HOME ECONOMICS for CCEA GCSE





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Introduction

This Student's Book has been written to follow the subject content of the CCEA GCSE specification in Home Economics.

GCSE Home Economics is divided into two parts:

- Diet and Health
- Consumer Awareness.

(DIET AND HEALTH

In this part of the course you will develop the knowledge, understanding and skills needed for providing healthy diets for family members throughout life. You will learn that people of different ages have different dietary needs and that food choice is affected by social, economic, environmental, cultural, physiological and psychological factors.

CONSUMER AWARENESS

This part of the course enables you to apply knowledge, understanding and skills as discerning and effective managers of resources. You will learn to recognise how choices can be influenced by personal, social, cultural, economic and environmental factors.

ABOUT THE BOOK

The chapter titles in this book match the list of contents of the GCSE specification. Each chapter begins with a list of its learning outcomes and includes a range of activities, which are designed to help you meet the assessment objectives outlined on page 5. Terms shown in **bold italics** the first time they appear in the text are explained in the Glossary.



The two parts of this course help you to understand the dietary needs of different family members and to become a discerning consumer.

ASSESSMENT

In GCSE Home Economics, students are assessed against three assessment objectives (AO). You must be able to:

- AO1: recall, select and communicate knowledge and understanding of a range of contexts
- AO2: apply skills, knowledge and understanding in a variety of contexts and in planning and carrying out investigations and tasks
- AO3: analyse and evaluate information, sources and evidence, make reasoned judgements and present conclusions.

The skills required to meet these objectives are developed during your two-year GCSE course and are assessed as this table shows.

Content	Assessment	Weighting
Unit 1: Diet and Health and Consumer Awareness	External assessment (compulsory) Format: 1 hour 30 minutes examination (single tier) The examination has two sections: • Section A: Diet and Health • Section B: Consumer Awareness. Both sections include short-answer questions, structured questions and extended-response questions that require extended writing. All questions are compulsory.	40%
Unit 2: Diet and Health (controlled assessment)	Internal assessment (compulsory) Format: One controlled assessment task consisting of: • a planning activity • a practical activity • an evaluation activity.	40%
Unit 3: Consumer Awareness (controlled assessment)	Internal assessment (compulsory) Format: One controlled assessment task including: • identification of issues • research-based activity • primary investigation • conclusions and evaluation.	20%

8 TIPS FOR EATING WELL

The Food Standards Agency has identified '8 tips for eating well'. These are:



The Food Standards Agency suggests that the two keys to a healthy diet are:

- eating the right amount of food for how active you are
- eating a range of foods to ensure you are getting a balanced diet.

ACTIVITY 2

- a Divide into eight groups. Each group will focus on a different one of the '8 tips for eating well'.
- **b** For this activity, you will need to read the Food Standards Agency's leaflet, '8 tips for making healthier choices'. You can download it from

www.food.gov.uk/multimedia/pdfs/eatwell0708.pdf

- **c** In your group, gather information so that you can present the following to the rest of the class:
 - the reason why the tip is important for healthy eating
 - suggestions for putting the tip into practice
 - recipes that could be used, or modified, to meet the advice of the '8 tips for eating well'
 - specific groups of people for whom the tip is particularly relevant, for example, people in certain age stages or people with dietary disorders.
- d Decide what will be the most appropriate method for presenting the information you have collected. You could produce a fact sheet, poster, PowerPoint[®] presentation, information leaflet or note-making grid. It is important that the information you share is accurate and clearly presented.
- e Your group could plan, make and evaluate a meal or a menu which demonstrates how your chosen tip for eating well can be put into practice.

This is the front of the Food Standards Agency's leaflet which explains the tips for eating well. You will need this leaflet for activity 2.



What's in food?

