

## TECHNICAL MONOGRAPH

PRODUCT NAME: GLUplus

CONSTITUENTS:	Common Name	Botanical Name
	Chondroitin	
	MSM	
	Glucosamine hydrochloride	

## INTENDED PURPOSE

GLUplus is a nutritional aid designed for cartilage maintenance and rebuilding. It has ingredients that inhibit the activity of enzymes that break down cartilage.

## EVIDENCE FOR EFFICACY

- **Chondroitin sulphate is a complex structural carbohydrate that is the main structural component of cartilage and provides much of its resistance to compression. Oral supplements of chondroitin sulfate improve synovial fluid properties in osteoarthritis patients, reduce inflammatory markers and oxidative stress. When used with glucosamine it may prevent cartilage GAG degradation. Chondroitin has beneficial effects on the metabolism of tissues involved in osteoarthritis including chondrocytes, synoviocytes and cells from subchondral bone (Hochberg et al. 2013; Dechant et al. 2005; Matsuno et al. 2009). Alleviated symptoms of degenerative joint disease are evidenced by improved stride characteristics in horses (Forsyth et al. 2006).**
- **Glucosamine hydrochloride** is one of two forms of glucosamine that can be provided as an oral supplement for reducing the pain, inflammation and oxidative stress associated with joint disease. It has also been shown to improve synovial fluid properties in joints of osteoarthritic patients. (Block et al. 2010; Kantor et al. 2013; Matsuno et al. 2009) and is associated with alleviating signs of inflammation and stride length in horses (Forsyth et al. 2006).
- **Methyl sulfonyl methane (MSM)** is a naturally occurring sulfur compound with well-known antioxidant and anti-inflammatory properties. MSM alleviated pain, inflammation and improved physical function on osteoarthritis patients (Debbi et al. 2011; Kalman et al. 2012). These benefits were enhanced when MSM was used in combination with glucosamine (Usha and Naidu 2004). Chronic daily oral supplementation exerts protective effects on oxidative and inflammatory exercise-induced injury in humans and horses (Marañón et al. 2008).

## References

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