



Diet and Haemochromatosis



Irish Haemochromatosis Association C.L.G.

Iron Overload

HI Haemochromatosis International

EFAPH 
European Federation of Associations of Patients with Haemochromatosis

INDI 
Irish Nutrition + Dietetic Institute



Irish Haemochromatosis Association C.L.G.

The Carmichael Centre,
North Brunswick Street,
Dublin 7

Phone: +353 1 8735911

Email: info@haemochromatosis-ir.com

Web: www.haemochromatosis-ir.com

Registered Charity: No.CHY14876



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Introduction

A healthy diet is one of the building blocks of good health – and this is true for people with haemochromatosis as well as for everybody else. A healthy balanced diet helps to ensure that you are getting all the nutrients you need to stay healthy and well. People are often confused about diet and haemochromatosis, so this booklet will help you to understand the foods that you can eat and some of the foods you might need to limit.

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Why do people with haemochromatosis need to limit some foods?

A healthy person normally absorbs 1-2mg of iron per day. People with haemochromatosis absorb more iron from their food (and from drink, for example iron fortified milk) than normal. This iron can build up in your body and can cause problems if it is not treated. Your doctor will help to treat your haemochromatosis by regularly removing some blood – your blood is rich in iron and regularly removing some blood helps to reduce the amount of iron that is stored in your body. Limiting some very high iron foods as well as foods that increase the absorption of iron can also help limit iron absorption in your body¹.

What happens if I store too much iron?

If you absorb and store too much iron, it can build up in different places in your body. Over time, this build-up of iron can cause damage and lead to disease including liver disease, heart disease (cardiomyopathy), diabetes and joint problems^{2,3}. However, once you are diagnosed with haemochromatosis, your doctor can start to reduce the amount of iron stored in your body.

How can diet help?

It is important to remember that diet cannot treat haemochromatosis, but some changes can help to limit the amount of iron your body stores in between your treatments².

Do I need to avoid foods with iron?

No, there is no need to cut out foods that contain iron. Iron is an essential nutrient that you need to eat even when you have haemochromatosis. Iron is found in lots of foods (please see Haem Iron Foods and Non-Haem Iron Foods table below Pg. 6) that give your body other important nutrients. If you were to cut out all of these foods, you would have a very unbalanced diet and would miss out on many important nutrients.

Why do we need iron?

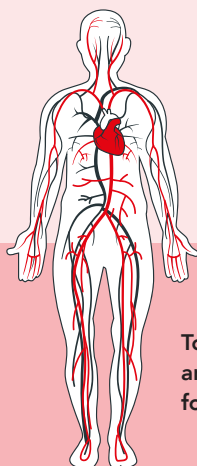
Why do we need iron?

There are lots of reasons why we need to keep iron in our diets⁴:



To make healthy red blood cells – iron helps to carry oxygen around your body in your red blood cells. If you don't have enough iron, you can become anaemic and feel very tired and rundown.

For normal brain function – your brain relies on iron to work properly – being low in iron can make it harder to concentrate and affect how your brain works.



To help release energy from food – iron helps with your metabolism and regulating your energy



To make myoglobin, an important protein for healthy muscles

An important part of a healthy immune system

To reduce tiredness and fatigue

How much iron do I need?

The amount of iron you need depends on your age and sex⁵.

Gender	Age	Recommended Amount ⁵
Female	Before Menopause (from 18 to around 50)	16mg per day
Female	After Menopause (after age 50)	11mg per day
Male	18 years and older	11mg per day



Managing the iron in your diet

When it comes to iron in your diet there are a number of things to think about:

1. The amount of iron in the food
2. How easy or difficult it is for your body to absorb that iron
3. Adding foods that reduce iron absorption
4. Avoiding or limiting foods that increase iron absorption

Some foods have a lot of iron, and some have only a little. There is no need to completely avoid high iron foods, but it is a good idea to limit how often you have these foods. You also need to think about how your body absorbs the iron in your food. In foods like meat, the iron is easily absorbed. In foods like spinach and lentils, your body has more difficulty absorbing the iron. This is because there are two different types of iron: Haem Iron and Non-Haem Iron⁶.



Haem Iron

Haem iron is found in meat, poultry and fish. Your body finds it very easy to absorb this type of iron.



