

BLOOD COLLECTION

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To achieve the goal of learning more about the physiology of any and all rhino species requires a hands on approach. Many facilities have added a specially designed chute to their new or existing rhino quarters.. Chutes allow for the rhinos to be conditioned into a small confined area. Once conditioned, the benefits of having a calm rhino in a chute situation include the ability to collect blood, semen and vaginal swabs, to perform reproductive exams on females and trans-rectal ultra sound examinations; to administer vaccinations or treatments as well as to be able to perform close visual observations of individuals.

All rhino facilities are different as is the way they are managed. Some facilities have great chutes, some have less than adequate chutes and some have no chutes. Management varies regarding daily, monthly and seasonally routines of the rhinos. Many facilities have extended indoor housing for cold weather, day yards and night quarters while other facilities do minimal rotating between housing areas. It is hoped, through this presentation to encourage keepers to find ways within their own facilities by which basic conditioning can be helpful and possible even if their facility does not have a chute system.

At the first Rhino Workshop at Disney's Animal Kingdom in 1999, the Disney keepers showed a video of the conditioning routine of their rhinos done within their indoor quarters. Today, my talk will be about conditioning rhinos at White Oak Conservation Center for blood collection with and without the use of chutes.

At White Oak Conservation Center the white rhino enclosure designs and sizes are as follows:

- 1.0 sub adult - .7 acre cable yard and a 3562 ft.² horizontal pipe corral
- 4.5 - including adults, calves and sub- adult - 6 acres with access to 1-5 corrals totaling 27, 640 ft² The corrals have horizontal bars with a total of 2 chutes. The chutes are the permanent pass-through design that can be used from either end.
- 1.0 adult - access to 3 horizontal pipe corrals of 20,016 ft²

Our black rhino enclosure designs and sizes are:

- 1.1 adults - 1.5 acre, cable yard plus 1 large horizontal pipe corral (4453 ft²) and two smaller corrals (4433 ft²)
- 3.0 - 1 mature, 2 sub-adults - 3.4 acre cable yard with access to 3 horizontal pipe corrals 18,983 ft²
- 1.0 adult - .3 acre horizontal pipe yard with access to 2565 ft² corral that has vertical pipes.

- 2.2 females and calves have 1.7 acres with horizontal pipes and access to 3 vertical pipe corrals of an additional 7245 ft²

General:

It takes a team effort from the staff to collect the samples. First you need a volunteer donor. In most cases, the veterinarians or technicians collect the blood samples, although all the rhino keepers are trained to collect blood.

When working with the rhinos, one must always be aware of the surroundings. Rhinos have a very good sense of sound and smell. One should always be aware that even though the keepers normally don't wear cologne there may be visiting personnel that will come to the procedure that do. Also, the rhinos tend to react more to whispering than normal levels of talking, and they can also get spooked from an unfamiliar voice or a different sounding vehicle. The rhinos may also react to the sound of wrappers on the vet equipment, extension sets, butterfly set ups, etc. Even though the rhino has poor vision, it is still important for the staff to be aware of the location of personnel and their activities so as to try to not distract the rhino.

When lining up the rhino into position, he is maneuvered to be parallel to the railings. It is very important to get the rhino as close to the railing as possible. The blood collector must reach in under the rhino to the medial side of the opposite leg. When collecting from a leg vein, the collector must be able to react to the rhino's stepping forward or backward. Communication between the keepers and the blood collector is very important since the keeper may be able to anticipate any movement by the rhino.

Except when it is warm, it helps if the collector uses a warm, moist towel on the leg to make the vein more visible. The actual stick is done very quickly in an upward, but not deep motion. Sometimes, the needle needs a little adjusting by twisting or slightly pulling the needle out.

Once the blood is dripping through the needle, the tubing is attached with the vacu-tube on the end. When the blood is flowing through the tubing, it works best if the vials and tubing are held down towards the ground and not high in the air so gravity can help fill the vial. The first vial will not fill up completely due to the amount of air that usually collects in the tubing. When all the needed vials are filled, the needle is removed and a small red-topped vial collects all the remaining blood in the tubing so as to not waste any blood.

When collecting from an ear vein, a shallow stick is done towards the top of the head. A butterfly setup is used. Blood is collected via syringe, then injected into the vials. A disadvantage of using an ear vein and a butterfly setup is that the attached tubing must be kept away from the ear as much as possible because the ears are very sensitive. If the rhino feels the tubing touching the ear, it will often flip the ear back and forth and this usually means the setup is flung a few yards away.

White Oak:

The rhinos at White Oak Conservation Center are given access to their yards on a 24 hour basis, though they are usually fed in the corrals. If work needs to be done in their yards then it is easy to lock them in the corrals due to their being conditioned to eat in the corrals. We do not have any completely solid enclosures for our rhinos. All corrals have a heat source, windbreaks, and suitable grass for grazing. Due to their large size, many of the corrals have mud wallows.

It is the rhino keepers' responsibility to setup the rhino in a good position in the chute or along the corral or yard bars or cables. White rhinos are offered hay and grain, and black rhinos are offered browse, grain or cut up fruit. Both the white and black rhinos are offered tactile contact to keep them in the proper position. Informal verbal commands are used as needed such as "Move up" and "back up." When working in the corrals it is best to separate the rhino to be treated from other rhinos except when collecting from a dam and/or her calf.

Sometimes we work the adult rhinos to come up head first then have them follow us along the barrier to get them parallel to the cable or bars. The keeper feeds the rhino from the side, or from the front, standing close to the head, while the vet or technician collects the blood.

