



Ferrazone®

The most bio-available
iron against anemia



Nouryon

About Ferrazone®

- Ferrazone is suitable for use in food and has been recommended by the World Health Organization as the only suitable iron supplement for the mass fortification of high-phytate cereal flours and is recommended for sugar, soy sauce and fish sauce. Ferrazone has already been used in large scale food fortification initiatives in Africa, Latin America, Asia and the Middle East.
- Ferrazone is manufactured at Nouryon's plant in Herkenbosch, the Netherlands. This production facility is certified according to the quality assurance system FSSC22000. Ferrazone is also certified for use in Kosher and Halal food.
- Ferrazone has officially been approved for use in food by the JECFA, the FDA and the EFSA.
- Ferrazone is manufactured according to the specifications as outlined in the monographs for food-grade ferric sodium EDTA by FCC 8th version and the JECFA.
- There are three grades available

Grade	Application
Ferrazone®	Food, beverages and supplements
Ferrazone® XF	Wheat and maize flour
Ferrazone® BP	Pharmaceuticals



Ferrazone®

How to combat anemia?

Iron deficiency anemia is one of the major health issues globally, affecting as many as 1.5 billion people. In general, iron deficiency anemia causes a loss of physical endurance due to reduced levels of hemoglobin and tissue iron. During pregnancy, iron deficiency anemia is associated with increased risk of maternal mortality. Iron deficiency in infancy and childhood is associated with significant loss of cognitive abilities and decreased resistance to infections.

Iron deficiency anemia

Iron is present in every cell in the human body and plays a vital role in red blood cells by helping to carry oxygen through the body. Iron deficiency affects the function of the human body. In severe form, iron deficiency results in anemia. Iron deficiency is the most prevalent nutrient deficiency in the world. As estimated by the World Health Organization (WHO) 40% of the world's population is anemic. It is responsible for approximately 20.000 deaths among children under 5 years of age. In addition iron-deficiency anemia in pregnancy is a risk factor for maternal mortality. 115,000 deaths per year from maternal causes among women of childbearing age have been attributed to iron deficiency. According to a World Health Organization (WHO) review of nationally representative surveys from 1993 to 2005, 42% of pregnant women and 47% of preschool children worldwide have anemia. Iron deficiency has its greatest impact on the health and well-being of preschool children and women of childbearing age, though it may also affect other population groups. Anemia

manifests itself in lower work productivity in men and women, decreased intelligence in children, and greater risk of lower birth weight babies in pregnant women.

Ferric Sodium EDTA for Flour and Food Fortification

The most efficient way of preventing and treating iron deficiency anemia is through the fortification of food products with a form of iron that is readily absorbed by the body. Our Ferric Sodium EDTA, Ferrazone, has been demonstrated to be both safe and effective in reducing iron deficiency, even in inhibitory diets lacking bioavailable iron.

The main challenge in its application is avoiding undesirable color and flavor changes of the fortified food. Also the iron compound should not cause teeth staining. And most important: the iron should be effective. Unlike other iron compounds, Ferrazone meets all these requirements:

- Well-soluble in water
- No metallic taste
- No teeth staining
- No rancidity
- Highly effective, even in presence of phytate

Fortifying staple foods (i.e. various types of flour) with Ferrazone is the most efficient way of combating anemia in developing countries. Therefore, Nouryon is working closely with NGO's, governments and leading producers of so called pre-mixes (a mix of vitamins and minerals used to fortify food) to provide the highest quality product and the know-how needed for successful application. Both past



and future generations have benefited or will benefit from a safe and effective source of iron in their diets, with help of our Ferrazone product.

Supporting the fight against malnutrition

Nouryon is part of the Amsterdam Initiative against Malnutrition (AIM); a public-private partnership strongly committed to reducing malnutrition. Purpose is to improve food and nutrition security. Worldwide there are 1.5 billion people suffering from the severe consequences of an inadequate diet that lacks essential vitamins and minerals. The AIM partners are determined to contribute to ending malnutrition through a broad portfolio of projects. These projects are executed throughout the entire food value chain with a focus on the consumer.

We have actively supported flour fortification initiatives since the 1980's by supporting organizations as Smarter Futures (part of Flour Fortification Initiative). Smarter Futures is a public-

The main advantages of Ferrazone for food fortification

- Completely water soluble
- No teeth staining
- Virtually inert to almost all other food ingredients
- No metallic taste
- No digestive effects
- High bioavailability

private-civic partnership that supports partnerships of flour millers, governments, vitamin and mineral suppliers, international organizations and academic institutions to make fortification of wheat flour a reality in Africa. The aim of Smarter Futures is to improve health in Africa through the enrichment of wheat and maize flour with essential vitamins and minerals. The key groups to benefit are women of childbearing age, adolescents (especially girls) and young children.

Application examples

Ferrazone can be used in many food products, but it is primarily used to fortify foods that are stored in dry form such as powdered beverages, candy bars and flour.



Wheat and Maize flour

Ferrazone can be added to wheat and maize flour, which are two out of three main consumed staple foods in the world. Examples of flour-derived products are bread, biscuits, pasta, instant noodles and cereals.



Drinks

Powdered drinks and ready-to-serve lemonades such as Cola and beer; and functional foods like sport drinks are also good targets for iron fortification.



Supplements

Ferrazone can also be used in iron containing food supplements under various forms (like syrups, sprays, tablets and powder sachets).



Condiments

Our Ferrazone may advantageously be used to fortify soy sauce, fish sauce, bouillon cubes and salt.



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ferrazone.com

We are a global specialty chemicals leader. Industries worldwide rely on our essential chemistry in the manufacture of everyday products such as paper, plastics, building materials, food, pharmaceuticals, and personal care items. Building on our nearly 400-year history, the dedication of our 10,000 employees, and our shared commitment to business growth, strong financial performance, safety, sustainability, and innovation, we have established a world-class business and built strong partnerships with our customers. We operate in over 80 countries around the world and our portfolio of industry-leading brands includes Eka, Dissolvine, Trigonox, and Berol.

Ferrazone® is a registered trademark in many countries