my revision notes

WJEC GCSE

FOOD AND NUTRITION (Wales)

For the 2016 specification

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Everyone has to decide their own revision strategy, but it is essential to review your work, learn key facts and test your understanding. These Revision Notes will help you to do that in a planned way, topic by topic. You can check your progress by ticking off each section as you revise.

Tick to track your progress

Use the revision planner on pages 4–6 to plan your revision, topic by topic. Tick each box when you have:

- revised and understood a topic
- tested yourself
- practised Now test yourself questions and gone online to check your answers and complete the quick quizzes.

You can also keep track of your revision by ticking off each topic heading in the book. You may find it helpful to add your own notes as you work through each topic.


My revision planner

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1. Food commodities
07 Bread, cereals, flour, oats, rice, potatoes and pasta
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20 Sugar and syrup

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62 Food spoilage
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5 Where food comes from
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84 Secondary stages of processing and production
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86 Fortifying and modifying foods to support better health

3 Macronutrient and micronutrients

Table 2.3 Functions, sources and consequences of too few or too many carbohydrates

Functions of carbohydrates in the body	• Provide energy for physical activity and maintaining body functions • Sweeten and flavour foods • Provide fibre (NSP) to help digestion
Sources of carbohydrates	**Monosaccharides** • Glucose: fruits and vegetables • Fructose: honey and some fruit and vegetable juices • Galactose: milk **Disaccharides** • Sucrose: sugar cane and sugar beet – all types of sugar and also golden syrup and black treacle • Lactose: milk • Maltose: grains **Polysaccharides** • Starch: in grains, cereals, pasta and some fruit and vegetables • Soluble fibre: oats, beans, peas, lentils and most fruit and vegetables • Insoluble fibre: wholemeal bread and pasta, wholegrain cereals, brown rice and some fruit and vegetables
What happens if we don't get enough carbohydrates?	• Weight loss • Body uses protein as a secondary energy source • Constipation • Increased risk of developing bowel cancer or diverticulitis
What happens if we eat too many carbohydrates?	• Weight gain (excess carbohydrates are converted to fat and stored in your body) • Too much sugar can cause tooth decay

How many carbohydrates should we eat?
- The Eatwell Guide advises that one third of your daily food should be starchy carbohydrates like bread, pasta, rice and potatoes.
- Starchy carbohydrates can also provide you with fibre if wholemeal and wholegrain products are consumed.
- An average (2,000 calories a day) diet should contain about 250 g of carbohydrate. (This would be, for example, a total of a bowl of wholegrain cereal, one portion of pasta and three slices of bread).

Exam tip
Some questions may ask about increasing the amount of carbohydrates in the diet to help with weight loss. In this case you would concentrate on polysaccharides, which take a long time to digest, and therefore fill you up for longer. A good example of this would be to encourage people to eat a starchy breakfast, such as porridge, wholegrain cereal or wholegrain muffins, flapjacks or wholemeal toast.

Now test yourself — TESTED
1 Name two monosaccharides and state where they are found in the food you eat. [2 marks]
2 Explain why the body takes longer to digest polysaccharides than disaccharides. [3 marks]
3 Explain how NSP helps the digestive system to work more efficiently and prevents constipation. [6 marks]
4 Discuss why eating a wholegrain breakfast cereal with milk can help someone who is on a weight-loss diet. [6 marks]
5 Explain why a diet that is high in sugary food is bad for young children. [6 marks]

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Micronutrients

Vitamins — REMEMBER

Vitamins are divided into two main groups: **fat-soluble vitamins** and **water-soluble vitamins**.
- Fat-soluble vitamins: when you cook foods containing these vitamins in fat, the vitamins will leach out of the foods into the fat.
- Water-soluble vitamins: when you cook foods containing these vitamins in water, the vitamins will leach out of the foods into the water.

