

## Red meat and minerals

Red meat is a useful source of a wide variety of vital minerals in a form that is readily absorbed by the body. It is a source of zinc and phosphorus and an important dietary contributor to iron intake. Red meat also contains potassium and magnesium and the trace element, selenium, which supports the body's antioxidant defences.

### Iron

Iron plays a major role as an oxygen carrier in haemoglobin in blood, or myoglobin in muscle, and it is also required for many metabolic processes. Dietary iron exists in two forms, haem and non-haem iron, with haem iron being more readily absorbed by the body. Most of the iron present in meat is in the haem form. Approximately 15–35% of haem iron is absorbed in the intestine, compared with only 10% of non-haem iron.

Non-haem iron absorption is influenced by a number of factors some of which inhibit absorption such as phytates in unrefined cereals and others which enhance absorption, such as vitamin C. Haem iron in meat is a further facilitator of non-haem iron absorption.

Low iron intakes are common in the UK. According to the National Diet and Nutrition Survey (NDNS)<sup>1</sup> mean iron intake in women aged 19-64 years was 82 per cent of the RNI and in girls aged 11-18 years was 58 per cent of the RNI; 21 per cent of women aged 19-64 and 27 per cent of girls aged 11-18 years had a mean iron intake below the Lower Reference Nutrient Intake (LRNI). A number of studies have confirmed the positive effect of including meat in the diet, on intakes of dietary iron.<sup>2,3</sup>

### Zinc

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<sup>1</sup> 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>

<sup>2</sup> Williamson CS et al. Nutrition Bulletin 2005;30:323-355

<sup>3</sup> Gibson S & Ashwell M. Public Health Nutrition, 2002; 6(4):341-350.

Zinc helps with the healing of wounds, and is also associated with the activity of a wide variety of enzymes. Zinc is present in a wide range of foods, particularly in association with protein and meat is an excellent source.

Importantly, the zinc contained in red meat is present in a highly bio-available form. In the UK, meat and meat products contribute 31-34 per cent of zinc intake.<sup>4</sup> Modelling by SACN suggest that a reduction in meat intake could have an even greater impact on zinc than iron intake. (SACN 2009)<sup>5</sup>

As with dietary iron, a number of factors affect the bioavailability and absorption of dietary zinc, including the composition of the diet. For example, a small amount of lean beef (75 g per day) has been found to enhance iron and zinc utilisation in young women (Johnson & Walker 1992)<sup>6</sup>, whereas phytate is a well known inhibitor of zinc bioavailability.

### Other minerals

Meat and meat products also contain useful amounts of magnesium, copper, cobalt, phosphorus, chromium and nickel. In particular, red meat usefully contains selenium, although the concentration will depend on the diet of the livestock and the soil in which the animal feed was grown. The proportion of selenium that meat contributes to the diet has not been measured in the UK since 1997 (when it contributed 23% of dietary intake). However, it is recognised that intakes of selenium in the UK have been decreasing over the past 20 years, as European wheat has replaced selenium-rich wheat from Canada and the USA. Therefore, meat may now contribute a larger proportion of selenium in the diet.<sup>7,4</sup>

Please visit [www.meatandhealth.com](http://www.meatandhealth.com) for more information.

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<sup>4</sup> 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>

<sup>5</sup> Scientific Advisory Committee on Nutrition (SACN) (2009) *Draft SACN report on iron and health*. Available at: [http://www.sacn.gov.uk/reports\\_position\\_statements/reports/draft\\_iron\\_and\\_health\\_report\\_scientific\\_consultation\\_-\\_june\\_2009.html](http://www.sacn.gov.uk/reports_position_statements/reports/draft_iron_and_health_report_scientific_consultation_-_june_2009.html) (accessed 1 November 2010).

<sup>6</sup> Johnson JM & Walker PM (1992) Zinc and iron utilization in young women consuming a beef-based diet. *Journal of the American Dietetic Association* **92**: 1474–8.

<sup>7</sup> BNF (British Nutrition Foundation) (2001) *Selenium and Health*. British Nutrition Foundation: London.