

2016 specification
first exams in 2018



Topic on a Page

For GCSE AQA Food Preparation and Nutrition

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3. Micronutrients – vitamins
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5. Making informed choices for a varied and balanced diet
6. Diet, nutrition and health
7. Cooking of food and heat transfer
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9. Functional and chemical properties of food 2
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11. Principles of food safety
12. Factors influencing food choice
13. Food choices
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15. British cuisine
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17. Sensory evaluation and sensory analysis
18. Food sources
19. Food and the environment, and sustainability of food
20. Food production
21. Technological developments associated with better health and food production

A4 Activity Mind Maps

1. Macronutrients – fats and proteins
2. Macronutrients – carbohydrates
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A3 Mind Maps also enclosed

Acknowledgements

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- 'Sunday Roast' courtesy of Mikey
- 'Fish and Chips' courtesy of Charles Haynes

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- 'Cow Factory' courtesy of Gunnar Richter
- 'Grain Structure' courtesy of Jkwchui



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


Teacher's Introduction

This resource is primarily intended to be used during revision by students studying AQA GCSE Food Preparation and Nutrition.

As a revision tool, this resource does not aim to cover the material in depth, but rather provide visual 'mind maps' of the entire AQA GCSE food preparation and Nutrition theory specification, which students can use as the basis of their revision, covering all the key vocabulary and knowledge that students need for their exam. The resource is especially suited to visual learners, and those learners who find it hard to revise from written notes.

The resource consists of:

- 21 activity mind maps (partially complete) for students to complete, labelled: 
- 21 completed mind maps, which provide solutions to the activity mind maps, labelled: 

All mind maps are provided in A3 and A4 formats.

How to use the resource:

- The sheets can be handed out at the end of the course, or at the end of each topic for revision purposes.
- The mind maps can be printed out poster size and displayed on the classroom walls as the topic is being taught, so that students have a visual reminder of what they have been covering in their lessons.
- The resource also includes partially completed mind maps. Students could be encouraged to complete the exercises as a way to recap on knowledge from the topic at the end of teaching. More able students could, additionally, be asked to think of further examples to illustrate the points, whereas lower-ability students could provide more illustrations, or colour-code the mind maps, to aid memory of the key topics.

October 2017

Free Updates!

Register your email address to receive any future free updates* made to this resource or other Food Preparation and Nutrition resources your school has purchased, and details of any promotions for your subject.

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

Go to zzed.uk/freeupdates

Macronutrients – fats and

Macronutrients are needed by the body in large

PROTEINS

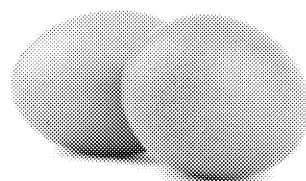
large biomolecules built of amino acids bound together into long chains

15% of daily energy intake

Proteins have many functions in our bodies:

Functions

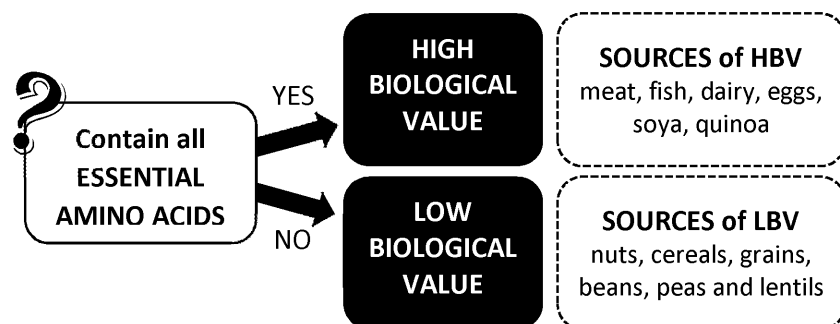
- Build enzymes and hormones
- Build cell membranes
- Repair and maintain tissues
- Defend the body (antibodies)
- Secondary source of energy



There are approximately 20 amino acids in total and each one has a specific function in our body. While most can be made by our bodies, approximately nine cannot – these have to be consumed through food.

