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## Influence of cutting date on the protein quality of forage legumes in the autumn regrowth

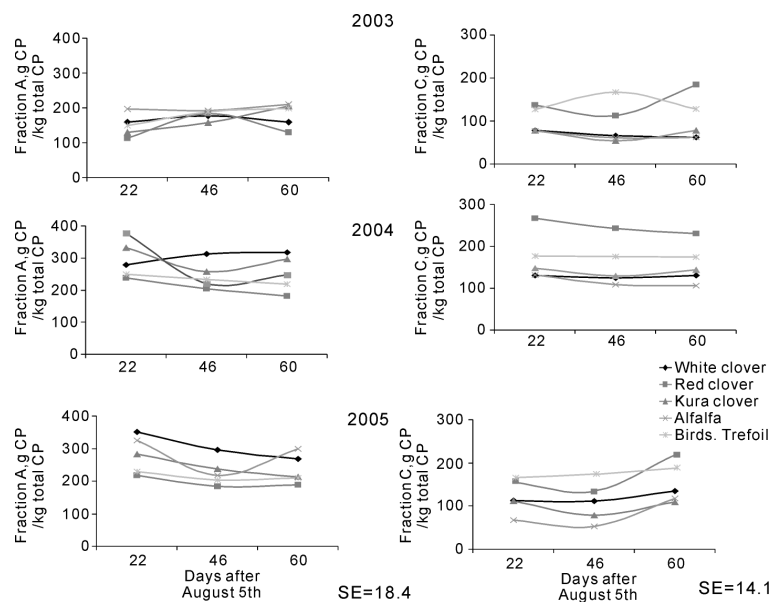
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**Key words:** forage legumes, non-protein N, protein quality

**Introduction** High crude protein content in binary swards in autumn is the result of the high proportion of forage legumes. This protein may be poorly used by ruminants as it contains large amounts of non-protein N, which leads to low N use efficiency by the animals. However, differences in legumes in terms of content of secondary plant compounds may be advantageous to avoid excessive N losses in production systems. Secondary compounds of relevance for improved N utilization in animal are the condensed tannins found in birdsfoot trefoil and the polyphenol oxidase found in red clover. The aim of the present study was to measure the variation in forage quality of different forage legumes in the autumn regrowth to find proper harvest management taking into consideration forage legume species and their protein quality.

**Material and methods** Binary mixtures with perennial ryegrass and white clover, red clover, alfalfa, birdsfoot trefoil or kura clover were established yearly in the autumn and sampling for this experiment were performed in the first production year of three consecutive years. A uniformly cut was performed in the beginning of August of each year and samples were collected at approx. 22, 46 and 60 days afterwards, cutting at 5 cm height. The legume proportion was determined on dry matter basis by separating legume, grass and weeds. The quality analyses were performed on the legume component only for fraction A (non-protein N) and C (in acid detergent fibre residue bound N). Data were submitted to analysis of variance and means were compared to white clover using Student's T-test. Probabilities were adjusted using the Bonferroni-Holm test.



**Figure 1** Content of fraction A (non protein N) and fraction C (in ADF residue bound N) of different legume species during the autumn growth in different years.

**Results** The highest legume proportion was observed for red clover and alfalfa, with values ranging between 60 and 70%. As shown in Figure 1, the fraction A was strongly dependent of the year effect. During autumn regrowth the course of fraction A development did not show a clear trend for all legume species. Whereas alfalfa showed a curvilinear progress, other legumes species were decreasing or were invariable in the fraction A content. Red clover and birdsfoot trefoil showed in general the lowest fraction A contents. White clover and alfalfa had fraction A contents in 2004 and 2005 above 300 g CP/kg CP. The content of fraction C in forage legumes varied markedly between species and years. Red clover and birdsfoot trefoil showed in general the highest contents. White clover and kura clover had contents of fraction C sometimes below 100 g CP/kg CP.

**Conclusions** Red clover and birdsfoot trefoil showed to have more beneficial forage quality related to their crude protein fractionation, and higher N use efficiency may be expected with these forage legume species in ruminant nutrition. However suitability of each species for the defoliation systems of choice in autumn, like grazing or silage making, may be restricted by the low persistence of individual legume species.