Training of a Black Rhino Calf from Birth Through One Year of Age at Disney's Animal Kingdom

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The first black rhino (*Diceros bicornis*) birth at Disney's Animal Kingdom occurred on 13 November 2000. The male calf, named Badru, was immediately incorporated into the animal training program. This paper will discuss background information about Disney's Animal Training Program, the first year of the black rhino calf's individual training program, and its success and benefits.

Animal Training Program at Disney's Animal Kingdom
Animal training at Disney's Animal Kingdom (DAK) is a team effort and an integral part of our animal husbandry program philosophy. The team includes the veterinary staff, curators, behavioral husbandry department, zoological managers, and keepers, each having different roles and levels of responsibility with equal importance. Each animal species has a contact veterinarian who is familiar with all of the individual animals in their area.

The role of the contact vet is to provide assistance with setting and prioritizing the medical goals for each individual and species. The contact vet also attends training sessions to facilitate in the training process. The role of the curator is to oversee the animal management side of the training process and make sure the animal management needs are met. The behavioral husbandry department oversees all the animal training that occurs within DAK. This includes assisting all animal areas with their individualized training programs as well as being the primary creators of the DAK training program. The zoological managers provide assistance to the animal management decisions that are directly related to training, as well as help carry out the training program in their animal areas.

The keepers carry out the "hands on" part of the animal training program. They will also provide any pertinent information about the individual animals to the rest of the animal management staff. The support and commitment of each individual person is essential to ensure that all husbandry goals are successfully met for the animal. Everyone having an important role to play in this process also ensures total buy in and support for the program. The philosophy that Disney's Animal Kingdom practices is based upon certain key factors including safety, teamwork, process, and goals. Safety is the first consideration for any of our training programs; safe for the keeper, animals, veterinary staff, equipment, and the process. The curators, zoological managers and the veterinary staff meet and discuss which management issues should be focused on for that particular species such as blood collection, vaccinations and annual health exams. Zoological managers, keepers and the behavioral husbandry team meet and develop a training plan to be carried out for that species. The philosophy also states that husbandry training, as the term implies, is an integral part of the keeper's daily animal care. Just as with feeding and cleaning, there is no separation between animal management and animal training.

The main goal of the training program is to create a safe, low stress environment to provide the best husbandry possible. The DAK training program strives to be proactive instead of reactive. Through training, routine examinations can be accomplished daily to assess the physical and mental status of the animals. If any special treatments are needed (e.g., skin treatments, foot care, vaccines, etc.) training can

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provide reduced stress methods of application. Other beneficial goals include efficient animal shifting on/off exhibit, mother/offspring separation, ongoing behavioral enrichment for the animals, and increased capabilities for gathering medical, reproductive, or nutritional information (e.g., ultrasounds; semen, blood, or urine collection, etc.)

A well-planned, consistently delivered training process is critical to the success of a program. At DAK, the program revolves around a framework of six major components: 1. Goal Setting 2. Planning 3. Implementing 4. Documenting 5. Evaluating and 6. Re-adjusting. This framework guides the process used to create, sustain and evaluate training initiatives. The first step is to set the goal that needs to be achieved for the animal. After the goal is set, a plan must be put into place to achieve the goal. This is done through an approval process where the desired behaviors to be trained and approximations are identified. The plan will then receive management approval. Once a plan has been approved, it can be implemented through training sessions. Documentation is done to keep a record of an animal's response to the training sessions. The team routinely evaluates its progress toward the established goal and looks for trends in the data. Based on the evaluation of trends in the documented data, the goal can be re-adjusted and if necessary, the process can be started over again with a different approach. The DAK training program may sound like it needs a lot of people and a lot of steps to go through, but the extra commitment is manageable and the result is a well-made plan with which to proceed (Mellen and Sevenich MacPhee, 2001).

All animal areas utilize the DAK training framework. Each area receives a skeleton manual that was designed to help facilitate and enhance an understanding of the animal training program. The manual consists of five sections that include goal setting/planning, implementation, documentation, new trainer integration, and general information. Each animal area tailors the manual to fit its team and animal collection, by adding individualized information to each section. Each team can reference its manual to review current cues, criteria, and training information. Finally, the manual is an informative tool for new trainer integration. The purpose of this manual is to help facilitate organization and communication of the animal training program goals and current status.

