# OptiMag® 125

## Highly Absorbable, Gentle Magnesium*


Available in 120 capsules and 240 capsules

## Clinical Applications

- Supports Cardiovascular Health*
- Supports Healthy Muscle Function*
- Supports Healthy Nerve Conduction*
- Supports Bone Health*
- Supports Energy Metabolism*
- May Support Healthy Glucose Metabolism*
- Supports Stress Management, Sleep Quality, and a Healthy Mood*
- Helps Ensure an Optimal Magnesium Intake for Overall Health*

***OptiMag® 125*** *features highly absorbable chelated magnesium to supplement dietary magnesium intake and gently boost the body's magnesium level.**

## Discussion

Magnesium has numerous critical roles in human physiology, and its intake is imperative for supporting overall health. It is a cofactor in more than 300 enzymatic reactions that regulate essential functions, including energy production, blood pressure, blood glucose, bone development, and muscle and nerve function.[1,2] Magnesium is widely available in foods such as whole grains, nuts and seeds, legumes, and green leafy vegetables.[2] In the United States, dietary surveys show magnesium intake is consistently below age-specific minimum recommended levels. An analysis of data from the National Health and Nutrition Examination Survey (NHANES) found that nearly half of Americans ingest less magnesium from food and beverages than is recommended.*[3]

Because magnesium is ubiquitous and necessary in many metabolic and biochemical cellular processes, insufficient magnesium intake is implicated in a wide range of health concerns. Supplemental magnesium can help ensure optimal intake, yet absorption pathways vary among the different forms, and some types can cause gastrointestinal (GI) distress in those with impaired digestion. Factors affecting absorption, tolerance, and retention of supplemental magnesium include the status of magnesium stores in the body and the type or form of magnesium ingested.*[4]

### Magnesium Lysinate Glycinate Chelate

Magnesium lysinate glycinate chelate is a mineral amino acid chelate in which magnesium is bound to the amino acids lysine and glycine, creating a complex that is readily absorbed across the intestinal wall.

Amino acids are used as chelating agents for magnesium to enhance bioavailability, stability, and safety. Chelates increase mineral bioavailability, protect magnesium from being bound in the GI tract, and lower the risk for osmotic diarrhea, which can occur with some magnesium forms.*[4]

In an example of the increased bioavailability and tolerability of chelated minerals, the effect of magnesium diglycinate—a chelated form of magnesium bound to 2 glycine molecules—was assessed in subjects (N = 12) with ileal resections. The results suggested that this form of chelated magnesium is likely absorbed intact via a dipeptide transport pathway in different areas of the gut than magnesium oxide, rendering it potentially more bioavailable in addition to being more suitable for those with intestinal resections.[5] Another study evaluating magnesium absorbability in healthy human subjects (N = 50) showed a trend for better short-term (24 hours) and long-term (60 days) absorbability for chelated magnesium compared with magnesium oxide. Further evaluation is needed to verify the superior bioavailability of chelated forms.*[6]

### Di-Magnesium Malate

Di-magnesium malate is a form of magnesium that is complexed with malic acid. In a scientific opinion paper, the European Food Safety Authority cited an unpublished, randomized trial in healthy volunteers (N = 14) in which the bioavailability and tolerability of 150 mg of magnesium from bisglycinate chelate, buffered bisglycinate chelate, and di-magnesium malate were found to be significantly higher than magnesium oxide.[7] In an animal study, time-dependent absorption, tissue penetration, and effect on behavior were evaluated for 5 magnesium preparations. Pharmacokinetically, the area under the curve calculation was highest for magnesium malate, suggesting enhanced bioavailability. Further research is needed in humans to assess the dose and effects of di-magnesium bound to malate on specific tissues and behavior.*[8]

### Stress, Sleep, and Mood

One of the main neurological functions of magnesium is its interaction with neurotransmitter receptors in the brain. Because of its role in brain chemistry, magnesium is also known to benefit the body in ways that may counter stress, promote restful sleep, and support a healthy mood.*[9-11]

In animal studies, magnesium administration has been shown to attenuate neurologic changes brought on by chronic mild stress.[11] Magnesium is often referred to as the relaxation mineral because it functions as a cofactor for neurotransmitter balance and neuronal stabilization in the nervous system.*[12]

In humans, analysis of case histories from magnesium-deficient individuals has helped researchers hypothesize magnesium's role in mood improvement.[9]

