

Energy use, diet, nutrition and hydration



UNTAMEDED
EDUCATION

2.1.3 Health, fitness and well-being

Basal Metabolic Rate

Fats

Vitamins

Carbohydrates

Macronutrients

Energy use, diet, nutrition and hydration

Energy Balance

Micronutrients

Minerals

Proteins

Fibre

Water



1. Basal metabolic rate

The rate at which we burn calories for energy is called our **basal metabolic rate**.

- ▶ Physical activity can **increase** our basal metabolic rate so we need to consume more calories.
- ▶ When we eat is also important.
- ▶ Ensure you leave at least **two** hours after and before exercise.
- ▶ During exercise you can consume **small** quantities that are easily digested.
- ▶ After activity you should consume plenty of **liquids** and after a period a balanced meal.



2. Energy

Average females need **2,000 kcal/day** and males need **2,500 kcal/day**. This may vary depending on the following factors:

- ▶ **Teenagers** need more energy than young **children**.
- ▶ **Males** tend to need more energy than **females**.
- ▶ **Athletes** need more energy than **non-athletes**.
- ▶ People with **active** lifestyles need more energy than people with **non-active** lifestyles.
- ▶ **Taller** people need more than **shorter** people.



To maintain **energy balance** the food intake needs to match energy needs.

An increase in energy intake can result in **weight gain**.

An increase in energy needs without an increase in energy intake will result in weight **loss**.



3. Macronutrients

- ▶ Macronutrients are the types of food we need in large amounts. These include:
- ▶ **Carbohydrates**
- ▶ **Proteins**
- ▶ **Fats**

4. Carbohydrates

Why are they important?

- ▶ ProvideS the most ready source of **energy**.
- ▶ Allows the athlete to perform for longer and is used for **endurance** events such as cycling and marathon running.



Sources of food

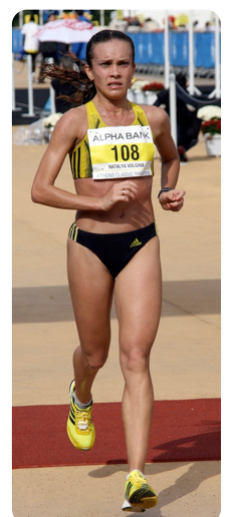
- ▶ **Complex carbohydrates** - Bread, rice, pasta and potatoes.
- ▶ **Simple sugars** - Sweets and cakes.

Useful sources of energy

- ▶ Over **half of our energy needs** are taken from carbohydrates, athletes need even more.

Carbohydrate loading is a technique used by endurance athletes to maximise their carbohydrate stores.

- ▶ This involves eating **high carbohydrate meals** 24 hours before the day of the competition.
- ▶ This helps maximise the **glycogen stores**.
- ▶ One downside is this can leave the performer feeling heavy and sluggish.
- ▶ It should, however, **offset** the effects of fatigue.





5. Protein

Why are they important?

- ▶ They provide amino acids that **build muscle tissues** to make the body stronger.
- ▶ They **repair** muscle tissue.

Sources of food

- ▶ Meat, eggs and nuts.

Useful sources of energy

- ▶ Protein provides a **small amount of energy** if needed.

Power and strength athletes need to build muscle. To assist them they combine training with a **high protein diet**.

- ▶ They should consume 1.2 - 1.7 grams per kilogram of body weight.
- ▶ A high protein diet is also used during the **rehabilitation** from an injury.
- ▶ This kind of diet can also help athletes who need to lose weight.



6. Fats

Why are they important?

- ▶ Provide large amounts of **energy**.
- ▶ They contain essential **fatty acids** that the body needs to function.
- ▶ **Insulates** the body against the cold.

Sources of food

- ▶ **Saturated fats** - Butter, cheese, ice cream and fatty meats.
- ▶ **Unsaturated fats** - Avocado, nuts, soybean and olive oils.

Useful sources of energy

- ▶ Fats provide **50%** or more of our energy needs.
- ▶ They can only be used at low intensities when oxygen is in **plenty** supply.





7. Micronutrients

- ▶ Micronutrients are chemical substances that are essential to normal **growth** and **development**.
- ▶ **Vitamins**
- ▶ **Minerals**

8. Vitamins and minerals

Why are they important?

- ▶ **Aid growth.**
- ▶ Boost our **immune** system.
- ▶ Regulate body functions.

Sources of food

- ▶ Vegetables and fruit.

Useful sources of energy

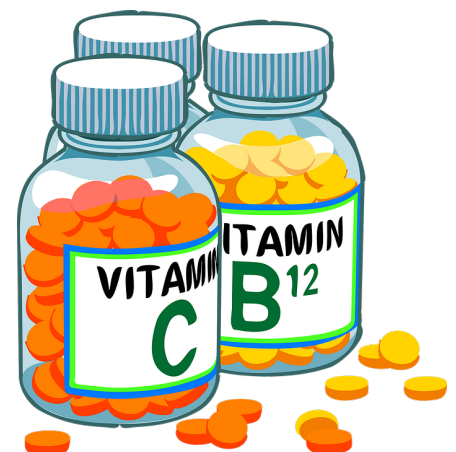
- ▶ Vitamins and minerals do **not** generate any energy.

Important vitamins

- ▶ **B3** and **B6** help with gaseous exchange.
- ▶ Vitamin **C** assists with exercise induced asthma.
- ▶ Vitamin **D** assists with mood and energy regeneration.
- ▶ Vitamin **E** reduces the risk of pneumonia.

Important minerals

- ▶ **Calcium**
- ▶ **Iron**
- ▶ **Iodine**
- ▶ **Magnesium**
- ▶ **Zinc**
- ▶ **Phosphorus**





9. Water 2-2.5 litres

Why is it important?

- ▶ Incorrect water balance can cause **dehydration**.
- ▶ **Lubricates** joints.
- ▶ Removes **waste products**.
- ▶ **Regulates** temperature.

Sources of food

- ▶ Water can be found in most **food** and **drink** products but the best way to hydrate is to drink it directly.

Useful sources of energy

- ▶ Water provides **no** energy but it does aid the chemical reactions that release energy.



10. Fibre/roughage

Why is it important?

- ▶ It pushes your food along your **intestine** preventing constipation.
- ▶ It absorbs **poisonous** wastes from digested foods.
- ▶ Makes you feel full.

Sources of food

- ▶ Fruit, vegetables, bread and cereals.

Useful sources of energy

- ▶ Fibre is **not** a source of energy.



11. Optimum Weight

The four main factors that influence your **optimum weight**.

1. **Gender** - Men have a higher **muscle mass** and skeleton so have a higher optimum weight.
2. **Height** - Increased height results in a **larger skeleton** and a higher optimum weight.



Energy use, diet, nutrition and hydration

3. **Muscle girth** - Increased **muscle mass** results in a higher optimum weight.

4. **Bone structure** - A high **bone density** increases the optimum weight.

Different athletes have different optimum body weights. Here we can see the different body types of these athletes.

