

THE EFFECT OF PRE-PARTUM PROTEIN SUPPLEMENTATION ON PRODUCTIVITY OF GRAZING DAIRY COWS

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The effects of pre-partum feeding on body condition and subsequent milk production of grazing cows have been well documented (Grainger *et al.* 1982). However, specific nutrient effects have not been evaluated and this experiment was designed to examine whether the addition of a protein supplement to the diet of "dry cows" could influence subsequent milk production.

Thirty seven Friesian cows (4 - 8 years old) were assigned according to age and expected calving date to a supplemented (S) and non supplemented group (C). The S group were fed 1 kg/head.day of Norpro (0.5% formaldehyde treated sunflower meal, 33% crude protein and 11 MJ/kg) in individual stalls. The supplementation commenced a mean 8 weeks prior to expected calving date and ceased at calving. Milking commenced 1 day post calving and all cows were supplemented with 1 kg/head.day of lucerne hay and 7 kg/head.day of a barley based concentrate diet which also contained 8% sunflower meal as the major source of protein. During the pre- and post-partum periods all cows grazed together on white clover and phalaris based pastures yielding 2500kg DM/ha at the commencement of grazing.

Cow liveweights were recorded at the commencement of the supplementation period and 1 day before expected calving. Calf birth weight was recorded within 18 hours of calving and the interval between calving and first mating and the number of services per conception were recorded. Milk production and milk composition were measured fortnightly beginning in the second week of lactation. Least squares analysis of variance was used to examine treatment differences at each time of measurement.

C and S cows had initial mean live weights of 645 15 and 675 15 kg (NS) respectively and mean live weight at calving did not differ significantly between groups. Calves from the S cows were heavier at birth (37.2 vs 32.5 kg, $P < 0.05$). The interval to first mating was not significantly different between the C (13 1.4 days) and the S (119.1 .days) groups but the number of services per conception was higher in the C group (1.72 vs 1.20, $P < 0.05$).

S cows produced significantly more ($P < 0.05$) milk than the C cows (Table 1) at each milking. Protein yield was greater in the S cows (0.72 vs 0.9 1 kg, $P < 0.01$) throughout the 12 weeks of the experiment; the difference in milk fat yield (kg/day) between the C (0.77) and the S (1.03) groups approached significance ($P < 0.06$).

Table 1. Mean milk production (L/day) for control and pre-partum protein supplemented cows.

Week	2	4	6	8	10	12
Control (C)	23.5	25.3	23.5	22.5	23.4	22.2
Norpro suppl.(S)	27.9	29.3	28.7	27.4	26.9	25.6
SEM	0.80	0.96	0.99	0.89	0.96	0.88

There are few previous studies of the effect of pre-partum protein supplementation on milk production and Van Saun *et al.* (1993) reported no significant increases in milk production in heifers fed *ad libitum* on diets differing in protein (12 vs 15%) and UDP proportions (27 vs 39%). Increases in milk production by pre-partum supplementation have generally been associated with condition score and body weight changes but in this experiment the effects of supplementation on production appear to be independent of changes in body energy stores. It is possible that this effect was mediated via mammary development, the additional protein being utilized for foetal and maternal tissue changes in late pregnancy. Supplementation may have increased the store of body protein available for mobilisation in early lactation with consequent positive metabolic signals for the onset of reproductive function.

GRAINGER, C., WILHELMS, G.D. and MCGOWAN, A.A. (1982). *Aust. J. Exp. Agric. Anim. Husb.* 22: 9-17.

VAN SAUN, R.J., IDLEMEN, S.C. and SNIFFEN, C.J. (1993). *J. Dairy Sci.* 76: 236-44.