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Study on Reproductive Activity of *Equus asinus* in Relation to Environmental Factors in Central Ethiopia

ALEMAYEHU LEMMA¹, HORST JÜRGEN SCHWARTZ¹, MERGA BEKANA²

¹Humboldt-Universität zu Berlin, Livestock Ecology, Germany

²Addis Ababa University, Clinical Studies, Ethiopia

Abstract

Reproductive activity in donkeys around the tropics is all year round with certain seasonal peaks to which often-different nutritional, climatic and managerial conditions are associated. The influence of these locally fluctuating seasonal conditions on ovarian activity was studied by real time ultrasonography in 7 local Jennies (*Equus asinus*) during the dry, short and long rainy seasons from December 2001 to October 2002 in central Ethiopia. Semi-quantitative analysis of the pasture condition and availability, and Body Condition Scoring (BCS) were carried out to study the nutritional status. The jennies developed 1–3, 2–4, 2–5 ovulatory and 1–2, 1, 1–4 anovulatory waves per animal during the dry, short and long rainy season respectively. The mean (\pm sd) inter ovulatory interval (IOI) for the dry season was longer and follicles grow slower than during the short and long rainy seasons ($p < 0.05$, 27.3 ± 7.26 days, 0.88 ± 0.74 mm per day; 23.8 ± 4.44 days, 1.15 ± 1.1 mm; 26.6 ± 6.48 days, 0.90 ± 0.64 mm respectively. Mean (\pm sd) BCS and forage estimates were found to be significantly lower during the dry season ($p < 0.001$; BCS = 2.7, 3.8, and 3.9, and Forage estimate = poor, satisfactory and good) for the dry, short and long rainy seasons respectively. BCS was positively correlated with higher grades of forage condition and availability ($t = 0.4$ at $p < 0.05$) and influenced seasonal distribution of follicles. The mean (\pm sem) maximum diameter of pre-ovulatory follicle was significantly larger during the short rainy season than the dry and the long rainy seasons (37.8 mm ± 2.1 , 31.0 mm ± 1.82 , 33.2 mm ± 1.22 , $p < 0.05$) respectively. The dry season is the main harvest period in the study locality and all the jennies were vastly used for pack and transport in the field, around the house and market during this time than the following wet seasons. Some of the minor relationship observed between seasonal climatic values and different size groups of follicle were not biologically definable. Jennies produced relatively larger follicles with better growth rate, had higher number of ovulatory waves and also a shorter IOI during the short rainy season which seems to be the best breeding period for the traditionally herded jennies. Results of this study indicate the existence of normal but significantly different ovarian activity among the seasons with the peaks mainly related to differences in nutrition and management. Tropical donkeys in this particular area are therefore not strictly seasonal breeders but the pattern of reproductive activity follow the influence of local environmental factors through the different season. The relative effects of individual factor need a further detailed verification.

Keywords: Environmental factors, *Equus asinus*, reproduction