

Sulfur (MSM)

A Basic Essential Nutrient Needed Now, More than Ever Before

Methylsulfonylmethane is a relatively new dietary supplement form of sulfur that is found in our living tissues. MSM supports healthy connective tissues like tendons, ligaments, and muscle. Thus, it is important in conditions such as arthritis, muscle pains, bursitis, etc. MSM should be considered an integral part of any health care practice because of its physiological action, indirect importance, and current / future uses.

To understand MSM, some background information is necessary. MSM is a "naturally-occurring nutrient found in normal human diets" (1). It gets into the diet through the sulfur cycle. Ocean plankton release sulfur compounds which rise into the ozone where ultra-violet light makes MSM and DMSO. DMSO, dimethyl sulfoxide, is a precursor to MSM. MSM and DMSO return to the surface of the earth in rain (1). Plants concentrate MSM and return it to the earth and the sea. Evaporation into the air results in their return to the earth (1).

MSM has a unique action on body tissues. It decreases the pressure inside the cell. In removing fluids and toxins, sulfur affects the cell membrane. MSM is an organic form of sulfur, whereas sulfites in foodstuffs are inorganic. Sue Williams states "sulfur is present in all cells" and is in the form of "organic compounds throughout the body" (2). However, sulfur can be found in the body in sulfate forms. It forms sulfate compounds with sodium, potassium, magnesium, and selenium. MSM has a significance, because sulfur compounds are found everywhere throughout the body and in nature.

Sulfur has an indirect importance, because sulfur compounds play a role in many body organs and systems. Sulfur is in the hair, skin, and nails. Many amino acids, the building blocks of protein, have sulfur as a component. Taurine is a sulfur-containing amino acid formed from methionine (2). Taurine stabilizes cell membranes (2). Methionine contains sulfur, detoxifies cells, and is involved in pain relief (2). Carnitine comes from methionine and transports long chain fatty acids preventing accumulations of lipoproteins (2). Many B-complex vitamins interact with or contain sulfur. Sulfur is needed for insulin production.

One current use of MSM is for joint problems, as sulfur is found in and near osseous structures. Sulfur supports healthy muscles, tendons, and ligaments. Arthritic conditions have responded to oral MSM. Some researchers note results from MSM when used for post-exercise muscle pain (1). MSM normalizes pressure inside cells and removes toxins. Oregon Health Sciences University has conducted arthritis studies with mice. The mice, which received MSM, had "no degeneration of articular cartilage" (1). The other non-MSM mice had cartilaginous degeneration. The university has used MSM on over 12,000 patents. Researchers make no claim about MSM as a supplement, but osteoarthritis, rheumatoid arthritis, muscle soreness and muscle pain respond to oral MSM.

One researcher claims MSM is about as safe as water. One should drink extra water with MSM use. There are other dietary factors to consider.

Avoiding nightshade plants has helped arthritis patients (tomatoes / potatoes / green pepper/eggplant). Biotin and vitamin C help the body assimilate MSM. Biotin and vitamin C are found in fresh fruits. Eating fresh fruits while taking MSM could be helpful.

In addition to arthritis, it may have other future uses. Dr. Stanley Jacob believes, 'most people are deficient' in sulfur (1). Insulin synthesis depends upon sulfur. Many vitamins require or contain sulfur. Some researchers claim it has many future uses such as in allergies (1).

A good MSM product is both safe and effective. The MSM source for MSM supplements is often lignin from pine trees. Lignin is a molecule in plants that is part of a plant's cell wall. Lignin oxidation in oak wine barrels results in the vanilla flavors of wines. The pine tree lignin is an ideal source for a good MSM product.

For those who do not want to take MSM as a supplement, food sources of sulfur are as follows: sunflower seeds, garlic, lentils, soybeans, and yogurt. Persons with kidney problems or recurrent kidney stones may not want to take MSM. Certain renal tubular defects can make a person susceptible to recurrent kidney stones (2). Other kidney defects include errors of metabolism in which processing of sulfur amino acids is altered (2). Such persons may wish to avoid MSM.

One thousand to three thousand milligrams per day is a typical dosage range, but some people take well above that amount. This author takes MSM alone.

From the cell walls of pine trees to the cells of the human body, a good MSM supplement can contribute to good health.