- **Essential amino acids** – cannot be made by our bodies and need to come from food
- **Non-essential amino acids** – readily made by the body

Different foods contain different amounts of these essential amino acids. Foods that contain them all are called **high biological value** (HBV) and a protein source that lacks one of these essential amino acids is called a **low biological value** (LBV) protein.



You can obtain HBV proteins by combining two LBV proteins. This is called **protein complementation**.

Protein Complementation

A process of combining two or more LBV protein sources to obtain an HBV protein

Examples of protein complementation:

- baked beans + bread**
- rice + peas**
- peanut butter + porridge oats**

Too much or too little protein and the following can happen:

Excess	<ul style="list-style-type: none"> • Kidney and liver diseases • Weight gain
Deficiency	<ul style="list-style-type: none"> • Kwashiorkor • Slowing of growth rate • Swelling

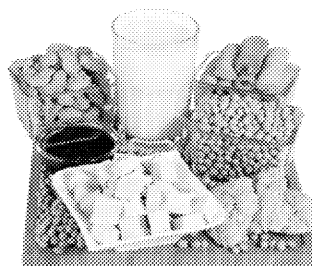
What about vegetarians and vegans?

Protein Alternatives

Vegetarians and vegans don't consume meat so instead they use protein alternative products, which are manufactured in order to provide protein in a diet, and protein-rich plant foods.

Examples include:

- Mycoprotein (Quorn®)
- Tofu
- Tempeh
- Soy chunks
- Textured vegetable proteins (TVP)
- Beans, lentils, chickpeas



FAT

The fat

Fun

There are two

S

Contain a
Solid at room

meat, cheese
whole milk

V

Inv

Excess

- C
- H
- C
- F
- T

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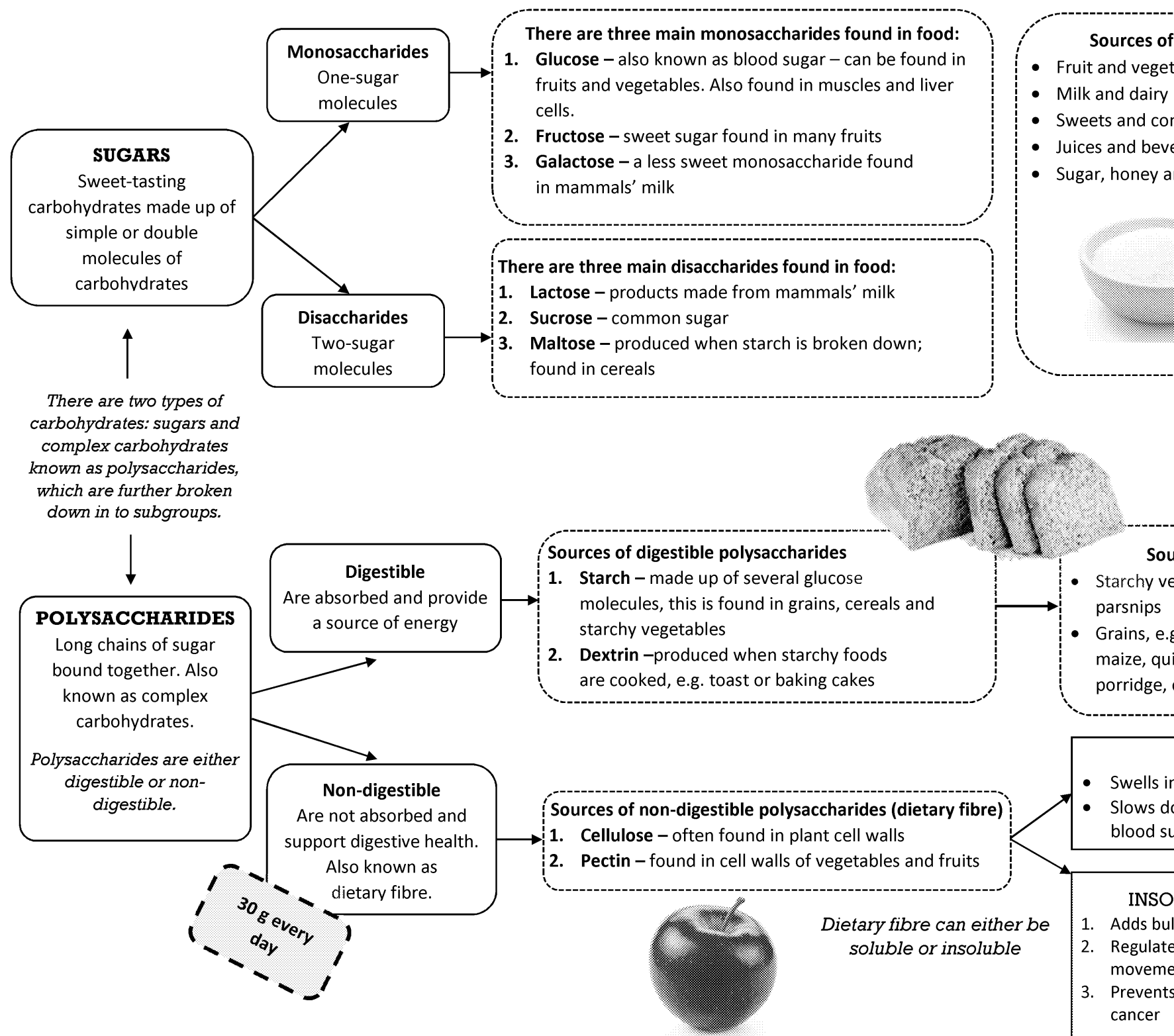


