

At Arm's Length: Training 0.2 Black Rhinos (*Diceros bicornis*) for Free-Standing Transrectal Ultrasounds

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Abstract

*For the past decade and a half, Cleveland Metroparks Zoo has had a successful Black Rhino (*Diceros bicornis*) breeding program. Led by Alisa Sandor, Lead Animal Keeper, and Dr. Mandi Schook, Associate Research Curator, our staff looked for new methods of gathering information which could ultimately help further rhino breeding success. Staff decided to begin training our rhinos for free-standing transrectal ultrasounds. This would allow us to closely monitor the progress of the first successful pregnancy by natural breeding of one of our female rhinos and it would provide an avenue to more accurately track estrus cycles of both of Cleveland Metroparks Zoo's two oldest female Black Rhinos. Finally, it could provide a transition point to train for a long-term objective of potential artificial insemination. Some strategies used to obtain this behavior relied heavily on the pre-developed husbandry relationships that existed between animal care staff and the rhinos. Some behaviors needed refined, while others needed created in order to reach our goal. This presentation explores the training methods utilized in acquiring this behavior, hopefully adding yet another tool to help zoo rhino populations.*

Introduction

Black Rhinoceroses (*Diceros bicornis*) are one of the world's most critically endangered mammals. They have had the most drastic decline of total numbers of individuals over the past century of any other rhino species, losing 96% of its wild population (International Rhino Foundation, 2015). There are thought to be only 5,055 Black Rhinos remaining in the world (IUCN African Rhino Specialist Group, 2013). Cleveland Metroparks Zoo (CMZ) is home to 1.3 Black Rhinos. The rhinos at CMZ include Inge

our oldest female at approximately 22 years of age, along with her daughters Kibibbi, 12, and Johari who just turned 5. Juba is our only male rhino. He is Kibibbi's son and turned 3 in July.

The decision was made to begin training our two oldest rhinos, Inge and Kibibbi, for transrectal ultrasounds. This behavior would allow us to monitor the progress of Kibibbi's pregnancy, as well as to provide a better understanding of the timing and length of rhino estrus cycles. Once this new behavior was trained it could provide a progression point to potential attempts at artificial insemination. At the time, we did not have access to a training chute inside of the rhino barn. After discussing our options with our Curators, Veterinarians and the Conservation and Science Research staff we felt confident in the ability to train this behavior safely in a protected contact, but free-standing manner.

Methods

Without the use of a training chute, we understood that the behavior would need to be acquired in a safe, slow and comfortable time table for both rhinos and staff. Introducing individuals who were unfamiliar to our rhinos was a step that did not take very much time. Our rhino barn is one of the most oft toured areas at CMZ, so the rhinos were already very comfortable with different faces, including Dr. Mandi Schook our Associate Research Curator who would be performing the ultrasounds. Dr. Schook would take the time being around the barn from the very beginning stages of approximations. We would initiate training the behavior by combining two learned behaviors, "target" and "lean in", and then adding additional adaptations for the tactile portion along the backend of the rhinos. The reinforcement that would be used was a combination of sliced produce (apples and carrots) along with alfalfa cubes. Our rhinos have gotten accustom to the verbal bridge "Good". The primary trainer would work the individual rhino from a protected contact setting inside of our first rhino holding stall (Stall 1). The rhino would be closed off in the adjacent stall (Stall 2). The trainer would cue "target", then bridge and reinforce the behavior. Next would be the "lean in" cue. It was optimal for the rhino to be positioned with its backend nearly touching the front side of Stall 2 while staying parallel to the side panel bars of Stall 1, so that Dr. Schook would be able to have the reach necessary to obtain the ultrasound. Once again, this process was learned quite quickly by both rhinos. Though their positioning within Stall 2 was new, the behaviors were already well cultivated. The next steps would prove to be somewhat more challenging, as we would now introduce the rhinos to Dr. Schook touching various sites on their hindquarters. She did so while wearing the medical apparel full arm length plastic gloves that would be used during the ultrasounds. There was little to no adverse response by either rhino with this new stimulus. The subsequent progression of the training would have Dr. Schook beginning to touch, grab and manipulate the tail of the rhino. This was done utilizing several training sessions over the course of several days.

After many sessions of approximations, the following move was to begin using a lubricant on the glove and to begin palpating around and eventually inside of the rectum. As these sessions progressed, it was apparent that our primary reinforcement, sliced produce, would be enough to maintain the attention of both rhinos during the procedure. Once Dr. Schook felt comfortable enough with palpations obtaining optimal distance needed for the ultrasound to work, the hand-held ultrasound probe was introduced. Initially, the reinforcement would be near constant. Eventually, we would be able to decrease the constant reinforcement and we also began using alfalfa cubes amongst the apples and carrots so as to not overload our rhinos with produce. Almost immediately, Dr. Schook was able to obtain views of the reproductive systems of both rhinoceroses, which had never before been achieved in the history of Cleveland Metroparks Zoo.

Results

Both females responded to the first aspect of training this behavior as expected, very quickly. The “target” and “lean in” cues were established behaviors already ingrained into both Inge and Kibibbi’s normal husbandry routine. The slow, tactile portion with Dr. Schook manipulating at the hindquarters of both animals was also achieved fairly quickly. Inge and Kibibbi learned the behavior at near simultaneous rates. Once the internal practices began occurring, we noticed the need to use more produce as a primary reinforcement to maintain the attention of the rhinos in this part of the training. Inge seemed to be more comfortable than Kibibbi with the transrectal manipulations. Therefore, we did not need to be as constant with her reinforcement. Kibibbi at times, even to this very day, can act a bit more restless during the ultrasounds. She did need more consistency of reinforcement to allow for the procedure. However, both rhinos have now been able to be transrectally ultrasounded on an as needed basis.

Discussion

Inge and Kibibbi are both unique cases in terms of their comfort level in training with our staff. Alisa Sandor has worked with Inge since the rhino’s arrival to Cleveland in 1998. Their established training relationship is closing in on 20 years. In turn, Alisa has been part of Kibibbi’s life from the time she was born in 2003. I believe this cannot be highlighted enough in terms of the comfort level and trainability of these rhinos. The cooperation and communication between staff members at CMZ provided an opportunity to safely and successfully train this behavior without the use of a restraint. The ability to now perform transrectal ultrasounds on two of the most genetically important Black Rhinos in North America is a grand achievement for all of us in this profession. The information that researchers can now obtain from these ultrasounds may prove invaluable.

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