Reindeer milk

Eloranta, E.[1], Nieminen, M.[2] & Soppela, P.[2]

[1] Department of Physiology, University of Oulu, Oulu, Finland

[2] Finnish Game and Fisheries Research Institute, Reindeer Research Unit, Rovaniemi, Finland

The semi-domesticated reindeer (*Rangifer tarandus tarandus* L.) is a ruminant which exhibits an advanced adaptation to the seasonality of the northern environment. Calving, growth rate of the newborn calves, antler growth, recovery from rigors of the winter and lactation in females are well suited to the Holarctic spring and early summer when high-quality forage is available after long and nutritionally unfavourable winter. Because the summer is short new offspring must be born as early in the spring as possible to maximize the growth-period.

The characteristic lactational cycle of reindeer commences at or just before snow-melt and ends usually in autumn before the rut. The milk energy content of various deer species varies but the protein:fat and protein:energy ratios are remarkably constant (Luick et al. 1974) and are comparable with those of domestic species (Arman 1979). Peak milk production is not maintained for long periods which minimises the loss of maternal nutrients and allows time for replenishment of maternal energy and nutritional stores.

In this paper we review earlier studies of reindeer milk during lactation and present the chemical composition of milk which is based on our current study of milk composition in naturally and artificially fed reindeer hinds.

This study was carried out at the Kaamanen Reindeer Research Station in Northern Finland (69° 10N'). 19 adult reindeer hinds were milked during the end of May 1986. The hinds were freely grazing (Group I) or fed with concentrates (Group II) from January to April. Concentrates comprised of feeds containing on average 13% crude protein and 4% crude fat, mainly rapeseed oil. At the end of April the hinds were put together and fed with concentrates (Poron Herkku, Raision Tehtaat Oy) which contained 13% crude protein and 7% crude fat in DM (4% rapeseed oil in ration). The hinds were milked by hand 5–12 days (mean 10 days) after calving when they had been at the same feed about one month.

Crude lipid content was determined with Rösegottlieb method and crude protein content with Kjeldahl method. Fatty acids were analyzed with gas liquid chromatography.

The milk of reindeer is high in dry matter, fat (about 20%) and protein (about 10%) but moderately low in lactose content (Luick et al. 1974). In the present study crude fat and protein contents were slightly lower than those of earlier studies. No significant differences were found in naturally (Group I) or artificially (Group II) fed hinds in crude fat (9.3% and 9.7% respectively) and protein (6.9% and 7.1% respectively) contents of milk.

Analysis in milk TG resulted in the identification of 19 fatty acids from 10 to 20 carbon chain lengths. In group I which had been freely grazing during spring the dominant fatty acid in milk TG was palmitic acid (16:0, 32%) followed by oleic acid (18:1, 29%) and myristic acid (14:0, 16%). In group II which had been artificially fed during spring, the dominance of TG fatty acids was 18:1 (32%), 16:0 (30%) and 14:0 (14%).

Milk PL comprised of 20 fatty acids with carbon chain lenghts from 12 to 22. PL was saturated by about 56% in both groups. The fatty

acid pattern was similar in both groups, the dominant acid being 18:1 (mean 36%).

The range of the daily milk yield in reindeer has extended from 47 ml to 1590 ml (Varo & Varo 1971, McEvan & Whitehead 1971). In the present study the average milk yield was 720 ml/day. The peak yield occurs within 9th day post partum and lactation ends in early October (Luick et al. 1974). A number of authors have noted that milk yield declines and fat and protein concentrations rise with advancing lactation.

References:

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