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In a post-hoc analysis of data from a randomized controlled trial, analysts suggested that magnesium (300 mg), with or without B6, provides a meaningful clinical benefit for stress-associated mood in individuals with stress and low magnesium levels.*[13]

Studies have also suggested that magnesium supplementation may positively affect endocrine-related sleep changes associated with aging[14] and may improve objective and subjective measures of sleep.[15-18] In a clinical study of elderly subjects (N = 46), those given 500 mg of magnesium daily for 8 weeks reported improvements in subjective sleep measures such as sleep efficiency and time. Objective measures included increased melatonin levels and reduced cortisol, which may contribute to improved sleep.[15] Further investigations are needed to confirm the role of supplemental magnesium and the dose needed to counter stress, promote restful sleep, and support a healthy mood.*

**Cardiovascular Health**

In the cardiovascular system, magnesium is involved in modulating cellular function through cardiac conduction, contraction, and excitation of cardiac cells. It is necessary to regulate ion transporters, including potassium and calcium channels, which enhance vascular relaxation and inhibit vasoconstriction. Magnesium also supports endothelial function through modulation of nitric oxide synthesis and is necessary for the metabolism of adenosine triphosphate (ATP), the molecule that provides energy for all metabolic processes. Tight regulation of magnesium concentration is necessary for optimal cardiac function, and low levels can impact physiological activity.[1,19] In fact, a substantial body of epidemiological and experimental evidence has linked magnesium deficiency with cardiovascular health risk factors.*[20]

While the physiological role of magnesium in modulating functions within the cardiovascular system is well-established, the role of supplemental magnesium in supporting cardiovascular health and decreasing cardiac risk factors is less consistent.[2,21,22] In 2022, the FDA announced a qualified health claim for magnesium and reduced risk of high blood pressure. The announcement stipulated that there would be no objection to claims linking the consumption of magnesium and reduced risk of hypertension, provided that claims are worded to avoid misleading consumers and specify that the scientific evidence is inconsistent and inconclusive. [2,21,23] Other reviews have concluded that magnesium supplementation can help to reduce risk factors linked to hypertension, especially in those with low magnesium levels. For example, a dietary magnesium intake of approximately 250 mg/d was associated with lowering risk factors related to a reduced blood supply to the heart muscle.*[20]

In a 12-week randomized, double-blind study, 250 mg/d of magnesium was evaluated for its effect on cardiometabolic markers in subjects with prediabetes (N =86). Of significance to cardiovascular health, high-density lipoprotein cholesterol levels were increased with magnesium supplementation; however, other markers were not significantly improved at the dose or duration studied.[24] Large, well-designed clinical trials are needed to help understand specific mechanisms and establish the oral magnesium dose needed to affect cardiometabolic markers associated with cardiovascular health.*[2]

**Muscle Function and Nerve Conduction**

Magnesium supports nerve conduction through its function in controlling the transport of ions, which nerve cells use to generate electrical impulses. As a result, magnesium plays an essential role in the communication between the nervous system and muscles. As a cofactor, it regulates biochemical reactions for muscular contraction, nerve transmission, and neuromuscular conduction.[20] Magnesium also functions to protect against over-excitation that can lead to neuronal cell death, a factor in many neurological conditions.*[12]

Research has widely linked low magnesium levels to impairments in exercise performance and muscle recovery. This is attributed to the role of magnesium in processes that affect muscle function, such as oxygen uptake, energy production, and the balance of sodium, potassium, and calcium ions.[25] In a study assessing the effects of magnesium supplementation on muscle soreness and performance, college-aged subjects (N = 22) were given 350 mg/d combined with an exercise program designed to induce fatigue. Magnesium supplementation was found to be beneficial for attenuating soreness associated with a new exercise program. Supplementation also showed a trend toward having a positive performance impact, with improvement noted in the number of repetitions required for muscle failure during exercise sessions. However, further studies are needed to establish the statistical significance of this outcome.*[26]

**Bone Health**

Magnesium is necessary for healthy bone formation; approximately 60% of the body's magnesium reservoir is found in bones. The function of magnesium in bone health is complex. It influences the activity of osteoblasts and osteoclasts; when magnesium is deficient, osteoclast activity is increased, which can lead to bone loss. It affects the concentration of vitamin D and parathyroid hormone, which are both regulators of bone homeostasis. Magnesium also increases the solubility of minerals that constitute hydroxyapatite crystals in the formation of trabecular bone.*[1,2,20]