Conditions That Have Reportedly Responded to MSM Supplements

- **Acne**
- **Allergies**
- **Arthritis**
- **Asthma**
- **Candida Yeast Infections**
- **Carpal Tunnel Syndrome**
- **Chronic Fatigue**
- **Constipation**
- **Diabetes**
- **Digestive Disorders**
- **Fragile Hair & Nails**
- **Migraine Headaches**
- **Muscle Pain & Cramps**
- **Parasites**
- **Skin Damage & Aging**
- **Toxic Build-up**
- **Ulcers**

A body made up of healthy, flexible cells will not only feel better, it will look better too. The body is continuously at work replacing old, worn out cells with new ones. The process goes on 24 hours a day, 7 days a week, without stop. When all the raw materials needed for cell-building are available, it is a very efficient process. When there are deficiencies, the new cells may be weak, rigid or deformed.

One of the most important raw materials for building healthy new cells is a form of organic sulfur known as methyl sulfonyl methane (MSM). This element is so essential to life that it is found in every cell of every plant and every animal. Sulfur makes up 0.25% of human body weight. However neither plants nor animals can use elemental sulfur directly. Sulfur is not easily available to living organisms in its inorganic form.

MSM is not a medicine, a drug, or a food additive. It is a *food*. MSM is an organic form of sulfur that can be easily absorbed and utilized by the body. Although DMSO and MSM are chemically similar, each is unique. MSM is a pure, stable, white crystalline powder without the unpleasant smell or taste of DMSO. (1-3) Also, MSM does not give you a strong body odor like DMSO.

Since sulfur is a component of all cells, it is essential that the body have a plentiful supply of this mineral in its usable form. There is a positive synergistic effect on building healthier cells when MSM is taken in combination with vitamin C. The new cells are more pliable and permeable, allowing fluids to pass through the tissue more easily. (1) Internally this means more efficient elimination of toxins, a reduction in inflammation and pain - so you feel better. On the outside it shows up as a softer, smoother complexion, stronger hair and nails - so you look better.

MSM for Relief of Pain and Inflammation

Approximately half of the total body sulfur is concentrated in the muscles, skin and bones. One of the most significant uses of MSM as a supplement is its demonstrated ability to relieve pain and inflammation. When rigid fibrous tissue cells swell and become inflamed, pressure and pain result. Since MSM can restore flexibility and permeability to cell walls, fluids can pass through the tissues more easily. This helps equalize pressure and reduce or eliminate the cause of pain. Harmful substances such as lactic acid and toxins are allowed to flow out, while nutrients are permitted to flow in. This prevents the pressure buildup in cells that causes inflammation. (1)

MSM has shown a remarkable ability to reduce or eliminate muscle soreness and cramps both in geriatric patients and in athletes. It's even given to racehorses before a race to prevent muscle soreness, and afterward to reduce the risk of cramping. People with arthritis report substantial and long-lasting relief with MSM supplements. Taken along with glucosamine, a key substance in the process of rebuilding cartilage, MSM can relieve pain and help repair worn or damaged cartilage in joints, ligaments and tendons with healthy, flexible new cells. (1)

How Does MSM Work?

MSM makes cell walls permeable, allowing water and nutrients to freely flow into cells and allowing wastes and toxins to properly flow out. The body uses MSM along with Vitamin C to create new, healthy cells, and MSM provides the flexible bond between the cells. Without proper levels of MSM, our bodies are unable to build good healthy cells, and this leads to problems such as lost flexibility, scar tissue, wrinkles, varicose veins, hardened arteries, damaged lung tissues, dry cracking skin, digestive disorders, joint problems, and inability to defend against allergic reactions to food, animals and plants.

MSM is an anti-oxidant that helps to clean the blood stream and flush toxins trapped in our cells. It is also a foreign protein and free radical scavenger. In order to maintain good health, we need to supplement our diets with MSM, to enable the body to heal itself. The body uses what it needs, and after 12 hours will flush out any excess amounts.

The Beauty Mineral for Hair, Skin and Nails

Sulfur has been called nature's "beauty mineral" because it is needed to keep the hair glossy and smooth and keeps the complexion clear and youthful. It is needed for synthesis of collagen and is prevalent in keratin, a tough protein substance necessary for health and maintenance of the skin, nails and hair.

