Okapi Husbandry Manual

1. General Husbandry/Housing Requirements

a. Exhibit and husbandry requirements will meet or exceed those set by any and all applicable regulatory agencies.

b. Temperature

i. Okapis are not cold-tolerant animals. Captive okapis should not be kept outside when the ambient temperature falls below 55° F(7° C). for extended periods.

ii. When okapis are kept outdoors below 55°F(7° C), heated shelters or wind breaks must be made available to them.

iii. Okapis can withstand outside temperatures of 110° F (43°C). However, indoor temperatures over 95°F (35°C). will require the use of some sort of mechanism to remove the heat from the building.

c. Exhibit Barriers

i. Barriers can be constructed of cable, chain-link, wood, or block wall. Horizontal spacing of cables in a cable yard should be 6"(15cm) for the first 3'(90cm) of height, 8"(20cm) apart from there up.

ii. Height of the barriers should be a minimum of 6', (1.8 m).

iii. Care should be taken to provide visual barriers outside the exhibit boundaries, as okapis will sometimes run blindly when frightened or when pursued during breeding attempts.

d. Outdoor Enclosures

i. The enclosure ideally would consist of a simulated rainforest environment that could create opportunities for natural behaviors for this species.

ii. Outdoor enclosures preferably should be flat or gently sloping and should provide at least 900 square feet

iii. There should be adequate enclosure space to allow all okapi's access to the outdoors, weather permitting.

4. There must be ample foliage and vegetation to provide adequate cover for the okapis, as they are very reclusive animals.
5. Males need small bushes 2' to 3' (60-90 cm) in height, as they mark their territories by walking over the tops of such vegetation while urinating.
6. Some sort of noise attenuation should be provided, such as a buffer zone of vegetation, if the enclosure is in close proximity to a busy roadway or other source of noise disturbance.
7. Adequate shade must be provided, as the okapi is naturally an animal of the dense rainforest. While artificial shade structures may be used to a limited degree, they should not take the place of large live trees.
8. If possible, misters should be provided for the comfort and behavioral enhancement of the okapis.
9. Animals should always have access to water and foliage.

E. Indoor Quarters

1. Okapis are typically brought into indoor barn stalls nightly and during days of inclement weather.
   (1) "Inclement weather" is characterized by precipitation, temperatures below 55° F(13° C), and/or high winds.
   (2) Okapis are exhibited outdoors in a temperature range of 55°F(13° C) to 110° F(43° C). When colder, give them the choice to go in or out for short periods of time.
2. All barns should have some sort of temperature control to keep the animals from being exposed to major temperature fluctuations.
3. Stalls should be 12' by 15' to 12' by 20' (4m x 5m to 4m x 7m).
4. Stall floors should be either of decomposed granite or non-slip rubber matting to ensure sure footing for the okapis.
5. While rough-brushed concrete floors have commonly been used, some Okapi have experienced swollen carpal joints as a result. Utilizing other floor materials such as DG, fine grade limestone, or non-slip rubber matting may minimize this problem.
6. Stalls should be bedded with pine shavings, cedar, or straw bedding to absorb urine.

7. A "Dutch door" design can be used in the barn stalls.
   (1) The bottom door is solid and is hinged on the side.
   (2) There are two top doors; a solid door, which is hinged on the side, and a barred door, which can be hinged on the side or can be a slider.
   (3) The barred door allows for added ventilation during hot weather or when the animals have to be held inside for extended periods of time.

II. Personnel

A. Okapis should only be worked by experienced keepers who are specifically trained to work with this species.

B. Visitors to the facility should be kept to a minimum and must be authorized by a Curator, Animal Care Manager or Lead Keeper.

C. Authorized behavioral observers may be present in designated areas to record observations on estrus, breeding behavior, animal introductions and interactions.

