



Ferritin Blood Test

RESULT REPORT

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1 Your individual result report

Patient: John Doe	Sample number: T2ZHGL / P106721
Date of birth: 19.10.1990	Receipt: 19.10.2018
Weight: 89 kg	Issue: 22.10.2018

Dear John Doe,

As per your request, we measured your iron level. For this purpose, we checked the concentration of ferritin in your blood. Ferritin is the storage form of iron and provides the most significant information regarding your basic iron supply.

Iron is vital for blood formation and oxygen transport. In case of a deficiency, an iron deficiency anaemia can occur. A ferritin test can even detect a hidden deficiency which is characterized by an incipient emptying of the iron stores.

Many people have low ferritin levels (less than 100 ng/ml) as a result of their diet, life situation or different underlying diseases. In old age, the normal value can rise above 100 ng/ml due to inflammatory processes.

This test cannot and doesn't intend to replace a medical consultation with a doctor.

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If you want a personal consultation regarding your test results or have general questions, feel free to contact one of our nutritionists at support@cerascreen.co.uk or 020 36952395.

Your cerascreen® Team

2 Your test result

The ferritin value in your capillary blood is 20,00 ng/ml.

The ferritin concentration is sometimes also given in µg/l. The conversion is 1 ng/ml = 1 µg/l

ferritin level	significance
< 15 ng/ml	iron stores are empty
15-30 ng/ml	iron stores are nearly empty
31-99 ng/ml	iron stores are nearly sufficient
100-310 ng/ml	iron stores are sufficient
311-799 ng/ml	iron stores are nearly overcharged
from 800 ng/ml	iron stores are overcharged

As you can see in the table above, your iron stores are nearly empty. You should aim at a ferritin level of 100 ng/ml in order to be sufficiently supplied with iron.

3 How to reach optimal ferritin levels?

Based on your current iron blood level of 20,0 ng/ml ferritin, you should raise it permanently in order to optimise your iron supply and to replenish the iron stores.

You are missing

80,0 ng/ml to reach the target value of 100 ng/ml. You can raise your ferritin level by the following measures:

Intake of 8000,0mg* iron in the form of iron supplements according to the following scheme:

1st week: 80 mg daily

2nd week: 100 mg daily

from the 3rd week onwards, for 35 days: 200 mg daily

or

800,0 mg iron supply in the form of infusions or injections by a doctor.

* since the intestine can only absorb 10 % of the iron supplied through food or supplements into the blood, the iron supply needs to be accordingly higher than with an injection or infusion. This will not affect your health, as the remaining 90% will be excreted through the colon. An iron-rich diet helps to build up your iron stores. Please see chapter 8 for further tips.

It pays off to control and optimize your ferritin levels. You will feel the effects, such as higher performance or the decline of complaints, probably already after a short time.

4 What does my body need iron for?

Iron plays a major role in many body functions. Iron is needed among others for blood formation and oxygen transport to all body cells.

There are three main biochemical functions of iron:

- The cells need oxygen to keep up functioning. Iron helps to transport is transported to the cells with the help of iron and stored there.
- The inner cellular processes require electron transport and exchange. Iron is vital for this.
- Enzymatic reactions play a major role in metabolism of all living beings. Iron is significantly involved in these reactions.

Without iron, many mechanisms in the body could not take place.

25 % of the iron are stored (ferritin), another 1-3 % are transport proteins (transferrin) and the rest is the so-called 'functional iron' e.g. haemoglobin, the red blood pigment. Haemoglobin transports the inhaled oxygen from the lungs to the whole body and brings back carbon dioxide to the lungs for exhalation to the lungs. Myoglobin from the muscle cells, which improves the transfer of oxygen to the cells, also contains haemoglobin. Iron deficiency reduces the oxygenation of the muscle.

5 How much iron does the body need?

Since the body has no regulation mechanism for breaking down and excreting excess iron, a so-called iron overload can occur. This leads to damages to the liver, pancreas and heart muscle. This is life-threatening without medical intervention. It is not recommendable to take iron supplements unless a deficiency was determined. Food does normally not cause an overload of iron.

6 When do I require extra iron?

The iron requirement arises from the loss via the intestinal tract, skin and kidneys and is 1 mg/day. In addition, the low bioavailability of iron as well as the loss due to body growth, menstruation, pregnancy and nursing period have to be considered. The body's store is 2 - 5 g.

In general, iron deficiency can occur in anyone at all ages if there is a insufficient supply, a hemorrhage or a resorption disorder. Several factors promote this situation:

6.1 Iron deficiency in women

Approx. 80 % of women of reproductive age have too low iron levels and between 10 to 20 % have an iron deficiency. The blood loss during menstruation is about 50 ml and corresponds to an iron loss of 25 mg. If you don't compensate this loss, it will affect your iron levels.

During pregnancy, the iron requirement rises sharply and is often not covered sufficiently. A European study found a iron deficiency-related anemia in 30 % of pregnant women. This anaemia causes a higher risk of disease or risk of death for mother and child. The number of premature births and miscarriages increases and the unborn baby grows slower. In addition, the risk of (urinary tract) infections rises and the tolerance of the mother to birth blood loss decreases.

Breastfeeding also requires more iron because the child absorbs part of the mother's iron. The blood loss during childbirth also must be compensated.

6.2 Iron deficiency in different age groups

Due to their growth, children and young people have a higher demand for iron. A survey of these groups in the USA showed that iron supply especially in infants (aged 1-2 years) and teenagers is insufficient. In these age groups, additional supply of iron is particularly important for a normal physical and mental development.

