

MILK COMPOSITION OF THE SUMATRAN RHINOCEROS (*Dicerorhinus sumatrensis sumatrensis*)

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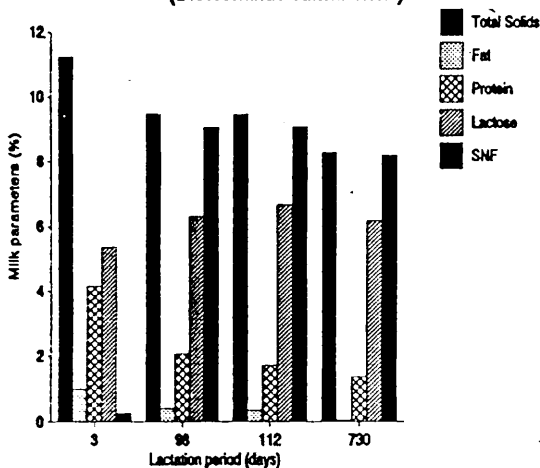
SUMMARY Knowledge of the milk composition of the Sumatran rhinoceros is an essential part of the captive breeding programme. The major composition of milk of the Sumatran rhinoceros at 3 days' lactation consists of 11.24% total solids, 0.99% fat, 4.17% protein, 5.38% lactose and 10.27% solids-non-fat. The fat and protein content reduced markedly to 0.07% and 1.37% respectively at 2 years lactation. This information will provide a basis for formulating milk substitute to feed any hand-reared Sumatran rhinoceros calves. Comparison of the milk was made with the other species of rhinoceros.

INTRODUCTION Currently, there is no information on the milk composition of the Sumatran rhinoceros which is essential as a guideline for the hand rearing of the Sumatran rhinoceros calves in the future. With the increase in habitat destruction, the chances of acquiring young Sumatran rhino increases. In handraising rhino calves, the use of accurate formulation is important in ensuring adequate nutrition. Analysis of the milk constituents of the Black, White and Indian rhinoceros are available (Fowler, 1986; Gregory et al., 1965). This paper reports the milk analysis of the female, Rima that gave birth in captivity at Zoo Melaka in 1987.

MATERIALS AND METHODS Milk was collected from the female on the third day of lactation, using both mammary glands. Prior to the collection, the calf was allowed to suckle briefly. This was normally done between 0830H to 1100H. The milk was

collected in a 4-inch-diameter wide-mouthed container before transferring into a 30 ml bottle, which was immediately frozen. The samples were sent to the Veterinary Public Health Laboratory, Petaling Jaya, Malaysia for analysis of the major milk constituents. Similarly, milk was collected at 14 weeks, 16 weeks and at 2 years lactation.

Fig 1: Milk composition of Sumatran rhino (*Dicerorhinus sumatrensis*)



RESULTS The total solids, fat and protein declines markedly throughout the lactation period (Fig. 1). The total solids constituent decreased by 26.25% between the first collection (3 days) and the last (2 years). Fat composition decreased from 0.99% at 3 days lactation to .007% at 2 years. Similarly, the protein content was 4.17% at 3 days' lactation, 2.07% at 14 weeks, 1.7% at 16 weeks and 1.37% at 2 years. The solids-non-fat percentage increased from 10.27 to 9.06 and 9.09 at 14 and 16 weeks respectively before decreasing to 8.20 at 2 years. Lactose increased steadily to 6.68% at 16 weeks before reducing to 6.19%.

DISCUSSION The fat composition in the Sumatran rhinoceros at 3 days lactation was comparable to the Black and White rhinoceros, although in the White, the value is 0.3% lower (Greed, 1960; Jones, 1978). Similarly, some authors described milk fat composition in the Indian and Black as traces or negligible (Aschaffenburg, 1961; Fowler, 1986). In the mare and the Brazilian tapir, the fat composition was reported as 1.5% and 3.4% respectively (Robinson, 1987; Omrod, 1967). In the Sumatran rhinoceros, fat constituent declined steadily from 0.99% at 3 days to 0.42% and 0.07% at 98 days and 730 days lactation respectively. However, in the Indian rhinoceros, the fat composition were 4.0% and 3.5% at 40 and 50 days lactation respectively (Lang, 1961). In the White rhinoceros, the fat composition increased by 300% at 56 days lactation (Jones, 1978). In the Sumatran rhinoceros, the total solids and protein composition declined markedly at 14 weeks, 16 weeks and 2 years lactation.

Previous reports indicated that hand raising rhinoceros calves require a good understanding of animal nutrition and medicine. The death of an orphaned Sumatran rhinoceros calf in 1984 was partly attributed to an incorrect milk substitute and a concurrent pulmonary congestion with suppurative pleuritis (Mohd-Tajuddin et al., 1990). Similarly, a Black rhinoceros calf that was fed on SMA, S-26 milk (Wyeth Laboratory, Inc. Philadelphia, USA) hardly gained 20 pounds (Kreag, 1966). At Hamburg Zoo, hand rearing of an Indian rhino calf was successful although problems associated with severe diarrhoea, constipation and flatulence were observed as early as 11 days after feeding the milk substitute. During the first 24 days on substitute milk, the bodyweight decreased by 2 kg. (Hagenbeck, 1966). At Zoo Melaka, the daily weight gain of the Sumatran rhino calf was 860 grams per day during the first year (Zainal-Zahari, 1990). Another Indian rhino calf was hand-reared from 3 days of age and fed with milk from tuberculin-tested disease free cows containing 3.1% fat, 3.3% protein and 4.7% lactose. Similar problems associated with severe diarrhoea and constipation were observed during the period (Hagenbeck, 1969). Data on the hand-rearing of the White rhinoceros was published previously (Wallach, 1969).

Cows' milk and recently available milk formulae (Nespray, Nestle, Denmark; Fernleaf, New Zealand Dairy Board, New Zealand; Lactogen, Nestle, Malaysia) are therefore unlikely to substitute adequately for species-specific milk. The correct formulation of milk fat, milk protein and lactose at different stages of lactation will ensure a more accurate nutrient intake for the growing calf. In the Sumatran rhino calf, suckling was still observed at 2 years of age. Although the dam continues lactating normally, the major milk composition decreases very markedly indicating a decrease reliance on milk. At this age the calf consumes a similar diet as the adult.

CONCLUSION Knowledge of the composition of the milk in rhinoceros, as in other wild species, is essential for proper hand-rearing. Not only does the composition change over time, it appears to vary between species.

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