

Topeka Zoological Park
Birth Management Plan for Bornean Orangutan
“Rudy” and “Lena”

Overview:

Rudy and Lena had breeding recommendations from SSP in 2011. Both are pregnant and expected to give birth in February/March of 2013. Rudy and Lena are sisters.

General Species Information (taken from The Orangutan Husbandry Manual)

Gestation

Gestation ranges have a range of 225- 273 days, with an average of 8.16 months (245 days+/-12 days).

Confirmation of Pregnancy

The Orangutan SSP recommends the best method to confirm pregnancy is the presence of labial swelling. The labia begin to swell about two to four weeks after conception. The swelling is very pronounced and easy to see. The swelling does not disappear until after parturition. Labial swellings vary in appearance and size.

Pregnancy tests and ultrasound are additional methods to confirm pregnancy.

Behavior Changes

Changes in behavior have been reported include: loss of appetite, lethargy, and personality changes. Females may self-nurse prior to birth. Pregnant females may continue to participate in sexual behavior. In the later stages of pregnancy females may appear agitated, restless, and lethargic, avoiding interaction with conspecifics. Losses of appetite and constipation have also been noted.

Diet Changes and Vitamin Supplementation

Proper nutrition during pregnancy is essential for the health of both the mother and fetus. A well-balanced diet should be assured with special attention to adequate levels of protein, energy calcium and other vitamins and minerals, especially folic acid. It is more important to ensure that the pregnant female maintains a healthy weight. As a general rule, the developing fetus is so small that a significant increase in food is not necessary until lactation begins (lactation can double or triple metabolic needs). An oral supplement with any standard human prenatal vitamin is recommended during pregnancy and lactation.

Parturition (taken from Fresno Chaffee Zoo/SSP Husbandry Manual)

Reports on the duration of labor vary from 25 minutes to 4 hours depending on the health and reproductive status of the female, as well as the number of offspring she is carrying (although twinning is rare). The labor process is generally comprised of three stages. During the first stage the female shows signs of discomfort, her activity level increases, and a clear vaginal discharge may be observed. The second phase constitutes the actual birthing process; the frequency of the contraction increases, the female may lie down (dorsally or ventrally), and the infant is expelled in a head-first orientation. The umbilicus is usually severed by the female with her teeth. The umbilicus must be carefully monitored in relation to the infant's body to ensure it does not constrict the infant's body in any way. Finally, during stage three, the placenta is passed. This may occur immediately or as late as several hours after parturition, it is not unusual for the female or other members of the orangutan group to eat the placenta. Any placenta tissue that is not consumed and easily retrievable should be collected in a sterile container (if possible) and given to veterinary staff for examination. Minor vaginal bleeding or continued contractions may be observed for up to several days after the birth. (Sodaro et al, 2006). As long as the amounts are small and the discharge is not abnormally odiferous or discolored, and the animal acts healthy, this is usually normal.

Mothers generally clean the mucus from the infant's face immediately following parturition, usually with either their fingers or by sucking. Sexual behavior may also be exhibited by the female towards her neonate, such as "dorsal-dorsal mounting, oral-genital inspection and manipulation and insertion of fingers into anal-genital areas" (Sodaro et al, 2006).

Infant birth weights vary considerably, ranging from 1420 grams to 2040 grams (3.12 to 4.49 pounds) with an average of 1720 grams (3.78 pounds). They have minimal body fat at parturition, so "the rib cage is prominent and the abdomen may appear sunken" (Sodaro et al, 2006). Passage through the birth canal may cause the infant's head to initially appear slightly misshapen (Sodaro et al, 2006). The first bowel movement is usually composed of meconium, a thick, dark stool produced *in utero*. Once the infant begins nursing, the stool becomes softer and pale yellow.

