



# HEMOFACTORS™

Helps to prevent iron deficiency anemia

## IRON – THE MOST COMMON NUTRIENT DEFICIENCY

Iron is the most common nutrient deficiency in North America. The groups at highest risk are infants under two years of age, teenage girls, pregnant women, the elderly, and athletes. Studies have found evidence of iron deficiency in as many as 30 – 50% of people in these groups, and about 10% of healthy, menstruating women in the United States are iron deficient. During pregnancy, the number is even higher (Fairbanks, *et al*). Iron deficiency and anemia are not the same, however a deficiency can lead to an anemic condition, whereby the blood is deficient in red blood cells or the protein hemoglobin. Approximately 4 – 5% of North Americans are actually anemic.

Iron is critical to human life. It plays a central role in carrying oxygen to our cells and in cell metabolism. However, it can be difficult to get sufficient iron from dietary sources so supplementation is often required. Natural Factors HemoFactors provides a non-irritating, high-absorption form of iron that suits the needs of women and men of all ages.

## THE CAUSES OF IRON DEFICIENCY

Iron deficiency has many causes, including an increased iron requirement, inadequate dietary intake, diminished iron absorption or utilization, blood loss, or a combination of these factors (Fairbanks, *et al*). Increased requirements for iron occur during the growth spurts of infancy and adolescence, during pregnancy and lactation, and during athletic training. Inadequate intake of iron is quite common. Iron is not easily absorbed from most foods, except meat, which contains the most bioavailable form of iron.

Decreased absorption of iron is often due to a lack of hydrochloric acid secretion in the stomach. Other causes of decreased absorption include chronic diarrhea, malabsorption, the surgical removal of part of the stomach, antacid use, and consumption of foods, such as tea, that block iron absorption (Fairbanks, *et al*).

Blood loss due to menstruation is the most common cause of iron deficiency in women of childbearing age. Other common causes of blood loss include bleeding from peptic ulcers, hemorrhoids, and donating blood (Fairbanks, *et al*). Athletes also lose iron during intensive training.

## HOW DOES IRON WORK IN THE BODY?

Iron is essential for the production of hemoglobin. Hemoglobin is the protein in red blood cells that carries oxygen from the lungs to the body tissues, and carries waste carbon dioxide from the tissues to the lungs. A deficiency in iron causes a decrease in the amount of hemoglobin in the red blood cells, which leads to insufficient oxygen reaching the cells to maintain health and vitality. Iron is also essential in several key enzymes that release energy. Iron ions serve to transport electrons within cells, making and breaking chemical bonds in biochemical reactions. These important cellular operations would not occur without iron.

## CONSEQUENCES OF IRON DEFICIENCY

Anemia is the most common clinical sign of iron deficiency. It develops during the final stage, as a result of deficient erythropoiesis (the process by which red blood cells are produced). It often develops without warning and the symptoms may be mistaken for something else or overlooked.

Chronic exhaustion and low energy are the most common symptoms of iron deficiency. A shortage of iron in the blood means that our cells are robbed of the oxygen they need to burn the body's fuel. Furthermore, it impairs the delivery of oxygen to the tissues and the removal of carbon dioxide. It also impairs the function of iron-containing enzymes in cellular energy production and metabolism. These cumulative effects drain the body of energy.

Even marginal iron deficiency can significantly impair immune function. In iron-deficient individuals, it is common to find increased rates of infection, lymphatic tissue shrinkage, and defective white blood cell function (Agarwal). Iron deficiency may be a factor in chronic infections and frequent colds.

Virtually any nutrient deficiency can result in impaired brain function, especially in children. Since iron deficiency is so common, it is the most important nutritional cause of learning disability. Research indicates iron deficiency is associated with marked decreases in attention span, persistence, and voluntary activity. Fortunately, iron supplementation can restore normal mental function (Fairbanks, *et al*). Additionally, iron supplementation can reduce the risk of recurring ear infections in children since it strengthens the immune system.

Menstrual blood loss is well recognized as a major cause of iron deficiency anemia in fertile women. However, chronic iron deficiency can also be a cause of excessive menstrual blood loss, a condition known as menorrhagia. Iron supplementation often produces a dramatic decrease in menstrual blood loss. In one double-blind, placebo-controlled study, 75% of women on iron supplementation had significant reduction of menorrhagia compared with only 32.5% for the placebo group (Arvidsson, *et al*).

Additional signs and symptoms of iron deficiency include: pale skin, especially under eyes, nails and palms of the hands; brittle hair and nails; cold hands and feet; heart palpitations and rapid pulse; lack of focus and concentration; poor sleep; swelling or soreness of the tongue and canker sores; headaches; and restless leg syndrome.

## GROUPS AT HIGH RISK

In general, women are at greater risk of iron deficiency anemia than men. That is because women lose blood – and with it, iron – each month during menstruation. The rates of iron deficiency amongst this group are astonishing – almost 40% between the ages of 12 – 19. With more young women suffering from heavy menstrual cycles, iron deficiency anemia has increased dramatically.