III. Daily Care and Maintenance

A. Inspection of Facility and Animals

1. The exhibit should be inspected daily before releasing animals to their respective enclosures.
   (1) Ensure that the fence lines are secure.
   (2) Ensure exhibit is free from animal hazards.
   (3) Check all appropriate gates, locks and alleyways.
2. All barn stalls should be checked.
   (1) Look for signs of excessive pacing, which may indicate stress, physical discomfort or estrus.
   (2) Examine stalls for urine and fecal output; monitor consistency and volume, record any changes in logbook.
   (3) Monitor overnight food and water consumption.
3. Inspect all okapis, using both visual and tactile observations.
   (1) Evaluate overall condition of animal.
   (2) Check coat condition and color, looking for wounds, hair loss, abscesses, and the like.
   (3) Check eyes for tearing, mucous, foreign matter, opaqueness or ulcerations.
   (4) Inspect hooves for cracks, chips or irregular growth patterns.
   (5) Observe animal's gait for any abnormalities.
   (6) When possible and safe to do so, keepers should run their hands over the animals. This will help to keep animals desensitized to human contact.
   (7) Animals should be weighed monthly, sometimes weekly if there are problems or particularly during pregnancy and growth. Calves should be weighed daily, and animals from 6 months old to 1 year should be weighed weekly. Normal weights for adult male okapis range from 550-630 pounds (250-290 kg.) Normal weights for adult female okapis can range from 630-720 pounds (285-330 kg.).
4. Observe the behavior of the individual animals and of any group dynamics.
   (1) Watch for signs of lethargy, physical discomfort or any abnormal behavior.
   (2) Monitor and record any estrous or breeding behavior.
   (3) Monitor and record conspecific interactions, animal introductions, maternal care, and record for future use.

B. Daily Routine

1. Check daily diary or keeper records for current information about the okapis.
2. Check information log for updated enclosure assignments and groupings for animals.
3. Clean enclosures and put out clean water and fresh food.
   (1) Water should be located away from food to prevent contamination by dropped foodstuffs. Clean, fresh water must be available at all times.
   (2) Browse should be hung at an appropriate and convenient height for the okapis. The browse hanger should be such that it does not pose any hazard to the animals.
   (3) Browse and other food items should be dispersed in multiple locations to promote an increased activity level in the okapis. Alfalfa or hay should be broken up to allow keeper to check the quality of the forage. Items to check for include mold and/or foreign objects.
4. If conditions are appropriate, the okapis are moved from their barn stalls to their assigned enclosures.
   (1) During inclement weather, exhibit maintenance, construction work or other activities deemed to be disruptive to the animals, okapis are kept in their barn stalls. Inclement weather would include precipitation and/or daytime temperatures below 55°F (7° C).
   (2) Okapis moving to the yard(s) furthest away from the barn should be moved first to avoid moving an okapi past an occupied yard.
5. Keepers are encouraged to have as much physical contact as possible with the animals when moving them into and out of stalls. This keeps them accustomed to being handled and touched. It is important for keepers to be familiar with the individual differences.
6. Proceed to clean and feed out each barn stall.
   (1) When animals are kept in the barn, cleaning can be accomplished by shifting animals from one stall to another, from a stall to a catch pen, or combining compatible animals together during cleaning.
   (2) Lay down clean pine shaving or cedar bedding or other appropriate bedding material.
   (3) Inspect or clean drinkers.
   (4) Dispense fresh hay, pellet, browse, fruits and vegetables as indicated.
7. Sweep or hose alleyways as needed.
8. Bring okapis in at the end of the day in the reverse order in which they were put out, making everything as routine as possible.

9. Set heaters if necessary; thermostats are set at 62°F (17° C), 20°C with newborn animals in stable.
10. Secure all stalls, gates and doors.

IV. Behavior

A. Social Groupings

1. Okapis are solitary, reclusive animals. They can, however, be exhibited in pairs or groups in certain cases.

   (1) An adult male okapi can be kept with one or more adult females during all months of the year without problems, if closely monitored. The male should not be allowed to harass a female and should be removed if he is persistent or if the female appears stressed.

   (2) Adult males and females should be housed together on exhibit if breeding is desired. They should be housed separately in barn stalls. The youngest recorded female breeding was at 19 months of age.

   (3) If two males are kept together, both should be immature or one should be immature and the other mature. When the immature male reaches sexual maturity, the two animals should be separated when aggressive posturing is witnessed.

   (4) Keeping an immature male and an immature female together should not pose any problems, however, their behavior should be monitored for any aggression.

   (5) The number of females kept together in the same enclosure should be governed by the size of the enclosure and the individual temperaments of the animals.

2. Sex, age and individual temperament are all factors that can determine which animal pairings and groupings will be successful and which will be problematic. Behavioral profiles should be used on each animal to determine pairings.

