

Prevention, dietary adjustment show promise in fending off joint pain in young horses

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A series of studies by researchers in the department of animal science at Texas A&M University suggest prevention is the best solution to prevent arthritis in young quarter horses.

Dr. Josie Coverdale, associate professor in equine science, and Dr. Jessica Lucia, a former graduate student under Coverdale and now a professor at Sam Houston State University, found use of anti-inflammatory aids mixed with daily rations can help decrease joint inflammation in young <u>horses</u>.

"Arthritis is one of the most common reasons we retire horses, and this study shows that prevention of joint damage in early training may be possible through diet," Coverdale said. "It's pretty clear the damage comes during early training and that damage often leads to arthritis later in life. A lot of pharmaceuticals are given to treat pain, but few actually help repair the cartilage. We went with the premise that prevention is the best approach rather than trying to treat an existing condition."

Coverdale said they used the horse production herd at Texas A&M to develop the model and test several diet additives. Lucia read through numerous journals and read a study that used LPS (lipopolysaccharide) injected into the joint for induction of localized inflammation in horses.

"We came across LPS, which has been used in older horses, but not younger horses," she said. "LPS is the inflammatory part of E. coli, which can be injected using a sterile solution. The beauty of that method



is you inject it in the knee and in 24 hours you get pretty quick swelling that is associated with cartilage turnover and related pain."

This allowed researchers to study the inflammation and breakdown of cartilage over time and mimic the progression of inflammation and cartilage changes associated with intense exercise.

"This initial model study showed us the pattern of inflammation and isolated appropriate markers to measure cartilage breakdown using joint fluid removed from the knee at various time points," Coverdale said.

Once the LPS model was established to predictably cause joint inflammation,Coverdale said, different dietary strategies were used to try to decrease the amount of inflammation, which included antiinflammatory dietary supplements such as glucosamine - commonly used by men and women runners to aid in building back damaged cartilage.

Coverdale said previous data with glucosamine supplementation was "hit or miss with adult horses," but they wanted to see for themselves and test the theory that prevention in young horses was easier than treating arthritis in the adult.

"We found that it tended to increase new cartilage production and decrease

the breakdown of existing cartilage, which was good," she said.

Thirty milligrams of glucosamine per kilogram of body weight was given to the study horses, Coverdale said.

"We certainly got a positive response, which was what we wanted," she said.



Another component of Coverdale's research has been studying conjugated linoleic acid, or CLA, which "is fairly similar to glucosamine in that there are documented anti-inflammatory effects, which may be used to remediate and repair cartilage in joints."

"Horses receiving supplemental CLA tended to exhibit greater repair of their cartilage when injected with LPS rather than break it down," she said. "Two percent of the diet was given in the CLA and thatcan be economically feasible for horse owners."

The research group has also evaluated horses at varying ages to determine the response to LPS based on age. They concluded that young horses were more likely to synthesize new cartilage in response to inflammation while older horses were more likely to experience <u>cartilage</u> degradation or damage.

"This further illustrates that dietary intervention provided to young horses in training to prevent joint damage may yield the best results," she said. "With all four of these projects it confirmed that intervening during times of early growth and training with some of these dietary additives is worth it. Waiting on down the line as the horse ages is probably too late. Most people are waiting until they see symptoms in these adult horses and by then it is too late.

"It's more cost effective and beneficial to do this early. Using it as a prevention method is much better."

Coverdale also praised the collaborative efforts of other researchers at Texas A&M, including Dr. Tom Welsh, a professor of physiology in the department of animal science, and Texas A&M College of Veterinary Medicine researchers Caroline Arnold and Robin Dabareiner.

"These types of projects truly represent what being an Aggie is all about



- the function of a group with varied interests to develop research projects that answer real world questions and provide high-quality training of students. Everyone brought something to the table and contributed their expertise to the group."

Coverdale said the research projects also helped Lucia win graduate student competitions at two different Equine Science Society meetings.

"The initial project to develop the LPS model was funded by the H. Patricia Link Quasi-Endowment funds in the department of <u>animal</u> <u>science</u>," she said. "This funding was pivotal in furthering the research efforts and helped generate interest from other funding sources such as Cargill Animal Nutrition and the American Quarter Horse Association.

"The whole premise of the Link funds is to help researchers develop a model or provide preliminary research data to support further funding efforts. This was a perfect example of how this can work."

Provided by Texas A&M University

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