blood.



All the food we eat can be placed into one of five groups

An eighth of your diet should contain:

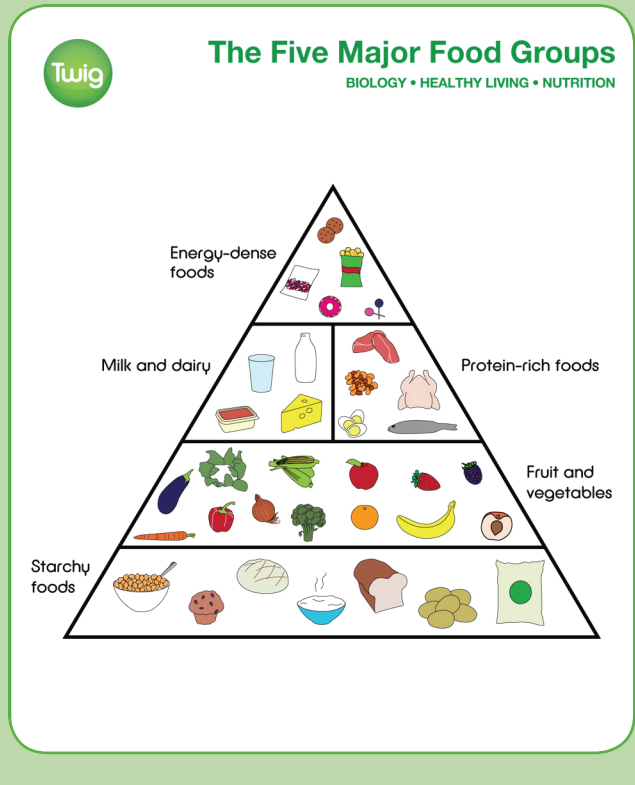
- Protein-containing foods – these are also a good source of vitamins and minerals. Fish is an important source of protein, and oily fish is also rich in omega-3 fatty acids which are linked to many health benefits. You should try to eat at least two portions of fish a week, including one portion of oily fish. If you are a vegetarian, beans, nuts and seeds are a good way to get protein into your diet.

A small proportion of your diet should contain:

- Fats and sugars – these are a good source of energy, but if we eat too much of either then they are stored in the body as fat. This can lead to extreme weight gain (obesity), which increases the likelihood of developing type 2 diabetes, heart disease and some cancers.

- **Suggested Film**
- **Balanced Diet**

DIAGRAM 01:



• How do diets differ around the world?

A person's diet is influenced by where they live, the climate, the natural environment and cultural habits. However, what all cultures have in common is the reliance on a 'staple food' which is the major source of nutrition and energy. Common staple foods are wheat, corn, potatoes and rice and are all sources of carbohydrates.

Rice is the most popular staple food and feeds half the world's population, mostly in Asia. Wheat comes second and is mostly eaten in Europe, the Middle East and North Africa. Countries in Latin America, Western and Central Africa, and Southern China eat corn (maize), which makes it the third most consumed staple food globally.

Extension Question

Q2. How has globalisation changed traditional diets?

Increasing wealth in emerging economies has led to a growth in the number of people who can afford to eat a diet rich in protein and fats, where previously they would have eaten much more fruit, vegetables and staple carbohydrates. This has raised prices for meat around the world. Cases of obesity have risen very sharply in countries like China where it was previously unknown, particularly amongst the young.

- **Suggested Film**
- **Balanced Diet**

Section 2: Growth and Development

• What diet does a baby need?



A pregnant woman needs to consider the effect of her diet on her unborn child

Even before a baby is born, a pregnant woman needs to consider the effect of her diet on her unborn child. During pregnancy, only 300 additional calories are needed each day. Excessive weight gain by the mother can lead to complications during the pregnancy and labour, and may influence childhood obesity.

Up until the age of six months, babies can get all of their nutritional needs purely from milk. Breast milk contains all of the nutrients a growing baby needs, as well as passing on antibodies from the mother to help their immune system develop. Formula milk can be used, although it is harder for the baby's stomach to digest. It is important not to overfeed babies, as excess weight by the age of four months is linked to obesity and associated diseases in child and adulthood.

From the age of six months, babies can start to be weaned on to solid foods. Up until this age, the digestive system of a baby is still developing and introducing solids too early can lead to an increased risk of infections and allergies.

