



E-BOOK

Diet



Table of contents

Iron-rich foods: let's find out about them to know how they can be useful for our body	3
Low iron: what to eat to promote normal levels of iron in the body	
Iron-rich diets: How useful are they for maintaining normal iron levels?	
Iron-containing fruit: which to choose for our well- being	
Which food are rich in iron? Let's find out with the iron-rich food table	
Iron-rich plant foods: which to choose and how to cook them	22













Iron-rich foods: let's find out about them to know how they can be useful for our body

Iron is a precious nutrient for our body because it plays an important role in the formation of **haemoglobin**, **myoglobin** and some important enzymes: **cytochromes**. Iron also promotes the correct **development of the immune system** and **supports normal cognitive function** in adults and children. Let's analyse which foods are **rich in iron** and how they can be useful for the body's normal needs.

Which foods contain iron?

Foods containing iron are both animal-based (e.g., liver, spleen, muscle) and plant-based (green leafy vegetables, legumes, dried fruit). However, when talking about **iron-rich foods**, a small note must be made regarding the **bioavailability of iron** consumed through diet.

Not all the iron consumed through diet is **absorbed** in the same way by our body. Iron in animal-based food is more easily absorbed than iron in plant-based food. Why? The iron present in meat is mainly **haem iron**, an iron bound to particular substances known as **porphyrins**, which can be absorbed as such **in the bowel** at specific sites. **Non-haem** iron, present in plant-based food, is less protected from the presence of any substances that decrease its absorption and has no specific absorption sites.













How is iron absorbed?

Haem iron is derived from haemoglobin and myoglobin in meat. The porphyrin ring, which, together with iron, forms the chemical complex known as **haem**, protects iron from reactions with other substances present in the bowel and promotes its solubility and **intestinal absorption** by enterocytes (the epithelial cells present on the intestinal villi).

The iron contained in vegetables, legumes and fruit, on the other hand, is an **inorganic** iron or **non-haem iron**. This type of iron can be present in two forms: bivalent iron (Fe2+) or trivalent iron (Fe3+). Our body is able to absorb bivalent iron, whilst it has difficulty absorbing trivalent iron. The basic environment of the intestine, where **dietary iron is absorbed**, however, promotes the formation of trivalent iron. In order for the latter to be absorbed by intestinal cells, it must be reduced to bivalent iron by an enzyme: duodenal cytochrome B.

The absorption of **dietary iron** is influenced by the concentration of iron in the body: in the event of **iron deficiency** or **sideropenia** the absorption of iron in the intestine usually increases; in the event of **high iron**, i.e., **high concentrations of iron in the body**, intestinal absorption is decreased.

In addition, certain substances present in food may promote or discourage the absorption of iron in food. **Vitamin C** (ascorbic acid) **promotes the absorption of iron**, whilst phytates, oxalates, tannins and calcium hinder the absorption of this precious nutrient.













What are the most iron-rich foods?

We said that animal-based food contains **haem iron**, which is more easily assimilated by our body, whilst plant-based food contains only **non-haem or inorganic iron**. A varied and balanced diet involves consuming the correct amount of each food to provide the body with the right amount of nutrients. However, in the event of deficiency or increased requirements, it may be important to know which **foods are richer in iron**.

The top iron-rich animal-based foods include the following:

- Liver
- Spleen
- Offal
- Meat and muscle (especially turkey and horse meat)
- Fish (tuna, mackerel, snapper, sardine, anchovy)
- Molluscs
- Egg yolk

The top iron-rich plant-based foods include:

- Legumes (dried beans)
- Soy flour
- Nuts
- Whole grain cereals
- Oat flakes
- Green leafy vegetables (spinach, watercress, cabbage, lettuce, endive)













It must be mentioned that only part of the iron consumed through diet is absorbed by the body. Knowing the variables and foods that regulate their absorption is a useful approach to **keeping normal iron levels in the body under control.**

What foods help to overcome iron deficiency?

A balanced diet, which alternates between the foods listed above, is usually sufficient to maintain normal levels of iron in the body. Some **specific physiological conditions** (menstrual cycle, pregnancy, breastfeeding), however, may require an **increased need for iron**. Also in this case, a healthy and balanced diet is the first step to **prevent deficiencies**, but sometimes diet alone is not enough. In these cases, it is advisable to consult your doctor or pharmacist to consider using a **dietary supplement containing iron**.

