

Energy use, diet, nutrition and hydration



UNTAMED
EDUCATION

2.2 Health, fitness and training

Basal Metabolic Rate

Fats

Carbohydrates

Vitamins

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Energy Balance

Minerals

Proteins

Water

Fibre



1. Basal metabolic rate

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

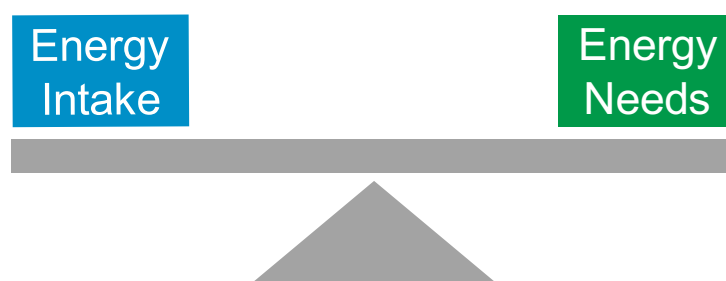
- ▶ Physical activity can **increase** our basal metabolic rate so we need to consume more calories.
- ▶ When we eat is also important.
- ▶ Ensure you leave at least **two** hours after and before exercise.
- ▶ During exercise you can consume **small** quantities that are easily digested.
- ▶ After activity 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 **2,500Kcal/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**.



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Energy is derived from food sources:

- ▶ **muscle cells** release energy from glucose in a process called **respiration**.
- ▶ some glucose is converted to **glycogen** and **stored** in the muscles and liver.

3. Nutrients

- ▶ The body needs a **balanced diet** as unused calories are stored as fat and nutrients are needed for growth and hydration.
- ▶ **Carbohydrates**
- ▶ **Proteins**
- ▶ **Fats**
- ▶ **Vitamins**
- ▶ **Minerals**
- ▶ **Water**
- ▶ **Fibre**



4. Carbohydrates

Why are they important?

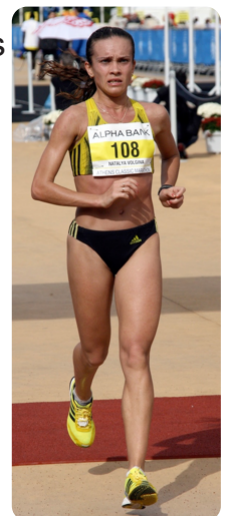
- ▶ Provides the most ready source of **energy for cell respiration**.
- ▶ Allows the athlete to perform for longer and is used for **endurance** events such as cycling and marathon running.

Sources of food

- ▶ Bread, rice, pasta and potatoes.

Useful sources of energy

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





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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 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**.
- ▶ 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**.
- ▶ Many power athletes will also consume protein **supplements**.



6. Fats

Why are they important?

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



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Sources of food

- ▶ Butter, cheese, ice cream, fatty meats and oil.

Useful sources of energy

- ▶ Fats provide **70%** of our energy needs.
- ▶ They can only be used at low intensities when oxygen is in **plenty** supply.



7. 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.



8. Water

Why is it important?

- ▶ Water balance prevents **dehydration**.

Dehydration causes:

- ▶ Blood plasma is made up of mostly water so without it the blood will **thicken** and slow blood flow.
- ▶ Blood thickening causes increased **heart rate** and irregular heart beat.
- ▶ Causes an increase in temperature and **overheating**.
- ▶ Slows **reactions** and decision making.



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- ▶ Increase in muscle **fatigue** and cramps.

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.

9. 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.

