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THE EFFECT OF HERBAGE AVAILABILITY AND  
SPECIES CHOICE ON GRAZING PREFERENCE  
OF DAIRY CATTLE.

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Requirements for the Degree of Masterate in Applied  
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## Abstract.

Herbage intake is one of the factors determining animal performance. Intake and quality of the diet consumed by animals are both determined by selective grazing. The motivation to graze selectively is in part a function of dietary preferences. The study of diet selection requires knowledge of what animals prefer to eat when there are no or minimal constraints to them obtaining their diet. This experiment aimed to investigate the effect of relative availability of a preferred species on dairy cattle response at grazing, and to evaluate the feasibility of the use of monocultures of pasture species for studies of preferences of dairy cattle. Three species-contrasts each composed of two adjacent 1-ha monocultures of either White clover:Ryegrass (W\_Rye), Lotus corniculatus:Ryegrass (L\_Rye) or Lotus corniculatus:Red clover (L\_Red) were used. White clover (W) and lotus (L) had been previously determined as preferred over ryegrass (Rye) and red clover (Red). Each species-contrast was subdivided into four plots and the height of the preferred species was set at 4, 6, 8 and 10 cm, whereas that of the less preferred species was set at 10 cm across plots. Groups of yearling Holstein heifers grazed the plots, and observations on grazing behaviour were made by recording grazing activity and species location at 10-minute intervals during daylight hours for three consecutive days, twice in summer and twice in autumn during 95/96 at the AgResearch Flock House Research Centre, near Bulls. During summer, a second week of grazing followed each period of observations for grazing activity, where attempts to estimate herbage dry matter intake and diet composition using the alkane technique were made. From the species-location information, total grazing time (GTt), expressed in hours, and distribution of GTt between preferred (GTp) and less preferred (GTl) species was obtained. The proportion of GTt allocated to grazing the preferred species was considered as a measure of preference. Statistical analysis was performed by GLM procedures of SAS. Regression analyses were carried out for grazing activity parameters on actual height of the preferred species.

Animals showed preference for a mixed diet with partial preference for the legume component (W, 67 %, and L, 70 %) over grass, whereas partial preference in the L\_Red species-contrast was close to indifference (L, 55 %). However, this partial preference differed between seasons, being in general stronger in summer than in autumn. Partial preference decreased with decreases in height of the preferred species. However, herbage bulk density (BD) appeared to be important also in influencing preference since more marked responses to height were observed in autumn when sward had lower BD compared with summer. Botanical composition of the sward upper stratum was also considered to influence animal preferences.

Diet composition estimation from herbage and faecal alkanes suggested that animals consumed the preferred species at higher proportions than indicated by the proportion of GTt allocated to the preferred species. This was possibly due to differences in rate of intake between herbage species. However, more research is needed in this area in order to establish more accurately the relationship between these two techniques.

It is concluded that animals respond to changes in herbage availability of a preferred species and to species choice by adjusting grazing time between preferred and less preferred species. It would be appropriate to research the potential animal performance benefits of increasing the availability of a preferred species in proportion to that preferred by the animals.

This work confirms the use of monocultures of pasture species to be useful in the evaluation of preference of dairy cattle. Inclusion of a wider arrangement of species-contrasts is recommended.

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## Table of contents.

