

day she developed a severe diarrhoea which lasted for five days and lost weight for the first three days of this condition, gaining very little during that week. For the next five weeks her bowel movements were irregular and slightly hard, and she never had more than one bowel movement a day. Later, except for occasional bouts of diarrhoea, she usually had two normal bowel movements a day.

PRODUCTS MENTIONED IN THE TEXT

Esbilac is a powdered milk substitute for bitch's milk, manufactured by the Borden Company, Feed Supplements Division, 250 Madison Ave., NY 17, NY, USA.

Mellin's Food is a milk modifier distributed by Mellin's Food Company of North America, Chicago 10, Illinois, USA.

A brief note on breeding Indian elephants

Elephas maximus

at Mysore Zoo

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Mysore Zoo has had a pair of Indian elephants *Elephas maximus* for a number of years. The male, obtained in 1951, is white and is called 'Swethavarna'. The female, obtained in 1947, is called 'Padmavathi'. Until 1965 the two elephants were allowed to graze freely in the neighbouring forest during the summer. On two occasions Padmavathi mated with wild bulls, giving birth to a calf in

1948 and again in 1956. After 1965 the elephants were no longer sent into the forest to graze, partly because of the drought. On 29 March 1965 Swethavarna mated with Padmavathi. On 28 January 1967 at 0400 hours she gave birth to a calf after a gestation period of 666 days. The calf was successfully reared.

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Notes on the artificial rearing of a Great Indian rhinoceros

Rhinoceros unicornis

at Hamburg Zoo

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Under a co-operative breeding arrangement with Basle Zoo our female Great Indian rhinoceros *Rhinoceros unicornis*, 'Nepali', was mated with their male. On 9 April 1967, after a gestation period of 464 days, 'Nepali' gave birth to her second calf, a female, 'Schita'.

For about 24 hours she was a good mother, licked her calf and allowed it to suckle but on the morning of 11 April she mishandled the calf in

such a way that I decided to remove it. The artificial rearing of the calf proceeded without complications. Ordinary commercial bottled milk was used which had the following constituents:

3.1% fat
3.3% protein
4.7% lactose
0.7% minerals (ash)
88.2% water

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Dagen no. Observation	DATE	WEIGHT kg	SHOULDER cm	HEIGHT cm	TOTAL LENGTH cm	BELLY GIRTH cm <small>behind ribs</small>	LENGTH OF THE CENTRAL ARMOURD PLATE cm
3	12.4.1967	65.5	67	—	115	120	33-34
5	14.4.1967	69	—	—	—	—	—
8	17.4.1967	75.5	—	—	—	—	—
12	21.4.1967	83	—	—	—	—	—
15	24.4.1967	84.5	—	—	—	—	—
21	30.4.1967	94.3	—	—	—	—	—
23	8.5.1967	105.6	—	—	—	—	—
37	13.5.1967	115.5	—	—	—	—	—
40	19.5.1967	125.5	74	—	132	136	39
50	29.5.1967	144	76	—	133	150	41
						BREAST GIRTH cm <small>behind ribs</small>	
58	6.6.1967	156	76	—	135	125	42
64	12.6.1967	163	—	—	—	—	—
71	19.6.1967	172	—	—	—	—	—
78	26.6.1967	182	—	—	—	—	—
86	3.7.1967	197	82	—	150	135	45
113	31.7.1967	232	88	—	159	151	50
148	4.9.1967	318?	95	—	175	156	52
146	31.12.1967		106	—	205	186	66
345	19.3.1968		109	—	210	200	68

Table 1. Measurements of size and weight in a hand reared Great Indian rhinoceros *Rhinoceros unicornis* at Hamburg Zoo.

