



Research Article

SUCCESSFUL HAND-REARING OF SERVAL CAT *LEPTAILURUS SERVAL* (SCHREBER, 1776) AT SARDAR PATEL ZOOLOGICAL PARK, GUJARAT, INDIA

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ABSTRACT

The Sardar Patel Zoological Park (SPZP) is captive leaving of Serval cat *Leptailurus serval* currently which one of the out Indian zoos. The two kitten birth over the 69 days of gestation. Unfortunately observed filicide behaviour and one kitten death; another neonate separated immediately and decide to hand rearing. Report present up to 250 days observation and collecting data of kitten weaning as well as body weight. Our knowledge significantly with the successful breeding and hand rearing of this serval cat kitten. The experience has provided the surety the ability to rear neonates if intervention is ever required. The work being carried out at SPZP contributes to the maximum efforts to conserve these Carnivores species of mammals.

Keywords: *Leptailurus serval*, Sardar Patel Zoological Park, Cat, Carnivores.

INTRODUCTION

Leptailurus serval is a member of the family Felidae, also known as Cat family. Serval is found throughout Africa, reside in southern Africa, especially in Zimbabwe and the province of Natal. Adults are slender, agile, and approximately 60 cm in length from shoulder to tail. Weight of the males is about 9-18 Kg and that of females is about 9-13 Kg. On the basis of their size, their legs and ears are long and considered the largest in the Felidae family (Alderton, 1993). They are mostly found in reed beds and grasslands; also spend time in forest brush, bamboo thickets, marshes, and streams within their home range (Geertsema, 1991). The life span is estimated of 10 years in the wild while that of captivity is on average 22.4 years. The longest lived in wild was estimated to be 23 years. In Basel Zoo of Switzerland reported one female with her last litter at age 14 and lived 19.5 years (Grzimek, 1990; Livingston, 2009; Walker *et al.*, 1964; Weigl, 2005).

The class mammals have mammary glands through which they produce milk and feed their young ones. The female may have one pair or as many as a dozen or more of mammary glands. Most of the Indian zoos exhibit one or

more species of native or exotic mammals. Captivity is performing a vital role for ex-situ conservation, education and research. The 'Recognition of Zoo Rules, 2009' emphasizes the need of 'nursery for hand rearing of animal babies' in the recognized zoos to support their rearing and rehabilitation required for animal welfare (Mohapatra *et al.* 2019). Milk replacers represent a great advance in zoo husbandry techniques. Prior to their introduction, a mixture of one part of evaporated milk and two parts of water were the standard diets, varied in specified cases, for hand-rearing mammals in zoos (Crandell, 1964). There are instances, where cow milk was used with varied dilution to successfully rear leopard, jackal, lagomorphs, giraffe (Dhoot *et al.*, 2000, 2003; Mohodaya, 1990a; Ashraf *et al.*, 1997; Khadri and Valandikar, 2002).

MATERIAL AND METHODS

The Serval cat growing in Sardar Patel Zoological Park of Gujarat state, India, copulated in October 2020. The pair mates for two days in a row with an average of 30- 40 min duration in morning to late evening. After the gestation period of approximately 69 days, two kittens were born

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inmorning at around 11:30 on 31 December 2020. At around 15:00 one kitten was filicide by female and another kitten was immediately rescued by first author for further hand-rearing treatment.

The kitten was shifted to incubation and nursery room in the hospital, the place is the isolation from other animals to reduce the risk of infections. The access to the neonate was limited to the care taker and veterinary staff. An ambient temperature of 96 F was maintained in the first week of kitten and gradually dropping to 97-99 F. Humidity was also maintained in the room. Towel with double layer was used as a bedding material. The milk formula is Lactol kitten milk replacer. The formula about 33.5 g was mixed in 100ml of lukewarm water. The amount of feeding was 20% of the body weight into six times (6x) to twice in a day as per growth, with six to eight hours of night sleep. A routine was maintain for feeding and weighed at the same time. Systematic hand-rearing care and handling care of Neonatal felids were followed by using references such as Andrews (2020), Strick, 2006, 2007, Buzas (2012), Hedberg (2002) and Grant (2015).

