

# Accepted Manuscript

Daily rhythmicity of behavioral responses in donkeys of different age groups during the cold-dry (harmattan) and hot-dry season in a tropical savannah

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PII: S1558-7878(18)30073-X

DOI: [10.1016/j.jveb.2018.08.001](https://doi.org/10.1016/j.jveb.2018.08.001)

Reference: JVEB 1173

To appear in: *Journal of Veterinary Behavior*

Received Date: 5 April 2018

Revised Date: 28 June 2018

Accepted Date: 7 August 2018

Please cite this article as: Ocheja ZAKARI, F., Olusegun AYO, J., Ibrahim REKWOT, P., Umar KAWU, M., Salka MINKA, N., OLAIFA, F., Jimoh IBRAHIM, M., Onimisi AVAZI, D., Daily rhythmicity of behavioral responses in donkeys of different age groups during the cold-dry (harmattan) and hot-dry season in a tropical savannah, *Journal of Veterinary Behavior* (2018), doi: 10.1016/j.jveb.2018.08.001.

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**Abstract**

The aim of the study was to evaluate the daily rhythms of behavioural activities of adult, yearling and foal donkeys during the cold-dry (harmattan) and hot-dry seasons in a tropical savannah. Thirty, clinically, healthy free-ranging donkeys, divided into three groups of 10 donkeys each according to their age, served as experimental subjects. Behavioural activities of donkeys were monitored bi-hourly from 06:00 to 06:00 h (GMT +1) during the cold-dry and hot-dry seasons. Application of single cosinor procedure showed that behavioural activities exhibited varying levels of daily rhythmicity in both seasons. Behavioural activities of adult, yearling and foal donkeys peaked during the afternoon period (13:11 h - 14:45 h) of the photophase of the light-dark cycle during the cold-dry and hot-dry seasons. The diurnal index of activity rhythm showed that donkeys are mostly diurnal animals. During the study period, the percentage time spent on feeding during the harmattan season was higher ( $P < 0.05$ ) than during the hot-dry season in adults ( $37.38 \pm 1.57$  % vs  $30.72 \pm 1.29$  %), yearlings ( $33.20 \pm 1.43$  % vs  $27.00 \pm 1.25$  %) and foals ( $16.79 \pm 0.82$  % vs  $14.38 \pm 0.65$  %). The percentage time spent dozing during the hot-dry season by adults ( $28.21 \pm 1.59$  %), yearlings ( $29.31 \pm 1.60$  %) and foals ( $37.64 \pm 1.48$  %) was higher ( $P < 0.05$ ), when compared to the corresponding values ( $23.75 \pm 1.55$  %,  $26.43 \pm 1.59$  % and  $42.42 \pm 1.40$  %, respectively) obtained during the harmattan season. In conclusion, daily rhythmicity of behavioural activities in donkeys, kept under natural light-dark cycle were similar in both seasons, although the intensity of activity was higher in the cold-dry than the hot-dry season. This finding may be useful in the management, improvement of productivity and welfare of working donkeys under different thermal environmental conditions.

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