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 Apple
 Astragalus
 Bamboo
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 Myrtle
 Barbados Cherry / Acerola
 Barbary/Jaundice Berry
 Barley Grass
 Basil
 Bastard Myrobalans
 Beauty Berry / Priyangu
 Beaver Tree / Houpu
 Magnolia
 Bell Pepper / Sweet Pepper
 Bergamot Orange
 Bindweed
 Birdsnest, Edible Swiftlet
 Bitter Apple
 Bitter Melon / Bitter Gourd
 Black Caraway / Roman
 Cander
 Black Chokeberry
 Black Cohosh
 Black Currant
 Black Ginger / Black
 Galingale
 Black Pepper
 Black Radish
 Black Sweet Cherry
 Black Tea
 Black Walnut / American
 Walnut
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 (Guggulu)/Frankincense
 Brazilian Ginseng
 Brewer's Yeast
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 Burdock
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 Camomile / German
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 Camu Camu
 Caralluma
 Caraway / Meridian Fennel
 / Persian Cumin
 Carrot
 Cascara Buckthorn
 Cats Whiskers
 Cayenne Pepper

Magnesium taurate

Products

Magnesium is a chemical element with the symbol Mg and atomic number 12 in the periodic table of elements.

The name magnesium comes from Magnesia, a district of Thessaly/Greece where it was first found and to this present day a lot of magnesium ore is present in the area.

In human biology, magnesium is the eleventh most abundant element by mass in the human body. Its ions are essential to all living cells, where they play a major role in manipulating important biological polyphosphate compounds like ATP, DNA, and RNA. Hundreds of enzymes thus require magnesium ions to function.

Magnesium is not easily absorbed in the body unless first attached to a transporting substance. For this reason, many supplement manufacturers have "chelated" magnesium to organic and amino acids.

There are different types of magnesium salts used as supplementation.

The most well-known are:

- Magnesia (E530):** Magnesium oxide, or magnesia, is a white solid mineral that occurs naturally as periclase and is a source of magnesium (see also oxide). It has an empirical formula of MgO. It is formed by an ionic bond between one magnesium and one oxygen atom. Magnesium oxide is hygroscopic in nature and care must be taken to protect it from moisture. Magnesium oxide is the most dense magnesium compound and the one most often used in mineral supplements and multivitamins. In medicine, magnesium oxide is used for relief of heartburn and sore stomach, as an antacid, magnesium supplement, and is a short-term laxative. It is also used to improve symptoms of indigestion. It is used as an alkali, neutraliser and anti-caking agent. It can be found in frozen dairy products, butter, canned peas, cocoa products, medications. It contains about 60% elemental magnesium, but is extremely poorly absorbed. Only about 4% of its elemental magnesium is absorbed.
- Magnesium Chloride (E511):** This is a form of magnesium which is found in nature and is a common component of sea waters. Magnesium chloride has been found to have a high bioavailability due to its superior solubility in water. In fact, water solubility has been found to be directly related to supplement absorbability. It is believed that the "non-saturable" component of magnesium absorption in the digestive system is related to "solvent drag", the mechanism by which minerals and electrolytes accompany solvents such as water in the process of digestion and absorption. It is also often used as acidity regulator for sterilised vegetables. The elemental Mg-content is about 40%.
- Magnesium taurate:** This is a combination of the amino acid taurine and magnesium. Taken together in this combination, magnesium and taurine have a synergistic effect, stabilizing cell membranes, making this form of magnesium highly absorbed. Magnesium taurate does not have great laxative effect and is the recommended form of magnesium for people with heart problems. It appears that the amino acid taurine is important for heart health and may prevent arrhythmias and protect the heart against the damage caused by heart attacks. Magnesium taurate requires oral supplementation for six to twelve months to restore intracellular levels. Taurine provides the basis for magnesium taurate supplements. As an amino acid, taurine can enhance absorption of magnesium due to the active transport systems that exist for these compounds. Taurates may provide specific benefits for those suffering from hypertension or trouble sleeping, as taurine provides a calming effect on the central nervous system. There are reports which show that taurine has featured in protocols for improving absorption of fats and in diet drinks to reduce jitteriness. Such complementary effects make magnesium taurate a very useful product. The elemental Mg-content is about 8%.
- Magnesium acetyl taurinate (ATA-Mg):** ATA Mg®, a new Magnesium Vector with proven physiological effect. It is a "better Magnesium" and "better Taurine" all together. It associates the known properties of magnesium and Taurine with innovative characteristics: ATA-Mg is an inhibitor of kainic acid neurotransmitter (involved in headache) and vascular protector. These properties are particularly interesting for gynaecological disorders such as premenstrual syndrome. The N-acetylation of taurine makes taurine more lipophilic and increases its cellular penetration, and therefore increasing the neuro-muscular activity of beta-sulfonic amino acid. Optimizes passage through the blood-brain barrier and entry into neuronal cells. The acetylated N Taurine induces a better cellular penetration of magnesium and an increase of the neuro-muscular activity. The elemental magnesium content ranges between 6,5-7,0 %.
- Magnesium bisglycinate:** This is an amino acid chelate of the mineral magnesium and the amino acid glycine, and is the version of magnesium preferred by naturopathic doctors. It is attached to an organic molecule (like glycine) that helps it to be more easily transported and absorbed in the intestines. Magnesium Bisglycinate is highly bioavailable. The bisglycinate form is not dependent on stomach acid for absorption as it uses mechanisms similar to those used by amino acids. It is said to be absorbed 228 per cent better than Magnesium Chloride and is also better tolerated. The content of elemental magnesium ranges usually from 10,5 - 12,9%.
- Magnesium glycinate:** Chemists form magnesium glycinate by bonding the mineral magnesium ions with glycine. Glycine, an amino acid, allows for superior absorption inside the digestive tract, because of the active transport systems employed by intestinal cells to absorb amino acids. Whereas minerals typically passively diffuse across the gut wall, and this active transport system increases absorption of amino acids and any substances they are bound with. Therefore it is easily absorbed and highly bioavailable. The elemental magnesium content is about 20%.
- Magnesium amino chelate or Magnesium chelate:** The generic drug name for chelated magnesium is magnesium amino acids chelate. It is a magnesium supplement that contains the mineral magnesium bound to, or chelated with, an organic molecule such as amino acids. The best known forms of Magnesium amino acid chelate are: magnesium aspartate, magnesium glycinate and magnesium taurinate. Chelated magnesium supplements are believed to be more absorbable forms of magnesium. Chelation increases the absorption of magnesium in the small intestine, thereby treating conditions associated with the deficiency of the mineral. Magnesium chelate increases bone density, assists in improving cholesterol and can reduce migraines.
- Magnesium citrate:** This is a product where magnesium is combined with citric acid, which has the chemical formula C₆H₆O₇Mg. Magnesium citrate is used in liquid form as a saline laxative to treat constipation, or to completely empty the intestines prior to surgery. Magnesium citrate powder is used for capsules to increase levels

