Natural History Note

Notes on the diurnal activity of early post-natal black wildebeest calves

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Vrahimis, S. and O.B. Kok. 1994. Notes on the diurnal activity of early post-natal black wildebeest calves. *Koedoe* 37(2): 109-113. Pretoria. ISSN 0075-6458.

The diurnal activities of early post-natal black wildebeest calves *Connochaetes gnou* were investigated at the game farm Tussen-die-Riviere, Orange Free State. Calves younger than one month spent approximately 85% of the diurnal budget lying, alternated by 10% standing. At two and three months of age, slightly more than half of the diurnal time budget was spent lying down, with a minor peak in the early morning and a major peak in the afternoon. A progressive increase in the time spent feeding occurred from the first to the third month of life. No fixed diurnal pattern could be distinguished with respect to standing and "other" categories of activity.

Key words: black wildebeest, *Connochaetes gnou*, diurnal activity, young calves.

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Information on the diurnal activity patterns of African ungulates (Leuthold 1977) is insubstantial, and virtually nothing is known of the activities of calves. Unique amongst antelopes, *Connochaetes* and *Damaliscus* species have precocial young which show a well-developed following response (Leuthold 1977; Walther 1965). They accompany their mothers from the moment they first gain their feet and are able to run within minutes of birth (Estes 1966, 1974; Von Richter 1971a, 1971b). With regard to wildebeest, calving is also strictly seasonal and highly synchronised, with the bulk of the young being born within a three-week period (Estes 1966; Skinner *et al.* 1973; Von Richter 1971a, 1971b; Watson 1969).

In this study on the behaviour of similar-aged individuals, we concentrated on the diurnal activities of young black wildebeest calves. We quantified these activities and noted behavioural changes during the young ungulates' ontogeny.

The diurnal activities of early post-natal black wildebeest calves *Connochaetes gnou* (Zimmerman, 1780) were investigated at Tussen-die-Riviere (30°25′S to 30°35′S; 26°3′ E to 26° 20′E), during and immediately after the calving season, which extends from mid-November until the end of January (Vrahimis 1984). Newborn calves could easily be distinguished from the yearlings and adults by their light brown colour, small size, and absence of horns. Direct field observations of nursery herds consisting of adult females, calves, female yearlings and a small proportion of male yearlings, were carried out. This was done on a weekly basis from sunrise to sunset for up to 13 hours continuously during December, January and February 1983-1984. As the majority of young were born at the beginning of the mid-sum-