Section A: Diet and Health

In this chapter you will learn about the following nutrients: carbohydrate, fat, protein, minerals (sodium, calcium, iron), vitamins (A, D, B group, C) and water. After studying the chapter, you should be able to:

- identify valuable sources of nutrients and explain the functions of each nutrient
- explain the effects on health of deficiency and excess of each nutrient
- explain the use of Guideline Daily Amounts (GDAs) in planning healthy balanced diets
- discuss these nutrition essentials:
- protein: biological value and complementation
- fat: saturated and unsaturated
- carbohydrate: soluble and insoluble non-starch polysaccharides (NSP)
- vitamins and minerals: links between vitamin C and iron, vitamin D and calcium; factors maximising availability of calcium and iron.

Diet refers to the food we eat or drink. A balanced diet containing food from all sections of the 'eatwell plate' is central to overall good health. In order to plan a balanced diet, it is important to understand that all foods provide a range of nutrients necessary for good health. Poor diet choices can have an adverse impact on health, leading to disorders such as *iron deficiency anaemia, obesity, coronary heart disease, hypertension, diabetes, dental caries* and *osteoporosis*.

This chapter outlines the main functions and sources of the nutrients required for optimal health.

CARBOHYDRATES

The main function of carbohydrate is to provide the body with energy. There are two main types of carbohydrate:

- sugars, which are simple carbohydrates
- starches, which are more *complex carbohydrates*.

The difference between the two types is important. Sugars are absorbed quickly by the body, and raise blood sugar levels rapidly. Starches take longer to digest and absorb. They have a positive impact on keeping blood sugar levels constant.

The body needs a constant supply of carbohydrate to meet its energy requirements. About 50 per cent of dietary energy should come from carbohydrates. If the diet is low in carbohydrate, the body uses protein for energy instead. This then means that less protein is available for the growth and repair of body tissues.

Sugary foods, such as a chocolate caramel bar, and starchy foods, such as pasta, are two different sources of carbohydrate.

Non-starch polysaccharide (NSP)

A third type of carbohydrate is *non-starch polysaccharide (NSP)*. This is found only in plants. Unlike the other carbohydrates, NSP is not absorbed but is needed to keep the digestive system healthy.

There are two main types of NSP: insoluble and soluble. Table 2.1 shows that they have different functions. This means that it is important to eat a variety of foods, rich in both types of NSP, to maximise benefits to health.

Table 2.1: The functions and sources of the two types of non-starch polysaccharides (NSP)



Wholemeal bread and lentil soup are sources of NSP. This meal is also an example of protein complementation, which is explained on page 12.



ACTIVITY 1

When you have studied the whole of this chapter, answer these questions on carbohydrates.

a Complete a glossary for the following diet and health terms:

- sugars
- starches
- non-starch polysaccharide (NSP)
- insoluble NSP
- soluble NSP
- intrinsic sugars
- extrinsic sugars
- milk sugars
- non-milk extrinsic sugars (NMES).
- b How much energy does 1g of carbohydrate provide?
- c Outline the different functions of sugar and starch.
- d Identify the percentage of dietary energy that should be provided by carbohydrate and explain why meeting this target is so important.
- e Why is it important to eat a variety of foods rich in insoluble and soluble NSP?
- f What is the 'protein-sparing effect' of carbohydrate?
- g Why is it important to reduce consumption of non-milk extrinsic sugars (NMES)?

FAT

Butter and lard are sources of saturated fat. A diet high in saturated fat has been associated with raised blood cholesterol levels, which are a risk factor for coronary heart disease. Many studies have shown that unsaturated fats are better for health.

Olive oil is a source of unsaturated fat.

Fat provides the body with a concentrated source of energy. There are two main types of fat:

- Saturated fats, such as butter and lard, are typically solid at room temperature and are mainly found in foods from animal sources.
- *Unsaturated fats,* such as olive oil or sunflower oil, are typically liquid at room temperature and are mainly from plant sources.

Fats are composed of fatty acids. The body can make all of the fatty acids it needs except for two, known as *Omega 3* and *Omega 6*. These are called *essential fatty acids (EFAs)* and must be provided in the diet.





ACTIVITY 2

When you have studied the whole of this chapter, answer these questions on fat.