Due to the husbandry needs and medical issues that they face in captivity, DAK chose black rhino as one of its high priority species for animal training. The Ituri Forest team (keepers and management) and the behavioral husbandry team created documents outlining important information that all team members abide by. These documents include a list of appropriate cues and criteria, an explanation of animal trainer roles and duties, and training session guidelines. These documents were created primarily to maintain consistency within the Ituri Forest training program. There are approximately 20 trainers and 30 animals (six of which are black rhino) in Ituri Forest, so consistency plays a vital role in the success of our program. The black rhino cues and criteria consist of specific verbal, visual, and/or tactile cues and final criteria that the animals must comply to. The purpose of this detailed description of cues and criteria is to maintain consistency among the animal care team. Any keeper, when necessary, can train maintenance behaviors on any animal by following the set cues and criteria. This can be important in emergency situations where a veterinarian needs to treat an animal and a training team member is not available.

The Ituri Forest animal trainer roles and duties outline the "job description" of the trainers. There are four roles a trainer can play. The team coordinator is a constant role that one trainer fills per animal. In addition to standard trainer duties, the training coordinator ensures that their team objectives comply with Ituri Forest training plan goals and criteria, reviews all training plans created for the animal, maintains a strong flow of communication between training team members, and keeps the management staff updated on the status of the training program. A training team member (secondary trainer) is a constant role that one to two people can fill per animal. This role is an assisting role to the training team coordinator. Standard training team member duties include: train towards the set team goals and approximations on a regular basis, submit training plans for approval, maintain a record of all training sessions and review entries on a regular basis, and train behaviors in the learning and maintenance phase. The focal trainer and

support trainer are roles that can change with each training session. The focal trainer controls the entire session. He/she is the only one to give cues and reinforcement to the animal during a session, unless otherwise agreed upon. The support trainer actively participates in the training session in conjunction with and under the direction of the focal trainer. During procedures, the support trainer also serves as a communication vehicle between the focal trainer and the veterinarian (and/or other person(s) involved).

The training session guidelines outline what is expected of the trainer and the animal during a training session. The purpose of these guidelines is to maintain consistency between sessions and discourage bad habits that could occur during sessions, such as ending a session gratuitously and incorrect bridging. To keep documentation of training plans and sessions consistent, electronic forms (software) were created with the input of the Ituri team. Electronic training screens for training give the team more flexibility in recording/accessing their training progress; as a result, facilitating organization and communication. The "New Trainer Integration Plan" documented in the manual assigns a mentor to the new trainer. It is the responsibility of the mentor to help integrate the new trainer into the animal training program, as well as help in developing their training skills. The new trainer must go through a series of steps including attend DAK's "Training Methods" class, review the Training Manual, observe/work training sessions with mentor, pass an assessment, assist mentor with a "learning phase" behavior, work training sessions without the mentor, and finally, be approved by management. Once all of these steps have been completed successfully, the new trainer is assigned to an animal training team. All of these informative animal training documents were compiled and entered into the Ituri Forest Training Manual. Since animal training is constantly changing, any new or updated information is entered into the manual.

Black Rhino Calf Training

The first black rhino calf born at Disney's Animal Kingdom, "Badru," became a participant in the Training Program one-month postpartum. The training team was made up of two members who worked together in creating/carrying out the training plans for the calf. There were two stages to the calf's overall training program; the first stage consisted of all training prior to conditioning of a bridge. The second stage consisted of all training following the conditioning of the bridge. The purpose behind this breakdown was based on food consumption. The training team found it difficult to progress with the learning phase of husbandry behaviors while the calf was dependent on milk. When the calf was ready, there was an obvious change in his focus on food. When this change in focus occurred, the second stage of training began.

The initial training plan was created with input from the Behavioral Husbandry team and the dam's training team. The Behavioral Husbandry team helped in setting priority goals, behaviors, and a plan to achieve them. The dam's training team needed to be a part of all the decisions made since the mother would be directly affected by her calf's training and vice versa, due to housing. The long-term goals included molding Badru into a calm, trusting, and flexible animal. This would mean keeping aggression levels low, relationships with humans appropriate and positive, and keeping the ability to accept new situations for the calf strong. The short-term goals consisted of building a positive human/calf relationship and initial dam/calf separation training.

