



## Exercise's Effects Vary by Tendon Type

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Researchers from the United Kingdom recently embarked on an 18-month exercise study to determine why the equine superficial digital flexor tendon (SDFT) is more prone to injury than the various other tendons located in the distal (lower) part of the limb. The group found significant changes in the composition of the SDFT in horses that were in high-intensity training, changes that suggest the tendon was aging faster. However, they also noticed that a related tendon was more elastic, which indicated the horses' tissues were adapting to the work in a positive way.

"Tendon injuries in equine athletes are common and tend to occur more frequently in some tendons, which suggests that these tendons are structurally different or respond to exercise differently," explained study co-author Helen Birch, BSc, BSc (Ost.), PhD, a senior lecturer at the Institute of Orthopaedics and Musculoskeletal Science at University College London. "At present, little research has been conducted on the effect of exercise on the soft connective tissues like tendons."

Birch and her colleagues hypothesized that high-intensity exercise results in degenerative changes in injury-prone tendons such as the SDFT, but not in other locomotor tendons that are rarely injured, such as the common digital extensor tendon (CDET). They recruited 12 mares for the 18-month study, splitting them into high-intensity and low-intensity groups. Six horses included in the high-intensity group were galloped three times a week and trotted on the alternate days, while the six horses in the low-intensity group were walked only.

After completing of the study, the researchers evaluated the biochemical composition and biomechanical properties of the tendons.

"Our analyses identified marked differences in tissue composition and biomechanics between the SDFT and the CDET," reported Birch.

The CDET showed adaptive changes (beneficial changes in response to exercise) to long-term, high-intensity exercise, while the SDFT appeared to undergo accelerated aging.

Since they noted no differences in the *mechanical* properties of the SDFT between the high- and low-intensity exercise groups, Birch and colleagues were unable to definitively conclude whether the biochemical alterations they noted were adaptive), or if they were early signs of microdamage to the delicate SDFT.

"We also were not able to determine when these changes began to occur during the 18-month study," explained Birch.

This study contributed to the research community's body of knowledge on the response of tendon to exercise, and it will ultimately help change the way we train horses to prevent career-limiting or even career-ending tendon injuries.

Further research on tendon injuries is ongoing.

The study, "Physical activity: Does long term high intensity exercise in horses result in tendon

degeneration?" was funded by the Horserace Betting Levy Board, and it is scheduled to be published in an upcoming edition of the *Journal of Applied Physiology*. The study abstract is available on [PubMed](#).

**Readers are cautioned to seek the advice of a qualified veterinarian before proceeding with any diagnosis, treatment, or therapy.**



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