Celandine
 Ceylon Ironwood Tree
 Chaga Mushroom / Cinder
 Conk
 Changbai Mountain Ant
 Chestnut Rose / Burr Rose
 Chia
 Chinese Bitter Orange /
 Sour Orange
 Chinese Cat's Claw / Gou
 Teng
 Chinese Chlorella
 Chinese Foxglove
 Chinese Hawthorn
 Chinese Knotweed / Fo-Ti
 Chinese Peony
 Chinese Scullcap
 Cinnamon
 Cloves / Lavang / Cengkeih
 Coco-Grass / Nut Sedge
 Cola Nut
 Common Grape Vine
 Common Ladies Mantle
 Common Walnut / English
 Walnut
 Common Yarrow
 Cordyceps / Caterpillar
 Fungus
 Coriander / Chinese Parsley
 Costusroot, Indian
 Cumin / Cummin
 Damiana
 Dandelion
 Date Palm
 Devils Backbone / Veldt
 Grape
 Devils Claw
 Dodder
 Dog Rose
 Dong Quai / Female
 Ginseng
 Durian
 Echinacea
 Eucalyptus / Fever Tree
 European Blueberry
 False Daisy
 Fennel
 Fenugreek
 Feverfew
 Field Horsetail / Common
 Horsetail
 Flax/Linseed (Natural
 Omega 3)
 Gaint Knotweed
 (Resveratrol)
 Gall Nut, Indian / Ink Tree
 Gambooge / Brindleberry
 Garlic
 Gastrodia, Tall
 Ginger
 Ginkgo Biloba
 Globe Artichoke
 Gojiberry / Wolfberry
 Golden Rod
 Goldendrop / Ratanjot
 Gotu Kola
 Grapefruit
 Graviola / Soursop /
 Guanábana
 Great / Hairy Willow Herb
 Great Mullein / Common
 Mullein
 Green Coffee
 Green Lipped Mussel
 Green Tea
 Griffonia Simplicifolia
 (Lectins)
 Guarana
 Gurmar
 Haematococcus Pluvialis
 (Astaxanthin Algae)
 Heartsease / Wild Pansy
 Henna Plant
 Himalayan Cherry, Wild
 Holy Basil
 Hop, Common
 Horny Goat Weed /
 Bishop's Hat
 Horse Chestnut

of magnesium in the blood to treat magnesium deficiency. Magnesium citrate is probably the mostly widely used magnesium supplement because it is inexpensive, easily absorbed and only has a mild laxative effect. The best form is magnesium citrate powder, which can be taken every day when mixed with water. Magnesium citrate is more highly soluble at lower pH levels and hot water. To get it to thoroughly dissolve it might be necessary to add an acidic compound in some formulations when it isn't already added in the formulation. The regular Magnesium citrate powder contains about 30% elemental magnesium.

