

Name: Allison M. Clay

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(*Connochaetes Taurinus*)

Dissertation Director: Dr. Lee Talbot

ABSTRACT

Many mammalian species display seasonal breeding patterns, reflecting optimal environmental conditions for breeding. In some cases, employing reproductive synchrony within that season may lead to additional fitness benefits, such as a lowered risk of neonate predation. Western white-bearded wildebeest (*Connochaetes taurinus mearnsi*) present an exceptional example of reproductive synchrony, characterized by clustered breeding during a three week annual rut that results in a pronounced annual calving peak. There is little available information on normal endocrine parameters or estrous cycle characteristics of the wildebeest. Thus, a longitudinal, non-invasive, behavioral endocrine study was conducted on female wildebeest captured from the Serengeti-Mara migration and kept in an enclosure within their natural range for approximately sixteen months. Fecal progesterin levels were shown to reflect ovarian activity and pregnancy, and indicate that wildebeest are polyestrous, spontaneous ovulators. It was hypothesized that male rutting calls act as cue in synchronizing estrous in this species. To test this, fecal progesterin analyses were used to assess the effects of exposure to male vocalizations on ovarian function. Two separate female groups were

exposed to recordings of male rutting vocalizations for a 3-week period with or without direct male presence; a third group was maintained in isolation of all male stimuli. The results demonstrate that exposure to male rutting vocalizations tightens reproductive synchrony within herds, augments ovarian function (i.e., corpus lutea-derived progesterone production), and results in sustained estrous cyclicity. The potential involvement of other social factors in reproductive function in females was also investigated. In the three smaller groups, stable linear dominance hierarchies were observed. Proximity was correlated to the timing of the first post-partum estrous cycle, raising the possibility that chemical signals are also involved in the timing of ovarian activity. Fecal corticoid concentrations showed significant individual variation, but did not indicate any correlation between stress and any variables measured, including dominance rank. Future research on reproductive timing and function in male wildebeest, as well as on female herd membership in the migratory population would greatly expand our understanding of the unique reproductive strategy employed by this keystone species.