

# Assessment of palatability of different grass and legume species, and of their combinations

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## Abstract

Forage palatability is a relative characteristic accumulating all forage attributes related to intake and digestibility. In this context, the palatability of cocksfoot (*Dactylis glomerata* L.), crested wheatgrass (*Agropyron cristatum* (L.) Gaertn.), sainfoin (*Onobrychis viciifolia* Scop.), white clover (*Trifolium repens* L.) and bird's foot trefoil (*Lotus corniculatus* L.) was compared through the preference of cows for them during grazing. The above mentioned grass and legume species were grown alone and in all 10 possible two-component mixtures between them each of plots of 12 m<sup>2</sup> in four replications. The preferences of twelve cows for the different swards were assessed by visual observation, every 5 min. of each animal during the first hour after the animals were taken to the grazing paddock along four consecutive days, six hours per day. During the observed period the cows spent 48.7% of the time grazing legumes grown alone and their mixtures, 10.7% of the time grazing pure and mixtures grasses, and 40.6% of the time grazing grass:legume combinations. The ratio between time spent for grazing legumes, grass:legume mixtures and grasses was 5: 4: 1 which is similar to the grazed forage quantity of the respective legumes, grass: legume mixtures and grasses.

Keywords: palatability, grazing, grasses, legumes.

## Introduction

Forage intake is a value related to palatability, morphological, chemical and physical properties of the forage and depending on the animal properties and its responses to diets. In the presence of more than one forage the animals have the possibility of choosing and giving preference to the forages that have better acceptability, olfactory, or visual senses (Minson and Bray, 1986; Black *et al.*, 1989). The forage palatability is of importance when establishing new varieties of different grass species for grazing by ruminants. Gillet *et al.* (1983) assessed forage palatability by a test of consumption, or the so called crib cafeteria, where the animals had access to several cut green forages put in the crib. The obtained results in the crib cafeteria for the intake of the different forages were considered as relative values allowing comparisons between them. The preference of animals during grazing of different species give information of palatability but depends on many factors (Parsons *et al.*, 1994; Penning *et al.*, 1994).

The objective of this study was to compare the palatability of cocksfoot (*Dactylis glomerata* L.) and crested wheatgrass (*Agropyron cristatum* (L.) Gaertn.), and legumes sainfoin (*Onobrychis viciifolia* L.), white clover (*Trifolium repens* L.) and bird's foot trefoil (*Lotus corniculatus* L.), grown alone or in mixture between them by the preference of cows assessed by minutes eating each forage during the first hour of grazing. For the sake of brevity we called this method grazing cafeteria.

## Materials and methods

The trial was carried out at the Institute of Forage Crops in Pleven. Pure swards of cocksfoot, crested wheatgrass, sainfoin, white clover, bird's foot trefoil and their two-component mixtures between them each in four replications (plots of 12 m<sup>2</sup>), i.e. a total of 60 plots were used. Twelve cows were observed in paddock while grazing the third growth at the age of 42 days from the last cutting of swards. The swards in this study were grouped as follows: pure legumes as legume, legume: legume mixtures as legumes, pure grasses and grass: grass mixtures as grass, and grass:legume mixtures. The observations were made during grazing of third growth at the age of 42 days from the last cutting. During 4 consecutive days 12 cows, which grazed on the natural pasture before and after the trial were allowed to

graze for 6 h on the paddock with plots and their feeding behavior during the first hour was assessed by visual observation. Every 5 min the time spent by each animal grazing a determined plot was recorded. The total grazing time was considered 100% and the relative proportion of grazing time for each legume and grass in pure or mixed stands was determined. At the beginning and at the end of the trial dry mass yield of each sward were determined. The amount of grazed forage was determined by the difference between dry mass yield at the beginning and at the end of the four days trial. The amount of grazed forage from each sward was presented in relative value as a proportion of the total grazed forage.

