

HORSE LOCOMOTION: why and how to supplement?

Equestrian sports allow horses to fully demonstrate their exceptional athletic ability. Whether it's jumping courses of jumps, covering dozens of kilometres at a fast pace, contorting themselves during a dressage test or even pulling a carriage, their locomotory system is put under pressure.

Every rider concerned with looking after his horse in the long term has to pay special attention to the health of his horse's locomotory system and more particularly to his joints.

The aim of this article is to provide concrete answers as to how to supplement your horse if we wish to:

- Prevent joint problems.
- Manage painful mobility diseases that are susceptible to becoming chronic and thus jeopardising the well-being, and ultimately the sporting career of your companion.

I. COMPOSITION OF AN ARTICULATION (JOINT)

An articulation, or joint, refers to the meeting place of two or more bones. The articulation also consists of:

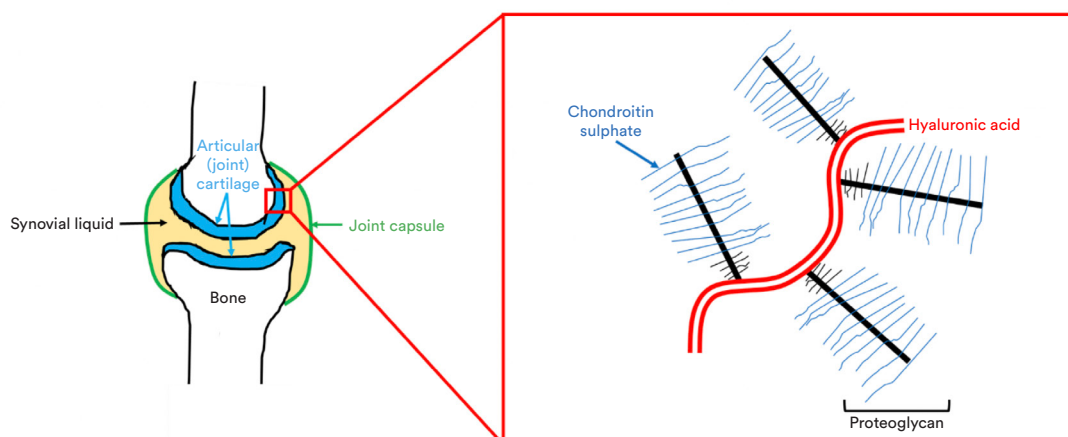
- Ligaments connecting the bones.
- A joint capsule delimiting a cavity filled with synovial fluid, a lubricating liquid which facilitates movements.
- Cartilage.

Articular cartilage is situated on the surface of bones within joints. It has a dual function: it allows the two extremities to slide smoothly over each other and also to absorb repeated impacts between the bones during movement. Its' resilience and elasticity thus directly condition the fluidity of movements. Furthermore, cartilage bathes in a liquid called, the synovial liquid, which nourishes and lubricates the joint.

Articular cartilage is composed of cartilage cells (called "chondrocytes") that synthesize the constituents of cartilage: the **collagen fibres** (type II), which form a strong matrix trapping the **proteoglycans** fixed to the **hyaluronic acid**. Their primary role is to hold water, principal component of articular cartilage which gives its' elastic characteristics.

More precisely, proteoglycans are made in part from **chondroitin sulphate**. As for glucosamine, it's synthesized from glucose in the cartilage cells. It's the precursor of a number of the constituents of proteoglycans (including chondroitin sulphate) and hyaluronic acid. Finally, **sulphur** plays a central role in the functioning of cartilage: it's essential to the synthesis of collagen, hyaluronic acid and of chondroitin sulphate. Sulphur is also needed for normal cell functioning.

DIAGRAM OF AN ARTICULATION – CARTILAGE MATRIX COMPONENTS



CHONDROPROTECTIVE AGENTS: feed supplements for joint health

A number of supplements are used by man, the horse and domestic animals, for maintaining optimum articular health, relieving pain in the case of degenerative diseases such as osteoarthritis, or improve post-operative articular recovery. They are called chondroprotective agents as they have a role in cartilage protection (the word “chondral” is the adjective used in medicine to designate cartilage).

Amongst the different ingredients available on the market, it's important to employ those whose effectiveness has been scientifically proven, and to use them at the recommended doses:

- The natural components of cartilage such as **chondroitin sulphate**, **glucosamine**, **hyaluronic acid** and **collagen**.
- Methylsulfonylmethane (MSM), a source of sulphur.
- **Avocado/soybean** unsaponifiables (ASU).

Furthermore, the origin and the composition of chondroprotective agents employed is important. For example there exists two different forms of glucosamine: glucosamine sulphate and glucosamine hydrochloride. A study showed that in the horse, the sulphate form is better absorbed than the hydrochloride form (source 1).

Finally, we should be aware that until now, no side effects of chondroprotective agents have been brought to light in their use in the horse in the medium term (up to 6 months). However, no studies have been undertaken in gestating mares. In consequence, in this precise situation we recommend that you consult your vet who will be able to advise you after weighing up the benefits /risks of such supplementation for the health of the mare and foal.

