

Iron, Health & At Risk Groups



With Registered Nutrition Consultant

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About Me



BSc in Nutrition and Human Biology and MSc in Nutrition and Public Health



Registered with the Association for Nutrition, the Nutrition Society, SENSE Nutritionists and the Guild of Health Writers



Specialise in Child and Maternal Nutrition



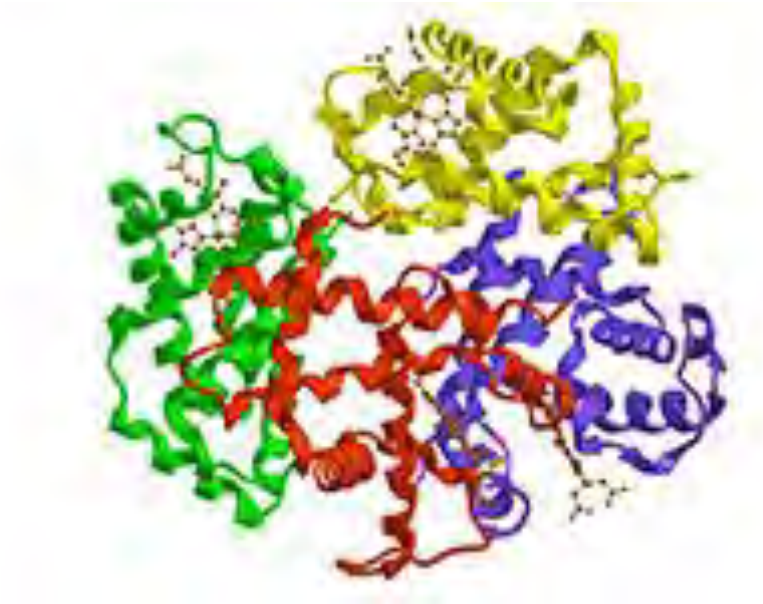
TV, Radio and Print Media: Mother & Baby, Harper's Bazaar, The Metro, The Guardian, Women's Health and Pregnancy & Birth



Charlotte Stirling-Reed
REGISTERED NUTRITION CONSULTANT

Iron is important for...

- Transport of oxygen in red blood cells
&
- Enzymes



EU approved claims for Iron



- ▶ Iron contributes to normal **cognitive function**
- ▶ Iron contributes to normal **energy-yielding metabolism**
- ▶ Iron contributes to normal formation of **red blood cells** and haemoglobin
- ▶ Iron contributes to normal **oxygen transport** in the body
- ▶ Iron contributes to the normal function of the **immune system**
- ▶ Iron contributes to the **reduction of tiredness and fatigue**
- ▶ Iron has a role in the process of **cell division**
- ▶ Iron contributes to normal **cognitive development** of children

Iron Deficiency Anaemia

- 20-30% stored iron
- Absorption regulated by need
- If low intakes - hb conc drops & anemia
- Host of symptoms
- 25% world population anaemic



Current Recommendations

Fascination trying to work out the RNI for iron. So many factors involved:

- *Individual responses and iron needs*
- *Losses from the body - menstruation*
- *Bioavailability of iron type*
- *Adaptations to absorption*
- *Inhibitors and enhancers in the diet*
- *Storage capacity*
- *Sex and age*
- *Contraception*
- *Infections and disease state*



N.B. It is probable that the current DRVs for iron are too high, particularly for girls and women of reproductive age

Current Recommendations

Table 2: Dietary reference values for iron – mg/day ($\mu\text{mol}/\text{day}^*$) (DH, 1991)

Age	Lower reference nutrient intake (LRNI)	Estimated average requirement (EAR)	Reference nutrient intake (RNI)
0–3 months	0.9 (15)	1.3 (20)	1.7 (30)
4–6 months	2.3 (40)	3.3 (60)	4.3 (80)
7–9 months	4.2 (75)	6.0 (110)	7.8 (140)
10–12 months	4.2 (75)	6.0 (110)	7.8 (140)
1–3 years	3.7 (65)	5.3 (95)	6.9 (120)
4–6 years	3.3 (60)	4.7 (80)	6.1 (110)
7–10 years	4.7 (80)	6.7 (120)	8.7 (160)
11–14 years (males)	6.1 (110)	8.7 (160)	11.3 (200)
11–14 years (females)	8.0 (140)	11.4 (200)	14.8 (260)
15–18 years (males)	6.1 (110)	8.7 (160)	11.3 (200)
15–18 years (females)	8.0 (140)	11.4 (200)	14.8 (260)
19–50 years (males)	4.7 (80)	6.7 (120)	8.7 (160)
19–50 years (females)	8.0 (140)	11.4 (200)	14.8 (260)
50+ years	4.7 (80)	6.7 (120)	8.7 (160)

