The combination of avocado/soybean unsaponifiables (ASU) and glucosamine/chondroitin sulfate (GLU/CS) profoundly suppressed COX-2 production in Lipopolysaccharide (LPS)-activated equine chondrocytes (see figure 1). The combination was more effective than either was alone.\(^1\)

The combination of hyaluronic acid (HA) and ASU/GLU/CS significantly lowered PGE2 production in IL-1β-stimulated equine chondrocytes (see figure 2); effects were better than HA or ASU/GLU/CS alone. The decrease in PGE2 production was associated with inhibition of the translocation of NF-κB, a mediator that helps “switch on” the inflammatory response.\(^2\)

Another study showed that ASU and EGCG (epigallocatechin gallate, an extract from green tea) significantly decreased COX-2 expression (see figure 3) and PGE2 production in cytokine-activated equine chondrocytes. The combination was better than either agent alone. As above, effects were associated with inhibition of NF-κB translocation (see figure 4).\(^3\)

These in vitro studies show that the ingredients in COSEQUIN ASU and COSEQUIN ASU PLUS inhibit production or expression of numerous mediators along the inflammatory cascade.

**The use of COSEQUIN ASU and COSEQUIN ASU PLUS may be beneficial to provide joint health protection when other modalities are used**

Addition of enrofloxacin to equine chondrocyte cultures was shown to up-regulate PGE2 production. This increase was inhibited by the combination of ASU/GLU/CS.\(^4\) So while intra-articular administration of an antibiotic may be needed to treat infection, ASU/GLU/CS may help minimize any effects it may have on cartilage.

Inflammatory mediators caused increases in PGE2 production and activation of matrix metalloproteinase-9 (MMP-9), an enzyme that breaks down cartilage, in equine chondrocytes. Adding phenylbutazone to the cultures decreased PGE2 production as expected, but phenylbutazone and ASU/GLU/CS together also decreased MMP-9 activation.\(^5\) Based on these results, administration of ASU/GLU/CS when using phenylbutazone may help to maximize attenuation of both inflammatory mediators and enzymes, which all play a role in cartilage breakdown.

To order, contact your distributor or call Nutramax Laboratories Veterinary Sciences, Inc. at 1-888-886-6442, and for more information visit CosequinEquine.com

**REFERENCES:**