

Section One — Knowledge Organiser

Welcome to this section's Knowledge Organiser. It's a handy summary of the section — so dig in and enjoy...

Proteins

Made up of **amino acids** (the body's building blocks).

- **11 non-essential amino acids** (ones the body can make).
Learn these 4 — alanine, asparagine, aspartic acid & glutamic acid.
- **9 essential amino acids** (ones the body can't make).
Histidine, isoleucine, leucine, lysine, methionine, phenylalanine, threonine, tryptophan & valine.

Sources — seeds, meat, fish, dairy, nuts, beans.

Used for — growth, repair, maintenance.

Excess — strain on liver and kidneys.

Deficiency — slows growth, weak immune system, oedema, kwashiorkor, poor hair / skin / nails.

Alternative proteins include **soya, mycoprotein, TVP & tofu.**



Dietary reference values — **55 g** for males, **45 g** for females per day, **6 g** extra when pregnant.

High biological value proteins (mostly animal sources) have **all** the **essential amino acids**.

Low biological value proteins (only in plant sources) are **missing** at least one essential amino acid.

Protein complementation = combining LBV proteins to get all essential amino acids.

Carbohydrates

- Sugar** is found **naturally** (e.g. fruit) or **added** to food.
 - Digested **rapidly** — **energy released quickly**
 - Sugars are **monosaccharides** or **disaccharides**
- Starch** is found in **potatoes, cereals** etc. Starchy foods have lots of **nutrients** & are often high in **fibre**.
 - Digested **slowly** — **steady release of energy**
 - Starches are **polysaccharides**

Glycaemic Index (GI) shows how quickly carbohydrates affect blood sugar levels.

Excess — gets converted into fat (may lead to obesity), dental caries, type 2 diabetes.

Deficiency — low blood sugar (hunger, dizziness, tiredness), body starts to use up fat & protein (weight & muscle loss).

Fats

Made up of **3 fatty acids** and **glycerol** (triglycerides).

- **Saturated fats** usually come from **animal sources**.
- **Unsaturated fats** come from mostly **vegetable sources**. **Healthier** than saturated fats. Unsaturated fats can be **monounsaturated** or **polyunsaturated**.

Needed for **energy, vitamins, insulation, protecting bones & organs, making cholesterol & essential fatty acids** (ones the body can't make):

- **Omega-3** helps with **brain function & heart health**. Sources include **oily fish & seeds**.
- **Omega-6** helps **lower cholesterol & reduce inflammation**. Sources include **chicken, nuts & vegetable oils**.

Excess — **obesity, type 2 diabetes**. Saturated fats lead to **higher cholesterol** (increased risk of **coronary heart disease**).

Deficiency — **vitamin deficiency, weight loss, less insulation / bone & organ protection**.

Dietary reference values — **70 g** per day. No more than **20 g** saturated fat.

Vitamins

Some are **fat-soluble** & found in **fatty foods**. Stored in **fat tissue**.

- A** — for good **eyesight, growth, healthy immune system / skin** → 0.7 mg for men & 0.6 mg for women per day.
- D** — helps **absorb minerals** (especially calcium) → 0.01 mg per day for adults.

Others are **water-soluble**. **Dissolve** in water & **lost** through urine — **need** to take them in **daily**:

- B group** — keep the **nervous system** healthy
B1, B2, B3 help with energy release,
B9 & B12 help make red blood cells.
- C** — **protects** body from infection, **heals** wounds

Water-soluble vitamins are **lost** when fruit & veg **exposed** to **air** or left in **water**.

Minerals

Mineral	Function
Calcium	Strong bones & teeth, healthy nerves & muscles, blood clotting
Iron	Forms part of haemoglobin in red blood cells
Magnesium	Healthy bones & energy release
Potassium	Cardiovascular health, nerves & muscles, regulating fluid balance
Fluoride	Helps strengthen teeth & prevent dental caries
Iodine	Helps make some hormones



You need to know the effects of excesses and deficiencies of **vitamins & minerals** — see p.7-9.

Fibre and Water

Fibre

- Helps with **digestion** — prevents **constipation, bowel cancer** etc.
- In **fruit, pulses, nuts, veg, wholegrain foods**.
- Adults need **30 g** per day.

Water

- Helps **get rid of waste, control body temperature & digest food**.
- You need **6-8 glasses** a day — but **more** if it's **hot** or you're **exercising**.