Iron

Iron is a trace element which is needed by the body for the formation of blood. The human body normally contains 3-4g of iron, more than half of which is in the form of haemoglobin, the red pigment in blood. Haemoglobin transports oxygen from the lungs to the tissues. Iron is a constituent of a number of enzymes. The muscle protein myoglobin contains iron, as does the liver - an important source during the first six months of life. The body's iron balance varies mainly according to dietary intake, as losses from the body are generally small - although women lose iron during menstruation.

Iron Requirements

In 1991 the UK's Department of Health recommended Reference Nutrient Intakes (RNI) for iron was as follows. The RNI is a daily amount that is enough or more than enough for 97% of people. The RNI is similar to the Recommended Daily Amount used previously in the UK.

Type of Person	Amounts Required (mg/day)
infants from 0-3 months	1.7
rising at 12 months	7.8
children	6.1-8.7
teenagers	11.3-14.8
men	8.7
women	14.8

The US Recommended Dietary Allowances are similar at 10mg a day for adult men and post-menopausal women; 15mg for adolescents and pre-menopausal women, and an additional 15mg a day for pregnant women.

Vegan Sources of Iron

Good plant sources of iron include dried fruits, whole grains (including wholemeal bread), nuts, green leafy vegetables, seeds and pulses. Other foods rich in iron but which are usually eaten in smaller amounts include soya flour, parsley, watercress, black molasses and edible seaweeds. The use of ironware when cooking foods also contributes to dietary intake.

Examples of amounts of foods providing 2mg iron

Type of food	Quantity (g)
Pistachios	14
Cashews (roasted)	32
Whole lentils	57
Chick peas (boiled)	95
Wholemeal bread	74
Sesame seeds or tahini	19
Black molasses	22
Apricots (dried)	59

Iron Absorption

Up to 22% of the iron in meat is absorbed, while only 1-8% is absorbed from eggs and plant foods. If the body stores fall, the rate of iron absorption rises. About 40% of the iron in animal foods is in a form called haem iron, while the remainder, and all the iron in plant foods, is in the less well absorbed non-haem form. Iron absorption can also be reduced by tannins (e.g. in tea) and phytates (found in nuts, grain and seeds). At this point one tends to wonder whether the rumours of vegans suffering from anaemia have substance, however, this isn't the whole story and the reader will be heartened to learn that research has shown that iron deficiency in vegans is no more common than in the rest of the population.

The absorption of iron from plant foods is improved by the presence in a meal of vitamin C (ascorbic acid), other organic acids such as malic acid (e.g. in pumpkins, plums and apples) and citric acid (in citrus fruits). Laboratory research in which experimental meals were given to 299 volunteers has shown that the inclusion of foods (such as fresh salad, orange juice or cauliflower) providing 70-105mg of vitamin C in each meal increased the absorption of iron. A particularly pronounced effect was seen when 4.5oz cauliflower containing 60mg of vitamin C was added to vegetarian meals, causing more than three-fold increase in iron absorption.[1]

Earlier studies have shown that, when iron intake from plant foods is relatively high (14-26mg/day), even large amounts of phytate do not adversely affect iron balance.[2]

There has been some concern that fibre in food can also inhibit the absorption of iron. However a study has shown that the iron balance was more favourable when fibre intake was 59g a day, than on a low-fibre regime of only 9g.

Iron, Vegans and the General Population

Iron deficiency is believed to be fairly common in the general population and a 1985 survey of young British omnivore women showed that, on average, they were consuming only just over half the current recommended intake. The Dietary and Nutritional Survey of British Adults revealed that one third of all women had low iron stores. Symptons of iron deficiency anaemia include tiredness and breathlessness especially on physical exertion, giddiness, palpitations, headache and poor concentration.

Studies of British vegans have reported an average intake of approximately double the recommended Reference Nutrient Intakes. At this level of iron consumption, any possible inhibitory effects of fibre and phytate on absorption are unlikely to be important. As vegan diets contain about three to four times the British and US recommendations for vitamin C, absorption of iron is enhanced.

Conclusions

Vegans have a high dietary iron intake and although iron from plant sources is less well absorbed than that from meat, high levels of vitamin C in the diet enhances iron absorption. Studies show that the iron status of vegans is usually normal, and iron deficiency is no more common than in the general population.

References

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