Nutri-West presents a new formula, Complete MG, that utilizes three of the top magnesium binders: malate, glycinate and citrate, along with soluble fiber, MCT (medium chain triglycerides) and taurine to give you the ultimate in magnesium absorption and utilization!

Magnesium - The Multi-faceted Mineral

- Why it’s needed for optimal health and happiness…

Magnesium is necessary to activate the ATP for energy in every cell of our body. It is involved in more than 700 metabolic reactions. It can determine optimal performance of every cell in bone, muscle and organ system. It is important to both physical and mental health. Yet, many foods are depleted of magnesium; many dietary components and drugs interfere with magnesium absorption; many people suffer from deficiency; intake & absorption decrease as we age; and urinary excretion increases with age. An estimated 75% of Americans have daily magnesium intakes less than the RDA (World Health Organization. Calcium and Magnesium in Drinking Water: Public health significance. Geneva: World Health Organization Press; 2009). Also, blood tests of magnesium (serum magnesium) can be inaccurate unless the red blood cell magnesium is measured directly.

Magnesium is Support for: energy, muscle cramps, muscle relaxation, nerve conduction, normal heart rhythm, DNA synthesis; protein synthesis, immune system, healthy bones, mental health, restful sleep, healthy blood pressure maintenance, blood glucose homeostasis, activation of vitamin D, headache, attention span.
Magnesium (as malate, citrate and glycinate). **Malate, citrate and glycinate** are exceptional carriers for magnesium that greatly increase the absorption rate of magnesium into the system. Utilizing all three of these carriers takes advantage of the nutritional benefits of each one. Choosing these forms over other, less absorbable forms can make a big difference in overall magnesium absorption. **Synergistic ingredients, such as MCT (medium chain triglycerides), inulin (soluble fiber), coconut fiber and taurine** contribute to a proprietary formula that optimizes the delivery and efficacy of one of our most vital minerals.


Magnesium is needed for many, many reactions and organ systems. We have included some of them in this booklet so that you can view some of the various facets by which magnesium supports our goals for health and happiness. *For instance…*

**Energy (Mg-ATP)** - Energy is impossible without ATP, and ATP is useless without magnesium, because the synthesis of the Mg-ATP complex is one of the over 200 enzymatic reactions requiring magnesium. What many people do not realize is that ATP needs to bind with magnesium to be active; the binding process actually changes the shape and the charge of the ATP, such that energy can be accessed. Every one of our 100 trillion cells needs activated ATP to conduct its biochemical processes. Without magnesium, ATP cannot be activated and used as an energy source.

Since malate is also good support for energy, magnesium malate makes an excellent combination formula. The enzyme succinyl-CoA synthetase (from the citric acid cycle/ Kreb’s cycle/energy producing cycle) is specific for succinate and does not react appreciably with citrate nor with the other acids in the cycle, such as fumarate and oxaloacetate, but it does show some activity with malate (Acta Crystallogr D Struct Biol. 2016 Aug;72(Pt 8):912-21. Structural basis for the binding of succinate to succinyl-CoA synthetase. Huang J & Fraser ME). In a randomized, double blind, placebo controlled, crossover pilot study published in the Journal of Rheumatology, 1200 mg of malic acid was administered daily for fatigue support and determined to be safe and beneficial (Russell IJ et al. Treatment of fibromyalgia syndrome with Super Malic: a randomized, double blind, placebo controlled, crossover pilot study. J Rheumatol. 1995 May;22(5):953-8.)

“Because of magnesium's role in energy production and storage, normal muscle function, and maintenance of blood glucose levels, it has been studied as an ergogenic aid for athletes” (Curr Sports Med Rep. 2015 Jul-Aug;14(4):279-83. Magnesium and the Athlete. Volpe SL.)

