Maintaining reindeer on roughage diet during winter

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Abstract: The supplementary rations of reindeer usually contain dry hay, grains, molasses and commercial feeds. Dried water horsetail (*Equisetum fluviatile*) has been traditionally used as feed for domestic animals and reindeer in certain areas in northern Finland. With diets containing a high proportion of roughage, voluntary intake is limited by the capacity of the reticulo-rumen and by the rate of disappearance of digesta from this organ. The purpose of this study was to investigate how much roughage (dried water horsetail) reindeer can digest and whether it is possible to maintain reindeer on pure roughage diet during winter.

The feeding experiment was arranged in Kaamanen Reindeer Research Station in northern Finland from 26th of January to 4th of May in 1989. Sixteen adult female reindeer were divided into two groups with equal mean body weight. The reindeer were weighed weekly during the experiment. Eight reindeer were fed roughage *ad libitum* and the intake of feed was measured daily. The control group was fed with concentrates restricted to 1.1 feed units/animal/day. Blood samples were taken from jugular vein once/month during the experiment. Chemical composition of serum was measured by standard methods.

The daily intake of reindeer varied 1.5–4.1 kg roughage, 1.0–2.7 kg dry matter and 0.8–1.4 fattening feed units during the experiment. The body weight of roughage fed reindeer increased 6.7 kg (9.1 %) on average during the first three weeks of the experiment. At the same time the concentrate fed reindeer gained 1.1 kg (1.5 %) on average. The concentrate fed reindeer continued to increase their body weights towards the end of the experiment, while the roughage fed reindeer maintained their body weights at the level of February. Serum protein, cholesterol and calcium concentrations were higher and serum creatinine and phosphorus concentrations lower in the concentrate fed reindeer than in the roughage fed reindeer during the experiment. Serum triglyceride concentration remained constant but serum urea concentration varied in both groups during the experiment. The high cellulose content of dried water horsetail (28.3 % of dry matter) retarded digestion in the rumen and led to maximum filling of the forestomachs and a rapid increase in the body weights of the roughage fed reindeer during the first weeks of the experiment. The protein intake of the roughage fed reindeer were higher than that of the concentrate fed reindeer. However, the serum protein concentration of roughage fed reindeer was lower than that of the concentrate fed reindeer. Larger part of the roughage protein was metabolized to energy despite of the same calculated net energy intake (1.1 f.f.u.) in both groups of reindeer. However, serum urea and creatinine concentrations had no indication of gave no indication of catabolism of muscle protein in the roughage fed reindeer. The high calcium and low phosphorus concentration of the roughage was reflected in serum of the reindeer.