- Magnesium gluconate (E580):** This is a compound with formula $MgC_{12}H_{22}O_{14}$. It is a salt of magnesium and gluconic acid. It has E number "E580". Magnesium gluconate is used to treat low blood magnesium. As a supplement, magnesium gluconate has the best bio-availability of all magnesium supplements. Flushing may occur as a side effect of taking magnesium gluconate. Diarrhoea, upset stomach or dizziness can be the side effects of taking magnesium gluconate. Magnesium gluconate is not recommended for individuals who are allergic to magnesium. Magnesium gluconate contains about 5.5% elemental magnesium. It is easily absorbed and quick acting.
- Magnesium aspartate:** Vitamin and mineral supplements are often wasted, because of inadequate absorption by the body. Attaching them to amino acids increases absorption. Magnesium aspartate is one example of these so-called chelated mineral compounds. Not all magnesium aspartate supplements are the same. The amount of chelation of the aspartic acid with the magnesium affects the chemistry of the final product. For example, some magnesium aspartate supplements have the chemical formula $Mg(C_4H_6NO_4)_2 \cdot 2H_2O$, indicating that two water molecules are associated with each magnesium aspartate molecule. Other formulations show three water molecules associated with each magnesium aspartate molecule, and still others show four water molecules. Each of these formulations affects the molecular weight of the compound. The appearance of various magnesium aspartate compounds range from a white to off-white powder, insoluble in water, to a white, crystalline or clear powder that's freely soluble in water. Safety studies in England concluded that magnesium aspartates demonstrate greater oral absorption and bioavailability compared to less soluble magnesium preparations such as magnesium oxide, magnesium hydroxide, magnesium carbonate and magnesium sulphate. Magnesium aspartate is used in disease prevention, treatment and as a mineral supplement. It helps protect the heart by diminishing myocardial calcium uptake, which is responsible for cardiac hazards. And is also used to treat migraines.
- Magnesium glycerophosphate:** This is a compound with formula $MgC_3H_9O_6P$. This inorganic magnesium salt is available as tablets, capsules, liquid solutions or liquid suspensions for oral use. Magnesium glycerophosphate is a mixture, in variable proportions, of magnesium (RS)-2,3-dihydroxypropyl phosphate, and of magnesium 2-hydroxy-1-(hydroxymethyl)ethyl phosphate, which may be hydrated. Magnesium glycerophosphate comes as a white powder, hygroscopic, practically insoluble in alcohol. It dissolves in dilute solutions of acids. It is very well soluble in water and therefore has a good bioavailability. It is almost tasteless, odour-free and is colourless in solution. The British national formulary (BNF) states that oral magnesium glycerophosphate is a suitable preparation to prevent recurrence of symptomatic hypomagnesaemia in people who have already been treated for this condition. Magnesium glycerophosphate contains not less than 11.0 per cent and not more than 12.5 per cent of Mg.
- Magnesium lactate (E329):** This is the magnesium salt of lactic acid. It is a naturally occurring mineral that helps to support functions of the cardiovascular system, nervous system and digestive system. It also aids in muscular movement and utilization of glucose. Magnesium lactate is used as a supplement to treat magnesium deficiency, heartburn, indigestion and upset stomach. It consists of about 12% elemental magnesium and has a bioavailability of 99%.
- Magnesium malic acid/magnesium malate:** Magnesium malate forms when magnesium is reacted with malic acid, yielding a chemical with the formula $C_4H_4MgO_5$. Malic acid is a weak organic acid found in vegetables and fruit, especially apples. The weak bond with magnesium makes it readily soluble in the body. Malic acid is a key component of several energy making chemical reactions in the body. Magnesium malate is most commonly used to treat a condition known as fibromyalgia. It is a poorly understood disease that is characterized by fatigue, muscle pain, stiffness, headache and memory problems, and may be linked to low magnesium levels. Magnesium malate has the ability to chelate metals, and most importantly, toxic metals. For example, high concentrations of aluminium can cause damage to the central nervous system, loss of memory and dementia. Magnesium malate can bind to these metals and render them ineffective. Magnesium malate is considered an alpha hydroxy acid, and among the fruit-derived acids that are good for the skin. Fruit acids are typically used in cosmetics because they help exfoliate the skin. Magnesium malate also promotes the production of saliva, which helps control oral bacteria. Because of its antiseptic properties, magnesium malate is used in toothpaste and mouthwash. Magnesium malate contains about 11% elemental magnesium, but to some products Magnesiumoxide is added to increase the elemental Magnesium level up to 15-18%.
- Magnesium stearate (E572):** Magnesium stearate, also called 'octadecanoic acid, magnesium salt'. It is a white substance, powder which becomes solid at room temperature. It has the chemical formula $Mg(C_{18}H_{35}O_2)_2$. It is a salt containing two equivalents of stearate (the anion of stearic acid) and one magnesium ion (Mg^{2+}). It is a long-chain fatty acid that occurs naturally in meats, chocolate and coconut oil. This chemical compound is most commonly used as a food additive or pharmaceutical excipient and its E number then is E470b. In confectionary and use in cosmetics (baby powder) it has E-number E572. Magnesium stearate is made by hydrogenating palm or cottonseed oil, and makes it an effective lubricant for supplement production. This is also the main reason that it is present in so many vitamin supplements. Magnesium stearate can form a film on other ingredients in nutritional tablets that decreases the hardness of the tablet and increases the amount of time it takes for them to disintegrate. The anti-coagulating properties in magnesium stearate also make it a common ingredient in cosmetics as it helps products such as foundation, lip gloss and mascara from separating into liquid and oil. It is also used in perfumes, deodorants and hair care products. The Food and Drug Administration notes that the magnesium stearate used as an ingredient in supplements and foods is not associated with any public health hazards and is generally recognized as safe. It is also used as a stabiliser, anti-caking and release agent, emulsifier for artificial sweeteners and confectionary. The content of elemental magnesium ranges usually from 4,0 - 5,0%.
- Magnesium sulphate (E518):** This is an inorganic salt (chemical compound) containing magnesium, sulphur and oxygen, with the formula $MgSO_4$. It is often encountered as the heptahydrate sulphate mineral epsomite ($MgSO_4 \cdot 7H_2O$), commonly called Epsom salt. Epsom salt occurs naturally as a pure mineral. Another hydrate form is kieserite. Traditionally, it is also used to prepare foot baths, intended to soothe sore feet. The reason for the inclusion of the salt is partially cosmetic: the increase in ionic strength prevents some of the temporary skin wrinkling (partial maceration). However, magnesium sulphate can also be absorbed into the skin, reducing inflammation. For topical application it is supplied in a gel preparation for treating aches and pains. Oral magnesium sulphate is commonly used as a saline laxative or osmotic purgative. Athletes use it to soothe sore muscles. It is also used as a laxative. Magnesium sulphate is the main preparation of intravenous magnesium. Other indications for internal use are: replacement therapy for hypomagnesaemia, for reduction of the symptoms

