Healthy Eating and Haemochromatosis
Many people affected by haemochromatosis have concerns about the amount of iron in their food.

Iron is an essential part of a balanced diet. This is true even for people with haemochromatosis. In addition, changes to your diet cannot prevent iron overload. A restricted or heavily controlled diet is therefore not recommended for people affected by haemochromatosis.

However, with a few sensible adjustments, a healthy, balanced diet can help to slow the rate at which your body absorbs iron from food. In conjunction with venesection, this can limit the re-accumulation of iron in the body.

This leaflet explores the importance of including iron as part of a healthy and varied diet, the different food sources of iron, and the impact of certain foods on the rate of iron absorption. Armed with the right knowledge you can make healthy choices when it comes to your diet.

Disclaimer: This leaflet has been approved by our medical advisers but is not a substitute for professional guidance. Please speak to your doctor before making any significant changes to your normal diet, particularly if you are affected by another medical condition such as diabetes, whether linked to iron overload or not.
Iron is used by the body for a number of essential functions.

- **Production of myoglobin**
  (a protein that helps muscles grow)
- **Production of haemoglobin**
  (a protein in red blood cells that carries oxygen around the body)
- **Energy metabolism**
- **Brain development**
- **Immune system**
- **Internal temperature regulation**

We all need a certain amount of iron each day to stay healthy. This usually comes from our food.

<table>
<thead>
<tr>
<th>Gender</th>
<th>Age</th>
<th>Normal daily iron intake</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>19–64</td>
<td>8.7 mg</td>
</tr>
<tr>
<td>Female</td>
<td>19–50</td>
<td>14.8 mg</td>
</tr>
<tr>
<td>Female</td>
<td>50–64</td>
<td>8.7 mg</td>
</tr>
</tbody>
</table>

(NHS, 2017)

The problem for people with haemochromatosis is that their bodies absorb more iron from food — as much as four times that of people without haemochromatosis.

An average rate of absorption is around 1 mg iron per day. For someone with haemochromatosis, this rate increases to 2–4 mg per day. (Helen Long & Emily Capener, 2017)

This increased rate of absorption leads to an accumulation of iron, which is then stored in the liver, joints, heart, pancreas and other endocrine glands, causing serious tissue damage.

Certain foods, called enhancers, increase the rate of iron absorption. Others, called inhibitors, can reduce it.

This diagram shows how iron absorbed in the intestine (duodenum) is transported to muscle, liver, and bone marrow. Haemoglobin is the protein in red blood cells that transports oxygen, and macrophages are cells that recycle red blood cells and the iron they contain. This normal cycle of iron in our bodies is finely balanced and is crucial for our wellbeing.
Everyone, including people affected by haemochromatosis, should aim to eat a balanced diet. This means eating a wide variety of foods in the right proportions, so that your body receives all the nutrients, vitamins, and minerals that it needs to function, including iron.

No food is completely healthy or completely unhealthy; healthy eating is about getting that balance right. There are some foods that we should eat more of and some foods that we should eat only occasionally.

Take a look at the diagram below to see how much of each food group you should try to eat each day for a healthy, balanced diet.

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**Iron in Food**

There are two different types of iron found in our food.

- **Haem iron**: found in food sources that also contain haemoglobin such as red meat, poultry, pork, offal, and oily fish e.g. mackerel.
- **Non-haem iron**: found in non-animal food sources such as green leafy vegetables, grains, pulses, beans, eggs, dark chocolate, wholemeal bread, brown rice, and nuts. It is also added to fortified foods such as cereal and flour.

Both haem and non-haem food sources contain similar levels of iron, but our bodies find haem iron much easier to absorb.

Eating more non-haem iron food sources and less haem iron food sources can be beneficial if you are affected by haemochromatosis.

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**A Normal Balanced Diet**

“15–35% of the haem iron we consume is absorbed by the body. 5–15% of non-haem iron is absorbed.”

*Gerdien (G.M.) van Doorn, 2012*
Foods that Slow Iron Absorption (Inhibitors)

Eating more of certain foods can slow down or prevent the absorption of iron, particularly non-haem iron.

Some of these inhibitors bind with the iron and prevent it from being absorbed whilst others provide competition for absorption, which reduces the uptake of iron.