3. Keeper observations are the key to evaluating social situations of the okapis.

   (1) Conspecific interactions must be monitored daily.

      (a) Between females.

      (b) Between males.

      (c) Between adults and calves.

      (d) Between calves.

      (e) Between juvenile males.

   (2) Estrous behavior must be closely monitored.

      (a) Interval between cycles and duration. The average interval between cycles is 10-13 days. The average length of cycle is 2-5 days.

(b) Signs of estrus: pacing, posturing, excessive licking, increased attention from the male (flehmen, lafschlag, pursuit), sounds; stiffened front legs.

(3) Watch for signs of aggression towards other okapis or towards keepers: kicking, stomping, head butting and pressing, horn raking, posturing, chasing, snorting.

B. Behavioral Enrichment

1. Facility enhancement

(1) Create a more stimulating natural environment with dense plantings of trees and shrubs.

(2) Provide more vegetation, either natural or in the form of cut browse, to stimulate foraging behavior of okapis.

(3) Install misters where practical for hot, dry weather.

(4) The barn stalls can be outfitted with hemp ropes and branches hung from the ceiling to create a "jungle" effect. Animals will spend time manipulating and scratching themselves on this apparatus. (Watch for ingestion of rope fibers!!)

2. Enrichment techniques

(1) Provide food items (browse, pellets, hay) in multiple locations in the exhibit to stimulate foraging activity in the animals.

(2) Offer melons or pumpkins with holes carved into them; this will encourage animals to spend time pulling the flesh out with their tongues.

(3) Provide a small container with holes in it which can be filled with raisins or different kinds of nuts. Beware of high fat (=> energy) content!

(4) Explore the acquisition and offering of a wider range of browse items.

(5) Be open to new enrichment techniques that may be in use at other facilities or are presented for consideration by staff members.

(6) Add low-level browse or bush species to allow male okapi areas to mark their territory.

V. Breeding and Parturition

A. Breeding

1. Check SSP/EEP breeding recommendations.
2. Animals should be paired upon determination of estrus. Provide preparation period in nearby stalls just before placing together. (Animals should have visual contact prior to introduction.)
3. Males can become aggressive towards females and keepers during courtship; animals should not be introduced without adequate keeper staff to observe and intervene, if necessary. Animals should be separated if the male is overly aggressive or the female is overly stressed.
4. Estrus generally lasts 2-5 days. Male and female can be separated following breeding or left together, depending on the male.

B. Parturition

1. Preparation
   (1) Make facility preparations (lighting, temperature regulation, calf "creeps" in stall and enclosure). Prepare floor to avoid slipping on hard or slippery floors.
   (2) Place pregnant okapi in maternity yard (or preferred birthing location) 3-4 weeks prior to due date.
   (3) Gestation in the okapi ranges from 419 to 449 days, with an average of 430 days. See attached Okapi Gestation Period Chart.
   (4) Relocate adult male away from expectant female.
2. Signs of impending parturition.
   (1) Mammary development. Swelling of the upper abdominal region of the udder, just beneath the vulva, is a sign of imminent delivery (within 48 hours) but is not <u>always</u> seen!
   (2) Dilation and/or distention of the vulva. This can be obvious 2 months before delivery.
   (3) Pacing and/or nervous behavior.
3. The supervisor or Lead Keeper will make a determination as to when "night checks" should be made on an expectant animal and when/if a 24-hour watch is necessary. Video monitoring should be set up. The video equipment should be set up well in advance.
4. Actual birth of calf.
   (1) Parturition should occur inside a barn stall. A Curator, Animal Care Manager, or supervisor should make any exceptions to this policy.
   (2) The barn stall should be heavily bedded with pine shavings or cedar bedding to cushion any falls to the ground, if the dam delivers

while standing. This will also prevent leg splaying of neonates during parturition.

(3) Determine whether or not the presentation of the calf is normal.

(4) Monitor the duration and intensity of labor. Average duration of labor is 2-3 hours, about 1 hour if birth is monitored by video. Duration can be much longer (2-3 hours) if watched by people who are physically present near by.

(5) Keep animal care management staff and veterinary staff apprised of progress of labor. They will determine what intervention, if any, is required. Note to SSP/EEP veterinary advisors: Catalog good and bad experiences with birth interventions.