Table 2.4 Fat-soluble vitamins

	Function in the body	Sources	What happens if we don't get enough?	What happens if we eat too much?
Vitamin A	• Helps eyesight • Keeps the throat, digestive system and lungs moist • It is an antioxidant, helps stop damaging substances from the air and water entering our bodies	• Found as retinol in animal foods such as milk, cheese, butter and oily fish, liver and liver products. • Found as beta-carotene in plant foods (for example, red and orange fruit and vegetables and dark green leafy vegetables)	• Unable to see in dim light (called night blindness) • Difficult for the body to fight disease and infections • Children will have poor growth	• Too much Vitamin A can be poisonous – it will build up in the liver • Pregnant women should avoid eating too much of the retinol as it can cause birth defects in the developing baby
Vitamin D	• Controls the amount of calcium that is taken from food • Helps to develop strong bones and teeth • Has also recently been found to be important in brain function	• Dairy products: butter, cheese, milk and eggs • Liver • Oily fish • Added by law to margarine • Most comes from exposure to sunlight	• Weak bones and teeth • Young children will develop rickets • Older people develop osteomalacia • Elderly people develop osteoporosis	• It is unlikely you will eat too much Vitamin D in your diet • Taking Vitamin D supplements over a long period of time can cause more calcium to be absorbed in your body, which may damage the kidneys • Excessive intake can also weaken bones
Vitamin E	• It is an antioxidant • Helps to keep the cells in the body healthy • Helps prevent the development of some cancers and heart disease	• Vegetable oils • Nuts • Peanuts • Seeds • Wheat germ oil	• Deficiency is very rare, occasionally it can arise if a person has a problem absorbing fat	• It is unlikely you will eat too much Vitamin E from a normal diet
Vitamin K	• Helps the blood to clot	• Green leafy vegetables • Cheese • Liver • Asparagus • Coffee • Bacon • Green tea	• It is very rare to have a deficiency in adults	• It is very unlikely that you will eat too much and there is no evidence that too much will harm you

2 Macronutrients and micronutrients

WJEC Eduqas GCSE Food Preparation and Nutrition 27

Features to help you succeed

Exam tips

Expert tips are given throughout the book to help you polish your exam technique in order to maximise your chances in the exam.

Typical mistakes

The authors identify the typical mistakes candidates make and explain how you can avoid them.

Now test yourself

These short, knowledge-based questions provide the first step in testing your learning. Answers are at the back of the book.

Key words

Key words from the specification are highlighted in bold throughout the book.