- a How much energy does 1g of fat provide?
- **b** Outline two differences between saturated and unsaturated fat.
- c Identify two food sources of saturated fat and two food sources of unsaturated fat.
- d Why is it important to include foods rich in Omega 3 and Omega 6 in the diet?
- e Identify two food sources of essential fatty acids (EFAs).
- f State two consequences on health of eating excess fat.

When you have studied the whole of this chapter, answer these questions on protein.

- a How much energy does 1g of protein provide?
- b State three functions of protein.
- c What are amino acids?
- d Describe the difference between dispensable and indispensable amino acids.
- e What is protein quality and why is it so important?
- f List two food sources of LBV and HBV protein.
- g Explain the complementary action of proteins.

All these foods are sources of protein. Proteins from animal sources have a higher biological value than proteins from plant sources. The exceptions to this rule are gelatine, an animal protein with low biological value (LBV), and soya, a plant protein with high biological value (HBV).



Proteins are the basis of body structures such as muscles, skin and hair. They are composed of *amino acids*. The body needs amino acids to produce new body tissues and to repair damaged tissues. Amino acids are classified as:

- dispensable amino acids, which can be produced in the body
- indispensable amino acids, which cannot be made in the body and so must be provided by the diet.

Humans need about twenty amino acids, and about ten of these are indispensable.

The quality of the protein eaten is important and depends on the amino acids that are present. If a food contains all the indispensable amino acids in the approximate proportions required by humans, it is said to have a high biological value (HBV). A food that lacks one or more of the indispensable amino acids is said to have a low biological value (LBV).





Separately, baked beans and toast each have a low biological value. But combining them results in a meal of high biological value.

Complementary action of protein

LBV proteins lack one or more of the indispensable amino acids. This is called the limiting amino acid and it varies in different proteins. When two LBV protein foods, such as a pulse and a cereal, are eaten at a meal (for example, beans on toast, or lentil soup with bread), the amino acids in one food will compensate for the limiting amino acid of the other, resulting in a meal of high biological value. This is known as complementation (the complementary action of proteins).

Complementation is particularly relevant for people who exclude animal products from their diet, for example, vegetarians and *vegans*. As long as these people eat a variety of LBV proteins in combination, the quality of their protein intake can be as good as that of someone who eats HBV foods.

NUTRIENTS AND THEIR ROLES

Nutrients have specific roles in helping to achieve optimal health. Table 2.2 summarises the main functions and sources of carbohydrate, fat and protein and highlights the impact on health of deficiency and excess of these nutrients. It is important to develop your knowledge of this information and to be able to apply it throughout your study of Diet and Health.

Table 2.2: The functions and sources of carbohydrate, fat and protein, and the effects of having too little or too much of them in the diet

Nutrient	Functions	Sources	Deficiency	Excess
Carbohydrate	 Provides energy (1g provides 3.75 <i>kcal</i>) Has protein-sparing effect (so protein is used for growth and repair rather than energy) Non-starch polysaccharides (NSP) help to: prevent constipation lower blood cholesterol levels keep blood sugar levels constant 	 Sugars Intrinsic sugars (found in the cellular structure of foods): in whole fruits and vegetables Extrinsic sugars (not found in the cellular structure of foods): milk sugars in dairy products non-milk extrinsic sugars (NMES) in honey, fruit juices, table sugar, confectionery Starch, in potatoes, bread, rice, pasta 	Low NSP intake is associated with: • constipation • some gut diseases such as diverticulitis and bowel cancer	 Frequent consumption of food and drinks containing NMES can increase risk of dental caries Too much energy (kcal) can lead to excess weight gain and obesity
Fat	 Provides energy (1g provides 9 kcal) Keeps us warm Insulates and protects organs Important in forming structure of body cells Source of fat- soluble vitamins A and D Source of Omega 3 and Omega 6 	 Saturated fat Found in meat, eggs, dairy products, butter Unsaturated fat Found in olive oil, sunflower oil, olives, avocados Essential fatty acids Found in oily fish, margarine, nuts, seeds 	Deficiency is rare	 Can lead to high blood cholesterol levels, a risk factor for coronary heart disease Too much energy (kcal) can lead to excess weight gain and obesity
Protein	 Needed for growth and for repair of body tissues Can be used as a secondary source of energy (1g provides 4 kcal) 	 Animal protein Found in meat, fish, eggs, dairy products Plant protein Found in cereal products, nuts, pulses Novel protein Tofu, soya products 	 Can delay growth in children Protein energy malnutrition occurs in developing countries and mainly affects young children 	Excess is rare

