algania

Algae for a healthier life

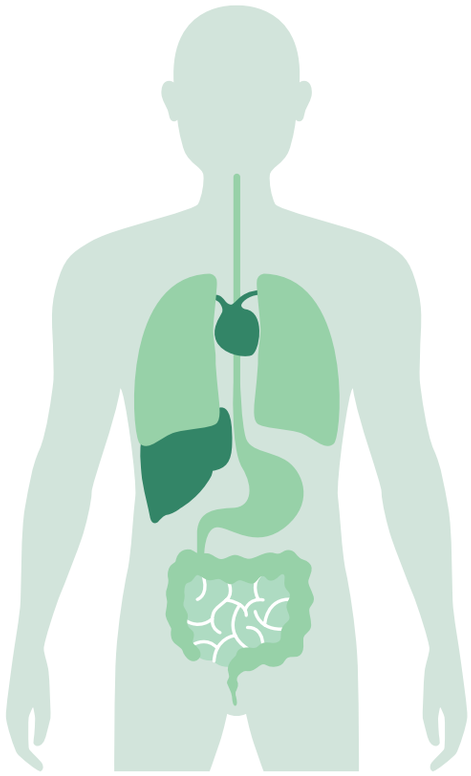
NUTRACEUTICAL INGREDIENTS

Iron Spirulina

Clinically supported bioavailable iron

NATURAL ORIGIN.
PROVEN SCIENCE.
REAL BENEFITS.

2 Iron needs, deficiencies and at-risk groups



Healthy adults possess 3 to 4 grams of iron, making it the most abundant transition metal in human body.

Iron is particularly important for our capability: as an elementary constituent of the red blood pigment, hemoglobin, it takes care of oxygen transport in the body and is involved in gaining energy and cell growth.

About 200 billions of red blood cells are produced daily in the bone marrow.

Each blood cell lives about 110 days before it is sorted out and broken down in the liver, spleen and bone marow.

Since there are daily iron losses due to cell desquamation from the intestine, a normal subject absorbs up to 1 mg of elemental iron from his diet.

So, for a sufficient intake, 10 to 14 mg of elemental iron is recommended daily. But this quantity is rarely reached; approximately 20% of the world population is iron-deficient.

Adolescent girls and women increase their iron needs to as much as 1,1 mg of additional iron per day due to menstrual blood loss. This also Happen during the latter stages of pregnancy, where 4 to 6 mg of iron are required to be absorbed. Anemia is a common medical disorder that contributes significantly to maternal morbidity in the world.

Iron deficiency has many faces: Fatigue, poor concentration, headaches, loss of appetite, nervousness, shortness of breath and increased susceptibility to infection

Age/Group	Iron needs	
Children	1	mg Fe
Adult men	0,5-1	mg Fe
Adult women premenopause	1,2	mg Fe
Adult women postmenopause	0,5-1	mg Fe

3 Iron Spirulina, premium natural iron ingredient

1

Therapeutic efficacy
Clinicaly supported ingredient designed to help address iron deficiency, anemia-related fatigue and low vitality

Cultivated in an ecological cultivation environment
Produced in a controlled natural environment with ecological cultivation standards and responsible resources use.

2

3

Clean label quality
Pesticide free • Hey metal controlled
GMP manutacturing • High purity profile

Versatile claims platform
Can be formulated with health-oriented claims (anenia, iron deprivation)*, or food claims (Super food, ideal for Vegans. Energy forathletes. Energy for working women).
*To be adapted to local regulation

4

5

Broad formulation compatibility
Available in powder or granules for multitype of formulation: snacks, drinks, pills, gummies, etc.

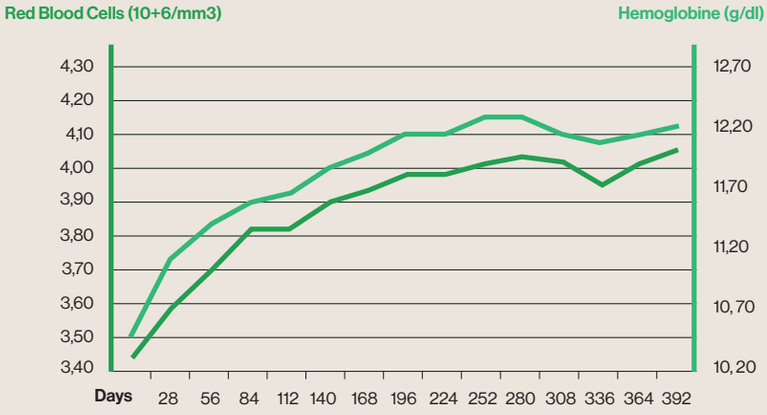
Pro-longevity positioning
Iron spirulina by ALGANIA does not significantly generate free radicals and may even inhibitoxydative reactions (Hannaert et al. 2005). This provides an additionnal benefit for longevity and supports possible long term consumption (ideal for vegans who need a daily iron intake).

