

Changes in grass quality of coastal meadows in Estonia

T. Köster, K. Kauer, R. Viiralt and A. Selge

Estonian Agricultural University, Institute of Soil Science and Agrochemistry, Kreutzwaldi 64, 51014, Tartu, Estonia, Email: tints@eau.ee

Keywords: coastal grasslands, grass quality, crude protein

Introduction In Estonia the reason for reduction in coastal meadows and expansion of the stands of the common reed (*Phragmites australis*) is the discontinuation of traditional use of grasslands which were previously grazed and cut. *Phragmites australis* usually produces dense and monospecific stands at the waterline, where species richness is low. It can survive in ungrazed shore meadows, but it suffers from grazing (Tyler, 1969). The investigated *Phragmitetum australis* association had been influenced by grazing activities, but it remained rather sparse and due to that had relatively low productivity, reaching 3.11 t DM/ha. Traditionally coastal meadows have been used for grazing and have given stable quality of feed and good animal performance. The quality of fodder is an important factor for farms using the coastal areas for grazing. The aim of the study was to determine the changes in quality of the different plant associations in the coastal area.

Materials and methods In 2001-2003 the research area on the island Hiiumaa was established to investigate the plant associations in coastal grasslands. The investigated farm (total area 544 ha) in South-Eastern Hiiumaa embraced c. 400 ha of coastal meadows and it is partly grazed by horses and beef cows in addition to substantial grazing by birds. Six investigation sites were chosen to analyse the quality of plant associations at different times during the vegetation period. The height of cut was 2-5 cm for *Juncus gerardii* and 10-30 cm for *Phragmitetum* association. Plant material was analysed for crude protein (CP), acid detergent fibre (ADF), neutral detergent fibre (NDF). Digestible DM (DDM= $88.90-(0.779*ADF)$, %), DM daily intake (DMI=120/NDF, % of cattle weight), relative feed value (RFV= (DMI*DDM)/1.29, points) and metabolizable energy (ME) content were calculated on the basis of ADF and NDF (Nutrient Requirements of Dairy Cattle, 2001). Statistical analysis was by ANOVA and standard deviations (SD) are presented.

Results Crude protein is very sensitive to the stage of grass maturity. With *Phragmites australis* the protein content had very high value in the end of May but then dramatically dropped in June (Fig 1).

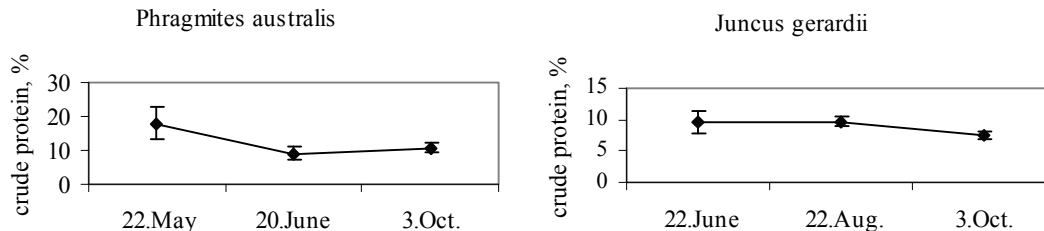


Figure 1 Changes in content of crude protein during the vegetation period in plant associations dominated by *Phragmites australis* and *Juncus gerardii* (n=5; M±SD)

The other components did not change significantly during the vegetation period. The content of NDF ranged 65-71%, ADF 34-40%, DDM 58-62%, DMI 1.7-1.8%, RFV 75-78 points and ME 8.9-9.4 MJ/kg. In comparison, the nutritive value was higher for the plant association dominated by *Juncus gerardii*: NDF ranged 59-64%, ADF 29-31%, DDM 61-66%, DMI 1.9-2.1%, RFV 93-105 points and ME 9.6-10.5 MJ/kg.

Conclusions Large areas of coastal meadows in Estonia have grown into reed and one possibility to stop that process is grazing. The *Phragmitetum australis* association was characterised by high content of protein at the early development stage, but this decreased rapidly during the vegetation period. Contents of ADF and NDF were higher in the *Phragmitetum* association than with *Juncus gerardii*, but did not change significantly between sampling dates. Consequently the calculated values for digestible DM and other aspects of feeding value were lower for *Phragmitetum* plant association.

References

- Nutrient Requirements of Dairy Cattle (2001). Seventh Edition. National Academy Press. Washington, D.C.
Tyler, G. (1969). Studies in the ecology of Baltic sea-shore meadows. II Flora and vegetation. *Opera Botanica* 25, 101 pp.