

SOME ASPECTS OF HERBAGE QUALITY IN CANTERBURY HIGH AND HILL COUNTRY PASTURES

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A current review of some general aspects of herbage quality and its evaluation is presented. It is concluded that the two-stage *in vitro* digestion procedure is a reliable predictor of *in vivo* digestibility, and that the more time-consuming chemical analyses can be used to indicate changes in the herbage which may explain observed digestibility changes.

In a 4-year study at Mesopotamia Station, South Canterbury, there was little evidence to suggest that early closing and fertilizer treatment of high country pastures, either individually or together, will improve the supply of available herbage in the following spring. On the contrary, not only did continued grazing of pastures to June result in more forage being available to the grazing animal, but a significant improvement in the quality of herbage was observed. The only observed gain as a result of early closing was an increase in the yield of cocksfoot in the subsequent spring. The application of super-phosphate at the rate of 400 kg/ha had little effect in increasing the yield and quality of the total sward, although indications are that for a more sustained period this effect may have been significant. The high quality of clover, cocksfoot, and Yorkshire fog in this environment is indicated. Browntop and sweet vernal also gave high digestibility values in spring, and the former maintained its quality into summer but was inferior to sweet vernal in the autumn.

The digestibility of the available herbage under a continuous grazing management system for four seasons on a hill country site at Coopers Creek, North Canterbury, was investigated. Values improved from 70% in early spring to 80% in the late-spring/early-summer period. This was followed by a general decline to 50-60% by January, and further trends appeared to be related to autumn rainfall patterns. In dry autumns the summer decline in digestibility continued to winter, while in higher rainfall autumns the digestibility was maintained, if not improved, during autumn. The dynamics of pasture growth and decay play a large role in the quality of standing herbage in both the hill and high country.

Improved digestibility values during summer and autumn were established when the herbage was closed from grazing for periods of 6 to 8 weeks, largely due to the accumulation of new growth.

The digestibility of herbage grown on different soil variants of Hurunui steepland soil showed no major differences except the improved digestibility of herbage grown in areas used as stock-camps.

Generally, little difference was noted in the digestibility of pastures grown on a sunny or shady aspect during spring, although shady aspect herbage was 5 to 8% lower in early spring. During late summer and autumn, pastures tended to be superior in quality on the shady aspect, but as winter approached the ranking was reversed.

Expressed on a dry matter basis, the chemical composition of herbage grown at Coopers Creek was in the ranges 14 to 20% for cellulose, 10 to 15% for hemicellulose, 2 to 5% for pectin, 8 to 12% for soluble sugars, 5 to 7% for lignin, and 15 to 19% for crude protein, at the dates studied. With the exception of phosphorus and sodium, all the minerals analysed for were present in adequate amounts for good pasture growth.

Best relationships between chemical composition and digestibility were found for cell wall and crude protein percentages ($r = 0.79$). The fact that these relationships were closer when the data were analysed separately for each harvest date prompted, in part, an investigation of the use of a capacitance meter to predict the yield of digestible dry matter. The data presented show promising indications.