

What is Glucosamine?

Glucosamine is an amino sugar, a small molecule made by cartilage cells, and is the building block for glycosaminoglycans (GAG's). GAG's are larger molecules that maintain the resilient structure of articular cartilage, and its "shock-absorbing" and joint lubricating functions.

Glucosamine is produced naturally by cartilage cells. It is also produced by shellfish and can be extracted from their shells. For glucosamine to be absorbed, it needs to be bound to another molecule in the form of a salt. Glucosamine hydrochloride is the most suitable salt form. Glucosamine stimulates metabolic function in cartilage and boosts production of cartilage building proteins.

What is Chondroitin Sulphate?

Chondroitin sulphate is a GAG produced by cartilage and some other body tissues. It binds with cartilaginous collagen so the cartilage can be strong, slippery and flexible. It also inhibits production of enzymes that break down and destroy cartilage. Chondroitin sulphate is the most abundant GAG in cartilage. There are two forms of chondroitin sulphate; chondroitin-4-sulphate and chondroitin-6-sulphate. Chondroitin-4-sulphate is the most abundant in mammalian (e.g. human) cartilage, while chondroitin-6-sulphate is derived primarily from shark cartilage. These two types of chondroitin are not the same and can vary greatly in molecular weight and size. CosaminDS contains chondroitin-4-sulphate. As we age, our cartilage cells produce less chondroitin-4-sulphate. This is associated with the normal progressive degeneration of cartilage. Supplemental chondroitin-4-sulphate helps to maintain the structural integrity of cartilage and inhibit the enzymes that gradually destroy it. Although it is a large molecule, radio-labelled studies have shown that over 70% of high quality chondroitin sulphate is absorbed unchanged.

What is the role of Manganese Ascorbate?

Manganese is an essential trace element and co-factor in the synthesis of GAG's. When added to glucosamine, efficient GAG production is stimulated. A deficiency of manganese limits the production of cartilage and synovial (joint) fluid. Manganese ascorbate is easily absorbed from the digestive tract.

Why is it important to use Glucosamine and Chondroitin together?

The glucosamine and chondroitin in CosaminDS work in a synergistic way to support joint cartilage. Taking these two compounds together in the correct proportions, is better than taking either alone, because they have different but complementary actions. Glucosamine helps stimulate cartilage, while chondroitin decreases cartilage breakdown.

What Data Supports the Effectiveness and Safety of CosaminDS?

CosaminDS is the only glucosamine/chondroitin product supported by controlled clinical trials(2, 3). Some recently published studies are indicated on the back page and are available on request or on our website. There are also many published studies supporting the function and safety of the individual ingredients in both animals and man(4, 5). A comprehensive reference list of these studies is available on our website(www.biocel.co.nz).

The Cosamin formulation and manufacturing process was developed by Nutramax Laboratories Inc of the USA, over 10 years ago. CosaminDS is now used widely throughout the world and has achieved an international reputation for quality, effectiveness and safety. On-going research and clinical studies are in progress. Recognising the importance

of product quality and consistency, a recent continuing education course for US physicians recommends that they use the "brand name used in clinical trials".(6)

1. Woodward JR, Lippiello L, Karpman R, Paper #48, 66th Annual Meeting American Academy of Orthopaedic Surgeons, February 3, 1999, Anaheim, CA
2. Hungerford DS, Orthopaedic Special Edition, p.3.9-42, January-April 1998.
3. Das AK, Eitel J, Hammad TA, Paper #180, 66th Annual Meeting American Academy of Orthopaedic Surgeons, Anaheim, CA, February 6, 1999.
4. Leffler CT, Philippi AF, Leffler SC, Mosure JC, Kim PD, Military Medicine, 164:2:85-91, February 1999.
5. Davis MW, Drug Topics (CE Accredited Supplement) p.35-135, April 1998.
6. Das A, Orthopaedic Special Edition, (CME Accredited Insert), 5:1:1-4, February 1999.

Why is CosaminDS different from other Dietary Supplements?

CosaminDS is a unique, patented formulation of glucosamine, chondroitin and manganese ascorbate.

- Only this particular formulation has been extensively researched in controlled clinical trials and been shown to be safe and effective.
- It is used as a supplement by people worldwide, and has a long and proven track record of user satisfaction.
- CosaminDS is the only glucosamine/chondroitin product supported by controlled clinical studies. In addition, there are many published studies documenting the functional and structural effects of the formulation in both man and animals(1).
- CosaminDS is produced in state of the art manufacturing facilities, that conform to GMP (Good Manufacturing Practice) Standards. Consistent batch purity and uniformity is verified by a strict Quality Assurance programme.
- As well as the quality and purity of ingredients used in its manufacture, it is the specific amount of ingredient in each capsule which ensures that CosaminDS delivers a highly predictable response. Only a specific source and molecular range of chondroitin-4-sulphate is included in CosaminDS, and the glucosamine and manganese ascorbate are of the highest purity.

Are there any Disadvantages in using CosaminDS?

- CosaminDS has an excellent safety record. Safety studies have shown no demonstrable toxicity. A small percentage of people may experience mild, reversible intestinal flatulence, especially at initial dose rates. This can be alleviated by taking CosaminDS with food followed by a glass of water. At maintenance rates, there are no known disadvantages.
- Unlike NSAID's, whose usefulness can be limited by their side effects, CosaminDS has no similar disadvantages. There are no known interactions with any drug or other nutritional supplement and no known contraindications.
- Carefully designed studies have determined that CosaminDS has no clinical effect on blood clotting. However many factors can influence blood clotting. It is recommended people taking warfarin or other anticoagulants have clotting times evaluated at intervals when taking CosaminDS.
- Although glucosamine and chondroitin are carbohydrates, they are not metabolised to glucose, but because many factors can affect insulin and glucose levels, it is recommended that diabetics monitor blood glucose levels regularly when commencing CosaminDS.

