

Wildebeests' super-efficient muscles allow them to walk for days without drinking

25 October 2018, by Bob Yirka



A wildebeest wearing a RVC wildlife tracking collar. The collar electronics on the top side of the collar are balanced by a battery box, seen under the neck. Credit: Professor Alan Wilson

A team of researchers with the University of London, University College London and the University of Botswana has found that the wildebeest has extremely efficient muscles. In their paper published in the journal *Nature*, the researchers describe their study of the migrating animal and what they found.

Prior observation of the wildebeest in the wild has shown that the large [animals](#) migrate across parts of Africa looking for food and water. It is one of the few characteristics of the animals that draws attention. Normally they only make it into nature documentaries when they are eaten by other more photogenic animals. Some wildebeest herds have been found to travel as far as 1,900 kilometers—sometimes attracting tourists as they go. Perhaps just as remarkable, the animals do it during the heat of day, which can soar to over 38 degrees C. And until now, it was believed that the creatures, also known as gnu, needed to stop during such migrations each day to drink water.

But the researchers with this new effort found that wildebeests can travel for up to five days without drinking any water at all. Curious as to how they could accomplish this feat, the researchers darted several specimens and took [muscle](#) tissue samples for study back in their lab.

The researchers found that the muscle tissues were extremely efficient. Administering electric shocks while measuring the amount of heat released showed that approximately 62.6 percent of the energy used by the muscles went into muscle movement—just a third was lost as heat. The researchers point out that such [high efficiency](#) has only ever been surpassed by turtles. Most animals have muscles that are far less efficient, with an average of just 25 percent efficiency.



A wildebeest wearing a RVC tracking collar. The black globe thermometer and humidity sensor can be seen on the left side. Credit: Professor Alan Wilson

The [researchers](#) also point out that such high muscle efficiency is why the animals are able to walk so long without drinking—with less heat loss, less water is required for cooling. That means less is given off as evaporation, resulting in less need

for drinking.

The wildebeest is thus the largest animal to have its muscle efficiency measured directly, and offers a framework for studying other animals in the field as well.

More information: Nancy A. Curtin et al.

Remarkable muscles, remarkable locomotion in desert-dwelling wildebeest, *Nature* (2018). [DOI: 10.1038/s41586-018-0602-4](https://doi.org/10.1038/s41586-018-0602-4)

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