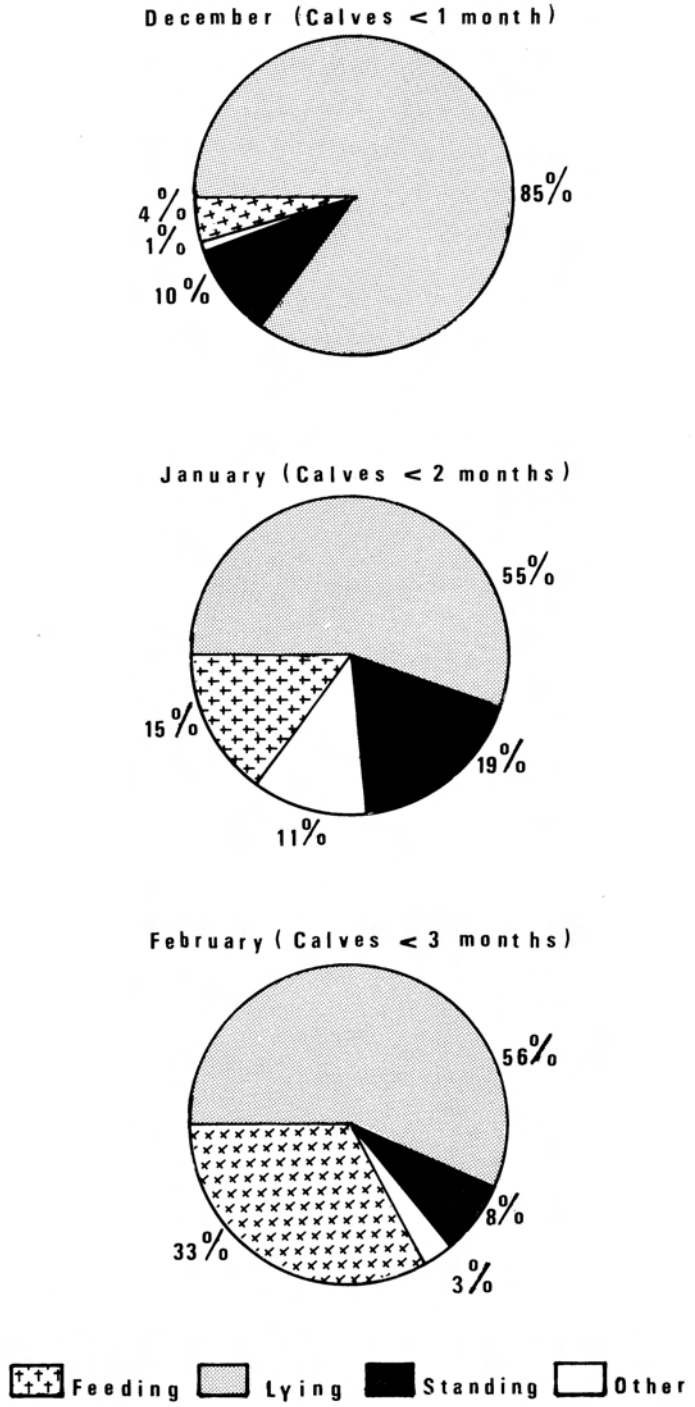

Fig. 1. Proportion of overall activities shown by early post-natal black wildebeest calves at the game farm Tussen-die-Riviere.

mer calving season, the ages of the approximately 35 calves monitored varied from less than one to a maximum of three months. Field observations were conducted from a vehicle parked at a distance so as not to disturb the animals. The scan sampling method as described by Altmann (1973) was employed using ten-minute intervals. All recordings were then grouped hourly and expressed as a percentage. Four categories of activity were distinguished, namely feeding, standing, lying, and other activities. The latter included a variety of activities which did not feature prominently in the diurnal activity pattern, for example playing, running and purposeful walking.

The relative proportion of diurnal activities shown by black wildebeest calves of varying ages is summarised in Fig. 1. In all cases lying down dominated the other categories of activity. Time spent lying decreased from 85% during the first month (December) to slightly more than half of the overall diurnal period during the second and third months. Feeding showed a progressive increase from 4% to 33% during the corresponding period, whilst time spent standing varied between 8% and 19%. Excluding the value of 11% recorded at the end of the calving season (January), the "other" category of activity only represented a minor portion of the diurnal schedule.

Figure 2 illustrates the diurnal activity patterns of the different age groups of black wildebeest calves. In all cases lying down was recorded throughout the day. Newborn black wildebeest spend the largest part of the day lying down. This initial lying phase is considered to be part of the normal behavioural development of the calves, and may also be an innate means of predator avoidance. In this regard it is perhaps significant to note that the tawny coat of the young calf is completely different from that of the older calves or adults, thereby enhancing the possibility that the calf is well-adapted to concealment in its natural environment (Estes 1974). During subsequent months the time spent lying down appeared to have stabilised at a much lower level (55%-56% as opposed to 85% of the diurnal time budget). At approximately three months of age the calves seemed to have established a marked bimodal lying pattern displaying a minor peak in the early morning and a major peak in the afternoon when ambient temperatures were usually high.

Unlike most bovids whose newborn spend long periods lying alone in seclusion while the mother feeds at a considerable distance (Leuthold 1977), black wildebeest calves follow their mothers immediately after birth (Von Richter 1971a, 1971b). Most individuals recorded standing were in close proximity to their mothers, either standing very close to them or running at their heels, and even managing to keep up with the herd at high speeds. Even though individuals of the various age groups were recorded standing at all hours of the day, no fixed diurnal pattern could be distinguished.