**Glutathione Production** – One of the many co-factor properties that magnesium exhibits is that it is needed for the synthesis of glutathione, the most powerful antioxidant in the body. Glutathione fights free radical damage, and also hooks onto toxins to remove them from the body. When dysfunctional livers were examined, “all magnesium supplements revealed normalization of oxidant and antioxidants parameters. Histopathological examination supported the biochemical and molecular findings” (Drug Chem Toxicol. 2016 May 5:1-10. Comparative study of antifibrotic activity of some magnesium-containing supplements on experimental liver toxicity. Molecular study. El-Tantawy WH et al.)
Detoxification - Magnesium facilitates detoxification, not only by increasing glutathione synthesis, but by being a chelator for environmental toxins/metals (i.e. lead, aluminum, mercury), and by nourishing the cell so that metals are less likely to enter. Magnesium is a “critical component of the antioxidant system” that is crucial in detoxification (Pharmacol Rep. 2015 Oct;67(5): 914-20. Pretreatment with magnesium ameliorates lipopolysaccharide-induced liver injury in mice. El-Tanbouly DM et al.) Magnesium allows ions and nutrients to enter the cell, and at the same time allows toxic waste to be removed from the cell. This contributes to the key role that magnesium plays in maintaining the structure and integrity of the cell.

Nerve Impulse Conduction – Because of its ability to regulate ion exchange in nerve cells, magnesium can optimize impulse transmission. Additionally, one article cited the power of combining taurine with magnesium (i.e. in the Complete MG formula) to achieve multiple mechanisms of action, which included inhibition of NMDA (N-methyl-D-aspartate) receptors, antioxidant effects, and activation of BDNF (brain-derived neurotropic factor)-related mechanisms (Neurotox Res. 2016 Aug 27. Effect of Magnesium... Lambuk L et al.)

Muscle Function – Maintenance of healthy muscles is one of the most important facets of magnesium. Calcium and magnesium regulate the contraction/relaxation cycle of the muscle, with magnesium being responsible for relaxation. Magnesium is excellent support for muscle cramps.

Immune System – Magnesium is involved in the production and activation of white blood cells. Inflammatory bowel disease, because of the nature of the condition, predisposes to multiple deficiencies, and among them is magnesium (World J Gastroenterol. 2016 Jan 21;22(3):895-905. Owczarek D et al. Diet and nutritional factors in inflammatory bowel diseases.)

Healthy Bones and Teeth – One of the main purposes of magnesium is to help build strong bones but exact mechanisms by which magnesium influences osteogenesis has been unclear. In October 2016, researchers published data showing that magnesium increases neuronal calcitonin gene-related polypeptide-α (CGRP), and this is a likely mechanism by which implants containing only magnesium have been used for fracture support “with considerable efficacy” and, “Taken together, these findings reveal a previously undefined role of magnesium in promoting CGRP-mediated osteogenic differentiation, which suggests the therapeutic potential of this ion in orthopedics” (Nat Med. 2016 Oct;22(10):1160-1169. Implant-derived magnesium induces local neuronal production of CGRP .... Zhang Y et al.)
Magnesium is needed for the reactions involved in bone and tooth health. This need has spurred various online articles to appear such as “Magnesium - The Forgotten Nutrient For Dental Health”. In one study, magnesium ions reacted with human tooth enamel. The researchers reported that,”In this study we showed that treatment of human tooth enamel with solutions saturated with magnesium induced changes in the nanocrystals at the outer surface of the protective enamel layer. The physical properties of the tooth were modified; tooth microhardness increased and the color shade became whiter, thus suggesting that this method could be used as a clinical treatment to improve dental mechanical properties and esthetics” (Acta Biomater. 2016 Jun;37:174-83. Diagenesis-inspired reaction of magnesium ions with surface enamel mineral modifies properties of human teeth. Abdallah MN et al.

**Heart Health & Rhythm** – Magnesium is essential for heart health. Magnesium balances calcium and counters unhealthy calcium buildup (calcification) in tissues. It also has a beneficial, stabilizing effect on mitochondrial membrane potential, which is important to maintain normal rhythm (Biochem Biophys Res Commun. 2016 Sep 9;478(1):314-22. Magnesium inhibits the calcification of the extracellular matrix in tendon-derived stem cells via the ATP-P2R and mitochondrial pathways. Yue J et al.) A comprehensive review in the Am J Clin Nutr 2012 examined studies including more than 241,000 people, and found that those with higher magnesium levels were much more likely to be heart healthy (Larsson, S et al. Dietary magnesium intake…. a meta-analysis of prospective studies. AJCN 2012; 95(2):269-270.)

