

New research could help breed for less 'spooky' horses

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Identifying genes that influence horses' tendency to react to danger. Credit: UF/IFAS

In the wild, horses must be alert for predators that might attack them. This means that even domesticated horses are hardwired to be aware of

danger and can scare easily.

Unfortunately, this so-called "startle response" or "spooking" is reflexive, and [horses](#) often cannot distinguish between the danger a Florida panther might present versus a plastic bag floating by a riding arena. Some horses react to these perceived threats by rearing, bolting, or bucking, which can create dangerous situations for owners and riders.

University of Florida researchers are working to identify genes that influence horses' tendency to react to these "spooky" plastic bags. Identifying these [genetic traits](#) would be a first step toward one day selecting or breeding horses for the temperament types we prefer. These research results might be a decade away.

Samantha Brooks, UF/IFAS associate professor of equine genetics, and her team have run an experiment on several groups of young horses that are part of the UF/IFAS breeding program that helps understand startle responses.

The horses wear wireless [heart-rate](#) monitors and are loose in a round pen. At set intervals, an umbrella is opened quickly within the animals' line of sight. The team analyzed the animals' behavior and change in heart rate throughout and after the initial startle reaction.

"We can't read their minds," said Brooks. "Their heart rate tells us what is going on inside that we cannot see from reading their body language alone. It was interesting to see the stories their heart rates told us."

Two clear groups of horses emerged from the data. The first group was startled by the umbrella opening, had a spike in heart rate, maintained a reactive or hyper-alert state including more time spent looking and moving away from the umbrella. The second group startled much like the first group to the umbrella opening, but with a different outcome.

The horses experienced a spike in heart rate but then calmed quickly and carried on with their day. These animals perceived the stimulus and found it startling but did not go through the behavioral patterns of avoidance, fear, etc. like the first group.

"Horses have adapted over thousands of years to live with people," she said. "Some of those changes include a reduction in startle response and are really helpful to better understand the horses we work with today."

Now that two clear groups have emerged, the team will take this information and develop a study to differentiate the genetic components that make up how horses react to fear. Blood and hair samples were taken from each horse in the study for future analysis.

Knowing how genetics weigh into behavior can help horses and owners find their right fit. Perhaps the spooky horse is not the best option for a 10-year-old 4-Her. But a spookier, high-strung horse might be a better fit for a high-energy "job" like show jumping.

"Understanding each horse's genetic makeup will help you understand the type of animal you need," said Brooks. "If we learn early on what this animal's natural tendencies are most likely to be, we can make educated decisions on training and future careers to give the horse the best shot to grow into their potential, rather than becoming a problem or danger."

Additionally, understanding a horse's reaction to uncomfortable situations can make a difference in how they are handled for medical procedures, transported and more.

"It's important to know these traits because it can impact how we care for horses overall," said Barclay Powell, a Ph.D. student working on the project. "This will be hugely important to the veterinary field as well. It's

not only helpful for the people handling the animals, but also for the horses' welfare."

"It doesn't matter if the horse is a racehorse, therapy animal or driving a carriage, an unplanned startle response is generally a problem," said Brooks. "We are just beginning to scratch the surface of this. It might take us 10 years or more to really have a clear understanding, but it is worth the effort."

"This research provided graduate and [undergraduate students](#) an opportunity to see research in action and learn more about horse behavior," said Carissa Wickens, UF/IFAS associate professor and research partner. "The students involved learned so much about conducting field-level behavioral testing and working with young horses. They enjoyed being part of the process, another exciting element of this project."

The findings are published in the journal *Genes*.

More information: Barclay B. Powell et al, Behavioral and Physiological Reactions to a Sudden Novel Object in the Weanling Horse: Quantitative Phenotypes for Future GWAS, *Genes* (2023). [DOI: 10.3390/genes14030593](https://doi.org/10.3390/genes14030593)

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