Horseradish
 Indian Cassia
 Lignea/Cassia Cinnamom
 Indian Coleus / Coleus Forskohlii
 Indian Fig Opuntia
 Indian Gamboge / Gummigutt
 Indian Ginseng
 Indian Gooseberry
 Indian Kino Tree / Malabar
 Indian Madder / Madderwort
 Indian Sarsaparilla
 Japanese Horseradish
 Japanese Knotweed (Resveratrol)
 Javanese Turmeric / Temu Lawak
 Joseph's Coat
 Juniper, Common
 Kale, Curly
 King Oyster Mushroom
 Kombu
 Konjac / Devil's Tongue
 Kooroo Color / Sweet Potato
 Korean Ginseng
 Kratom
 Kudzu
 Lavender
 Leaf Green/Chlorophyll
 Lemon
 Lemon Balm
 Lemon Grass / Camel Grass
 Licorice
 Ligustrum Seed / Grossy Privet Fruit
 Lodh Tree
 Lovage
 Lovage / Cnidium
 Love Vine / Laurel Dodder
 Maca
 Maitake Mushroom
 Mandarin / Loose Skinned Orange
 Mangosteen
 Manyflower Tickclover
 Maqui Berry / Chilean Wineberry
 Maral Root / Rhaponticum
 Marine Phytoplankton
 Maritime Pine
 Meadowsweet
 Mexican Arnica / False Arnica
 Milk Thistle
 Miracle Fruit/Miraculous Berry
 Miracle Grass / Southern Ginseng
 Monk's Pepper / Chasteberry
 Moringa Tree / Miracle Tree
 Motherwort
 Muchkund Tree
 Mukul Myrrh Tree / False Myrrh
 Mulberry Mistletoe
 Mulberry, White
 Musk Root
 Nettle, Stinging
 Night Jasmine / Coral Jasmine
 Northern Bilberry
 Norwegian Kelp
 Notoginseng / San Qi / Sanchi
 Oak, White
 Oats Grass
 Olive
 Oolong Tea
 Oregano / Pot Marjoram
 Oriental Arborvitae
 Oyster Mushroom
 Pacific Oyster
 Pagoda Tree, Japanese

of acute asthma, to treat eclampsia in pregnant women, to delay premature labour (tocolysis) and as an aid for barium chloride poisoning. There are various magnesium sulphate preparations available with various contents of elementary Magnesium contents generally ranging from 10-20%.

- Magnesium carbonate (E504):** Magnesium carbonate, $MgCO_3$, is an inorganic salt that is a white solid. Several hydrated and basic forms of magnesium carbonate exist. The most common magnesium carbonate forms are the anhydrous salt called magnesite ($MgCO_3$) and the di, tri, and pentahydrates known as barringtonite ($MgCO_3 \cdot 2H_2O$), nesquehonite ($MgCO_3 \cdot 3H_2O$), and lansfordite ($MgCO_3 \cdot 5H_2O$), respectively. The anhydrous salt is practically insoluble in water, acetone, and ammonia. Magnesium carbonate can ordinarily be obtained by mining the mineral magnesite. The trihydrate salt, $MgCO_3 \cdot 3H_2O$, can be prepared by mixing solutions of magnesium and carbonate ions under an atmosphere of carbon dioxide. Magnesium carbonate can also be synthesized from magnesium hydroxide and carbon dioxide. Magnesium carbonate is used as an oral supplement for people with low magnesium in their blood, which occurs most often when someone uses diuretics or has lost fluids through diarrhea or vomiting, for example. Because of its alkaline nature, magnesium carbonate can be consumed as an antacid by people who have problems with indigestion and heartburn. In large doses, magnesium carbonate goes from antacid to laxative and can therefore be used to combat constipation as well. Magnesium carbonate is also used as E-number E504 as an acidity regulator, alkali, and anti-caking agent for many different products. Its hygroscopic property -its ability to absorb water- makes it a great drying agent too and can be found for this purpose in many products. Magnesium carbonate, $MgCO_3$, contains about 24% elementary magnesium.

Introduction

In 1618 a farmer by the name of Henry Wicker at Epsom in England attempted to give his cows water from a well. They refused to drink because of the bitter taste of the water. However the farmer noticed that the water seemed to heal scratches and rashes. The fame of Epsom salts has spread since then. Eventually it was recognized to be magnesium sulphate, $MgSO_4$.

In 1808, Sir Humphrey Davy first isolated several of the alkaline earth metals, naming them after their oxides as barium, strontium, calcium, and magnium. Davy derived the term "magnium" from the common name for magnesium oxide: magnesia. Eventually the term magnesium replaced the term magnium in general usage.

Richard Willstätter won the Nobel prize in 1915 for describing the nature of the structure of chlorophyll in plants, noting magnesium as the central element.

Magnesium compounds are used medicinally as common laxatives, antacids (e.g., milk of magnesia), and in a number of situations where stabilization of abnormal nerve excitation and blood vessel spasm is required (e.g., to treat eclampsia). Magnesium ions are sour to the taste, and in low concentrations they help to impart a natural tartness to fresh mineral waters.

