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598. MEASURING FECAL HORMONE CONCENTRATIONS IN THE ENDANGERED FLORIDA MANATEE. Iske LV Larkin[1], Timothy S Gross[2] and Roger L Reep[1]. [1]University of Florida, Department of Physiological Sciences, Gainesville, FL; [2]United States Geological Survey, Gainesville, FL.

The Florida manatee is a unique marine herbivore of the order Sirenia. This endangered species is found in coastal and estuarine waters of Florida throughout the year. An understanding of Florida manatee reproductive biology is important in establishing population models, making management decisions, and recognizing differences between healthy and unhealthy states. While fieldwork and necropsies suggest that manatees are not strong seasonal breeders, an examination of the reproductive hormone fluctuations that could corroborate these findings has not yet been conducted. The overall goal of this research was to characterize hormone concentrations of testosterone, estradiol and progesterone in male and female manatees for at least one year. A fecal radioimmunoassay (RIA), a non-invasive technique available to measure steroid concentrations, was used to analyze hormone fluctuations in 12 female and 14 male captive manatees. The results from this study showed that the majority of adult males had higher testosterone concentrations (160 – 68,614 ng/g), compared to concentrations observed in female manatees (160 – 5,919 ng/g). Female estradiol and progesterone values indicated an estrous cycle length of approximately 28 – 42 days. Seasonal fluctuations in hormone concentrations were observed with slight peaks during spring and/or fall. Results of these studies corroborate the field observations and indicate that fecal radioimmunoassays can be a useful tool for measuring hormone concentrations in Florida manatees. On going studies include fecal samples collected from a wild female manatee tagged for 6 months and captive females trained for blood, urine and fecal collections to more frequent monitor reproductive steroids, LH, FSH, and glucocorticoids.

599. PROFILING PREGNANCY AND PARTURITION IN THE WHITE RHINOCEROS *(Ceratotherium simum)*: A CASE STUDY. Susan Bowers[1], Scott Gandy[1], Ken Paul[2], Lisa Woods[2], Denise D'Angelo[2], Carolyn Horton[2], Chris Tabaka and Scott Willard[1]. [1]Mississippi State University, Mississippi State, MS; [2]Memphis Zoo, Memphis, TN.

In this case study, an attempt was made to use vaginal electrical conductance (VEC) to predict calving in a female white rhino, and to determine the relationship between VEC and hormonal profiles during pregnancy. The principle behind VEC is that a change in the ionic balance of vaginal and cervical mucus occurs in response to changes in reproductive hormones, which occurs during the estrous cycle and the latter stages of gestation. Three times weekly, VEC readings were recorded and fecal samples collected from early to mid-gestation, with daily fecal collections starting 4 months prior to calving. The extracted fecal samples were analyzed for immunoreactive estrogens (E2), progestagens (P4), and cortisol by RIA. Prior to calving VEC readings did not decrease, but remained consistent throughout most of pregnancy (180 to 220 relative units; RU). Fecal P4 decreased 236.2 ng/g between d 17 and d 1 prior to calving, whereas E2 increased 15.4 pg/g between 4 and 2 months prior to calving, with an additional increase of 13.5 pg/g occurring 1 month prior to calving. Fecal cortisol increased 5 months prior to calving, stabilized for the next 3 months, and increased again within 3 weeks prior to calving. During this study, a decline in VEC occurred 168 d prior to calving (107 RU decrease), and remained at these levels for 4 weeks. At the time of this VEC decrease, the female became aggressive toward the male and began lactating. Fecal P4 and E2 did not change during this time, however fecal cortisol increased as VEC readings returned to normal, along with a return of normal behavior and cessation of lactation. Following 168 d after this episode, the female calved normally (16-mon gestation). In summary, the use of VEC could not predict parturition in the white rhino. However, an anomaly occurred during pregnancy that was supported by VEC readings, a change in behavior and a subsequent increase in fecal cortisol. The etiology of this anomaly is unknown, yet did not compromise pregnancy.

600. LINKS BETWEEN THE DISTRIBUTION OF INTERBIRTH INTERVALS AND REPRODUCTIVE TRAITS IN MURID RODENTS. Oscar L Buzzio[1,2]. [1]Laboratory of Reproduction and Lactation (IMBECU-CONICET), Mendoza, Argentina; [2]Laboratory of Physiology (IHEM-CONICET), Mendoza, Argentina.

In colonies of murid species which present postpartum estrus, continuously mated females can become pregnant while nursing the recently delivered litter. This situation produces a higher energetic demand to the female that now has to nurture a lactating litter and an unborn litter simultaneously. Lactational embryonic diapause (LED) and early lactational estrus (ELE) are different reproductive traits that accomplish the same task: reduce the litter overlap. The analysis of the frequency distribution of interbirth intervals of continuously mated murid rodents would permit to estimate certain reproductive parameters as the presence or not of LED and ELE. In the bibliography there is partial or no data regarding LED and ELE in 17 of the 26 species studied. A method was developed that allowed classify species as having a particular LED/ELE combination: it considered significant exponential and linear decay regressions and the analysis of the birth rate in different intervals of each species' curve. Species with LED-/ELE- status were: *Calomys laucha, Calomys musculinus, Calomys venustus, Dicrostonyx rubricatus* and *Lemmus lemmus*. Species with LED±^{short}/ELE+ status were: *Akodon dolores, Akodon molinae, Calomys lepidus, Clethrionomys glareolus, Clethrionomys rutilus, Dicrostonyx groenlandicus, Di-*

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