## Results and discussion

The data on relative distribution of grazing time across the different sward types are represented in Fig. 1. The grazing time on grass:legume mixtures was the longest and representing 40.6% of the total grazing time, and that on pure grasses and their mixtures between them the shortest, accounting for only 10.7%. The cows spent over twice more time grazing pure legumes (23.9%) than grasses, which indicates the higher palatability of the legumes. The grazing time on pure legumes (23.9%) was almost equal to that on legume: legume mixtures (24.8%), which indicates that the different combinations had no effect on legume palatability. The total time spent grazing pure and mixtures legumes (48.7%) was longer than that grazing grass: legume mixtures (40.6%).

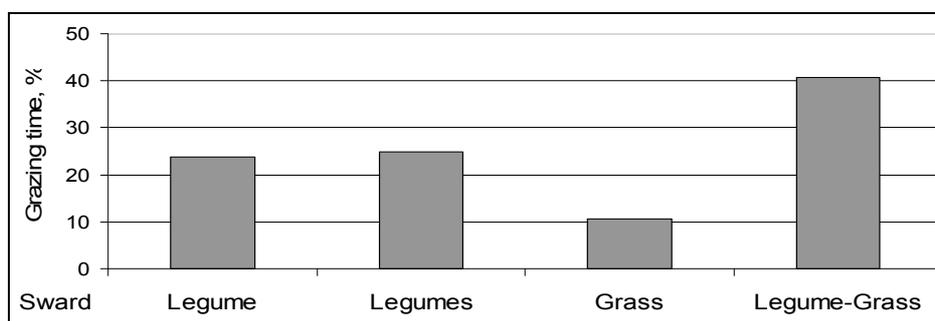


Figure 1. Time spent by cows in grazing: legume - pure legumes, legumes – legume mixtures, grass – pure grasses and grass mixtures, legume-grass – legume/grass mixtures.

The ratio of grazing time of pure and mixture legumes, grass: legume mixtures and grasses was 5:4:1 respectively. The results of grazed forage during 4-day and 6 hours per day (24 hours in total) grazing are represented on Fig. 2. Grazed quantity of legumes, either pure (33.3%) or in mixture (32.4%) was the maximal, and that of grasses the minimal (10.0%). Intake of pure legumes including sainfoin, white clover and bird's foot trefoil accounted for 33.3% of the total grazed forage, whereas intake of wheatgrass, cocksfoot and their mixture was 10% only. Grass: legume mixtures took an intermediate position with 24.3% of the total grazed forage. The ratio of the grazed forage during grazing period was 6.5:2.5:1.0 for pure and mixtures legumes, grass: legume mixtures, and pure and mixtures grasses respectively, and it is similar to the ratio of respective grazing time obtained in the first hour of the grazing period.

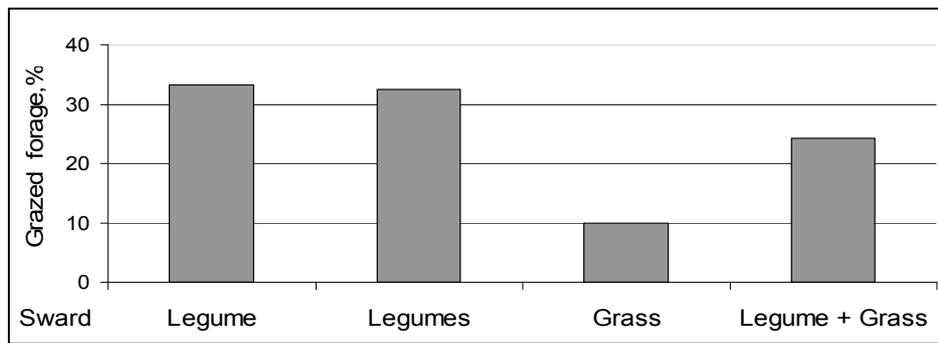


Figure 2. Grazed forage by cows, % of the total.

### Conclusion

The results obtained in the first hour of the grazing period suggest that animals prefer legumes, either pure or in mixture, to grasses. The cows spent over twice more time grazing pure legumes than pure grasses, which indicates the higher palatability of the legumes. The different two-component combinations between sainfoin, white clover and bird's foot trefoil had no effect on their palatability. The ratio of grazing time of pure and mixture legumes, grass:legume mixtures and grasses was respectively 5:4:1 which is approximately similar to the ratio of the grazed forage quantity from the same swards which was 6.5:2.5:1.0.

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