



## **Dynamic of nutrients quality characteristic of pasture in different altitude in South Bohemian region**

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### **ABSTRACT**

Yield, botanic composition and chemical analyses of grass and herbage were measured in seven localities with different altitudes between 450 and 900 metres above sea level.

Grass and herbage are the most natural and optimal feedstuff for cattle. Grazing management should notably regulate the pasture composition, i.e. support dominance of soft stoloniserous strains of grasses and decrease occurrence of weed and less value strain of gramineous grasses. Grazing in the early growth period supported the development of lower stoloniserous grameous grasses and *Trifolium repens*. A part of the herbage evaluation was observation milk and meat quality on farms. Due to grazing there were some changes in protein content and protein fraction, although not statistically significant.

**Keywords:** pasture, botanic composition, altitude

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### **INTRODUCTION**

The quality and nutrient composition of grass are important factors for the welfare of ruminants and the quality of animal products (Zastawny et al., 2004). Good pasture and grazing management can improve nutrients and botanical structure (Čermák et al., 2004; Gaisler, P., 2005). Optimal structure of good pasture consists of 50-70% of grass, 10-20% of clover and 10% of other plants (Čermák et al., 2001, Mrkvička, Veselá 2004). The increase of protein following a high proportion of clover has negative impact on the fibre content in fresh pasture and can create problems for silage production for the winter season (Kadlec et al., 2001, 2004, Pozdíšek et al., 2003).

### **MATERIAL AND METHODS**

In 2004-2005 7 different experimental locations were chosen in the Sumava Mountains area between 450 to 900 m. Three farms had dairy cows, 2 farms had beef cattle on pasture, and 2 farms had a combined beef and dairy herd. During summer, all cattle were grazing.

Dairy cows were supplemented with concentrate and hay according to their milk production. During winter, the cattle on all farms were fed with silage. The pasture yield, botanic structure of grass, clover and other plants and the quality of animal product were monitored.

The samples of forages were analysed for content of DM, ash and crude protein (CP). Ash-free NDF, ADF and ADL were determined using a Fibertec analyser (Fibertec System M). NDF was determined according to Van Soest et al. (1991). An overnight pre treatment with  $\alpha$ -amylase (A6380, Sigma) at 38 °C according to Ferreira et al. (1983) was followed by addition of sodium sulfite and a heat stable  $\alpha$ -amylase (Termamyl, Novo Nordisk, Denmark) during NDF boiling. ADF and ADL were analysed according to Van Soest et al. (1991). CP was analysed according to the Kjeldahl method (AOAC, 1990). Ash was determined after combustion at 525 °C (AOAC, 1990).

### **RESULTS AND DISCUSSION**

Figures 1 and 2 show the botanic types of plants in different altitudes.

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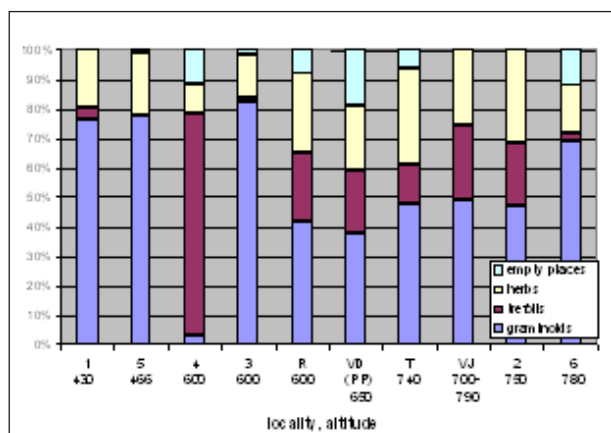


Fig. 1: Proportion of grass, clover and herbs in May

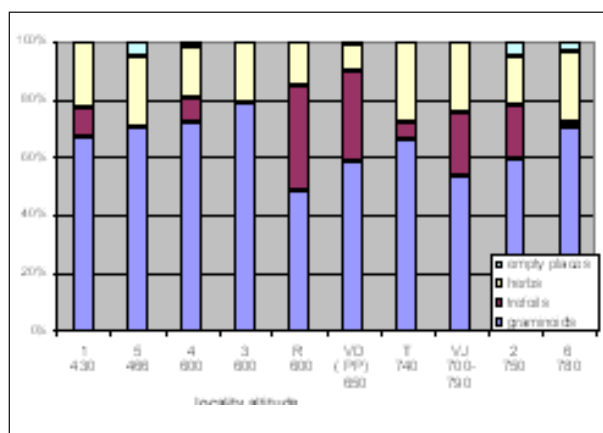


Fig. 2: Proportion of grass, clover and herbs in September

Table 1: Average nutrients content, in DM 100% of 7 localities for cows without milk productions

