

Table 6. Upper canine (tusk) measurements of four young walrus, *Odobenus rosmarus divergens*, at Marine-land, California, over a three-and-a-half year period.

Date	Walrus No. 1 ♀	Walrus No. 2 ♀	Walrus No. 3 ♂	Walrus No. 4 ♂
26.1.62	17.78 mm	17.78 mm	17.78 mm	22.86 mm
10.2.63	12.00 mm	12.00 mm	10.00 mm	52.00 mm
10.4.64		39.76 mm (R) 34.98 mm (L)		104.96 mm
30.7.65	31.7 mm	44.45 mm (R) 31.7 mm (L)	25.4 mm	150.8 mm

material is sprayed on in liquid form. Its thickness is determined by the number of applications.

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REFERENCE

BROWN, D. H. (1963): The health problems of walrus calves and remarks on their general progress in captivity. *Inter. Zoo Yearb.*, 4: 13-23.

REPORT ON THE HAND-REARING OF AN INDIAN RHINOCEROS

Rhinoceros unicornis

AT HAMBURG ZOO

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IN June 1957 'Nepali II', a female Indian rhinoceros, *Rhinoceros unicornis*, aged about one year, was imported from the Indian Nature reserve of Kaziranga and arrived at Hamburg Zoo.

In 1962, Dr E. M. Lang, director of Basle Zoo, kindly offered to have Nepali II at Basle Zoo to be mated with the adult Basle bull rhino, 'Gadadhar'. Thus on 21 September 1962 Nepali was transported by train to Basle, accompanied by her keeper. On the whole she was quiet during the journey and only became unusually excited when the

locomotive let off steam, especially during a period when the wagon she was travelling in was directly behind the engine. On 13 February and on 6 May 1963 Nepali was mated with Gadadhar. On 20 May 1963 she arrived back in Hamburg.

Throughout the summer of 1963 she was fed mainly on grass, supplemented with abundant foliage, a few raw potatoes, carrots and boiled rice with bran.

At the end of July 1964 Nepali became very irritable and would no longer allow her keeper to go inside her den. The irritability increased until 11 August 1964 when a calf, a bull, was born in 20 minutes by breech birth. The mother turned round, quick as a flash, and sniffed at the calf. Twenty minutes later it was trying to feed. During the following two days the mother was very gentle with the calf which fed for four to six minutes each hour. The mother fed and defaecated regularly. From the fourth day after the birth, for no known reason, the mother attacked the calf with loud snorts and ill-treated it. She would let it feed for about five minutes in the hour and she would let it sleep by her but she would suddenly attack it again, so that on the fourth day we decided to separate the calf from the mother. She constantly wanted to have the calf with her and as long as it was drinking she would remain quiet but immediately afterwards she would become completely untrustworthy. The staff kept watch for 24 hours and as soon as the mother's mood seemed favourable, she was allowed together with the calf again. As the mother obviously did not have sufficient milk the calf was bottle-fed from the fifth day though it

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was still permitted to feed from the mother whenever this was possible. The progress of the calf over an eight-month period of hand-

rearing are summarised in Table 1. Figures describing the calf's growth rate are given in Table 2.

Table 1. Account of the hand-rearing of a male Indian rhinoceros calf, *Rhinoceros unicornis*, born at Hamburg Zoo on 11 August 1964.

Date	Supplementary food from the bottle		Feeding from the mother within 24 hours	Remarks
	Food			
15.8.64	Alete II	2,180 g	7 times	
16.8.64	Alete II	2,140 g	14 times	
17.8.64	Top quality milk 5% fat	6 litres	15 times	Mother 15.30 hours 300 mg Librium. At 17.00 hours (without success) 200 mg Librium
18.8.64	Top quality milk 5% fat	10½ litres	2 times a.m. and p.m.	
19.8.64	Top quality milk 5% fat	8½ litres	2 times a.m. and p.m.	
20.8.64	Top quality milk 5% fat	7½ litres	2 times a.m. and p.m.	
21.8.64	Top quality milk 5% fat	10 litres	7 times	
22.8.64	Top quality milk 5% fat	12½ litres ½ banana	3 times	
23.8.64	Top quality milk 5% fat	11½ litres 1 banana	1 time	

On 23 August the ill-treatment of the calf by the mother became so dangerous to its life that we decided to go over completely to an artificial diet.

Date	Food	Medicines	Dung	Remarks
24/26.8.64	Top quality milk daily 14 litres and 1-2 bananas			
27.8.64	13½ litres	Arobon, Carbo-guanicil 2 tablespoons Humatin daily	acute diarrhoea. <i>Pyocaneus</i> and <i>Proteus</i> germs in faeces	no success
28.8.64	change to Alete II, oat gruel, Poms children's semolina, later when refusing food addition of Boviserin		acute diarrhoea	very weak hardly able to stand

Table 1—contd.

