Heme Iron SAP

Science-based heme-iron source for optimal absorption

Heme iron is a highly bioavailable form of iron, isolated from animal sources with maximal human intestinal absorption. Heme iron is not associated with common side effects of elemental (nonheme) iron supplementation such as constipation, nausea, and gastrointestinal upset.

ACTIVE INGREDIENTS

Each vegetable capsule contains:

Iron (heme iron polypeptide from porcine hemoglobin)	11 mg
Vitamin C	90 mg
Folate (from calcium L-5-methyltetrahydrofolate)	333 mcg
Vitamin B_{12} (methylcobalamin)	333 mcg

Also contains: Vegetable magnesium stearate, microcrystalline cellulose, and silicon dioxide in a vegetable capsule composed of vegetable carbohydrate gum and purified water.

This product is non-GMO.

Contains no: Gluten, soy, wheat, eggs, dairy, yeast, citrus, preservatives, artificial flavour or colour, starch, or sugar.

Heme Iron SAP contains 30 capsules or 60 capsules per bottle.

DIRECTIONS FOR USE

Take 3 capsules once daily with a full glass of water, with or without food, or as directed by your healthcare practitioner. Do not lie down for 30 minutes after taking this product. If you are taking other medications, take this product a few hours before or after them. Consult a healthcare practitioner for use beyond 7 weeks. Consult a healthcare practitioner to monitor blood iron content.

INDICATIONS

Heme Iron SAP may be used in the treatment of iron deficiency with or without anaemia.

CAUTIONS AND WARNINGS

Consult a healthcare practitioner prior to use if you have peptic ulcer, regional enteritis, or ulcerative colitis. Constipation, diarrhoea, nausea, upset stomach and abdominal cramping may occur. Iron may cause stools to turn black, an effect that is not harmful. A very serious allergic reaction to this product is rare; do not use if you have an allergy to pork products. Before using heme iron polypeptide, tell your pharmacist or doctor if you are using methyldopa or other iron-containing products. Iron supplements can decrease the absorption of drugs such as tetracycline antibiotics, penicillamine, cefdinir, chloramphenicol, levothyroxine, levodopa, and quinolone antibiotics; therefore, doses of these medications should be spaced as far as possible. This product may interfere with certain laboratory tests (including testing for blood in stool), possibly causing false test results; make sure laboratory personnel and all doctors know you are taking this product. This product should not be used if you have certain medical conditions. Individuals that are pregnant, breast-feeding, or have hemochromatosis, other types of anaemia, repeated blood transfusions, or stomach/intestinal problems should tell their pharmacist or doctor before using this product.

KEEP OUT OF REACH OF CHILDREN

Accidental overdose of iron-containing products is a leading cause of fatal poisoning in children younger than 6 years. If accidental overdose does occur, call a doctor or poison centre immediately.

PURITY, CLEANLINESS, AND STABILITY

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

Scientific Advisory Panel (SAP): adding nutraceutical research to achieve optimum health

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For healthcare professional use only.

BACKGROUND

Iron is an essential mineral to human physiology; its deficiency a worldwide nutritional challenge. The most abundant trace element in humans, it is structurally essential to the formation of haemoglobin and myoglobin, and imperative in oxygen transport, energy production, and DNA synthesis.[1, 2] Two types of iron are present in the diet: heme iron, a small fraction of total dietary iron derived from haemoglobin and myoglobin from animal sources; and nonheme (elemental, inorganic) iron, available in abundance from vegetable sources and used in the fortification of commercially available foods.[1, 3, 4, 5]

IRON-DEFICIENCY ANAEMIA

Iron deficiency affects an estimated two billion people worldwide and is most common in developing countries, with a prevalence estimated to as high as 30% in some areas of the world.[2–4, 6–12] Thirty-nine percent of children younger than 5 years, 48% of children aged 5–15 years, and 42% of women between 15 and 49 years of age are anaemic in developing nations.[9, 10] In developed countries, 20% of pregnant women are affected by iron-deficiency anaemia.[10] Menstruating women have at least double the requirement for iron repletion from the diet, due to menstrual bleeding and pregnancy.[2, 12] Low iron status is associated with poor immunity, lower productivity in adults, and impaired cognitive development in infants and children.