**DNA Synthesis; Protein Synthesis** – Magnesium is required for DNA and RNA synthesis, reproduction, and protein synthesis, and imbalances in magnesium status can result in unwanted neuromuscular, cardiac or nervous system dysfunction (disruption in homeostasis of essential organ systems) (Nutrients. 2015 Sep 23;7(9):8199-226. Magnesium… Gröber U et al.) Magnesium is not only involved in DNA/RNA synthesis, it is the crucial element that cinches the deal, as demonstrated by the title of a research article in Science (June 2016), “Capture of a third Mg²⁺ is essential for catalyzing DNA synthesis” (Science. 2016 Jun 10;352(6291):1334-7). In the article, Gao Y and Yang W report that, “It is likely that the third cation (of magnesium) provides the ultimate boost over the energy barrier to catalysis of DNA synthesis.”

**Inflammation Support** – We have seen that magnesium is correlated with stress, and it has been reported that a moderate deficiency of Mg may increase chronic inflammatory stress. Low levels of magnesium were associated with a much higher CRP (C - Reactive protein) concentration (CRP is a by-product of inflammation) in a study published in Sleep Breath (Sleep Breath. 2016 Sep 6. [Epub ahead of print] Serum levels of magnesium and their relationship with CRP in patients with OSA. Karamanli H et al.) Supplementation with magnesium improved hematologic and metabolic inflammatory markers in another study as well (J Diet Suppl. 2016 Jul 26:1-13. [Epub ahead of print] Ige AO & Adewoye EO).

“The results of our study have indicated, to our knowledge for the first time, that IL-33/ST2 (an interleukin immune system player) pathway plays a role in enhancing inflammation and tissue damage at the site of acute inflammation by affecting the concentration of magnesium and GSH (glutathione),” important for antioxidative capacity, as well as gene expression of supportive cytokines (Exp Mol Pathol. 2016 Aug;101(1):31-7. Effects of IL-33/ST2 pathway in acute inflammation on tissue damage, antioxidative parameters, magnesium concentration and cytokines profile. Stankovic MS et al.)
Kidney Stone Support – Because one of the roles of magnesium is to balance calcium and counter unhealthy calcium buildup (calcification), magnesium is excellent support for kidney stones. The National Kidney and Urologic Diseases Information Clearinghouse estimates the yearly cost of kidney stones in the United States to be 5 billion dollars. High urinary calcium can be the cause of kidney stones in upwards of 80% of cases. The most prevalent stone composition is calcium oxalate. The general rule is that a diet with adequate calcium is better than a diet too low in calcium intake, which allows preferential absorption of oxalate in the gut and increases the risk of calcium oxalate stones. The key, it seems, is to avoid calcium oxalate binding, and one of the ways to achieve this is to supplement with magnesium citrate. Magnesium balances calcium, and citrate “acts to stabilize crystal formation rate and can be used to adjust urinary pH in the appropriate clinical setting. Specifically, citrate is theorized to act by binding with calcium in a soluble complex, thus reducing the amount of calcium available for binding to oxalate” (Lee YH, Huang WC. The efficacy of potassium citrate based medical prophylaxis for preventing upper urinary tract calculi; a midterm follow up study. J Urol. 1999;161:1453-1457.)

Mental Health – Magnesium may favorably affect mental status (J La State Med Soc. 2015 May-Jun;167(3):151. Kaiksow FA & Bhatnagar D.) The regulatory effects of magnesium on N-methyl-D-aspartate (NMDA) channels make it a factor in protocols for depression. Depressed patients are more likely to have low magnesium levels, and there was a significant relationship between hypomagnesemia and intensity of depression that “suggests a role for this element in the pathogenesis of the disorder” (Biol Trace Elem Res. 2016 Jun;171(2):275-82. Serum Magnesium Status in Patients Subjects with Depression in the City of Yazd in Iran 2013-2014. Rajizadeh A. et al.)