Macronutrients – carbohydrates

CARBOHYDRATES

50% of daily energy intake

Large biomolecules built of carbon, oxygen and hydrogen, either in the form of simple, double or complex molecules. They are made up of hundreds of molecules of sugar bonded together



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Micronutrients – vitamins

Micronutrients are needed by the body in small amounts.

Fat-soluble vitamins

Vitamins A, D, E and K, present mainly in fatty foods, which can be stored in the body for long periods of time – excess may be harmful

A

Retinol

Beta-carotene

DRV
600 mcg
daily

Functions:

- Growth and development of the body
- Helps support vision at night
- Keeps the skin and cell membranes healthy



Sources:

- Liver, milk and dairy, egg yolk, oily fish
- Red, yellow and green vegetables and fruit

Deficiency: night blindness, flaky and dry skin
Excess: toxic, harmful to unborn babies

Beta-carotene – inactive form of vitamin A, found in plant foods

Retinol: active form of vitamin A, found in animal-origin foods

D

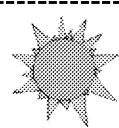
Cholecalciferol

Sunshine vitamin

DRV
10 mg
daily

Functions:

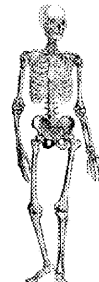
- Healthy bones and teeth
- Helps absorb calcium



Sources:

- Produced in the skin in response to sunshine exposure
- Liver, milk and dairy, egg yolk, oily fish

Deficiency: rickets, osteoporosis, depression, increased risk of cancer
Excess: damage to the kidneys and other organs, weakened bones



Vitamin D deficiency is very common in the UK. For this reason, a doctor can prescribe you a vitamin D supplement.

E

Tocopherol

DRV
4 mg daily

Functions:

- Helps growth of the baby during pregnancy
- Keeps cell membranes and muscles healthy
- Helps build sperm cells and red blood cells

Sources:

- Vegetable oils, seeds and nuts
- Egg yolk, wheatgerm

Deficiency: muscular dystrophy, anaemia, infertility
Excess: loss of appetite, nausea, flatulence, diarrhoea



K

Phylloquinone

DRV
0.1 mcg
daily
per kg
body mass

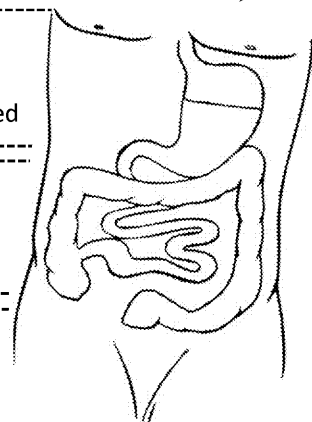
Functions:

- Ensures proper blood clotting and healing of wounds
- Prevents bleeding by supporting blood clotting when injured

Sources:

- Produced by gut bacteria
- Leafy green vegetables, green tea

Deficiency: bleeding, bruising
Excess: very rare, no known symptoms



Vitamins
A, C, E

Antioxidants

Protect cells from the damage caused by free radicals.