IRON DEFICIENCY IN PREGNANCY

Pregnancy dramatically increase a woman's iron requirements as her iron stores become depleted: only 20% of reproductive-aged women are estimated to have adequate iron stores for optimal pregnancy conditions, and approximately 40% of women worldwide enter pregnancy with no stores at all.[6] Maternal iron-deficiency anaemia is associated with an increase in preterm delivery as well as impaired neurological and psychological development.[1, 6]

Daily iron supplementation (30–60 mg/d elemental iron) with folate (400 mcg/d) in pregnancy increases maternal hemoglobin concentrations and decreases the risk of anaemia, leading to reduced risk for low-birth weight infants and impacting neonatal mortality. For cutoff values for each trimester for iron deficiency and recommendations for supplementation dependent on trimester, see the review by Cao and O'Brien.[6]

ABSORPTION OF IRON

Total iron bioavailability in the diet may be as low as 15%, suggesting that current recommendations for iron consumption from the diet may not be adequate to maintain adequate iron stores for optimal human health.[3] Poor absorption and inadequate dietary intake is a likely major contributing factor to the development of iron-deficiency anaemia, particularly in high-risk populations.

Nonheme iron is generally subject to poorer absorption, due to factors including—but not limited to—dietary phytates and fibre, and all forms of iron are better absorbed when ingested with meat proteins, but impaired by egg, milk, and dairy proteins such as casein.[1, 5, 10]

Meat, citric acid, ascorbic acid, an acid environment in general, and other antioxidants likely increase the bioavailability of iron, due to their ability to reduce ferric iron to ferrous iron, and in the case of ascorbic acid, an inhibitory effect on inhibition by dietary phytates and fructooligosaccharides (FOS).[1, 5] Further, achlorhydria is a known factor in the development of iron-deficiency anaemia, where 44% of those diagnosed with idiopathic iron-deficiency anaemia showed impaired gastric acid secretion, versus only 1.8% in healthy controls, contributing to a negative iron balance.[5]

Contrary to popular belief, concurrent supplementation of calcium at levels below 800 mg for less than one month do not impair iron absorption.[8, 9] Concurrent consumption of soy may impair iron absorption, though generally, cereal grains and legumes do not have any impact on bioavailability.[14]

SUPERIOR BIOAVAILABILITY OF HEME IRON V. NONHEME IRON

Heme iron is generally considered of higher bioavailability by at least three times relative to nonheme (elemental) sources of iron (< 15% v. < 5%),[1, 3, 4] as it is absorbed intact through the mucous cells of the gastrointestinal tract via the heme carrier protein 1 (HCP1) into intestinal enterocytes, at which point elemental iron is liberated from its porphyrin ring via enzymatic action.[1, 5, 7, 12, 14]

In a head-to-head comparison study with placebo control, heme iron bioavailability was calculated to be 23.7% higher than (inorganic, nonheme, elemental) iron sulfate based on ferritin increases.[7]

Polypeptide forms of heme iron maximize the effectiveness of heme iron sources: As pure hemoglobin, 6 g would need to be ingested to deliver 20 mg of elemental iron, and this would be dependent not only on gastrointestinal cross-membrane transport, but also on enzymatic digestion of the hemoglobin.[2]

REDUCED SIDE-EFFECT PROFILE OF HEME IRON

The most common side effects of iron supplementation include constipation, diarrhoea, nausea, and stomach upset.[1, 4] Heme iron has a low capacity to cause gastrointestinal side effects; a common complaint leading to poor compliance for the utilization of nonheme iron sources.[1, 2, 4, 7]

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.[4]

REDUCTION-OXIDATION BALANCE

Iron, as a metallic element, is an important mineral in reduction-oxidation reactions in human physiology. Like other transition metals, iron has the potential to act as a prooxidant in certain physiological conditions. High consumption of heme iron from red meats and processed meats is correlated with increased risk of coronary heart disease, stroke, cardiovascular disease and atherosclerosis, and overall mortality. As such, while supplementation is appropriate in a deficient state, the supplementation at high levels of heme iron will promote inflammation and the chronic diseases that follow, acting as a toxic element in these doses and producing reactive oxygen species.[2, 11, 12] Dietary adequacy of minerals such as calcium, magnesium, and zinc mitigate this negative effect.[11]

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