



Magnesium Complex Liquid

MINERAL SUPPLEMENT

Concentrated Combination of Organic Magnesium Sources

- Includes magnesium glycinate, citrate, and malate
- Helps to maintain cardiovascular health*
- Promotes healthy glucose metabolism*
- Supports muscle function*
- Helps to prevent magnesium deficiency
- Delicious natural blueberry-raspberry flavor

GENESTRA BRANDS Magnesium Complex Liquid is a concentrated combination of three organic magnesium sources, including magnesium glycinate, citrate and malate. Magnesium is one of the most common nutritional deficiencies: insufficient magnesium intake is estimated to occur in approximately 2/3 of the American population.¹ Magnesium plays an important role in regulating insulin-mediated glucose uptake, and low serum magnesium levels are associated with decreased insulin secretion.² In healthy non-diabetic participants with low serum magnesium levels, daily supplementation with 300 mg of magnesium has been shown to improve glucose metabolism and pancreatic β -cell function.^{3,4} Each tablespoon serving of Magnesium Complex Liquid provides 500 mg of magnesium to help prevent magnesium deficiency, maintain cardiovascular health, promote healthy glucose metabolism, and support muscle function.*



Supplement Facts

Serving Size: 1 Tablespoon (15 ml) / Servings per Container: 30

Each Tablespoon Contains		% DV
Calories	30	
Total Carbohydrate	5 g	2% ♦
Magnesium (magnesium glycinate/ citrate/malate)	500 mg	125%

♦ Percent Daily Values (DV) are based on a 2,000 calorie diet

Other ingredients: Purified water, glycerin, xylitol, citric acid, DL-malic acid, natural flavor (blueberry/raspberry), xanthan gum, potassium sorbate, sodium citrate, organic stevia leaf extract (glucosylsteviosides)

Recommended Adult Dose: Adults (19 years and older): Take one tablespoon daily or as recommended by your healthcare practitioner. Adolescents (9-18 years): Take ½ tablespoon daily or as recommended by your healthcare practitioner.

Product Size: 15.2 fl oz

Product Code: 04235



Scientific Rationale:

Magnesium is the fourth most abundant mineral in the human body and is a cofactor in over 300 metabolic reactions.⁵ Magnesium is involved in the maintenance of normal blood pressure, glucose metabolism, muscle function, and bone integrity, among several other key physiological roles.⁵

Cardiovascular Health:

Based on epidemiological study results, magnesium intake is inversely associated with blood pressure.⁶ Magnesium may help to maintain blood pressure by acting as a calcium channel antagonist, and stimulating production of prostacyclins and nitric oxide.⁷⁻⁸ In a double-blind, placebo-controlled trial conducted on 47 healthy magnesium-deficient participants that had mean

blood pressure levels within the normal range, magnesium supplementation helped to support endothelial function. Participants were randomized to receive either placebo or magnesium supplementation (382 mg/day of magnesium) for 4 months. Both groups were advised to consume a diet with 40% carbohydrates, 40% lipids, and 20% proteins, as well as to exercise for at least 30 minutes three times per week. At the end of the 4-month supplementation period, systolic and diastolic and blood pressure levels remained the same in the placebo group. In the magnesium group, serum magnesium levels were restored to normal levels (> 1.8mg/dL), and systolic and diastolic and blood pressure levels were significantly reduced by 2.1 and 3.8 mm Hg, respectively.⁹

Continued on reverse

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Glucose Metabolism:

Magnesium plays an important role in both glucose and insulin metabolism.⁵ *In vitro* and animal studies have found that low magnesium levels decrease insulin sensitivity via reduced tyrosine-kinase activity and autophosphorylation at the insulin receptor level.¹⁰⁻¹⁴ In healthy non-diabetic participants, magnesium supplementation has been shown to improve both glucose metabolism and pancreatic β -cell function.^{3,4} In a 3-month long, double-blind, placebo-controlled clinical trial conducted on 60 healthy participants with low serum magnesium levels, daily supplementation with 300 mg of magnesium significantly improved fasting insulin sensitivity, as measured by the homeostasis model analysis for the insulin resistance (HOMA-IR).³ In a similar trial, supplementation with 300 mg/day of magnesium significantly reduced fasting glucose and insulin levels. Participants in the magnesium group also had significantly lower HOMA- β index (used to measure insulin secretion) and Belfiore index (used to determine insulin sensitivity) values. Based on these changes, the authors concluded that magnesium supplementation was associated with improved ability of pancreatic β -cells to compensate for variations in insulin sensitivity.⁴

C-Reactive Protein:

Magnesium's role in maintaining endothelial function and glucose metabolism may be due in part to its effects on c-reactive protein (CRP) levels. Both magnesium intake^{15,16} and serum magnesium are inversely associated with CRP levels.^{17,18}

Muscle Function:

Magnesium is a cofactor for the enzyme creatine kinase, which generates ATP from phosphocreatine stored in muscle tissues during intense exercise. In a double-blind, placebo controlled clinical study conducted on 25 healthy young (15-20 years) male volleyball players with normal magnesium levels, magnesium supplementation for 4 weeks improved lactic anaerobic metabolism. Baseline measurements were performed to determine lactate production during peak treadmill exercise and maximum height during jumping exercises

(countermovement jump and countermovement jump with arm swing). Participants were then randomized to either the placebo or magnesium (584 mg of magnesium) treatment groups for 4 weeks, and then repeated the series of measurements. Lactate production during peak exercise was significantly reduced in the magnesium group in comparison with baseline measurements. Jump height was also significantly improved in the magnesium group, in comparison with the placebo group.¹⁹

Magnesium supplementation may help in the treatment and prevention of muscle cramping in pregnant women, who typically have lower serum magnesium levels. Muscle cramps are painful involuntary muscle contractions caused by spontaneous motor nerve discharges. While as many as 30-45% of pregnant women suffer from leg cramps, there is no standardized treatment protocol. In a 4 week long, double-blinded, randomized, placebo-controlled trial including 86 healthy pregnant women with recurrent muscle cramps, daily supplementation with magnesium glycinate significantly reduced the frequency and intensity of leg muscle cramps. Prior to treatment, participants completed a questionnaire that assessed the number of leg cramps they experienced per week and intensity of cramp pain (rated on a 100-mm visual analogue pain scale). Participants were then randomized to either the magnesium glycinate group (3 tablets per day providing 300 mg of magnesium glycinate) or placebo tablet group. After 4 weeks of supplementation, participants repeated the leg cramp questionnaire. Compared with baseline measurements, the frequency of leg cramps was reduced by half in 86% of participants, and ~70% of participants experienced a 50% reduction in leg cramp pain intensity. The improvements in leg cramp frequency and intensity were significantly greater in the magnesium glycinate group, in comparison with the placebo group.²⁰

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Magnesium Complex Liquid Companion products

These companion products provide additional support an active lifestyle, by helping to reduce fatigue and maintaining cardiovascular and cognitive health.*



Super EFA Liquid

- Supports cognitive and cardiovascular health*
- Helps to maintain serum triglyceride levels already within the normal range*



Carnitine (Acetyl L-Carnitine 500 mg)

- Helps reduce fatigue*
- Helps support cognitive function in the elderly*

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