Relationship building was an important building block to the black rhino calf training program. The calf's first experience with humans occurred at DAK; therefore, it was extremely important to interact with him in a positive manner at all times. Relationship building included tactile/verbal interaction, hand feeding, as well as any other interaction the calf found reinforcing. The frequency and duration of relationship building was maximized during the calf's first year of life, since this is the time period when calves seem to learn the most. Relationship sessions were common in the first stage of training. The sessions included sitting with the calf while he was housed with his mother and offering multiple types of positive reinforcement.

Through anecdotal evidence, separation of black rhino mothers from their calves seems to be stressful and challenging due to the strong pair bond. Black rhino dam/calf separation must occur by the time the calf is approximately three years of age due to sexual maturity and a risk of inbreeding. In order to be proactive with our training program, the rhino calf training team began separation training at one month postpartum. The initial phase of separation training began with giving Badru access to a creep to be able to leave his mother's proximity (three or more body lengths distance) and be out of visual range. Badru was fed and trained in the creep area; this was done to have him associate positive interactions with being separated from his mother. This training was also beneficial for the mother; she had to become desensitized to her calf being out of proximity and visual range, as well. Vocalizations were common for the calf and mother, but they both became comfortable with the situation over time, especially with the help of reinforcement and strong keeper/animal relationships. Separation training continued to progress over the course of the year as other training priorities came into play.

Since human-directed aggression can be a concern with the black rhino, any aggressive behaviors were not reinforced so as to discourage them. To avoid confusion in later stages of training, the team had to be aware of their body language and verbal language directed towards the calf. This was done to avoid establishment of bad habits for the training team or the animal in the future. The rest of the Ituri team assisted in these early stages of training by opportunistically rubbing the calf down, giving him access to the creep twice a day (morning, night), and adhering to the established keeper/calf interaction guidelines. These guidelines included ignoring aggressive behaviors by withdrawing attention from the animal (not walking away), not actively calling him over in any way, being aware of verbal and body language directed at the calf, and avoiding tactile contact with his horn region for aggressive reasons. Pressing on his horn tended to illicit head tossing, which is an unwanted behavior. The first stage of training lasted for approximately five months and was very successful. The calf was voluntarily spending up to two hours away from his mother, approaching keepers on his own, and seemed to be a very calm and adaptable animal. Relationship building with the rhino calf was a great tool for animal management because it helped with molding Badru into an animal that was comfortable around humans and it established trust between he and the animal care staff.

The second stage of training consisted of training all the black rhino husbandry behaviors and procedures, in addition to keeping up with the separation training and the relationship building. The calf's training team began with conditioning a bridge. The dog whistle was chosen in order to have a different bridge than the mother's (a clicker). This was to avoid any confusion during training in close proximity to each other. A verbal bridge was also used: "good boy." Having two clear bridges helped with flexibility throughout the training process. The training team followed the standard learning plan of blow whistle (or verbal "good boy") and feed to condition the bridge. This entire process took approximately two weeks.

Once the bridge was established, the training team moved on to training husbandry behaviors. The training team organized the black rhino behaviors into a priority that was appropriate for the calf, based on veterinary recommendations. Per our veterinary staff, our goal was to develop a training plan that would reduce the necessity for immobilizations for the following priority procedures: body examination, oral examination, wound care, blood collection, transrectal ultrasounds, transdermal ultrasounds, and vaccinations (IM, ID, TB test). The husbandry behaviors trained to accomplish these procedures without immobilization included: come, target, steady, back, open, foot, over, and down. Using these established behaviors, the calf was trained for the priority procedures through desensitization sessions. Each of these behaviors (including procedures) started with a training plan that was created by a member of the training team. The training plans were reviewed and approved by the Ituri Forest and behavioral husbandry management staff. Approved plans were then used when training the calf. However, actual approximations were slightly different from the approved plan. This was expected since it is impossible to predict the animal's reaction and progress during the learning phase of a behavior. The training team always stayed flexible and worked with the animal's reactions to different stimuli.