The <u>SiderAL® range of dietary supplements</u> based on <u>Sucrosomial® Iron</u>, a technology that promotes high digestibility and absorption of iron, may be a valid nutritional supplement in cases of iron deficiency or increased iron requirements.













Low iron: what to eat to promote normal levels of iron in the body

When **iron is low**, i.e., when we are dealing with iron deficiency, it is important to know **what to eat** and what not to eat in order to **maintain normal blood iron levels**. In this article, we will learn more about the most appropriate dietary behaviours to be adopted in order to deal with a possible iron deficiency or an increased body need for this nutrient.

Low iron and diet: which foods to choose

Iron is an essential nutrient for our body, as it is a mineral necessary for the **formation of haemoglobin**, for the normal function of the **immune system** and for **supporting normal cognitive function**. Iron is also important for the **growth and normal development of children and adolescents.**

Under normal health conditions, **daily iron requirements** are met by a varied and balanced diet. Nutrition, in fact, enables us to **rebalance the physiological losses of iron** that our body eliminates through faeces, sweat and, in the case of **women**, menstruation or breastfeeding.

In the event of **low iron**, it is even more important to follow a diet that ensures an **adequate iron intake**. Your doctor will tell you what to eat and what to avoid if you have an **iron deficiency**, low **serum iron** or **low haemoglobin values**.













Foods containing iron

Foods contain iron in two forms:

- Haem iron, bound to haemoproteins (haemoglobin and myoglobin), is more easily assimilated, but is only present in animal-based foods (meat, liver, spleen, fish, molluscs).
- Non-haem or inorganic iron is also present in plant-based foods (green leafy vegetables, legumes, dried fruit), but is only assimilated when reduced to bivalent iron by specific enzymes in the body.

Both **haem iron** and **non-haem iron** consumed with food are **absorbed in the intestine** (in the duodenum). Some factors, however, facilitate the absorption of **haem iron** over **non-haem iron**. **Haem iron** is more assimilable by our body for two reasons:

- 1. It is better protected from any substances that decrease the absorption of this nutrient;
- 2. there are specific sites on the cells of the of the intestinal villi epithelium for the absorption of haem iron.

The absorption of **non-haem iron**, on the other hand, is more variable as it is influenced by substances that can decrease its absorption and requires the intervention of enzymes that reduce **trivalent iron** (not assimilable) to **bivalent iron** (assimilable by intestinal cells). However, some nutrients can promote the absorption of iron in the intestine. Vitamin C (ascorbic acid) is a nutrient present in fruits and vegetables that promotes the absorption of **non-haem iron**.













Vegan diet, vegetarian diet and low iron

It is not necessarily the case that those who follow a vegan diet, or a vegetarian diet can necessarily have **low iron**. The levels of iron in the blood are determined by several factors and nutrition is only one of them. As regards nutrition, it should also be mentioned that some plant-based foods are rich in iron as well as in vitamin C, an important cofactor for the adequate **absorption of iron**. **Cabbage** or **broccoli** are just two examples of foods containing significant amounts of iron and vitamin C. The combination of **iron-rich foods** (green leafy vegetables, legumes, dried fruits) and vitamin C-rich foods such as kiwis, oranges, tomatoes and lemons also promotes **the absorption of non-haem iron contained in plant-based foods**.

Low Iron: what to eat and what to avoid

Low iron is a condition that can be determined by several factors. It is recommended to discuss with your doctor what the causes of your **iron deficiency** may be. However, one of the factors that can lead to **low iron levels** is inadequate nutrition.

Iron-rich foods suitable for people with low iron include the following:

- Liver, spleen and offal
- Meat (mainly turkey, horse, beef)
- Fish (mackerel, snapper, sardine, anchovy, tuna)
- Molluscs and crustaceans
- Egg yolk
- Dried legumes
- Soya flour
- Oat flakes
- Green leafy vegetables (spinach, endive, lettuce, cabbage, broccoli)
- Whole grain cereals
- Dried mushrooms













Foods that can reduce the absorption of dietary iron (especially **non-haem iron**) include all foods containing significant amounts of calcium (milk and dairy products), phytates (some cereals and legumes), oxalates (spinach, rhubarb) and tannins (coffee, tea, chocolate, wine).

