

IRON NEEDS OF TODDLERS FACTSHEET

WHAT IS IRON?

Iron is a mineral that is found abundantly in the environment and is also important in the body. It is found naturally in many foods, added to some for fortification, and also may be taken as a supplement if needed¹.

Why is iron important?

In the body, iron is required for a number of essential roles:

- Component of haemoglobin which transports oxygen from the lungs to the tissues¹
- Component of myoglobin which stores oxygen to be used for muscle contractions²
- Needed for muscle development during growth³
- Component of some enzyme systems that release cell energy²
- Involved in synthesis of neurotransmitters in the brain²
- Involved in nerve development²
- Involved in formation of lactoferrin in breastmilk²
- Helps maintain a healthy immune system³

How much iron do toddlers need?

Iron needs vary throughout life and by gender. For around the first 6 months of life, a baby should have sufficient iron stores provided mother's iron status was adequate. Beyond 6 months of age, the weaning diet needs to include iron rich foods to meet requirements for growth².

Iron reference nutrient intake, mg/d⁴

| | |
|-------------|---------|
| 0-3 months | 1.7mg/d |
| 4-6 months | 4.3mg/d |
| 7-12 months | 7.8mg/d |
| 1-3 years | 6.9mg/d |



Bioavailability of iron

Iron in the diet comes in two forms - haem and non-haem³:

- Haem iron is readily absorbed and there is little in the diet that inhibits absorption. Haem iron is found in meat, fish and poultry.
- Non-haem iron is not readily absorbed and there are many dietary factors that inhibit absorption. Non-haem iron is found in cereals, pulses, legumes, fruits, and vegetables.

Although non-haem iron is not as well absorbed as haem iron, it does contribute more to iron nutrition as it is present in most meals⁵.

There are dietary factors that can either help with iron absorption or inhibit it⁵:

- Iron absorption enhancer - Vitamin C (good sources are red and yellow bell peppers, spinach, kale, broccoli)
- Iron absorption inhibitor - Phytates (mainly found in seeds, grains and legumes) and polyphenols (such as tannins found in tea or coffee)

In the UK, all bread must be fortified with iron. Some breakfast cereals are also iron fortified as are infant formulas and toddler milks which are tailored to fit the nutritional needs for toddlerhood.

What are the implications of too much or too little iron?

Too much:

- Very excessive intakes of iron from supplements or medicines can cause gastrointestinal upsets and faintness¹.
- Haemochromatosis is a condition caused by a gene mutation which leads to excessive build-up of iron in the body and needs treatment⁶.

Too little:

- Iron deficiency can progress through stages from mild, to moderate, to iron deficiency anaemia (IDA) where iron stores are exhausted, red blood cells reduce in size and haemoglobin concentration decreases¹. Mild or moderate iron deficiency may not cause any symptoms, however moderate iron deficiency in children is associated with cognitive and motor developmental delays and behavioural problems².

Common symptoms of IDA are shortness of breath, tiredness, lacking in energy, having pale skin or heart palpitations⁷. Children with mild anaemia may not show any symptoms.

Over 50% of UK toddlers aren't achieving the daily reference nutrient intake (RNI) for iron⁸.

Good food sources of iron

It is important that toddlers are offered iron-rich foods in their diet.

- Good sources of haem iron are liver, red meat, oily fish and eggs.
- Good sources of non-haem iron are beans and pulses, bread, fortified breakfast cereals, dried fruit such as apricots, and green leafy vegetables such as spinach and broccoli, and nut butters.
- Also toddler milks which are fortified for this age group, may play a role in contributing to the iron intake of toddlers⁹.

REFERENCES:

1. National Institutes of Health. Available at: <https://ods.od.nih.gov/factsheets/Iron-HealthProfessional/> (Accessed August 2021)
2. Infant and Toddler Forum. Available at: https://infantandtoddlerforum.org/media/upload/pdf-downloads/4.4_-_Iron_Deficiency_Anaemia_in_Toddlers.pdf (Accessed August 2021)
3. BDA. Available at: <https://www.bda.uk.com/resource/iron-rich-foods-iron-deficiency.html> (Accessed August 2021)
4. Department of Health. Report on Health and Social Subjects No. 41. London. HMSO, 1991
5. Abbaspour N, Hurrell R, Kelishadi R. J Res Med Sci. 2014;19(2):164-174.
6. NHS. Available at: <https://www.nhs.uk/conditions/haemochromatosis/> (Accessed August 2021)
7. NHS. Available at: <https://www.nhs.uk/conditions/iron-deficiency-anaemia/> (Accessed August 2021)
8. Public Health England. Available at: <https://www.gov.uk/government/statistics/nns-results-from-years-9-to-11-2016-to-2017-and-2018-to-2019> (Accessed August 2021)
9. Hojsak I et al. J Pediatr Gastroenterol Nutr. 2018. Jan;66(1):177-185

10 FOODS HIGH IN IRON