Non-Haem Iron

Non-haem iron is mainly found in eggs and plant foods like spinach, wholegrains, lentils and nuts. It is more difficult for your body to absorb this type of iron. This is also the type of iron typically found in fortified foods like iron fortified breakfast cereals (we advise people to limit or avoid iron fortified cereals where possible).



Haem Iron Foods	Non-Haem Iron Foods
Your body absorbs more of the iron from these foods	Your body absorbs less of the iron from these foods
Red Meat Chicken Turkey Fish, especially oil-rich fish Shellfish/seafood Offal (e.g. liver, kidney)	Eggs Beans and lentils Nuts and seeds Fortified breakfast cereals Bread especially wholemeal bread Green leafy vegetables – especially spinach and kale Chocolate – especially dark chocolate and cocoa powder Dried fruit e.g. raisins

Eating more foods containing non-haem iron instead of foods with haem iron may be helpful for people with haemochromatosis^{7,8}.





Iron Enhancers and Inhibitors

In addition to the amount of iron in your food, there are foods that affect how much iron your body absorbs. Some foods and nutrients (for example vitamin C) can increase absorption of iron from foods. These are called enhancers. Other foods like tea and coffee can decrease the amount of iron that you absorb. These are called inhibitors.



Enhancers

Enhancers are foods and nutrients that increase the amount of iron your body absorbs^{7,8}. It is best to avoid eating these foods or nutrients when you are eating foods high in iron (haem and non-haem). This helps to reduce the amount of iron you absorb from these foods.

Enhancers	
Fructose	Fructose (found mainly in fruit juices) can increase absorption of iron – limit fruit juices to 150mls per day and have them around 1 hour before or after meals
Alcohol	Limit alcohol (see alcohol guidelines)
Vitamin C in fruits and vegetables	No need to avoid
Vitamin C supplements	Best to avoid. If you do need to take a vitamin C supplement, have them at least 1 hour before or after eating

Inhibitors are foods that can help to reduce or prevent the absorption of iron from foods high in iron (haem or non-haem foods) ^{7,8,9,10}. Eating these foods with or just after a meal may help to reduce absorption of iron from your meals.

Inhibitors	
Phytates	Found in nuts, seeds, beans, lentils and wholegrains. Although some of these foods are sources of iron, the phytates in them reduce iron absorption.
Polyphenols	Polyphenols include tannins found in tea and coffee. Drinking tea or coffee with or just after meals may help reduce iron absorption
Calcium rich foods with meals	Foods like milk and yoghurt may help to reduce iron absorption if you eat them with meals.
Dietary fibre	High fibre foods like wholegrain bread, bran-based cereals, fruits and vegetables are all good sources of dietary fibre.
Oxalates	Found in green leafy vegetables like spinach, almonds, beetroot, berries, soy foods and rhubarb

Limiting foods that have haem iron, reducing enhancers and adding more inhibitors can reduce the amount of iron you absorb overall. Following this advice may reduce your phlebotomy (when your doctor takes blood to help lower your iron levels) by 1-2 sessions per year¹¹. However, diet advice alone will not be enough to treat your haemochromatosis.





How much iron is in my food?

You do need to eat some foods that contain iron every day. Below is a list of some foods and the amount of iron that they contain:

Food	Iron
Haem Iron Foods	
100g Calf's liver	12.2mg
2 slices Black Pudding (60g)	7.1mg
Small portion (85g) lambs' liver	6.5mg
50g Chicken Liver Pate	3.0mg
100g (small serving) beef	2.7mg
1 chicken leg (thigh and drumstick)	1.4mg
100g turkey breast	0.6mg
1 small chicken fillet (120g cooked)	0.5mg
1 salmon darne (100g)	0.4mg
1 fillet of mackerel (80g)	1.0mg
100g tin of tuna, drained	1.1mg
120g can of sardines in brine, drained (90g of sardines)	2.5mg

Non-Haem Iron Foods	
400g tin of kidney beans, drained	4.8mg
40g serving, iron fortified breakfast cereals	4.0mg
400g tin of chickpeas, drained	3.5mg
100g cooked green lentils	3.5mg
100g cooked red lentils	2.4mg
50g almonds	1.7mg
1 tablespoon pumpkin seeds	1.2mg
1 boiled egg	1.0mg
*Remember that you absorb less of the iron found in non-haem foods	

Alcohol and Haemochromatosis

People with haemochromatosis are advised to limit alcohol^{1,2}. The iron overload caused by haemochromatosis can lead to liver damage and cirrhosis. In this case, your doctor may advise you to avoid alcohol completely.