Karen Pryor's "Ten Laws of Shaping" was a strong influence in the training style used (Pryor, 1996). Most of the behaviors were taught in small approximations to ensure a continuous flow of reinforcement. The training team focused on one learning phase behavior per session, to cut down on any confusion for the animal. When a new behavior was introduced, the criteria for maintenance behaviors were relaxed. This was so the animal could focus on the learning aspect of the session. Each session was planned out beforehand in order to maintain consistency and organization during the session. The training team always stayed flexible. If one plan didn't work, something else was tried. This type of flexibility was vital when training the rhino calf since his daily behavior changed constantly due to his change in age. Every training session had a clear beginning and a clear end. This was an important communication piece for the training team and animal. Sessions were ended on positive notes; we "quit while we were ahead." This was reinforcing for the training team as well as the animal.

Types of reinforcement that were used during training varied from pieces of produce, such as apples, bananas, sweet potatoes, and carrots, to monkey biscuits, to tactile reinforcement, and finally to verbal reinforcement through tone of voice or use of the verbal bridge. All of these types of reinforcement were decided upon due to the animal's positive reaction towards them. During the learning phase of behaviors, a fixed 1:1 ratio (continuous) schedule of reinforcement was used. For every correct behavior, the animal received primary reinforcement. Once a behavior was learned and became a maintenance behavior a variable schedule of reinforcement was used. Variable reinforcement seemed to work best because he was constantly stimulated and could not predict what would come next. This cut down on frustration levels for the calf, as well as for the training team.

The training team followed six important steps when training the husbandry behaviors. Those steps were: plan carefully, progress slowly, desensitize all stimuli, bridge precisely, maintain trust, and apply proven operant techniques (Ramirez, 1999). Training plans for each behavior were used as a guide and helped in maintaining organized, consistent sessions. Small successive approximations were used in order to ensure a positive experience and to create strong behaviors. Desensitizing stimuli decreased the number of possible confounds that could possibly occur. Precise bridging was key in communicating what was expected/wanted of the animal. Confusion and frustration were kept to a minimum when the animal was reinforced at the exact moment a desired behavior was performed. Maintaining trust was vital during the training process. Building a strong positive relationship earned the calf's trust. This was important when dealing with situations the calf might find uncomfortable. Some operant techniques applied during rhino calf training included a combination of targeting, physical manipulation, and capturing. Capturing and physical manipulation were used more frequently for the simpler behaviors such as come, target, steady, open, down, foot, and back. Targeting was used for more complicated behaviors/procedures such as over (left and right), blood draw body positioning, and rectal exam/ultrasound body positioning. Mimicry was not used simply because it didn't seem to be an option. The rhino calf did not appear to show any interest in his mother's training sessions and did not show signs of copying her learned behaviors. The six steps used when training Badru the husbandry behaviors seemed to work well. His learning curve was steep and he has proven to maintained strong behaviors into his second year.

Separation training during the second stage of Badru's training program progressed well. After four months, the training team began restricting access between the mother and calf for up to three minutes. This was accomplished by calling Badru over into the creeped area, shutting the door in between the pair, and cutting off all visual and tactile contact. While this was done, both animals were heavily reinforced to strengthen comfort levels during separation. The duration of separation progressed from three minutes to overnight in about a year's time. An important part of the separation process was keeping the two rhinos occupied while in separate stalls. Their diets, as well as training sessions, enrichment devices (e.g.: Boomer Balls®, palm logs, large branches, etc.) and interaction with other rhinos through doors in the stalls were often used for this purpose. Enrichment was already a large part of the rhino's daily routine, so

keeping these animals occupied was not a time-consuming effort. When Badru was ten months of age, separation occurred for approximately three hours in the morning and three hours in the evening. Therefore, the pair was only together overnight after the keepers left for the night. The training team decided the next step was to increase the separation time to include overnight. Since nursing was no longer necessary for the calf to survive and he seemed behaviorally ready, separation was increased to overnight when Badru was 19 months old. The night keeper staff performed hourly checks on the pair overnight for approximately two weeks to make certain mother and calf were doing well. Both animals did fine and continue to be housed separately while in the barn. The only observed reactions included vocalizations and pacing, although these behaviors were also observed while the pair was housed together. This barn housing separation has been incorporated into daily animal management and hopefully will make the inevitable permanent separation less stressful on the animals.