Lactation and Nursing (taken from SSP Husbandry Manual)

Before birth, milk production, and even milk expression (called "milk let down") can occur. Self-nursing during pregnancy and after birth is frequent and does not usually indicate a medical problem. Milk is present immediately after birth but breast tissue may not appear full or engorged for a few days. Colostrum (the first milk, which contains essential immunoglobulins for protection against disease) as well as milk is typically thin and watery in appearance.

Nursing bouts are normally frequent and of short duration. Suckling usually occurs within four to six hours after birth. Occasionally up to two days will pass before nursing takes place. The decision to remove the infant from its mother should be based on the physical condition and behavior of both the infant and the mother.

Diet and Supplementation during Lactation

During lactation energy needs double or triple. It is essential that adequate levels of total calcium, with a ratio of at least two parts calcium: one part phosphorus, be provided throughout lactation. Post-parturition, Rudy and Lena's diet may need to be raised due to the increased energy demands of nursing. The SSP manual suggests following the recommendation for human females by increasing the new mother's diet by 500 kcal/day during the first six months of lactation if the female is healthy and has not put on an excess amount of weight during her pregnancy. It is imperative that Rudy and Lena receive adequate concentration of vitamin D, calcium, and phosphorus for milk production and other biological needs. Fortunately, these requirements are typically met through commercially produced primate biscuits which are a normal part of their diet.

Signs of Potential Pregnancy Complications Previously Observed in Orangutans (taken from Fresno Chaffee Zoo)

Observations	Possible Problems
Bloody vaginal discharge (especially large quantities observed late in pregnancy)	Placenta previa or placenta abruption
Signs of labor that last more than 6 hours	Dystocia or placenta abruption
Thick, creamy, odiferous, or discolored vaginal discharge	Uterine infection
Lethargy or anorexia that lasts for more than 6 hours, missing a meal	Pregnancy toxemia

Table 1 (Wells et al, 1990)

History of Expectant Female “Rudy”

Rudy was born at Topeka Zoo on November 23, 1985. Premature at birth, she was pulled and hand-reared. Rudy’s, half-brother Joseph (DOB 2/12/86) was rejected by his mother and was also pulled for hand-rearing. After a successful introduction in May 1987 both were raised by a surrogate (Paddi/Hilda) at the Topeka Zoo. With the exception of loan a to Tampa’s Lowry Park Zoo (12 October 1990 – 8 August 1991), Rudy has resided at the Topeka Zoo. Based on copulation dates Rudy is estimated to give birth between 27 January and 16 March. February 17 is 35 weeks or 245 days. Rudy had labial swelling beginning 29 June. A pregnancy test on 23 June was negative. Pregnancy tests on 12 July and 1 August were positive. Clear Blue Easy brand pregnancy tests were used for testing. An ultrasound also confirmed pregnancy. This is her second pregnancy with the same sire. She had no complications with her first pregnancy. She has been an excellent mother and no intervention has been necessary since her daughter, Rayma was born on 5 April 2005. Rayma had an umbilical hernia at birth; no surgery was necessary and is healthy. She still resides at the Topeka Zoo.

History of Expectant Female “Lena”

Lena was born on April 2, 1982 at Buffalo Zoo and was hand raised. She was donated by Buffalo Zoo and arrived at Topeka Zoo on 28 October 2004 from Columbus Zoo. Lena and Mawas have been recommended to breed since Lena arrived at Topeka Zoo. Copulation has been observed for several years but pregnancy did not occur until this year. A fecal hormonal study which confirmed ovulation was done and a gynecologist exam showed no abnormalities. Based on labial swelling Lena is estimated to give birth between 4 February and 24 March. February 25 is 35 weeks or 245 days. Lena had labial swelling beginning 7 July. A pregnancy test on 12 July was negative. A pregnancy test on 1 August was positive. Clear Blue Easy brand pregnancy tests were used. An ultrasound also confirmed pregnancy. This is her first pregnancy. Lena has observed Rudy’s maternal care with Rayma.