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My revision planner

1 Food commodities

1. Food commodities

2 Principles of nutrition

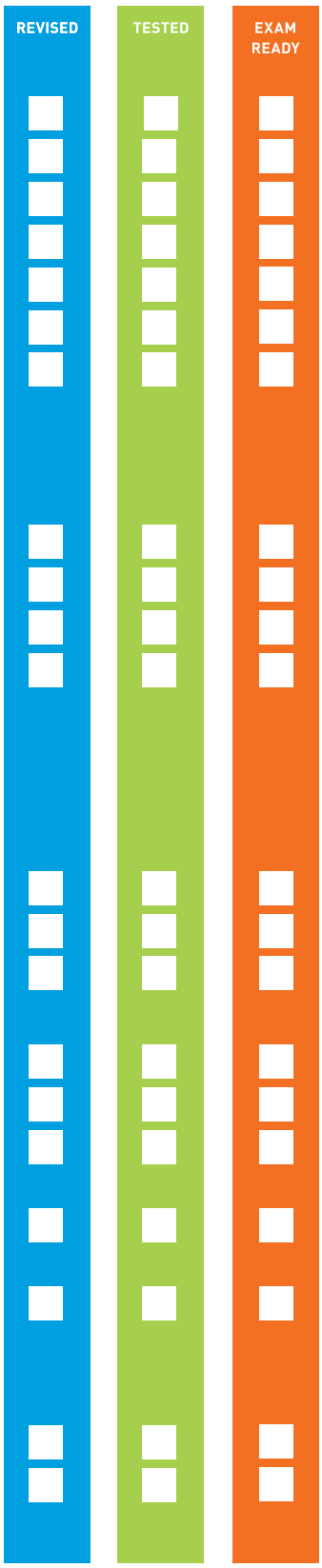
2. Macronutrients and micronutrients

3 Diet and good health

3. Energy requirements of individuals

4. Plan balanced diets

5. Calculate energy and nutritional values of recipes, meals and diets



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4 The science of food

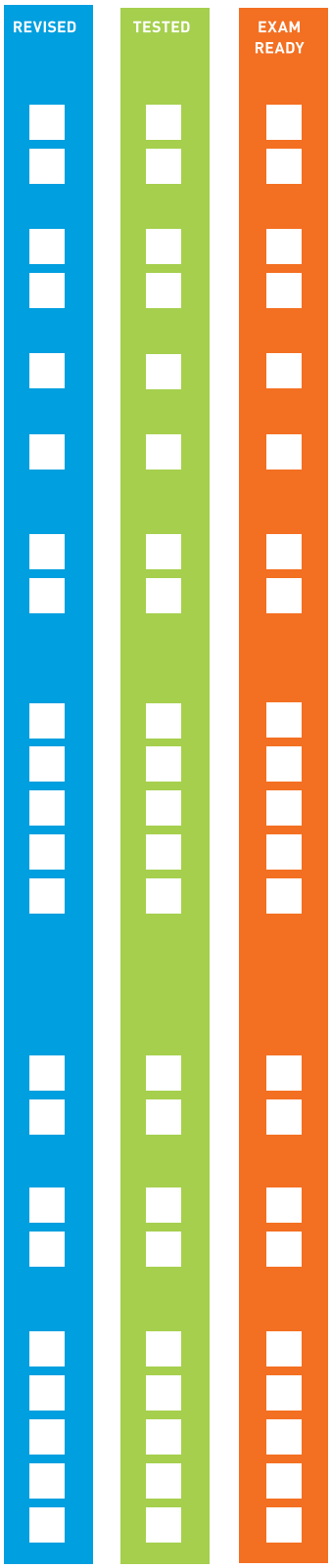
6. The effect of cooking on food

7. Food spoilage

5 Where food comes from

8. Food provenance

9. Food manufacturing



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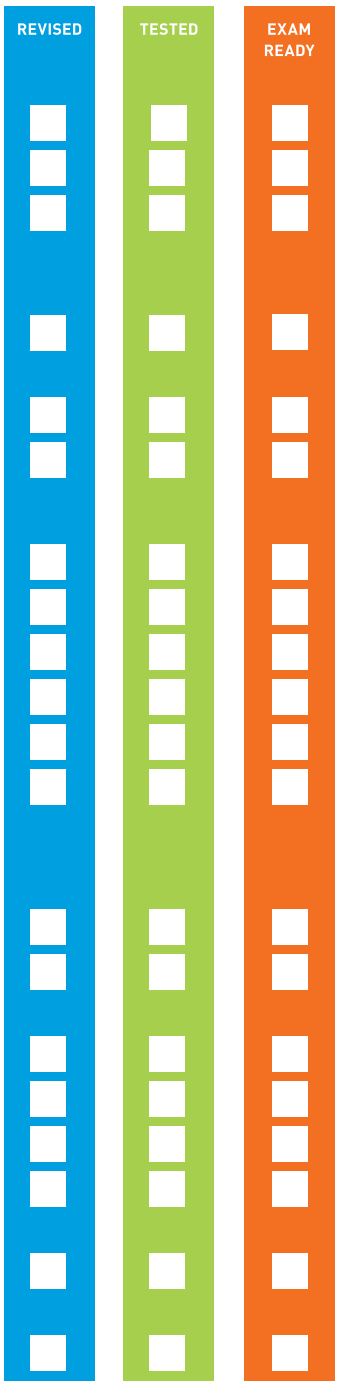
6 Cooking and food preparation



10. Factors affecting food choice

11. Preparation and cooking techniques

12. Developing recipes and meals

Success in the examination

Sample examination questions, model answers and mark schemes

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1 Food Commodities

Food commodities are the basic foods that make up our daily diet.