<b>ABSTRACT.....</b>	<b>II</b>
<b>ACKNOWLEDGEMENTS.....</b>	<b>V</b>
<b>TABLE OF CONTENTS.....</b>	<b>VII</b>
<b>LIST OF TABLES.....</b>	<b>IX</b>
<b>LIST OF FIGURES.....</b>	<b>XI</b>
<b>LIST OF APPENDICES.....</b>	<b>XII</b>
<b>1. INTRODUCTION.....</b>	<b>1</b>
1.1 OBJECTIVES.....	2
<b>2. LITERATURE REVIEW.....</b>	<b>3</b>
2.1 FACTORS INFLUENCING DIET PREFERENCE AND SELECTION.....	3
2.1.1 <i>Herbage factors influencing preference and diet selection.....</i>	<i>4</i>
2.1.2 <i>Animal factors influencing preference and diet selection.....</i>	<i>6</i>
2.1.3 <i>Rate of intake and its relation to preference.....</i>	<i>8</i>
2.2 PARTIAL PREFERENCES -MIXED DIETS.....	10
2.3 HERBAGE N-ALKANES IN DIET SELECTION AND HERBAGE INTAKE STUDIES.....	12
2.3.1 <i>Controlled-release devices.....</i>	<i>14</i>
2.3.2 <i>Diet composition through alkanes.....</i>	<i>14</i>
<b>3. MATERIALS AND METHODS.....</b>	<b>16</b>
3.1 LOCATION.....	16
3.2 MONOCULTURES OF PASTURE SPECIES.....	16
3.3 TREATMENTS.....	17
3.4 ANIMALS AND MANAGEMENT.....	19
3.5 GRAZING ACTIVITY.....	19
3.6 BITING RATE (BR).....	20
3.7 HERBAGE MEASUREMENTS.....	20
3.7.1 <i>Sward surface height.....</i>	<i>20</i>
3.7.2 <i>Herbage mass.....</i>	<i>20</i>
3.7.3 <i>Botanical composition.....</i>	<i>20</i>
3.7.4 <i>Herbage quality.....</i>	<i>21</i>
3.8 DIET COMPOSITION AND DRY MATTER INTAKE.....	22
3.9 STATISTICAL ANALYSES.....	23



3.9.1 Observation data .....	23
3.9.2 Biting rate (BR).....	24
3.9.3 Herbage mass and Bulk density.....	24
3.9.4 Pluck samples .....	24
3.9.5 Botanical composition.....	24
3.9.6 Diet composition and dry matter intake.....	25
<b>4. RESULTS.....</b>	<b>26</b>
4.1 HERBAGE MEASUREMENTS.....	26
4.1.1 Sward surface height (SSH).....	26
4.1.2 Herbage mass.....	26
4.1.3 Bulk density (BD).....	27
4.1.4 Botanical composition.....	28
4.1.4.1 Leafiness.....	28
4.1.4.2 Stemminess.....	29
4.1.4.3 Dead matter.....	30
4.1.4.4 Seedheads/flowers.....	31
4.1.4.5 Unsown species.....	32
4.1.5 Herbage quality.....	33
4.1.5.1 Preferred species.....	33
4.1.5.2 Less preferred species.....	33
4.2 GRAZING ACTIVITY.....	36
4.2.1 Total Grazing Time (GTt).....	36
4.2.2 Grazing Time on the Preferred Species (GTp).....	38
4.2.3 Grazing Time on the Less Preferred Species (GTl).....	41
4.2.4 Proportion of GTt allocated to the preferred species.....	45
4.3 RATE OF BITING (BR).....	48
4.3.1 Rate of biting (BR) on the preferred species.....	48
4.3.2 Rate of biting (BR) on the less-preferred species.....	51
4.4 DRY MATTER INTAKE AND DIET COMPOSITION.....	54
4.4.1 Herbage measurements.....	54
4.4.1.1 Sward surface height (SSH).....	54
4.4.1.2 Herbage mass.....	55
4.4.1.3 Bulk density (BD).....	56
4.4.1.4 Botanical composition of the sward upper stratum.....	56
4.4.1.4.1 Leafiness.....	56
4.4.1.4.2 Stemminess.....	57
4.4.1.4.3 Dead matter.....	57
4.4.1.4.4 Seedheads/flowers.....	58
4.4.1.4.5 Unsown species.....	58