After weaning, the kitten was introduce with water and solid food such as me-o cat kitten pellets, me-o cat fish (gravy), boiled egg and boiled chicken soup. A data sheet was maintained for daily recordings of hand-rearing information. It allows us to keep a track on any changes and is a useful reference for future hand-rearing purposes. Daily weight gain, intake of each feed, temperature, defecation (urine, faeces, colour and consistency), medication given, various stages of physical and behavioural development were recorded. Moreover, offering some enrichment with cardboard rolls, wooden ball, boxes, large soft toys for Cubs were used for playing while under supervision.

Housing

The Neonatal felid was kept in a thermo regulator room with an ambient temperature of 30°C to 32°C in the first week of life and gradually dropping to 24°C thereafter 30 days. A commercial portable heater was kept as per recommended. Alternatively a box 0.5 m² with 30 cm height with a warm blanket sheet occupying half the floor area was used (Figure 1). The warm blanket should be set at the lowest setting and be covered by at least one layers of bedding. The size of the housing was set on the basis of the neonate's degree of mobility.

Once the kitten reached 60 day it was kept open in incubation room from a box, with slight rough surface for proper locomotion. The water bowl and feeding dish as well as one dry soil bucket for urination and defecation was kept inside the housing. After 210 days, the kitten was shifted from nursing room to outdoor enclosure with night shelter room. The footbaths were kept throughout the facility and at entry point of nursery room and animal outdoor enclosure.

Feeding observation

On the first day we provide electrolyte for the first 24h. After that on second day we started feeding the kitten with Lactol Kitten milk (LKM). The feeding bottle and nipple size plays a vital role according to the animal size, so we choose the Lactol feeding set (25 ml bottle with four tits and washing brush). The neonate was kept on its stomach with head slightly elevated to feed from tilt bottle, so that there is always milk in the nipple. We allowed the kitten to push and knead on smooth towel with its front side of body while sucking (Figure 1). After waking up from the sleep, the kitten has a strong sucking action. According to the guideline by Andrews (2020), in the first week 35-45 ml LMK feed was given every 3h and six times per day (6-7 ml each time) with a night sleep break time of 4-6 h. follow the (Table 1) for further feedings.



Figure 1. Feeding position of closed eye kitten (age of 4th day).

The Me-O kitten food (MKF) was first introduced in a small amount and also approach to drink water. After 75 days the kitten started feeding on the MKF (20g) on the regular bases in the morning time and later the feed quantity was maintained as per body weight. After completion of 90 days, the amount per day was 210ml LKM and 20g MKF with some amount of Boiled egg (BE). The kitten started feeding on a one BE in the evening regularly, the yolk was primary preferred. On 105th day, we introduced the Me-O fish for kitten (MF) and on 120th day with boiled chicken soup (BCS). After four months the kitten used to intake 160ml LKM twice in a day, MKF mix with MF, BE and

BCS. After reaching 150th day, LKM has been stopped and the kitten was totally transformed to solid food i.e. 40g MKF and 20g MF in the morning (06:00 h), two BE in noon (12:00 h) and 60g BCS in late evening (18:00 h). After 240th days (eight months) feeding schedule was 80g MKF mixed with 30g MF (00:30 h), four BE (12:00 h) and 200g BCS warm (18:00 h), occasionally they prefer BCS late night. The LKM was fed up to 150 days, introduced food after 120 days and LKM with other feed (MKF, MF, BE and BCS) from 60 to 150 days, almost 90 days (Table 1).

Table 1. The food consumption data of hand-reared Serval cat till 240th day.

Age in Months	Age in Day	Feed Consumption (per day)
1st Month	Day 1	25 ml electrolyte/ 6x
	Day 2	35 ml/ 6x LKM
	Day 7	50 ml/ 6x LKM
	Day 14	65 ml/ 6x LKM
	Day 27	75 ml/ 6x LKM
	Day 30	80 ml/ 6x LKM (start the drink water also)
2ed Month	Day 45	125 ml/ 5x LKM
	Day 60	165 ml/ 5x LKM + MKF introduce
3ed Month	Day 75	180 ml/ 4x LKM + 20 g MKF
	Day 90	210 ml/ 4x LKM + 20 g MKF + BE introduce.
4th Month	Day 105	180 ml/ 3x LKM + 20 g MKF + 1 BE + MF introduce
	Day 120	160 ml/ 2x LKM + 20 g MKF + 20g MF + 2 BE + BCS introduce
5th Month	Day 150	40 g MKF + 20g MF + 2 BE + 60g BCS
6th Month	Day 180	40 g MKF + 20g MF + 2 BE + 100g BCS
7th Month	Day 210	50 g MKF + 20g MF + 3 BE + 130g BCS
8th Month	Day 240	80 g MKF + 30g MF + 4 BE + 200g BCS

