

Name: _____

Date: _____

Reading v1: Horses--Ancient and Modern

Both the global climate and local environments have changed significantly in the 50 million years between the multi-toed ancient horses and the modern Przewalski's horse and plains zebra that have only a single, large toe or hoof. Over that time, Earth has become cooler and drier. Fifty million years ago, much of the land where horses lived was similar to tropical rainforests--warm and damp with many plants and trees. Over time, as the planet cooled and got drier, those rainforests disappeared and more-open forests took their place, with grasslands and just some trees. In modern times, the environments where horses are found are wide-open grasslands.



Mezy moo, CC BY-SA 3.0

Those ancient tropical rainforests where the multi-toed horses lived were rich in resources. There were many different types of plants that could be used as food by the herbivorous animals. The terrain was crowded with trees and vines growing in all directions. A lot of different kinds of animals lived in those rainforests. Like the horses, some ate only plants. Some small predators thrived on insects. Larger predators were ambush hunters, lying in wait for smaller animals to come by and then pouncing on them.

In open grasslands where modern horses live, there are also rich resources. Grass grows in abundance and is the primary source of food for animals that live there. The terrain is mostly flat and firm and covered with grasses and a few other kinds of plants. The grass grows in wide-open expanses that sometimes go on for miles with nothing to interrupt the view. The grasses provide food for many insects and other herbivores, including the horses. Small predators catch and eat insects and some small

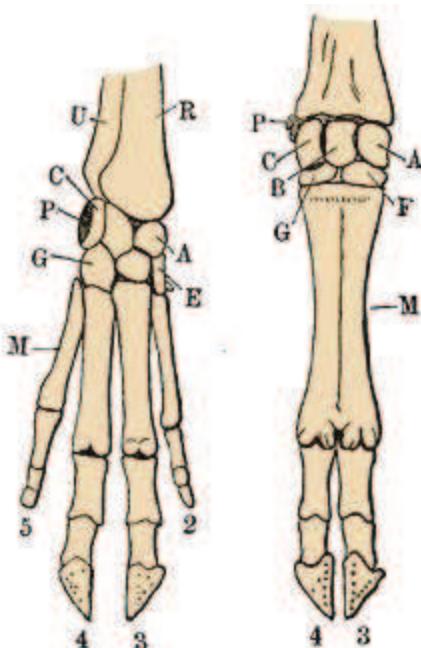


Javier Puig Ochoa, CC BY 3.0

mammals, like mice. Larger predators in the grasslands, like lions and cheetahs, typically hide in the grass and stalk their prey, then chase them down in order to catch them.

Nothing is known from the fossil record about how long ancient horses lived or how often they reproduced. Modern horses live for about 30 years. They are first able to reproduce when they are 3-5 years old. They generally give birth to one offspring (called a foal) every two years.

Just like you, many scientists are interested in the toes of horses. They want to know more about the multiple toes that ancient horses had. However, there are no ancient horses alive to be studied. So scientists study other ungulates (hooved animals), such as deer, goats, boar, cattle, and camels, in order to understand how the multiple toes work. These ungulates are animals that are similar to horses in many ways except they have two toes, called cloven hooves. Scientists found that with two toes, the animals are able to spread their toes as they step forward and then close their toes when they place them down. This allows them to grasp and hold onto rocks and uneven surfaces very well. Animals with single, flattened hooves like zebras or Prezewalski's horses cannot grasp the ground their feet land on. However, they are able to lift and place their feet quickly, which allows them to run very fast.



Forelegs of boar (left) and cattle (right). Meyers Konversionlexikon

References

- Cothran, E. G., & Podhajsky, A. W. (2018). *Evolution of the horse*. Encyclopædia Britannica. Retrieved from <https://www.britannica.com/animal/horse/Evolution-of-the-horse>
- American Museum of Natural History. (n.d.). *The evolution of horses*. Retrieved from <https://www.amnh.org/exhibitions/horse/the-evolution-of-horses>

- Ginsberg, J. R. (2013). Biodiversity of Mammals. In S. A. Levin (Ed.), *Encyclopedia of Biodiversity* (second edition) (pp. 681–707). Elsevier, Inc.
<https://doi.org/10.1016/B978-0-12-384719-5.00089-7>
- McHorse, B. K., Biewener, A. A., & Pierce, S. E. (2019). The evolution of a single toe in horses: Causes, consequences, and the way forward. *Integrative and Comparative Biology*, 59(3), 638–655. <https://doi.org/10.1093/icb/icz050>
- *On your toes: AMNH.* American Museum of Natural History. (2021). Retrieved from <https://www.amnh.org/exhibitions/horse/the-evolution-of-horses/on-your-toes>
- Williams, P. (2016). *The remarkable comeback of Przewalski's Horse*. Retrieved from <https://www.smithsonianmag.com/science-nature/remarkable-comeback-przewalski-horse-180961142/>