The desensitization process was very successful for the rhino calf. Many of the procedures he needed to be desensitized to were achieved quickly and on the first try. Tactile desensitization was done first and began immediately following birth. The calf seemed to enjoy tactile interaction; therefore, it was easy to have him accept the animal care staff touching him all over his body. This would be vital for procedures such as body exams, blood collection, ultrasounds, and wound care. Chute (hugger) desensitization was done with ease. Badru exhibited little to no reaction to being in an open/closed down chute, or to being manipulated in the chute. This desensitization also began early in life since he had access to the open chute during his daily housing routine. Blood draw desensitization was performed while Badru was confined in the chute. This was done only because the training team felt he was ready and he had not learned how to line up for blood collection in the stall yet. While restrained in the chute, the focal trainer held the animal in a "steady" while the support trainer went through all the steps of blood collection minus the actual stick with a needle. A "steady" requires the animal to stand still for a prolonged period of time. The leg vein was sprayed with nolvasan, wiped with gauze, and pinched to simulate an actual leg stick. Small challenges included the animal lifting his leg as it was stuck, but that was worked through quickly by bridging him when he did not move his leg. Badru was a willing participant with little or no reaction for blood collection in less than two months time. Rectal/Enema/Ultrasound desensitization was also achieved easily. While confined in the chute, the support trainer was able to work through the following approximations over the course of one month:

1. Lift tail
2. Tactile around anus
3. Application of lubricant gel to anus
4. Insertion of fingers/hand/arm into rectum (beyond sphincter)
5. Insertion of hose into rectum
6. Turning on water for hose while inside rectum
7. Filling rectum with water
8. Removing hose from rectum
9. Insertion of ultrasound probe into rectum up to shoulder
10. Movement of probe inside rectum
11. Animal standing for procedure for prolonged period of time (up to 30 minutes).

Environmental stimuli for these sessions varied, which seemed to be a good desensitization tool. The number of observers, noise, and animals present, among other stimuli, were used randomly for each session. None of these seemed to create a challenge for the procedure at hand. Badru was simply reinforced when he did not react to a new environmental stimulus that was present. Each approximation was heavily reinforced (primary, tactile, and verbal) as it was achieved. The most important part of each approximation was reading the animal's behavior and making each step as positive as possible for the animal through reinforcement. TB testing and vaccination (IM/ID) desensitization took place in the stall. The calf was very curious so an object passing by his eye while he stood steady was a challenge. It was worked through by having the focal trainer hold him in a steady, while a support trainer waved objects in front of his eye and around his neck area. Once this would not distract Badru, the training team

progressed to simulating vaccinations in the side of his neck. This entailed slapping his neck area, poking/pinching his neck area, and applying strong pressure to the neck region. For every small approximation, the calf was reinforced heavily. Within one month, Badru would stay steady for actual vaccinations applied to the neck region. Desensitization was an easier part of the training process for the rhino calf. His age seemed to play a large part in that. He seemed more open than DAK's adult rhinos to try new things in a shorter time span. He seemed trusting of his training team and was comfortable with all these new experiences we were creating for him.

Challenges with training Badru were minimal and easily worked through with the assistance and advice of the management staff (curator, vet staff, behavioral husbandry team, and zoological managers). The most significant challenge was his attention span. Being a younger animal, his attention span was short and his mind seemed to be working quicker than his body. He would lose focus easily and begin to "offer behaviors" if there was a latency between reinforcement and the next cue. To overcome this challenge, the training team simply tailored its training styles to fit Badru's needs. Sessions were planned very specifically ahead of time and were kept short. There was no latency between reinforcement and the next cue. Many times, Badru was simply put in a steady while the trainer figured out what to do next. This flexibility was vital and seemed to work well for the trainers and the animal.

Distractions from Badru's mother were a challenge. Badru would often break from a session and join his mother. The solution involved training the mother simultaneously and giving Badru a time-out every time he broke away during a session. The time-out would consist of the trainer stepping a few feet away from the animal's stall and ignoring the animal for a short period of time (approximately 30 seconds). After the time-out, the session would resume with the use of a cue. If Badru broke away more than three times in one session, the session was ended, using the "end of session" cue, and the trainer(s) would leave Badru's proximity. Badru went through a period where he would roar if he saw another animal during his training sessions. To extinguish this undesired behavior, he was given a time-out when he roared during a session. If this occurred more than three times, the session was ended accordingly. Challenges will always occur; the best tools used when working through Badru's challenges were being flexible, staying consistent, and being patient. Working through a challenge always takes time, but the result is a strong desired behavior instead of an undesired one.

