
Iron

Summary

- Iron is an important dietary mineral that is involved in various bodily functions, including the transport of oxygen in the blood.
 - Dietary iron is found in both animal and plant products.
 - The most significant influence on iron absorption is the amount of iron already stored in the body.
 - Certain foods and drinks affect how much iron your body absorbs.
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Iron is an important mineral that is involved in various bodily functions, including the transport of oxygen in the blood. This is essential for providing energy for daily life. Good sources of iron include red meat, offal and iron-fortified breakfast cereals.

Iron is lost from the body through sweat, shedding intestinal cells, and blood loss. About one third of the world's population is iron deficient. Menstruating women are at greater risk than men and postmenopausal women of iron deficiency. It is thought that up to five per cent of the Australian population has iron deficiency anaemia.

Roles of iron in the body

Some of the many roles of iron in the body include:

- **oxygen transport** – red blood cells contain haemoglobin, a complex protein that carries oxygen from the lungs to the rest of the body. Haemoglobin is partly made from iron, and accounts for about two thirds of the body's iron
- **myoglobin** – a special protein that helps store oxygen in muscle cells. Myoglobin contains iron and is responsible for the red colour of muscle
- **enzymes** – many enzymes throughout the body contain iron, including those involved in energy production. Enzymes are catalysts (increase the rate of chemical reaction) that drive many cell functions
- **immune system** – proper functioning of the immune system relies, in part, on sufficient iron. The immune system helps us fight infection.

Recommended dietary iron intakes

The average person needs to absorb just a small amount of iron each day to stay healthy (around 1 mg for adult males and 1.5 mg for menstruating females). To achieve this, however, we need to consume several times that amount. This is because our bodies absorb only a fraction of the iron contained in the foods we eat.

The Australian Recommended Dietary Intake (RDI) for iron is the amount of dietary iron required to meet the needs of most of the population. This amount is different for different age groups and life stages.

Recommended dietary intakes (per day)

Age and life stage	Recommended dietary intake of iron (mg/day)
Babies 0–6 months – breastfed	0.2

Babies 0–6 months – formula fed	The iron in formula is less well absorbed (about 10–20 %) than the iron in breastmilk. This is why infant formula available in Australia is iron-fortified. Following the instructions on the formula packet will provide your baby with the iron intake they need to meet their daily requirements. This intake will be significantly higher than for breast-fed infants.
Infants aged 7–12 months	11
Girls and boys aged 1–3 years	9
Girls and boys aged 4–8 years	10
Girls and boys aged 9–13 years	8
Boys aged 14–18 years	11
Girls aged 14–18 years	15
Women aged 19–50 years	18
Pregnant women	27
Breastfeeding women aged over 18 years	9
Breastfeeding women aged 14–18 years	10
Women aged 51 years and over	8
Men aged 19 years and over	8

Types of iron in our diets

The two types of iron found in our diets are:

- **haem iron** – found in animal tissue such as beef, lamb, kangaroo, chicken and fish. Offal products such as liver and kidney are particularly rich in haem iron (however pregnant women should avoid eating too much offal as it contains large amounts of vitamin A, which can cause birth defects). This form of iron is most easily absorbed by the body
- **non-haem iron** – found in animal tissue, animal-based products and plant foods such as dried beans and lentils. Good vegetarian sources of non-haem iron include iron-fortified breakfast cereals, wholegrains and legumes (beans and lentils).

How much iron do we absorb from our diet?

How much iron you absorb from your diet depends on how much iron your body is storing.

The healthy body absorbs around 18 per cent of the available iron from a typical western diet (which includes animal foods) and about ten per cent from a vegetarian diet. However, you may be absorbing much less than that, even if your diet includes iron-rich foods.

The most significant influence on iron absorption is the amount of iron already stored in your body. The body stores iron in various places, including the liver. If your stores are high, your body absorbs less iron from the foods you eat. Conversely, low iron stores increase your ability to absorb iron.

