

Magnesium Malate



Applications

- Muscle Support
- Energy Production
- Mineral Support
- Bone Health
- Sleep Support
- Antioxidant Support
- Stress Support

Introduction

NutraMedix Magnesium Malate consists of **magnesium** bound to **malic acid**. Magnesium is an essential mineral in the human diet. It is the second most abundant intracellular cation (Mg^{+2}) and is involved in more than 350 enzymatic reactions and over 80% of metabolic functions.¹⁻³ Magnesium is needed for cellular energy metabolism, DNA transcription, RNA synthesis, membrane stabilization, and calcium metabolism, among many other functions.^{1,2} Magnesium may help support muscular, skeletal, and neural health.^{1,2,4} Dietary magnesium may be found in seeds such as pumpkin and chia; nuts and their butters such as almonds, cashews and peanuts; legumes such as black beans, kidney beans, and edamame; and spinach, among others.⁵ It can also be found in hard water, due to the high mineral content.⁶ As many as 70% of Americans may be magnesium deficient,⁷ and subclinical deficiency occurs before serum magnesium adjusts.⁸ Because of this, serum magnesium levels do not reliably correlate with either total body magnesium or amounts in specific tissues.⁹

Malic acid is commonly found in apples and other fruits. Malic acid is often added to food products to contribute a sour taste. Malic acid in the form of malate is an important part of the Krebs' cycle, which helps metabolize food into energy in the form of ATP. Malic acid may help support overall muscle health.

Magnesium levels depend on intestinal absorption and renal excretion.² Magnesium malate has been found to be more bioavailable than many of its magnesium counterparts. In a single-dose rat study, magnesium malate had the highest area under the curve followed by magnesium acetyl taurate, while magnesium citrate and magnesium oxide had the lowest bioavailability.¹⁰ A small single-center, randomized, double-blind, four-arm crossover trial with 14 healthy adults found similar results, with dimagnesium malate significantly more bioavailable than either magnesium oxide or magnesium citrate.¹¹ Magnesium malate may help support muscle health and energy production more than either one alone, due to different mechanisms of support.

NutraMedix Magnesium Malate is free of dairy, soy, gluten, sugar, yeast, and mold. It is cGMP NSF Certified (ANSI Standards 173 Section 8), as well as FDA (Food and Drug Administration) and FSMA (Food Safety Modernization Act) Compliant.

Muscle Support

Magnesium participates in energy metabolism, and may help support and maintain skeletal muscle health.¹² It may also support skeletal muscle relaxation.¹³ **Malic acid** may assist with skeletal muscle support by helping maintain lactic acid levels already within the normal range.¹⁴ Magnesium and malic acid work synergistically to support skeletal muscle health. Additionally,

magnesium may also help support both cardiac and smooth muscle, helping maintain both cardiac and vascular health.¹⁵ Because of this, magnesium may help maintain cardiac output and peripheral vascular resistance already within the normal range.¹⁵

Energy Production

Magnesium helps create energy in the form of ATP from dietary sources, and may support the utilization of other essential nutrients.⁷ Magnesium may also help support healthy daytime energy levels.¹⁶ In a study with healthy male volleyball players, compared to the control, the magnesium group had lactic acid levels significantly closer to normal, post exercise, suggesting that magnesium supplementation can support metabolism in anaerobic conditions.¹⁷ **Malic acid** may help maintain serum lactate levels within the normal range during and after exertion.¹⁴ Together, magnesium and malic acid play important roles in energy production via ATP, under both aerobic and anerobic conditions.^{14,17}

Other Support

Mineral Support

Given that as many as 70% of Americans may be magnesium deficient, magnesium intake may benefit from support.⁷ For prevention of deficiency, the RDA for elemental magnesium in ages 19-30 is 310 mg/day for women and 400 mg/day for men.⁵ In ages 31 and older, the RDA is 320 mg/day for women and 420 mg/day for men.⁵

Bone Health

Approximately 50% of the body's magnesium is located within bone, where it contributes to structural integrity.² Magnesium is a cofactor for the synthesis, transport, and activation of vitamin D,^{18,19} and may also help regulate calcium absorption.² Magnesium's role in both of these processes helps support and maintain healthy bones.^{2,18}

Sleep Support

Magnesium may help support healthy sleep by supporting NMDA and GABA levels already within the normal range.²⁰ It may also help maintain healthy sleep quality.²¹

Antioxidant Support

Magnesium may help contribute antioxidant activity, as it is a cofactor of superoxide dismutase and other antioxidant enzymes.²²⁻²⁴

Stress Management Support

Magnesium may help support relaxation and stress management in everyday stress.^{25,26}

Safety and Cautions

Magnesium is generally well-tolerated. At higher doses, loose stools and/or gastrointestinal irritation are possible. This is less likely to occur at the recommended dosing.²⁷ Do not take magnesium with levodopa/carbidopa, as it may reduce the bioavailability of levodopa/carbidopa.²⁷ When taken with aminoglycoside antibiotics, magnesium can increase the risk of neuromuscular weakness.²⁷ Magnesium can decrease absorption with bisphosphonates when taken together, and doses should be separated by at least two hours.²⁷ Magnesium may decrease the absorption of quinolone antibiotics, which should be taken at least 2 hours before, or 4-6 hours after magnesium.²⁷ It may also decrease the absorption of tetracyclines,²⁷ as well as the absorption of digoxin.²⁷ Magnesium may have additive effects with calcium channel blockers,²⁷ and may increase the risk for ketamine toxicity.²⁷ It may also increase the absorption of sulfonyleureas.²⁷ Use caution when taking magnesium with potassium-sparing diuretics, as these can decrease magnesium excretion and increase magnesium levels.²⁷

Malic acid is generally recognized as safe (GRAS) in food and food products. As a supplement, it is generally well-tolerated. Though one study has shown that malic acid may cause loose stools, it may have been due, instead, to the magnesium that was taken concurrently.²⁸ In one animal study, malic acid derived from tagetes root was shown to decrease blood pressure.²⁸ As with magnesium, malic acid may have additive effects with hypotensive medications.

Safety is not documented in breastfeeding or pregnant women, or in children under age 3, due to insufficient safety research.

*This statement has not been evaluated by the Food and Drug Administration. This product is not intended to treat, cure, or prevent any diseases.

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NutraMedix

MAGNESIUM MALATE

SUPPORTS MUSCLES AND ENERGY
PRODUCTION †

SUGGESTED USE: Take two capsules twice daily before meals or as directed by your physician. Do not use if pregnant or nursing. Stop use if adverse reactions develop. Keep out of reach of children.

† These statements have not been evaluated by the Food and Drug Administration. This product is not intended to diagnose, treat, cure or prevent any disease.

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Dietary Supplement

120 Vegetable Capsules

Supplement Facts

Serving Size 2 Capsules
Servings Per Container 60

Amount Per Serving	% Daily Value
Magnesium (from dimagnesium malate), (Albion™)	200 mg 50%

Other Ingredients: Vegetable Capsule, Vegetable Magnesium Stearate

GLUTEN, SOY & DAIRY FREE

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