The most noteworthy development in the diurnal activities of early post-natal black wildebeest calves involved the progressive increase in the time spent feeding. Limited feeding by the younger calves (December and January) was confined mostly to the early morning, around midday and again in the late afternoon. At three months of age feeding took place primarily during the course of the morning. Even though calves of approximately three months suckled frequently, up to a third of the diurnal time budget was spent "grazing". However, as reported by Leuthold (1977), most feeding during this period consisted of exploring potential food sources by nibbling at the vegetation, litter and soil. The limited grazing recorded for calves younger than one month contradicts the finding of Von Richter (1971a) that the young only commence nibbling on grass blades after four to six weeks.

"Other" activities are mostly performed during the middle of the day and did not feature prominently in the diurnal activity pattern of newborn calves. A noticeable increase in the time spent performing other activities during

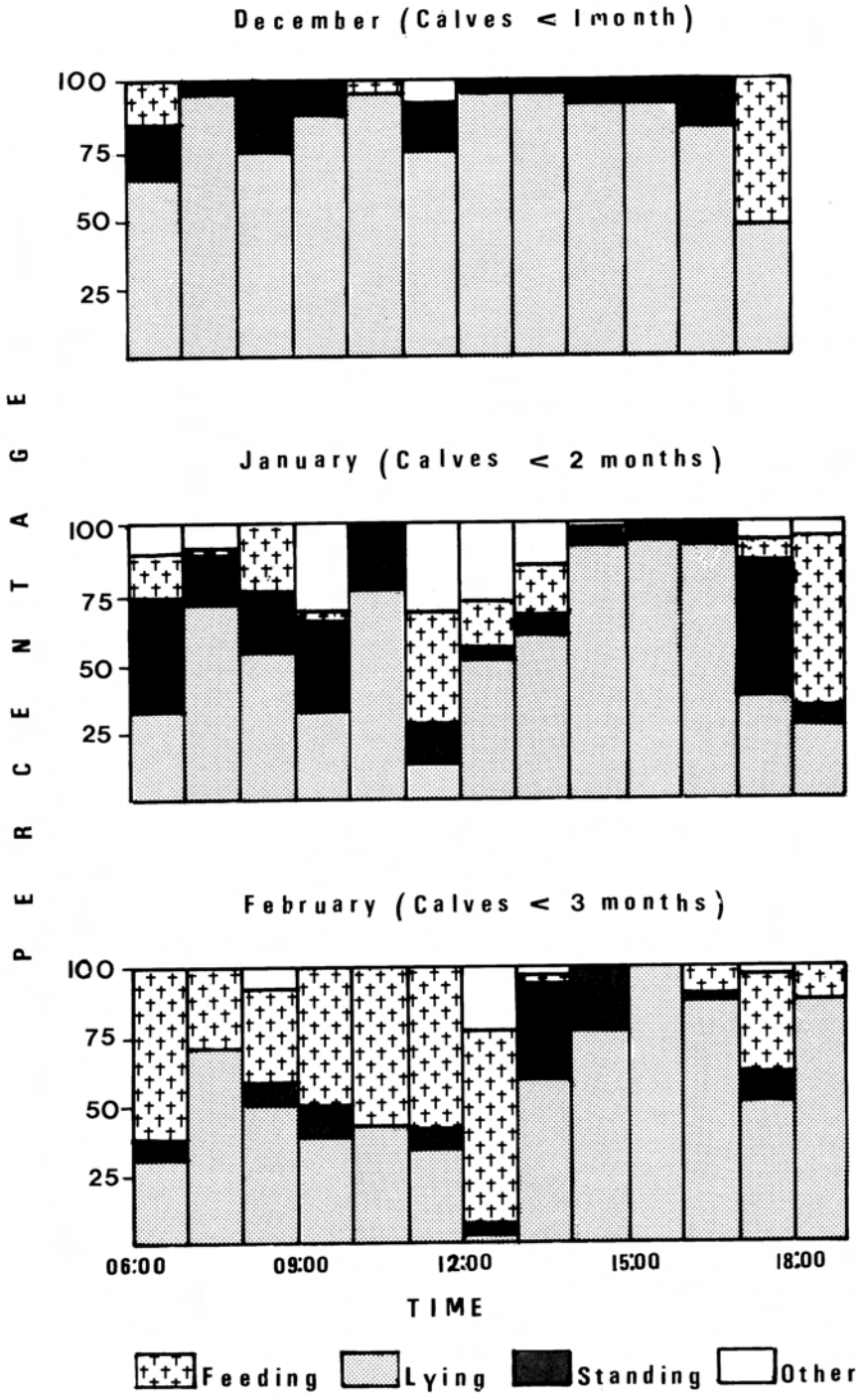

Fig. 2. Diurnal activity patterns of early post-natal black wildebeest calves at the game farm Tussen-die-Riviere.

the second month of life can probably be ascribed to the weakening of the mother-calf bond and the formation of so-called nursery groups. These groups often showed synchronised activity distinct from the main body of the herd, such as playing and exploring. At approximately three months af age the aggregation of calves was more pronounced with the young spending most of the day together. True creche behaviour, where a subgroup of similar-aged young is accompanied by one or two adult females (Gosling 1969; Jarman & Jarman 1973), was, however, only observed once. Nevertheless, it illustrates the strengthening bond between the three-month old calves.

Permission to conduct the study was granted by the Directorate of Nature and Environmental Conservation of the Orange Free State. Mr. C.A. van Ee kindly prepared the figures.