Bread, cereals, flour, oats, rice, potatoes and pasta

Bread

REVISED

- Bread is eaten regularly in our diet and contributes in a major way, so it is a **staple food**.
- It can be used in many ways.
- It can be sweet or savoury or flavoured, for example, with cheese, or have extra toppings added, for example, poppy seeds.

Figure 1.1 Bread products

Bread is made from dough. The ingredients are:

- flour
- salt
- yeast
- liquid.

(The liquid is usually water, but can be milk.)

The ingredients are mixed together and kneaded, left to rise, kneaded again, shaped, **proved** (left to rise) and baked.

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Nutritional value of bread

Bread is in the starchy carbohydrate section of the Eatwell Guide. It also contains some protein, B-group vitamins, calcium and iron. Wholemeal bread contains fibre.

Storage of bread

- Fresh bread: in a bread bin or sealed paper bag.
- Sliced supermarket bread: in a plastic bag.
- Bread can be frozen for up to two months.
- Bread goes dry and stale quite quickly.

Cereals

REVISED

In the UK we grow wheat, barley, oats and rye. Most of these are processed into other foods before we eat them.

Figure 1.2 Different cereal plants

Nutritional value of cereals

Cereals contain fibre, carbohydrates, Low Biological Value (LBV) protein (plant protein that does not contain all of the essential amino acids), B-group vitamins, Vitamin E, fat and iron.

Storage of cereals

Cereals can become stale, contaminated with bacteria and moulds, or develop different odours if not stored correctly.

- Store cereals in a cool, dry place in an airtight container.
- Keep old and new cereals separate.
- Always check the sell-by or use-by date.

Flour

REVISED

This is made from wheat or rye. There are two main types:

- Strong flour is used for bread making. This is made from hard, winter wheat.
- Weak flour is used for cakes, pastry and biscuits. This is made from spring wheat.

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Nutritional value of flour

- Strong flour contains **gluten**, which is a protein. This will be stretched when bread dough is kneaded, and forms the structure of the bread.
- White flour in the UK is **fortified** with iron, calcium and the B-group vitamins Thiamine and Niacin. These are all lost during the processing of wheat into flour.
- Wholemeal flour has all of the bran from the wheat, so has 100% **extraction rate**.
- White flour has the bran, germ, fat and some of the minerals removed, so has a 75% extraction rate.

Storage of flour

- Store flour in a cool, dry place in the original packaging in a sealed container to prevent weevils infesting the flour.
- Check the use-by date before use. Wholemeal flour still contains fat so can become rancid with age.
- Never mix old and new flour.

Oats

REVISED

Before oats can be used, a protective husk around the grain has to be removed.

- Oats can be crushed or rolled to form oatmeal, which is used for porridge or to make flapjacks.
- Jumbo oat flakes can be used for breakfast cereals such as muesli.
- Fine oat flour can be made by grinding the grains, or by processing them in a food processor. The flour can be used for baked foods such as biscuits and scones.

Nutritional value of oats

Oats contain carbohydrates, plus smaller amounts of protein, fat, calcium, iron and some B-group vitamins. Starchy carbohydrates from oats provide a slow releasing energy source.

Figure 1.3 Oats

Storage of oats

- In a dry, cool place
- In an airtight container after opening.

Rice

REVISED

- Rice is a staple food, as it is eaten all over the world as a main part of the diet.
- It has an outer husk removed during processing.
- It can be used for sweet and savoury foods.
- It can be boiled, baked or stir-fried.
- It can be bought as short-grain or long-grain varieties.

Nutritional value of rice

Rice is a carbohydrate food, so is an excellent energy source.