Sometimes on cold days the rhinos are more sensitive to the stick and don't stand well. We may try a couple times but if it is all negative re-enforcement we stop. Some animals are particular as to who is doing the collecting, so we have to have the individual staff member present on the day we plan to collect from that particular animal.

For the past year, we have tried to get all the rhinos collected every other month. Additional blood may be collected for various other reasons.

We have a running calendar that is used to keep track of the rhinos collected and is updated weekly by the lead keeper and field vet technician. We use the following codes:

- "√" for bleeding attempted, but no blood collected;
- "c" for complete blood sample collected;
- "s" for serum only collected;
- "b" for whole blood only collected;
- "i" for iron sample collected.

White Rhinos:

We received 1.5 white rhinos from Kruger National Park South Africa in November 1998. Only one was approachable upon arrival, but within a few weeks, there were 3 individuals that approached us for contact. We have a total of 6.5 white rhinos of which we are collecting from 4.4.

Due to the possible medical problems, and the observation of abnormal behavior, the first rhino of the group was collected from 5 months after her arrival. The other rhinos were conditioned for collection from 6 to 18 months after arrival.

Chute conditioning started by working the white rhinos using alfalfa hay which is a treat and not part of their usual diet. When working with our white rhinos in the chutes, the first goal was to

have them remain calm while standing in the chute. We start with tactile contact to the nose, face, head, back, ear and eventually pinching the ears to simulate a needle prick. Then, we continue to make tactile contact to the rear legs and front legs and, begin pinching the front legs to simulate a needle prick. After pinching the skin on the leg successfully we introduce the warm, damp towel to help the vein be more visible. Next we introduce a field vet technician with the blood draw tray, full of the items needed. Most of the items do not make additional sounds except for the voice of the tech and the crinkly noise from taking the plastic wrapper off the extension set. This always gets a nervous reaction from the rhinos until they are conditioned to it. Most of the white rhinos were easy to condition to stop in the chutes due to the fact that they walk through them to get from one corral to the next.

We use the "free stall" method, allowing the rhino to leave at anytime by backing out. The front gate remains closed during the session. When finished with the conditioning or procedure, the rhino has the option to back out or the front gate is opened and the rhino can leave moving forward.

With the white rhino calves we start to make tactile contact as soon as possible. They are usually curious at a younger age than the black rhinos. Once the calf approaches, we make contact with the head first, then move the contact back along the body and to their legs. The calves already have the "target spots" (chest area and inside the rear legs) that relaxes them to stretch their rear leg back and eventually squat or lay down.

What appears to have helped with one of the less friendly females is that her calf became very interested in the keepers, and enjoyed the contact. The dam seemed to calm down more because of the calf being calm.

We are hoping that our most difficult rhino female will be more accepting towards us if her calf allows the keeper contact.

Black Rhinos:

At White Oak, even though we don't have chutes in our black rhino areas, the concept of conditioning remains the same, though the setup is different than with the white rhinos.

We start working with the calves at about 1 -2 months of age. The first step is to condition them to approach keepers at the corral bars. Once the animal approaches the keeper, tactile contact is started with the calf's face and nose, and progresses as time and calf allow. Eventually the keeper is able to touch the head, ears, back, side, then the legs. The calf usually approaches for sliced apples and the keeper can begin touching the calf at that time. At first the calves only come towards the keepers head first, remaining close to their dam. Once we can touch them on a regular basis, we start working them towards a corner of the corral so we can feed them straight ahead. This also allows another keeper to give contact from the side. Eventually it will be the keeper in front and the blood collector at the side, with the possibility of another keeper giving tactile contact around the belly and rear legs.

When working in the corrals the rhino who needs to be collected from is separated from the other

rhinos. There are exceptions, when we are collecting from the 3 black rhino bachelors, or when collecting from a female with a calf. With the 3 males, they work better with the other males close by. What works best is to have 2-3 keeper/feeders and 2 - 3 blood collectors. The keepers must keep the rhinos occupied until all are collected from. If they are done individually, there is a chance of one getting satisfied with food before collecting is completed. Sometimes we can use one male to help keep another male closer to the corral bars by just his body on the other side of the rhino and both remaining parallel to the corral bars.

When collecting from a female with a calf, we keep them together to avoid needless stress to the situation.

Equipment:

The equipment that is in the blood collecting kit includes 1 and 1 ½ inch needles, vacutainer luer adaptor, vacutainer holder, extension set 30", butterfly 21 x 3/4 12" tubing infusion set, tray, 6-12 ml luer tip syringe, pen for labeling, tube tray, 2 x 2 alcohol gauze, a cooler with warm towels, and assorted tubes.

Large red top: VB10 mls SST gel and clot; used for serum.

Large green top: VB 10 mls sodium heparin; spin down for plasma.

Small purple top: VB K2 EDTA 7.2mg/ml; for CBC (complete blood count).

Small blue top: buffered CIT.Na 3.2%; Spin down for plasma for fibrinogen; once collected tube should be put in a slushy ice bath.

The staff should know what testing is needed and what kinds of samples are needed for various lab work in order to have the correct tube selection. The label on each tube should have the species, ID# and name (if needed), date and time of collection and location.

I hope my talk today has demonstrated that at White Oak Conservation Center, we have been able to successfully collect blood and perform health examinations on the rhinos through conditioning. If your facility does not have a chute system, there may be ways to condition your rhinos to perform the basic behaviors needed to collect blood.