MINERALS

Minerals are essential nutrients that the body needs in small amounts. They have many different functions, but in general they are protective and help to keep us healthy. Table 2.3 summarises the main functions and sources of the minerals sodium, calcium and iron and highlights the impact on health of deficiency and excess of each.



A healthy diet includes no more than 6g of salt per day (3g per day for children).

Nutrient	Functions	Sources	Deficiency	Excess
Sodium	 Helps to keep body fluids balanced Maintains nerve function 	 Table salt Salty snacks, e.g. crisps or peanuts <i>Processed foods</i>, e.g. some types of ready meals, meat products, breakfast cereals 	Deficiency is rare	 Is linked with an increase in high <i>blood pressure</i> (hypertension) Increases the risk of <i>strokes</i> and coronary heart disease
Calcium	 Important for the formation of bones and teeth Necessary for nerve and muscle function Involved in blood clotting 	 Milk, cheese and other dairy foods Green leafy vegetables such as broccoli and cabbage Soya beans, tofu, soya drinks with added calcium Nuts White bread Fish where bones are eaten, e.g. sardines 	• Can reduce peak bone mass, which is a contributory factor in the development of osteoporosis in later life	Excess is rare
Iron	 Needed to form haemoglobin in red blood cells, which transport oxygen around the body Boosts energy stores Needed for normal functioning of the immune system 	Haem iron (mainly from animal sources, easily absorbed by the body) • meat, liver Non-haem iron (mainly from plant sources, not as easily absorbed by the body) • beans, nuts, dried fruit, fortified breakfast cereals, green leafy vegetables, eggs	• Leads to low iron stores in the body and eventually to iron deficiency anaemia	• Very high doses can be fatal, particularly to children, so iron supplements should be avoided at this stage of life

Table 2.3: The functions and sources of sodium, calcium and iron, and the effects of having too little or too much of them in the diet

Answer the following questions on minerals.

- a Outline two functions of sodium.
- **b** State the consequences to health of excess sodium in the diet.
- c List three foods high in sodium.
- d Outline two functions of calcium.
- e State the consequences to health of a deficiency of calcium in the diet.
- f List three food sources of calcium.
- g Outline two functions of iron.
- h State the consequences to health of a deficiency of iron in the diet.
- i Differentiate between haem and non-haem iron.
- j Identify two food sources of haem and non-haem iron.

Calcium from yogurt is more easily absorbed than calcium from spinach.

Absorbing calcium

Calcium is most easily absorbed from milk and dairy products. It is less easily absorbed from plant foods. Calcium absorption may be reduced by the presence of phytates in plant foods (for example, cereals and pulses) and by the presence of oxalates in vegetables and fruit (for example, spinach and rhubarb).

The way that calcium is absorbed by the body is partly controlled by vitamin D (see pages 16–17). A lack of vitamin D can reduce the amount of calcium that the body absorbs. This can affect bone health and contribute to the development of osteoporosis.

Absorbing iron

Vitamin C in the orange juice helps absorption of iron from the cereal. Iron from animal sources, known as 'haem iron', is absorbed more effectively than iron from plant sources.

Absorption of non-haem iron from plant sources is affected by various factors. NSP, phytate in cereals or pulses and tannins in tea can reduce absorption of non-haem iron.

Eating food containing vitamin C at the same time as food containing iron from non-haem sources can help the body to absorb the iron. Examples are to have fruit juice or fruit with *fortified* breakfast cereal, vegetables with beans, or nuts with rice.