For people with haemochromatosis who do not have liver damage, it is still advised that you limit alcohol. Alcohol does put pressure on your liver. Alcohol also increases iron absorption from food. Finally, some alcoholic drinks are sources of iron themselves, especially cider. Please note, not all wine or beers have the same iron content and it is advisable to look for lower iron content options. See the table below for the iron levels in some alcoholic drinks.

Drink	Amount of Iron
125ml Rose Wine	1.3mg
125ml Glass red wine	1.1mg
1 pint (536mls) Stout	1.1mg
125ml Glass white wine	0.63mg
500ml Bottle Cider	2.5mg
1 pint/536ml Lager	0.01mg
Spirits	0mg

What are safe levels for alcohol?

In Ireland guidelines for alcohol are a maximum of 11 standard drinks per week for women and 17 standard drinks per week for men. These are limits for people without medical conditions. Your doctor may advise you to drink less than this or to avoid alcohol altogether.

1 standard drink is:

- ½ pint of beer, lager, ale, stout or cider
- 100mls of white wine
- 75mls of red wine
- 1 pub measure of spirits



Raw Shellfish and Haemochromatosis

People with haemochromatosis need to avoid raw shellfish¹². Shellfish, especially in sub-tropical areas, can be contaminated with a type of bacteria called *Vibrio Vulnificus*. This type of bacteria thrives on iron and so it can cause a more serious infection in people with iron overload. Cooking shellfish at a high temperature destroys these bacteria. Be careful if you are handling raw shellfish as the bacteria can get onto your skin. Always wash your hands well with soap and water if you have handled raw shellfish.

Pregnancy and Haemochromatosis

If you do become pregnant, your doctor should recommend that you stop your phlebotomy². There are lots of changes to how your body handles iron during pregnancy so you need to discuss your treatment with your doctor for individual advice. Make sure you tell all the medical staff involved in taking care of you during your pregnancy that you have haemochromatosis.

You do need to continue to eat a healthy diet and to limit foods that are very high in iron as well as iron supplements. Do check the labels on any pregnancy supplements you are taking to make sure that there is no iron. Women with haemochromatosis can become iron deficient during pregnancy especially if there is a lot of nausea and vomiting. Follow the advice of your doctor or dietitian if you do find that you are low in iron.



Balancing Your Healthy Eating

It is easy to focus just on your hemochromatosis. Remember that your body needs a wide range of foods to be healthy. Working towards a balanced diet can help to maintain good energy levels, look after your heart health and stay as healthy as possible.

Healthy Eating – Where to start?

Fruit and Vegetables – 5-7 servings per day

Fruit and vegetables are packed with vitamins and fibre. There are a source of vitamin C (healthy skin and healthy immune system); vitamin D (healthy bones); vitamin A (healthy skin and night vision). Some vegetables like spinach and kale will also give you iron but there is no need to avoid these foods as they have factors that actually help to reduce iron absorption.

The easiest way to make sure you are getting enough fruit and vegetables is to have some at every meal – breakfast, lunch and dinner. At least one third to one half of every meal should be fruit, salad or vegetables. These can be mixed into meals like stews and curries or served on the side.

Breakfast: Add chopped fruit like banana or apple to unfortified breakfast cereals; try a mix of chopped melon, grapes and kiwi with wholegrain toast or grill some tomatoes with a poached egg.

Lunch: If you normally eat a sandwich, add a bowl of vegetable soup or a side salad to make sure that vegetables count as one third to one half of your meal.

Dinner: Pile your plate with vegetables or salad. Not only will you be getting more of the nutrients you need, but you will be starting to balance nutrition by making vegetables a bigger part of your meals. Adding vegetables like leafy greens, beetroot, parsley and spinach to your meal can help to reduce the amount of iron you absorb.

Carbohydrate Foods

Carbohydrate (or carb) foods include bread, pasta, rice, potatoes and breakfast cereals. These foods are one source of energy for your body, but you need to choose the right types and especially the right amounts.

Wholegrain or high fibre carb foods give us fibre – which we need. They also help to reduce iron absorption. Almost 80% of people living in Ireland do not eat enough fibre. Wholegrain foods are also a source of B vitamins.



