

Scientific Advisory Committee on Nutrition

Paper for Discussion:

**Working Group on Iron
Agenda Item 3**

Please see the attached paper for consideration;

Please also see:

1. Department of Health. Nutritional Aspects of the Development of Cancer. Report on Health and Social Subjects No 48. London: HMSO 1998. (Available on request).

Scientific Advisory Committee on Nutrition

Working Group on Iron

At SACN's first meeting on 13 June 2001, the Committee agreed to set up a Working Group on Iron.

BACKGROUND

National Surveys have consistently identified that a substantial proportion of some groups in the population, particularly young women, children and the elderly have low iron status as defined by ferritin levels, and consequently they may be at risk of iron deficiency anaemia.

Meat, in particular red meat, contributes a significant proportion of iron in the diet and it is efficiently absorbed compared to iron from vegetable sources. As total meat consumption has been falling since 1980, there is concern that any general recommendation to reduce meat consumption should not compromise micronutrient status, particularly that of iron. In 1998 the Working Group on Diet and Cancer of COMA recognised this aspect in their report entitled the 'Nutritional Aspects of the Development of Cancer' which highlighted possible links between red meat and bowel cancer.

The Working Group recommended for adults that "higher consumers should consider a reduction" (in red meat consumption). But the Group were "aware of the possible associated adverse implications of a reduction in meat consumption on other aspects of health, particularly iron status and recommended that this should be the subject of review" (DH 1998).

There is a delicate balance between iron insufficiency, sufficiency and excess; both poor iron status and excess absorption and storage may be detrimental to health. Severe IDA is associated with impaired work performance and child development, and increased maternal and child morbidity (Stolzfus 2001). The impact of more moderate iron deficiency and excess, and the need for and appropriateness of public health measures requires debate.

TERMS OF REFERENCE FOR THE WORKING GROUP:

The following term of reference for the Group was agreed:

To review the dietary intakes of iron in its various forms and the impact of various dietary patterns on the nutritional and health status of the population and to make proposals.

Members agreed that both beneficial and adverse effects of increasing iron intakes need to be considered including:

- The effect of low-grade infections/inflammation on iron status.

- The effect of iron status on mental and physical development.
- Effect of nutritional status of other micronutrients on iron absorption and utilisation.
- The potential adverse effects of excess iron, in particular, promotion of free radical damage and the risk of cardiovascular disease and cancer.

Committee members agreed that the Chair of the Working Group will be a member of SACN and members should include scientists/experts with an awareness of the following areas:

- the interaction of iron with other nutrients;
- molecular aspects regarding cellular and metabolic regulation;
- pathological considerations;
- broader social and ethical dimensions and;
- epidemiological considerations.

BACKGROUND PAPERS

Papers have been included to set the scene for the deliberation of the working group. These are intended to provide a general background and address topics relevant to the UK and the terms of reference of the group:

Status, intakes and recommendations

- The normal range of haemoglobin values as used by WHO and UK. **Annex 1.**
- A selection of tables from NDNS of iron status parameters from the three most recent UK nutritional surveys as an indication of the iron status of at risk groups (preschool age children, school age children and adolescents and the elderly). **Annex 2.**
- Trends in the amount and sources of iron consumed taken from UK household food survey data from 1990-2000 as an indication of iron intakes. **Annex 3.**
- Exerts from the most current COMA reports that outline current UK and EU recommendations on iron intake and UK recommendations on meat consumption. **Annex 4, 5 & 6.**

General information iron physiology, nutrition and disease

- Two general iron reviews covering a board range of iron related topics. **Annex 7 & 8.**

The link between iron and health in particular it's relationship with :

- immune function and infectious disease. **Annex 9.**
- child development. **Annex 10, 11, 12, 13 & 14.**
- pregnancy outcome. **Annex 15.**
- general health in an elderly US cohort. **Annex 16.**

US recommendations for the primary and secondary prevention. Annex 17 & 18

PLANNING OF WORK PROGRAMME

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Members are invited to:

