Voluntary feed intake of reindeer in relation to ambient temperature

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Reindeer live in arctic and subarctic regions, where ambient temperature can vary from -45°C in mid-winter to + 35°C in mid-summer. In many reviews on food intake it is concluded that food intake increases in cold and decreases in hot environments (Baile & Forbes 1974, Arnold 1984). A seasonal decrease in voluntary feed consumption of *ad libitum* fed reindeer during winter has been reported earlier (Ryg & Jacobsen 1982). However, increased feed intake of reindeer during cold winter periods is reported by reindeer herders feeding reindeer in practice. Our objective was to determine the effects of ambient temperature on voluntary feed intake of reindeer.

Eight adult female reindeer and eight half-year-old reindeer calves (4 males and 4 females) were fed with pelleted feed concentrates (contained 9 % ash, 10 % crude protein (CP), 15 % crude fibre (CF), 7 % ether extract (EE) and 59 % N-free extract (NFE) on dry matter basis) from the beginning of November in 1987 until the calving period in May 1988. After the calving the reindeer were changed to a high protein feed (contained 10 % ash, 20 % CP, 13 % CF, 7 % EE and 50 % NFE in DM). The females and their newly born calves (4 males and 4 females) were fed together until mid-December 1988, when the calves were weaned and excluded from the experiment. The yearlings were also fed with the same feed at the same time. In the middle of September 1988 the female and male yearlings were separated to prevent the mating. From the middle of December 1988 the feeding of reindeer continued with the winter feed until next calving period in May 1989. The reindeer were fed twice daily *ad libitum*. The offered feed and the daily feed remains were weighed. The ambient temperature was measured daily with a thermograf. The reindeer were weighed weekly.

The mean daily ambient temperature (T_a) varied between - 29.3°C and + 21.1°C. The maximum daily intake of dry matter (DI_{max}) of pregnant females was 3.5 kg while T_a was - 6.5°C and the minimum daily intake of dry matter (DI_{min}) was 1.0 kg while T_a was - 8.0°C. The DI_{max} of lactating females and their calves exeeded 5.7 kg in September (T_a + 1.1°C) and their DI_{min} was 1.9 kg in the middle June (T_a + 13.2°C). The DI_{max} of half-year-old calves was 2.9 kg while T_a was - 22.3°C and DI_{min} was 0.9 kg while T_a was - 5.3°C. Daily intake of growing reindeer declined during mid-winter and increased to a peak in August (DI_{max} 3.7 kg). The yearling males decreased their feed intake from September to October 40.2 %, while the feed intake of yearling females remained unchanged. The DI_{min} of yearling males was 0.4 kg during the rut in October (T_a + 0.3°C) and that of yearling females was 0.8 kg in the middle of November (T_a - 12.8°C). During the winter the DI_{max} of yearling males was 3.5 kg while T_a was - 14.3°C in January and that of yearling females was 3.1 kg while T_a was - 13.1°C in November. The low winter temperatures may increase metabolic energy demand for thermoregulation and an increase in food intake of reindeer would be expected. However, the short photoperiod during autumn and winter has the opposite effect (Kay 1985). Mating, pregnancy, lactation and growth also influence voluntary feed intake of *ad libitum* fed reindeer.

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