

Iron, Haemoglobin and Anaemia Factsheet

Why is Iron so Important?

Put simply, iron is a mineral that is essential in the production of haemoglobin. Haemoglobin is the part of the red blood cell which attaches to oxygen and transports it around the body. Anaemia results when there is not enough haemoglobin in the body and is characterised by tiredness and breathlessness during exercise (though these symptoms are not exclusive to anaemia). Other symptoms include headaches, light-headedness, a pale complexion and rapid heart rate. Anaemia may cause poor athletic performance because oxygen cannot get to the working muscles where it is needed fast enough.

How is Anaemia Caused?

Usually, anaemia is caused by insufficient dietary intake of iron (deficiency anaemia) though there can be other causes which inhibit iron absorption (caffeine, digestive disorder), increase iron consumption (pregnancy), increase iron loss (bleeding) or alter iron turnover (prolonged infection).

Is Anaemia more Common in Athletes?

Not necessarily, though it is more likely to be detected in athletes due to the associated poor performance. Females and vegetarians are particularly susceptible though anaemia can occur in anyone. Anaemia is measured by the amount of haemoglobin per measure of blood (i.e. < 12 g/dl) and because the volume of blood increases with endurance training, the blood may become more dilute in athletes, resulting in 'sports' anaemia. The repetitive pounding associated with running may cause iron loss in the following ways: (i) breakdown of red blood cells in the feet and subsequent loss of haemoglobin in the urine (haemoglobinuria); (ii) bruising of the bladder and subsequent loss of blood in the urine (haematuria); (iii) trauma to the digestive tract and subsequent loss of iron, usually in association with diarrhoea. Low ferritin (iron stores), yet normal haemoglobin levels are common in athletes. The cause of this (latent iron deficiency) is unknown.

Normal haemoglobin levels:

Male: 13.5-17 g/dL
Females: 12-15 g/dL

Normal ferritin values:

Males: 15-445 µg/L
Females: 10-235 µg/L

Recommended daily allowance (RDA) of iron:

Male: 6.7 mg/day
Female: 14.8 mg/day



Iron Supplements

Generally iron supplements should not be administered for longer than 6 months. Do not take iron supplements if you have a stomach ulcer or any stomach or bowel disorder. Iron preparations are best taken before a meal on an empty stomach. Do not take within 1 hour of bedtime. Side Effects include: Nausea, stomach upset, heartburn, vomiting, diarrhoea. Continuous use may cause constipation and darkening of the stools. Keep iron supplements away from children. Never give iron supplements intended for an adult to a child.

Some Good sources of Iron

Food	Iron (mgs)
Liver (calves)	6.10 per 50 g
Minced beef (cooked)	3.10 per 100 g
Sirloin steak (cooked)	3.80 per 200 g
Mackerel (smoked)	1.20 per 100 g
Bran flakes	10.00 per 50 g
Cornflakes	2.00 per 30 g
Baked beans	2.80 per 200 g (half medium tin)
Red kidney beans	4.00 per 200 g (half medium tin)
Chick peas (boiled)	2.80 per 140 g (4 tbls)
Red lentils (boiled)	4.00 per 160 g (4 tbls)
Brown bread	1.30 per 2 average slices

Food	Iron (mgs)
Wholemeal roll	1.80 per 50 g (1)
Brown rice (raw)	0.70 per 2 oz portion
White rice (raw)	0.25 per 2 oz portion
Dried apricots	7.00 per 200 g (5)
Raisins	1.90 per 50 g (2 tablespoons)
Prunes	2.60 per 100 g (10 prunes)
Dry roasted peanuts	0.50 per 25 g (small packet)
Walnuts	1.20 per 40 g (12 halves)
Cashew nuts (roasted)	1.80 per 30 g (30)
Broccoli (boiled)	1.00 per 40 g (normal portion)
Cabbage (boiled)	0.30 per 40g (2 large tablespoons)



Absorbing Iron

Iron needs an acidic environment to be absorbed. Meat produces acid in the stomach when it is being digested, but vegetable/fruit sources of iron must be eaten with acidic foods (e.g. ones which contain Vitamin C) for them to be absorbed properly. Additionally antacids and certain foods (milk, eggs, rhubarb, caffeine beverages) may decrease iron absorption.

Can Iron Improve Performance?

No! More is not always better and unless you have an iron shortage, iron supplements will not increase performance. However, a lack of iron can greatly reduce performance, and the normal benefits of altitude are not evident in those who have low iron availability. It may therefore be necessary to take iron supplements while training at altitude. Those who have sports anaemia or latent iron deficiency, do not necessarily benefit from iron supplements.