MSM is responsible for the flexible disulfide bonds between cells, including those that make up the skin. It blocks undesirable chemical and physical cross-linking or bonding of collagen, which is associated with tough, aging skin. Consequently MSM enhances tissue pliability and encourages repair of damaged skin. If there is insufficient sulfur in the body when new cells are being manufactured, the new cells will be rigid. This rigidity can contribute to cracking, wrinkling and unsightly scar tissue. When sufficient sulfur is present for new cells, the skin is softer, smoother and more flexible. MSM provides that sulfur.

Acne, including the severe acne rosacea, responds favorably to MSM supplements. Adequate sulfur and vitamin C are also needed for healing. When the body is deficient in these nutrients, the new tissue will be elevated leaving an unattractive, raised scar. Because MSM makes the skin more permeable and pliant, it can also help prevent blistering and promote faster healing from sunburn or wind damage.

With MSM supplements, nails show not only an increase in growth rate, but also increased toughness and resistance to chipping and cracking. This effect has been seen both in human nails and horses hoofs.

Allergens, Toxins and Parasites

Flexible, permeable cells are also important in that they allow toxins, allergens and foreign substances to be flushed out of the body more easily. When skin cells are soft and permeable, many toxins can be eliminated through the sweat glands, which takes some of the load off the liver and kidneys. While MSM is not a cure for allergies, supplementation may reduce symptoms by allowing allergens to be removed from the body more quickly. Even reactions to insect bites,

poison ivy and poison oak are less severe when the diet is supplemented with MSM. Vitamin C is also synergistic in this application in that it can lower histamine levels.

MSM has also shown amazing anti-parasitic action against Giardia, Trichomonas, roundworms, nematodes, Enterobius and other intestinal worms. When parasites attach themselves to the intestinal lining, they can live, reproduce and rob the body of nutrients indefinitely. MSM blocks parasites by competing for receptor sites on the mucous membrane. When parasites cannot attach themselves, they are simply flushed out of the system.

The same is true with food allergens. MSM coats mucosal surfaces and occupies the binding sites that could otherwise be used by challenging food allergens. It can also bind with offending agents to produce harmless substances, which are then excreted from the body. This facilitates normal digestion and assimilation and allows the body to get maximum nutritional value from foods that would otherwise cause a reaction. Individuals who experience an allergic response to certain foods have reported improved or complete tolerance to those foods when they take MSM supplements. Healthy flexible colon tissues along with improved digestion, can also relieve constipation.

Diabetes

Sulfur is also a component of insulin, the hormone that regulates carbohydrate metabolism and insufficient sulfur may result in decreased insulin production. It is also possible that a lack of bio-available sulfur would make the cells so rigid and impermeable that they become unable to absorb sugar from the blood efficiently, leaving blood sugar levels elevated. Studies indicate that regular MSM supplements which cause the cell to become permeable, could help balance blood sugar and allow the overworked pancreas to return to normal.

Why Supplement?

Since sulfur is present in every cell of every living thing, it might seem that we would get plenty of this essential mineral from dietary sources and should not need supplements, but that may not be the case. Meat, poultry, fish, eggs and dairy products are the main sources of dietary sulfur, but we have been advised to restrict or remove many of those foods from our diets. Vegetarians, especially those who do not eat eggs, are at particular risk for sulfur deficiency. Plants cells contain sulfur but not in abundant quantities and much of the MSM present in unprocessed foods is lost in washing, cooking or steaming. And, of

course, MSM levels decline noticeably with age - doesn't everything? So, the older you get, the more important it becomes to maintain adequate sulfur levels in the body.

Usage and Toxicity

Due to its positive effects, particularly in maintaining healthy cell formation, 2,000 to 6,000 mg. of supplemental MSM daily is recommended. Of course, the optimum daily dosage of MSM depends largely on body size, age and the nature and severity of any deficiency symptoms you may be experiencing. Since vitamin C provides a positive synergistic it should be taken along with MSM.

MSM ranks in the "extremely low" toxicity category with a toxicity profile similar to that of water. When oral supplements are taken, the body will distribute MSM where it is needed. After about 12 hours, any excess amounts will be flushed out of the body. MSM, a member of the sulfur family, should never be confused with sulfa drugs to which some people are allergic.

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