

Iron SAP

Science-based iron glycinate for enhanced bioavailability

Iron-deficiency anemia is the most prevalent type of anemia in North America. It can cause fatigue, weakness, headaches, and poor concentration. Particularly susceptible are women of childbearing age and pregnant women, children, undernourished laborers, and the very poor. In children, deficiency can result in irreversible impairment of growth and cognitive development, emotional problems, and impaired immune function. Common problems with iron supplementation have included poor bioavailability, extensive inhibition by dietary components (most notably phytates), and gastrointestinal side effects. Iron chelated with the amino acid glycine is more highly absorbable and elicits greater clinical efficacy than other forms, while exhibiting minimal digestive discomfort.

ACTIVE INGREDIENTS

Each vegetable capsule contains:

Iron (from iron bisglycinate)	30 mg
Vitamin B ₁ (thiamine hydrochloride)	5 mg
Vitamin B ₆ (pyridoxal-5'-phosphate)	5 mg
Vitamin B ₁₂ (methylcobalamin)	400 mcg
L-Methylfolate (from L-5-methyltetrahydrofolate, calcium salt) ...	500 mcg
Copper (from cupric citrate)	1 mg
Riboflavin (riboflavin-5'-phosphate sodium)	5 mg
Vitamin B ₃ (inositol hexanicotinate, flush-free)	5 mg

Other ingredients: Succinic acid (100 mg), L-glycine (100 mg), vegetable magnesium stearate, silicon dioxide, and microcrystalline cellulose in a vegetable capsule composed of vegetable carbohydrate gum and purified water.

This product is non-GMO.

Contains no: Gluten, soy, wheat, corn, eggs, dairy, yeast, citrus, preservatives, artificial flavor or color, starch, or sugar.

Iron SAP contains 60 or 120 capsules per bottle.

DIRECTIONS FOR USE

Adolescents ≥ 9 yrs and adults: Take 1 capsule daily with food or as directed by your healthcare practitioner. If you are taking other medications, take this product a few hours before or after them.

1 capsule provides 30 mg of elemental iron.

INDICATIONS

Iron SAP provides nutritive support for healthy cellular respiration, red blood cell formation, and increased hemoglobin and plasma ferritin. **Iron SAP** can reduce the symptoms of iron deficiency anemia and improve markers of iron status.

IRON BOUND TO AMINO ACIDS FOR SUPERIOR NUTRITION

Iron glycinate, also known as iron bisglycine chelate, is composed of one unit of inorganic iron bound to two glycine molecules that protect it from dietary inhibitors and intestinal interactions in the duodenum, thereby increasing bioavailability.^[1] All three components are utilized by the body as precursors to hemoglobin, the protein responsible for the delivery of oxygen to peripheral tissues.



Scientific Advisory Panel (SAP):
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ENHANCED BIOAVAILABILITY

Iron absorption begins in the stomach, where the acidic pH solubilizes the compound and reduces it to the ferrous (Fe²⁺) form for absorption by the duodenal cells of the intestine.^[1] Thus, the ability to remain soluble over a wide range of pHs is imperative for complete uptake. A study comparing ferrous fumarate, ferrous sulfate, ferrous bisglycinate chelate, and sodium-iron ethylenediaminetetraacetic acid (NaFeEDTA) found only the latter two forms to be completely soluble at pHs of both 2 and 6.^[2]

Iron bisglycinate chelate demonstrates superior absorption compared to other forms of iron:^[1, 3, 4]

- In various food sources — greater absorption than iron sulfate and electrolytic iron when taken with milk, wheat, and whole maize flour;^[3, 12]
- In corn-based breakfast high in phytates and polyphenols — 2× higher absorption than iron sulfate;^[5]
- In cow's milk — fortification with 15 mg/L iron bisglycinate chelate was absorbed at 11% v. 4% with ferrous sulfate;^[3]
- In iron-deficient infants — apparent iron bioavailability was reported to be 3.4 times greater for bisglycinate chelate than ferrous sulfate (90.9% and 26.7% respectively).^[6] These results corroborated with a retrospective study looking at preterm infants, where quarter of the dose of iron bisglycinate (compared to iron sulfate) achieved equivalent efficacy and reduced elemental iron load.^[15]
- In marginally iron-deficient adult women, ferrous bisglycinate chelate was better absorbed than ferrous ascorbate (52% versus 40%).^[7]
- Iron bisglycinate at a dose of 25mg/day compared to ferrous sulphate at a dose of 50mg/day produced the same effects in prevention of iron deficiency in pregnant women (n=40).^[11]
- Compared to polymaltose iron, supplementation with iron bisglycinate (3mg Fe/kg body weight/day for 45 days) increased ferritin and mean corpuscular hemoglobin levels in children with iron deficiency anemia.^[14]
- Iron bioavailability and efficacy has been confirmed in patients with celiac disease on a gluten free diet, as well as newly diagnosed celiac disease patients having intestinal lesions.^[16]

