

Stress test—how scientists can measure how animals are feeling

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Credit: University of Western Sydney

To help determine how stress is affecting animals across Australia, researchers at Western Sydney University are utilising non-invasive methods to help farmers, zookeepers and pet owners ensure their animals are happy and healthy.

Stress is an important biological response for [animals](#) as it helps their bodies prepare to fight or flee from danger. But many animals in the modern world are forced to coexist with humans in farms, zoos or homes, and the onset of [chronic stress](#) can have devastating results, both for them and their owners.

"Stress can affect the weight of farm animals, leading to losses for animal producers, and can disrupt the breeding patterns of endangered animals in captivity," says Dr Edward Narayan, Senior Lecturer in Animal Science, from the School of Science and Health.

"Here at Western Sydney University we are working with clients to collect animal scats under routine husbandry and run them through our laboratories to measure stress levels."

When a stress result is sparked in an animal, the brain-body starts to release biomolecules such as cortisol, which is the main stress hormone in large animals such as humans, elephants and sheep. Ultimately, this cortisol is broken up by the kidneys, and ends up in excreta.

"By testing these scats, we can monitor and track animals from a distance and gain a snapshot and new understanding of their mood and health," says Dr Narayan.

This research comes under the umbrella of conservation physiology, a rapidly expanding field of study that measures the physiological responses of organisms subject to human interference. While the traditional field of conservation biology seeks to manage the natural environment to help protect threatened species, conservation physiology is a way to improve the health and happiness of animals in contact with humans.

For animals, a life with minimal stress is linked to happiness, as high stress reflects fear and anxiety. In most cases, happiness for animals revolves around the daily needs for survival, such as securing food and shelter. By reducing stress among animals, scientists can help them redirect energy often used for survival to other uses, such as increasing fat reserves and reproduction.

"Considering human activity has pushed the world to the sixth mass extinction event, measuring the [stress levels](#) of native animals may help conserve their dwindling numbers by providing real-time data on species' physiological resilience and vulnerabilities towards anthropogenic induced environmental changes. By having access to this data, researchers are able to help direct conservation and management efforts towards at-risk species," says Dr Narayan.

The potential applications are vast, as the studies can be replicated across species living in different

settings, from koalas in nature parks, to sheep in pasture, and even domestic animals in apartments. It also enables researchers to monitor population health during management interventions, such as species translocation and invasive pest species eradication programs.

"At the moment, we're working with sheep farmers in regional Australia to help monitor the physiological markers of their animals, with the ultimate aim of tracking their mood. By ensuring the sheep are stress free, we can improve their productivity in terms of meat quality and reproduction. In addition, we're also working with international animal rescue programs such as Animals Asia to provide crucial data on the stress physiology of Asiatic black bears being rescued from bile farms in Vietnam."

In addition to analysing scats, Dr Narayan and researchers at Western Sydney University also examine other samples, such as hairs and urine. The researchers are planning to utilise drone technology to help farmers in remote locations track their animals as they are moved across vast distances. The tests can even be ordered by domestic animal owners looking to track the stress responses of their pets.

"Cats and dogs are very prevalent in Australia, and are obviously affected by human behaviour. For example, a dog may be stressed if it's not provided with tender loving care, or a cat may be upset if it's not able to access a warm space in winter. What the non-invasive tests can measure is their stress responses over time, giving us baseline indicators of their mood and allowing us to intervene if necessary by pinpointing the moments of great [stress](#) in their lives, and working backwards to discover the cause."

Provided by University of Western Sydney

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