II. IN WHAT SITUATIONS IS SUPPLEMENTATION USEFUL?

1. OSTEOARTHRITIS

WHAT IS OSTEOARTHRITIS?

Osteoarthritis is the most widespread articular disease. It can occur at any age even if the risk of it appearing increases as the horse ages.

It is a chronic and painful joint disease which leads to lameness in horses. It is characterised by a deterioration of the cartilage which loses elasticity and thickness. The pain is referred to as “mechanical” because it's triggered by the use of the arthritic joint, and relieved by rest.

During flare-ups of osteoarthritis, the affected joints can show inflammation with articular swelling and heat. The pain takes on an “inflammatory” character.

The reasons behind the appearance of osteoarthritis are multiple: trauma, morphological anomalies or even infections in the joints. It should be underlined that the principal risk factor for osteoarthritis is ageing. Probably due to a drop in the production of the components that give cartilage cells their elastic properties.

Finally, more often than not, osteoarthritis worsens as the thickness of the cartilage diminishes.

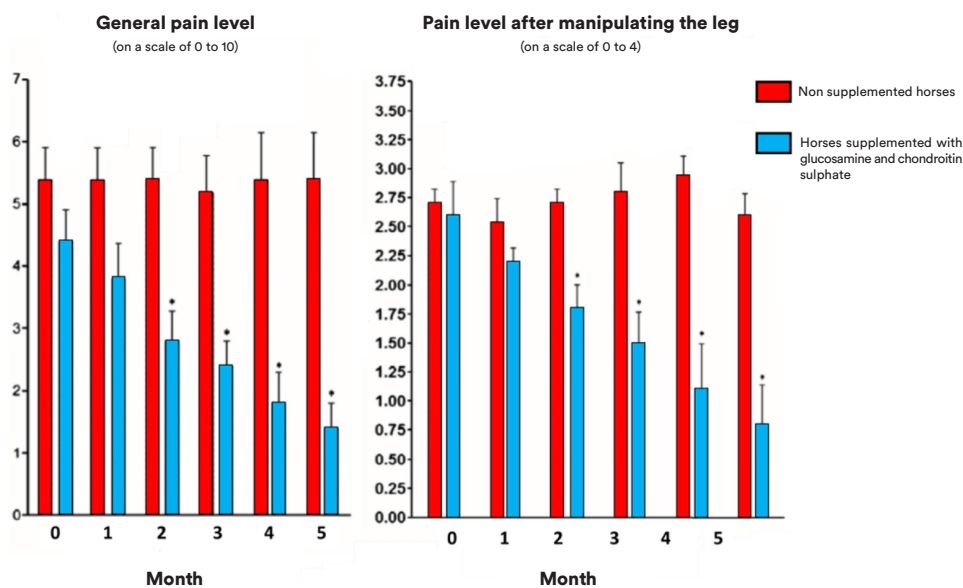


HOW TO SUPPLEMENT THE HORSE SUFFERING FROM OSTEOARTHRITIS?

Management of the disease must first start by putting into place a treatment whose aim is to protect the remaining joint cartilage. For this reason, supplementing with chondroprotective agents is of interest as they can have a beneficial effect on slowing the progress of the disease. Indeed, it has been shown that supplementing with glucosamine/chondroitin sulphate combinations along with with ASU reduces inflammation and deterioration of cartilage components (sources 2 and 7).

Improvement in cartilage health is reflected by a gradual decrease in “mechanical” pain and so therefore an improvement in mobility. For example, supplementing with glucosamine and chondroitin sulphate reduces signs of (“mechanical”) pain in arthritic horses (source 8). It should be noted however that pain decreases gradually as the months during which the horses are supplemented pass: in the study shown below, it really starts to be observed after 2 months of supplementation.

PAIN WHILST WALKING AND TROTTING PROGRESSIVELY DIMINISHES IN HORSES SUFFERING FROM OSTEOARTHRITIS WHO ARE SUPPLEMENTED WITH GLUCOSAMINE CHONDROITIN SULPHAT (source Gupta et al., 2009) (8)



In the event of active inflammation (acute arthritis), characterised by articular heat and swelling along with more pronounced lameness than usual (caused by “inflammatory” pain), supplementing with chondroprotective agents is not enough to quickly halt the inflammatory process. In this case, it’s preferable to seek a medical treatment based on non-steroidal anti-inflammatory drugs (NSAID). Indeed, the latter allow the inflammation to be stopped, with the effect of quickly relieving pain and protecting the articular surfaces likely to suffer deterioration during a prolonged inflammatory state. However, resorting to the use of NSAIDs should be intermittent as their long term administration can contribute to accelerating the evolution of osteoarthritis (source 9).

Remember: Daily supplementation with chondroprotective agents improves joint comfort in horses suffering from osteoarthritis and helps to slow the disease.

