

The timing of daily grazing on annual ryegrass or sulla forage: the effects on milk yield and composition of Comisana ewes

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Introduction The timing and duration of grazing greatly affect the response of animals. Night grazing, in addition to grazing during the day, seems to be one of the most important practices for improving animal performance (Bayer *et al.*, 1987). Many authors have already underlined the major benefits of night grazing, such as improved body condition, reduced heat stress, increased forage intake and milk production. However, labour constraints, insecurity, damage to crops by animals are considered as the main reasons for not practising day and night grazing. The aim of this research was to improve knowledge about the effects of daily grazing time in ryegrass or sulla forage on milk yield and composition of Comisana ewes.

Materials and methods The research was carried out in a semi-arid, hilly area of Sicily (37°30'N; 13°31'E; 178 m a.s.l.). For 5 weeks from 3 May 2004, two plots of 2.500 m² area, sown with *Lolium multiflorum* subsp. *wersterwoldicum* (R) and *Hedysarum coronarium* (S), respectively, were grazed by Comisana ewes. There were two daily grazing times for each forage resource: 8h (from 08.00 h to 16.00 h) and 24h. Thus, 40 ewes were homogeneously divided into 4 groups, on the basis of milk yield, lactation phase (102±30 d) and liveweight, and assigned to the treatments: R8, R24, S8, S24. During the night, R8 and S8 ewes were housed in an open shelter, without feeding supplements. Once a week individual and bulk milk production in each group was recorded and sampled. Individual milk samples were analysed for fat, protein and lactose content. Casein, whey protein and non-protein N (NPN) were determined in bulk milk samples

Results and conclusion Herbage mass on offer was relatively high in all plots throughout the trial (> 3 t DM/ha); post grazing herbage mass never fell below 2.0 t DM/ha. Grazing time and forage species significantly increased milk yield and energy when ewes grazed for 24h compared to 8h and on S than on R, probably due to higher forage intake in both cases (Table 1). The content of fat and protein fractions in milk of ewes grazing on R decreased significantly when the grazing time was extended from 8h to 24h, as a consequence of the increase in milk yield. On the contrary, significant increases in fat, protein and casein content were observed in the milk of ewes in S24 compared to S8, although the milk yield increased. Ewes on S8 had higher milk yield than on R8, but the quality was lower, whereas the S24 group had higher milk yield and quality than R24. These results can be related to the content in condensed tannins (CT) of sulla.

Table 1 Effects of grazing time and forage on milk yield and composition

	R8	R24	S8	S24	Significance		
					Grazing time (GT)	Grazed forage (GF)	GT*GF
Milk yield (g/d)	599a	705b	786b	907c	**	***	
Milk energy (kcal/d)	730 a	821 a	830 a	1007 b	***	***	
Fat (%)	8.2a	7.6b	6.7c	7.1d		***	***
Lactose (%)	4.5a	4.7b	4.6ab	4.7b	*		
Protein (%)	6.3a	6.1b	5.9b	6.4a			***
Casein (%)	5.3a	5.0b	4.8c	5.2a		*	***
Whey protein (%)	1.2a	1.0b	1.2a	1.2a	*	***	**
NPN mg/ml	36.8ab	35.6a	40.6b	40.6b		*	

*= P ≤ 0.05; **= P ≤ 0.01; ***= P ≤ 0.001; a,b,c,d: P ≤ 0.05

In fact, CT decreased the time spent eating the main meals and increased the number of small meals (Landau *et al.*, 2000). In this way, CT favoured a longer eating time, then a slowdown of the ruminal transit, improving the degradation of the tannin-protein complex and the protein utilization. In conclusion, the daily grazing time of 24h can be a suitable management practice to improve ewes milk yield, in particular on S meadow.

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