Current Social Situation

Topeka Zoo currently has 1.3 orangutans, 1.0 Mawas, has been at Topeka Zoo since July 2004, Rudy, Lena, and Rayma. All of the orangutans at Topeka Zoo are together at all times except for morning and afternoon transfers.

Pre-Partum Preparations (taken from Fresno Chaffee Zoo)

Nutrition

According to the nutrition chapter of the Orangutan SSP Husbandry Manual, no dietary changes are required for females during the first trimester of pregnancy other than the implementation of a prenatal vitamin regimen. Caloric increases can be made during the second and third trimester (By 300 – 350 kcal/day) but isn't necessarily required due to the relatively small size of the developing fetus. It is more important to ensure that the pregnant female maintains a healthy weight and does not develop risk complications due to obesity,

Staff Assignments

Animal Care Supervisor/Manager of Zoo Operations/ Zoo Director/Education Curator

- Review and approve all aspects of Birth Management Plan
- Provide support for all aspects of animal keeping activities
- Ensure that adequate supply of bedding/hay will be available
- Ensure that all personnel (zoo staff, volunteers, maintenance staff, FOTZ staff and media) follow protocol for limited access as stated in the Birth Management Plan

Veterinary Staff

- Review and approve all aspects of Birth Management Plan
- Maintain good relationships with Rudy and Lena
- Provide medical support as well as nutritional advice for all aspects of the pregnancies, birth and animal health care issues.

- Compose team of medical professionals
 - OB/GYN
 - Pediatrician
 - Perinatologist
- Order and prepare all supplies needed for hand rearing

DA Staff/Trainers (Beckee, Joe, and Mary)

- Review and become familiar with Birth Management Plan
- Use positive reinforcement to encourage good maternal behavior
- Keep routine as normal as possible before and after birth
- Become familiar with signs of impending birth
- Post calling list in building
- Primary keeper will compile a notebook (Infant Care Notebook) for record keeping that all staff caring for dam/infant will complete daily
- Primary trainers, relief keeper and veterinarian will follow chart regarding training behaviors

Maternal Training Behaviors, Benefits & Level of Mastery

(From St. Paul Como Zoo)

Behavior	Benefit	Level of Mastery
Present nipple and allow it to be manipulated	Desensitize nipple for nursing infant, aid in feeding through the infant must be removed	Polished
Present abdomen and allow it to be touched with hands	Aid in ultrasounds and examinations	Polished
Present arm for hand injection	Eliminate need to perform traumatic darting if sedation is required	Trained
Present vagina	Inspect vagina for swelling	Polished
Present the baby	Teach an adult to present the infant to the mesh for visual inspection and supplemental feeding	In progress

Supplemental feeding	Allow for supplemental feeding, by a keeper, through the mesh	In progress
Shift into holding	Allow separation from group if needed	Polished

Key: Polished= any orangutan trainer can successfully requested behavior;
 Trained= only specified trainers can successfully request behavior; In progress=
 behavior is still in the process of being shaped Not trained= shaping for behavior
 has not yet begun.

Polished behaviors= Beckee, Joe, Mary, Dr. Llizo. Trained behaviors= Beckee, Joe,
 veterinarian. In Progress and Not trained behaviors= Beckee, Joe.

*Rudy had maternal training with her first pregnancy.

*Lena has had maternal training at the Topeka Zoo.

The SSP Husbandry Manual recommends that females be given as much choice as possible to move around and choose the birth location. Heavy bedding should be at least 8-10 inches deep. Types of bedding may include straw, shredded paper, brome/timothy hay, and wood wool.