Measurement of liver iron levels confirms successful absorption of supplemental ferrous bisglycinate chelate.^[3]

SUPERIOR EFFICACY

Iron bisglycinate chelate supplementation results in greater gains in markers of iron status as compared to other forms of iron:

- In iron-deficient adolescents — 30 mg/d of ferrous bisglycinate chelate was equally as effective as 120 mg/d of ferrous sulfate.^[8] Furthermore, treatments with 60 or 120 mg/d ferrous bisglycinate chelate resulted in higher plasma ferritin levels than 120 mg/d ferrous sulfate;^[8]
- In iron-deficient infants and young children — at a dose of 5 mg/kg body weight for 28 days, both groups had significant increases in hemoglobin, but only the bisglycinate chelate group had a significant increase in plasma ferritin.^[6] In iron deficient school children, supplementation with 3.66mg of elemental iron for 7.5 months showed significant improvement in hemoglobin, serum iron and transferrin saturation with iron bisglycinate treatment but not with electrolyte iron treatment.^[12] Iron bisglycinate compared to polymaltose iron showed higher efficacy in increasing iron stores in children age 1 to 13 having iron deficiency anemia.^[14] Preterm infants supplemented with iron bisglycinate at a dose of 0.75mg/

kg/day exhibited the same efficacy as seen with a dose of 3mg/kg/day of ferrous sulfate.^[15]

- In cancer patients with iron-deficiency anemia (n=24), supplementation with iron bisglycinate (28mg/day for 20 days and 14mg/day for 40 days) showed similar efficacy compared to ferrous sulfate dose of 105mg/day for 60 days.^[13]

REDUCED GASTRIC IRRITATION

Iron supplementation has been associated with gastrointestinal (GI) side effects including constipation, bloating, and nausea. Iron bisglycinate chelate has been shown to elicit fewer side effects compared to other inorganic iron supplements.^[4, 6, 9] In a 1994 study, supplementation of 120 mg/d ferrous sulfate resulted in a 33.3% incidence GI irritation v. only 15.4% with ferrous bisglycinate chelate.^[8] This evidence has been further substantiated with recent clinical trials, where pregnant women supplemented with ferrous bisglycinate reported fewer incidents of gastrointestinal problems compared with pregnant women supplemented with ferrous sulfate.^[11] Similar results have been observed with cancer patients where iron bisglycinate compared to ferrous sulfate showed lower GI toxicity.^[13] However, some individuals may still experience mild gastro-intestinal side effects with iron bisglycinate and a heme iron supplement would be a better alternative for such individuals. Heme iron has a low capacity to cause gastrointestinal side effects, and in a 12-week intervention study, the dietary supplementation of 27 mg/d of heme iron was as effective as 35 mg/d nonheme iron at raising body iron levels, without typical side effects of nonheme supplementation.^[16]

SAFETY

Iron bisglycinate chelate is generally recognized as safe (GRAS) according to US-FDA guidelines and has been demonstrated to have a No Observable Adverse Effect Level (NOAEL) to at least 500 mg/kg body weight in rats.^[10] Iron bisglycinate chelate has a lower acute oral toxicity than ferrous sulfate.^[3, 13] Absorption inversely correlates with iron stores, minimizing the risk of iron overload.^[7] Iron bisglycinate has been well tolerated by patients suffering from celiac disease who are on a gluten free diet, as well as children newly diagnosed with celiac disease.^[17]

PURITY, CLEANLINESS, AND STABILITY

All ingredients listed for all **Iron SAP** lot numbers have been tested by a third-party laboratory for identity, potency, and purity.

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