Adequate magnesium intake clearly plays a role in bone health; however, research results on the specific effects and optimal dose of magnesium supplements have been somewhat conflicting. Intervention studies with magnesium supplements in varying dosages, between 250 mg and 1800 mg, have shown a benefit in terms of bone mineral density and fracture risk.[27,28] In a large, prospective study, researchers investigated the relationship between magnesium intake (from food and supplements) and the onset of fractures in men and women (N = 3765) over an 8-year period. They found that higher magnesium intake had a protective effect on future fractures, with a more significant effect noted in women than men. Those meeting the recommended daily magnesium intake were also found to be at lower risk for fractures.[29] In another short-term study in postmenopausal women (N = 20) with osteoporosis, researchers found that 290 mg/d of magnesium suppressed bone turnover compared with placebo.[30] However, more randomized controlled trials in healthy populations are needed to elicit the optimal dose and duration of supplemental magnesium for supporting bone health.*

**Energy and Glucose Metabolism**

The molecule that provides energy for all cellular metabolic processes, ATP, exists primarily as a complex with magnesium. Magnesium is necessary for the elaborate intracellular metabolic processes that break down carbohydrates, proteins, and fat for energy utilization.[20,31,32]

Specific to glucose metabolism, magnesium plays a prominent role in beta-cell activity in the pancreas. It influences insulin secretion and, therefore, the ability to regulate blood glucose. Lack of dietary magnesium can impact insulin secretion, leading to impaired glucose utilization and insulin resistance.[33,34] Although the role of magnesium in glucose metabolism is well understood, studies examining the effects of supplemental magnesium have had conflicting results, confounded by factors such as differences in dosing, methodologies used, and poor-quality studies.*[35]

In a double-blind, placebo-controlled trial, researchers studied the effect of oral magnesium supplementation on characteristic symptoms of metabolic syndrome, including insulin sensitivity. Nondiabetic, insulin-resistant, overweight subjects (N = 52) with normal magnesium levels were given 365 mg of magnesium or placebo for a 6-month period. Magnesium supplementation resulted in an improvement of fasting plasma glucose and some insulin sensitivity indices when compared with placebo, suggesting the need for optimization of magnesium status to decrease risk factors associated with metabolic syndrome.[36] In subjects (N = 42) with type 2 diabetes,

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**OptiMag® 125 Supplement Facts**

Serving Size: 2 Capsules

| | Amount Per Serving | %Daily Value |
|---|---|---|
| Magnesium (as dimagnesium malate and magnesium lysinate glycinate)[S1] | 250 mg | 60% |
| ** Daily value not established. | | |

**Other Ingredients:** Capsule (hypromellose and water), hydroxypropyl cellulose, ascorbyl palmitate, microcrystalline cellulose, and silica.

**DIRECTIONS:** Take 1-2 capsules twice daily at or between meals, or use as directed by your healthcare professional.

Consult your healthcare professional prior to use. Individuals taking medication should discuss potential interactions with their healthcare professional. Do not use if tamper seal is damaged.

**STORAGE:** Keep closed in a cool, dry place out of reach of children.

**FORMULATED TO EXCLUDE:** Wheat, gluten, corn, yeast, soy, animal and dairy products, fish, shellfish, peanuts, tree nuts, egg, sesame, ingredients derived from genetically modified organisms (GMOs), artificial colors, and artificial sweeteners.

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VEGETARIAN CAPS

participants given 250 mg of oral magnesium daily for a 3-month period demonstrated a significant improvement in glycemic control indicators and reduced insulin resistance.[37] Further, in healthy, overweight individuals (N = 14), those who took 500 mg of oral magnesium for 4 weeks showed glucose and insulin homeostasis improvement. Metabolic biomarkers, including fasting C-peptide, which is released from the pancreas when it makes insulin, and insulin concentrations, were improved.*[38]

**OptiMag® 125** is formulated with magnesium lysinate glycinate chelate and di-magnesium malate, a powerful combination designed to enhance bioavailability and elevate the body's magnesium level. The crucial role of magnesium in a multitude of the body's metabolic and biochemical processes underscores the necessity for further trials to determine the optimal dose and duration for supplementation in healthy individuals.*

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DRS-177
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