• Suggested Film
- Life Cycle Nutrition

• Why are teenagers always hungry?

Growth accelerates at the onset of puberty and generally stops in the late teens as growth plates fuse. Girls will start their growth spurt earlier than boys, but boys grow faster, which is why men are usually taller than women. Muscle bulk also increases, especially in boys. This means the body requires a great deal of energy and this is reflected in a vastly increased appetite. Teens that get their calories from fatty or sugary foods will not get the nutrients that are also vital at this time. It is important to combine regular, balanced meals with exercise to encourage overall fitness.

• Suggested Film
- Life Cycle Nutrition

DIAGRAM 02:



Recommended Daily Calorie Intake

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Recommended Daily Calorie Intake				
	Males		Females	
	Activity Level		Activity Level	
Age	Sedentary	Moderate	Sedentary	Moderate
2	1000	1000	1000	1000
3	1000	1400	1000	1200
4-5	1200	1400	1200	1400
6	1400	1600	1200	1400
7	1400	1600	1200	1600
8	1400	1600	1400	1600
9	1600	1800	1400	1600
10	1600	1800	1400	1800
11	1800	2000	1600	1800
12	1800	2200	1600	2000
13	2000	2200	1600	2000
14	2000	2400	1800	2000
15	2200	2600	1800	2000
16-18	2400	2800	1800	2000
19-20	2600	2800	2000	2200
21-25	2400	2800	2000	2200
26-40	2400	2600	1800	2000
41-45	2200	2600	1800	2000
46-50	2200	2400	1800	2000
51-60	2200	2400	1600	1800
61-65	2000	2400	1600	1800
66 and +	2000	2200	1600	1800

• How do dietary needs change in old age?

As we age, we still need to eat the same amounts of protein, vitamins and minerals, and fibre, but a reduction in metabolic rate, physical activity and body mass means that the energy requirements of the elderly are much less. Although it is always advisable to cut down on dietary fat, it is not always appropriate if someone is frail, has lost a lot of weight, or has a small appetite. In fact, under these circumstances, additional fat can help with much needed weight gain.

A decline in physical mobility in old age can lead to constipation and other bowel problems, so it is important for the elderly to eat foods high in fibre, such as fruit and vegetables. Drinking plenty of fluid will also help. Getting enough fluid will also prevent drowsiness and confusion. Dehydration can be a problem in old age as older people are not as aware of the feeling of thirst as those who are younger, due to decreased coordination of sensory signals from the brain and body.



The energy requirements of the elderly are less, due to a reduction in metabolic rate

- Suggested Film
 - Life Cycle Nutrition

Section 3: Health Problems

• What if you don't get enough of a nutrient?

If your diet regularly lacks recommended nutrients, you are at risk of developing nutritional deficiencies and associated health problems.

- Anaemia is a common disorder which can result from a lack of iron. Its symptoms include tiredness, shortness of breath and heart palpitations. It is usually treated with iron tablets.
- Scurvy is caused by a lack of vitamin C (ascorbic acid) and its symptoms include tiredness, gum disease and internal bleeding. Untreated scurvy causes death, but eating foods rich in vitamin C, such as oranges, lemons and broccoli, prevents it.
- Vitamin D is necessary for the gut to absorb calcium properly. Vitamin D deficiency in children leads to the development of rickets, a softening of the bones that can result in long-term deformities of the skeleton. Treatment includes an increase in dietary calcium, phosphates and vitamin D, as well as increased exposure to sunshine.
- Pellagra results from too little vitamin B₃ (niacin) and affects the digestive system, skin and nerves. It was initially thought that pellagra was an infectious disease, but Dr Joseph Goldberger carried out several years of research in the early 1900s to prove that it was a vitamin deficiency, which could be easily treated with an increased dietary intake of vitamin B₃.



Vitamins have huge effects on health, therefore it is important you get the right amount

Extension Question

Q3. What are food supplements?

Some people take food supplements to provide missing or additional nutrients, including vitamins, minerals or fibre. Food supplements can be taken as tablets, liquids or made up into solutions, and are classified variously as foods, drugs or natural health products depending on the country they are sold in.

- Suggested Films
 - Malnutrition
 - Vitamin Deficiencies

• Why is it unhealthy to be too thin?

Just as weighing too much can be bad for your health, so can being underweight. If your Body Mass Index (BMI) is below 18.5, it may be an indication that your weight is too low. To calculate BMI, divide weight (kg) by height (m²).