Locality	May, 2005					August, 2005				
	DM %	CP %	CF %	ADF %	NDF %	DM %	CP %	CF %	ADF %	NDF %
1	13.5	17.5	21.0	28.2	46.0	25.0	12.0	27.5	33.5	54.9
2	14.0	16.7	20.7	27.7	41.6	26.9	10.9	30.0	38.0	55.0
3	20.9	20.0	19.6	25.9	45.4	30.0	9.5	26.9	34.5	58.0
4	25.8	19.6	17.5	24.2	32.5	26.3	13.8	25.8	31.6	51.0
5	23.8	13.6	22.8	29.4	45.9	22.3	11.4	24.0	29.4	44.7
6	20.9	17.7	18.9	24.5	38.9	21.4	12.3	23.9	31.5	47.6
7	19.1	19.7	19.5	24.1	41.3	-	-	-	-	-

Table 2: Nutrients content in localities (VJ), (T) and (R) in 100 % DM average of localities for cows with milk production

Locality	May, 2005					August, 2005				
	DM %	CP %	CF %	ADF %	NDF %	DM %	CP %	CF %	ADF %	NDF %
VJ	14.7	18.7	17.2	23.3	44.6	17.4	17.7	19.0	25.6	41.2
T	17.4	12.1	24.2	31.8	51.9	20.1	19.0	19.4	27.1	43.6
R	10.4	16.4	18.0	23.9	39.3	20.0	16.7	20.4	26.2	44.0

Table 3: Content of richness species in pasture through 2 years (average)

Species agro botanic group	P content in %					
	1. VJ		2. T		3. R	
	2004	2005	2004	2005	2004	2005
Grasses	81	62	75	71	49	42
Trefoils	3	6	14	22	36	40
Other plants	16	32	11	7	15	18

The contents of dry matter (DM), crude protein (CP), crude fibre (CF), neutral detergent fibre (NDF) and acid detergent fibre (ADF) in DM are presented in Table 1. The some for cows milk production presented in Tables 2 . In the table 3 the content of average richness species of grasses, trefoils and other plants are present. In the stands 2 and 3 the increasing of trefoils especial white clover are increased. This showed high utilisation of pasture and good management.

Grazing influenced not statistically significant a low nutrient content in grass with herbs gave a lower cut production, especially in terms of cutting, grazing management and lower part of fertilisation N. This is in line with results of studies made by for example Cermak et al (2004), Pozdišek et al. (2003), and Zastawny et al. (2005). The differences of content different nutrients crude, fibre,protein and dry matter in different altitude in month may and august are in graphs 3, 4 presented. (fibre, ADF,NDF and protein in 100% dry matter)

