

# Methylsulfonylmethane



Also known as: **Dimethyl Sulfone**; **DMSO2**; **MSM**; **Methyl Sulfonylmethane**; **Methylsulphonylmethane**; **Methyl-Sulfonyl-Methane**

## Description

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Methylsulfonylmethane is a type of Sulfuric Compound that is naturally present in the body (i.e. it is an [endogenous](#) form of Sulfur). MSM is similar in chemical structure to (but claimed to be safer than) Dimethyl Sulfoxide (DMSO) - MSM is the active therapeutic constituent of DMSO and is also an oxidative metabolite of DMSO. It is odorless, tasteless and stable. Its physical format is a white crystalline powder.

## Health Benefits of MSM

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### Aging Process

- The body's content of MSM appears to decline in tandem with the progression of the **Aging Process**. [\[more info\]](#)
- MSM may inhibit the **Cross-Linking** of the body's endogenous Proteins (Cross-Linking of Proteins such as Collagen is a major aspect of the Aging Process). [references](#)

### Cardiovascular System

- MSM may improve **Blood Circulation**. [\[more info\]](#)

### Detoxification

- MSM is claimed to rapidly (within twenty minutes of ingestion) alleviate the symptoms of **Hangovers** (according to anecdotal reports). [\[more info\]](#)

### Digestive System

- MSM (500 - 2,000 mg per day) may prevent and treat **Constipation** (especially Constipation in elderly persons). [references](#)
- MSM (3,000 mg per day) may alleviate **Heartburn**. [references](#)
- MSM (3,000 - 10,000 mg per day) may prevent **Intestinal Parasites** from adhering to the Gastrointestinal Tract and may thereby facilitate the expulsion of Intestinal Parasites from the body: [references](#)
  - MSM may be an effective treatment for **Roundworms** (Nematodes). [references](#)
- MSM is claimed to prevent and treat **Intestinal Permeability** (MSM is claimed to coat the Mucous Membranes of the Intestines, preventing Antigens from entering the Bloodstream through the Intestinal Wall). [\[more info\]](#)

### Ears/Hearing

- MSM (instilled into the Ears via MSM eardrops) is claimed to alleviate **Age Related Hearing Loss** (according to many anecdotal reports). [\[more info\]](#)
- MSM (instilled into the Ears via MSM eardrops) is claimed to alleviate **Tinnitus** (according to many anecdotal reports). [\[more info\]](#)

### Excretory System

- MSM (as a constituent of Toothpaste or Mouthwashes) may alleviate **Halitosis**. [references](#)
- MSM may be an effective treatment for **Interstitial Cystitis**. [references](#)

### Eyes/Vision

- MSM (applied topically as eyedrops) may alleviate **Bloodshot Eyes**. [references](#)
- MSM (applied topically as eyedrops) may reduce intraocular pressure in **Glaucoma** patients. [\[more info\]](#)

### Immune System

- MSM (3,000 - 6,000 mg per day) may help to prevent and alleviate **Allergies** (including long-standing Food Allergies and Respiratory System Allergies). [references](#)
- MSM may help to prevent **Autoimmune Diseases**: [references](#)
  - MSM may help to prevent and treat **Lupus Erythematosus** (SLE form). [references](#)
- MSM may help to prevent **Breast Cancer**. [references](#)
- MSM may help to prevent **Colon Cancer**. [references](#)

- MSM may help to prevent the **Common Cold**. [references](#)
- MSM (consumed orally) may inhibit some types of **Detrimental Fungi** and MSM (lotion applied topically) may destroy many types of Detrimental Fungi that reside on the Skin including: [\[more info\]](#)
  - **Histoplasma capsulatum** [references](#)
- MSM may inhibit some types of **Detrimental Protozoa** including: [\[more info\]](#)
  - **Entamoeba histolytica** (especially when MSM is used concurrently with Cat's Claw). [\[more info\]](#)
  - **Giardia lamblia** (which causes **Giardiasis**) [references](#)
  - **Trichomonas** [references](#)
- MSM may reduce **Inflammation**. [\[more info\]](#)
- MSM may help to prevent **Influenza**. [references](#)

