LONGITUDINAL SERUM PROGESTERONE ANALYSIS TO ASSESS REPRODUCTIVE SUCCESS IN FEMALE WHITE RHINOCEROS (*Ceratotherium simum*)

Marcie Oliva, LVT, Vickie Steele, Tim President, and Linda M. Penfold, PhD*

White Oak Conservation Center, 581705 White Oak Road, Yulee, FL 32097 USA

Abstract

Rhinoceros species can be conditioned with food treats for voluntary blood sampling from leg or ear veins. Blood sampling allows real time analysis of endocrine events, and in this study was employed over a period of approximately 5 yr to assess the reproductive status of a herd of female white rhinoceroses *(Ceratotherium simum;* n = 6*).* Serum was collected (1 – 4 times per month) from five adults and one juvenile and stored frozen (-70˚C) until analysis for progesterone by enzyme-linked immunoassay using a polyclonal anti-progesterone antibody. Results described 11 pregnancies from 4 females, established onset of puberty in the juvenile female, and identified the remaining non-reproductive adult female as a 'flatliner' (where undetectable concentrations of progesterone were measured over an extended period of time). Interestingly, this female showed variable serum progesterone concentrations consistent with ovarian activity at the beginning of the study, together with observed mating by the male, but after 4.5 yr serum progesterone decreased, and eventually declined to undetectable levels that lasted for 14 mo. For the pregnant females, although serum progesterone steadily increased until shortly before parturition when it declined rapidly, variable monthly serum progesterone concentrations precluded a single sample pregnancy diagnosis until month 13 ($P < 0.05$). However, multiple samples with most values exceeding 15 ng/ml over a 2 - 3 wk period would likely reliably confirm pregnancy after month 5. No differences in mean serum progesterone were noted between pregnant females ($P > 0.05$), but one female had lower mean progesterone non-pregnant concentrations ($P < 0.05$) than the other three females. Lastly, a 1 yr period of cycling activity with no pregnancies during the study ended abruptly with the replacement of a diagnosed infertile male with a proven breeder and four pregnancies occurred within 3 mo.