4.4.2 <i>Grazing activity</i> .....	59
4.4.2.1 Total grazing time (GTt).....	59
4.4.2.2 Time spent grazing the preferred species (GTp).....	62
4.4.2.3 Time spent grazing the less preferred species (GTl).....	64
4.4.2.4 Proportion of GT allocated to grazing the preferred species.....	66
4.4.3 <i>Rate of biting (BR)</i> .....	69
4.4.3.1.1 BR on the preferred species.....	69
4.4.3.1.2 BR on the less preferred species.....	70
4.4.4 <i>Dry matter intake and diet composition</i> .....	71
4.4.4.1 Relationship between diet composition estimated through alkanes and partial preferences derived from distribution of grazing time.....	72
<b>5. DISCUSSION</b> .....	<b>74</b>
5.1 EVALUATION OF PROCEDURES.....	74
5.1.1 <i>Monocultures of pasture species</i> .....	74
5.1.2 <i>Sward herbage height</i> .....	74
5.1.3 <i>Observations of grazing behaviour as a measure of preference</i> .....	75
5.1.4 <i>Dry matter intake and diet composition</i> .....	76
5.2 SWARD CHARACTERISTICS.....	78
5.2.1 <i>Physical characteristics</i> .....	78
5.2.2 <i>Chemical characteristics</i> .....	79
5.3 RATE OF BITING (BR).....	80
5.4 SPECIES-CONTRAST EFFECTS ON PREFERENCES.....	82
5.5 SEASON EFFECT ON PREFERENCES.....	86
5.6 SWARD SURFACE HEIGHT (SSH) EFFECT ON PREFERENCES.....	91
5.7 FINAL DISCUSSION.....	93
5.8 CONCLUSIONS.....	97
<b>BIBLIOGRAPHY</b> .....	<b>98</b>

### List of tables.

Table 1. Average sward surface height (cm) of experimental plots.....	26
Table 2. Total herbage mass (kg DM ha <sup>-1</sup> ) of the preferred and less preferred species, as influenced by height, and season.....	27
Table 3. Bulk density (kg DM ha <sup>-1</sup> cm <sup>-1</sup> ) of the preferred and less preferred species, as influenced by height, and season.....	28
Table 4. Leafiness (%) in the sward upper stratum as affected by height and season.....	29
Table 5. Stemminess (%) in the sward upper stratum as affected by height and season.....	30
Table 6. Dead matter (%) in the sward upper stratum as affected by height and season.....	31

Table 7. Seedheads/flowers (%) in the sward upper stratum as affected by height and season. ....	31
Table 8. Unsown species (%) in the sward upper stratum as affected by height and season. ....	32
Table 9. Near infrared reflectance spectroscopy (NIRS) analyses for samples of preferred species as influenced by season and species within contrast. Values are expressed as g/100 g DM, except for energy (Megajoules of metabolizable energy per kg DM) and digestibility (% of the DM). ....	34
Table 10. Near infrared reflectance spectroscopy (NIRS) analyses for samples of less preferred species within contrast. Values are expressed as g/100 g DM, except for ME (metabolizable energy; Megajoules/kg DM) and digestibility (%). ....	35
Table 11. Total grazing time (GTt; hours) as affected by height of the preferred species, species-contrast and season. ....	37
Table 12. Species-contrasts intercepts computed for the regression of total grazing time on actual height by season. ....	38
Table 13. Grazing time on the preferred species (GTp; hours) as affected by height, species-contrast and season. ....	40
Table 14. Regression of grazing time on the preferred species (GTp) on actual height. ....	41
Table 15. Grazing time on the less preferred species (GTl; hours) as affected by height, contrast and season. ....	43
Table 16. Regression of grazing time on the less preferred (GTl) species on actual height. ....	45
Table 17. Proportion of total grazing time (%) spent on the preferred species, as affected by height, species-contrast and season. ....	46
Table 18. Regression of proportion of grazing time on the preferred species on actual height. ....	48
Table 19. Rate of biting (bites per min.) on the preferred species, as affected by height, contrast and season. ....	49
Table 20. Intercept for the rate of biting on the preferred species by species contrast and season. ....	51
Table 21. Rate of biting (bites per min.) on the less preferred species, as affected by height of the preferred species, contrast and season. ....	52
Table 22. Regression of biting rate on the less preferred species on actual height. ....	54
Table 23. Height (cm) of experimental plots during the intake period. ....	55
Table 24. Total herbage mass (kg DM ha <sup>-1</sup> ) of the preferred and less preferred species, as influenced by height. ....	55
Table 25. Bulk density of the sward upper stratum (kg DM cm <sup>-1</sup> ha <sup>-1</sup> ) of the preferred and less preferred species, as influenced by height. ....	56
Table 26. Leafiness (%) in the sward upper stratum as affected by height. ....	57
Table 27. Stemminess (%) in the sward upper stratum as affected by height. ....	57
Table 28. Dead matter (%) in the sward upper stratum as affected by height. ....	58
Table 29. Seedheads/flowers (%) in the sward upper stratum as affected by height. ....	58
Table 30. Unsown species (%) in the sward upper stratum as affected by height. ....	59
Table 31. Total grazing time, grazing time allocated to the preferred and less preferred species (hr), as influenced by height of the preferred species. ....	60

