

Red meat and minerals

Red meat contains many essential minerals. These include iron, phosphorus and potassium. It also contains a number of trace elements that are required in much smaller amounts but are nevertheless essential for the body to function properly. These include zinc, cobalt, copper and selenium.

Iron

Iron is needed to carry oxygen in the blood and for many other important functions within the body. Low levels of iron in the body can cause tiredness and fatigue and, over a prolonged period, can lead to the development of iron deficiency anaemia, which can have an impact on health and wellbeing (e.g. increased risk of infections, poor mental concentration, breathlessness). Untreated iron deficiency anaemia in pregnancy has been associated with a number of problems, including increased risk of low birthweight, premature delivery and poor mental development¹. Red meat consumption can help to increase iron intake.^{2,3}

Low iron intakes are common around the world and, in the UK, around 27% of women aged 19-64 years have iron intakes that are likely to be inadequate⁴. Among girls aged 11-18 years this figure is even higher, with around 48% likely to not be consuming enough iron to meet their needs.

Iron in the diet exists in two forms, haem and *non-haem* iron. Most of the iron found in red meat is in the haem form which is more readily absorbed than *non-haem* iron. *Non-haem* iron is found in foods from plant origin such as quinoa, wholemeal bread and some pulses. Haem iron is 2-6 times more available for absorption from the diet than *non-haem* iron⁵.

Some plant compounds (phytates and polyphenols), present in foods such as wholegrain cereals, tea, coffee and pulses, can reduce absorption of *non-haem* iron, although this is not an issue for the majority of the population. Vitamin C found in fruit

¹ National Institute for Health and Care Excellence. Iron deficiency anaemia. Clinical Knowledge Summaries. Feb 2013.

² Moshe G et al. J Pediatr Gastroenterol Nutr. 2013 Dec;57(6):722-7

³ Gibson S & Ashwell M. Public Health Nutrition, 2003; 6(4):341-350.

⁴ Bates B et al. National Diet and Nutrition Survey. Results from Years 5-6 (combined) of the Rolling Programme (2012/13 – 2013/14), Public Health England,

⁵ Scientific Advisory Committee on Nutrition. Iron and Health. 2010.

and vegetables can enhance *non-haem* iron absorption. Haem iron in red meat also helps to improve the absorption of *non-haem* iron from plant sources.

Zinc

Zinc has many important functions; for example it is needed for the growth of body cells, fertility and to support the immune system. Red meat is a good source of zinc and in the UK, around 20-25% of total zinc intake comes from red meat⁶.

As with dietary iron, a number of factors in the diet influence the amount of zinc absorbed. The zinc in meat is well absorbed and consuming a small amount of lean meat improves absorption from other foods. In contrast, phytates, found in wholegrain cereals and pulses, inhibit both zinc and iron absorption. Around 19% of 11-18 year olds and 6% of adults have low intakes of zinc.

Selenium

Selenium has a number of important roles in the body, including regulating thyroid hormones, helping to maintain normal male fertility and protecting the body's cells against free radical damage. Red meat (particularly beef, pork and offal) is a source of selenium and, around 18% of selenium is derived from red meat, on average, in the UK.

Low intakes of selenium are common in the UK population. Around 23% of boys and 44% of girls aged 11-18 and 26% of men and 46% of women aged 19-64 are likely to not be consuming enough selenium to meet their needs. The health effects of this are unclear but intakes are continuing to be monitored at a national level⁷.

Other minerals

Red meat also contains useful amounts of potassium, copper, cobalt, phosphorus, chromium and nickel, all of which are needed for a healthy body.

For example, phosphorus helps to maintain normal bones and teeth whereas potassium is needed for the normal functioning of the nervous system as well as blood pressure control. Although some minerals are only needed in very small quantities they are still vitally important for the maintenance of health.

⁶ Bates B et al. National Diet and Nutrition Survey. Headline results from year 1 of the Rolling Programme (2008/2009). A survey carried out on behalf of the Food Standards Agency and the Department of Health. Available:

<http://www.food.gov.uk/science/dietarysurveys/ndnsdocuments/ndns0809year1>

⁷ Scientific Advisory Committee on Nutrition. Position statement on selenium and health. May 2013.

Functions of selected minerals

Mineral	Function
Iron	Iron helps to make red blood cells, which carry oxygen around the body. It also contributes to normal brain development in children, helps the immune system work as it should and helps to reduce tiredness and fatigue.
Zinc	Zinc has many functions in the body. It contributes to normal brain function and protein synthesis and helps to maintain normal hair, skin and nails. It also helps with the normal healing of wounds and contributes to normal fertility and reproduction.
Potassium	Potassium helps regulate the water content in the body and maintain a normal blood pressure. It also helps the nerves and muscles function normally.
Copper	Copper helps to maintain normal connective tissues and helps the immune system to work as it should. It also helps to maintain a normal nervous system and helps to transport iron around the body.
Phosphorus	Phosphorus contributes to the maintenance of normal bones and teeth. It is needed for the normal growth and development of bone in children.
Chromium	Chromium helps to maintain normal blood glucose levels and helps to breakdown carbohydrate and fat.
Selenium	Selenium has a key role in the control of thyroid hormone metabolism. It helps to protect the cells in our bodies against damage and the immune system to work as it should. It also helps maintain normal skin and nails and normal fertility in males.

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