Answer the following questions on vitamins.

- a Identify the fat-soluble and water-soluble vitamins.
- b Why is it important not to consume an excessive amount of foods rich in fatsoluble vitamins? Does this advice apply to watersoluble vitamins?
- c Which two vitamins are antioxidants?
- d List three functions of vitamin C.
- e Write down three dietary sources of vitamin B₁₂.
- f An excess of which vitamin could cause miscarriage?
- g Describe the link between vitamin D, rickets and osteomalacia.
- h Identify two plant and two animal sources of vitamin A.
- i What is the main function of vitamin B₁?
- j Outline the consequences of a diet deficient in folate.
- k Why should foods rich in vitamin C and iron be eaten together?
- I Identify three factors that affect the absorption of calcium.

VITAMINS

Vitamins are essential nutrients that are needed in very small amounts. Usually only a few

milligrams (mg) or micrograms (mcg) are needed per day. Most vitamins cannot be made by the body and have to be provided by the diet. An exception is vitamin D, which can be obtained by the action of sunlight on the skin.

There are two types of vitamins.

• The fat-soluble vitamins are vitamins A and D. They are found mainly in fatty foods from animal sources, such as butter,

lard, dairy foods, liver and oily fish. Although the body needs these vitamins every day, foods containing them do not need to be eaten every day. The body will store unused fat-soluble vitamins in the liver and in fatty tissue and if high amounts are stored, it can be harmful.

• The water-soluble vitamins are vitamins B and C. They are found mainly in fruit, vegetables and grains. They can be destroyed by being exposed to heat or air and can be lost in the water used for cooking.

Water-soluble vitamins are not stored in the body. Any excess of them is excreted. Therefore these vitamins need to be consumed daily to fulfil dietary requirements.

Table 2.4, on page 17, summarises the main functions and sources of vitamins A, B group, C and D, and highlights the impact on health of deficiency and excess of each.

Chapter 2: What's in food?

ſ	Nutrient	Functions	Sources	Deficiency	Excess
Ň	/itamin A	 Promotes: healthy eyesight healthy skin normal growth and development healthy immune system Has <i>antioxidant</i> properties, protecting cells from damage 	 Animal (retinol) Cheese, eggs, oily fish, whole milk, fortified margarine, liver Plant (carotene) Carrots, green leafy vegetables (e.g. broccoli, cabbage), orange-coloured fruits (e.g. apricots, nectarines) 	Leads to poor vision in dim light and eventually to night blindness	 Excess retinol can be toxic During pregnancy, large amounts of vitamin A can harm the unborn baby, leading to miscarriage or stillbirth
	/itamin D	• Helps regulate the amount of calcium in the body (needed for keeping bones and teeth healthy)	 Oily fish, eggs, butter, meat, fortified foods (e.g. margarine, breakfast cereals) Most vitamin D is obtained from sunlight on the skin 	 In children, leads to skeletal deformity called <i>rickets</i> In adults, leads to pain and bone weakness called osteomalacia 	Large amounts of vitamin D can weaken bones
	Vitamin B ₁	 Assists with the release of energy from food 	Fortified cerealsMeat	 Causes lethargy Can restrict growth 	Excess is rare
vitamins	Vitamin B ₁₂	Promotes healthy blood	Fortified cerealsMilkEggs	Can cause anaemia	Excess is rare
Bgroup	Folate	 Is important during pregnancy to prevent neural tube defects in the baby (e.g. <i>spina bifida</i>) Needed for red cell production and to prevent anaemia 	 White bread Fortified cereals Green leafy vegetables (e.g. broccoli, cabbage) Pulses 	 Can increase risk of anaemia In pregnancy, may cause neural tube defects in the baby (e.g. spina bifida) 	Excess is rare
	/itamin C	 Helps protect and keep cells healthy Helps the body absorb iron from food Promotes development of connective tissue Is involved in wound healing Has antioxidant properties, protecting cells from damage 	 Peppers Broccoli Sweet potato Oranges Kiwi fruit 	sources of vit	Excess is rare e functions and amins and the ing too little or too a in the diet

- a We are advised to drink approximately two litres of water per day. Outline three functions of water in the diet.
- b Identify a range of foods which contain a high proportion of water and which could be included in the diet to help meet daily fluid requirements.