6

4 Iron Spirulina is bioavailable

Numerous studies have demonstrated that iron from spirulina is highly bioavailable for human consumption.

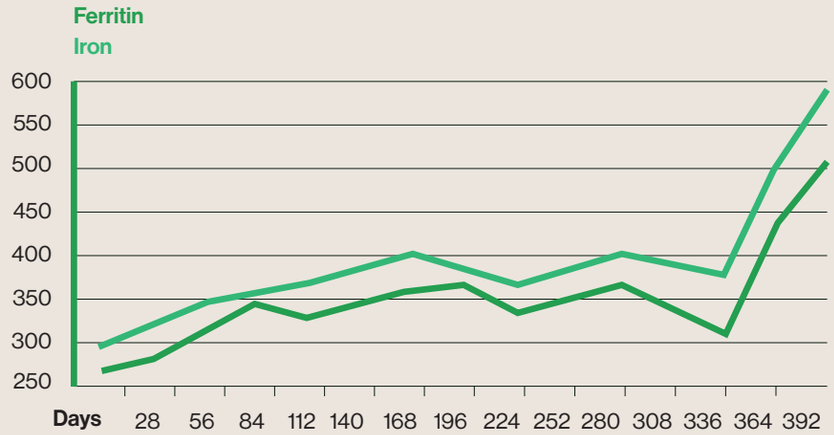
Our unique Iron Spirulina has been tested during a simple-blind, single-arm study for treating chronic anemia in chronic kidney disease patients not on dialysis. We can conclude that iron is highly available (not published).
The biovailability is good with small amount of iron (44 mg per day) and is maintained during a long period of time (more than one year of treatment without particular side effects).
When the dose has been changed to 74 mg per day at the end of the study, we can observe a dose response curve.



Changes in hemoglobin (Hb) Red Blood Cells (RBC) from baseline to day 392. P=0,002

Rationale:

-from the day 0 to day 168: 44 mg of iron
-from the day 169 to day 251: washout period
-from the day 252 to day 280: 44 mg of iron
-from the day 281 to day 363: washout period
-from the day 364 to 392: 74 mg of iron



Change in serum ferritin and serum iron from baseline to day 392. P=0,001 Serum ferritin levels follow the treatment periods and the washout periods.

Interestingly iron bioavailability is still effective after long term treatment and we observe clearly even a dose response at the end of the study.

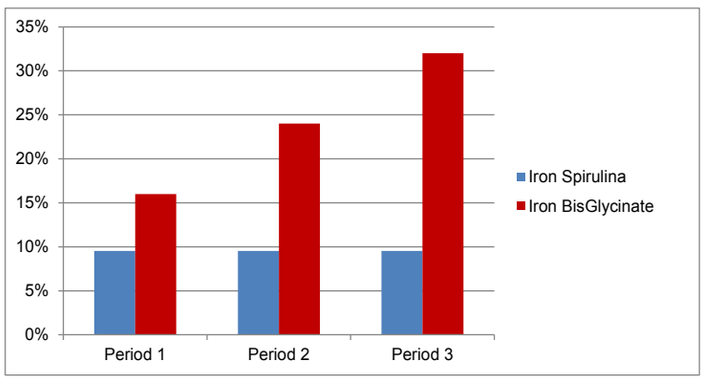
5 Excellent tolerance with comparable absorption

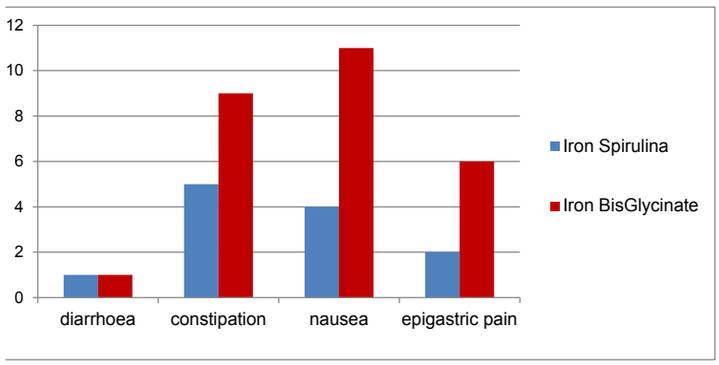
During a study of the use of Iron Spirulina and Iron bis-glycinate for reducing iron deficiency in pregnant women we conclude that Iron Spirulina induces less side effects than iron bisglycinate (Barberis 2009). In the same time, we observe that the absorption of the iron from Iron Spirulina was not lower than bisglycinate iron.

The aim of the study was to estimate the compliance of the treatment and the perception of the side effects **(60 mg of elemental iron per day).**

Question:
During the last 4 weeks, have you left for a time or reduced iron supplementation due to its side effects?

The statistical analysis shows a significant difference P=0,044
Moreover, the compliance for the bisglycinate treatment increase in time. This is not the case for Iron Spirulina.

