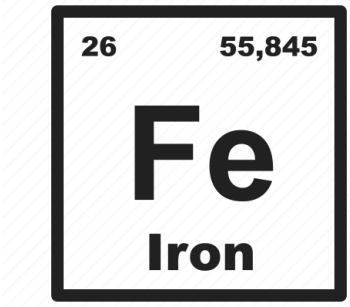
# Iron Overview

**Why We Need It?**
Iron is an essential mineral that plays a crucial role in oxygen transport, energy production, and immune function. It is a key component of hemoglobin in red blood cells, helping to deliver oxygen throughout the body. Iron deficiency is one of the most common nutrient deficiencies worldwide, leading to fatigue, weakness, and anemia.

**Functions in the Body**
Oxygen Transport: Forms hemoglobin, which carries oxygen in the blood.
Energy Production: Supports cellular respiration and ATP synthesis.
Brain Function: Aids cognitive development, memory, and focus.
Immune Support: Helps the body fight infections.
Muscle Function: Forms myoglobin, which stores oxygen in muscle cells.




**Daily Recommended Intake (RDI):**
Infants (0-6 months): 0.27 mg/day
Children (1-8 years): 7-10 mg/day
Adolescents (9-18 years): 11-15 mg/day
Men (19+ years): 8 mg/day
Women (19-50 years): 18 mg/day
Women (51+ years): 8 mg/day
Pregnant Women: 27 mg/day
Lactating Women: 9-10 mg/day
Upper Limit (UL): 45 mg/day (excess intake may cause toxicity, including organ damage).

**Benefits of Supplementation**
- Prevents and treats iron deficiency anemia.
- Boosts energy levels and reduces fatigue.
- Supports healthy cognitive function and mental clarity.
- Enhances physical performance and muscle oxygenation.
- Strengthens the immune system and aids in wound healing.

**Most Bioavailable Form**
Heme Iron: Found in animal-based foods, highly absorbable.
Non-Heme Iron: Found in plant-based foods, less absorbable.
Ferrous Sulfate: Common supplement form, high bioavailability.
Ferrous Bisglycinate: Gentle on digestion and well-absorbed.
Ferric Citrate: Used for iron supplementation in kidney disease patients.

**Best Food Sources**
Heme Iron (Animal Sources): Red meat, liver, poultry, seafood (oysters, clams, sardines).
Non-Heme Iron (Plant Sources): Lentils, beans, tofu, spinach, quinoa, nuts, fortified cereals.
Iron Absorption Enhancers: Vitamin C-rich foods (citrus fruits, bell peppers, tomatoes) improve iron absorption.
Iron Absorption Inhibitors: Calcium, tannins (tea, coffee), and phytates (whole grains) can reduce absorption.

**Conclusion**
Iron is essential for oxygen transport, energy levels, and overall health. While heme iron from animal sources is more bioavailable, plant-based eaters can optimize absorption by combining iron-rich foods with vitamin C. Supplementation may be necessary for individuals at risk of deficiency, such as pregnant women, athletes, and those with anemia.