UltraFer is a highly absorbable iron supplement with a lower likelihood of side effects and greater biological availability that uses the technological innovation of a liposomal-like complex ultradispersed in a sucrester (sucrose ester). Sucrose esters are obtained by fatty acid esterification of methyl esters with sucrose. The sucrose esters’ moiety plays a primary role in protecting the complex from breaking down and helping increase the absorption and bioavailability of the mineral element. The esterified fatty acids are essentially emulsifiers used to obtain a better stabilization between the water (aqueous phase) and oil (fatty phase) phases, which is essential for improving absorption via the transcellular and paracellular pathways. Tricalcium phosphate is also used to form the liposomal-like complex by supporting the molecular bonds (Figure 1). The lipid bilayer of the complex is completely similar in structure and properties to cell membranes, which allows for ease of transport into biological membranes.

**Advantages compared with other mineral forms**

It is thought that associating a mineral with liposomes markedly changes its pharmacokinetics (absorption and metabolism within the body) and lowers systemic toxicity. The absorbed target molecule is prevented from premature degradation and/or inactivation after introduction to the target organism. Liposome association also greatly improves palatability by helping mask the metallic tastes characteristic of minerals, especially iron. This technology ensures better tolerability by sequestering the minerals inside the liposomal-like complex so that the mucous membranes are never exposed directly to iron. UltraFer has maximum absorption and bioavailability, allowing fast and efficient uptake into the bloodstream.

**UltraFer (microencapsulated ferric pyrophosphate)**

Anemia is the most common blood disorder worldwide. Among various types of anemia, iron-deficiency anemia is the most common type, which affects about 2 billion people globally. Iron-deficiency anemia could be treated by diet changes and iron supplements. However, the use of conventional iron supplements has several limitations. Some main problems of oral iron administration are side effects such as heartburn, stomach ache, coloration of the
feces and mucous membranes, diarrhea, constipation, and preoxidation of the iron upon contact with the stomach mucous membranes. Another limitation is the low absorption rate. It is already known that the physiological absorption rate is only 10–20% of all iron ingested. Therefore, the side effects and the low absorption rate greatly limit the effectiveness of regular, long-term iron supplementation.

UltraFer is an innovative form of iron. It is a microencapsulated, liposomal-like complex containing ferric pyrophosphate. In vitro studies showed that the sucrose esters in nontoxic concentrations significantly increased permeability of the monolayer barrier formed by Caco-2 cells. Recent research data also indicated that the sucrose ester increased iron permeability through both transcellular and paracellular routes. In a study comparing the bioavailability of UltraFer and three other conventional iron formulations, the data showed that UltraFer treatment increased ferritin level in intestinal cells approximately three to nine times higher when compared with the other formulations, indicating a significantly higher bioavailability of UltraFer (Figure 2).

Advantages and Benefits:
- High Absorption and Bioavailability
- Excellent Tolerability
- Excellent Taste
- No Gastrointestinal Tract Irritation
- No Color Change of Mucosae
- No Darkened Stools
- No Pro-Oxidant Effects

References