Table 32. Regression of total grazing time on actual height. ....	62
Table 33. Regression of grazing time on the preferred species (hr) on actual height. ....	64
Table 34. Regression of grazing time on the less preferred species on actual height. ....	66
Table 35. Grazing time on the preferred species expressed as a proportion (%) of total grazing time. ....	67
Table 36. Regression of the proportion of total grazing time spent grazing the preferred species on actual height. ....	67
Table 37. Proportion (%) of the preferred species in the diet selected by experimental animals on treatments 4 and 10 cm during intake phases 1 and 2.....	71
Table 38. Intercepts for the regression of the proportion in the diet, of the preferred species on the proportion of grazing time spent in the preferred species, by contrast. ....	72

### List of figures.

Figure 1. Experiment layout (not to scale).....	18
Figure 2. Trends in total grazing time as influenced by height and season. a. W_Rye, b. L_Rye, and c. L_Red species-contrast. Solid line: Summer. Broken line: Autumn. ....	39
Figure 3. Trends in grazing time on the preferred species as influenced by height. a. W_Rye, summer and autumn; b. L_Rye, b.1 Summer, Period 1 & 2; b.2, Autumn, Period 1 & 2; c. L_Red, c.1 Summer, Period 1 & 2; c2, Autumn, Period 1 & 2. ....	42
Figure 4. Trends in grazing time on the less preferred species as influenced by height. a. W_Rye, b. L_Rye, and c. L_Red species-contrast.....	44
Figure 5. Trends in the proportion of total grazing time allocated to the preferred species as influenced by height. a. W_Rye, b. L_Rye, b.1 Summer; b.2 Autumn, Period 1 and 2. c. L_Red. ....	47
Figure 6. Trends in the rate of biting the preferred species as influenced by height. a. W_Rye, b. L_Rye, and c. L_Red.....	50
Figure 7. Trends in the rate of biting the less preferred species as influenced by height. a. W_Rye, b. L_Rye, and c. L_Red. ....	53
Figure 8. Total grazing time as affected by height. a. W_Rye, b. L_Rye, c. L_Red.....	61
Figure 9. Grazing time on the preferred species as affected by height. a. W_Rye, b. L_Rye, c. L_Red. ..	63
Figure 10. Grazing time on the less preferred species as affected by height. a. W_Rye, b. L_Rye, c. L_Red. ....	65
Figure 11. Proportion of grazing time on the preferred species as affected by height. a. W_Rye, b. L_Rye, c. L_Red.....	68
Figure 12. Rate of biting on the preferred species as affected by height. ....	69
Figure 13. Rate of biting on the less preferred species as affected by height.....	70
Figure 14. Relationship between proportion of grazing time allocated to the preferred species and the proportion of the preferred species in the diet consumed. ....	73

## List of Appendices.

Appendix 1. SAS programs and ANOVA tables. ....	116
Appendix 2. Sward surface heights (SSH) throughout the experiment.....	123
Appendix 3. Botanical composition of the sward upper stratum throughout the experiment. ....	125