

Iron

Summary

- Iron is an important dietary mineral that is involved in various bodily functions, including the transport of oxygen in the blood.
- The most significant influence on iron absorption is the amount of iron already stored in the body.

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 shedding intestinal cells, sweat 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 for iron deficiency. It is thought that up to five per cent of the Australian population has iron deficiency anaemia.

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)

Infants 0–6 months	0.2 mg for breastfed infants (the iron in formula is less well absorbed, so the intake in formula-fed infants is significantly higher.)
Infants aged 7–12 months	11 mg
Girls and boys aged 1–3 years	9 mg
Girls and boys aged 4–8 years	10 mg
Girls and boys aged 9–13 years	8 mg
Boys aged 14–18 years	11 mg
Girls aged 14–18 years	15 mg
Women aged 19–50 years	18 mg
Pregnant women	27 mg

Lactating women	9 mg (10 mg for 14-18 year old adolescents who are breastfeeding)
Women aged 51 years and over	8 mg
Men aged 19 years and over	8 mg

Roles of iron

Some of the many roles of iron 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 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.

High-risk groups for iron deficiency

Certain people are at increased risk of iron deficiency, including:

- 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 or breastfeeding women
- people with poor diets such as alcoholics, 'fad dieters' or people with eating disorders
- vegetarians or vegans
- athletes in training
- people with intestinal worms
- Aboriginal Australians
- 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.

Types of iron

The two types of iron include:

- **haem iron** – found in animal tissue such as beef, lamb, chicken and fish. Offal products such as liver and kidney are particularly rich in haem iron. Pregnant women should avoid eating too much offal as it contains large amounts of vitamin A, which can cause birth defects. The body absorbs just under one quarter of the iron contained in animal foods.
- **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 and wholegrains.

Iron stores affect absorption

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 that boost iron absorption

Certain foods and drinks help your body to absorb greater amounts of iron, including:

- Vitamin C (found in fruits and vegetables) increases iron absorption.
- Animal protein boosts iron absorption from plant sources.
- 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.

Dietary factors that reduce iron absorption

Certain foods and drinks reduce your body's ability to absorb iron, including:

- Soy proteins can reduce absorption from plant sources.
- Tannins from tea, coffee and wine reduce iron absorption by binding to the iron and carrying it out of the body.
- The phytates and fibres in wholegrains such as bran can reduce the absorption of iron and other minerals.
- Vitamin A helps to release stored iron, so not enough vitamin A in the diet could lead to iron deficiency.
- Calcium and phosphorus reduce the absorption of plant-sourced iron.

Iron supplements

Iron deficiency anaemia is diagnosed with a blood test. You may be advised by your doctor to take iron supplements. Remember:

- 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.
- If possible, iron supplements should be taken on an empty stomach.
- Take the supplements 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. Haemochromatosis is a condition characterised by excessive iron stores. Excessive iron stores can lead to organ damage especially of the liver, heart and pancreas. Some symptoms include fatigue and weakness, joint pain, weight loss and loss of body hair.

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.

Where to get help

- Your doctor
- Dietitians Association of Australia Tel. 1800 812 942.

Things to remember

- Iron is an important dietary mineral that is involved in various bodily functions, including the transport of oxygen in the blood.
- The most significant influence on iron absorption is the amount of iron already stored in the body.

This page has been produced in consultation with and approved by:

Deakin University - School of Exercise and Nutrition Sciences

Content on this website is provided for information purposes only. Information about a therapy, service, product or treatment does not in any way endorse or support such therapy, service, product or treatment and is not intended to replace advice from your doctor or other registered health professional. The information and materials contained on this website are not intended to constitute a comprehensive guide concerning all aspects of the therapy, product or treatment described on the website. All users are urged to always seek advice from a registered health care professional for diagnosis and answers to their medical questions and to ascertain whether the particular therapy, service, product or treatment described on the website is suitable in their circumstances. The State of Victoria and the Department of Health & Human Services shall not bear any liability for reliance by any user on the materials contained on this website.

For the latest updates and more information, visit www.betterhealth.vic.gov.au

Copyright © 1999/2019 State of Victoria. Reproduced from the Better Health Channel (www.betterhealth.vic.gov.au) at no cost with permission of the Victorian Minister for Health. Unauthorised reproduction and other uses comprised in the copyright are prohibited without permission.