Cattle diet preference and species selection as influenced by availability

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INTRODUCTION

Diet composition is partly determined by selective grazing. In general, cattle show a preference for a mixed diet (Cosgrove *et al*., 1996), with partial preference for legumes over grasses (Parsons *et al*., 1994). This work was conducted to determine if cattle modify their dietary preference as the availability of a preferred species decreases.

MATERIALS AND METHODS

Three species-contrast plots were composed of adjacent 1-ha monocultures of either White clover:Ryegrass (W:Rye), Lotus corniculatus:Ryegrass (L:Rye), or Lotus corniculatus:Red clover (L:Red). To test the effect of relative species availability on preference, each contrast was subdivided into four plots with the height of the preferred species (previously determined as W and L) set, by mowing, at 4, 6, 8 or 10cm and the alternative species set at 10cm. Groups of three young heifers grazed each plot and their species location and activity (ie. grazing or not grazing) recorded at 10-minute intervals during daylight hours, for two 3-day periods in summer, and in autumn. Grazing time was dervied from the proportion of observations showing grazing.

Other measurements included biting rate, pasture mass (PM), and botanical composition of the upper sward stratum.

RESULTS

Total grazing time (GT) and grazing time on each species, was highly influenced (P<0.001) by species-contrast (Table 1).

The interaction (P<0.01) between species-contrast and height resulted from different trends in GT with height of the preferred species (Fig. 1). Grazing time on both grass-legume contrasts, L:Rye and W:Rye, tended to decrease as the height of the preferred species increased. Conversely, GT on L:Red increased slightly with increases in the height of L.

TABLE 1: Total GT (h) by contrast and its allocation to preferred (Pref) and alternative (Alt) species.

Contrast	Total	Std.dev	Pref	Std.dev	Alt	Std.dev
W:Rye	6.57	0.97	4.46	1.26	2.11	0.95
L:Rye	7.44	1.09	5.23	1.48	2.21	1.24
L:Red	6.79	1.38	3.74	1.04	3.05	1.01

FIGURE 1: Trends in total GT with changes in height on the preferred species.

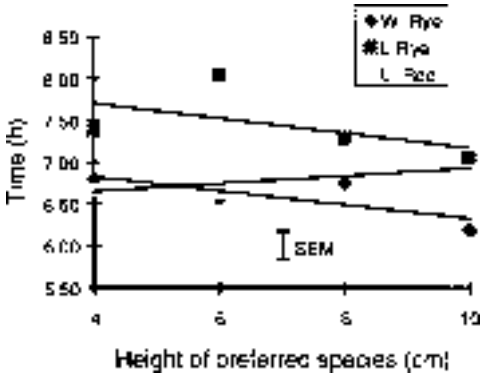
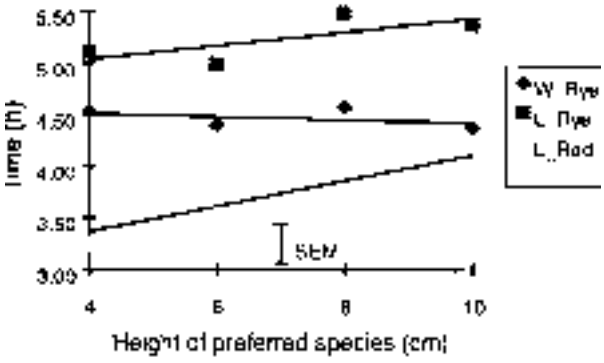


FIGURE 2: GT on the preferred species as influenced by height.



Time spent grazing on L in both L:Rye and L:Red contrasts tended to increase with height, while time spent grazing on W in W:Rye showed a weak trend to decrease as height increased (Fig. 2).

Pasture species influenced pasture mass (PM), and bulk density (BD; kg DM ha^{-1} cm^{-1}) of the sward upper stratum (P<0.001). Overall, W had the highest BD (141.9), followed by L (134.8), Red (107.0) and then Rye (80.1). White clover had the greatest leafiness (67.9%) compared with L in L:Rye (39.4%) and in L:Red (31.7%). Both PM and the rate of biting on the preferred species increased with sward height (P<0.05), except for the rate of biting on the 10 cm treatment which was lower than at 8 cm. Bulk density of the upper stratum was not significantly influenced by height (p>0.05).

DISCUSSION

Cattle prefer legumes compared with grass, as indicated by the greater time spent grazing the legumes. The extent to which this partial preference of cattle is modified

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by availability, was influenced by the legume species. The extent to which preference is modified by height is influenced by the pasture species on offer, and was greater for L in both L:Red and L:Rye than for W in W:Rye.

The greater BD and leafiness in the upper stratum of the legume swards, may facilitate prehension and allow both higher intake rate and higher quality diet (Mitchell *et al*., 1991). This may explain the difference in GT between the species-contrasts, and in the time spent grazing each species within a contrast.

CONCLUSIONS

Research is required to further clarify why in some cases, cattle seek to maintain a preferred species in their diet even as its availability declines (eg white clover), but in others, are less motivated to maintain a preferred species.

REFERENCES

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