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SERUM ADIPOSITY PARAMETERS AND REPRODUCTIVE PROBLEMS IN FEMALE WHITE RHINOS

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In 2004, the AZA Rhinoceros Research Advisory Group generated a list of priorities that should be examined in our captive rhinoceros population. Two of the stated priorities are: factors involved in reproductive failure of the Southern white rhino F_1 population and the etiology of reproductive pathologies in all rhino species. We hypothesis that obesity in the captive population as well as problems related to insulin/glucose metabolism are factors involved in reproductive pathologies of the Southern white rhino F_1 generation.

Obesity is a risk factor associated with numerous disease pathologies in multiple animal species and is a known problem in many captive animal populations including rhinos.[1] Concerning reproductive problems, obesity is a known risk factor for polycystic ovary syndrome, erratic estrous cycles and leiomyomas in humans.[2-4] Obese mares exhibit an extended interval between successive ovulations and prolonged periods of elevated circulating concentrations of progesterone.[5] Besides being a biomarker for adiposity, leptin plays a role in reproductive activity at the level of the hypothalamic-pituitary axis, regulation of early embryo cleavage and development, and has an inhibitory effect on developing ovarian follicles in humans and other animals.[4-11] Adiponectin, which decreases in obesity, is negatively associated with plasma insulin and may be involved in insulin resistance, hyperandrogenism, and polycystic ovary syndrome in obese humans.[4,10]

Our objective is to compare biomarkers of adiposity (leptin, adiponectin, IGF-I, and insulin:glucose) from the captive female white rhino population to reference values generated from wild female white rhinos to determine if the populations are similar. Evaluation of the captive white rhino population will be conducted further by examining female white rhinos that have had reproductive pathologies confirmed or which have been unsuccessful in reproducing to females who have shown repeated success or which have been evaluated and exhibit no reproductive pathologies.

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