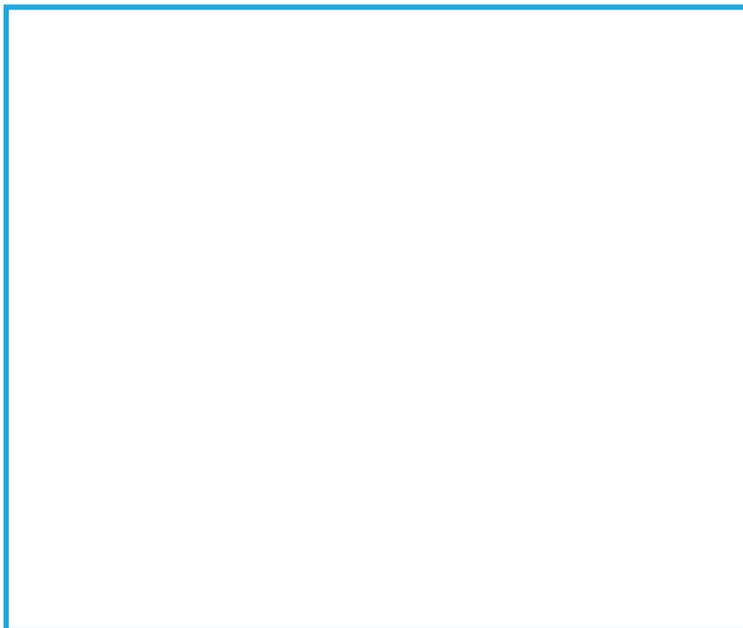


Glucosamine Chondroitin MSM



120C

Ingredients

Glucosamine/Chondroitin/MSM contains pure glucosamine sulfate, as confirmed by HPLC testing. Glucosamine sulfate is extracted from chitin, a long-chain polymer consisting of many glucosamine molecules linked together. Chitin forms structural frameworks in many living things, including aquatic crustaceans such as lobsters, crabs, and shrimp. In our formula, the glucosamine is purified and then sulfated and stabilized with potassium chloride.

Note: Glucosamine sulfate is derived from the shells of oceangrown shellfish. It is processed to remove all residues of protein and impurities, yielding pure glucosamine sulfate as the final material.

Glucosamine/Chondroitin/MSM contains chondroitin sulfate with a purity of 90 percent or greater. Quality assurance testing is performed using two sophisticated laboratory analysis methods: High-Performance Liquid Chromatography (HPLC), and Cetyl Pyridinium Chloride (CPC) Titration.

Glucosamine/Chondroitin/MSM features OptiMSM® methylsulfonylmethane, MSM distilled to be 99.9% pure. A biological compound that occurs in the human body and in some foods, MSM is an excellent dietary source of bioavailable organic sulfur.

The MSM Story-One of Nature's Primary Sources of Organic Dietary Sulfur!

The human body requires a continuous supply of usable sulfur, and MSM is one of the primary organic sulfur-containing molecules for use by living organisms. From life's earliest beginnings, primitive marine organisms (blue-green algae and phytoplankton) have absorbed inorganic sulfur from ocean waters and produced organic sulfur molecules, primarily dimethyl sulfonium salts. These salts are released back into the sea, where they are converted to dimethyl sulfide, which readily evaporates, ending up in the upper atmosphere. Dimethyl sulfide is then oxidized by UV light, forming DMSO and MSM. The two compounds are delivered to land masses in rain water, and absorbed by plants. MSM is a stable end product of this process, serving as a primary source of sulfur in the food chain.