Help prevent cardiovascular disease, cancer and maintain healthy skin.

FREE RADICALS are particles of oxygen that have lost one or more electrons and steal electrons from other molecules in the body, causing oxidative stress.

Sources of antioxidants

- Fresh fruit and vegetables
- Nuts
- Whole grains
- Oily fish

Vitamin B1
Thiamine

DRV 1 mg daily

- Helps energy metabolism
- Supports nervous system

Vitamin B2
Riboflavin

DRV 15 mg daily

- Supports energy metabolism and cell growth

Vitamin B3
Niacin

DRV 15 mg daily

- Releases energy from carbohydrates
- Helps maintain healthy skin and nerves

Vitamin B9
Folate / folic acid

DRV 200 mcg daily

- Ensures healthy blood and nervous system
- Helps prevent neural tube defects

Vitamin B12
Cobalamin

DRV 1.5 mcg daily

- Helps energy metabolism and nerve function

Vitamin C
Ascorbic acid

DRV 40 mg daily

- Builds collagen for skin and blood vessels
- Helps iron absorption
- Helps maintain healthy immune system
- Helps prevent oxidative stress

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Micronutrients (minerals)

Micronutrients are needed by the body in small amounts

Calcium (Ca)

- Works together with phosphorus and vitamin D to ensure proper bone and tooth health
- Helps blood clotting
- Ensures proper functioning of nerves and muscles

Rickets – effect of calcium deficiency in children, in which bones don't grow properly and impair movement

Osteoporosis – effect of calcium deficiency in adults, in which bones become weak, brittle, easy-to-break and heal slowly

Commonly found in milk and dairy products

Also present in nuts, bread and cereals, oily fish and green vegetables

DRV: 700mg daily

Iron (Fe)

- Necessary for building red blood cells

Haem iron

(Easily absorbed by the body)

Red meat, offal, egg yolk

Non-haem iron

(Difficult to absorb)

Green leafy vegetables, dried fruit, chocolate, lentils

Haemoglobin – red pigment in the blood cells which carries oxygen around the body

Menstruation

Part of the female monthly cycle when bleeding occurs

excess

Stomach ache
Nausea
Vomiting
Constipation

Iodine (I)

- Builds hormones in the thyroid gland
- Controls the rate of metabolism

excess

Weight gain
change in metabolism

Swelling of the thyroid (goitre)

Thyroid:
small gland in the front of the neck

Red meat, sea fish, shellfish, cereals, grains, Nuts, meat and fish.

May be breathed in at the seaside and in salt caves

DRV: 140 mcg daily

Fluoride

- Builds and strengthens teeth

excess

Brittle tooth enamel
Tooth decay

Bony fish (e.g. toothpaste)

Fluoride is also found in...



Phosphorus (P)

- Works together with calcium and vitamin D to ensure proper bone and tooth health
- Essential for energy release

excess

Tiredness
Depression

Decalcification of bones
Weak, brittle bones

deficiency

Milk and dairy

Bread and cereals

Nuts, meat and fish

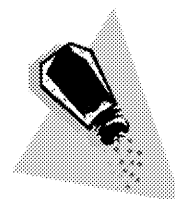
DRV: 550 mg

Sodium (Na)

- Maintains body water balance
- Important for the conduction of nerve impulses

excess

High blood pressure
hypertension
Heart failure and
Kidney damage



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Macronutrients - fats and

Macronutrients are needed by the body in large

PROTEINS

large biomolecules built of amino acids bound together into long chains

15% of daily energy intake

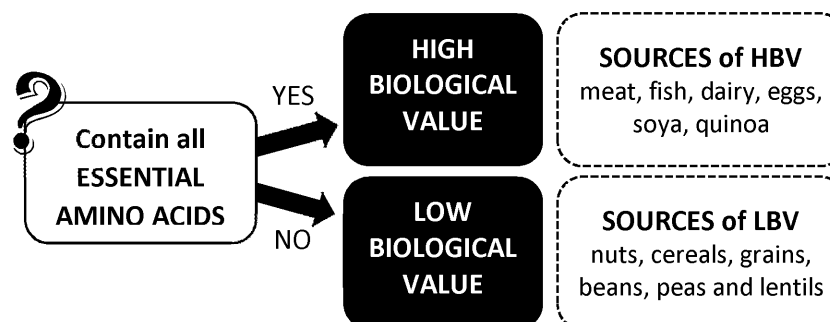
A Identify the functions of proteins.