Green vegetables such as spinach are good sources of magnesium because the centre of the chlorophyll molecule (which gives green vegetables their colour) contains magnesium. Some legumes (beans and peas), nuts and seeds, and whole, unrefined grains are also good sources of magnesium. Bread made from whole grain wheat flour provides more magnesium than bread made from white refined flour. Tap water can be a source of magnesium, but the amount varies according to the water supply. Water that naturally contains more minerals is described as "hard". "Hard" water contains more magnesium than "soft" water.

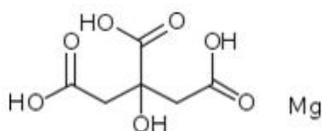


Photo: Structure of Magnesium Citrate

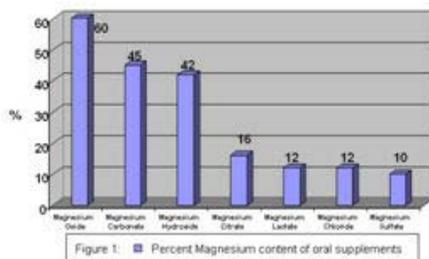


Photo: Percentage Magnesium content of oral magnesium supplements



Photo: Magnesium Sulphate powder

Application

Magnesium supplements are available in a variety of forms, including tablets, capsules, chews, liquids and powders. There is Magnesium oil, shots and Transdermal Magnesium Gel: A magnesium preparation that you rub into the skin. Magnesium is well-absorbed this way and is a good choice for people with poor digestion, those who simply can't tolerate magnesium any other way.

Papaya
Parsley
Peanut / Groundnut
Peppermint
Pomegranate
Poor Man's Ginseng
Poria / Hoelen / Indian Bread
Pot Marigold
Potency Wood / Marapuama
Psyllium / Sand Plantain
Pueraria Mirifica / Kwao Krua
Pumpkin
Puncture Vine / Yellow Vine
Pygeum / Iron Wood / (Red)Stinkwood
Raspberry, European
Red Beet Root
Red Clover
Red Marine Algae
Red Sandalwood
Red Yeast Rice / Fermented Red Rice
Reishi Mushroom / Lingzhi Rice
Roselle
Rosemary
Roseroot
Rubia Root / Dan-Shen
Rye Grass
Sage, Common
Salad Burnet / Garden Burnet / Small Burnet
Salvia Divinorum
Sandalwood
Sarsaparilla
Saw Palmetto
Schisandra
Sea Buckthorn
Senna, Alexandria
Sesam / Gingelly
Sesame
Shepherd's Purse
Shikakai / Fruit For Hair
Shilajit / Mineral Pitch
Shitake Mushroom
Siberian Ginseng
Siberian Yarrow/Love Parade
Sichuan Pepper / Szechuan Pepper
Slippery Elm
Small Flower Willow
Soybean
Spinach
Spirulina / Blue-Green Algae
St. John's Wort
Stephania
Stevia
Stinking Chamomile
Stonebreaker / Seed-Under-Leaf
Sweet Orange
Synthetic Borneol Camphor
Thyme
Thyme-Leaved
Gratiola/Baby Tears
Tomato (Lycopene)
Tongkat Ali / Pasak Bumi
Tree Turmeric
Turmeric, Common
Ursolicacid / Prunol / Malol
Uva-Ursi / Bearberry
Valerian
Velvet Bean, Cowitch, Kapikachu
Wakame Kelp
Watercress
Wedelia
Wheatgrass
White Horehound / Common Horehound
White Kidney Bean
Wild / Northern Highbush Blueberry

One factor that affects the effectiveness of magnesium supplements is the amount of elemental magnesium they contain. Another important factor in the effectiveness of magnesium supplements is the bioavailability of the supplements.

The Magnesium substances which may be used in Europe, according to Regulation (EG) Nr. 1170/2009 Appendix II, in the manufacture of food supplements are:

magnesiumacetate	magnesiumhydroxide
magnesium-L-ascorbate	magnesiummalate
magnesiumbisglycinate	magnesiumoxide
magnesiumcarbonate	magnesium-L-pidolate
magnesiumchloride	kaliummagnesiumcitrate
magnesiumsalts of citric acid	magnesiumpyruvate
magnesiumgluconate	magnesiumsuccinate
magnesiumglycerofosfate	magnesiumsulphate
magnesiumsalts of phosphoric acid	magnesiumtaurate
magnesiumlactate	magnesiumacetyltaurate
magnesium-L-lysinate	

The Magnesium substances which are allowed to be added to food in Europe, according to Regulation (EG) Nr. 1170/2009 Appendix III, are:

magnesiumacetate	magnesiumsalts of phosphoric acid
magnesiumcarbonate	magnesiumlactate
magnesiumchloride	magnesiumhydroxide
magnesiumsalts of citric acid	magnesiumoxide
magnesiumgluconate	kaliummagnesiumcitrate
magnesiumglycerofosfate	magnesiumsulphate

