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Influence of zoo visitors on behaviour and salivary corticosterone concentrations in zoo animals

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In the last years several studies focussed on the influence of zoo visitors on captive animals. Especially for non-human primates changes were demonstrated in many behavioural patterns (e.g. activity, social behaviour, aggression and spatial dispersion). However, only few studies investigated other mammals.

The aim of this study was to evaluate the influence of zoo visitors on behaviour and salivary corticosterone concentrations of mammals others than primates. A group of 1,3 white rhinos (*Ceratotherium simum simum*) and a group of 0,2 bushpigs (*Potamochoerus porcus pictus*) kept in the Allwetterzoo Münster were investigated. During the day the rhinos were housed together in an outdoor enclosure which was separated from the visitors' passage by a border of plants. The bushpigs' indoor enclosure was out of sight of the visitors, but at the outdoor enclosure visitors could directly contact the animals.

In summer 1999 on 39 days (with a total of 148 h) the rhinos' behaviour and on 12 days (with a total of 52 h) the bushpigs' behaviour was observed. At the end of each observation day saliva was collected from all individuals and corticosterone levels were measured by radioimmunoassay. The observation days were classified with regard to three parameters:

- (1) number of visitors
- (2) noise level and
- (3) intensity of optical stimuli from the visitors in front of the enclosure.

According to these parameters observation-days were divided into two categories for each parameter:

- (1) "low" and "high",
- (2) "quiet" and "loud" and
- (3) "inconspicuous" and "conspicuous".

Behavioural data and saliva-corticosterone levels were compared between these categories of visitor performance.

On "conspicuous" and "loud" days the rhinos performed less resting behaviour, whereas the frequencies of comfort and agonistic behaviour were

increased. On days with high numbers of visitors the rhinos were also found in closer proximity to each other. Obviously, salivary corticosterone concentrations were not affected significantly by the visitor performance.

On “full”/“loud” and “conspicuous” days the bushpigs stayed longer in close proximity to the visitors and showed more visitor directed behaviour. Salivary corticosterone concentrations were also not affected significantly by the visitor performance.

The results of this study show that the visitor performance had a distinct influence on the animals' behaviour, but the visitors did not represent a stressor for the animals. For the bushpigs they even were an enrichment of their environment.