In old age, iron deficiency is frequent again. The reasons are:

- chronic diseases with impaired iron absorption of the intestine
- social reasons or lack of appetite lead to lower supply of iron through food

6.3 Iron deficiency caused by special circumstances

On the one hand, ferritin values can be low due to iron loss caused by bleeding such as after blood donations, accidental blood loss or by internal bleeding. On the other hand, low ferritin values can arise from blood decomposition due to burn injuries or resorption disorders as in many diseases of the gastrointestinal tract such as coeliac disease. A gastric bypass, gastric resection or chronic inflammatory bowel diseases can also cause difficulties in the absorption of iron.

Some diseases are accompanied by anaemia. This is the case for oncological diseases, chronic kidney insufficiency and heart failure.

Moreover, there are situations in which the measured ferritin value is changed (even too high). This can be the case when inflammatory processes take place, if there is a vitamin C deficiency, liver dysfunction, oxidative stress or increased cell death.

6.4 Iron deficiency in competitive athletes

The iron requirements of competitive athletes - especially of endurance athletes - are higher than in the average population. Among athletes, the widespread high-carbohydrate diet, which is low on iron, contributes to an insufficient iron supply.

6.5 Conclusion

If you belong to one of the above-mentioned risk groups or the blood test has determined a deficiency, you should control your ferritin level regularly to identify the deficiency at an early stage to take countermeasures.

We don't recommend iron intake in self-therapy and without appropriate laboratory examination because of the risk of iron overload.

7 Symptoms of iron deficiency

Early symptoms for iron deficiency are red cracks at the corner of the mouth (rhagades), dry and damaged hair and skin, as well as skin changes of the oral and gullet mucosa. Later on, the physical performance, the thermoregulation of the body and the immune response can be impaired. Most often, the symptom of unusual tiredness drives patients to their doctor. Hair loss has been known for years as a symptom associated with iron deficiency. Further symptoms are a lack of concentration and drive. External signs are pale skin and mucous membranes, difficult respiration, rapid pulse, palpitations, skipped heartbeats, headaches and oedema of the lower leg (water retention in tissue).

Cognitive impairment and developmental difficulties can occur. If the iron deficiency

lasts longer, it leads to the so-called iron deficiency anaemia. This is one of the most frequent deficiency diseases worldwide.

Should you feel symptoms of iron deficiency, make sure to consult with a doctor to discuss further steps.

8 How can I supplement iron?

There are several options to increase your iron: supplements, iron-rich foods, injections or infusions by a doctor.

8.1 Supplementation via iron supplements

To raise your iron blood levels and to replenish your iron stores, you can use over-the-counter pharmacy or also prescription iron supplements. These preparations contain different iron quantities and forms.

If your ferritin level is severely low or if the absorption through the intestine is impaired, otc-preparations might not be enough to compensate the deficiency. In this case, please consult with your doctor so that the ferritin level is controlled regularly. Then, iron is administered by either injections or infusions.

The valency of iron preparations is important. Trivalent iron is metabolized optimally if it is taken during a meal. Divalent iron should best be taken one hour before a meal.

8.2 Supplementation via injections or infusions

In case of a severe deficiency or bowel function disturbances, iron can alternatively be administered by injections or infusions. These have to be prescribed and performed by a doctor.

8.3 Supplementation via food

Iron is a trace element the body cannot produce itself. Therefore, it needs to be supplied via food. Both plant and animal food contain iron. The body can absorb and utilize 18 % of iron from animal foods but only 5 % from plant foods. When body's iron stores are exhausted, the absorption rate can rise to 20 % for plant foods and to 35 % for animal foods.

The so-called heme iron of animal origin is in the usable divalent form, whereas the non-heme iron is trivalent so the body first needs to convert it into the soluble form. A mixed diet contains in average 5-15 mg non-heme iron and 1-5 mg heme iron per day.

Salted and cured herring as well as pork liver have the highest iron content. Further

good iron sources are meat, offal and chicken egg. Plant foods such as legumes and cereals also contain a large amount of iron.

Below, you will find an overview of iron-rich foods from the above-mentioned food groups.

Food	Iron content per 100 g of edible part
salted herring	20.0 mg
pig liver	18.0 mg
amaranth	9.0 mg
quinoa	8.0 mg
lentils	8.0 mg
egg yolk	7.2 mg
beef liver	6.9 mg
millet	6.9 mg
soybeans	6.6 mg
chanterelles	6.5 mg
white beans	6.2 mg
peas	5.0 mg
oat flakes	5.4 mg

Please note: You can only offset an iron deficiency via a dietary change if it was caused by your diet.

8.4 What influences iron absorption? Recommendations

Many factors positively or negatively influence intestinal iron absorption.

The following foods or food components affect iron absorption:

- calcium salts in dairy products
- lignin in wholemeal cereals and linseed
- oxalic acid in rhubarb, spinach, red beet and cocoa
- phosphate in cola drinks
- phytate as in wholemeal cereals and soya
- polyphenols in tea and coffee
- salicylate as in aspirin

Apart from using heme iron, the following food components can improve bioavailability of iron:

- vitamin C (ascorbic acid)
- fruit acids e.g. citric acid
- fruit acids e.g. citric acid

From the above overview, the following concrete advice can be deduced:

- Eat iron-rich vegetables
- Only rarely eat foods high in oxalic acid; possibly bind it by adding milk or sour cream
- Use wholemeal cereals such as oat flakes or wholemeal rice (contains more iron compared to wheat flour)
- Exploit the positive effects of vitamin C: drink a glass of orange juice with a meal
- Prefer traditionally produced sourdough bread as certain processing steps reduce phytic acid which impairs iron absorption
- Drink less tea, coffee, cola drinks and cocoa

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