There are many reasons why people are underweight. It may be due to an underlying medical problem or it may be that you are not getting enough calories in your diet. Whatever the reason, being underweight can have a profoundly negative effect on your health.

A lack of energy-rich food in your diet can lead to feeling unnaturally tired and having poor physical stamina. This may be exacerbated by a lack of oxygen-carrying red blood cells caused by a lack of iron in the diet: this is called anaemia. As well as lacking iron, you may be missing out on other important nutrients such as calcium. Calcium is needed for healthy bone growth and its absence can cause osteoporosis (brittle bone disease) in old age, at which point the damage is irreversible.

Being underweight also interferes with the ability of your immune system to function properly, so you increase your risk of catching infections.

If a woman is too thin, her periods will become irregular or stop entirely (amenorrhoea). This can cause problems with fertility and result in complications during pregnancy.

DIAGRAM 03:

BMI Calculator
BIOLOGY • HEALTHY LIVING • NUTRITION

Weight	lbs	100	105	110	115	120	125	130	135	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215
	Kg	45.5	47.7	50.0	52.3	54.5	56.8	59.1	61.4	63.6	65.9	68.2	70.5	72.7	75.0	77.3	79.5	81.8	84.1	86.4	88.6	90.9	93.2	95.5	97.7
Height	in/cm	Underweight				Healthy				Overweight				Obese				Extremely Obese							
5'0"	152.4	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42
5'1"	154.9	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
5'2"	157.4	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
5'3"	160.0	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
5'4"	162.5	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
5'5"	165.1	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39
5'6"	167.6	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39
5'7"	170.1	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38
5'8"	172.7	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38
5'9"	175.2	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37
5'10"	177.8	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37
5'11"	180.3	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37
6'0"	182.8	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36
6'1"	185.4	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36
6'2"	187.9	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
6'3"	190.5	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
6'4"	193.0	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35

Extension Question

Q4. What is anorexia nervosa?

Anorexia nervosa is a serious mental health condition that is characterised by an obsessive fear of gaining weight. It is often linked to a distorted body image whereby the individual feels that they are overweight. Someone who is anorexic will restrict their diet to around 600-800 calories a day, in comparison to the recommended 2500 calories for men and 2000 calories for women.

• What is malnutrition?

Malnutrition arises when you do not get the right proportion of nutrients in your diet to keep you healthy. It is possible to be obese and malnourished if your diet lacks the right balance of nutrients in the food you eat. Malnutrition also arises when there is a limited range of food to eat. This is different to starvation, which occurs when there is not enough food, of any sort, available. The total lack of food will inevitably lead to malnutrition.

Extension Question

Q5. What impact does childhood malnutrition have?

Generally, if malnutrition occurs in childhood, it leads to a reduction in physical and mental development. It is particularly important for children to get enough protein as they are going through a period of fast growth. If a child lacks sufficient protein in their diet they can develop kwashiorkor. The child will be underweight due to a lack of protein, but they will have an extended abdomen because of fluid accumulating in their stomach, they will also be weak due to poor muscle development. A high-protein diet will improve the child's health but they are likely to have stunted growth.

• Suggested Film - Malnutrition

• Quizzes

Balanced Diet

Basic

• What do we mainly need carbohydrates for?

- A – strong bones
- B – quick-release energy supply
- C – repairing muscles
- D – building up fat

• Which nutrients are used mainly for growth and repair in the body?

- A – proteins
- B – fats
- C – vitamins
- D – minerals

• Which vitamin is needed for healthy bones?

- A – vitamin A
- B – vitamin B
- C – vitamin C
- D – vitamin D

• What shape is often used to show the proportions of different food groups needed for a balanced diet?

- A – pyramid
- B – circle
- C – square
- D – ring

Advanced

• Which of the following contains a lot of protein?

- A – meat and fish
- B – cereals
- C – rice
- D – vegetables

• Iron is important for carrying oxygen around the body in which cells?

- A – white blood cells
- B – fat cells
- C – red blood cells
- D – nerve cells

• Which of the following contains the most calcium?

- A – carbohydrates
- B – milk and dairy products
- C – fruits
- D – cereals

• How much of your diet should be made up of fruit and vegetables?

- A – 1/3
- B – 2/3
- C – 1/5
- D – 1/10

• Answers

Balanced Diet

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