#### Metabolism

- MSM may inhibit the **Cross-Linking** of the body's endogenous Proteins (Cross-Linking of Proteins such as Collagen is a major aspect of the Aging Process). [references](#)
- MSM may alleviate **Diabetes Mellitus** (by facilitating the endogenous production of Insulin and by decreasing Insulin Resistance). [references](#)
- MSM (4,000 mg per day) may reduce the toxic accumulation of Lactic Acid following **Exercise** and may accelerate the recovery from Exercise. [references](#)
- MSM is claimed to alleviate **Fatigue**.
- MSM may decrease **Insulin Resistance** (by increasing the permeability of Cells which may cause them to become more responsive to the actions of Insulin). [references](#)

#### Musculoskeletal System

- MSM (orally or topically) is claimed to alleviate the Pain associated with **Backache**. [\[more info\]](#)
- MSM may alleviate the Pain and Inflammation associated with **Bursitis**. [references](#)
- MSM (consumed orally and/or lotion applied topically) may reduce the Inflammation and Pain associated with **Carpal Tunnel Syndrome**. [references](#)
- MSM may enhance the health of the body's **Cartilage** (by contributing its Sulfur content to Cartilage). [references](#)
- MSM (consumed orally and/or lotion applied topically) may alleviate the Pain and Inflammation associated with **Epicondylitis**. [references](#)
- MSM may accelerate the healing of **Fractures** (according to anecdotal reports).
- MSM may be a useful treatment for some of the symptoms of **Fibromyalgia**. [references](#)
- MSM may alleviate the Pain and Inflammation of the Joints that is associated with **Gout** (but may require several weeks of daily supplementation before its beneficial effects become apparent). [references](#)
- MSM may improve the function of the **Joints** and alleviates Joint Pain. [references](#)
- MSM may concentrate in **Mucous Membranes**. [references](#)
- MSM (especially when combined with supplemental Vitamin C) may alleviate **Muscle Cramps**. [references](#)
- MSM may alleviate **Muscle Pain**. [references](#)
- MSM (2,250 mg per day) may alleviate **Osteoarthritis** (by improving the integrity of Cartilage and Joints). [references](#)
- MSM has been reported anecdotally to cure some cases of **Polymyalgia Rheumatica**. [\[more info\]](#)
- MSM may alleviate the Pain and Inflammation associated with **Rheumatism**. [\[more info\]](#)
- MSM may alleviate the Pain and Inflammation associated with **Rheumatoid Arthritis** and may inhibit the further degeneration of Cartilage in Rheumatoid Arthritis patients. [references](#)
- MSM may alleviate the Pain and Inflammation associated with **Tendonitis**. [references](#)
- MSM (consumed orally and/or lotion applied topically) may alleviate the Pain and Inflammation associated with **Tennis Elbow**. [references](#)

#### Nervous System

- MSM (3,000 - 9,000 mg per day) may increase **Alertness**. [references](#)
- MSM (3,000 - 9,000 mg per day) may alleviate **Anxiety**. [references](#)
- MSM (rarely) may alleviate **Migraines**. [references](#)
- MSM (3,000 - 9,000 mg per day) may increase **Concentration** ability. [references](#)
- MSM (3,000 - 9,000 mg per day) may improve **Mood**.
- MSM may alleviate **Nausea**. [references](#)

- MSM may alleviate **Pain** (it is speculated that MSM may inhibit the transmission of Nerve Impulses associated with Pain). [references](#)
- MSM (16% water-soluble solution of MSM administered to each nostril 15 minutes prior to Sleep) may reduce **Snoring** in chronic Snoring sufferers. [references](#)
- MSM may minimize the toxic effects associated with excessive **Stress**. [references](#)

#### Oral Health

- MSM (as a constituent of Mouthwash or Toothpaste) may alleviate **Gingivitis**. [references](#)

#### Respiratory System

- MSM may alleviate **Asthma** (where Asthma is caused by Allergies). [references](#)
- MSM is claimed to reverse **Emphysema** (according to some physicians' observations) and supplemental MSM may improve walking distance in Emphysema patients. [references](#)
- MSM (2,600 mg per day) may reduce the symptoms of **Hay Fever**. [references](#)

#### Sexual System

- MSM (3,000 - 5,000 mg per day orally or MSM cream applied topically to the Penis) is claimed to be useful for the treatment of **Peyronie's Disease**. [references](#)
- MSM is claimed to alleviate the Headaches associated with (the PMS-C form of) **Pre-Menstrual Syndrome** (PMS) (according to anecdotal reports). [\[more info\]](#)

