

Nutritional preference of dry pregnant dairy cows for natrophilic pasture of varying metal concentration

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The instinctive liking of mammals for sodium is well known and the ability to taste it is inherent in all ruminants. Increased herbage sodium (Na), magnesium (Mg) and calcium (Ca) contents and a reduction in herbage potassium (K) has been recorded at Na fertilizer application ranging between 32-64 kg Na/ha/yr by Chiy and Phillips (1993, Grass and For Sci, 48, 203-212). The changes in chemical composition resulted in a greater cow grazing preference for and increased biting rates in the high-metal forage. These effects were reported specifically for forage sodium altered by sodium supply to pasture, but not in relation to the other major metals in forage which are also affected by Na supply. Furthermore, the responses were observed only for Na application rates lower than 65 kg Na/ha/yr and lactating dairy cows were used. Pregnancy increase the physiological sodium requirement and the presence of the foetus is known to physically restricts voluntary DMI of cows when the need is greatest. In two experiments during the present study, variations in metallic cation concentrations in treatment forages were achieved by total applications of 0 (Nil), 33 (L), 68 (M), 106 (H) and 177 (VH) kg Na/ha/yr and the nutritional behaviour of dry pregnant dairy cows was studied.

Forage metallic cation contents were affected

by Na and so was the nutritional behaviour of cows grazing the treatment pastures. Sodium content increased up 5 g Na/kg DM at the H and VH. Herbage K contents were low and tended to be reduced by Na. Herbage Mg, Ca and DM digestibility increased linearly up to M and H, but thereafter declined. The proportion of time that cows spent grazing increased in direct proportion to Na, Ca and Mg up to the M treatment but in inverse relation to the K content. Cows grazed the high cationic herbage to a lower herbage height, particularly at the high application rates. Dry matter Digestibility was also increased up to the M level and thereafter decreased. Biting rate of cows was greatest at the M treatment.

Both studies suggest that the increased forage Na, Ca, Mg and DMD in grazing treatments that was achieved by moderate Na supply in the present experiment and low levels of Na in previous studies e.g. Chiy and Phillips (1993, Grass and For Sci, 48, 203-212) can increase cow grazing preference and biting rate but, the agronomic and cow effects are progressively diminished at H to VH levels. The specific effects of the different cations was beyond the scope of the present study. In addition, the effects of the cations on nutritional preference as distinguished from that of DMD requires further investigation.

Treatment	N	L	M	H	VH	SED
Cations content (g cation/kgDM)						
Na	2.73	3.63	4.10	5.18	4.93	0.286
K	10.17	9.61	9.38	9.34	9.13	0.312
Ca	4.42	5.48	5.55	5.62	5.10	0.204
Mg	1.79	1.95	2.16	1.87	1.69	0.079
Dry matter digestibility (g/kgDM)	712	744	854	807	735	15.6
Herbage height (cm)	8.65	8.03	8.01	7.53	7.66	0.219
Proportion of total time spent grazing	0.137	0.150	0.159	0.160	0.152	0.005
Biting rate (number per minute)	69.0	73.6	78.0	76.8	67.6	1.46