

THE IMPORTANCE OF MAGNESIUM

This White Paper discusses the importance of **magnesium** for our body and an innovative technology that ensures optimal absorption for physiological functions



INTRODUCTION

Magnesium is a macroelement of which we have in variable quantities between 22 and 26 grams, and of these more than 50% is mineralized at bone level. In our body magnesium acts as a cofactor for more than 300 enzymes and therefore is involved in numerous processes, ranging from the synthesis of essential neurotransmitters at the central level, to the production and release of cellular energy. In addition, magnesium, acting in balance with calcium, also intervenes in the regulation of fundamental processes such as muscle contraction, heartbeat, coagulation and blood pressure.

This mineral is essential for our health, as it contributes:

- To normal energy metabolism;
- To the well-being of the nervous system;
- To reduce fatigue and facilitate muscle relaxation;
- To normal psychological function;
- To the maintenance of healthy bones and teeth;
- At normal electrolyte balance.

Magnesium is particularly abundant in bran, leafy vegetables, legumes, cereals and bananas. A deficiency of this mineral is usually manifested by cramps, physical and mental fatigue, irritability and sleep problem.

MAGNESIUM ABSORPTION

From 20% to 80% of dietary magnesium is absorbed in the small intestine, in particular in portions of the duodenum and ileum, and in a low percentage is absorbed in the large intestine tract. The absorption involves two distinct mechanisms: **passive**, which depends on the concentration gradient that is established between the intestine and the blood circulation; this type of absorption takes place by paracellular, through the tight junctions between the enterocytes.

The other mechanism, instead, is the **active** one and occurs by transcellular pathway, through specific transporters, so called **TRPM6/7** (transient receptor potential melastatin 6/7), which

make magnesium pass from the apical to the basolateral side of the intestinal cell (enterocyte) and finally magnesium gets into the bloodstream. (Figure 1)

Of the total amount of magnesium introduced with the diet, only **30-40%** is absorbed by our body.

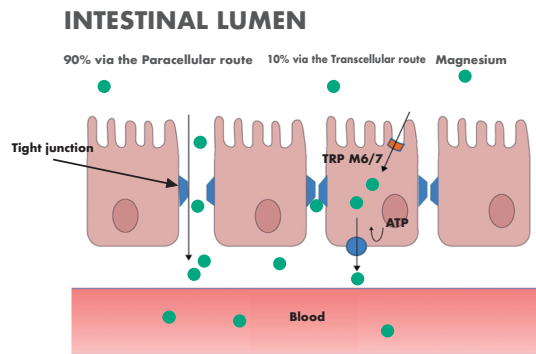


Figure 1. Types of magnesium absorption

CAUSES OF MAGNESIUM DEFICIENCY

There are many factors that cause a magnesium deficiency in our body.

The most common cause is the presence of **phytic acid**, a substance widely present in cereals and legumes, which interacts with magnesium to form insoluble salts, reducing its absorption; for this reason it is considered an “antinutritional” factor.

Moreover, most of the minerals contained in food are absorbed, albeit with different and specific mechanisms for each, in the small intestine. Those who suffer some forms of malabsorption (such as obesity or gluten intolerance), that alter the proper functioning of this intestinal tract, may develop a shortage of multiple nutrients, such as: iron, folate (vitamin B9), vitamin D, calcium, B vitamins, zinc, **magnesium** and copper.

Beneficial effect of magnesium on sleep

Sleep problems can occur in various forms, such as difficulty falling asleep, frequent waking up at night or waking up in the morning, resulting in an inability to get back to sleep. These are mainly due to transient and linked to periods of moderate-intense stress (e.g. work-related stress family stress etc.) conditions.

People who experience difficulty sleeping, often report a sense of psycho-physical discomfort upon awakening which then leads to the appearance of symptoms such as excessive daytime drowsiness, irritability, poor concentration, interpersonal, social and professional problems.

How magnesium affects our brain and our sleep-wake rhythm

Among the various remedies to improve sleep benefits, we can find **magnesium**.

Among its many functions, magnesium also plays an important role in maintaining the correct electrical activity of the brain, by regulating the glutamate/GABA balance. Glutamate is the main

excitatory neurotransmitter present in our central nervous system, whereas GABA is the main inhibitory neurotransmitter. Like all neurotransmitters, it is essential that they keep in balance: an excess of one or the other can lead to profound morphological and functional changes that affect our mental health and insomnia can be one of these. The magnesium ion acts as an agonist of GABA, going to enhance the inhibitory effect of this neurotransmitter, vice versa is an antagonist of glutamate and therefore counteracts its excitatory effect. This dual action of magnesium results in an overall relaxing effect on the central nervous system.

Sucrosomial® magnesium- SideMag®

Not all supplements on the market contain the same type of magnesium and this is the fundamental difference. In fact, magnesium can be found in the form of several salts:

- inorganic, such as magnesium oxide;
- organic, such as magnesium pidolate;
- chelates, such as magnesium bisglycinate;

Among these, certainly magnesium oxide (MgO) is the one with the highest content of elemental magnesium, although its absorption is very limited by the body. Generally, magnesium, due to this limit of absorption, has a poor gastrointestinal tolerance that is frequently manifested by nausea, abdominal cramps and laxative effects.

To overcome this limit, thanks to the research Alesco s.r.l., SideMag® has been born, an innovative ingredient based on magnesium oxide that uses the Sucrosomial® technology, where the mineral is transported by the Sucrosome® (Figure 2) a matrix composed of phospholipids and sucrose esters of fatty acids (sucresters).

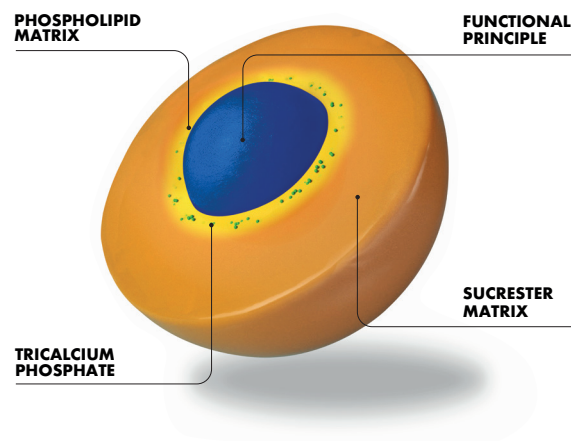


Figure 2. Structure of the Sucrosome®

This innovative structure allows magnesium to be absorbed by our body in greater quantities, without blocking its classic absorption route.

In conclusion, SideMag® allows a high absorption of magnesium by the body, without causing the common adverse effects due to its excellent tolerability.

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