

## Effect of stage of maturity on the nutrient content of alfalfa

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**Introduction** Alfalfa (*Medicago sativa*), one of the major agricultural crops in the Czech Republic, is grown on 15.8% of the arable land. Alfalfa silage forms a substantial part of diets for farm animals. It is very important to choose a suitable term of harvesting for ensilage from the view of optimal nutrient content. The stage of maturity at cutting has large effects on each component, except crude protein (Yu *et al.*, 2004). Alfalfa can be difficult to ensile due to a high buffering capacity and a low WSC content.

**Materials and methods** The objective of experiment was to examine changes in nutrient content and yield of alfalfa at four different maturity stages (small buds, big buds, bloom, after bloom). Alfalfa (*Medicago sativa*), cultivar Europe, was grown on the experimental field at the Research Institute of Animal Production in Prague (sugar beet growing region, 280 m above sea level). The area 15x15 m was marked out on the 10 ha alfalfa field. The four samples (every 1x1 m) were analysed in this area in all stage of maturity. Alfalfa was planted at seeding rate 18 kg/ha in 2002 with wheat as a foregoing crop and legume-cereal mixture as a cover crop. The plants were picked up from 12 May to 10 June 2003, during the first cut. The yield was recorded and the plants were analysed.

**Results and discussion** The results of chemical analyses are shown in the Table 1. Protein content of alfalfa decreased significantly after the big bud stage ( $P<0.05$ ). The highest water soluble carbohydrate (WSC) content was observed in the stage of big buds. Thereafter the WSC content decreased while the fibre crude content increased ( $P<0.05$ ). When the crop stand passes over to bloom stage, the nutrient content changes and the forage quality falls. It is due to the fact that some nutrients are transferred to the generative organs. Protein content in the stage of after bloom was reduced by about 30% in comparison with the stage of small buds.

**Table 1** Nutrient content of alfalfa at four stages of maturity

	Unit	Small buds	SE	Big buds	SE	Bloom	SE	After bloom	SE
Dry matter	g/kg	165.3 <sup>a</sup>	3.03	175.2 <sup>a</sup>	4.61	207.8 <sup>b</sup>	8.37	231.8 <sup>b</sup>	1.15
Protein	g/kg	219.6 <sup>a</sup>	4.30	203.1 <sup>a</sup>	4.10	173.5 <sup>b</sup>	2.67	154.2 <sup>c</sup>	0.53
Crude fibre	g/kg	226.7 <sup>a</sup>	4.81	235.4 <sup>a</sup>	5.38	320.4 <sup>b</sup>	9.08	312.7 <sup>b</sup>	3.78
WSC	g/kg	37.4 <sup>d</sup>	1.41	45.3 <sup>c</sup>	1.71	27.6 <sup>b</sup>	0.69	23.3 <sup>a</sup>	0.57
Yield of DM	t/ha	2.9 <sup>a</sup>	0.09	3.4 <sup>b</sup>	0.14	5.5 <sup>c</sup>	0.39	5.6 <sup>c</sup>	0.05

<sup>a,b,c,d,e,f</sup> Means followed by the same letter on a row are not different (Tukey  $\alpha = 0,05$ )

**Conclusions** It is recommended to ensile alfalfa at the maturity stage of big buds. In this stage the protein content is only about 7.5% less than in the small buds stage and in this stage the WSC content is highest and the crude protein content is still optimal. The yields of dry matter are highest in the maturity stage after bloom. In the after bloom maturity stage the dry matter yield increases but the nutritive value is reduced.

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### References

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