240C

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Benefits

Supports Joint Structure, Function, and Comfort*

The Roles of Glucosamine and Chondroitin Sulfate in Joints

Articular cartilage is a connective tissue composed of specialized cells (chondrocytes) embedded in a matrix of protein fibers (mostly collagen) and clusters of complex proteoglycan molecules that consist of a protein core with numerous side chains. These side chains, chiefly chondroitin sulfate and keratin sulfate, are long polysaccharide molecules called glycosaminoglycans. Chondroitin sulfate (CS) and the other glycosaminoglycans strongly attract water due to the negative charges of their sulfate groups. These negative charges also repel each other, creating spaces between glycosaminoglycan side chains where water can enter. This combination of solid and liquid results in articulating tissue that is necessary for the normal function of healthy joints.¹

Glucosamine is a fundamental building block for proteoglycans and glycosaminoglycans. Glucosamine sulfate (GS) helps to maintain joint health through its ability to both act as a component of and stimulate the manufacture of glycosaminoglycans and the hyaluronic acid backbone essential for proteoglycans.²

The Abundant Evidence Behind Glucosamine and Chondroitin Sulfate

Extensive joint health research over the past few decades has investigated the effects of glucosamine sulfate, chondroitin sulfate, or a combination of the two. A 2009 meta-analysis summarized results from 6 well-designed studies involving a total of 1,502 research participants. The authors of this meta-analysis were able to make some conclusions about the apparent effectiveness of long-term oral supplementation with CS or GS. Glucosamine sulfate at 1,500 mg daily over a period of at least 3 years and chondroitin sulfate at 800 mg daily over a period of at least 2 years both helped subjects maintain healthy knee cartilage structure.³ In a 2008 review of GS & CS used for joint support, the London physician who wrote it concludes that, "Glucosamine, chondroitin, and the combination of these two agents have stood the test of time."⁴

Glucosamine sulfate is one of the most important—and thoroughly researched—dietary supplements for joint health ever developed.⁵ In addition to its potential to influence joint structure (and thus function), research also backs the ability of GS to influence joint comfort. In one such multicenter, randomized, double-blind, parallel-group study of 252 subjects, joint comfort in the knee was found to be higher in the glucosamine sulfate group than the placebo group.⁶ Similar studies of equal magnitude found that GS enhanced joint comfort.^{7,8} Key among findings from these types of studies is the reoccurring theme of a good safety profile for glucosamine sulfate; reported "side effects" of GS were essentially no different than placebo.

Similar to glucosamine, chondroitin sulfate is known to influence the maintenance of healthy joints—in this case by acting on matrix metalloproteases (MMPs). Chondroitin sulfate has been shown to inhibit MMP-3 synthesis, which plays an important role in homeostasis of proteoglycans. Additionally, CS can downplay MMP-13 in chondrocytes, helping to maintain the integrity of articular matrix.⁹

Clinical Trials Explore MSM's Joint Action

Results from a randomized, double-blind, placebo-controlled pilot trial examining the effect of MSM supplementation on joint comfort in 50 men and women are promising. Subjects taking OptiMSM® methylsulfonylmethane for 12 weeks experienced greater joint comfort than those taking placebo, suggesting potential for MSM as a joint support nutrient that warrants further investigation in larger clinical trials.¹⁰ MSM also produced statistically significant changes in urinary malondialdehyde, a marker of oxidative stress.



360C

Supplement Facts

Serving Size 2 capsules
Servings per container 180 servings

	Amount per serving	% Daily Value
Chloride (from glucosamine sulfate 2KCl)	84 mg	2%
Sodium (from chondroitin sulfate sodium)	28 mg	1%
Potassium (from glucosamine sulfate 2KCl)	91 mg	3%
Glucosamine sulfate 2KCl	750 mg	†
Chondroitin sulfate (from chondroitin sulfate sodium)	600 mg	†
Methylsulfonylmethane (MSM)	500 mg	†

† Daily Value not established.

Other Ingredients: Gelatin (capsule), microcrystalline cellulose, magnesium stearate (vegetable source).

Suggested Adult Use: Take 2 capsules twice daily, with or without food, or as recommended by a nutritionally informed physician.

Contains shellfish (crab, shrimp, lobster, crayfish)

Non-GMO and Gluten Free

Store in a cool dry place.

MSM has also been used in combination with glucosamine to study their impact on the health of joints. In one such study, a total of 118 subjects were randomized into one of four groups for 12 weeks: glucosamine (500 mg three times daily), MSM (500 mg three times daily), the combination of glucosamine and MSM, or a placebo treatment. Glucosamine alone and MSM alone were shown to promote joint function, while the combination was found to be even more effective, by both subjective and objective measurements.¹¹

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Scientific References

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