- No studies have evaluated CosaminDS during pregnancy or lactation, so use of CosaminDS during pregnancy should be an individual decision made after consultation with a physician.

Why is CosaminDS Available Only from Biocel Health Ltd?

Biocel Health Ltd has been established by health professionals to market only highest quality, proven nutraceuticals. CosaminDS meets our strict criteria for quality, safety and efficacy. It is not available via mail order companies or from health stores or other retail outlets.

We believe appropriate information and advice should accompany any consumer decision to choose CosaminDS, or any other Biocel Health nutraceutical. Such information can be accessed from our website (www.biocel.co.nz) or by contacting Biocel's health professionals on 0800 BIOCEL (0800 246 235).

To ensure consumers can make a well informed choice based on accurate and comprehensive information, it is our policy to first help individuals determine that CosaminDS is appropriate for them to use. Hence we recommend seeking the advice or opinion of a health professional before commencing CosaminDS.

Biocel Health supports and reinforces the need to consider any weight, dietary, exercise or lifestyle changes that may help with management of degenerative joint conditions. We supply an information resource kit with each Starter Pack of CosaminDS and promote using the continuing support of health professionals, the Arthritis Foundation, and others who offer support services.

To maintain this information access and support, we provide CosaminDS only by direct delivery to consumers.

Delivery Options for CosaminDS

Starter Pack

New users begin with a starter pack containing 180 capsules to ensure sufficient for the initial 60 day period, by which time the benefit of CosaminDS is generally apparent. The pack includes a resource kit containing information on the management of degenerative joint disease, how to use CosaminDS, a daily planner and other useful items.

Maintenance/Refill Packs

CosaminDS can be re-ordered directly via the phone number 0800 BIOCEL (0800 246 235) in packs of 90 or 180 capsules.

How Should CosaminDS be Used?

CosaminDS comes in easy to swallow capsule form ensuring the ingredients maintain their quality and integrity. Each container has an airtight seal and desiccant to preserve the product during storage.

The capsules may be split apart and the powdery contents may be mixed with food or a drink if desired.

It is best to commence taking CosaminDS at a high initial dosage until benefits are experienced. Then the dosage can be reduced to a maintenance level that suits the individual. (See recommendations)

When May the Effects of CosaminDS be Experienced?

CosaminDS is a nutraceutical, a product having the characteristics of both a nutrient and a pharmaceutical. By their very nature, nutraceuticals do not provide the immediate effects that may be expected from drugs. It takes some time before the benefits of a nutraceutical may become apparent.

With CosaminDS, it is typically 4-8 weeks before the benefits become apparent. It takes time for articular cartilage to metabolise the supplemented nutrients and synthesise the components that assist the restoration of joint mobility. How quickly and effectively this occurs depends on many factors, including the severity of joint degeneration present, the nature of the degeneration, and the ability of the cartilage cells to respond to the supplemented nutrients.

Other influences on the time until benefits of CosaminDS develop may include changes in weight, diet, life-style, type and level of exercise, and the effects of any medications.

- For mild to moderate cases of joint degeneration:
Where immediate relief from soreness and stiffness may not be considered necessary, CosaminDS alone may be sufficient to manage the condition. In such cases, benefits may be expected within 4-8 weeks.
- For more severe or chronic cases of joint degeneration:
NSAID's (non-steroidal anti-inflammatory drugs) or other medication may manage pain relief while CosaminDS is used to improve joint structure and function. When satisfactory cartilage response is achieved, a reduction or withdrawal from NSAID's may be managed.
- Where joint damage is due to injury: CosaminDS assists the natural repair processes by providing the nutrients cartilage requires.

When may CosaminDS be Beneficial?

Of the degenerative joint conditions, osteoarthritis (OA) is the most common form of arthritis. OA affects many people over the age of 45 and is more common in women. It can affect younger people, often sports people with joint injuries. Characteristics of OA include soreness, stiffness, and reduced mobility and flexibility of the affected joints.

Relief from pain and the ability to enjoy an active life are major priorities for many with degenerative joint disease.

A wide range of medical options are available to relieve symptoms. They include NSAID's (non-steroidal anti-inflammatory drugs), corticosteroids and intra-articular "lubricants". All can be very effective at relieving pain, but seldom support the structural and functional needs of articular cartilage, or work to reduce the degenerative processes.

Nutritional supplementation with CosaminDS approaches the problem of joint degeneration in a different way. CosaminDS supports cartilage function and helps diminish further degeneration.

CosaminDS can assist people:

- experiencing the early symptoms of joint degeneration,
- wishing to reduce reliance on NSAID's or other medication,
- who would benefit from help with the natural repair processes for injured joints,
- wishing to maintain joint integrity and reduce the impact of normal degenerative processes.

The benefits include:

- improved joint mobility and a return to enjoyable exercise,
- a reduction in the reliance on NSAID's,
- improved joint structure and function through provision of the necessary nutrients.
- Where severe joint degeneration has occurred and there may be little articular cartilage left to buffer the impacts of "bone on bone", CosaminDS may be of limited help. Neither may it help where joint degeneration is due to reasons other than joint wear and tear or joint injury, such as with rheumatoid arthritis.