Here are a few examples:

<table>
<thead>
<tr>
<th>Inhibitor</th>
<th>Dietary sources</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tannins</td>
<td>Tea, coffee</td>
</tr>
<tr>
<td>Oxalates</td>
<td>Spinach, kale, rhubarb, strawberries, beetroot, oregano, parsley</td>
</tr>
<tr>
<td>Polyphenol</td>
<td>Chocolate, walnuts, almonds, peppermint, berries</td>
</tr>
<tr>
<td>Phytates</td>
<td>Sesame seeds, lentils, cereals, grains, wholemeal bread</td>
</tr>
<tr>
<td>Calcium</td>
<td>Milk, yoghurt, cheese, leafy greens</td>
</tr>
<tr>
<td>Copper</td>
<td>Beans, potatoes, dark leafy greens, black pepper</td>
</tr>
<tr>
<td>Manganese</td>
<td>Nuts, leafy greens, wholegrain foods</td>
</tr>
</tbody>
</table>

When it comes to meal planning, try to include plenty of the above ingredients. Here are a few ideas to get you started …

- Season pasta with fresh oregano, parsley and black pepper
- Sprinkle sesame seeds over your next home-made stir fry
- Switch to wholegrain bread, pasta, and rice
- Add fresh apple slices, spinach, and kale to your salad
- Tea or peppermint tea with your meal slows absorption and is great for digestion
- Try strawberries drizzled in dark chocolate for dessert

Foods that Speed Iron Absorption (Enhancers)

Other foods can actually increase the rate of iron absorption. Try to eat less of these at meal times, including at least one hour before and after a meal.

- **Sugary foods** (these should also be avoided if you are affected by diabetes, whether linked to iron overload or not).
- **Saturated animal fats**
- **Fructose** (a fruit sugar found in fruit juices).
- **Vitamin C** (the Vitamin C found in most fruit and veg is easily broken down by cooking, but if you need to take Vitamin C supplements for any reason, take them between meals).
- **Alcohol** (turn to page 8 to find out more about the effects of alcohol).
- **Sorbitol** (a low calorie sweetener often used in place of sugar).

Making healthy choices can impact the rate of iron absorption from your food, but it’s important to keep in mind that changes to your diet cannot prevent iron overload. Venesection remains the key recommended treatment for people affected by haemochromatosis.

- **3–4 mg** The amount of iron found in a portion of red meat
- **250 mg** The amount of iron removed via one venesection
We should all consider the impact of alcohol on our general health and wellbeing. When you have haemochromatosis, the effects can be particularly significant, for the following reasons.

- Alcohol acts as an enhancer, increasing the rate of absorption of iron from food.
- Alcohol can damage liver and heart health, key organs affected by iron overload.

When it comes to alcohol consumption, consider the following guidelines:

- Consume in moderation, if at all. This means a maximum of 14 units per week. These units should also be spread evenly throughout the week. (NHS, 2017)
- Try to avoid drinking alcohol at meal times, including one hour before and after a meal.
- Anyone with liver disease, whether linked to iron overload or not, should avoid all alcohol.

<table>
<thead>
<tr>
<th>Alcohol</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beer – 5.2% (pint)</td>
<td>3.0 units</td>
</tr>
<tr>
<td>Beer – 5% 330 ml (bottle)</td>
<td>1.7 units</td>
</tr>
<tr>
<td>Cider – 5.2% (pint)</td>
<td>3.0 units</td>
</tr>
<tr>
<td>Wine – 12% (large glass)</td>
<td>2.1 units</td>
</tr>
<tr>
<td>Spirits – 40% 25 ml (single shot)</td>
<td>1.0 unit</td>
</tr>
<tr>
<td>Alcopops – 5.5% (bottle)</td>
<td>1.5 units</td>
</tr>
</tbody>
</table>

(NHS, 2017)

Smoking has a negative impact on many aspects of our physical health. However, if you are affected by haemochromatosis, the risks can be even more significant, and you should avoid smoking.

The heart and liver, two key organs affected by iron overload, can both also be damaged by smoking, which has been linked to conditions such as heart disease, hypertension, cardiomyopathy, and liver cancer. People with haemochromatosis should not smoke.

“It is well known that smoking increases ‘stickiness’ of the blood, increases the risk of clot formation and accelerates furring of arteries. Recent epidemiological studies have also shown that it is also an independent risk factor for progression of scarring in the liver and that applies to all types of liver disease including that caused by iron overload”. Dr D Das, Gastroenterologist.

If you want to stop smoking, the online NHS service, Smokefree, can help. Visit quitnow.smokefree.nhs.uk to get started.

You can also call the Smokefree National Helpline and speak to a trained adviser on 0300 123 1044.

“Smoking increases ‘stickiness’ of the blood, increases the risk of clot formation and accelerates furring of arteries.”

Dr D Das, Gastroenterologist.
Here are a few more things to consider when thinking about your food and drink.

The Role of Nutrition
Changes to your diet cannot reduce levels of stored iron but your doctor may advise changes to relieve symptoms of iron overload such as fatigue or diabetes. A referral to a diettian or nutritionist may also be beneficial.

Vitamins and Supplements
A deficiency of Vitamin B and/or D can make symptoms worse. However, people affected by haemochromatosis should avoid multi-vitamins as many contain iron and/or Vitamin C. As a general rule, multi-vitamins and supplements should not replace a normal balanced diet and should be taken under the advice of your doctor who can check vitamin levels. Be very wary about buying multi-vitamins or supplements online or based on advice from unregulated internet forums.

