

Why is HA (hyaluronan) Important for Joints?

Joints are classified into three different categories: synarthroses (non-movable), amphiarthroses (slightly moveable), and diarthroses (moveable).

The diarthrodal joints account for the greatest number in the body. Equine synovial joints have many parts that all must work together to provide an appropriate frictionless weightbearing surface. Simply put, articular cartilage lines the bone of the joint. A synovial membrane surrounds the joint, this membrane provides synovial fluid that lubricates the joint. Joint fluid comes from synoviocytes, which are an integral component of the synovial membrane; these synoviocytes produce the proteins necessary for joint health. One of these is hyaluronan (HA), a glycosaminoglycan (GAG), which is a substance that attaches to collagen and elastin to form cartilage.

HA not only helps keep the cartilage that cushions joints strong and flexible, but also helps increase supplies of joint-lubricating synovial fluid. Along with lubricin (another protein produced by synoviocytes) it is the main source of lubrication in a diarthrodal joint.

HA is a major component of the synovial fluid, as well as articular cartilage. HA in articular cartilage is synthesized locally by the chondrocytes. A molecule of HA acts as the center of molecules called aggrecans, that are responsible for the hardness and compressive stiffness of articular cartilage. Therefore, without adequate amounts of HA, the joints will become brittle and weaken. Molecules of HA can vary greatly in size but are considered relatively large. Because of this, HA plays an important role in regulating what molecules make up synovial fluid by preventing other large molecules from entering the synovial cavity. It helps bring nutrients to cells in the joint and carry toxins away from those same cells.

The amount of HA in each joint varies, with smaller joints generally having a higher concentration than the larger ones. The concentrations of HA in equine joints affected with radiographically apparent arthritis are generally lower than healthy equine joints.

The exact mechanism by which endogenous (made in the body) or exogenous (produced outside the body) HA works is truly unknown. However, multiple studies have shown all methods of administration; orally, intra-articularly, and intravenously administered HA provide benefits. These benefits include anti-inflammatory effects, pain relief, and increased joint health. HA eventually breaks down and is absorbed in the body, so the effects are not permanent and continued treatment will be necessary for continued beneficial effects.