In the event of deficiency or increased bodily iron requirements, your doctor may also recommend the use of a **dietary supplement** to **restore normal iron levels in your body.**

The <u>SiderAL® range</u> consists of **food supplements containing** <u>Sucrosomial® Iron®</u>, which can be useful in cases of iron deficiency or increased iron requirements.













Iron-rich diets: How useful are they for maintaining normal iron levels?

People suffering from iron deficiency or increased body needs for this nutrient can also benefit from a varied and balanced diet. However, when iron is low, it may be useful to pay more attention to foods rich in this nutrient and follow iron-rich diets after consulting your doctor. In this in-depth article, we will find out which foods can help to maintain normal body iron levels.

Iron: an essential nutrient for the body

Iron is an essential nutrient for the well-being of our body. In addition to playing an important role in the production of **haemoglobin**, **myoglobin** and important enzymes such as **cytochromes**, iron is the basis of the **normal function of the immune system and normal cognitive function**. Iron also plays a central role in the growth and normal development of **children and adolescents**.

Under normal health conditions, a varied and balanced diet is sufficient to meet body iron requirements. However, some physiological conditions (menstruation, pregnancy and breastfeeding) or pathological conditions (diseases that decrease iron absorption) may lead to low serum iron or low haemoglobin values. In these cases, it is important to consult a doctor to investigate the causes of the deficiency and to set up a suitable approach to rebalance the normal iron values in the body. In general, amongst the main remedies for iron deficiency, your doctor may recommend an iron-rich diet.













Iron and diet: what foods are useful in cases of deficiencies?

Let's see what iron-rich foods are useful for our body.

Meat

Meat (especially **turkey meat**, **horse meat and beef**) is always the basis of **iron-rich diets**. Meat, in fact, contains significant amounts of **haem iron**, i.e., iron derived from the haemoglobin and myoglobin present in the tissues of the animal. Liver, spleen, offal and muscle are the parts richest in iron and most recommended for **iron-rich diets**.

Fish, molluscs and crustaceans

In addition of being a valuable source of omega-3 fatty acids, fish is also an iron-rich food. **Tuna**, **mackerel**, **anchovy**, **snapper and sardine** are some types of fish frequently found in iron-rich diets. Amongst sea products, molluscs and crustaceans can also be an important source of iron.

Egg yolk

Eggs are known as one of the most important sources of fat and protein. Egg yolk is also an important source of iron.

Legumes

Legumes are valuable sources of plant protein and iron. In the case of iron, it is important to accompany the intake of legumes with foods rich in vitamin C to promote the absorption of inorganic iron contained in **beans**, **chickpeas** and **lentils**.













Whole grain cereals and oat flakes

Whole grains and oat flakes are foods that are traditionally recommended to ensure the right daily intake of carbohydrates, B vitamins, fibre and minerals such as iron.

Mushrooms

Mushrooms, especially **dried** ones, are a food that often appears amongst **iron-rich diets**. On their own, or in combination with meat and vegetables, they can be a pleasant variation as part of vegetarian or vegan diets.

Green leafy vegetables and fruit

Green leafy vegetables and fruit are valuable **sources of iron, folic acid and vitamins. Cabbage**, **broccoli** and **kiwi** fruit, in addition to their significant amount of iron, are foods that provide **vitamin C**, a nutrient that promotes the absorption of inorganic iron in the intestinal mucosa. Furthermore, **vegan and vegetarian diets** require **oranges**, **lemons** and **tomatoes**: even though they do not contain high amounts of iron, these foods promote the absorption of iron thanks to their high vitamin C content.

Food supplements

Your doctor may also recommend, in combination with a varied and balanced diet, the use of a **food supplement**. The <u>SiderAL® food supplement</u> range containing <u>Sucrosomial® Iron</u> can be useful in cases of iron deficiency or increased iron needs.