Dates to follow prior to first due date;

- Separate Mawas from group on random days/nights beginning 90 days before first due date
- Separate Mawas from group until after birth(s) three weeks before first due date
- Remove hammocks/fire hose from all holding units except O6 three weeks before first due date
- Begin to bed exhibit/birth areas heavy (8-10 inches deep) 3 weeks before first due date

When female goes into labor: (from Cheyenne Mountain Zoo)

- 1) If labor is suspected and/or confirmed, person who discovered female will notify primary orangutan keeper and veterinarian immediately. Primary keeper will evaluate situation and/or designate someone to notify those on the calling list. If primary keeper is not working that day contact senior DA staff member immediately. They will take over the primary keeper responsibilities until primary keeper or veterinarian arrives.
- 2) Close orangutan viewing to all guests and staff
 - Inform front gate by phone that orangutan indoor viewing is closed
 - Put signs on entrance doors directing guests to tunnel door
 - Put sign on service door "limited personnel only"
 - Unlock exit door for gorilla viewing
 - Put up gate/construction fence at the beginning of gorilla tunnel
- 3) DA primary keepers and veterinarian will observe. Primary orangutan keeper and veterinarian will continually evaluate situation and adjust staff presence as needed. Video tape birth if it does not disturb birth process.
- 4) Primary orangutan keeper, or designated staff can offer drinks (Gatorade, etc) if it does not stress dam/group.
- 5) Monitor all orangutan's behavior. Make adjustments if necessary.
- 6) No night observations unless determined necessary.

After female has given birth:

- 1) **No staff in service area or tree house** except DA primary keepers, veterinary staff, animal care supervisor, manager of zoo operations, and zoo director
- 2) Close orangutan viewing to all staff and guests if it is not already done
- 3) If birth during the day and dam/infant are in no immediate distress, do not disturb (shift, offer food/drink, etc.) for 2 hours
- 4) Evaluate infant visually- primary keepers and vet staff
 - Breathing- get respiration rate if possible
 - Good grip- is infant able to hold onto dam's hair

- Alertness- is infant looking around at all, looking at dam, or sleeping
 - What is the condition of the umbilical site/cord
- 5) Evaluate dam- primary keepers and veterinarian
- Breathing- get respiration rate
 - Vulvar/vaginal discharge, stool, urine, blood
 - Alertness
 - Was placenta delivered
- 6) Evaluate situation
- Who is carrying infant (hopefully dam)
 - How are other group members behaving toward dam/infant
- 7) If infant is in disposition
- Retrieve at the first opportunity with as little stress to the dam/group as possible
 - If body is being carried, re-evaluate every 24 hours
 - If animals are behaving inappropriately toward infant's body discuss with animal management and veterinarian staff
 - Keep building closed to zoo guests until body is recovered.
- 8) Observe dam/infant interactions- watch for/evaluate:
- Good eye contact between infant and dam
 - Rooting and suckling behaviors
 - How does female respond to rooting
 - If nursing occurs, time each occurrence (in minutes & seconds) & record. Refer to the second paragraph under Lactation and Nursing in this plan.
 - Position of infant on dam
 - Vocalizations
 - Grooming/touching
 - Genital inspection
 - Play
 - Urine/stool/blood/discharge- dam and baby
 - Dam may clean out the infant's mouth or suck the birth fluid/mucous off of the infant's face immediately post-partum.

- Sexual behaviors of dam toward infant (monitor closely but is not abnormal)
- Refer to positive and negative behaviors listed further in this document
- If major aggression of other group member (s) toward dam and/or baby:
 - Is dam protecting baby
 - May need to consider separating group

9) If aggression or mistreatment-dam toward infant-consider trying to separate dam from infant or immobilizing dam, only if infant's life is at risk. Give dam some time if at all possible.

10) If dam or infant is in critical distress- separate as needed; notify vet staff and supervisor immediately

11) If birth was during night, and dam/baby are in no immediate distress, wait until 7-8 hours to disturb group- see below.

12) If birth was during day, wait 2-3 hours to disturb group.

- Offer dam LOTS of fluids
- Give extra food & enrichment
- Collect placenta if possible; this is NOT a priority, especially if it will stress dam/group to shift them. If shifting animals, add more hay.

