

## LAMENESS IN HORSES AND ITS IMPACT

Lameness in horses is a major concern, as it is the **main cause of training days lost and failure to compete.**<sup>1,12</sup>

It is also the **primary reason for poor performance and early retirement** of competing horses.<sup>12</sup>

Approximately **60% of lameness in horses is related to OA** and up to **33% of equine patients assessed in hospital had visible intra-articular lesions related to OA.**<sup>4,12</sup>

**±80%**  
of lameness in the  
hindlimbs is seen  
below the stifle.<sup>1</sup>

**±95%**  
of lameness in the  
forelimbs occurs  
below the knee.<sup>1</sup>

### CAUSES OF LAMENESS AND ASSOCIATED OSTEOARTHRITIS IN HORSES:<sup>1,12</sup>

- Trauma to the joint;
- conformation;
- developmental defects;
- infection;
- metabolic disturbances;
- circulatory and nervous disorders;
- shoeing;
- nutritional deficiencies;
- management and environmental factors;
- and ageing.

## THE CARTILAGE MATRIX IN AN ARTHRITIC JOINT

In osteoarthritic cartilage the metabolism of chondrocytes gets disturbed, causing the slowdown of production of extracellular matrix components and the decrease of essential building blocks of cartilage like hyaluronan and proteoglycans.<sup>5,8</sup>

Joint inflammation causes destructive enzymes to increase, leading to the breakdown and degeneration of the structure within the cartilage.<sup>2</sup>

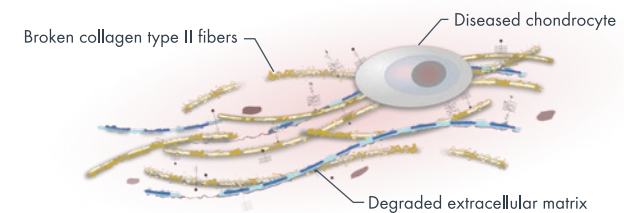


Image of diseased cartilage with degraded extracellular matrix<sup>2</sup>

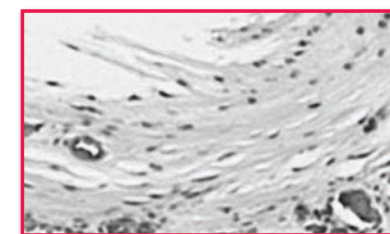
Over time this breakdown causes the cartilage to thin and become brittle and uneven, giving way to:<sup>2,3,5</sup>

#### MACROSCOPIC LESIONS:

- subchondral bone destruction;
- formation of osteophytes or bone spurs;
- meniscal lesions;
- and fibrillation and erosion of the cartilage.

#### MICROSCOPIC LESIONS:

- disorganisation of the chondrocytes;
- decrease of proteoglycans;
- and synovial inflammation.



Healing is often delayed as cartilage lacks both nerves and blood vessels.<sup>3</sup>

## THE BAR HAS BEEN RAISED.



### A NUTRITIONAL AID FOR THE PRODUCTION, PROTECTION AND RESTORATION OF CARTILAGE MATRIX IN JOINTS



COLLAGEN  
TYPE II



ASU



CHONDROITIN  
SULPHATE



GLUCOSAMINE



MSM

## WHAT LIES BENEATH

TREATING THE PROBLEM, NOT JUST THE SYMPTOMS







### ABSORPTION

Studies show that glucosamine is rapidly absorbed (2 hours), metabolized and bound to plasma globulins and distributed into tissues to the extent that only 1% of glucosamine remain free in plasma.<sup>2,13</sup>

Both glucosamine and chondroitin sulphate show a high tropism for articular cartilage, with radiolabelled glucosamine and chondroitin sulphate levels far exceeding plasma concentrations.<sup>2</sup>

## THE ROLE OF CHONDROTECTORS & DISEASE MODIFYING OA DRUGS

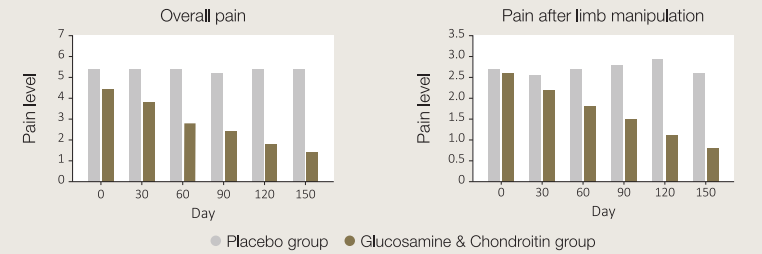
Compounds that either protect the articular cartilage during the course of OA or alter the course of the disease by modifying the biochemical cascades that contribute to the OA.<sup>9</sup>

Chondroprotectors like glucosamine sulphate, chondroitin sulphate (CS) and collagen hydrolysate, are all basic components of the cartilage and synovial fluid, and have been shown to:<sup>3</sup>

- slow the progression of cartilage destruction;
- help regenerate the joint structure;
- reduce the pain in the joint;
- and increase mobility by providing protection.

