



# Iron and anaemia

Iron deficiency is one of the most common nutritional problems in the world and about half the children in developing countries are affected. It is also perhaps one of the most widely ignored problems, despite its serious effects. In our region, many people, particularly children and pregnant women, are deficient in iron.

## Effects of iron deficiency

Iron forms a vital part of red blood cells. It is also involved in metabolism, the process of using energy in the body for activity. Anaemia develops when the body is short of iron. The symptoms include:

- ✚ tiredness
- ✚ shortness of breath
- ✚ general un-wellness
- ✚ pale skin – particularly under the eyes and fingernails.

Tiredness affects an individual's ability to work and be productive and has been shown to have major effects on national productivity and economies when many in the population are affected.

While the short-term symptoms can be very limiting and affect a person's ability to work, the long-term consequences of iron deficiency are also very serious. They include:

- ✚ poor physical growth, poor mental development and slowed/delayed learning in anaemic children;
- ✚ increased risk of complications for the mother during pregnancy and delivery;
- ✚ increased risk of stillbirths, low birth weight babies and subsequent health problems in the baby; and



- ✚ general ill health and increased susceptibility to infections.

## Diagnosing iron deficiency



Initially, a lack of iron will result in the body using its stores. When these run out, transferrin, which is in the blood and carries iron around the body, drops below acceptable cut-off levels.

As the state of iron deficiency gets worse, haemoglobin levels in the red blood cells will eventually be affected. Haemoglobin is important for red blood cells, which carry oxygen around the body.

Anaemia, the medical condition that refers to below-normal blood haemoglobin levels, is not only caused by a lack of iron, but also by a lack of vitamins B2 and B12 as these are needed to help the body to use iron effectively. To make sure someone really has iron-deficiency anaemia, their blood transferrin levels need to be checked also.

## Food sources of iron

Iron is an essential mineral; this means that we must have sufficient iron in our diet.

<i>Good sources</i>	<i>Moderate sources</i>	<i>Poor sources</i>
red meat liver, kidney and other offal	chicken and turkey spam, corned beef/mutton	
small fish with liver 	tinned fish tuna reef fish seafood (e.g. turtle, sand crab, clam)	milk egg  seafood (e.g. lobster)
	yam, taro	breadfruit
	peanuts, seeds	coconut (all types)
	dark green leafy vegetables (e.g. kangkong, chaya, bele, sweet potato leaves, spinach, pumpkin leaves) chinese cabbage green beans broccoli	
	beans such as lentils, kidney beans, mung beans, soya beans	
	fortified breakfast cereals	
	dried raisins	

(Note: the following contain almost no iron – turkey tails, rice, ramen (instant noodles), breadfruit, bread, cookies, biscuits and doughnuts.)

It is important to be aware of the two different forms of iron found in food: haem and non-haem. The haem type is found in meat, fish and eggs. The non-haem form is found in plant foods such as cereals, fruits and vegetables. The body finds it easier to absorb iron from haem foods than from non-haem foods. The absorption of iron from non-haem foods is affected by diet. Some factors help absorption and others reduce it:

- ✦ tea and coffee (drunk within two hours of a meal) dramatically reduce absorption;
- ✦ substances found in cereals, rice, nuts and milk also reduce absorption;
- ✦ substances found in fresh fruits and vegetables, such as vitamin C, fermented foods, such as soy sauce, and haem iron increase absorption.

Absorption rates are also affected by:

- ✦ pregnancy – absorption increases to try and meet increased needs;
- ✦ iron status – when iron stores in the body are low, absorption increases; and
- ✦ intakes of iron – when intakes are very high, the percentage absorbed decreases to prevent overload.

### Causes of iron deficiency

The poor absorption of iron, particularly with diets low in meat and fish, is a key factor in iron deficiency. In addition to low iron intake, a number of other factors frequently contribute towards deficiency by increasing the need for iron:

- ✦ high needs – for example, in pregnancy, during infancy;

⚡ high losses – for example, hookworm infection (which is a very important cause of deficiency in the developing world), malaria, blood loss during menstruation.

## Infants

High needs for iron (relative to food intake) cause high rates of iron deficiency in three- to twelve-month-old babies. During the first six months, infants use their existing iron stores along with iron from breastmilk to meet their needs. While breastmilk has fairly low levels of iron, it is well absorbed. The iron in formula milk is, by contrast, poorly absorbed, so to ensure reasonable total intake levels, manufacturers significantly increase the amount of iron. By the time infants are six months old, they require more iron than either breastmilk or formula milk can provide. This means that in addition to breastmilk, complementary (solid foods) must be introduced at six months and must include foods that are rich in iron.



Unfortunately, a baby is born with less stores of iron if the mother has low body iron during pregnancy and this can cause iron deficiency when the baby is only a few months old. Ideally, women should be supplemented with iron during pregnancy. If babies are given complementary foods before they are six months old, the amount of iron they absorb from milk decreases. Therefore, the early introduction of complementary foods is not recommended, even in babies who are deficient. Iron drops can be given if necessary.

## Dealing with iron deficiency anaemia

There are a few measures that can be taken to reduce both individual and population iron-deficiency problems:

- ⚡ promote the use of iron-rich foods that are rich in iron;
- ⚡ educate people about which foods affect iron absorption;
- ⚡ develop strategies to limit infections that increase iron needs, such as diarrhoea, colds, measles and malaria;
- ⚡ fortify foods with iron – for example, add iron to flour if flour is commonly eaten;
- ⚡ use supplements – for example, tablets for adults and drops for children.

## Supplements

In many countries, iron tablets are given to pregnant women because nearly all women become iron deficient during pregnancy. It is also common to give iron drops to babies over three months of age. Iron tablets for adults should, ideally, include folic acid as this helps the body to use iron.

It is very important that people who are iron deficient understand the value of taking iron tablets. One of the most challenging problems with iron tablets is that many people stop taking them after a few days. This is generally due to side-effects such as stomach aches. These side-effects can be reduced by taking the tablets with lots of water and during a meal. They generally pass within a few days, so people should be encouraged to keep taking them until the symptoms stop.

## Toxicity

While iron can be toxic in large amounts, this problem rarely occurs because the body adapts to the high intake by reducing its absorption of iron. Care should be taken to keep iron tablets away from children. It is possible to become very ill by taking too many tablets at once, and children may be attracted to their colour and assume they are sweets.