- Go for wholegrain bread instead of white
- Choose high fibre breakfast cereals like porridge or muesli. Remember to limit cereals that have added iron.
- Choose jacket potatoes – and eat the skin. You will get a lot more fibre as well as B vitamins if you eat potatoes skin and all.
- Try brown rice and brown pasta
- Try other wholegrains like quinoa and buckwheat

Carbohydrate portion sizes

Although wholegrain and high fibre carbs are very good for you, you still need to watch portion sizes. A good rule of thumb is to make sure that carbs are about $\frac{1}{4}$ of your plate at lunch and dinner. How many of us cover the whole plate with pasta and then put the rest of the meal on top? Pasta should only be $\frac{1}{4}$ to $\frac{1}{3}$ of your plate. The same is true for rice.

Dairy & Calcium-Rich Foods

You need a lot of calcium for healthy bones. Not eating enough calcium can weaken your bones and lead to osteoporosis or brittle bone disease. In Ireland one in four men and one in two women will break a bone due to osteoporosis. One in three women and one in five men over the age of 50 years of age may have osteoporosis in Ireland. (HSE, 'Strategy to Prevent Falls and Fractures in Ireland's Ageing Population' (2008).

When we talk about dairy, we are really talking about milk, cheese and yoghurt as these are the foods with calcium – sadly, butter and cream do not have any calcium. You can also get calcium in other foods like calcium fortified soya milk and tinned fish with bones. You will get a little calcium in green vegetables but it is very difficult to get all of your calcium from green vegetables alone. Calcium is the mineral that we need the most of in the body – we need at least 800mg per day and more if you are a teenager or if you are breastfeeding. After the menopause, women may also need more calcium.

Where can I get Calcium?

You need 3 servings of calcium rich foods everyday (5 for a teenager or if you are breastfeeding)

1 serving is:

1 glass of milk

1 glass of calcium-fortified soya milk

1 pot of yoghurt

1 pot calcium-fortified soya type yoghurt

30g of hard cheese like cheddar

Vitamin D and Healthy Bones

Vitamin D is needed to help our bodies to absorb the calcium we eat. No matter how much calcium we eat, we cannot absorb it without vitamin D. We are supposed to get vitamin D from the sun but if you live in a cloudy country like Ireland, then a vitamin D deficiency can be a real problem. Apart from a general lack of sunlight, Ireland is so far north on the planet that, during the winter, the sun that reaches Ireland is too weak for us to make any vitamin D. This means that between October and March we don't make any vitamin D even if we do get a sunny day.

It is also hard to get enough vitamin D from food. Oil-rich fish like salmon is a good source as are eggs. However, 75-90% of adults in Ireland do not meet targets for vitamin D so many people may need a supplement especially in Winter¹³.

Protein

We find protein in all kinds of meat, chicken, fish as well as eggs, beans and nuts. Apart from giving us protein, these foods are major source of a lot of the minerals we need for health. Iron, zinc, selenium, magnesium and so on are found in these foods. We need protein foods in at least two meals every day. You can choose lower iron options like beans, lentils, chicken and fish and limit red meat.

Aim to have protein foods at lunch and at dinner. There is also no problem adding a little protein to breakfast.

Healthy Fats and Oils

Fat is an essential nutrient for a healthy body. Every cell in your body is made with fat and you need fat for healthy skin, healthy hair and to make important compounds in your body.

Choosing healthy fats is important for good health.

The best fats to cook with are olive oil and rapeseed oil. Other fats like butter and coconut oil can be used as an occasional treat but not every day.

You will find healthy fats in foods like nuts and seeds as well as avocado. But be careful – even healthy fats are very high in calories and if you overeat you may struggle to keep your weight healthy. Keep nuts to around 1 handful per day and seeds to 1-2 dessertspoons per day.

Less healthy fats are usually those found in cakes, biscuits, bars and treats. These foods tend to offer very little in terms of nutrition. There is no problem having the occasional treat but it is best to keep these foods to once a day or less and to choose the smaller size.

Omega-3 Fats

These are special fats found in oil-rich fish that help to keep our brains healthy. You will find them in oil-rich fish like salmon, trout, mackerel and sardines. Try to eat oil-rich fish at least once per week but more would be better! Remember that tinned salmon, sardines and mackerel have the same omega-3 as fresh fish.



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