VI. Neonatal Care

A. Monitoring of calf.

1. There should be a continuous keeper watch on the dam and calf following parturition, the duration of which will be determined by an Animal Care Manager or supervisor.
2. Information should be recorded according to a predetermined format. (See Okapi Calf Ethogram, Okapi Watch Notes, attached).
3. Establishing nursing is the most critical observation, preferably by video the first days to limit human intervention.
4. A neonate exam should be performed when the calf is 48-72 hours old. The time frame is dependent on the experience level of the dam, whether or not adequate bonding time has elapsed, and on a visual assessment of the health of the calf.
   (1) Calf must be separated from dam by allowing dam to leave stall with calf.
   (2) Collection of blood sample for glucose, Bova-S, baseline data.
   (3) Treat umbilicus with iodine.
   (4) Administer Vitamin E and Selenium at recommended dosage per body weight.
   (5) General health exam.
   (6) Weight and measurements. Normal newborn okapi weights range from 40 to 60 pounds (18-28 kg.), with an average of 56 pounds (25 kg.). See attached Okapi Birth Weight Chart.
   (7) Tissue sample for karyotyping. If calf is notched, ear notches may serve as biopsy tissue or umbilicus.

B. Calf must be provided with a "creep" area both inside the barn stall complex and in the outdoor enclosure where it can get away from the dam.

1. The outside "creep" can be constructed in a variety of ways.
   (1) It can be constructed of vertical poles or bars of a size and spacing to allow calves to enter but exclude adult animals.
   (2) It can also take the form of a framed opening (such as a gate) leading from the main enclosure into a small "hide" area. Dimensions approximately 3' by 3' (1x1 m).
   (3) "Creeps" constructed out of large cement culverts, minimum 36" (90 cm) in diameter, have also been successfully used.
   (4) Leave stable door open so the calf can go to a secure place if it feels threatened by something.
2. The barn stall "creep" is generally of a barred design, constructed of 1" (2.5 cm) square metal tubing.

(1) The "creep" can be incorporated into a vertically sliding door between two barn stalls.

(2) The top portion of the door is made of bars, spaced about 4" (10 cm) apart.

(3) The lower 4' (1.2 m) of the door is made of bars, spaced about 24" (60 cm) apart to allow a calf to come and go.

3. This helps to alleviate the excessive or over-grooming of the calf by the dam that has been observed on so many occasions

4. If excessive grooming remains a problem, such as causing damage to the tail or irritation to the ano-genital area, the calf may have to be fitted with a protective, custom-designed coat. Also, by leaving the calf separated from the dam during the night, it can solve many of the over-grooming problems.

5. The "creep" provided in the outdoor enclosure also helps to prevent the calf from overheating in direct sunlight.

6. Calves naturally separate themselves from their dams in the wild. They have been observed for up to 12 hours without nursing. In captivity, artificially separating a calf from the dam to allow only 2-3 nursing periods of ± 30 minutes has been done successfully.

7. In an effort to provide the Okapi calves with an instinctual nesting site, a triangular area of dead space between two yards is fenced off to provide a "creep". Measuring 26' by 19' by 20' (8mx6mx6m), the creep has a shelter over one corner and split gates leading to the adjacent yards on two sides. By using split gates, the openings into the creep area allowed access for the calves but not the adults. It is possible to add a center divider inside the creep area, thus allowing for a calf on either side with access to the corresponding dam's yard. Several trees and small shrubs inside the creep at one time helped provide shade and privacy for the calves, but they were eaten and/or destroyed as the calves grew.

8. In the barn, a dam and her calf are given two stalls at night. The stalls are divided by a specially made "creep divider" inset in the slider area between stalls. The top 2/3 of the divider has 8 to 10 vertical bars in place to allow for visual and tactile access; it also helps create a more open-looking barrier, not as intrusive as a solid panel. The lower 1/3 has only one vertical bar placed in the center. The calf can pass on either side of the bar; the dam, psychologically, cannot. If pressed, however, the dam can fit through. The creep divider provides an area away from the dam but still allows full visual access. There has been a decrease in over-grooming problems as a result of using the creep. The divider has two bolts acting as prongs to be set in small holes in the floor and two large bolts to be tightened into the ceiling once in place.