Magnesium substances for use in cosmetics and which are as such mentioned in EU Decision 96/335/EG from EU Cosmetic Directive 76/768/EEG and/or 2006/257/EG for substance specific purposes are:

magnesiumacetate	magnesiumlauryl hydroxypropyl sulfonate
magnesiumacetylmethionate	magnesiumlauryl sulfate
magnesiumaluminiumsilicate	magnesiummethyl cocoyltaurate
magnesiumascorbate	magnesiummyreth sulfate
magnesiumascorbylphosphate	magnesiummyristate
magnesiumaspartate	magnesiumnitrate
magnesiumbenzoete	magnesiumoleth sulfate
magnesiumbromide	magnesiumoxide
magnesiumcarbonate	magnesiumpalmitate
magnesiumcarbonatehydroxide	magnesiumpca
magnesiumchloride	magnesiumpeg-3 cocamide sulfate
magnesiumcocoate	magnesiumperoxide
magnesiumcoco-sulfate	magnesiumpotassium fluorosilicate
magnesiumfluoride	magnesiumpropionate
magnesiumfluorosilate	magnesiumsalisylate
magnesiumglucoheptonate	magnesiumsilicate
magnesiumgluconate	magnesiumsodium fluorosilicate
magnesiumglycerophosphate	magnesiumstearate
magnesiumhydroxide	magnesiumsulfate
magnesiumlanolate	magnesiumsulfide
magnesiumlaureth-5 sulfate	magnesiumtallowate
magnesiumlaureth-8 sulfate	magnesiumthioglycolate
magnesiumlaureth-16 sulfate	magnesiumtrisilicate
magnesiumlaureth sulfate	magnesium/aluminium/hydroxide/carbonate
magnesiumlaureth-11 carboxylate	magnesium/tea-cocosulfate

Medicinal actions

Magnesium is an important catalyst for the body's chemical reactions, meaning that it increases the rate at which chemical reactions occur. Some of the most important chemical reactions that involve magnesium are in the Krebs's cycle, the cycle inside every cell that leads to energy production.

Without magnesium the transmission of nerve and muscle impulses is compromised. This can lead to nervous disorders, depression and muscle weakness or twitches. Magnesium is a useful supplement for PMS symptoms that involves irritability and mood swings. Magnesium also decreases menstrual pain by relaxing the uterine muscles. In pregnancy magnesium acts as a uterine relaxant and can prevent premature labour.

Studies show supplemental magnesium in pregnancy also decreases the risk of birth defects such as cerebral palsy. Magnesium is an important mineral for cardiovascular health. It regulates the heartbeat, prevents the calcification of arteries and relaxes arterial vessels to prevent hypertension. Magnesium has also been researched for its ability to

Willow, White
 Yam, Wild
 Yerba Mate
 Yohimbine
 Yumberry / Chinese
 Bayberry
 Ziziphus / Wild Jujube

Other Products

7-Methoxyflavone
 Acetyl Carnosine (NAC)
 Acetyl L-Carnitine
 Acetylcysteine (NAC)
 Acetylglucosamine / Chitin
 Adenosine Monophosphate (AMP)
 Alanine L
 Alpha Lipoic Acid
 Alpha Lipoic Acid R
 Arabic / Acacia Gum E414
 Arginine
 Arginine Malate
 Ascorbyl Palmitate (Vit. C)
 Asparagine-L
 Astaxanthin
 Bamboo Tabashir
 Bee Pollen
 Beestings / Fore Milk / Immune Milk
 Beta Alanine
 Beta Glucan
 Betaine
 Branched-Chain Amino Acids
 Bromelain
 Btacarotene / Provitamin A
 Caffeine
 Calcium Bisglycinate
 Calcium Carbonate
 Calcium Citrate
 Calcium Gluconate
 Calcium HMB
 Calcium Pyruvate
 Calciumascorbate E302
 Caprylic Acid / Octanoic Acid
 Carnitine-L
 Chitosan
 Chlorogenic Acid
 Chlorpheniramine Maleate
 Choline Hydrogen Tartrate
 Chondroitin Sulphate
 Citicoline Sodium / CDP-Choline
 Citric Acid
 Citrulline Malate
 Citrulline-L
 Coenzym Q10
 Collagen Hydrolysate
 Collagen Type 1
 Collagen Type 2
 Copper Gluconate
 Corn Starch
 Creatine Ester, Cre-Ester, CEE
 Creatine Ethyl Ester Malate
 Creatine Phosphate
 Creatine, Monohydrate
 Cysteine L
 D-Aspartic Acid / D-Asparaginic Acid
 D-Chiro-Inositol (DCI)
 Deanol Bitartrate / DMAE Tartrate
 Dextrose / Natural Glucose
 Dicalcium Phosphate E341
 Dimercaptosuccinic Acid (DMSA)
 DMPS / Sodium 2,3-Dimercapto-1-Propanesulfonate
 Elastin
 Erythritol
 Ferrous Gluconate
 Flavin Mononucleotide (FMN)
 Flush Free Niacin (Vit. B3)
 Fructose / Fruit Sugar
 Glucosamine Sulfate
 Glucose / Dextrose / Grape

reduce cholesterol and to protect against osteoporosis.

Magnesium therapy is recommended by the ACC/AHA/ESC 2006 Guidelines for Management of Patients With Ventricular Arrhythmias and the Prevention of Sudden Cardiac Death for patients with ventricular arrhythmia associated with "torsade de pointes" who present with long QT syndrome as well as for the treatment of patients with digoxin intoxication-induced arrhythmias. Magnesium is also the drug of choice in the management of pre-eclampsia and eclampsia.

Low levels of magnesium in the body have been associated with the development of a number of human illnesses such as; asthma, diabetes, and osteoporosis.

Magnesium is needed for strong bones, a healthy immune system, normal nerve- and muscle function, a steady heart rhythm and for turning food into energy.