* $1\mu\text{mol} = 55.9\mu\text{g}$

*Adapted from SACN Iron & Health

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Current sources & intakes

- Fortified cereals
- Bread
- Meat and meat products
- Vegetables (including potatoes)



Affected by...

- Tannins
- Type of iron
- Vitamin C
- Blood loss & body needs



* Affect of enhancers and inhibitors may not have long term impact in whole diets.

Table 7: Proportion of males and females of different age groups in the UK with intakes of micronutrients below the lower reference nutrient intake (LRNI)*

Nutrient	Age groups										
	1.5-3 y	4-10 y		11-18 y		19 to 64 y		65-74 y		75 y+	
	All	Boys	Girls	Boys	Girls	Men	Women	Men	Women	Men	Women
Iron (food sources only)	10	0	3	12	54	2	27	0	8	2	12

*Adapted from British Nutrition Foundation

Table: Rates of IDA from NDNS years 7 &8 combined

Population Group	IDA/low iron from NDNS
11-18 year old girls	9%
Adult women	5%
Older women	1%

At risk groups

- ▶ Children 1.5-3.5 years
- ▶ Girls 11-18 years
- ▶ Women of childbearing age (defined by NDNS as women 19-49y)
 - *Females 11-49 in low income groups have highest proportions below LRNI



At risk groups

Children 1.5-3.5 years

Infants

- ▶ DRVs 0-6m?
- ▶ Chord clamping
- ▶ Preterm infants
- ▶ Breast milk substitutes mandatory
- ▶ Deficiency can be more common if late weaning or inappropriate food offered



Toddlers

- ▶ Fast growth rate = expanding red cell mass & growing tissues
- ▶ Iron essential from diet
- ▶ 10% below LRNI for iron
- ▶ Recommendations around weaning and feeding infants highlight importance of iron
- ▶ Weaning diet and meat/iron rich foods not highlighted

At risk groups

Girls 11-18 years

- ▶ Pubertal growth
- ▶ Increased tissue synthesis
- ▶ Menstruation = increased iron losses
- ▶ 54% girls below LRNI
- ▶ Higher requirements
- ▶ “diets” & poor eating habits (vegan?)



N.B. DRV may be too high, but also may not meet needs of 10% of women with highest menstrual losses
- supplement considered (COMA & NHS)

At risk groups

Women of childbearing age (19-49y)

- ▶ Low stores going into pregnancy may affect supply of iron for mother & baby
- ▶ Therefore inadequate iron pre-pregnancy may > need for supplementation during pregnancy
- ▶ Similar DRV to teens & pregnant women but 27% below LRNI
- ▶ If sufficient stores then mobilisation of stores, >in blood plasma and > absorption rate during pregnancy mean higher RNI not necessary



Iron intake is especially important in women of child-bearing age as iron deficiency in pregnancy is associated with low birth weight⁽⁹⁾, which is associated with an increased risk of cardiovascular disease in later life⁽¹⁰⁾

A note on pregnancy...

Pregnancy

- No increased requirement in the UK
- Physiological adaptations enough
- National Institute for Clinical Excellence (NICE) recommends iron supplementation considered for women with haemoglobin concentrations below 110 g/L in the first trimester and 105 g/L at 28 weeks (NICE, 2008).
- Routine supplementation interventions show mixed results - no benefit or negative



Recommendations

- ▶ Review DRVs for iron when more data is available
- ▶ HCPs be aware of at risk groups & signpost/inform accordingly
- ▶ Refer to iron during weaning from 6 months of age
- ▶ Interventions to improve diets of teens e.g. via schools
- ▶ Routine checking of iron during pregnancy in “at risk”?
- ▶ Informing public & at risk groups of iron importance
- ▶ Vegetarian and vegan diets - awareness of low iron risk



Questions



Thank you for Listening...

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