Storage of rice

Store in a dry, cool place, in an airtight container after opening.

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Potatoes

REVISED

- Potatoes are a staple food.
- They are grown in the UK and come in different varieties, which can be used for different methods of cooking.
- Potatoes can be baked, boiled, roasted or fried.

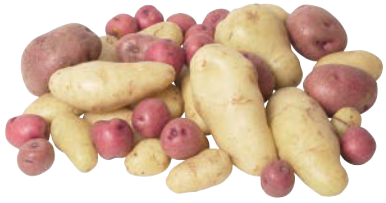

Figure 1.4 Different types of potatoes

Nutritional value of potatoes

Potatoes contain starchy carbohydrates, Vitamin C, Vitamin B_6 and Thiamine, and the skin contains fibre.

Storage of potatoes

- Potatoes should be stored in a cool, dark, dry, airy place. Exposure to light can cause them to turn green, which makes them toxic. The green parts should be removed before cooking.
- Storing potatoes in plastic bags makes them sweat and turn mouldy.

Pasta

REVISED

- Pasta is made from a strong type of wheat that is called **durum wheat**. This wheat contains more protein.
- Pasta is made with durum wheat flour, water, salt and sometimes eggs and oil.
- Pasta can also be coloured with spinach, tomato and squid ink.
- Pasta can be bought as dried or fresh in many different shapes.

Nutritional value of pasta

Pasta contains starchy carbohydrates. Wholemeal types contain fibre.

Storage of pasta

- Dried pasta: keep in an airtight container once opened.
- Fresh pasta: keep in the fridge.
- Homemade pasta: dry and store in the fridge in an airtight container.
- Fresh and homemade pasta can be frozen.

Exam tip

A question on bread, cereals, flour, oats, rice, potatoes and pasta may ask about staple foods in different countries. Asian countries have rice as a staple food because the climate is right for growing rice. The UK has the correct climate for growing wheat and potatoes, so those form a large part of our diet. You will need to think of reasons why a particular staple food is eaten.

Now test yourself

TESTED

1 Discuss the nutritional benefits of including potatoes in the diet. [4 marks]
2 Explain why white flour is fortified in the UK. [2 marks]
3 List two ways that rice can be cooked, and suggest a recipe for each of your chosen ways. [4 marks]
4 Give one reason why eating more wholemeal pasta may be beneficial in someone's diet. [2 marks]

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Fruit and vegetables

- Fruits and vegetables can be bought as fresh, frozen, canned, juiced and dried.
- Some are **seasonal** and only available at certain times of the year.
- Some fruits and vegetables are grown in the UK.
- Many fruits and vegetables are imported from abroad.

Fruit

REVISED

Nutritional value of fruit

Eating a variety of different types and colours of fruit will provide vitamins A, C and E, carbohydrates, fibre and some minerals.

Figure 1.5 Tropical fruits

Storage of fruit

- Citrus fruits such as oranges, lemons and limes: in a cool, dry place.
- Berry fruits such as raspberries and strawberries: in the fridge.
- Hard fruits such as apples and pears: keep out of direct sunlight or in the fridge.
- Stone fruits such as plums and peaches: in the fruit bowl or the fridge.
- Exotic fruits such as bananas and pineapples: in the fruit bowl.

Vegetables

REVISED

Types of vegetables

Table 1.1 Types of vegetable

Type of vegetable	Examples
Leafy	Cabbage, lettuce
Tubers	Potatoes
Root	Carrots, turnips
Stems	Asparagus, celery
Flowers	Cauliflower, broccoli
Fruits and seeds	Peas, courgettes
Fungi	Mushrooms

- Wales is well known for growing leeks, which are a staple vegetable in Wales and form the basis of a dish called Glamorgan Sausages.
- In Wales, an edible seaweed known as laver is gathered and processed commercially. It is used to produce bara lawr or laverbread, which is usually eaten sprinkled with oatmeal, then warmed in hot bacon fat and served with bacon for breakfast or supper. The seaweed itself can be found in some parts of the west coast, clinging to the rocks at low tide.

