

Variation in the quality of forage of six rangeland species in different phenological stages

Z. Ahmadi, H. Arzani and H. Azarnivand

Islamic AZAD University, Science & Research Campus, Iran, Email: aliabadi2004@yahoo.com

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Introduction An understanding of forage quality is fundamental to the measurement of grazing capacity. In addition, knowledge of forage quality is necessary for planning grazing and developing range improvement and development programmes, such as planting and seeding of rangelands. Among the different factors that affect forage quality, phenological stage is particularly important (Cook, 1972; Caballero *et al.*, 2001). The objective of this study was to investigate the effects of plant species, phenological stages and life form on forage quality indices.

Materials and methods Samples were collected from two highland ranges in the Vard Avard and Gachsar regions of Iran. There were six range species including *Bromus tomentellus* and *Dactylis glomerata* as grasses, *Frula ovina* and *Coronilla varia* as forbs and *Salsola rigida* and *Artemisia aucheri* as shrubs. They were dried, ground and analysed according to standard methods.

Results There were significant differences between amounts of crude protein (CP), acid detergent fibre (ADF), digestible dry matter (DDM) and metabolisable energy between different species, phenological stages and life forms ($P < 0.01$). Amongst the six species *C. varia* had the highest CP, ME and DDM with maximum values of 25.4%, 9.37 MJ/kg DM and 76.2% respectively, whilst the maximum value for ADF was 45.8% in *F. ovina*. In all species CP, ME, DDM decreased and ADF increased with advance in phenological stage. Among the three life forms and phenological stages, quality was highest in forbs at the vegetative stage and *C. varia* was the species with highest quality.

Conclusion These results suggest that the best time for grazing these rangelands was flowering stage because at this stage, there is a good compromise between yield (not reported here) and forage quality.

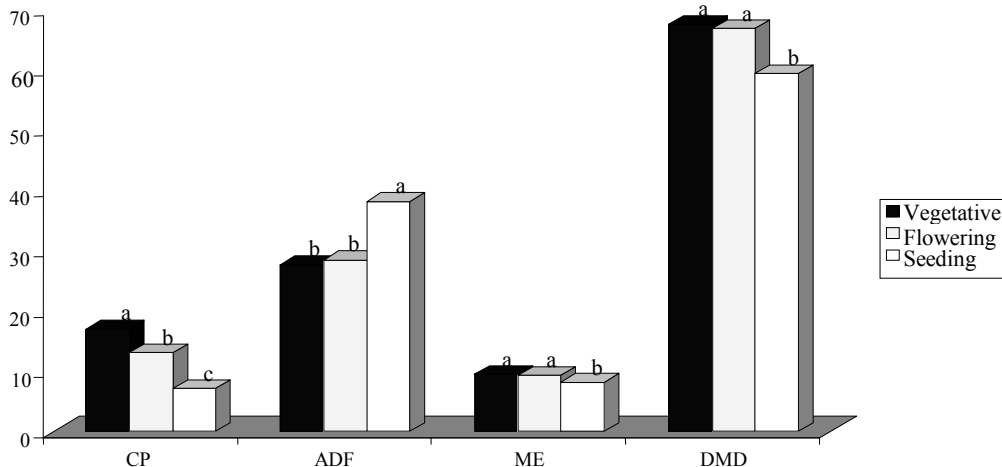


Figure 1 Values of crude protein, acid detergent fibre, metabolisable energy and dry matter digestibility at three phenological stages

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