Functions

There are approximately 20 amino acids in total and each one has a specific function in our body.

B Explain the difference between essential amino acids and non-essential amino acids.

Different foods contain different amounts of these essential amino acids. Foods that contain them all are called **high biological value** (HBV) and a protein source that lacks one of these essential amino acids is called a **low biological value** (LBV) protein.



D Identify what happens when we consume too little protein or too much protein.

Excess	
Deficiency	

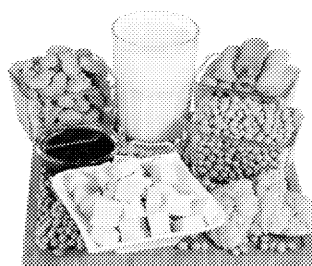
What about vegetarians and vegans?

Protein Alternatives

Vegetarians and vegans don't consume meat so instead they use protein alternative products, which are manufactured in order to provide protein in a diet, and protein-rich plant foods.

Examples include:

- Mycoprotein (Quorn®)
- Tofu
- Tempeh
- Soy chunks
- Textured vegetable proteins (TVP)
- Beans, lentils, chickpeas



FAT

The fu

Fu

E Outline each of the

S

F Descri

G Identify t

Excess

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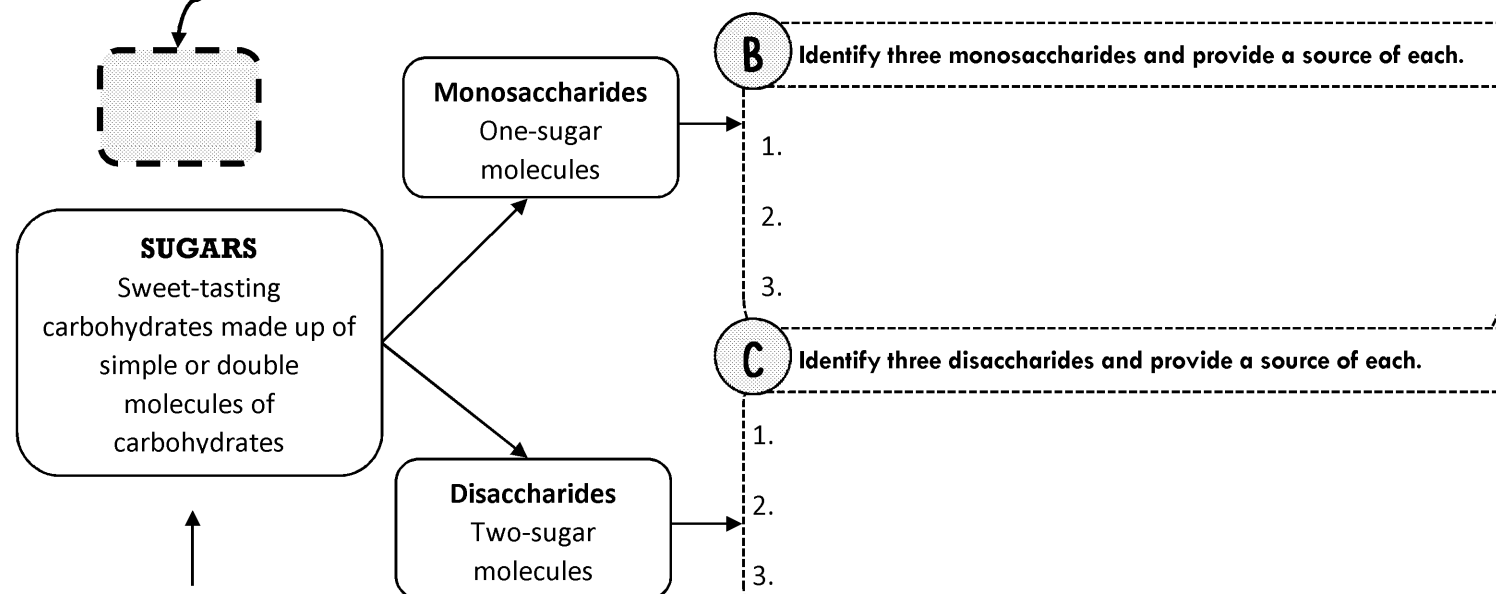