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Nutritional value of vegetables

Eating a variety of different types and colours of vegetables will provide vitamins A, C and E, carbohydrates, fibre and some minerals. Frozen vegetables can be as nutritious as fresh vegetables.

Storage of vegetables

- Most vegetables should be stored in cool, dry, well-ventilated places.
- Salad and green vegetables should be stored in the fridge. Green leafy vegetables will quickly lose vitamin C as they age.
- Vegetables should be eaten as fresh as possible to get maximum nutritional value.

Exam tip

Questions on fruit and vegetables will often be about their nutritional values in the diet. Remember the recommended daily consumption of fruit and vegetables is a minimum of five different types. Discuss the importance of the variety of nutrients found in different coloured fruits and vegetables, and remember that eating the skin will provide a good source of fibre in the diet.

Now test yourself

TESTED

1 Give examples of two types of berry fruits and explain how they should be stored. [2 marks]
2 Why is it important to eat green leafy vegetables when they are as fresh as possible? [2 marks]
3 List three nutrients found in vegetables. [3 marks]
4 Explain what laverbread is, and suggest one serving option for the product. [3 marks]

Dairy foods

Milk

REVISED

- The most common form of milk consumed in the UK is cow's milk. This comes in several varieties such as whole milk, semi-skimmed and skimmed milk.
- Other forms of milk are available, such as goat's milk, or alternative non-dairy forms such as rice, almond and soya milk.
- Milk is treated to make it safe to drink by killing harmful bacteria, using heat treatments.
- Pasteurised milk is heated to 72°C for 15 seconds then rapidly cooled to below 10°C and put into cartons or bottles.
- UHT milk, or long-life milk, is heated to 132°C for 1 minute, cooled rapidly and packed in sterile conditions. This lasts for many months, until opened.

Figure 1.6 Milk

Nutritional value of milk

Milk contains HBV (High Biological Value) protein, fat, sugar in the form of lactose, vitamins A, D, some of the B-group vitamins and a little Vitamin C, calcium, potassium and a small amount of iron.

Storage of milk

- Fresh milk: in the fridge and consumed by its use-by date.
- UHT cartons: in a cool, dry place; once opened treat as fresh milk and store in the fridge.

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Cheese

REVISED

- Cheese is made from fermented milk.
- Enzymes are added to **denature** the protein, and produce a solid. Then flavourings are added to produce different types of cheese.
- There are hundreds of types of cheeses produced both in the UK and around the world.
- Cheese can provide flavour, colour and texture to a dish, as well as valuable nutrients.
- Cheese has long been a traditional food of Wales and award-winning varieties, from the more famous Caerphilly, Tintern, and Y Fenni to the likes of Black Bomber and Perl Las, are produced using Welsh milk.

Figure 1.7 Different types of cheese

Nutritional value of cheese

Cheese contains HBV protein, calcium, varying amounts of potassium and sodium (depending on the type of cheese), vitamins A, D and some B-group vitamins (depending on the type of cheese). It has a high fat content.

Storage of cheese

- Cheese must be stored in the fridge.
- Hard-pressed cheeses last a long time, but must be wrapped, as they will dry out.
- Soft cheeses have a shorter shelf life and should be consumed within a few days.

Yoghurt

REVISED

- Yoghurt is made by adding 'friendly' bacteria to milk.
- This causes it to ferment by changing the sugar in the milk (lactose) to lactic acid, which denatures the protein and causes it to set.

Types of yoghurt

- Yoghurt can be made from different types of milk.
- Set yoghurt is set in the pot in which it is sold. Flavourings, fruit and sugar are often added.
- Live yoghurt contains live bacteria, which can be beneficial to the working of your digestive system.
- Greek yoghurt is thicker, has a higher fat content and is made from cow's or sheep's milk.

