How Temperature May Affect Horses: Using Ethograms to Examine Horse Behavior Based on Variations in Weather

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Abstract: This study is to serve as a baseline for future research regarding horses. The study was conducted by observing the horse's behavior and characteristics in various weather conditions from a proximal distance of 75 ft (25 yd). A chart of the animal's behavior and characteristics (ethogram) was created as a guide for learning how horses respond to weather. The preliminary results indicate that horses will adapt to their surroundings. When the temperature averages above or below 60 degrees Fahrenheit (15.6 degree Celsius) the horses displayed characteristics of relaxation and comfort.

Keywords: Horses, Horse Behavior, Temperature, Ethogram

Introduction

Around 5,000 years ago horses were first domesticated, it was then the interaction between man and horse began (Goldstein 2013). Horses cannot communicate like humans (i.e. talking verbally) with words and sentences nor with emotion or hand movements, however, horses can communicate through their behavior, their facial expressions, their body movements, tendencies and from the sounds they make such as nickering, snorting and neighing. Thus, learning about the behaviors and patterns of horses' aids in understanding research such as Catharina Carlsson et al. (2014) who studied how horses can assist in measuring authentic interactions between clients and staff in social work. As well as Marta Borgi et al. (2015) who studied the effectiveness of equine assisted therapy for children with autism spectrum disorder and found that the children working with the horses had an improvement of social interaction as well as a mild effect on their motor skills.

By comprehending the behaviors of horses, we can begin to understand equine - human interactions. The previous research on equine - human interactions focuses on how horses can affect humans therefore researchers know the impact horses have on humans, while research on how humans affect horses and their behavior is not necessarily as known. This study looks at understanding the behavior of horses through observations starting with their relationship with varying weather conditions. An underlying aspect this study will also examine the comparison of mares and geldings behavior. This study is to serve as the baseline for other research involving horses.

Methods

The study was conducted by maintained a proximal distance about 75 ft (25 yd) away from the horses to ensure there is no interference with the horse's behavior. I observed the horses and write down all the common characteristics displayed by them. Then I created a chart (ethogram) in excel with a list of the horses and the common behaviors. The ethogram was separated into two charts, an ethogram for geldings (males) and an ethogram for mares (females). While in the pastures with the horses, I used a recording device (i.e. cell phone, camera) to record all the animal's behavior each day for 5 minutes. It was imperative that while observing the horses that each horse is being seen. The purpose of recording while in the field allows for extra documentation of the horses that may have been overlooked while observing them.

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April 12th	59/33 degrees F; muggy, windy, cold														
Horses	Gender	List of Behaviors													
Name	Gelding or Mare	Grazing	Leg bending (back legs)	Leg bending (Front legs)	Standing still	Standing still w/ head down	Standing in a pack	Rolling around	Laying down	Head shaking while eating	Sounds	Tail swaying	Tail lifting	Sleeping	Yawning
Ghost	Gelding		X		X						X	X			
Scout	Gelding	X					X								
Tucker	Gelding	X	X				X			X		X			
River	Gelding	X			X		X				X				
Orin	Gelding	X										X			
Drummer	Gelding				X							X		X	
Hannah	Mare	X										X			X
Gracie	Mare	X				X						X		X	
Belle	Mare				X							X			
Cowgirl	Mare	X			X							X		X	
Princess	Mare	X			X							X			

Figure 1: One of the ethograms used during the study.

I found that it is best to observe the horses at the same time each day of the study to make sure time does influence the horse's behavior. Next, I recorded the temperature for each day the horses were observed. I then analyzed the footage and filled in the ethogram. (i.e. each time a horse does one of the behaviors listed, record it in the ethogram.) Finally, I compared the final data, look to see if there is variation in how the horses behave depending on the weather. Also looked for differences in the gelding's behavior and the mare's behavior.

Results and Discussion

I found that the preliminary results (Figure 1) indicates that temperatures averaging 67 degrees Fahrenheit (19.4 degrees Celsius) the horses continuously graze, stand in a pack of 3 or more, make sounds such as snorting and huffing more, as well as roll around in dirt. While in temperatures averaging 53 degrees Fahrenheit (11.7 degrees Celsius) the horses stand completely still, sway their tail from left to right, bend one of their back-hind legs, and on average sleep more during the day. Figure 1 also illustrates that the behaviors demonstrated by mares (female horses) and gelding (male horses) is quite similar. One component of preliminary data that I want to stress is that it should not to be referenced as stand-alone research, instead, the results from this study should be used in conjunction to other research on horses and aid in the comprehension of horse behavior.

Conclusion

Based on the preliminary data collected from the ongoing research, the findings illustrate how horses adapt to the environment around them, it is natural for a horse to spend majority of its day eating small meals of plants and grass, this is also known as grazing. The preliminary data express this fact as well as the idea that on days when the weather is colder than usual the horses in the study graze less and stand still more. A possible reason for this is due to the horse's ability to thermoregulate as a mechanism to conserve heat and energy (Thunes 2016).

According to Thunes (2016), horses thermoregulate their bodies by reducing the blood flow to their outer extremities such as the ears, legs, muzzle etc. to maintain temperature. The cecum, which is a part of the digestive tract of the horse aids in thermoregulation due to it ability to create heat

through fermentation (Geor 2002). Therefore, on days when it is colder outside, the horses don't graze as much as they would on warmer days, they graze just enough for their cecum to digest food and help thermoregulate their bodies. While in temperatures higher than usual the horses did not exert energy by running around the pastures rather, they preferred to casually stroll, graze throughout the day, and bend one of their hind legs. These behaviors indicate that the horses are comfortable, the bending of one of their hind legs means that the horses are in a relaxed state. As of now, the preliminary results do not indicate a noticeable difference in the behaviors of mares or geldings. On a personal note, I learned a great deal regarding my research with horses, as I did not have an equestrian background I came into the research with a limited knowledge on horses and their behavior meanings. I now comprehend how horses adapt to their surrounding as well as the methods horses use to communicate. Once this study is completed, I planned to expand research interest into equine - human interaction due to the research in this area being vague.

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