Dietary factors affecting iron absorption

Certain foods and drinks affect how much iron your body absorbs.

To boost iron absorption:

- Consume vitamin C (found in fruits and vegetables).
- Include animal protein (haem) with plant (non-haem) sources of iron, such as **meat** with beans – for example, beef and kidney beans in a chilli con carne.
- Cook plant sources of iron (such as vegetables). In most cases, cooking increases the amount of available non-haem iron in vegetables. For example, the body absorbs six per cent of the iron from raw broccoli, compared to 30 per cent from cooked broccoli.

Foods and drinks that reduce your body's ability to absorb iron:

- Soy proteins can reduce absorption from plant sources.
- Tea, coffee and wine contain tannins that reduce iron absorption by binding to the iron and carrying it out of the body.
- Phytates and fibres found in wholegrains such as bran can reduce the absorption of iron and other minerals.
- Inadequate vitamin A in your diet could lead to iron deficiency because vitamin A helps to release stored iron.
- Calcium and phosphorus reduce the absorption of plant-sourced (non-haem) iron.

High-risk groups for iron deficiency

One in eight people aged two years and over does not consume enough iron on average to meet their needs. If you do not have enough iron in your body, it is called being 'iron deficient'.

People who are at an increased risk of iron deficiency, include:

- babies given cow's or other milk instead of breastmilk or infant formula
- toddlers, particularly if they drink too much cow's milk
- teenage girls
- menstruating women, especially those who have heavy periods
- women using an IUD (because they generally have heavier periods)
- **pregnant women**
- breastfeeding women
- people with poor diets such as people who are alcohol dependent, people who follow 'fad diets', or people with eating disorders
- people who follow a **vegetarian or vegan diet**
- Aboriginal Australians
- athletes in training
- people with intestinal worms
- regular blood donors
- people with conditions that predispose them to bleeding, such as gum disease or stomach ulcers, polyps or cancers of the bowel
- people with chronic diseases such as cancer, auto-immune diseases, heart failure or renal (kidney) disease
- people taking aspirin as a regular medication
- people who have a lower than normal ability to absorb or use iron, such as someone with coeliac disease.

Learn more about **iron deficiency in adults**, and **iron deficiency in children**.

Iron supplements

Iron status is easily checked by a blood test. Depending on your iron status, your doctor may advise you to take iron supplements.

If you've been advised to take iron supplements, keep in mind that:

- The most common side effect of iron supplements is dark coloured or black stools (poo), so don't be alarmed by this change to your bowel habits.
- Other common side effects include nausea, vomiting, constipation and diarrhoea. See your doctor for advice but, generally speaking, treatment involves lowering the recommended dose for a short time to give the body time to adjust.
- Iron supplements should be taken on an empty stomach, if possible.
- Supplements should be taken exactly as advised by your doctor. The human body isn't very good at excreting iron and you could poison yourself if you take more than the recommended dose.

Too much iron can be harmful

The body stores iron very efficiently and too much iron can be toxic. Excessive iron stores can lead to organ damage, especially of the liver, heart and pancreas. In some cases, iron taken in large amounts can even be fatal. Some symptoms of iron poisoning include fatigue and weakness, joint pain, weight loss and loss of body hair.

Haemochromatosis is a condition characterised by excessive iron stores. Some studies suggest that haemochromatosis increases the risk of heart disease and some cancers, such as colorectal cancer. Treatment includes limiting the amount of iron in the diet and regularly removing blood until iron levels normalise, however it's important to see your doctor for personalised advice.

If you suspect an iron overdose, call your doctor or the **Victorian Poisons Information Centre** on **13 11 26** immediately (24 hours, 7 days) or visit your local hospital emergency department.

Where to get help

- Your **GP (doctor)**
- **Dietitians Association of Australia** Tel. **1800 812 942**
- **Victorian Poisons Information Centre** Tel. **13 11 26** – seven days a week, 24 hours a day – for advice about poisonings, suspected poisonings, bites and stings, mistakes with medicines and poisoning prevention advice.

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