WATER

Human beings are unable to survive without water, as it makes up over half of our body mass. As a result, regular fluid intake is essential for the correct functioning of virtually all cells.

The main functions of water are that it:

acts as a lubricant for joints and eyes
assists reactions in the body, such as digestion
is a component of blood, which transports oxygen and nutrients
helps the body get rid of waste
helps to regulate body temperature.

As well as drinking water, there are other valuable food sources of water, such as fruit, vegetables and milk, which should be consumed to meet daily fluid requirements.

GUIDELINE DAILY AMOUNTS

On many food labels, in the nutrition information, you will find a column of Guideline Daily Amounts (GDAs). The last column

the front of packets, like this:

NUTRITION INFORMATION				
Average	Per 100g	Per Biscuit	UK Guideline Daily Amounts	
Values			Adults	
ENERGY	2015 kJ / 481 kcal	87 kJ / 21 kcal	2000kcal	
PROTEIN	12.1g	0.5q	45g	
CARBOHYDRATE	57.4g	2.5g	230g	
of which Sugars	6.8g	0.3q	90g	
FAT	22.5g	1.0g	70g	
of which Saturates	13.4g	0.6g	20g	
FIBRE	2.7g	0.1g	24g	
SODIUM	1.1g	0.1g	2.4g	

ACTIVITY 7

- a Collect an example of a front-of-pack nutrition label displaying Guideline Daily Amounts (GDAs).
- b Outline the information provided on the label about GDAs.
- c Explain how the information about GDAs should be used.
- d Evaluate how useful this information is in helping you to make healthy dietary choices.

biscuits, lists Guideline Daily Amounts for adults. You may also see Guideline Daily Amounts on

of the table on the left, from a packet of cheese



You can find out more about GDA labelling from the extracts on page 19, which are from the websites of the British Nutrition Foundation and the Institute of Grocery Distribution.

HEALTHY EATING

EDUCATION

Front of Pack Labelling

GDA values were developed by the Institute of Grocery Distribution (IGD), and are based on recommendations made by the Committee on Medical Aspects of Food Policy (COMA) and the Scientific Advisory Committee on Nutrition (SACN). GDAs are commonly presented on the nutrition panel on the back of packets, but now several manufacturers and some retailers are using GDAs as the basis for front-of-pack labelling.

.....

An example of a front-of-pack nutrition label based on GDAs is presented here. The amount of calories, sugars, fat, saturates and salt is displayed together with the percentage of the GDA that is provided in one portion

of the food product.



Source: www.nutrition.org.uk

Home

What are the Guideline Daily Amounts?

Guideline Daily Amounts (GDAs) help consumers make sense of the nutrition information provided on food labels. ...

GDAs are guidelines for healthy adults and children about the approximate amount of calories, fat, saturated fat, carbohydrate, total sugars, protein, fibre, salt and sodium required for a healthy diet.

Because people vary in many ways, such as size and activity levels, GDAs cannot be used as targets for individuals. ...

It is very difficult, if not impossible, for an individual to achieve the GDAs for all nutrients in any one day. ... The aim is to provide a guide for consumers to assist them in making appropriate dietary choices. For example, they can use them as a basis against which to judge the contribution of fat made by a particular food product to their diet.

Source: www.igd.com

Strategies for learning

There is a lot of information in this chapter which must be learned and applied to all aspects of Diet and Health. The following strategies can help with learning and applying your knowledge accurately. Some strategies will suit you better than others - so you decide which ones to use.

Read, cover, remember

Produce mind maps

Produce question and answer cards

Practise past exam paper questions

- Develop note-making grids Design a test paper and mark scheme
- Highlight notes using colour