

AIS SPORTS SUPPLEMENT FRAMEWORK

IRON GROUP A



Iron is an important mineral involved in energy metabolism, oxygen transport, cognitive function and immunity. The body cannot produce its own iron and relies on absorption from the diet or supplements. Compromised iron levels are usually associated with symptoms of fatigue, lethargy, or reduced training and impaired performance.

BENEFITS OF OPTIMISING IRON STATUS

- > Identification of compromised iron stores through preventative blood screening (annually, biannually or quarterly) may help identify iron deficiency early, when management may be adequate by increasing dietary iron intake and maximising absorption.
- > Athletes are more susceptible to iron deficiency. You may be at higher risk if you are:
 - ☒ Female (iron lost during menstruation/ heavy periods)
 - ☒ Training at moderate altitude e.g. > 2000m (NB: screen 8-12 wks prior)
 - ☒ Completing high volume blocks of training
 - ☒ An endurance athlete
 - ☒ Vegetarian or vegan (less iron is absorbed from plants)
 - ☒ Under-fuelling or have a lower energy budget
 - ☒ Regularly donating blood
- > The treatment approach taken by your sports physician and dietitian will depend on the severity of the deficiency, cause and time frame in which iron levels need to be restored and may involve dietary modification, oral iron supplementation and/or intravenous iron.

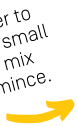
FOOD FIRST APPROACH

- > Increasing dietary iron intake is the initial and most conservative approach for treatment of iron deficiency.
- > For blood ferritin levels between 35-50 ug/L, work with your sports dietitian to increase iron intake via food choices, fuelling adequately, and avoiding 'iron inhibitors' when eating high-iron foods to maximise absorption.
- > The recommended daily intakes of dietary iron are:

Males = 8 mg per day Females = 18 mg per day

Dietary sources of haem iron (animal derived) = more easily absorbed (approximately 40%):

Ask your butcher to mince, freeze in small portions, and mix through beef mince.





Lamb liver
[65g cooked]
= 7 mg


Sardines, fried
[100g]
= 6 mg


Kangaroo steak,
grilled [130g]
= 5 mg


Beef/lamb steak,
grilled [130g]
= 4 mg


Eggs
[2]
= 2 mg


Beef sausage
[2 thin]
= 1.5 mg


Tuna (canned)
1 tin [90g]
= 1 mg


Dietary sources of non-haem iron (plant derived) = not as easily absorbed (approximately 5%):



Fortified breakfast cereal
e.g. 4 Weet-Bix®
= 6 mg


Red lentils
[1 cup cooked]
= 5 mg


English Spinach,
cooked, 1/2 cup [75g]
= 3 mg


Tofu, firm
[100g]
= 3 mg


Chickpeas, canned
[2/3 cup]
= 2 mg


Cashews/ almonds
[~30 nuts]
= 1.5 mg


Dried apricots,
30g [8]
= 1 mg

HELPS IRON ABSORPTION:

Include at the same meal as iron-rich foods



Vitamin C - [50+ mg] in the same meal as iron rich plant foods can increase absorption by up to 400% and help reverse the effects of iron inhibitors



Carotenoids - orange veggies and fruit, e.g. pumpkin, carrots, grapefruit and apricots



Fermented foods - reduce the presence of phytates e.g. kimchi, sauerkraut and miso

50 mg vit C =

- Guava, 1/2 fruit
- Red capsicum, 1/4 cup
- Orange, 1 small [70mL juice]
- Kale, 2/3 cup
- Brussels sprouts, 1/2 cup
- Green capsicum, 1/2 cup
- Kiwi fruit, 1 fruit
- Strawberries, 1/2 cup
- Broccoli, 1/2 cup
- Grapefruit, 1/2 fruit

INHIBITS IRON ABSORPTION:

Avoid at the same meal as iron-rich foods



Calcium - found in dairy foods (milk, yoghurt, cheese) can decrease absorption by 50 - 60%



Tannins - in tea and coffee can reduce absorption by 60 - 70%



Phytates - found in wholegrains, nuts, seeds and legumes are best cooked to reduce phytates present in food



HOW & WHEN TO USE ORAL IRON SUPPLEMENTS



Iron supplements should only be taken under medical supervision as part of an integrated iron management program, which includes blood tests, dietary assessment and enhancement of dietary iron intake as well as planned re-assessment

> For ferritin levels between 20-35 µg/L with normal haemoglobin (Iron Deficiency Non-Anaemia, IDNA) current research suggests:

100 mg elemental iron daily* for 8 - 12 weeks

** or every second day when there is gut upset (e.g. constipation)*



Review and retest iron status via blood test after 3 months. Blood sample is best taken in the morning in a rested state.



Consuming the iron supplement in the morning, either prior or immediately post exercise may result in a greater level of iron absorption.



The absorption of iron may be enhanced by consuming iron supplements with a source of Vitamin C (50-100 mg) or using an iron supplement that contains vitamin C.



Iron inhibitors such as phytates, tannins and other minerals (e.g. zinc and calcium supplements) should be avoided 1 hour each side of iron supplementation.



Intravenous iron should only be considered in consultation with a sports physician and must abide by the sports injection policy set by the World Anti Doping Agency and Sports Integrity Australia. This approach may be warranted in Iron Deficiency Anaemia (IDA) when both ferritin AND haemoglobin stores are depleted [ferritin < 20 µg/L and Hb < 135 g/L (males), < 120 g/L (females)]. A therapeutic use exemption (TUE) may be required.

Supplemental forms of iron:



Available in many forms including tablets (Ferrograd®) or liquids (Ferro-liquid), some also contain vitamin C (FerrogradC®).



If iron supplements are not well tolerated (e.g. constipation), Maltofer® or iron polymaltose may work best for some individuals.



Your sports doctor and dietitian can recommend the iron supplement best for you.

CONCERNS AND CONSIDERATIONS



Iron supplementation does not address dietary issues. Dietary advice from a sports dietitian is essential in the early investigation phase.



Intravenous and intramuscular iron supplementation carries a risk of anaphylactic shock and problems due to use of needles.



The underlying cause for iron deficiency should be investigated to exclude significant underlying pathology e.g. coeliac disease.



Some oral iron supplements can cause gut upset including constipation. Controlled-release supplements or alternate day dosage may alleviate this.



Iron supplements should not be taken without guidance from your doctor and sports dietitian. Iron overload /haemochromatosis is dangerous to health.



Blood tests to assess iron status are best performed in the morning; when hydrated; only low-moderate exercise in the previous 24 hours, and when no sign of infection or sickness.



All supplements have a doping risk of some kind. Some supplements are riskier than others. Athletes should only use batch-tested supplements. The Sport Integrity Australia app provides a list of more than 400 batch-tested products. (www.sportintegrity.gov.au/what-we-do/supplements-sport).

While batch-tested products have the lowest risk of a product containing prohibited substances, they cannot offer you a guarantee. Before engaging in supplement use, you should refer to the specific supplement policies of your sport or institute and seek professional advice from an accredited sports dietitian (www.sportsdietitians.com.au). Athletes are reminded that they are responsible for all substances that enter their body under the 'strict liability' rules of the World Anti-Doping Code.