C. Daily routine.

1. For the first week after birth, the dam and calf are given access to the catch pen and two barn stalls, one stall being fitted with the "creep" apparatus to exclude the dam.
2. At night, the dam and calf are closed into the barn stalls, with the calf having access to the dam's stall and the "creep" stall.
3. When the calf is approximately one week old, both dam and calf can be moved out to the maternity yard with the calf having access to the "creep" area within the yard.
4. The calf should be weighed two to three times during the first week of life to ensure weight gain. The calf should be weighed weekly until it is 8 weeks of age, monthly after that.
5. When safe to do so, and also during the first few days when dam is not in sight, physical contact between keepers and a calf is encouraged such as petting, scratching, rubbing ears, attempting to lift legs. This will help to desensitize the okapis to human contact.
6. A dam and her calf can be introduced to other females when the calf is between two and six weeks of age. The timing is dependent on the experience and comfort levels of the dam and the individual temperaments of the animals involved.
7. A dam and her calf can be introduced back to other male okapis when the calf is between five and ten months of age. The timing of this event is also dependent on the factors listed in #6 above. This time frame can be shortened if you wish to decrease the birth interval time frame.

VII. Veterinary Care

A. Routine veterinary care may consist of visual exams, vaccinations, parasite screening and treatment, and hoof trims.

B. In some cases, blood samples may be obtained by administering a "standing dose" of a tranquilizer, such as Rompun or Domosedan.

C. Chemical immobilizations.

1. Immobilizations should take place in a designated stall that is free of any animal hazards.
2. All personnel should be made aware of what their role in the procedure will be and necessary equipment should be assembled prior to the darting of the animal.
3. Maximum 15 hours without water, 24 hours without food.
4. One or two keepers should accompany the veterinarian to dart the animal and assist in positioning the animal or as directed by the veterinarian.
5. When the animal begins to feel the effects of the drug, keepers should be ready to enter the stall. (Place a halter with a lead rope attached on the animal.)
6. Control of the animal's head is maintained as the okapi goes down to keep the animal from regurgitating.
7. When the okapi is down and properly restrained and positioned, the medical and animal care staff can enter to begin their procedures.
8. A professional farrier can be used for hoof trims.
9. At the conclusion of the procedures, all supplies and staff should leave the stall, leaving three keepers and the veterinarian behind to administer the antagonist and steady the animal as it gets to its feet.
10. The okapi should remain in a barn stall throughout the rest of the day for recovery purposes and should be closely monitored for signs of renarcotization or other complications.

VIII. Emergencies

A. Animal emergencies include, but are not limited to:

1. Animal injury.
2. Dystocia.
3. Critical signs of illness.
4. Aggression between okapis.
5. Animal escape. (Follow Animal Escape Policy)

B. An Animal Care Manager, supervisor, and/or Lead Keeper should be contacted in the case of any animal emergency. In time of "critical illness", no time should be lost and veterinary assistance should come immediately.

1. These individuals will evaluate the situation and call for additional keeper help or veterinary assistance as required.
2. In the case of a serious conflict between two animals, the animals should be separated.
   (1) This should be done by no less than two experienced keepers.
   (2) This may necessitate driving a vehicle into the enclosure. (Not possible in most European Zoos.)

IX. Shipping and Transport

A. Trailer transport.

1. A trailer is the preferred method of land transport for okapis. In Europe, large crates are preferred.

(1) Animals seem to acclimate well to trailers as they are not unlike the barn stalls they are used to.

(2) The trailer or crate must be set in place well in advance of the travel date, (± 3 weeks). The animal should be fed in the trailer or crate to speed the acclimation process.

(3) The trailer or crate should be firmly secured in place when set in advance.

2. A crate must obviously be used for air transport of okapis.

(1) IATA regulations must be met or exceeded.

(2) The crate should be padded on the front and back doors, as well as the top to protect the head and eyes from potential damage.

(3) The crate must be sturdy enough to accommodate the size and strength of the animal and must have ample ventilation.

(4) Crate training in advance is essential to acclimate the animal to the shipping container and to help alleviate any agitation during transport. A double-sized crate may be useful for extremely nervous okapis.

In most cases, a member of the animal care staff or a veterinarian to ensure safe transport accompanies an okapi shipment. It is beneficial for an experienced Okapi keeper to travel with the animal to help it acclimate to new surroundings