#### Skin/Hair/Nails

- MSM (consumed orally or lotion applied topically) may alleviate **Acne**. [references](#)
- MSM (lotion applied topically) may alleviate **Dry Skin**. [\[more info\]](#)
- MSM (administered orally) may improve **Hair Condition**. [references](#)
- MSM (administered orally) may increase Hair Growth and may therefore be useful for persons experiencing **Hair Loss**. [references](#)
- MSM (lotion applied topically) may alleviate **Insect Bites/Stings** and many people who consume oral MSM report milder reactions to subsequent Insect Bites/Stings. [references](#)
- MSM (administered orally or lotion applied topically) may minimize the **Itching** associated with Insect Bites/Stings and contact with Poison Ivy and Poison Oak. [references](#)
- MSM (administered orally) may facilitate the growth of **Nails** (due to its Sulfur content). [references](#)
- MSM (lotion applied topically) may alleviate **Psoriasis**.
- MSM (lotion applied topically) may alleviate **Rashes**. [references](#)
- MSM (consumed orally or lotion applied topically) may alleviate **Rosacea**. [references](#)
- MSM (applied topically or consumed orally) may help to prevent **Scarring** and may eliminate some existing Scars. [references](#)
- MSM may "soften" the Skin of **Scleroderma** patients and may restore a significant amount of elasticity to the Skin of Scleroderma patients. [references](#)
- MSM (lotion applied topically) may alleviate the lesions associated with **Shingles**.
- MSM (administered orally or lotion applied topically) may help to prevent the undesirable Cross-Linking of the Collagen content of the **Skin** (Cross-Linking of the Skin's Collagen content is associated with **Wrinkles**). MSM also increases the elasticity of the Skin. [references](#)
- MSM (500 - 2,000 mg per day consumed orally or lotion applied topically) may alleviate **Sunburn**. [references](#)
- MSM may accelerate the healing of **Wounds**. [references](#)

### **MSM may Enhance the Function of these Substances**

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#### Amino Acids

- MSM contributes its Sulfur component to **Methionine** and (to a lesser extent) **Cysteine**. [references](#)

#### Carbohydrates

- MSM contributes its Sulfur component to **Chondroitin Sulfate** (CSA).

#### Hormones

- MSM may facilitate the production of **Insulin** (by donating its Sulfur content to Insulin). [references](#)

#### Immune System Chemicals

- MSM contributes its Sulfur component to **IgG**. [references](#)

#### Minerals

- MSM provides a highly bioavailable source of **Sulfur** to the body (Sulfur is utilized in the production of, and is a component of, many endogenous compounds of the body): [references](#)
  - Elemental Sulfur comprises 34% of the MSM molecule.
  - Vitamin C facilitates the conversion of supplemental MSM to endogenous Sulfur.

#### Proteins

- MSM may facilitate the formation of **Collagen** (by donating its Sulfur content to Collagen): [references](#)
  - MSM may inhibit the (undesirable) Cross-Linking of the body's Collagen content.
- MSM contributes its Sulfur component to **Keratin (Keratin Sulfate)**. [references](#)

#### Sulfuric Compounds

- MSM is believed to be the active therapeutic constituent of **Dimethyl Sulfoxide (DMSO)**.

### **MSM may Reduce the Toxic Effects of these Substances**

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#### Minerals

- MSM may facilitate the removal of **Aluminium** from the body. [more info]
- MSM may facilitate the removal of **Mercury** from the body. [references](#)

#### Organic Acids

- MSM may reduce the accumulation of **Lactic Acid** following Exercise.

### **These Substances may Enhance the Function of MSM**

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#### Vitamins

- The therapeutic effects of MSM are enhanced by the concurrent use of 2,000 mg of supplemental **Vitamin C** per day (Vitamin C is essential for the metabolism of [exogenous](#) MSM to [endogenous](#) Sulfur). [references](#)

### **Dietary Sources of MSM** [references](#)

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- MSM is a constituent of raw Fruits, Vegetables (especially Cruciferous Vegetables), Seafoods, Meat and Milk. It is extremely volatile and is highly susceptible to loss and degradation during Food Processing. Most people do not ingest significant amounts of MSM from Food (unless the diet is composed primarily of raw Foods).