Iron-containing fruit: which to choose for our wellbeing

Fruit contains essential nutrients for our body and is a valuable ally for our health. In addition to be a source of sugar, water and vitamins, fruit is also important for **providing the body with essential minerals, such as iron**. In this in-depth article, we will find out which **iron-containing fruit** can be useful in overcoming deficiencies or in case of increased needs for this nutrient.

Why is it important to take iron?

From the synthesis of haemoglobin to the normal energy metabolism,; from the support of the immune system to the maintenance of normal cognitive function, **iron enables the correct performance of certain essential physiological functions of our body.** A varied and balanced diet enables us to rebalance the amount of iron that our body loses through sweating, stools or, in the case of **women**, through menstruation or breastfeeding.

Fruit and especially nuts, is included amongst the **plant-based foods** that can help the body to **maintain correct iron levels**. The iron contained in fruit is **non-haem iron**, i.e., it is not bound to porphyrins as in the case of **haem iron** present in meat or other animal-based food. Non-haem iron has a lower bioavailability than haem iron, but in the case of fruit, the lower bioavailability is compensated for by the presence of **vitamin C**, a nutrient that promotes the absorption of inorganic or non-haem iron in the intestine.













Which iron-rich fruit should we consume?

Often (and not only when on a vegetarian or vegan diet), you wonder what kind of fruit can be useful for regular iron intake. In general, **dried or dehydrated fruit** contains more iron than fresh fruit.

Our body can get a good amount of iron from:

- Nuts (pistachios, cashews, peanuts, walnuts, pecans, pine nuts, chestnuts);
- Peaches, plums and dried or dehydrated apricots;
- Berries (raspberries, blueberries, blackberries);
- Strawberries;
- Bananas:
- Cherries:
- Pineapples;
- Avocados;
- Figs (both dried and fresh);
- Kiwis.

The importance of vitamin C-rich fruit

From the previous list, it should be noted that **pineapples**, **kiwis**, **cherries** and **strawberries** are foods that provide a good amount of vitamin C. The latter can promote the absorption of inorganic iron contained in fruit or other plant-based foods consumed through diet. Even **oranges**, although containing modest amounts of iron, are essential in the diet of those with **iron deficiency** because they are rich in vitamin C.













When do we need to consume iron?

Iron is an essential nutrient as it performs many important functions within our body. Amongst the various functions, iron contributes to the **formation of haemoglobin, myoglobin and important enzymes that regulate certain metabolic processes**; it supports the **normal function of the immune system** and **supports bone growth** and **the normal function of the cognitive system**, especially during **childhood and adolescence**.

The deficiency caused by a low iron diet is rare in industrialised countries. Iron deficiency caused by **disorders in absorption** or by physiological conditions that determine a loss or an increased need for iron (menstrual cycle, pregnancy, breastfeeding) are more common. A feeling of fatigue and general tiredness is amongst the first symptoms of an iron deficiency.

A varied and balanced diet, rich in **meat, vegetables and iron-containing fruit**, may be combined with a specific product. For example, a food supplement from the <u>SiderAL® range</u> can be useful in recovering an iron deficiency or in the event of an increased need for this nutrient [link to the range page].

With specific formulations for children and adults, the supplements in the **SiderAL®** range all contain **Sucrosomial® Iron**, a specific form of iron patented by **PharmaNutra**. **Sucrosomial® Iron**, compared with traditional iron, is more easily absorbed by the intestine, thus minimising the most common side effects related to iron intake (heartburn, unpleasant taste in the mouth, staining of the teeth and oral mucosa).













Which foods are rich in iron? Let's find out with the iron-rich food table

What is the purpose of iron? Let's find out more about its importance for the well-being of our body and what foods contain it, using the iron-rich food table.

What is iron and what is its function?

Before proceeding with the **iron-rich foods table**, it is important to remember what functions this precious nutrient performs and **what is the daily amount of iron our body needs.**

Iron is an essential nutrient for the production of haemoglobin, a red blood cell protein that binds oxygen and promotes its transport in the blood, myoglobin, which plays a similar role to haemoglobin, but within muscles and cytochromes, enzymes that contribute to our body's normal energy metabolism. Iron is also a fundamental element during pregnancy, breastfeeding and childhood, as it supports the growth of the body and the normal development of the cognitive function. Iron is important at all ages for supporting the normal function of the immune system.