LKM: Lactol Kitten milk MKF: Me-O Kitten Food, MF: Me-O Fish, BE: Boiled eggs, BCS: Boiled chicken soup, ml: millilitre and g: gram.

Urination and defecation

For urination and defecation the felids neonate has to be stimulated with warm moist cotton wool before and after each feeding session. Always keep ano-genital area clean and urine was produced after each feed but not faeces (Figure 2). During feeding on LKM the faeces colour was light to pale yellow and semi-solid but when feeding on LKM, the faeces colour was yellow to brown and solid. After two months we provided a dry soil tray for urination and faeces as most of the cat species urinate in a particular area. After defecation in the tray, the kitten dump some soil on the faeces (Figure 3).

Body Weight

The weight of the kitten at the time of birth was 181g. Every day the weight measurements were taken in the evening. With the help of LKM, the weight of the kitten in a span of 63 days increases from 181g to 801g. After starting LKM with MKF, MF, BE and BCS, weight increases to 1008g

and 1710g from 93 to 123 days. Currently after completion of eight months the weight of the kitten has increased from 181g to 3140g (Figure 2). Now the weight will not increase every day, but weight loss is never happened (Figure 3).

RESULTS AND DISCUSSION

Hand-rearing of Serval cat from day one of birth with the help of LKM formula is supposed to be first report in this zoo as none of the Indian zoo has yet reported such Hand-reared individual. After 45 days the male kitten was named "Chester". For hand-rearing of small felids, pre-digested with Lactaid is proved to be a suitable formula (LKM). There were no gastrointestinal problems and formula consumption was good. The growth curves were compared to the one reared by their mothers (similar body-size species), but according to the current situation this formula works better. In addition, MKF and MF are excellent for weight gain and body condition growth. When observed the priority by the kitten, the MF and BCS were the two foods.



Figure 2. To cleaning ano-genital area by warm moist cotton ball.



Figure 3. Successfully hand-rearing of serval cat *Leptailurus serval* (age of 240 day).

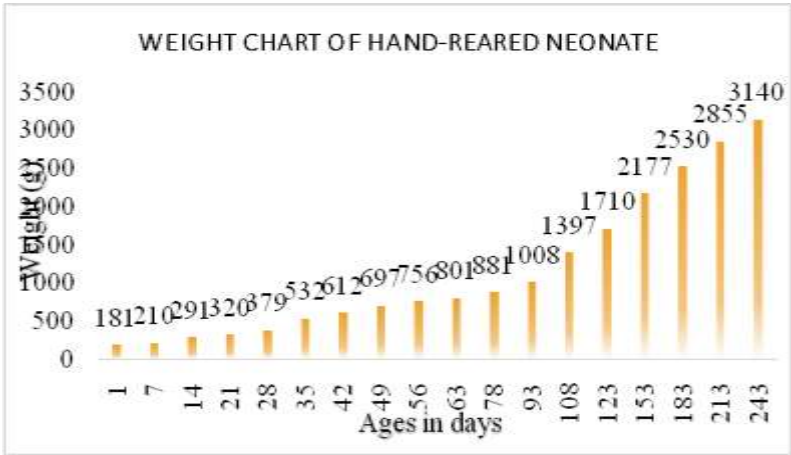


Figure 4. Weight gain chart of the hand-reared Serval cat neonate.

CONCLUSION

The result of successful hand-reared kitten can be achieve by following milk formula, feed quantity, feeding position, housing atmosphere, hygienity, disinfections, equipment sterilization, body growth, urination and defecation (Figure 4). The Collected data have allowed us to refine and improve our methods of hand-rearing in Serval cat.

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