### ORAL GLUCOSAMINE AND CS REDUCES MODERATE TO SEVERE PAIN IN OSTEOARTHRITIC HORSES

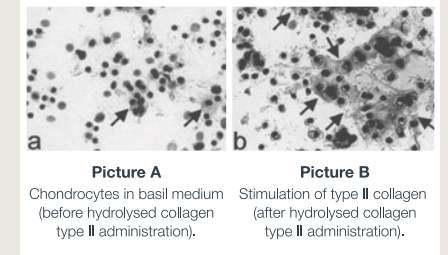
Effect of oral glucosamine and CS supplementation reduced overall pain score by 68% and pain after manipulation by 69% in horses with moderate to severe osteoarthritis, as assessed by veterinary surgeons at Murray State University Equine Centre.<sup>6</sup>



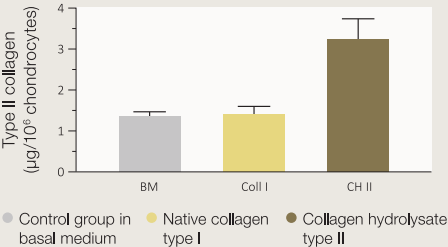
### HYDROLYSED COLLAGEN IS READILY ABSORBED AND ACCUMULATES IN ARTICULAR CARTILAGE

Orally administered hydrolysed collagen type II is highly bioavailable and has been proven to accumulate in articular cartilage. It stimulates the chondrocyte to produce type II collagen, restoring the architectural integrity of the cartilage.<sup>8</sup>

#### In vitro evidence of type II collagen biosynthesis following treatment of hydrolysed collagen<sup>8</sup>



Total collagen type II formation measured as secretion into the culture supernatants and its incorporation into the newly synthesized extra cellular matrix<sup>8</sup>



# GCS MAX<sup>®</sup>

## GCS MAX PROMOTES THE PRODUCTION, PROTECTION AND RESTORATION OF JOINT CARTILAGE IN HORSES

### CHONDROITIN SULPHATE

Chondroitin sulphate has been shown to promote active cartilage regeneration, inhibit degenerative enzymes, reduce pain and inhibit subchondral bone resorption.<sup>2,3,10</sup>

### GLUCOSAMINE HYDROCHLORIDE

Glucosamine is an important precursor for proteoglycan production and has been shown to prevent cartilage degeneration and subchondral bone resorption, enhance chondrocyte proliferation and extracellular matrix production.<sup>2,3,11</sup>

### HYDROLYSED COLLAGEN TYPE II

Hydrolysed collagen type II has been shown to accumulate in the articular cartilage and stimulates the chondrocyte to produce type II collagen, restoring the architectural integrity of the cartilage. It has also been shown to increase mobility and reduce pain.<sup>3,8</sup>

### AVOCADO/SOYABEAN UNSAPONIFIABLES (ASU)

ASU supplementation caused a significant reduction on the degree of macroscopic cartilage erosion, synovial hemorrhage scores and intimal hyperlasia in the synovial membrane.<sup>4</sup>

### MSM

MSM acts as an antioxidant within the joint and reduces both joint and muscle pain when given as a pre-treatment before strenuous endurance exercises.<sup>7</sup>



## COMPOSITION

Each 5 g contains (1 Level Scoop):	GCS MAX JOINT CARE	GCS MAX JOINT CARE ADVANCED
Glucosamine HCl	1350 mg	1800 mg
Chondroitin Sulphate (7-10 kDa)	320 mg	450 mg
Collagen Type II (Hydrolysed)	30 mg	50 mg
Avocado/Soyabean Unsaponifiables (ASU)	—	300 mg
Methylsulphonylmethane (MSM)	800 mg	1250 mg
Manganese (as Manganese Sulphate)	18 mg	18 mg
Ascorbic Acid (as Calcium Ascorbate)	108 mg	108 mg

## DIRECTIONS FOR USE

Horse's Weight	DIRECTIONS FOR USE		LENGTH OF USE (Long-Term)	
	First 4 Weeks	Long-Term Use	1.8 kg Tub	600 g Pack
< 400 kg	3 Level Scoops Twice Daily	1,5 Level Scoops Twice Daily	120 days	40 days
400-600 kg	4 Level Scoops Twice Daily	2 Level Scoops Twice Daily	90 days	30 days
> 600 kg	5 Level Scoops Twice Daily	2,5 Level Scoops Twice Daily	72 days	24 days

- GCS MAX Advanced can be mixed into the feed.

- 1.8 kg pack will last a 400-600 kg horse 3 months or 2 months as a starter pack.



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