Agree the Term of Reference for the Working Group

Comment upon background papers

Discuss Work Programme

**SACN Secretariat
March 2002**

ANNEXES to SACN/Irongrp/02/01

1. WHO. Iron Deficiency Anaemia. Assessment, Prevention and Control: A Guide for Programme Managers. UNICEF/United Nations University/WHO. WHO/NHD/01.3. WHO, 2001
2. National Diet and Nutrition Survey:
 - A. Children aged 1 ½ - 4 ½ years (Gregory et al 1995)
 - B. Young people aged 4-18 years (Gregory et al 2000)
 - C. People aged 65 years and over (Finch et al 1998)
3. Amount of Iron (mg per person per day) and the Percentage Contribution to the Diet in Great Britain in 1990, 1995 and 2000. National Food Survey, DEFRA
4. Department of Health. Nutritional Aspects of the Development of Cancer. Report on Health and Social Subjects 48. London: HMSO. 1998.
5. Department of Health. Dietary Reference Values for Food Energy and Nutrients for the United Kingdom. Report on Health and Social Subjects 41. London: HMSO. 1991.
6. Scientific Committee for Food. Iron. From: Nutrient and energy intakes for the European Community. Reports of the Scientific Committee on Food (Thirty-first series). Pub: Commission of the European Communities, 1993.
7. BNF. Iron: Nutritional and physiological significance. The Report of the British Nutrition Foundation's Task Force. Pub: Chapman & Hall. 1st ed. 1995
8. ESPHAN. Iron metabolism and needs in early childhood: do we know enough? A commentary by the ESPHAN Committee on Nutrition. IN PRESS.
9. Oppenheimer SJ (2001) Iron and its relation to immunity and infectious disease. J Nutr 131:616S-633S; discussion 633S-635S
10. Stoltzfus Rebecca J. (2001) Iron-Deficiency Anaemia: Reexamining the Nature and Magnitude of the Public Health Problem. Summary: Implications for Research and Programs. J.Nutr.131:697S-701S.
11. Nokes, C. Van den Bosch, C. Bundy, D. The Effects of Iron Deficiency and Anaemia on Mental and Motor Performance, Educational Achievement, and Behaviour in Children. A Report of the INACG (International Nutritional Anaemia Consultative Group). Washington, DC: International Life Sciences Institute, 1998.
12. Martins, S., Logan, S., & Gilbert, R. (2001) Iron therapy for improving psychomotor development and cognitive function in children under the age of three with iron deficiency anaemia (Cochrane Review). Cochrane Database Syst Rev 2: CD001444.
13. Grantham-McGregor, S. & Ani, C. (2001) A Review of Studies on the Effect of Iron Deficiency on Cognitive Development in Children. J Nutr 131: 649S-666S; Discussion 666S-668S.

14. Grantham-McGregor S, Ani C (1999) The role of micronutrients in psychomotor and cognitive development. *Br Med Bull* 55:511-27
15. Beard, J L. (2000) Effectiveness and Strategies of Iron Supplementation During Pregnancy. *Am J Clin Nutr* 71: 1288S-94S
16. Fleming, D J. Jacques, P F. Tucker, K L. Massaro, J M. D'Agostino, R B. Sr, Wilson, P W. Wood, R J. (2001) Iron Status of the Free-living, Elderly Framingham Heart Study Cohort: an Iron-replete Population with a High Prevalence of Elevated Iron Stores. *Am J Clin Nutr* 73: 638-46.
17. Centers for Disease Control and Prevention. (1998) CDC Report: Recommendations to Prevent and Control Iron Deficiency in the United States. *MMWR Morb Mortal Wkly Rep* 47:1-29.
18. U.S. Preventative Services Task Force. Screening for Iron Deficiency Anaemia – Including Iron Prophylaxis. In: *Guide to Clinical Preventative Services*. 2nd ed. Alexandria, VA: International Medical Publishing, 1996: 231-46.