Macronutrients - carbohydrates

CARBOHYDRATES

Large biomolecules built of carbon, oxygen and hydrogen, either in the form of simple, double or complex molecules, or as hundreds of molecules of sugar bonded together

A Identify how much of a person's daily energy intake should be provided by carbohydrates, and outline the functions of carbohydrates in the diet.



Sources of

- Fruit and vegetables
- Milk and dairy products
- Sweets and confectionery
- Juices and beverages
- Sugar, honey and syrups

There are two types of carbohydrates: sugars and complex carbohydrates known as polysaccharides, which are further broken down into subgroups.

POLYSACCHARIDES

Long chains of sugar bound together. Also known as complex carbohydrates.

Polysaccharides are either digestible or non-digestible.

Digestible
Are absorbed and provide a source of energy

Non-digestible
Are not absorbed and support digestive health. Also known as dietary fibre.

D Identify two types of digestible polysaccharides and two types of non-digestible polysaccharides, and provide a source of each.

Sources of digestible polysaccharides

Sources of non-digestible polysaccharides (dietary fibre)

Sou

- Starchy vegetables, e.g. potatoes, parsnips
- Grains, e.g. wheat, maize, quinoa, porridge, etc.

INSO

Dietary fibre can either be soluble or insoluble

F Identify two functions of soluble fibre and two functions of insoluble dietary fibre.

E Indicate how much dietary fibre should be provided every day with a balanced diet.

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Micronutrients – vitamins

Micronutrients are needed by the body in small amounts

Fat-soluble vitamins

Vitamins A, D, E and K, present mainly in fatty foods, which can be stored in the body for long periods of time – excess may be harmful

A Identify two functions and two sources of each of the fat-soluble and water-soluble vitamins.

A
Retinol
Beta-carotene
DRV
600 mcg daily

Functions:

Sources:

Deficiency:
Excess:



Beta-carotene – inactive form of vitamin A, found in plant foods

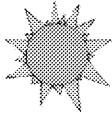
Retinol: active form of vitamin A, found in animal-origin foods

D
Cholecalciferol
Sunshine vitamin
DRV
10 mg daily

Functions:

Sources:

Deficiency:
Excess:



Vitamin D deficiency is very common in the UK. For this reason, a doctor can prescribe you a vitamin D supplement.

E
Tocopherol
DRV
4 mg daily

Functions:

Sources:

Deficiency:
Excess:

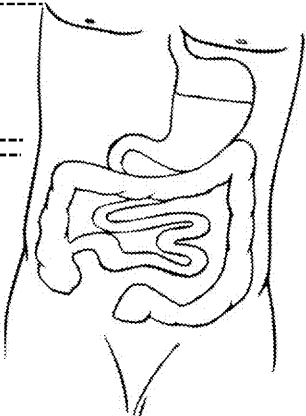


K
Phylloquinone
DRV
0.1 mcg daily per kg body mass

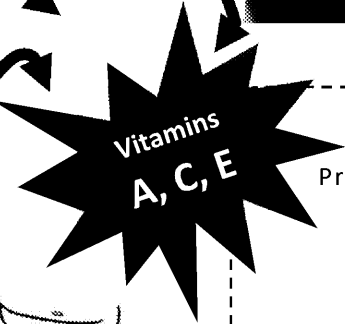
Functions:

Sources:

Deficiency:
Excess: very rare, no known symptoms



Vitamin B1 <i>Thiamine</i> DRV 1 mg daily	
Vitamin B2 <i>Riboflavin</i> DRV 15 mg daily	
Vitamin B3 <i>Niacin</i> DRV 15 mg daily	
Vitamin B9 <i>Folate / folic acid</i> DRV 200 mcg daily	
Vitamin B12 <i>Cobalamin</i> DRV 1.5 mcg daily	
Vitamin C <i>Ascorbic acid</i> DRV 40 mg daily	