Nutritional value of yoghurt

Yoghurt contains HBV protein, varied amounts of fat (depending on the type of yoghurt), calcium, sugar (lactose), vitamins A and D, some of the B-group vitamins and Vitamin E if it is whole-milk yoghurt.

Storage of yoghurt

- Store in the fridge.
- Eat by its use-by date.

Exam tip

You could be asked to suggest how you would substitute dairy products with alternatives to provide an ingredient that is suitable for someone who is lactose intolerant, or is a vegan.

Remember to explain in detail why the person cannot eat the ingredient in the original recipe, what you are using as a substitute, and why the replacement ingredient is suitable for the person.

Now test yourself

TESTED

1 List three nutrients found in milk. [3 marks]
2 Suggest one savoury and one sweet recipe where milk is one of the main ingredients. [2 marks]
3 Explain how yoghurt is made. [4 marks]
4 Name two Welsh cheeses. [2 marks]

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Animal sources

Meat

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- Animals used for meat in the UK are cows (for beef or veal), sheep (for lamb or mutton) and pigs (for pork, bacon, gammon or ham).
- Meat is made of muscle fibres, connective tissue and fat.
- The fat is either **visible**, for example, the fat that can be seen around the edge of a steak, or **invisible**, which is found in the connective tissue and is known as marbling.
- The length of muscle fibre determines how tough the meat is: longer fibres in the legs will be tougher than those in the back. Tougher cuts of meat will need long, slow cooking to make it tender.
- Meat is a high-risk food that must be prepared and cooked correctly to avoid food poisoning.
- Welsh lamb and beef have Protected Geographical Indication (PGI) from the European Commission. Lambs and calves born in Wales are tagged and logged from birth so can be identified at every stage of their lives and during production of meat products after being slaughtered.
- Gower Salt Marsh Lamb is grazed on the salt marshes.
- Welsh Black beef is also a recognised individual meat from Wales.

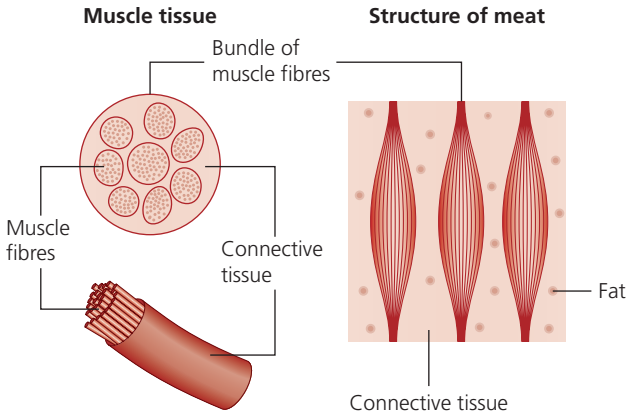

Figure 1.8 Structure of meat

Nutritional value of meat

Meat contains HBV protein, varying amounts of fat, vitamins A and D, some of the B-group vitamins (it is a good source of Vitamin B_{12}) and iron.

Storage of meat

- Raw meat: in the fridge on the bottom shelf. It should be in a covered container and used by its use-by date. If frozen, it should be well wrapped and defrosted thoroughly before cooking and should never be refrozen.
- Cooked meat: be cool within 1.5 hours, cover and put in the fridge. Store above raw meat in the fridge to avoid cross-contamination.

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Fish

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There are three main types of fish:

- **White fish**, for example, cod, haddock and plaice.
- **Oily fish**, for example, mackerel, sardines and fresh tuna.
- **Shellfish**, for example, crabs and lobster.
- Wales is famous for shellfish called cockles, which are gathered on the coast by small, local businesses, particularly on the Gower coast, near Penclawdd. Laws protect these cockles and licences are issued for their gathering, with only a certain number of licences issued per year. The gathering must still be done by hand with a rake and riddle.

