

Early reproduction retains fertility in cheetah females

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Reproduction in free-ranging female cheetah in Namibia is far better than expected. Their reproductive organs are healthy and approximately 80 percent of their young reach adulthood. With these findings, German scientists from the Leibniz Institute for Zoo and Wildlife Research (IZW) in Berlin have overturned the established dogma that cheetahs generally reproduce badly due to their low genetic diversity. The scientists demonstrated that female fertility critically depended on the age at which they conceived their first litter.

The world's largest population of cheetahs inhabits Namibian farmland. Although some farmers persecute and eliminate cheetahs, the cheetahs' main predators, lions and hyenas, are absent. "In contrast to the Serengeti National Park in Tanzania where almost 80 percent of cheetah cubs are killed by lions and hyenas, the majority of young cheetahs in Namibia reach adulthood," explains Dr Bettina Wachter from the IZW. The IZW scientists studied whether the reproductive problems that were thought to hamper cheetahs affected the Namibian population of this species. To achieve this, they investigated whether cheetah females had normal reproductive cycles and examined the condition of their internal reproductive organs.

"The findings were very positive. Our high-resolution ultrasound examinations revealed that the internal reproductive organs of free-ranging cheetah females are very healthy. All females cycled, were in estrous, pregnant or lactating," says Dr Robert Hermes from the IZW. The situation looked very different in captive cheetah females. Captive

cheetahs in Namibia usually live in large enclosures under conditions that are similar to those of free-ranging cheetahs except that they do not reproduce because they are prevented to do so by Namibian law. Most of the captive females did not show any evidence of a functioning cycle and their internal reproductive organs started to show pathologic changes from the age of four years.

The scientists also compared the stress levels of free-ranging and captive cheetahs by measuring of the size of the adrenal glands because stress has been suggested to be one potential reason why captive cheetahs rarely reproduce. They found that the adrenal glands appeared to be normal and levels of stress of the two studied groups were identical.

The scientists conclude that normal reproductive behaviour in young adults is a prerequisite for life-long fertility in cheetahs. Under natural conditions, animals usually start reproducing soon after reaching reproductive maturity and conceive again shortly after weaning a litter. Estrogen-driven maturation of egg cells therefore rarely occurs under natural conditions. In contrast, animals prevented from reproducing are exposed to cycles of fluctuating estrogen concentrations. This can compromise the internal reproductive organs and more rapidly deplete egg cells. As a result, these animals often become infertile at a young age.

"The results confirm previous findings from elephants and rhinos," says Hermes. When, for instance, reproduction of animals in zoos is delayed, it may fail for good because the processes and organs required for reproduction are impaired. In contrast, early reproduction activates the reproductive system and protects fertility.

"The findings will be of particular value if the decreasing cheetah population needs to be restocked with individuals bred in captivity," says Wachter. She suspects that their findings are likely to be of relevance

also for other mammals. Breeding facilities therefore should preferably use young females and females that bred at a young age because older females without a breeding history are likely to be infertile or have difficulties to reproduce.

More information: -- *Conservation Letters*:
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-- www.izw-berlin.de/

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