

Maternal investment in male and female offspring in a herd of semi-domesticated reindeer

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It has been suggested in some recent papers dealing with polygynous mammals, that large-bodied (dominant) females maybe fitter, when investing in sons. Additionally, early maternal investment in dimorphic mammal maybe heavier in male than in female offspring, because variation in offspring adult body size or/and sex-dependent neonatal mortality rate is influenced by magnitude of resource allocation to offspring. Higher mortality among male young is hypothesized to be a consequence of a greater susceptibility of males to food shortages associated with their faster growth rates and increased nutritional requirements.

We examined investment in an experimental reindeer herd in Inari, Finnish Lapland. Birth sex ratio was evidently influenced by maternal condition during previous breeding season. Averagely within each yearly age category amongst middle-aged (age 6 - 8 years, reproduced 4 - 6 times) females, cows giving birth to male calves had been heavier in previous autumn than cows, which parturated female offspring. When cows were allocated into two groups in relation to autumn weight, we found out, that proportion of male calves was significantly greater among offspring born to heavier females than to lighter ones. Body weight of young females (2 - 4 years old) did not have clear effect on successive offspring sex ratio. Second-breeders have more female calves than cows belonging to any other category of parity. This is suggested to mirror heavy costs of

reproduction for primiparous females. Sex ratio after a barren year was male-biased by 2:1 and proved out to be the only significant deviation from 1:1 ratio.

Male calves suckled more than female calves during first month following the birth of the calf. But, sex-dependent differences in suckling behaviour were essentially reduced, if male calves showing lowest growth rate were ignored. This astonishing finding was supported by the observation, that daily suckling time was negatively correlated ($r = -0.582$, $df = 17$) with milk yield. It may be suggested that malnutrition caused low-growing calves to suckle much.

Obviously of the same reason, calves of primiparous mothers suckled distinctive frequent. Permittance patterns of mothers lead us to ask if balancing of sex-related early mortality is a major function of selection for early investment in scarce environment. We think, that it is relevant to note the greater variation in early growth rate of male calves compared to that of the female calves.

Both the sex of the offspring and maternal dominance affected on mother-calf relationship in winter. Female calves had closer bond with mother than male calves. Calves within both sexes were more closely associated to dominant than subordinate mothers. We hypothesize, that dominant females are capable to invest heavier in their offspring in winter. That may be adaptive even at the cost for the foetal growth, because winter mortality is high among calves.