Iron deficiency is extremely common in pregnancy as iron requirements rise dramatically due to iron contributions to the fetus, placenta, and umbilical cord, and an increase in red cell mass in the mother (Fairbanks, *et al*). Iron loss in the urine, sweat and feces also increases. Therefore, the recommended daily intake of iron during pregnancy is 60 mg. Since this typically cannot be achieved through diet, supplementation is required. Typically the mother will also lose 150 to 300 mg of iron due to blood loss during delivery. But the need for additional iron is not over once the baby is delivered. Lactation requires additional iron supplies. It is important for women to continue taking iron supplements throughout their pregnancy and nursing period.

Children under two years of age and adolescents also have high iron requirements to support their rapid growth. Usually their diet provides inadequate iron and supplementation is required.

Not eating enough iron-rich foods increases the risk of developing iron deficiency anemia as well. Whether it's vegans and vegetarians, highly processed foods or calorie-reduced diets, inadequate iron intake puts people at risk. The elderly are also at risk due to reduced food intake and decreased stomach acid production, which impairs iron absorption.

A growing body of evidence indicates athletic training causes iron loss. This is especially prevalent in endurance sports. A recent study examined the effects on iron status of an intense six week training program for cyclists. Dietary iron intake remained consistent, but after three weeks the hemoglobin and red blood cell counts were depressed. Iron levels remained depressed even during the two week recovery period after training (Wilkinson, *et al*).

## SUNACTIVE® NON-IRRITATING, HIGH-ABSORPTION IRON

Ferrous sulfate is the most popular form of iron supplement. It is best absorbed when taken on an empty stomach, but doing so often causes nausea, gastrointestinal irritation, and constipation. So it is usually taken with food, which greatly reduces its absorption. This is the problem with many forms of iron.

SunActive iron is a special form of ferrous pyrophosphate that: is free from gastrointestinal side effects, due to its resistance to gastric juices; provides a sustained release of iron for up to 12 hours; is extremely stable; and has no flavour. The insoluble ferrous pyrophosphate is micronized to a tiny particle size, then microencapsulated to allow dispersal and assimilation.

SunActive iron provides non-irritating iron fortification with superior absorption. It also has high relative bioavailability, especially if taken on an empty stomach. In a stable isotope bioavailability study with adult women using infant cereal and yogurt drink, SunActive iron was found to have a bioavailability equivalent to ferrous sulfate (Fidler, *et al*).

## THE BENEFITS OF IRON

Research shows that supplementation can restore normal levels of iron in the blood and tissues, alleviating the adverse effects of iron deficiency (Agarwal). Supplementation can restore the normal functioning of: enzymes involved in energy production and metabolism; cognitive processes; and the immune system; as well as reduce excessive menstrual blood loss (Arvidsson, *et al*, Fairbanks, *et al*, Zhu, *et al*).

Several researchers have clearly demonstrated that even a slight iron deficiency leads to a reduction in physical work capacity and productivity (Agarwal, *et al*, Arvidsson, *et al*, Fairbanks, *et al*). Nutrition surveys done in the U.S. have indicated that iron deficiency represents a major impairment of health and work capacity, and results in economic loss for the individual and the country. Supplementation with iron has shown rapid improvements in work capacity in individuals who are not anemic but who are shown to be iron-deficient using the serum ferritin test. The iron-dependent enzymes involved in energy production and metabolism are impaired long before anemia occurs (Zhu, *et al*).

One study investigated women athletes with mild iron depletion. Their ability to transport and utilize oxygen was significantly impaired compared to the control group. The study also found that iron supplementation improved serum ferritin levels and athletic performance, without any measurable change in blood hemoglobin levels (Fidler, *et al*).

## DOSAGE

Chew one tablet daily with food or as directed by a health care practitioner. Take a few hours before or after taking other medications.

Vitamin C enhances iron absorption but other minerals, particularly calcium, magnesium, and zinc, can interfere with iron absorption, so it is preferable to take iron away from these minerals. According to Health Canada's iron monograph, iron supplements should be taken with meals; however, research conducted by Taiyo International showed that ferric pyrophosphate, the SunActive form of iron, has high relative bioavailability on an empty stomach, which would indicate that HemoFactors can, and perhaps should, be taken on an empty stomach.

## SAFETY

SunActive iron has GRAS (Generally Recognized as Safe) status. Toxicity experiments on healthy rats found that SunActive iron is safe under the conditions of intended use as a dietary ingredient. There have been no reported harmful effects in animal or human studies employing SunActive iron (Juneja, *et al*).

*Pregnancy and lactation:* Suitable for pregnant or lactating women.

*Children:* Although iron supplementation is considered suitable for children, it is preferable that children taking HemoFactors do so under the supervision of a health care practitioner. Keep all iron supplements out of the reach of children. Acute iron poisoning in children can result in serious consequences.

*Drug interactions:* Iron may interact with many medications, therefore it is best to take iron supplements a few hours before or after taking medications.

*Contraindications:* According to the Health Canada iron monograph, a laboratory diagnosis of anemia is recommended before supplementing with iron. However, since well-documented iron deficiency statistics confirm that iron is the most common nutrient deficiency in North America, moderate iron supplementation for those who are not clinically anemic is probably advisable.

Iron is critical for human life. Often our dietary intake of iron does not adequately satisfy the body's needs, and iron supplementation is needed. Natural Factors HemoFactors with SunActive iron is a great-tasting chewable tablet that provides all the benefits of this unique form of iron.

## KEY REFERENCES

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