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Stress and Disturbance 96

Effects of food dispersal, translocation and panic on salivary corticosterone concentrations in the white rhinoceros

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We already showed, in a group of white rhinos (*Ceratotherium s. simum*), that a feeding experiment performed in the morning resulted in behavioural changes throughout the day (SCHMIDT & SACHSER 1999). Here we present the effects of this feeding experiment on salivary stress hormone concentrations (A). We also investigated levels of corticosterone before and after a translocation (B) and a panic incident (C) in white rhinos.

(A) Feeding experiment: Five rhinos, kept at Münster Zoo, were studied. During the day the male and four females lived together in an outdoor enclosure. During the night each animal had its own box, where the main feeding took place. For ten weeks two additional feedings (about 10kg hay each) were offered in the outdoor enclosure. For the 1st feeding (morning) the amount of hay was placed either in a clumped (one heap for all animals) or in a dispersed mode (one heap per animal). These two feeding conditions were alternated weekly. The 2nd feeding (afternoon) always took place in the dispersed mode. During the feeding experiment a total of 80 saliva samples were taken from each animal in the morning and in the evening. (B) Translocation: A female rhino was moved from Münster Zoo to Erfurt Zoo. Saliva samples were taken five days prior to and eight days after the transport. (C) Panic incident: While leaving their indoor enclosure two female rhinos at Münster Zoo locked themselves up in a small passage. They panicked and got lightly injured. Saliva samples were taken four days prior to and six days after this incident.

The main findings were: (A) When the hay was provided in the clumped mode, both morning and evening corticosterone concentrations were elevated ($t=2.0\text{-}3.5$, $P=0.001\text{-}0.043$) in all five rhinos. Mean concentrations were raised by 17-54% above basal levels. (B) On all eight days after translocation salivary corticosterone concentration were elevated and reached 250% of the initial baseline level. (C) After the panic incident both animals showed increased corticosterone concentrations corresponding to 200% and 380% of the initial baseline levels respectively. From these investigations we conclude that measurement of salivary corticosterone is an appropriate parameter to study stress in white rhinos.

SCHMIDT, C. & SACHSER, N. 1999: Trouble in the morning affects the whole day! - Behavioural consequences of food dispersal in the white rhino. Zoology **102**, Suppl. II, 85.