Over the course of one year, the training program that DAK's first black rhino calf participated in yielded measurable results which included achieving the main goal of DAK's training program, as well as accomplishing Badru's individual training program goals. Badru has become a calm, flexible, and trusting animal that rarely exhibits aggressive behaviors. He is efficient in shifting on/off exhibit; he voluntarily participates in vital husbandry procedures without the use of anesthesia, such as trans-rectal and trans-dermal ultrasounds (chute only), routine blood draws (chute and stall), annual vaccinations (chute and stall), and major and minor wound, horn, foot and mouth care (chute and stall). Badru can be housed with or without the companionship of his mother while in the barn and never seems to react negatively to strangers/large groups of people in his close proximity.

Badru was a subject for an American Association of Zoo Vets Workshop for ultrasound techniques held at Disney's Animal Kingdom in April 2002. Dr. Thomas Hildebrand was able to perform a 45-minute long ultrasound with the use of three different probes transdermally and transrectally on Badru. A few confounds that occurred were the presence of approximately 30 veterinarians, a cell phone ringing, and a flock of free-roaming helmeted guineafowl vocalizing in close proximity to Badru. Badru's behavior was exceptional and he showed no signs of stress. Through the above-described success, he has become the product of a safe, low-stress environment and is provided the best husbandry possible at Disney's Animal Kingdom, hence, achieving the primary animal training program goal.

A training program such as the one implemented at Disney's Animal Kingdom is a large investment to make for any institution. However, the dividends can be worth the time and resources put into it. An animal that is trained to cooperate for a number of procedures without having to be immobilized greatly reduces any risk associated with such a procedure. The risk of human injury is also greatly reduced. An excited animal also increases the chance of damage to sometimes expensive equipment such as ultrasound probes. The ability to routinely manage and closely monitor the health of an animal without undo stress is another benefit. Every facility strives to find new ways to provide their animals with a low-stress environment and training can be a positive tool to achieve that. To be able to detect a health problem before the animal shows clinical signs improves the ability to treat and improves the chances of recovery. Preventative medicine can also reduce the need for treatment, in addition to possibly minimizing unnecessary suffering for the animal. Training can be beneficial by strengthening human/animal relationships, making daily husbandry practices easier on the staff and the animal. Education is another added benefit of a training program. Having a trained animal gives a facility a chance to educate themselves and other facilities/organizations about veterinary health, puberty, reproduction, and training, among other topics of interest. The black rhino calf's training program, explained above, has proven all of these benefits are realistic.

Based on the success of Badru's training program, incorporating a calf training program at a zoological facility can raise the overall level of any husbandry care for an animal collection. The earlier/younger an animal can be incorporated into a program, making it a part of their daily routine, the more comfortable that animal can and will be with the training process. This can yield vital health and behavioral information about the animal collection, as well as exceptional animal care.

In conclusion, Disney's Animal Kingdom animal training program is an integral part of the animal care process. The program affects all animal care staff, management and keepers alike. Safety, teamwork, process, and goals are the four main focal points of the program and are consistent within all the animal areas at DAK. Two members of the Ituri Forest team handle the black rhino calf animal training program. These team members have carried out the animal training process yielding incredible results within the first year of the animal's life. The team utilized several tools to carry out the program including DAK's Animal Training Manual, assistance from the Behavioral Husbandry department, communication from others (observers, teammates, etc.), Karen Pryor's "Ten Laws of Shaping", and Kenneth Ramirez's "Steps to Training Husbandry Behaviors." Other tools included patience, flexibility, and consistency. Through the use of the animal training program and its tools, outlined veterinary and animal management goals were achieved, such as dam/calf separation, routine blood draws, ultrasounds, annual vaccinations, routine body care, and the creation of a safe, low-stress environment to provide the best husbandry possible. The success of this training program has been beneficial to Disney's Animal Kingdom through veterinary/animal management conferences, research initiatives, as well as assisting in the practice of exceptional animal care.

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