Figure 1.9 Different types of fish

Fish is made of muscle and connective tissue. The muscle fibres are short, so fish is cooked quickly and is tender.

- Fish can be bought fresh, frozen, smoked, canned or dried.
- Fish can be cooked in a number of ways: baked, fried, grilled or poached.

Nutritional value of fish

Fish contains HBV protein, essential fatty acids (in oily fish), a good source of vitamins A and D (in oily fish) and calcium (if the bones are eaten, for example, in canned sardines). Fish is low in fat, but shellfish may contain high levels of cholesterol.

Storage of fish

- Fresh fish: in the fridge. Use as soon as possible after buying, as it will go off quickly.
- Frozen fish: fully defrosted before cooking. Do not refreeze raw fish.

Poultry

REVISED

- Poultry refers to turkey, chicken, duck, goose, guinea fowl and pigeon.
- Chicken is the most popular poultry in the UK.
- Poultry meat is made of muscle fibres, fat and connective tissue.
- Poultry can be cooked in several ways, for example, roasting, baking, frying, poaching and grilling.
- Poultry is a high-risk food that may contain salmonella bacteria.
- Cook poultry thoroughly until the centre reaches 72°C for at least two minutes.

Figure 1.10 Chicken

Nutritional value of poultry

Poultry contains HBV protein, some fat (but less than meat), vitamins A and D and some of the B-group vitamins.

Storage of poultry

- Raw poultry should be stored in the fridge on the bottom shelf. Keep it covered to prevent cross-contamination.
- Raw poultry can be frozen. Thoroughly defrost frozen poultry before cooking.
- Use poultry before its use-by date.

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Eggs

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- Eggs can be from hens, ducks, geese and quails in the UK.
- They come in different sizes.
- Eggs can be fried, poached, boiled, baked or scrambled.
- Eggs are used in many recipes to bind, set, enrich and aerate.
- Eggs can be from 'enriched' cage farm hens, where the hens are kept in cages.
- **Free-range eggs** come from hens that are allowed to roam outside.
- **Barn eggs** are from hens that can walk around inside a barn.

Eggs are a high-risk food and must be cooked properly to kill any salmonella bacteria.

Nutritional value of eggs

Table 1.2 Nutritional value of eggs

Egg white	Egg yolk
HBV protein	HBV protein
B-group vitamins	Vitamins A, D and E
	Iron
	Fat

Storage of eggs

- Store in the fridge with the pointed end down.
- Keep away from strong smelling foods.
- Use before the best-before date.

Gelatine

REVISED

- Gelatine is a flavourless food that is made from an animal source and is derived from collagen boiled down from bones, skins and tendons.
- It is commonly used as a gelling agent in food, for example, in desserts or in fruit jelly sweets such as jelly babies.
- It is used as a stabiliser, thickener or texturiser in foods such as yoghurt, cream cheese and margarine.
- It is used in reduced-fat foods to simulate the mouth-feel of fat and to create volume.
- It is used for the clarification of juices, such as apple juice, and vinegar.
- It comes in leaf and powdered forms.

Exam tip

Questions on meat, fish and eggs may focus on the nutritional content of these commodities. The question could be about which nutrients are contained in oily fish. Remember to differentiate between oily fish and white fish, explaining about the importance of the essential fatty acids found in oily fish.

Now test yourself

TESTED

1 Explain why government recommendations are to eat at least two portions of fish a week, one of which should be oily fish. [4 marks]
2 State the reason that stewing steak is tougher than fillet steak, and give one way you would cook the stewing steak to make it tender. [3 marks]
3 List the three main types of fish, giving one example of each type. [3 marks]
4 Discuss reasons that someone may prefer to buy free-range hen eggs over caged hen eggs. [6 marks]
5 Explain the difference between Welsh salt marsh lamb and English lamb. [3 marks]
6 Explain why only a certain number of licences are issued each year to allow cockles to be gathered on the Gower coast. [4 marks]

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