Restful Sleep - Sleep allows us to rest and repair. GH Stress disrupts circadian rhythms that affect sleep, body temperature and hormone concentrations. If magnesium can’t buffer stress, sleep gets disrupted. Cortisol is one of the hormones controlled by the circadian rhythm, and when its secretion is thrown off by lack of magnesium and disrupted circadian cycles, it can cause wakefulness at night, when cortisol is supposed to ebb and drowsiness in the morning, when cortisol is supposed to peak. Melatonin is also important. There are four steps to metabolizing melatonin, and they all require magnesium.

A study with 100 man and women (ages 51-85) who suffered from poor quality sleep were given 320 mg (half) and the other half received placebo. The magnesium group had lower C reactive protein and quality, restful normal sleep. Magnesium increases deep levels of sleep, regulates brain wave patterns, improves abnormal brain wave patterns associated with insomnia, reduces the time it takes to fall asleep, and helps sleep apnea and restless leg (Nielson, FH et al. Mag sup improves indicators of low magnesium status and inflammatory stress in adults older than 51 years with poor quality sleep. Magnes Res 2010;23(4):158-168.)

Healthy Blood Pressure - In a 2016 meta-analysis of well-controlled magnesium and blood pressure studies, researchers found that “Mg supplementation with a dose of 300 mg/d or duration of 1 month is sufficient to elevate serum Mg” and have a favorable effect on blood pressure homeostasis (Hypertension. 2016 Aug;68(2):324-33. Effects of Magnesium Supplementation on Blood Pressure: A Meta-Analysis of Randomized Double-Blind Placebo-Controlled Trials. Zhang X. et al.)
Blood Glucose Homeostasis – “Magnesium has been reported to improve glucose utilization” and contribute to the homeostasis of a healthy blood glucose level (J Diet Suppl. 2016 Jul 26:1-13. Oral Magnesium Treatment Reduces Anemia and Levels of Inflammatory Markers in Experimental Diabetes. Ige AO & Adewoye EO.) Magnesium also improved anemic state and reduced inflammatory markers in the same study.

Headache - “The serum level of magnesium is an independent factor for migraine headaches and patients with migraine have lower serum levels of magnesium during the migraine attacks and between the attacks compared with healthy individuals” (Int Clin Psychopharmacol. 2016 Sep;31(5):287-92. Serum concentration of magnesium as an independent risk factor in migraine attacks: a matched case-control study and review of the literature. Assarzadegan F et al.) Magnesium is a supplement with “good evidence for improvement of migraine symptoms” (Curr Treat Options Neurol. 2016 Nov;18(11):48. Diagnosis and Treatment of Childhood Migraine. Merison K & Jacobs H.)

Stress – Magnesium buffers the stress hormones, and can reduce damaging effects, however stress depletes magnesium. In fact, every time the stress hormones are released, they draw on magnesium stores and deplete them. A lot of things can generate stress, both psychological and physical. Mental factors, environmental toxins, internal dysbiosis/candida, GMO/non-nutritious food, drug side effects, nutrient deficiencies, etc. etc. are all stressors. Good stressors, like weddings and new babies, still release stress hormones that can deplete magnesium. Herbicides not only add to physiological stress, they deplete the magnesium stores of the plant on which they are used.

Synergy: Included in the Complete MG formula are: Caprillic Acid (mct-medium chain triglycerides), inulin and coconut fiber (both soluble fiber), which all increase absorption of magnesium, and also taurine, which supports the brain and complements the activity of magnesium (Neurotox Res. 2016 Aug 27. ... Effect of Magnesium Acetyltaurate Against NMDA-Induced Excitotoxicity... Lambuk L et al.)

Vitamin D – Magnesium activates vitamin D. Vitamin D can increase magnesium absorption, so if one is supplementing with vitamin D, it may be beneficial to take at the same time as magnesium (ScientificWorldJournal. 2015:318595. Vitamin D, Essential Minerals, and Toxic Elements... Schwalfenberg GK & Genuis SJ.)