Under normal conditions of health, our body needs approximately 10-14 milligrams (mg) of iron per day. Some specific physiological conditions, such as pregnancy, may require an increased body iron requirement and, in these cases, the daily intake of this mineral may increase to over 20 mg. The growth phases of children and adolescents, the menstrual cycle and breastfeeding may also require increased iron requirements.













Iron deficiencies: the importance of diet

Food is one of the **main sources of iron for our body.** Through the intake of **iron-rich foods**, our body is able to rebalance the amounts of this precious nutrient that are lost through sweating, stools or, in the case of **women**, also through menstruation and breastfeeding.

The **iron consumed through diet** is absorbed in the bowel (duodenum) and is transported throughout the body by transferrin. Iron that is not used immediately is stored mainly in the liver, but also in the spleen, bone marrow and skeletal tissue, bound to ferritin, a storage protein. When an **iron deficiency** occurs, the body uses its storage to **maintain normal levels of iron in the blood**. When the levels of circulating iron in the blood decrease, low **serum iron** occurs. When iron deficiency starts to become significant or prolonged, typical symptoms of **sideropenic anaemia** (iron deficiency anaemia) could occur, such as, for example:

- feeling of fatigue and general tiredness;
- headaches and irritability;
- pale skin and mucous membranes;
- increased fragility of nails and hair;
- shortness of breath, even at rest;
- difficulty sleeping at night.













Food

The iron-rich food table

Both animal- and plant-based can be valuable sources of iron. In animal-based food, iron is derived from the **haemoglobin** and **myoglobin** present in the blood and muscle of the animal. This iron is linked to porphyrins and, with the latter, constitutes what is known as **haem iron**. **Haem iron is absorbed more easily than non-haem iron**, which is mainly present in plant-based food. However, **fruit** and **vegetables**, often also contain also vitamin C, a nutrient that promotes the absorption of iron.

The following **table lists** the top 50 **iron-rich foods** (source: CREA - **Food Nutrition**)

Nutrition)

Quantity of iron (mg di Fe in 100 mg of food)

BOVINE SPLEEN	42
PORK LIVER	18
TEA LEAVES	15.2
CORVINA	14.4
BITTER COCOA POWDER	14.3
WHEAT BRAN	12.9
SHEEP'S LIVER	12.6
CAVIA STURGEON	11.8
BLACK PEPPER	11.2
WHEAT GERM	10
FRESH MINT	9.5













Food

Quantity of iron (mg di Fe in 100 mg of food)

HORSE LIVER	9
BEANS - (DRIED BORLOTTI)	9
BEANS - (DRIED CANNELLINI)	8.8
BEANS - (DRIED BLACK-EYED)	8.8
COW'S LIVER	8.8
FRESH ROSEMARY	8.5
BOVINE KIDNEY	8
BEANS	8
DRIED LENTILS	8
RADICCHIO (GREEN, FRESH)	7.8
PISTACHIOS	7.3
SOY FLOUR	6.9
DRIED SOY	6.9
BOVINE LUNG	6.7
DRIED CHICKPEAS	6.4
CHICKEN EGGS (WHOLE POWDER)	6.3
RAW FROG	6.0
OYSTER	6
DRIED PEACHES	6
CASHEWS	6
MUSSEL	5.8
SEABREAM	5.6
MUESLI	5.6
FRESH BASIL	5.5
SCORPIONFISH	5.5
LUPIN BEANS SOAKED	5.5
LIVER SAUSAGE	5.3
DEHYDRATED APRICOTS	5.3













Food

Quantity of iron (mg di Fe in 100 mg of food)

PIG'S HEART	5.3
FRESH ROCKET	5.2
OAT FLAKES	5.2
DRIED APRICOTS	5
SHEEP'S HEART	5
BROAD BEANS (DRIED SHELLED RAW)	5
HORSE HEART	5
DARK CHOCOLATE	5
CHICKEN EGGS YOLK	4.9
COMPRESSED BREWER'S YEAST	4.9
COW'S HEART	4.6

How to supplement your diet in the event of iron deficiency?