13) Operant Conditioning- After discussion with veterinarian, supervisor and/or manager of zoo operations, if it is deemed necessary, a primary keeper, preferably the primary trainer for the dam, will attempt to improve maternal response to the infant using maternal training behaviors. These behaviors will also be used to visually inspect the infant as needed.

14) Mother/Infant observations

- Should be made consistently on a daily basis
- Experienced observers should be used especially during the crucial first few days.
- Frequent meetings between keepers, supervisors and veterinarian to assess how the mother/infant bond and frequency of nursing are progressing.

15) Behaviors to look for if the dam is uncomfortable or stressed:

- She may appear agitated, antsy; pacing a lot
- Putting the infant down then picking it up frequently
- Putting the infant down and leaving it
- Non-attentive
- Dragging the infant
- Non-responsive to infant's cries
- Excessive shaking

16) Positive behaviors to look for with mother/infant:

- Eye contact between mother/infant
- Mother examining the infant (toes, fingers, genitals)
- Mother responsive to infant when fussy (may indicate infants wants to nurse)
- Frequent confirmed nursings
- Mother calm, comfortable
- Mother in charge in terms of who gets to touch the baby

17) If infant is being carried by dam and is not in critical distress, but is not nursing, give them some time to try to establish nursing behaviors.

- If dam is showing some appropriate behaviors, but is not nursing infant, consider intervening- *evaluate frequently*.
- **Healthy** infant orangutans should have brief, periodic times of alertness and should be able to grip properly to the dam.
- An infant that is **not thriving**- and needs immediate assistance- may seem unable to wake up and may have limp limbs with little or no grip.
- An infant's well-being can go downhill very quickly; veterinary and animal care staff needs to be ready to intervene at any point.
 - a. Keep staff/participants at a minimum.
 - b. Glucose level on infant.
 - c. Weigh infant (2.9 to 4.5 lbs., or 1.3 to 2kg = normal).

- d. Facilitate nursing for at least one hour, both breasts; give infant fluids while nursing if needed.
- e. Weigh dam if possible.
- f. Recover female with infant in ventro-ventral position.
- g. Do not pull infant for hand rearing unless all other options have been tried and exhausted. Consult with SSP.

19) *If infant is being carried by dam and is nursing, monitor closely.* Dam may not have adequate milk supply, so infant well-being and ability to grip would be indicators. Reglan may be prescribed by veterinarian to increase milk production, or supplemental bottle/formula feedings may be necessary. Hands-on intervention may be necessary as well.

20) *If pulling infant for hand-rearing:*

- Start one-on-one quiet time immediately with caregiver
 - a. No other staff present except one vet staff to quickly examine & get glucose levels; infants carried on caregiver's body during exam.
 - b. Do not use isolette unless infant is in critical condition; he/she will warm up on caregiver's body with blankets.
 - c. Weigh infant (2.9 to 4.5 lbs., or 1.3 to 2 kg = normal).
 - d. Start howdy time with adults on day one of hand-rearing if possible.
 - e. Topeka Zoo will follow protocols in the SSP Husbandry Manual "Hand Rearing" chapter.

21) **Other important information**

- Priority will be for the daily well-being of dam/infant/group. Viewing of animals may be limited to staff and guests at the last minute, on any day, determined by DA staff, veterinarian and/or management.
- Dam will probably not act "normal" for the first week after the birth, may have decreased appetite. Food will be offered as usual and adjusted if needed.
- Sticking to routine (feeding, cleaning, group composition) is essential after the infant is born. Any change in routine can throw a mother off.

- Priority should be placed on cleaning/preparing housing areas for the birth group ASAP each morning, but follow normal routine.
- Records, in the Infant Care Book and on Daily Animal Report need to be completed daily.
- Have regular meetings with DA keepers, supervisor and veterinary staff.
- Mawas should be put back with the group as soon as the females are healed and staff has no concerns.
- Once group is reintroduced staff will monitor and record any interactions between all animals