References

ALTMANN, J. 1973. Observational study of behaviour: sampling methods. *Behaviour* 49: 227-265.

ESTES, R.D. 1966. Behaviour and life history of the wildebeest (*Connochaetes taurinus* Burchell). *Nature, Lond.* 212: 999-1000.

ESTES, R.D. 1974. Social organization of the African Bovidae. Pp. 166-205. *In*: GEIST, V. AND F. WALTHER (eds.). *The Behaviour of Ungulates and its Relation to Management*. IUCN Publications new series no. 24, Morges.

GOSLING, L.M. 1969. Parturition and related behaviour in Coke's hartebeest, *Alcelaphus buselaphus cokei* Günther. *Journal of Reproduction and Fertility*, Supplement 6: 265-286.

JARMAN, M.V. AND P.J. JARMAN. 1973. Daily activity if impala. *East African Wildlife Journal* 11: 75-92.

LEUTHOLD, W. 1977. *African Ungulates*. Berlin: Springer-Verlag.

SKINNER, J.D., J.H.M. VAN ZYL AND J.A.H. VAN HEERDEN. 1973. The effect of season on reproduction in the black wildebeest and red hartebeest in South Africa. *Journal of Reproduction and Fertility*, Supplement 19: 101-110.

VON RICHTER, W. 1971a. Observations on the biology and ecology of the black wildebeest (*Connochaetes gnou*). *Journal of the Southern African Wildlife Management Association* 1: 3-16.

VON RICHTER, W. 1971b. *The Black Wildebeest* (Connochates gnou). Nature Conservation Miscellaneous Publication No 2, Orange Free State Provincial Administration, Bloemfontein.

VRAHIMIS, S. 1984. Comparative production and condition of black wildebeest (*Connochaetes gnou*) in the Orange Free State with emphasis on the interaction between habitat and the animal density. Unpublished Internal Report, Orange Free State Provincial Administration.

WALTHER, F. 1965. Verhaltensstudien an der Grantgazelle (*Gazella granti* Brooke, 1872) im Ngorongoro-Krater. *Zeitschrift für Tierpsychologie* 22: 167-208.

WATSON, R.M. 1969. Reproduction of wildebeest, *Connochaetes taurinus albojubatus* Thomas, in the Serengeti region, and its significance to conservation. *Journal of Reproduction and Fertility*, Supplement 6: 287-310.