The **iron-rich foods table** is an important starting point for setting a varied and balanced diet suitable for **keeping normal iron levels in the body under control**. However, in some cases, it may be useful to supplement the diet with specific nutritional supplements. The <u>SiderAL®</u> range of food supplements, based on <u>Sucrosomial® Iron</u>, can be useful in the event of an <u>iron deficiency</u> or **increased body iron requirements**.













Iron-rich plant foods: which to choose and how to cook them

Which **iron-rich plant foods** can we choose for an adequate intake of this mineral? And how should vegetables be cooked to preserve the amount of iron they contain? In this in-depth article, we discover how to correctly consume plant foods for an adequate intake of iron.

Which iron-rich plant foods can we consume?

Before we find out which **iron-rich plant foods** we can consume, we need to know that not all the iron consumed through diet is absorbed in the same way by the body. In food, in fact, iron is present in two different forms: **haem iron** and **non-haem iron**. Haem Iron derives from the haemoglobin and myoglobin present in blood and muscle, respectively, and it is, therefore, the typical iron of animal-based food. **Non-haem iron**, which will be the subject of this article, is characteristic of **iron-rich plant-based foods**.

Iron-rich plant foods particularly include the following:

- Legumes, especially dried legumes such as beans and chickpeas
- Fruit especially nuts (cashews, peanuts, walnuts, pecans), apricots, peaches and dried or dehydrated plums
- Wholegrain cereals
- Oat flakes
- Soya flour
- Green leafy vegetables (watercress, cabbage, broccoli, lettuce, endive)











Non-haem iron contained in plant-based food is more difficult to be absorbed by the body than **haem iron** for two reasons:

- 1. unlike haem iron, there are no specific sites that regulate its direct absorption by cells. In the intestinal environment, inorganic iron is found in the form of trivalent iron. Our organism absorbs trivalent iron (Fe3+) only after having reduced it to bivalent iron (Fe2+), thanks to the action of duodenal cytochrome B.
- 2. It is less protected from any substances that inhibit its absorption (such as phytates, oxalates and tannins contained in some foods). Spinach, despite its high iron content, is not considered amongst iron-rich plant-based rich because it also contains oxalates and phytates which bind the iron and prevent its proper intestinal absorption. On the contrary, some foods such as kiwis, despite containing a moderate amount of iron, are good plant sources of this nutrient because they are rich in vitamin C, a substance that facilitates the absorption of iron.

Therefore, in addition to **iron-rich plant foods**, we should also include **plant-based foods rich in vitamin C**, such as **kiwis** - already mentioned above -**pineapple**, **strawberries**, **oranges**, **tomatoes**, **peppers** and **berries**.

Iron-rich plant foods: how to cook them

In general, in order to preserve the nutrients present in plant-based foods, it is important to consume raw or steamed vegetables. Green leafy vegetables, in particular, should be consumed raw in order to maximise the absorption of essential nutrients useful for overcoming **iron deficiency** (iron itself, folic acid, vitamin C, B vitamins).













It is also important to avoid taking **iron-rich plant foods** in combination with foods that contain significant amounts of **phytate** (grains), **oxalates** (certain vegetables, such as spinach), **tannins** (tea, coffee, wine and chocolate) and **calcium** (milk, cheese, yoghurt and other dairy products). Phytates, oxalates, tannins and calcium are the most **common inhibitors of non-haem iron absorption in the intestinal.**

How do could you combat overcome iron deficiency with food?

Under normal health conditions, a varied and balanced diet is sufficient to maintain normal body iron levels. However, certain physiological conditions (menstrual cycle, pregnancy, breastfeeding, growth in children) or pathological conditions (diseases that decrease <u>iron absorption</u>) may lead to **iron deficiency or increased body iron demends**.

To overcome iron deficiency or in the event of increased need of this nutrient, a food supplement of the **SiderAL®** range containing **Sucrosomial® Iron** can may be useful. **Sucrosomial® Iron**, compared with the traditional iron present in other supplements, is more easily absorbed by the intestine, thus minimising the most common side effects (heartburn, staining of teeth and oral mucosa, gastrointestinal irritation) and also it taste good, because there is no metallic taste typical of iron administered orally.











Supplements are not intended as a substitute for a varied, balanced diet and a healthy lifestyle.