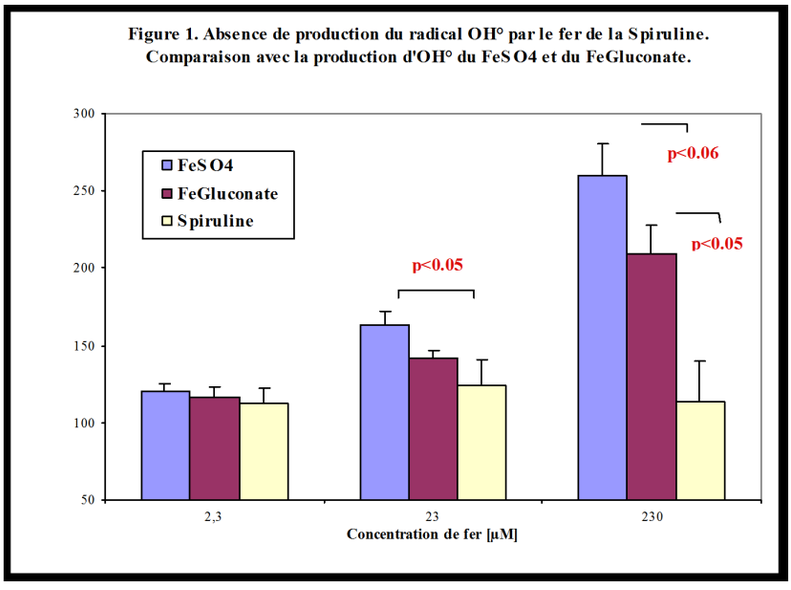




Question:
What was the worst side effects related to the iron supplementation?

Unsurprinsigly, we observe a predominance of epigastric pain and constipation in the two treatments.
The compliance with Iron Spirulina is much better than iron bisglycinate.

Pro-oxidative reactions such as the Fenton-like reaction, according to which the ferrous ion (Fe(II) or Fe2+) reduced the peroxide of hydrogen in ion OH- and radical hydroxyl (OH°). The Fenton-like reaction occurs indeed in vivo and are implied in several physiopathological situations.Indeed, radical OH° is one of the species oxygenated most toxic for the alive cells, because of its extreme reactivity. **The most significative of the study is that, unlike gluconate and of ferrous sulphate, the Iron Spirulina does not involve significant production of the radical hydroxyl (Fig 1.)**. Moreover, the spirulina itself inhibits the production of the radical hydroxyl induced by exogenic iron (Hannaert et al. 2005, not published)



6 Manufacturing excellence and quality assurance

Proprietary strain
Selected Spirulina platensis, rich in natural ferrous iron (Fe).

Controlled cultivation
Closed photobioreactors ensuring purity, consistency and sustainablity.

Gentle processing
Low temperature drying to preserve iron in its natural ferrous form and protest nutritional quality.

Quality & safety
GMP certified production - HACCP - ISO 22000.
Compliant with food and neutraceutical standards

Sustainable by nature
Water efficient, low land use, and high productivity microalgae for a better planet.

Pure microalgae science. Consistent quality. Responsible impact.

7 Scientific evidence

Bioavailability
Human studies demonstrate that iron from Iron Spirulina is highly bioavailable, effective at low doses (44mg/day) and maintained over long-term use.

Efficacy
Significant improvement in hemoglobine, red blood cels, serum ferritin and serum iron levels in anemic patients

Tolerance
Well tolerated with fewer gastrointestinal side effects compared to iron bis stycinate.

Safety
No serious adverse effects reported during long-term administration

Key references

• Barberis E.et al. (2009), Iron Spirulina versus iron bis-glycinate for improving iron status in pregnant women : a randomized controlled study. The Journal of Maternal-Fetal & Neonatal Medecine

• Leang L.S. et al. (2000) . Spirulina platensis is hignly bioavalable in anemic rats. J Nutr.

• Pakzadnia, M. et al. (2013). The effects of Spirulina supplemtation on anemia in pregnant women : a randomized, double-blind, placebo-controlled trial. Food Nutr.Res.

Decades of research support Iron Spirulina as a natural, effective and safe solution to help address iron deficiency.

8 Iron Spirulina Product facts

Source
Spirulina Platensisis Microalga

Iron form
Ferrous iron (Fe'-) 80%

Iron content
Natural content
Standardization available

Recommended Use
Ingredients for food supplements, functional foods and nutraceutical applications

Applications
Capsules, tablets, powders, beverages, bars, etc.

Certifications
GMP • HACCP
IS0 22000 - Kosher
Halal

Shelf life
24 Month

Origin
Switzerland / UE

algania
Algae for a healthier life

Advanced algae-derived nutraceutical technology

Partner with ALGANIA for science-backed, sustainable and high-quality ingredients.

Contact Matt Kairys
Cell: 201-889-9899
mkairys@unichemsupply.com