Raw Oysters and Clams
If you have haemochromatosis you should avoid eating raw oysters and clams. They can contain an organism called Vibrio Vulnificus, which relies on iron for growth and thrives in people affected by iron overload, causing an infection that can be fatal.

Exercise
As well as being good for your overall physical and mental health, exercise can also alleviate joint pain and improve blood flow (perfect just before venesection). You don’t need to join a gym to fit physical activity in to your day. Activities such as walking to the shops instead of driving, taking the stairs instead of the lift, or gardening will all help to keep you fit and healthy. Always seek advice from your physiotherapist or GP before beginning any new exercise.

Flour and bread products
Flour in the UK is generally enriched with iron but there is no need to worry about this because the amount of iron absorbed from a portion of bread is very small. Breads are an important source of fibre as part of your balanced diet.

Fortified breakfast cereals
Breakfast cereals are sometimes fortified with non-haem iron; if you have a choice of cereal it is best to choose one without added iron if you can. However iron absorption from cereals is low so there is no need to worry unduly about the occasional bowl.

Venesection remains the most effective way to treat Iron Overload. Whether you are in the iron removal phase or the maintenance phase, following these tips will help to ensure each session runs smoothly.

Before
• Hydrate! Drink plenty of fluid (not alcohol!) to help improve your blood flow.
• Exercise. Get your blood pumping with a quick 10 minute walk just before your venesection session.

After
• Drink water, tea or soft drinks and eat a suitable snack bar.
• Rest for at least 15 minutes; an hour if you can.
• Avoid lifting, carrying, or vigorous exercise for 24 hours.
• Avoid smoking and alcohol for at least an hour (and see pages 8 and 9).

Always
• Stick to a healthy, balanced diet.
### Information

**Additional reading**
Gerdien (G.M.) van Doorn, MSc, Wageningen University, Division of Human Nutrition (with the cooperation of: Ir. Irene (I.M.G.) Gosselink, Plant Research International); Dietary advice in HFE-haemochromatosis, May 2012.

**The Haemochromatosis Helpline**
Guidance to help you deal with various aspects of haemochromatosis is available through The Haemochromatosis Helpline. Trained volunteers who are affected themselves, or who have a family member with haemochromatosis, will do their best to support you.

<table>
<thead>
<tr>
<th>Helpline</th>
<th>Office</th>
</tr>
</thead>
<tbody>
<tr>
<td>03030 401 102 (local call rates apply)</td>
<td>03030 401 101 (local call rates apply)</td>
</tr>
<tr>
<td><a href="mailto:helpline@ironoverload.org.uk">helpline@ironoverload.org.uk</a></td>
<td><a href="mailto:office@ironoverload.org.uk">office@ironoverload.org.uk</a></td>
</tr>
<tr>
<td><a href="http://www.ironoverload.org.uk">www.ironoverload.org.uk</a></td>
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</tr>
</tbody>
</table>

The Haemochromatosis Society
PO Box 6356, Rugby, CV21 9PA.

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### At a Glance: Iron in Food and Drink

Tear this page out and stick it to your fridge as a handy reminder.
A reduction in haem-iron food and an increase in non-haem food can really help.

<table>
<thead>
<tr>
<th>Haem-Iron is found in ...</th>
<th>Non-haem Iron is found in ...</th>
</tr>
</thead>
<tbody>
<tr>
<td>Black pudding</td>
<td>Wholemeal bread and brown rice</td>
</tr>
<tr>
<td>Red meat</td>
<td>Lentils and baked beans</td>
</tr>
<tr>
<td>Oily fish e.g. tuna, mackerel, sardines</td>
<td>Nuts and seeds</td>
</tr>
<tr>
<td>Chicken</td>
<td>Plain chocolate</td>
</tr>
<tr>
<td>Offal</td>
<td>Eggs</td>
</tr>
<tr>
<td>Turkey</td>
<td>Tofu</td>
</tr>
</tbody>
</table>

Including inhibitors in your meals can slow down the rate at which your body absorbs iron from food. Try to avoid enhancers, particularly at meal times.

<table>
<thead>
<tr>
<th>Enhancers</th>
<th>Inhibitors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increase the rate of iron absorption</td>
<td>Slow the rate of iron absorption</td>
</tr>
<tr>
<td>Fruit juice (vitamin C)</td>
<td>Tea, coffee, peppermint tea, and milk</td>
</tr>
<tr>
<td>Alcohol</td>
<td>Yoghurt and cheese</td>
</tr>
<tr>
<td>Saturated animal fats</td>
<td>Spinach, kale, parsley, oregano, basil</td>
</tr>
<tr>
<td>Sugary foods</td>
<td>Lentils, cereals, beans, wholemeal foods</td>
</tr>
<tr>
<td>Sorbitol (sweetener)</td>
<td>Strawberries, apples, rhubarb, berries, almonds and walnuts</td>
</tr>
</tbody>
</table>