Iron is a micronutrient required for the formation of hemoglobin, an essential part of the red blood cells. Hemoglobin is responsible for red blood cells transporting oxygen to the muscles and carrying carbon dioxide away from the muscles. Iron is a component of myoglobin, in the muscles and important in the metabolism of carbohydrate and protein. Ferritin is a form of iron in bone marrow and indicate if the body’s stores of iron are low.

**Iron deficiency key points:**
- Deficiency has a negative impact on athletic performance and overall health
- Deficiency is often a result of insufficient intake of dietary iron over a prolonged period, or regular loses of iron (via menses, sweat, injury and malabsorption).
- It is more common in these groups:
  - Females, especially active females
  - Adolescent
  - Vegetarians/vegans
  - Endurance athletes
- Deficiency can also be caused by:
  - Overall low-calorie intake
  - Poor absorption of iron due to interactions with medication (i.e., antacids, anti-inflammatories, etc)
  - Loss through sweat, feces, heavy periods, and urine during periods of heavy training

### Ferritin Level

<table>
<thead>
<tr>
<th>Ferritin Level</th>
<th>What this means</th>
<th>Now what?</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;50 ng/dl</td>
<td>Iron stores are optimal</td>
<td>✓ No action needed</td>
</tr>
<tr>
<td>30-50 ng/dL</td>
<td>Iron stores are border line low</td>
<td>✓ Include more iron rich foods in your diet. ✓ Consume an over-the-counter multi-vitamin with iron supplement</td>
</tr>
<tr>
<td>&lt;30 ng/dL</td>
<td>Iron stores are low</td>
<td>✓ Include more iron rich foods in your diet ✓ Consume an iron supplement of 325 mg ferrous sulfate – 2x/day. This can be found over the counter at a pharmacy ✓ Recheck in 6 weeks.</td>
</tr>
</tbody>
</table>

### Symptoms of Iron Deficiency
- Fatigue
- Weakness
- Lack of stamina
- Delayed recovery
- Cold intolerance
- Shortness of breath
- Headaches
- Irritability
- Light headedness
- Compromised immunity

### When do you need a supplement?
- → After evaluation and recommendation by a medical provider.
- → You should not consume supplemental iron unless indicated. Excessive iron intake can be associated with other health risks and should be avoided.
- → Diagnosis of iron deficiency should include a dietary consult with the goal of moving athletes to a non-supplemental approach to preventing reoccurrence of deficiency.
What do look for in an iron supplement

1 mg of elemental iron is equivalent to 5 mg of ferrous sulfate. The average absorption of ferrous sulfate is 20%.

500-700 mg of ferrous sulfate = 100-150 mg of elemental iron
250-500 mg of ferrous sulfate = 50-100 mg of elemental iron

How to take your iron supplement

✓ With a meal
✓ With protein (especially animal protein, if possible)
✓ With vitamin C (oranges, orange juice, grapefruit, strawberries, etc.)
✓ Divide the doses, if possible, throughout the day
✓ Take before bed if the supplement causes nausea

Other key points to increase absorption:

✓ Do not take your iron supplement with a calcium supplement
✓ Do not take on an empty stomach

References


Beth Wolfgram MS, RD, CSSD, CSCS
Sports Dietitian