The most common medicinal applications of magnesium are:

- Supports a healthy immune system
- Regulates muscle function and helps muscles relax
- Maintains nerve function / Depression
- Cardiovascular disease and regulates heart rhythm
- Maintains normal blood pressure
- Diabetes
- Neuropathy
- Migraines
- Osteoporosis
- PMS & menstrual cramps
- Anxiety
- Sleep disturbances/insomnia
- High Blood Pressure
- Asthma

EFSA (European Food Safety Authority) has authorized several health claims for magnesium:

- Magnesium contributes to a reduction of tiredness and fatigue
- Magnesium contributes to electrolyte balance
- Magnesium contributes to normal energy-yielding metabolism
- Magnesium contributes to normal functioning of the nervous system
- Magnesium contributes to normal muscle function
- Magnesium contributes to normal protein synthesis
- Magnesium contributes to normal psychological function
- Magnesium contributes to the maintenance of normal bones
- Magnesium contributes to the maintenance of normal teeth
- Magnesium has a role in the process of cell division

The claim may be used only for food which is at least a source of magnesium as referred to in the claim SOURCE OF MAGNESIUM as listed in the Annex to Regulation (EC) No 1924/2006.

Industrial application

Besides the use of magnesium as a food additive or for medicinal or cosmetic purposes, magnesium has many more other industrial uses, amongst others:

- In vegetation, magnesium is the metallic ion at the centre of chlorophyll, and is thus a common additive to fertilizers.
- A refractory material is one that is physically and chemically stable at high temperatures.
- Magnesium stearate is often used as an anti-adherent in the manufacture of medical tablets, capsules and powders. Magnesium stearate is the most commonly used lubricant for tablets.
- Magnesium stearate is also used to bind sugar in hard candies like mints, and is a common ingredient in baby formulas.
- Anhydrous magnesium sulphate is used as a drying agent.
- Gardeners use Magnesium stearate to improve crops.
- Magnesium sulphate is used in bath salts.
- Magnesium sulphate may also be used as a coagulant for making tofu.
- Magnesium sulphate heptahydrate is used to maintain the magnesium concentration in marine aquaria.
- Magnesium sulphate is used as the electrolyte to prepare copper sulphate.
- Magnesium sulphate is used as a brewing salt in beer production.

Dosage

Acute magnesium poisoning is rare and difficult to achieve unless magnesium compounds are administered intravenously. For example: The acute oral toxicity (LD50) from trimagnesium citrate anhydrous is 5.400 mg/kg for mice and 11.700 mg/kg for rats. The LD50 for Magnesium chloride; oral, rat, is 8.100 mg/kg body weight.

Toxic hypermagnesaemia, presenting e.g. with hypotension or muscular weakness, is only seen at oral Mg doses greater than 2,500 mg, i.e. doses exceeding the European UL of 250 mg by a factor of more than 10.

The Dutch Food centre (Voedingscentrum) advises the following Magnesium intake:

- Sugar
- Glucuronic Acid Lactone
- Glutamic Acid L (E620)
- Glutamine-L
- Glutathione (GSH)
- Glycerol Monolaurate
- Glycine L
- Guar Gum / Guaran (E412)
- Histidine (His)
- Horse Milk
- Hydroxypropylcellulose (HPC)
- Inositol
- Inuline / Oligofructose
- Iron Sulphate
- L-Arginine A-Ketoglutarate (AAKG)
- L-Arginine-Ethyl-Ester
- L-Carnitine-L-Tartrate
- L-Carnosine
- L-Propionylcarnitine
- Lactobacillus Rhamnosus
- Lactoferrin
- Lactoferrin APO
- Lambda Carrageenan, Refined
- Lycopene
- Lysine-L Hydrochloride
- Magnesia
- Magnesium Acetyl Taurinate (ATA-Mg)
- Magnesium Amino Chelate
- Magnesium Bisglycinate
- Magnesium Citrate
- Magnesium Gluconate
- Magnesium Glycerophosphate
- Magnesium Lactate
- Magnesium Malic Acid
- Magnesium Stearate E572
- Magnesium Sulphate
- Magnesium Taurate
- Malic Acid
- Maltodextrin
- Manganese Citrate
- Manganese Gluconate
- Manganese(II) Bis(Glycinate)
- Mannitol
- Mannose-D
- Melatonin
- Methionine
- Methionine, DL-
- Microcrystalline Cellulose
- Milk Protein
- Monosodium Glutamate (MSG)
- Neohesperidin DC (NHDC)
- Omega-3 Fatty Acids
- Omega-6 Fatty Acids
- Organic Sulphur (MSM)
- Ornithine
- P-Aminobenzoic Acid
- Palmitic Acid
- Monoethanolamide (PEA)
- Phenylalanine-D (DPA)
- Phenylalanine-DL (DLPA)
- Phenylalanine-L (Phe)
- Phloridzin
- Plant Sterols
- Polycosanol (PPG)
- Potassium Sorbate E202
- Potassium Citrate
- Potassium Iodide
- Potassium Nitrate
- Proline, L-
- Protease-Aspergillus Acid
- Pterostilbene
- Quercetin Dihydrate

age group	19-22 year	22-50 year	51-65 year	>65 year	pregnant	breast feeding
Magnesium mg/day:						
Men	300-350	300-350	300-350	300-350		
Women	250-300	250-300	250-300	250-300	300-350	300-400

In 2010 the European Parliament approved the Recommended Daily Allowance (RDA) dosage of Magnesium to be 375 mg Magnesium per day for adults. The Recommended Dietary Allowances (RDA) is the average daily dietary nutrient intake level sufficient to meet the nutrient requirements of nearly all (97-98%) healthy individuals in a particular life stage and gender group.