#### (mg of MSM per 100 grams)

<b>Dairy Foods:</b>	Milk (cow's)	0.33	
<b>Herbs:</b>	Tea	0.03	Alfalfa trace
	Horsetail	trace	
<b>Processed Foods:</b>	Coffee	0.16	
<b>Vegetables:</b>	Tomatoes	0.086	Swiss Chard 0.005
	Corn	0.011	

### **MSM as part of the Global Sulfur Cycle**

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- MSM is the stable end product of the methyl-S-methane global Sulfur cycle which distributes bioavailable Sulfur for all animal and plant life. Approximately 85% of Sulfur (for life) is derived from the pathway:
  - Sulfonium Salts > Dimethylsulfide > Dimethyl Sulfoxide (DMSO) > Methylsulfonylmethane (MSM)
  - Sulfonium Salts (produced by phytoplankton in Water) yield the volatile thioether named Dimethylsulfide which is released into the upper atmosphere.
  - Sunlight catalyzes the oxidation of Dimethylsulfide to DMSO.
  - DMSO is further oxidized in the upper atmosphere (by Sunlight) to form MSM.

- This MSM is then concentrated into raindrops which return to the surface of the earth.
- Plants absorb and accumulate this MSM (and use some of this MSM for building Sulfuric compounds).

## Safety of MSM [references](#)

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- The **LD 50** of MSM is so high that it has not yet been determined (its safety is similar to that of Water):
  - Rabbits fed up to 20 grams of MSM per kg of body weight have a 100% survival rate.
  - Primates whose Blood levels of MSM were maintained at greater than 1 gram per kg of body weight for two years were free of any toxic effects.
  - Human subjects administered 500 mg of MSM per kg of body weight (intravenous administration) for six successive days experienced no measurable toxicity.
- No allergic reactions have ever been associated with human MSM use.
- There are no known contraindications to MSM use.

## Bioavailability [references](#)

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- Ingested MSM enters almost all tissues of the body within 24 hours of its oral ingestion.
- Most unused or metabolized MSM is excreted from the body within 96 hours of its ingestion (although some MSM remains in the body for up to 400 hours (16 days) after its ingestion.
- The **half-life** of MSM is approximately 38 hours.
- MSM is excreted from the body primarily via the Urine. Lesser amounts are excreted via Saliva, exhaled air and Perspiration.
- MSM remains within the body for a longer period than its "sister" compound - DMSO.
- MSM is capable of crossing the **Blood-Brain Barrier**.

## Human MSM Levels [references](#)

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- MSM is naturally-present in human plasma at a concentration of 700 – 1,100 ng/mL.

## Dosage Recommendations [More Information about MSM Dosages](#)

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### General Therapeutic Dosage

- The minimum effective dosage of supplemental oral MSM is **750 - 1,500 mg** per day.
- The optimal dosage of supplemental MSM is presently regarded as **2,000 - 6,000 mg** per day.
- The usual therapeutic dosage of supplemental MSM for the alleviation of Pain is 2,250 mg per day.

### Toxic Dosage

- Doses of up to **30,000 mg** (30 grams) of MSM have been used on a daily basis without adverse effects occurring.

### "Waiting Period"

- Most people who use supplemental MSM do not notice any therapeutic effects until they have used MSM on a daily basis for several days. Some people do not experience therapeutic effects until MSM has been used daily for several weeks.

## Commercial Availability of MSM

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### Oral Products

- MSM is available from health food stores and mail order supplement companies in the form of:
  - MSM powder (crystals)
  - 100 mg capsules
  - 500 mg capsules
  - 1,000 mg capsules
  - 400 mg tablets
  - 500 mg tablets

- 750 mg tablets
- liquid MSM (one teaspoon contains 390 mg of MSM)
- liquid MSM Oral Spray (designed to prevent Snoring)

#### Topical Skin Products

- MSM **lotion** for topical application is available from some health food stores and internet-based suppliers (some products contain 15% MSM).
- MSM Skin Cream containing 10% MSM.

#### Topical Dental Products

- MSM Toothpaste (containing 5% MSM).

#### Topical Eye Products

- MSM **Eyedrops** for topical application to the Eyes is available from some health food stores and mail order supplement companies (it is usually only sold in the USA and Canada).

#### Topical Hair Products

- MSM Hair Conditioner.
- MSM Hair Shampoo.

### **Chemical Data**

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#### Molecular Formula

- CH<sub>3</sub>SO<sub>2</sub>CH<sub>3</sub>

### **Related Topics**

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- [Dimethyl Sulfoxide](#)
- [Sulfur](#)
- [Sulfuric Compounds](#)