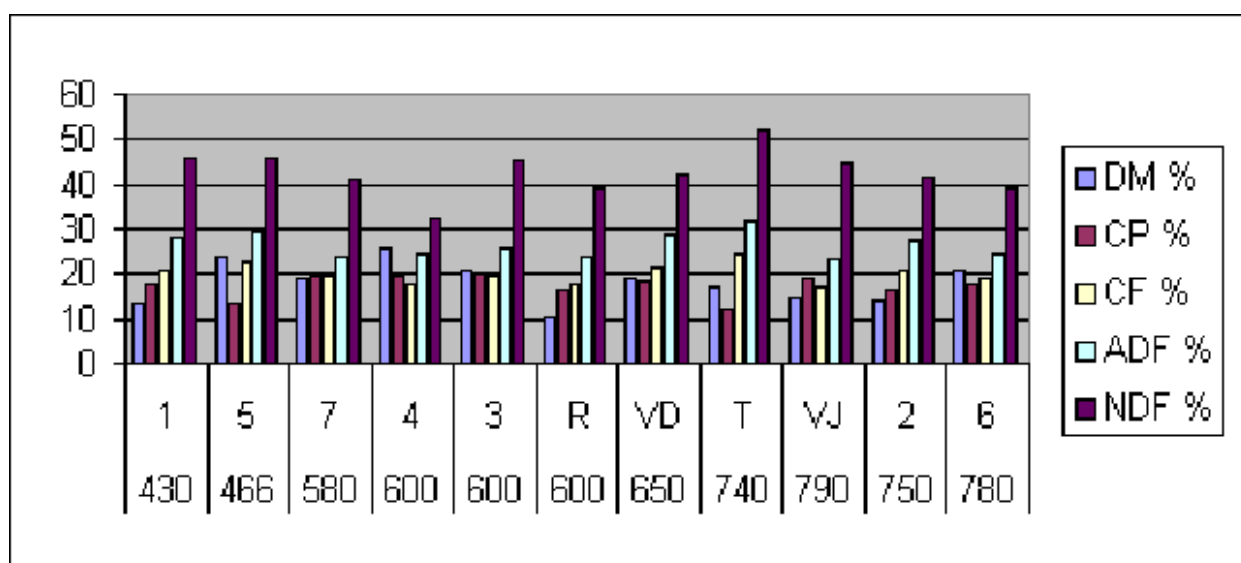


Fig. 3: The progress in DM, CP ,CF,ADF,NDF content in dependence on a different altitude May

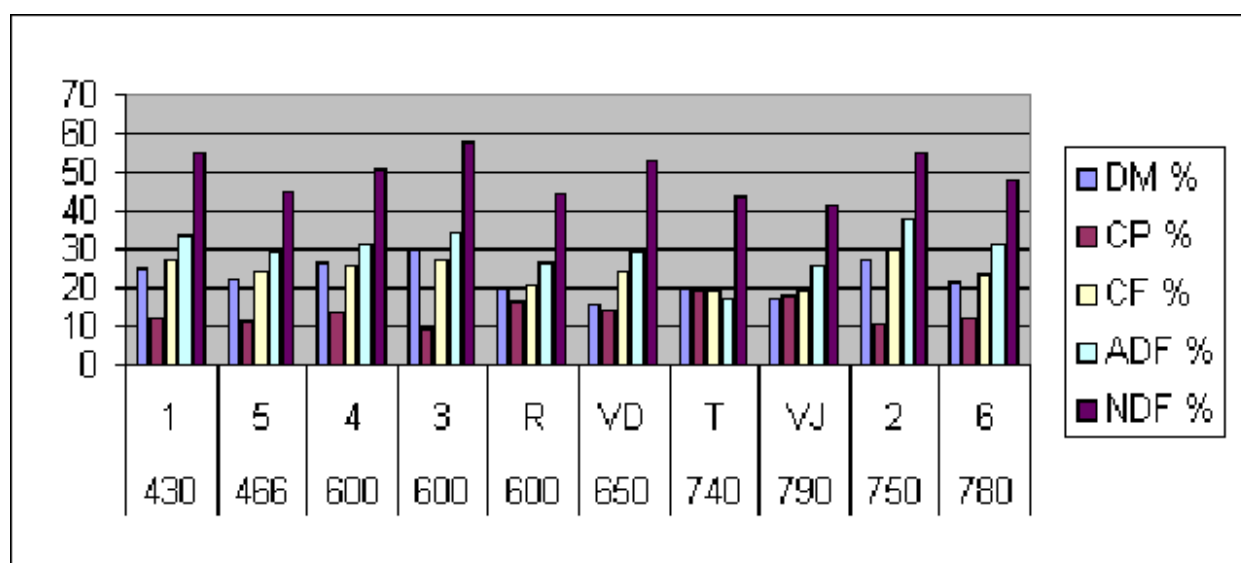


Fig. 4.: The progress in DM, CP ,CF,ADF,NDF content in dependence on a different altitude August

In the may the content of original dry matter is lower than in august. Higher stands of pasture depends on altitude had tendency to lower dry matter content.

In and of august and september the content of fibre are increased. The lignin and ash compound are increased in this months too. This results are Kadlec et al (2004), Čermák et al (2004), Pozdíšek et al (2003) in this form presented for extensive pasture utilisation.

## CONCLUSION

We suggest that evaluation of pasture nutrients, yield can give valuable information that can improve the grazing management. Grazing influenced not statistically significant a low nutrient content in grass with herbs gave a lower cut production, especially in terms of cutting, grazing management and lower part of fertilisation N. The content of average richness species of grasses, trefoils and other plants are present. In the stands 2 and 3 the increasing of trefoils especial white clover are increased. This showed high utilisation of pasture and good management. Higher stands of pasture depends on altitude had tendency to lower dry matter content.

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