Antioxidants
Protect cells from the damage caused by free radicals.
Help prevent cardiovascular disease, cancer and maintain a healthy immune system.
FREE RADICALS are particles of oxygen with an unpaired electron. They are highly reactive and can damage cells and DNA.
Sources of antioxidants:

- Fresh fruit and vegetables
- Nuts
- Whole grains
- Oily fish

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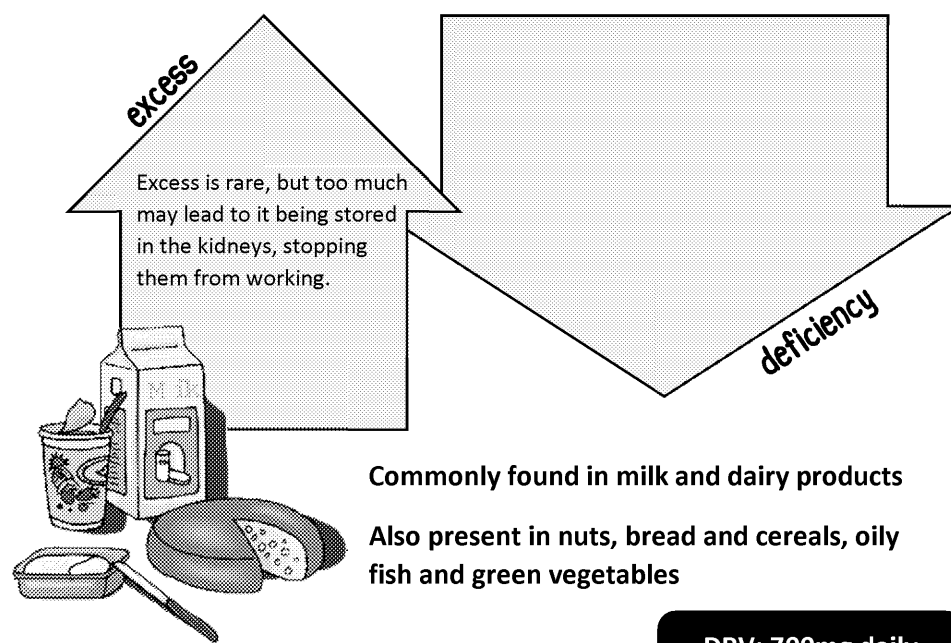
Micronutrients (minerals)

Micronutrients are needed by the body in small amounts

Calcium (Ca)

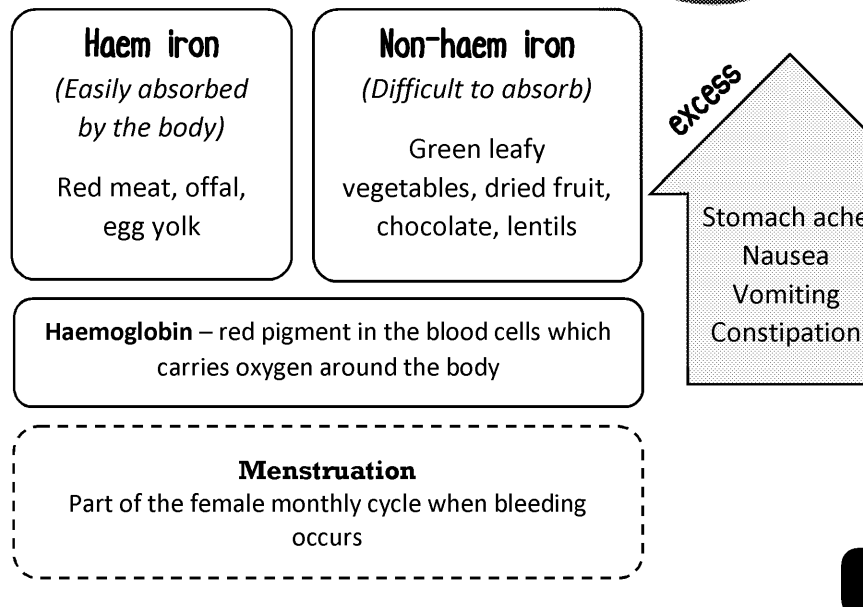
A Identify the functions and effects of deficiency or excess of each of the minerals.

