THE FEEDING VALUE OF VARIOUS FRACTIONS PREPARED FROM LUCERNE

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Increasing interest is being shown in the extraction of various polymers from herbage for use as basic raw materials in industrial processes. Should individual fractions of plants be used in this way, the remaining components would be available for use in animal production enterprises. This paper describes an evaluation for ruminants of various components of lucerne that may become available if this crop were mechanically fractionated.

Lycerne harvested in early bloom and containing on average 17.2% organic matter (OM) and 3.9% crude protein (CP) was pulped and pressed to provide green liquor and fibre residue fractions. Steam coagulation (94°C) of the green liquor and subsequent filtration provided brown liquor and crude coagulum fractions and washing of the latter provided a fraction designated lucerne protein concentrate. Energy balance, digestion, wool growth and body growth were measured by conventional techniques in Border Leicester x Merino sheep given these lucerne fractions. Green liquor was given to the sheep by continuous infusion via rumen fistulae whereas lucerne protein concentrate and casein were similarly infused in solution via abomasal fistulae.

Green liquor contained on average 9.1% OM and 4.1% CP and its production net energy value was 7.9 ± 0.5 MJ/kg OM. In experiments of 4 weeks' duration with weaner lambs fed ad libitum, body weight gain (g/d) was 283 ± 14 with a diet of roughage + maize + green liquor (50:10:40 on an OM basis) compared with 316 ± 9 with roughage + maize + soya bean (50:30:20). Green liquor, providing 160 g CP daily, increased greasy wool growth in roughage-fed sheep by 5.3 ± 0.4 g/100 g CP.

The lucerne protein concentrate contained on average 17.3% OM and 10.8% CP. The digestibility of the CP in the intestines was 83 ± 1%. When the concentrate was given to provide 87 g CP/d, greasy wool growth increased by 10.1 ± 0.9 g/100 g CP; by comparison, the corresponding value with casein was 9.3 ± 0.4 g/100 g CP.

The fibre residue contained on average 30.1% OM and 4.7% CP. The digestibility of OM and cell wall constituents were 65 ± 1% and 62 ± 2% respectively.

The data indicate a high energy value for the lucerne green liquor and a high biological value for wool growth for the lucerne protein concentrate. The fibre residue has the nutritive value of a medium quality roughage.

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