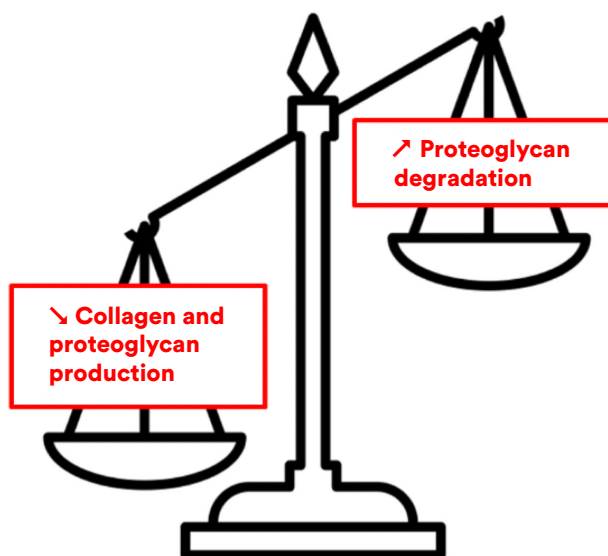
REVERDY TIP

In arthritic horses, we recommend giving one dose of REVERDY FLEXY a day for 1 month then continue by giving ½ a dose per day.

THE SPECIFIC CASE OF THE AGED HORSE

With age, the speed at which collagen and water holding proteoglycans degrade finishes by overtaking the speed at which they are produced. Therefore cartilage becomes less elastic and more brittle, hence the appearance of stiffness and joint pain. After a while, cartilage is prone to thinning and cracking, which will result in the development of osteoarthritis.

IN AGEING CARTILAGE, THE BALANCE BETWEEN PRODUCTION AND DEGRADATION IS BROKEN



However, it's possible to delay this degenerative phenomena by supplementing the aged horse with chondroprotective agents. Indeed, it has been shown that supplementation with chondroitin, glucosamine and N-acetyl-D-glucosamine (another form of glucosamine) improves mobility in horses aged over 15 years old.: range of joint motion, length of stride, swing duration and stance duration (source 10).

Remember: supplementing the aged horse with chondroprotective agents helps improve their articular comfort. It should be noted that horses whom are no longer ridden due to their age should be able to freely walk around each day in order to minimise joint stiffness.

REVERDY TIP

In the aged horse, we recommend giving one daily dose of REVERDY FLEXY for 1 month then continue by giving ½ a dose a day.

2. JOINT SURGERY: WHY AND HOW TO SUPPLEMENT AFTER SURGERY?

Whether it's to remove a fragment of cartilage or for other reasons, joint surgery remains an invasive surgical technique, which can potentially lead to lesions of the capsule and the articular surfaces.

A chondroprotective agent based supplementation after surgery can be useful to help post-operative recovery. For example, a study showed that oral supplementation with hyaluronic acid in yearlings, after surgery for removing cartilage fragments in the hock, reduced post-operative articular swelling (source 11).

Furthermore, a second study showed that the use of avocado and soya oil extracts (ASU) also improved post-operative recovery by:

- An anti-inflammatory and protective effect on cartilage.
- Better healing of the synovial membrane (part of the articular capsule) that was perforated during the intervention (arthroscopy) (source 3).

It's important to note that the benefits observed due to supplementation with avocado and soya oil extracts were greater than those obtained with certain injectable veterinary preparations (glycosaminoglycan polysulphate or hyaluronic acid based) tested according to the same type of study

Remember: Supplementing orally with hyaluronic acid and above all avocado and soya oil extracts improves post-operative recovery in joints.

REVERDY TIP

After joint surgery, we recommend giving one dose of REVERDY SUPER FLEXY per day for two months then to continue chondroprotective agent supplementation with ½ a dose of REVERDY FLEXY per day.

3. HOW CAN YOU KEEP YOUR HORSES JOINTS IN GOOD HEALTH?

Even if young and healthy, the horse can be confronted by situations that challenge his joints: heavy work, competition, working on hard ground or even breaking-in can cause micro-lesions that can lead to the development of articular inflammation.

A study showed that supplementing for about 3 months with glucosamine and chondroitin sulphate before experimental induction of articular inflammation reduced the production of factors implicated in cartilage degeneration in young horses (source 12). In the same manner, a second study showed supplementing with glucosamine, chondroitin sulphate, MSM and hyaluronic acid approximately 1 month before the development of inflammation reduced the inflammatory reaction within the joint.

Finally, it also has been shown that supplementing with glucosamine and chondroitin for 6 years permitted a decrease in the frequency of intra-articular injections (following the detection of pain by a vet) each year in show-jumping and eventing horses.

Remember: Preventative supplementation with chondroprotective agents helps to safeguard joint health.

REVERDY TIP

We recommend giving ½ a dose of REVERDY FLEXY for 1 to 3 months before an event that can challenge joints (breaking-in, competition...). This supplementation can be continued throughout the risk period.

PRESENTATION OF REVERDY FLEXY AND SUPER FLEXY

SITUATION	PRODUCT	DOSE	PERIOD
Osteoarthritis	FLEXY	1 dose/day then ½ dose/day	1 month
Old age	FLEXY	1 dose/day then ½ dose/day	1 month
Post-operative (articular)	SUPER FLEXY followed by FLEXY	1 dose/day ½ dose/day	2 months
Prevention	FLEXY	½ dose/day	1 - 3 months

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