

# IRON

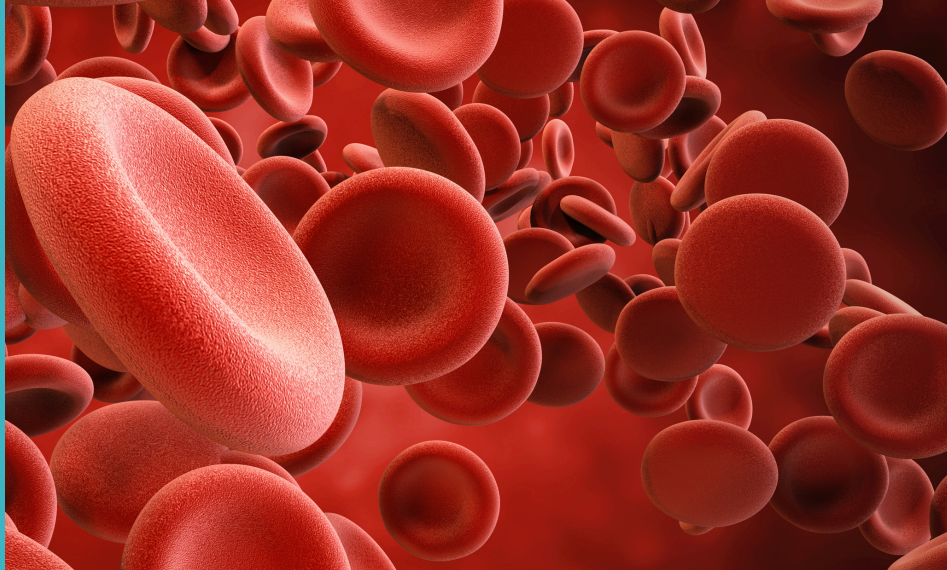
Iron is a mineral found in every cell of the body and is considered an essential mineral because it is required in the production of blood cells. The human body needs iron to make the oxygen-carrying proteins hemoglobin and myoglobin, which are essential in providing energy for daily life. Iron deficiency is one of the most common nutritional deficiencies, in fact, The World Health Organisation considers iron deficiency to be the number one nutritional disorder in the world. It is thought that up to 5% of the Australian population has iron deficiency anemia.

## ROLES OF IRON

**Oxygen transport** – Red blood cells contain hemoglobin, a complex protein that carries oxygen from the lungs to the rest of the body. A component of hemoglobin is made from iron, and accounts for approximately two thirds of the body's iron. In muscles, iron is an important part of myoglobin, which aids in the storage and transport of oxygen within the muscle cell.

**Energy Production** – Many enzymes throughout the body contain iron, including those involved in energy production. Enzymes are catalysts (they increase the rate of chemical reaction) that drive many cell functions.

**Immune System** – Adequate stores of iron are essential for the cells which fight and protect the body against infections. If your iron stores are low, your body is consequently more susceptible to infection.



## WHERE CAN I OBTAIN IRON FROM?

The human body is unable to manufacture iron therefore the body's iron needs must be obtained through the foods we eat. Although iron is widely distributed in foods, some sources are better absorbed than others. The two types of iron are:

**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 leafy greens, wholegrains and iron-fortified breakfast cereals.

## FOODS TO ENHANCE IRON ABSORPTION

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

**Vitamin C** - found in fruits and vegetables

**Animal Protein** - boosts iron absorption from plant sources

**Cooking Vegetables** - can increase the amount of available non-haem iron; for example, the body absorbs 6% of iron from raw broccoli, compared to 30% from cooked broccoli



“The vitamin C link - Vitamin C is important for dietary iron intake because it increases the body's ability to absorb iron.”



# DIETARY REQUIREMENTS

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.

AGE	FEMALES	MALES
9-13 yrs	8 mg/day	8 mg/day
14-18 yrs	15 mg/day	11 mg/day
19-50 yrs	18 mg/day	8 mg/day
51+ yrs	8 mg/day	8 mg/day
Pregnant	27 mg/day	-
Lactating	9 mg/day	-

# INHIBITORS OF IRON ABSORPTION



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

- Soy proteins can reduce iron absorption from plant sources
- Tannins from tea, coffee and wine reduce absorption by binding to the iron and removing it from the body
- 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 can lead to iron deficiency
- Calcium and phosphorus reduce the absorption of plant-sourced iron

# IRON DEFICIENCY

When loss of iron is not sufficiently compensated by adequate intake of iron from the diet, a state of iron deficiency develops over time. If left untreated, this can lead to iron deficiency, known as anemia. The danger in regard to anemia is that a deficiency in iron limits oxygen delivery to cells of the body. Initially this can lead to fatigue, dizziness, weakness and lethargy, however chronic or extreme iron deficiency can cause serious health problems including: organ damage, enlarged heart or heart failure - as the cardiovascular system must work harder to make up for the lack of oxygen-transporting hemoglobin or red blood cells. Other signs of deficiency include: pale skin, shortness of breath and frequent infections due to reduced immune capacity. Conversely, excess amounts of iron can result in toxicity and even death. Indicating why it is important to be aware of your daily iron intake.

# BEST SOURCES OF HAEM IRON:



FOOD SOURCE	SERVE	IRON (mg)
Liver	100g	11.0
Oysters	100g	3.9
Beef	100g	3.5
Liver Pate	40g (2 Tbsp)	2.0 - 3.0
Kangaroo	100g	2.6
Lamb	100g	1.8
Salmon	100g	1.3
Pork	100g	1.0
Chicken	100g	0.6 - 1.0

# BEST SOURCES OF NON-HAEM IRON:



FOOD SOURCE	SERVE	IRON (mg)
Spinach	145g (cooked)	11.0
Cereal (fortified)	30g (1 cup)	3.9
Tofu	100g	3.5
Lentils/Kidney Beans	40g (cooked)	2.0 - 3.0
Eggs	100g (2 eggs)	2.6
Almonds	50g	1.8
Dried Apricots	50g	1.3
Wholemeal Bread	60g (2 slices)	1.0
Broccoli	100g	0.6 - 1.0

# IRON TOXICITY

The body stores iron very efficiently, however too much iron can be toxic. Haemochromatosis is a condition characterised by excessive iron storage. 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.

# SUPPLEMENTATION

Iron deficiency anaemia is diagnosed with a blood test. You may be advised by your doctor to take iron supplements, however, you should never self-diagnose. Try using the tables on this handout and food labels to keep track of your daily iron intake. If you believe you may be iron deficient, speak to your doctor about taking a simple diagnostic test.



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