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Development of Artificial Insemination in the Greater One-Horned Rhinoceros

The Species Survival Plan (SSP) population of the Greater One-Horned (GOH) rhinoceros has prospered demographically with an annual growth rate of about 4%. However, the genetic foundation and diversity of this population is limited and inadequate for long-term viability. In an effort to improve the genetic diversity of captive GOH rhinoceros, scientists at the Center for Conservation and Research of Endangered Wildlife (CREW) at the Cincinnati Zoo and Botanical Garden are developing a transcervical artificial insemination technique using the natural reproductive cycle of the female. Artificial insemination could help ensure a genetically healthy and self-sustaining population of captive GOH rhinoceros by making it possible to produce offspring from behaviorally incompatible pairs and allow new genetic material to be introduced into captive populations globally.

Semen samples from male GOH rhinoceros are collected by electroejaculation and cryopreserved for use in the AI trials. Through the use of rectal ultrasonography, urinary hormones and behavior, the estrous cycle of the female GOH rhinoceros is monitored and AI procedures are timed around ovulation. A total of six AI procedures have been conducted in a female GOH rhinoceros. The first four AI procedures were conducted following ultrasonographic verification of successful ovulation and two AI procedures were conducted prior to ovulation. Ultrasonographic imaging during each AI procedure has allowed us to verify semen deposition directly in the cervix during early AI attempts and directly into the uterus during the more recent AI procedures. While the female has yet to conceive, the development and implementation of custom made AI tools has allowed us to perform nonsurgical inseminations accurately timed to within 24 hours of ovulation in this species. Although the project has been challenging, the role of the keeper staff in assisting and trouble shooting many hurdles along the way has been invaluable to the collection of sound scientific data and the progress of the project.