Functions:



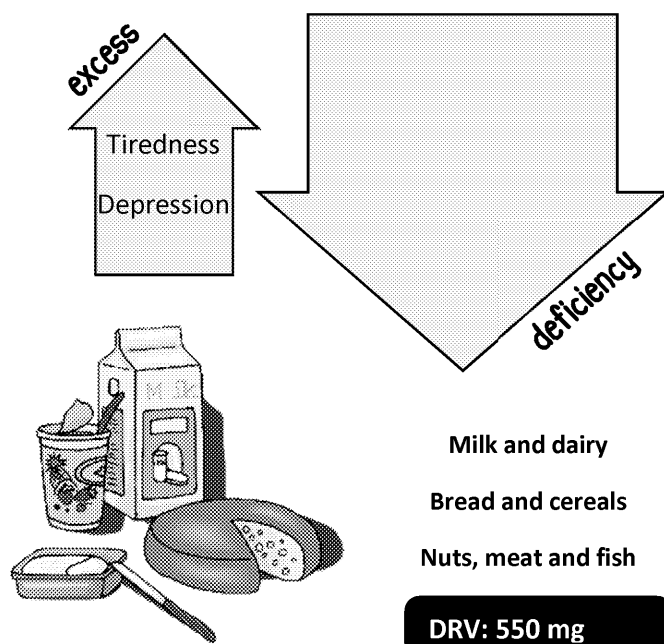
Iron (Fe)

Functions:



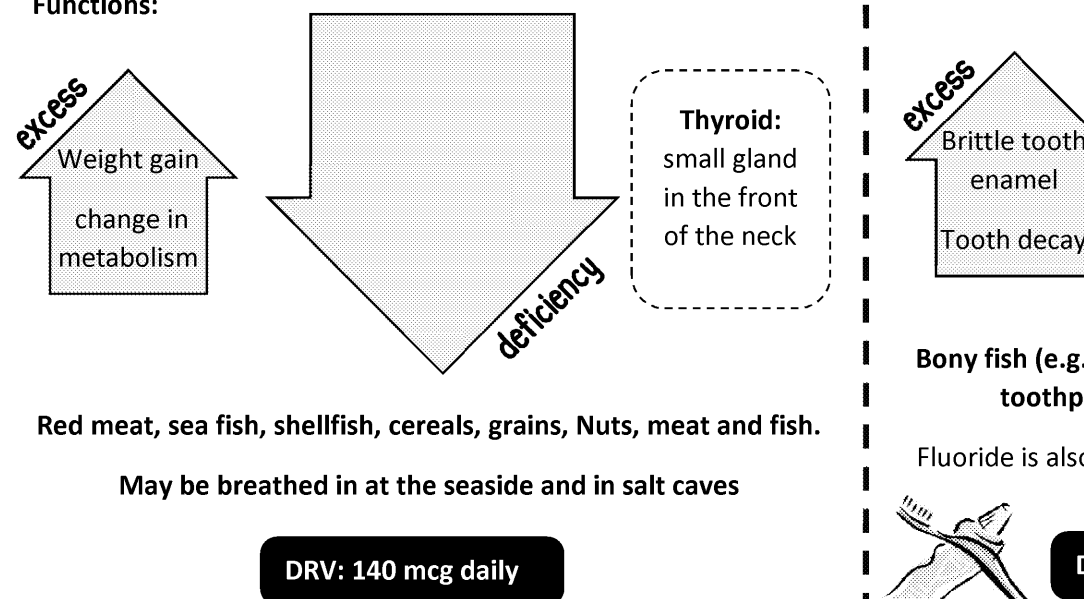
Phosphorus (P)

Functions:

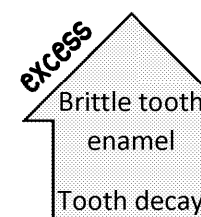


Iodine (I)

Functions:



Fluoride



Sodium (Na)

B What is the DRV for sodium?

DRV =

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