Date	Food	Medicines	Dung	Remarks
8.9.64	change to Alete II with rice water 3-9 litres	Humatin 6 times daily 2 tablespoons for 9 days	cannot defaecate; flatulence	
12.9.64		4 Lecicarbon		
13.9.64		2 Lecicarbon		
16.9.64		2 Lecicarbon	more droppings flatulence relieved	
17.9.64			defaecated freely, pulpy thin faeces	general condition improved
18.9.64				Humatin treatment ended successfully
19/23.9.64	in 24 hr 8 times each 1 litre Alete II with rice milk	3 × 24 drops of Protovita 1 day	normal	
23.9.64		3 × 1 teaspoon of Ferro-Folsan and 1 tablespoon of mineral salt mixture 4 Lecicarbon	has not defaecated since 20.9.64; acute flatulence	
24.9.64	only drinks 2½ litres	10 Lecicarbon 2-hourly	has not defaecated since 20.9.64; acute flatulence	Rolling about in pain refusing its food
25.9.64	drinking almost normally 9 litres in 9 feeds at: 0500, 0700, 0900, 1100, and 1300, 1500, 1700, 1900, and 2200 hours		defaecated well	
27.9.64	no more rice water. Fine-flaked oats instead: to 21 Alete 1 litre Schm. Fl. gruel. Daily increase in the quantity of liquid by 1 litre a day to a total of 14 litres by 11.10.64			
5.10.64		no more Ferro-Folsan		
11.10.64	change to top quality milk 1 litre more a day and therefore 1 litre less Alete			
17.10.64	increase in the total quantity of liquid to 16 litres	1 teaspoon Ferro-folsan (3 times daily)		

Table 1—contd.

Date	Food	Medicines	Dung	Remarks
24.10.64	Ditto to 17 litres			
2.11.64	addition of 3 tablespoons boiled milk rice			
3.11.64				drank by itself from the trough
7.11.64	6 meals 16 litres. 0600, 0730, 1030, 1330, 1630, 2200 hours			
12.11.64	total supplement of 125 g rice milk		diarrhoea	
13.11.64	no more rice milk		diarrhoea	
19.11.64	change: Eledon: to 1 litre of water 100 g, 60 g Mondamin, 100 g sugar; 14 litres a day	Coliston: 5 days 16 tablets 2 days 8 tablets 1 day 4 tablets	diarrhoea	
1.12.64	change: to usual drinking milk 1 litre more a day, litre less Eledon a day	no more Ferro- folsan	normal	diarrhoea cured
11.12.64	14 litres drinking milk. Birch foliage			
13.12.64	begins to eat hay			
18.12.64			no defaecation from 4.12.64 to 18.12.64	condition perfectly normal
19.12.64			defaecated very well without a laxative	
23.12.64	daily supplement of 250 g of dried oatflakes			
29.12.64	daily 500 g ditto			
11.1.65	addition of 2 litres boiled water to the milk			
14.1.65	2 apples, 1 kilo hay daily			
17.1.65	gradual change to 5 feeds: 0730, 1030 1330, 1630, 1830 hours			

Table 1—contd.

Date	Food	Medicines	Dmg	Remarks
19.1.65	4 feeds; 0730, 1030, 1330, 1630 hours			
3.2.65		3 times daily 1 teaspoon of Ferro- folsan to 24 drops Protovita and 1 teaspoon of mineral salts 3 times		
20.3.65	total liquid intake now 14 litres milk with 8 litres of water added: 3 apples, 1½ kilos roots, 500 g oat flakes, about 2 kilos hay, birch branches			
29.3.65	weekly 2 litres milk less, water instead			
20.4.65	quantity of liquids: 30 litres, of which 4 litres of milk. Change to grass fodder is envisaged		twice daily	in perfect condition of nourishment and health, very lively. comes into the open air every day

Table 2. Growth rate of an Indian rhinoceros calf, *Rhinoceros unicornis*, born at Hamburg Zoo on 11 August 1964.

Measurements of the Indian rhinoceros Gauhati, male

Date	Weight in kg	Height at shoulder in cm	Distance from nose to tail in cm	Length of middle armour in cm	Girth - breast circumference in cm
11.8.64	born				
28.8.64	87.5				
9.9.64	85.5				
26.9.64	98				
30.9.64	103				
14.10.64	115				
23.10.64	132.5		130	40	
21.11.64	158	81		43	
20.12.64	203	86	145.5	44.5	148
4.1.65	233	88	155	46	148
30.1.65	262	90	156	48	155
26.2.65	288	93.5	167	51.5	175

PRODUCTS MENTIONED IN
TABLE 1

Boviserin, Hoechst AG, Frankfurt/Main, Germany.
Carbo-Guanicil, Cilag-Chemie GmbH, Alsbach/
Bergstr, Germany.

Coliston, Fa. Grünental, Stolberg/Rhld., Germany.
Eledon, Powdered Nestle Buttermilk, Deutsche
Nestle AG, Lindau/Bodensee, Germany.
Ferro-Folsan, Kali-Chemie AG, Hannover, Ger-
many.

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