

SACN's draft report on Iron and Health

Alison Tedstone, SACN Secretariat
Food Standards Agency



Background

- COMA report: *Nutritional Aspects of the Development of Cancer, 1998*
 - highlighted possible links between red and processed meat consumption and colorectal cancer
 - recommended that “higher consumers should consider a reduction” in meat intakes
 - concerned that a reduction in red meat consumption may compromise other aspects of health, particularly iron status
 - recommended that this effect be reviewed
- Balance between iron deficiency and iron excess – as both are associated with adverse health outcomes
- Some population groups in the UK have low iron intakes

Terms of reference

- To review the dietary intakes of iron in its various forms and the impact of different dietary patterns on the nutritional and health status of the population and to make proposals
- Both beneficial and adverse effects to be considered

Methodology

- SACN Framework for the Evaluation of Evidence (SACN, 2008)
- Evidence on diet and health mainly restricted to cohort studies and RCTs in humans

Key facts about body iron

- Stored as ferritin in the liver, spleen and bone marrow
- Iron is required for:
 - transporting oxygen around the body
 - storage and use of oxygen by muscles
 - component of some essential enzymes
- Body has no effective way of excreting excess iron
- The amount in the blood stream is regulated by using stores and regulation of uptake from the gut.

Key facts about dietary iron (1)

- Three main sources of dietary iron:
 - animal and plant foods
 - foods fortified with iron
 - supplements containing iron
- Two main forms of iron in foods:
 - haem (in foods of animal origin, e.g. meat)
 - non-haem (in all foods, e.g. cereals, vegetables, nuts, fish and meat)
- Haem iron better absorbed by the body than non-haem iron

Key facts about dietary iron (2)

- Major food sources of iron in the UK are (% total iron intake):
 - cereals, e.g. breakfast cereals and white bread (~45%)
 - meat and meat products (19% in men; 15% in women)
 - vegetables (16% in men; 19% in women)
- Recommended intakes vary depending on age and gender
- Some foods may affect iron absorption:
 - enhancers: vitamin C, meat and fish
 - inhibitors: phytic acid, soy protein, polyphenols and calcium

What are the causes of iron deficiency and anaemia?

- Inadequate intakes of dietary iron
- Impaired absorption of dietary iron
- Increased blood losses due to menstruation
- Gastrointestinal blood loss caused by gastrointestinal disease (e.g. ulcer) or associated with use of non-steroidal anti-inflammatory drugs (e.g. aspirin)

Health consequences of iron deficiency and anaemia

- Iron deficiency and anaemia may be associated with impairments in:
 - Physical work capacity
 - Reproductive efficiency
 - Cognitive, motor and behavioural development in children

Health consequences of high iron intake / burden

Suggested links between:

- Iron intakes / status and colorectal cancer – **insufficient evidence**
- Iron intakes / status and cardiovascular disease – **no evidence**
- Iron supplementation in iron replete children and negative effect on growth – **limited evidence**
- Iron intakes and neurodegenerative conditions or rheumatoid arthritis – **no evidence**
- Iron intakes / status and diabetes mellitus – **insufficient evidence**

Health consequences of high meat intake

Evidence suggests that a high intake of red and processed meat is *probably associated with increased colorectal cancer risk*

UK situation

- Some population groups in the UK have low iron intakes*, for example
 - children aged 1½ - 2½ years (12-24%)
 - girls aged 11-18 years (44-48%)
 - women aged 19-49 years (25-40%)
- Current rate of iron deficiency anaemia – 0-6% across the various age and gender groups
- The rates of iron deficiency anaemia in the different population groups are not clearly consistent with their dietary intakes

**Lower reference nutrient intake (LNRI)*

Meat consumption and iron intakes in the UK

- Estimated average daily intake in the UK is 70 g/day
- Estimated average daily intake in Scotland is 63 g/day
- Small difference likely due to differences in methodology used rather than any difference in absolute intakes
- Reducing red meat consumption to 50 g/day had very little effect on iron intakes

SACN's draft recommendations (1)

- Health professionals need to be vigilant of poor iron status in groups at risk of iron deficiency and ensure that they are provided with appropriate medical advice
- Important as:
 - Some population groups in the UK have low iron intakes and may be at risk of iron deficiency
 - Iron deficiency and anaemia may be associated with adverse health outcomes
 - Important to ensure the appropriate use of iron supplements

SACN's recommendations (2)

- A healthy balanced diet including a variety of foods containing iron is important in helping people achieve adequate iron status, rather than focusing on inhibitors or enhancers of iron from foods or the use of iron fortified foods.
- Important as:
 - A variety of foods contribute to iron intakes in the UK
 - The effects of inhibitors and enhancers are less in the context of a complete diet, and do not appear to have long-term effects on markers of iron status
 - Iron used in fortified foods is generally of low bioavailability

SACN's recommendations (3)

- As a precaution, it may be advisable for intakes of red and processed meat not to increase above the current average (70 g/day) and for high consumers (100 g/day or more) to reduce their intakes.
- Important as:
 - Evidence suggests a *probable* association between high intake of red and processed meat and colorectal cancer risk
 - Approximately 33% of UK adults are considered “high consumers” (100 g/day or more)

SACN's recommendations (4)

- Iron supplementation should not be offered routinely to all pregnant women but should be considered for women identified with haemoglobin concentrations below 110 g/L in the first trimester and 105 g/L at 28 weeks.
- Important as:
 - No beneficial (or adverse) effects have been observed with routine iron supplementation during pregnancy
 - In line with the recommendation by the National Institute of Clinical Excellence (NICE)

Next steps

- The SFAC is invited to:
 - Comment on the scientific content of the draft report
 - Make a submission to SACN on the draft report – due 23 September 2009
- SACN will publish the final report by April 2010
- FSA Board will discuss the final report's recommendations in May 2010 and advise UK health ministers