Recommendations for magnesium in the USA are provided in the Dietary Reference Intakes (DRIs) developed by the Institute of Medicine of the National Academy of Sciences. Dietary Reference Intakes is the general term for a set of reference values used for planning and assessing nutrient intake for healthy people. Three important types of reference values included in the DRIs are Recommended Dietary Allowances (RDA), Adequate Intakes(AI), and Tolerable Upper Intake Levels (UL).

Recommended Dietary Allowances for magnesium for children and adults (USA):

Age (years)	Males (mg/day)	Females (mg/day)	Pregnancy (mg/day)	Lactation (mg/day)
1-3	80	80	N/A	N/A
4-8	130	130	N/A	N/A
9-13	240	240	N/A	N/A
14-18	410	360	400	360
19-30	400	310	350	310
31+	420	320	360	320

There is insufficient information on magnesium to establish a RDA for infants. For infants 0 to 12 months, the DRI is in the form of an Adequate Intake (AI), which is the mean intake of magnesium in healthy, breastfed infants. An AI is set when there is insufficient scientific data available to establish a RDA for specific age/gender groups. AI's meet or exceed the amount needed to maintain a nutritional state of adequacy in nearly all members of a specific age and gender group.

Recommended Adequate Intake for magnesium for infants:

Age(months)	Males and Females(mg/day)
0 to 6	30
7 to 12	75

The UL, on the other hand, is the maximum daily intake unlikely to result in adverse health effects. It's safe to get high levels of magnesium from food. But excessive use of magnesium supplements can be toxic. The upper limit -- the highest dose a person can take of magnesium supplements is set in the USA at:

Tolerable Upper Intake Levels for supplemental magnesium for children and adults

Age (years)	Males (mg/day)	Females (mg/day)	Pregnancy (mg/day)	Lactation (mg/day)
Infants	Undetermined	Undetermined	N/A	N/A
1-3	65	65	N/A	N/A
4-8	110	110	N/A	N/A
9-18	350	350	350	350
19+	350	350	350	350

Raspberry Ketone
Ribose, D
Royal Jelly / Queen Bee Jelly
Rutin
Selenomethionine
Silica / Silox E551
Sodium Citrate
Sodium Molybdate
Sodium Octanoate
Sodium Sulphate
Sodium Tetraborate / Borax
Sorbic Acid
Stearic Acid, Calcium Salt
Sucralose
Talc Powder (E553b)
Taurine
Theanine, L-
Trivalent Chromium (Glucose Tolerance Factor)
Tryptophan-L
Tyrosine-L
Valine, L-
Vitamin A Acetate
Vitamin A Palmitate
Vitamin B1
Vitamin B1 Activated
Vitamin B1 Thiamine Mononitrate
Vitamin B12
Vitamin B12
Adenosylcobalamin
Vitamin B12 Co-Enzym (Met-12)
Vitamin B15 / Pangamic Acid
Vitamin B2
Vitamin B3 (Niacin)

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The Tolerable Upper Intake Level (UL) for magnesium represents intake from pharmacological agents only, and does not include intake from food and water. Physicians may prescribe magnesium in higher doses for specific medical problems. There is no UL for dietary intake of magnesium; only for magnesium supplements.

Contra-indications

Although Magnesium can be considered as safe, there are some known adverse reactions and warnings applicable:

- Magnesium supplements can cause nausea, cramps, and diarrhoea.
- Magnesium supplements often cause softening of stool.
- Magnesium supplements may not be safe for people who take diuretics, heart medicines, or antibiotics.
- People with diabetes, intestinal disease, heart disease or kidney disease should not take magnesium before speaking with their health care provider.
- Extreme magnesium overdose can result in serious complication such as slow heartbeat, low blood pressure, nausea, drowsiness, etc. If severe enough, an overdose can even result in coma or death. However, a moderate overdose will be excreted through the kidneys, unless one suffers from serious kidney problems.
- High doses of magnesium (typically delivered by IV) should not be given to people with heart block.
- Avoid in patients with known allergy or hypersensitivity to magnesium or products made from it.

More information / news

- 2014-02-20 [Magnesium may protect against hip fractures](#)
- 2013-12-02 [Magnesium may help people with heart problems to live longer](#)
- 2013-05-30 [More magnesium may slash heart disease risk by 30%](#)
- 2013-05-07 [Magnesium is just as vital as calcium for kids bone development](#)
- 2013-01-24 [Magnesium - 'Sky is the limit' for the 'hottest ingredient in the mineral category'](#)
- 2012-08-03 [Dietary magnesium may reduce the risk of colon cancer](#)
- 2012-05-29 [Dietary magnesium may lower risk of death from heart disease](#)
- 2012-02-13 [Magnesium linked to better blood pressure](#)
- 2012-01-19 [Magnesium may reduce stroke risk](#)
- 2011-06-07 [Magnesium supplements may ease hot flashes for breast cancer patients](#)
- 2011-04-29 [Belgian supplier launches new taurine-magnesium vector for headache relief](#)
- 2011-03-01 [Nutrigenomics shows benefit of magnesium's metabolic actions](#)
- 2011-02-04 [Study highlights vital role of magnesium in type 2 diabetes](#)
- 2010-11-29 [Magnesium reduces sudden heart failure risk for women](#)
- 2010-03-15 [Magnesium may decrease colon cancer risk](#)
- 2010-02-15 [Magnesium supplements may boost lung health for asthmatics](#)
- 2009-12-07 [Magnesium benefits male hearts, but not women](#)
- 2009-04-01 [EFSA approves calcium, magnesium and zinc forms in food supplements](#)

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