

FACTSHEET

Nutrition, health and schoolchildren Iron Deficiency Anaemia



Anaemia is a condition in which the number of red blood cells (and consequently their oxygen-carrying capacity) is insufficient to meet the body's physiologic needs.

Anaemia is a global public health problem, with the World Health Organisation (WHO) estimating that it affects around 25% of the world's population. Iron deficiency anaemia is thought to be the most common cause of anaemia globally, affecting some 2 billion people. It is especially prevalent in less developed countries, but still remains a significant problem in the developed world. There are several other types of anaemia that affect children but these are less common.

What is iron deficiency anaemia?

Iron is used to produce red blood cells, which help store and carry oxygen in the blood. Iron deficiency anaemia is a specific type of anaemia where a lack of iron in the body leads to a reduction in the number of red blood cells. If you have fewer red blood cells than is normal, your organs and tissues will not get as much oxygen as they usually would.

Symptoms of iron deficiency anaemia

Symptoms can commonly include:

- fatigue and lethargy (lack of energy)
- shortness of breath
- heart palpitations (noticeable heartbeats)
- a pale complexion

Some children with mild iron deficiency anaemia may not show any symptoms.

Risk factors

The main risk factors for iron deficiency anaemia are:

- low intake of iron or poor iron absorption;
- period of life when iron requirements are especially high (e.g. growth and pregnancy);
- heavy blood loss as a result of menstruation;
- infections;

How is iron deficiency anaemia diagnosed?

Iron deficiency anaemia is typically diagnosed using blood tests. Combinations of biochemical indicators, such as haemoglobin (to measure anaemia) and ferritin concentrations (to measure iron stores), can be used to define iron deficiency anaemia. Mean cell volume and other red blood cell changes can also be used to help diagnose iron deficiency anaemia.

WHO criteria for identification of anaemia are haemoglobin concentrations of:

- | | |
|--------------------------|--|
| • children under 5 years | <110 g/L |
| • children 5-11 years | <115 g/L |
| • children 12-15 years | <120g/L |
| • over 15 years | non-pregnant females <120 g/L; males <130 g/L. |

WHO criteria used to define depleted storage iron are serum ferritin concentrations of:

- children under 5 years <12 µg/L
- children over 5 years <15 µg/L

Prevalence of anaemia

Based on the WHO thresholds of haemoglobin and serum ferritin concentrations used to define iron deficiency and anaemia, the prevalence of iron deficiency anaemia in the most recent UK dietary survey was around 5% for girls aged 11 to 18 years. There were no cases below the threshold for boys aged 11 to 18 years.

Dietary Intake

The Reference Nutrient Intake (RNI) of iron in schoolchildren (mg/d), the amount that is needed to meet the dietary need of most, is as follows

	Male	Female
4-6 years	6.1	6.1
7-10 years	8.7	8.7
11-18 years	11.3	14.8

The recommended intake of iron increases when girls reach puberty, due to increased losses from menstruation and this puts girls of this age at greater risk of having low iron status. The table below shows the prevalence of iron intakes below the Lower Reference Nutrient Intake (LRNI) (the amount that is estimated to be sufficient for only 2.5% of the population). Low intakes of iron are more common in girls aged 11 to 18 years, as is the prevalence of iron deficiency anaemia.

Age group	Percentage with iron intakes below the LRNI
Male 4-10 years	1
Female 4-10 years	3
Male 11-18 years	9
Female 11-18 years	48

If dietary intake of iron is low there is an increased risk of developing iron deficiency anaemia.

Dietary iron exists in two forms: **haem** (found almost exclusively in meat) and **non-haem**. Foods that provide non-haem iron are fortified breakfast cereals, beans, pulses, dark green leafy vegetables (such as watercress), tofu, nuts, seeds and dried fruit (such as apricots, prunes and raisins). Iron is also added to food as a fortificant, for example in wheat flour and breakfast cereals, and is available as supplements (although these should only be taken if advised to do so by a health professional).

Haem iron is generally well absorbed in the intestines. Non-haem iron is absorbed according to our iron needs. More iron is absorbed in when iron status is low, and less when iron stores are full. Iron absorption may be enhanced by the presence of vitamin C and inhibited by phytates and phenolic compounds. However, in practice, studies have found that these compounds do not appear to have a large effect on iron status in the population as a whole.

Iron and cognitive health

The European Safety Food Authority has published its opinion that on the basis of the review of evidence iron contributes to normal cognitive development in children aged 3 to 18 years. Some evidence suggests that iron deficiency anaemia may be associated with poor cognition in school-aged children and there is a beneficial effect of iron treatment on cognitive development in anaemic children aged 3 years or older. However, the long-term benefits of this have not yet been shown.

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