

USANA Technical Bulletin

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Magnesium

Technical Background

- Magnesium is a mineral essential for many fundamental processes of the human body. It normally exists in the body as a charged particle or ion, and most of it is stored in bones.
- Magnesium's importance has been known since the 1930s. It plays an integral role in hundreds of enzymatic functions and is important for general nerve, muscle, and bone health. Numerous roles have been discovered for magnesium, and many more are presently being researched.
- Recent studies have shown that magnesium deficiency may predispose patients to inflammation, putting them at higher risk for cardiovascular disease.¹
- Magnesium deficiencies are closely related to anginal attacks in men with variant angina.²
- Magnesium deficiency has recently been identified as an integral factor in both type-2 diabetes and hypertension.³ Animal studies have shown that insulin-resistant offspring are born to rats with restricted magnesium intake.⁴ Research is currently being conducted to assess the potential of magnesium in treating diabetes.⁵
- Magnesium may dilate blood vessels in cerebral circulation, possibly making it helpful for recovery in stroke patients.⁶ It is also used during cardiac surgery to reduce the incidence of arrhythmias.^{7,8}
- Migraine patients with low levels of magnesium may benefit from supplementation.^{9,10}
- Oral magnesium may be helpful in the treatment of pregnancy-related leg cramps.¹¹
- It is suspected that magnesium deficiency may play a role in bronchial asthma.¹²
- Magnesium is important for the absorption of calcium and is dependent on vitamin D for its own absorption.¹³ Fructo-oligosaccharides may also enhance the absorption of calcium and magnesium.¹⁴

Sources and Recommended Intake

- The Recommended Dietary Allowance (RDA) for magnesium is 420 mg/day for men and 320 mg/day for women.¹⁵ Most people consume less than this per day, putting them at risk for a number of conditions.
- Good dietary sources of magnesium include spinach, legumes, nuts, and some grains.
- Excessive magnesium intake can lead to gastrointestinal problems (such as diarrhea). Because the body absorbs magnesium inversely to the amount in which it is ingested, toxicity is rare and almost never occurs from excess magnesium in foodstuffs.¹⁵

- Magnesium levels are partially regulated by the kidneys.¹⁰ Individuals with severe renal dysfunction may have trouble excreting excess magnesium, which may lead to toxicity.

Abstracts

King DE, Mainous AG 3rd, Geesey ME, Woolson RF. Dietary Magnesium and C-reactive Protein Levels. J Am Coll Nutr. 2005 Jun;24(3):166-71. OBJECTIVE: Current dietary guidelines recommend adequate intake of magnesium (310-420mg daily) in order to maintain health and lower the risk of cardiovascular disease. Recent evidence from animal and clinical studies suggests that magnesium may be associated with inflammatory processes. The objective of this study was to determine whether dietary magnesium consumption is associated with C-reactive protein (CRP), a marker of inflammation, in a nationally representative sample. METHODS: Analysis of adult (>=17 years) participants in a cross-sectional nationally representative survey (National Health and Nutrition Examination Survey 1999-2000 [NHANES]) who were not taking magnesium or magnesium-containing supplements. The primary outcome measure was high sensitivity CRP (elevated >=3.0mg/L). RESULTS: Among US adults, 68% consumed less than the recommended daily allowance (RDA) of magnesium, and 19% consumed less than 50% of the RDA. After controlling for demographic and cardiovascular risk factors, adults who consumed <RDA of magnesium were 1.48-1.75 times more likely to have elevated CRP than adults who consumed >=RDA (Odds Ratio [OR] for intake <50% RDA = 1.75, 95% Confidence Interval [CI] 1.08-2.87). Adults who were over age 40 with a BMI >25 and who consumed <50% RDA for magnesium were 2.24 times more likely to have elevated CRP (95% CI 1.13-4.46) than adults >=RDA. CONCLUSIONS: Most Americans consume magnesium at levels below the RDA. Individuals with intakes below the RDA are more likely to have elevated CRP, which may contribute to cardiovascular disease risk.

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