DATE	MILK LITRES DAILY	NO. OF FEEDS DAILY	PERIOD HOURS	SUPPLEMENTS
11.4.67	2	—	1800-2200	
12.4.67	9	9	0200-2200	
13.4.67	15	11	0200-2200	
14.4.67	13.5	10	0200-2200	
15.4.67	11	10	0200-2200	
16.4.67	14.5	10	0200-2200	
17.4.67-21.4.67	15	10	0200-2200	
22.4.67-1.5.67	16	10	0200-2200	
2.5.67	17	10	0200-2200	
3.5.67-7.5.67	18	10	0200-2200	
8.5.67	19	11	0200-2200	
9.5.67-11.5.67	20	10	0600-2400	
12.5.67-22.5.67	20	9	0600-2200	24 drops 3 times daily of Protovita until December 1967.
23.5.67-25.5.67	20	9	0700-2200	
26.5.67-29.7.67	20	9	0700-2100	8 litres water, greenstuff, hay, green maize, carrots, cooked rice with bran. as above plus 2 litres water extra.
30.7.67-11.1.68	20	4	0700-1900	daily ration of: 10 kg roots, 8 kg hay, 5 kg calf-rearing pellets, Protovita and minerals.
12.1.68 onwards	no milk	2	0730-1630	

Table 2. Diet fed to hand-reared Great Indian rhinoceros *Rhinoceros unicornis* at Hamburg Zoo.

The milk came exclusively from tuberculin-tested and disease-free cattle. It was delivered fresh and chilled at 2–6°C (35–43°F) to the factory where the milk was pasteurised at 72–74°C (162–165°F) for 40 seconds and cooled to 2°C (35°F). During this process the milk was homogenised. The appropriate milk ration was delivered to us daily in one-litre bottles sealed in the dairy and stored in the refrigerator. The required number of bottles was brought up to the correct temperature in good time ready for feeding. After removal of the sealed cap a sterile rubber calf's teat was drawn over the neck of the

bottle and the milk was then fed to the animal. By this simple method the pasteurised milk reached the animal to all intents and purposes germ-free.

The keepers played with the calf twice a day in the paddock and encouraged it to walk. Like the mother the calf had the habit of pressing the rear part of its body against the wall of the den when defaecating. Those parts of the body which were soiled by this were washed and oiled every day.

Its increase in size and weight is very similar to that of the Basle Zoo's young rhino which was reared by its mother (see Table 1).

Breeding the Great Indian rhinoceros

Rhinoceros unicornis

at Mysore Zoo

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As a result of the resolution of the Indian Board for Wild Life that all the zoos in India should exhibit the Great Indian rhinoceros *Rhinoceros unicornis*, 'Rani,' aged about 18 years, was given to the Mysore Zoo by the Assam Government on 3 July 1956. Efforts to procure a male rhinoceros to give company to Rani were set afoot and on 28 April 1965, 'Kasi,' a male rhinoceros was obtained. Kasi had to remain in his crate for a few days to enable a wound in his front leg to be attended to. During this time the crate was kept very close to Rani's enclosure to enable them to get acquainted.

Rani took it quite happily and began to flirt in front of Kasi's crate. On the 6 May 1965, Rani came into oestrus and lay in front of Kasi's crate with mucus flowing from her vagina. Kasi was also noticed to be on heat, but because of the wound in his leg he was not let out of the crate.

On 21 June 1965, Kasi was released into Rani's enclosure. Instead of being friendly, the two rhinoceroses stood aggressively at a distance making a shrilling noise. At about 1830 hours the same day the male attacked Rani, inflicting severe injuries on her and we therefore separated them.

Two days later, Rani quietly moved into the open enclosure to meet Kasi and timidly stood in one corner facing him. Rani tried to display her subordination to Kasi by frequently going to the pond and eating the faeces of the male. Gradually they came closer and began to eat nearer to each other. They frequently fought with their horns but would draw back without hurting each other.

On 27 July 1965 Rani again came into oestrus and began to follow Kasi around. They both lay down frequently. Since Rani refused food but Kasi took his it could be inferred that Kasi had not yet come into heat.

Rani came into oestrus regularly on 27 August, 29 September, 20 October and 21 November 1965, and 26 January and 17 February 1966, but the male did not come into heat.

On 20 March 1966, Rani again came into oestrus and started moving behind Kasi, lifting her tail. Kasi was also ready this time and mounted Rani. The copulation, in a standing position in the open, was successful and lasted for one hour between 1400 and 1500 hours.

The male came on heat again on 5 May 1966 and tried to mount Rani, but she was not ready. They fought with each other and had to be