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Studies of grazing behaviour
by lactating cows during
winter, spring and summer

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Lisa A. Watson

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Abstract

The work outlined in this thesis was intended to study the grazing behaviour of lactating cows during winter, spring and early summer, and the effects of maize silage supplementation during winter. It also derived monthly rising plate meter equations over the period of the experiments, in order to assist with the estimation of cow intake and sward characteristics.

Supplementation influenced the quantity and relative proportions of grazing, ruminating and idling times. Total grazing times were 546 vs. 615-min./day, and total rumination times 403 vs. 333-min./day for supplemented and non-supplemented cows respectively. Substitution of pasture for maize silage occurred, with reductions in grazing time averaging 26-minutes per kg DM eaten as maize silage. Rumination values per kg of total DM eaten were similar at 29-minutes (supplemented) and 27-minutes (non-supplemented). Intake rate of pasture was not affected by offering maize silage as a supplement, but grazing time was reduced.

Cows preferred to graze during daylight hours, spending 47-57% of daylight hours grazing irrespective of daylength. Grazing activity peaked after milkings, and before dusk.

Autumn and spring calved cows were grazed together in two experiments in the spring and summer of 1998. Stage of lactation had no effect on bite rate, bite weight, and intake rate of herbage. Grazing times were related to metabolic requirements, and grazing behaviour was similar for cows which had calved in autumn or in spring.

Times for ruminating and grazing were similar for heifers and mature cows, with similar components of day and night-time grazing. Heifers have a lower intake rate (23 vs. 27-g DM/min), and smaller bite weights (423 vs. 507-mg DM/bite) without a faster bite rate (58 vs. 56-bites/min). Heifers also ruminated for longer per kg DM eaten, with similar ruminating times to mature cows (380 vs. 380-min/cow/day), despite their smaller daily pasture intake (12.9 vs. 15.3-kg DM/cow). It is suggested that the grazing behaviour of heifers is influenced by social factors, such as their dominance position in a herd.

Monthly rising plate meter equations were derived between July 1998 and February 1999. When used to rank pastures for grazing order, the importance of the slope rather than the intercept was demonstrated. However when the rising plate meter was being used to compare pasture with required target values (such as average farm pasture cover, and post-grazing herbage mass), the intercept was also important, to give an accurate pasture mass value.

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List of Abbreviations and Symbols

Abbreviations

ADF	Acid Detergent Fibre (NDF less hemicellulose i.e. cellulose and lignin)
a.m.	<i>ante meridiem</i>
ANOVA	analysis of variance
BR	bite rate
BS	bite size
BW	bite weight
CP	crude protein (Total Nitrogen \times 6.25)
DM	dry matter
h	hours
ha	hectares
lwt	live weight
ME	metabolisable energy (The gross energy in the feed less that lost in faecus, urine an
MF	milk fat
min.	minute
MJ	megajoule
MJME	megajoules of metabolisable energy
MS	milksolids
NDF	Neutral Detergent Fibre (cell wall materials e.g. hemicellulose, cellulose and lignin
OM	organic matter
P	probability
PGR	pasture growth rate
p.m.	<i>post meridiem</i>
PROC	procedure
RPM	rising plate meter
SAS	Statistical Analysis System
vs.	<i>versus</i>

Weights, volumes and measures

cm	centimetre
°C	degrees centigrade
kg	kilogram
l	litre
m	meter

Statistical terms

*	significant at $P < 0.05$
**	significant at $P < 0.01$
***	significant at $P < 0.001$
†	significant at $P < 0.1$
n	number
NS	not significant
R^2	coefficient of determinaion
s.e.d	standard error of the difference
SD	standard deviation
SE	standard error of the mean

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