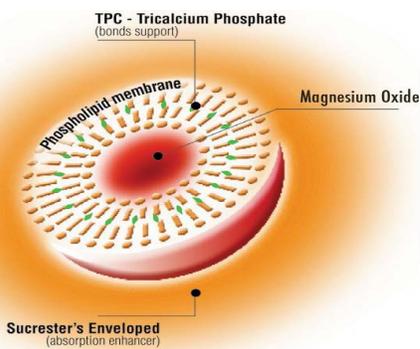


Sucrosomial™ Minerals Overview

Microencapsulated minerals with superior bioavailability

Sucrosomial™ minerals are a group of highly absorbable minerals with a lower likelihood of side effects and greater biological availability that use the technological innovation of phospholipid micelles (large, hollow spheres) made from sucrose esters of fatty acid (sucrester). There are formulations based on sucrosomial technology for magnesium, selenium, and zinc. Sucresters are obtained by fatty acid esterification of fatty acid methyl esters with sucrose and are also referred to as sucrose esters of fatty acids. The sucrester moiety plays a primary role in protecting the sucrosome from breaking down and helping to 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 a transcellular and paracellular pathway. Tricalcium phosphate is also used to make the sucrosome by supporting the molecular bonds that form. The sucrosome lipid bilayer has a lipid outer membrane that is completely similar in structure and properties to cell membranes, which allows for ease of transport into biological membranes.

Figure 1. Sucrester containing an iron compound at the center



Absorption mechanism of action

The minerals conveyed in sucrosomial membranes are very similar to chylomicrons, which are lipid micelles found in the blood and lymphatic fluid, where they transport fat from its port of entry in the intestine to the liver. It is thought that sucrosomes are absorbed through M cells (microfold cells) that are present throughout the intestine and may be carried by macrophages through the lymphatic circulation directly into the liver, where they are broken down into their smaller subparts by enzymatic actions, releasing the mineral.

Advantages compared with other mineral forms

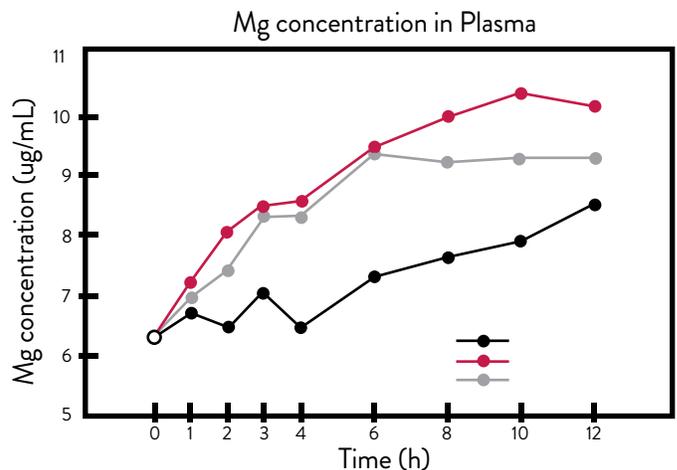
It is thought that associating a mineral with sucrosomes markedly changes its pharmacokinetics (absorption and metabolism within the

body) and lowers systemic toxicity. The absorbed target molecule is prevented from premature degradation and/or inactivation after introduction to the target organism. Sucrosome association also greatly improves palatability by helping to mask the metallic tastes characteristic of minerals. Sucrosomial technology ensures better tolerability by sequestering the minerals inside sucrosomes so that the mucous membranes in the mouth are never exposed directly to them. Sucrosomial minerals have maximum absorption and bioavailability, allowing a fast and efficient uptake into the bloodstream.

Sucrosomial™ Magnesium

Magnesium (Mg) plays an essential role in a large number of important cellular reactions, and it's essential in many metabolic processes (biosynthesis of lipids, proteins, and nucleic acids). Up to 60% of magnesium in the adult body is found in the bones. It is important for the activities of nerves and muscles, allowing the transmission of nerve impulses, and is essential for mineralization and skeletal development. Magnesium also helps with reduction of tiredness and fatigue. The use of conventional magnesium supplements is associated with gastrointestinal symptoms such as nausea, diarrhea, and laxative effect. Other components of the diet (phytates, calcium, phosphorus, and long-chain fatty acids) interfere with magnesium absorption.

Figure 2. Plasma concentration of magnesium levels in three groups



Sucrosomial Magnesium is a sucrosomial complex of magnesium oxide that offers excellent absorption and improved tolerability to enhance the more than 300 enzyme systems magnesium participates in. Sucrosomial Magnesium has a faster and 20% higher bioavailability compared with magnesium citrate (see Figure 2). Magnesium for

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dietary supplement applications can be used for reduction of the symptoms of premenstrual syndrome, reduction of the symptoms associated with menopause, sport nutrition products to increase performance, reduction of physical fatigue, and anti-anxiety and anti-stress. Sucrosomial Magnesium is formulated with sucrosomial magnesium oxide powder and contains 320–380 mg/g of elemental magnesium. Sucrosomial Magnesium is also available as Sucrosomial Marine Magnesium, a natural source of magnesium derived from seawater.

Sucrosomial™ Zinc

Sucrosomial Zinc is an innovative form of sucrosomial zinc containing a high concentration of zinc oxide in a special sucrosomial form for maximum bioavailability. The use of conventional zinc is associated with a low absorption and poor palatability. The absorption of zinc is less than optimal for the zinc oxide form because it is an insoluble form of zinc with a low bioavailability. Sucrosomial Zinc is 80% more bioavailable compared with zinc gluconate 8 hours after administration and shows a renal excretion similar to zinc gluconate, demonstrating a higher bioavailability. Sucrosomial technology enables this form of zinc to have a faster and higher bioavailability compared with zinc gluconate. Sucrosomial Zinc contains 42% zinc and has excellent palatability and tolerability, without interference of absorption from other minerals, unlike conventional nonchelated forms of zinc.

Zinc can be used in dietary supplements or food enrichment for its essential role in cognitive function, maintenance of vision, maintenance of normal hair, and immune system function, and is an essential component of many enzymes involved in the metabolism of proteins and nucleic acids as zinc proteins.

Sucrosomial™ Selenium

Sucrosomial Selenium is an innovative form of sucrosomial selenium as a sucrosome complex of phospholids and sucroesters containing sodium selenate. The use of sucrosomial selenium ensures better absorption of this element for increasing its concentration in the bloodstream. Sucrosomial Selenium allows a higher absorption of selenium by avoiding interactions with other nutrients due to its protective sucrosome form, containing 1% elemental selenium. Selenium contributes to the normal function of the immune system, normal thyroid function, proper growth of children and infants, and the growth of hair and nails. Other benefits of Sucrosomial Selenium are neutral taste and optimal tolerability.

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