Foods that are Highest in Magnesium, for example almonds, has only 20% of the RDA of magnesium per serving. Other magnesium containing foods are: other nuts (especially cashews), avocado, seeds, sprouts, dark leafy greens and vegetables (especially artichoke), fish (especially salmon), beans, yogurt and goat cheese (many avoid dairy), bananas, dark chocolate (without sugar) and dried fruit (watch the concentrated sugar content). Spinach has magnesium, but it also has oxalate that interferes with absorption. Edamame, black beans and whole grains contain magnesium, but can contain phytates and absorption blockers. It is not necessary to avoid these foods, but be aware that they should be balanced. Remember also that foods with magnesium come from soils containing magnesium, and many of our soils have been depleted. The result of oil refining is a removal of magnesium. Safflower seeds, for example, contain 680 mg of magnesium per 1,000 calories. Refined safflower oil lacks magnesium entirely. Organic, cold pressed, unrefined oils will contain magnesium.

You get the idea, getting enough magnesium through the diet can be challenging.
Items that deplete or interfere with magnesium absorption: alcohol, soda, tea (not herbal), coffee, chocolate, sugar, herbicides, antibiotics, diuretics, and medications that affect kidney function. Impaired digestion, aging, disease, stress, intense exercise, surgery, diarrhea, vomiting, and illness (especially affecting the digestive/intestinal area) can also reduce magnesium absorption.

Calcium is an important mineral, but it’s just as important not to let Ca++ overshadow Mg++; balance is critical. In one study, addition of 300 to 1000 mg of Ca++ to the diet decreased Mg++ absorption significantly in participants consuming an average of 370 of dietary Mg++ daily (Bohn T. Dietary Factors Influencing Magnesium Absorption in Humans. Current Nutrition & Food Science. 2008;4:53-72.) Many believe that negative traits recently attributed to calcium are due to non-absorbable forms, and also to the “crowding out” of Mg++, leading to insufficiencies and deficiencies.

Dan Murphy:

“Serial testing of Magnesium RBC levels and seeking the optimum blood level of 6.5 mg/dL may be the only way to ensure magnesium repletion.” p. 240

“For the average person, oral magnesium, even at high dosages, has no side effects except loose stools, which is a mechanism to release excess magnesium.” p. 240

“Magnesium can be taken with or without meals … Magnesium requires stomach acid to be absorbed.” p. 247 [Dr. Dan: “we like Nutri-West’s product Hypo-D for this”]

“Take your first dose of magnesium when you wake up in the morning and the last dose at bedtime.” p. 250

Magnesium and malic acid “are both critical to the body’s energy production.” p. 179

In magnesium malate, the weak double bond “makes it readily soluble in the body.” P. 246

Magnesium glycinate is another “highly absorbable form of magnesium.” p. 250

“Taken together in this combination, magnesium and taurine have a synergistic effect, stabilizing cell membranes, calming the nervous system, and inhibiting nerve excitation.” P. 245

“We also know that magnesium and the essential fatty acids (EFAs, found in fish) are interdependent; each works much more efficiently when the other is present in sufficient amounts.” pp. 252-253 [Dr. Dan: “take your fish oil and co-factors with your magnesium for maximum effect”].

Quotes taken from: The Magnesium Miracle by Carolyn Dean, MD., Ballantine Books, 2014
COMPLETE MG
Magnesium is involved in more than 700 metabolic reactions, and as such contributes to the health and well being of every organ system we have. Efficient chelators are important, and malate, glycinate and citrate top the list for ultimate absorption. Synergistic ingredients, such as MCT (medium chain triglycerides), inulin (soluble fiber), coconut fiber and taurine contribute to a formula that optimizes the utilization of one of our most vital minerals.

Each Tablet Contains: Magnesium (as malate, citrate, glycinate) 300 mg. Proprietary blend: 85 mg* Caprillic Acid (mct-medium chain triglycerides), Inulin, L-Taurine, Coconut Fiber.

120 – Tablets per bottle 1570*** - Product order number

Side Effects/Contraindications: Excess magnesium (everyone’s bowel tolerance will be different) can cause diarrhea and cramping. Contraindications (from p. 240 of The Magnesium Miracle by Carolyn Dean, MD): kidney failure; myasthenia gravis; excessively slow heart rate; bowel obstruction.