

**DRY MATTER INTAKE OF PERIPARTURIENT COWS ON A FRESH
PASTURE/PASTURE-HAY DIET.**

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Abstract

Reports of the depression in dry matter intake in the periparturient period have been inconsistent and little dry matter intake data is available for an all-forage diet prior to calving. Data to examine intake depression prior to calving was obtained from two experiments. In experiment 1, sixteen non-lactating, periparturient cows ate 1.3% of pre-calving body weight of grass-hay and freshly cut grass for two weeks pre-calving (restricted). Experiment 2 comprised thirty-six cows that ate 1.6% of pre-calving body weight of grass-hay and freshly cut grass for the final two weeks of pregnancy (*ad libitum*). Individual dry matter intakes were recorded for 14 days pre-calving.

Intake pre-calving was not depressed, irrespective of feeding level, until two days pre-calving. This suggests that when an all-forage diet is fed pre-calving, increasing the energy density of the diet to compensate for a depression in dry matter intake may not be necessary.

Keywords: Dairy cows, transition, periparturient, pasture, dry matter intake

Introduction

Nutrient recommendations are often presented as g kg^{-1} . However, a cow requires specific quantities of nutrients to meet her metabolic needs and if she were to consume less dry matter than expected, of diets containing recommended nutrient densities, nutrient intake would not meet defined requirements. Dry matter intake (DMI) is therefore probably the most critical factor in determining the nutritional adequacy of the diet (Van Saun, 1990; Dalley *et al.*, 1999).

The mean DMI of the dry cow has been reported to range from 7-15 kg day^{-1} (Van Saun, 1990). Several researchers have reported a depression in intake of 30-35% pre-partum (Bertics *et al.*, 1992; Grant and Albright, 1995; Grummer, 1995). Coppock *et al.* (1972) also found a significant depression in the dry matter intake of cows pre-calving, but only when greater than 25% of the diet was concentrate-based. Vazquez-Anon *et al.* (1994) did not find a depression in intake until 2 days prior to parturition when the pre-calving diet was predominantly forage.

This study characterised the DMI in the final two weeks prepartum when a pasture-hay and fresh pasture diet was fed in *ad libitum* or restricted quantities.

Materials and Methods

Two experiments conducted in September/October 1997 and July/August 1998 were used to describe the DMI of dry cows in the final 2 weeks of gestation. All cows were greater than three years of age and were selected to calve over a 2 week period based on the results of pregnancy diagnosis. In experiment 1, sixteen multiparous Holstein cows were offered a daily diet of harvested fresh pasture (5 kg DM) and pasture-hay (5 kg DM) for 3 weeks before calving. In experiment 2, thirty-six multiparous Holstein-Friesian cows were offered a pre-

calving daily diet of pasture-hay (5 kg DM) and *ad libitum* fresh pasture. *Ad libitum* pasture was based on 110% of pasture intake on the previous day.

Cows were individually fed hay at 06.00 h for 5 h and cut pasture at 15.00 h for 5 h. Cows were held as a single group on a bare paddock, where water was available *ad libitum*, when not feeding.

Measurements

DMI was measured daily for each cow by weighing feed offered and refused. Representative samples of feed offered and refused were dried at 105°C to constant weight to determine dry matter (DM) content.

Pastures had not been grazed for 6-7 weeks and had a yield of approximately 2500 kg DM ha⁻¹. Pasture was cut to approximately 40 mm immediately prior to the afternoon feed and harvested using a loader wagon. The cut grass was not chopped further, so as to best represent grazed grass. The sward consisted of approximately 75% perennial ryegrass (*Lolium perenne*), 20% other grasses (*Dactylus glomerata*, *Holcus lanatus* and some *Poa* species), 2.5% white clover (*Trifolium repens*) and 2.5% weeds on a DM basis. The hay in experiment 1 was chopped to approximately 3-5 cm using a New Holland 717 flail harvester. The hay used in experiment 2 was not chopped.

Statistics

Regression analysis (Genstat V, 1997) was used to determine the pre-calving DMI trend from 14 days pre-calving to 3 days pre-calving for each cow.

Results and Discussion

The intake of dry matter did not decline until 2 days pre-calving (Figure 1). The slope of the regression between intake and time were -0.024 ± 0.053 and 0.002 ± 0.064 kg DM cow⁻¹ day⁻¹ for *ad libitum* and restricted cows, respectively. A finding similar to that of Coppock

et al. (1972) and Vazquez-Anon *et al.* (1994). Coppock *et al.* (1972) reported that a depression in DMI was only observed when concentrates constituted more than 25% of the diet. Both the diet here and that offered by Vazquez-Anon (1994) contained forage primarily.

The reason for the increased depression in DMI pre-calving when concentrate supplements are added into the diet is not fully understood although it is suggested that it may be due to rumen fill (Grummer, 1995). However the findings of Coppock *et al.* (1972) do not support this conclusion.

A second possible reason for the decline in DMI prior to calving may be the association between elevated plasma oestrogen concentrations and reduced intake (Forbes, 1986). An increase in plasma oestrogen concentration has also been associated with altered dietary preferences causing cows to select against concentrates but not forages (Forbes, 1987). Thus the reduced intake in a total mixed ration may be due to the lack of ability to select against the concentrates in the mixture.

In conclusion, DMI of periparturient cows on a pasture and pasture-hay diet was not depressed until 2 days pre-calving. A comparison of this result with the DMI depression reported for diets containing concentrates suggests that an all-forage diet will maintain DMI prior to calving whereas a concentrate diet will reduce it. In some dairying systems high energy concentrates are included in the transition cow ration to increase the energy density of the diet during the period of declining DMI. However, there is very little data in the literature to show a production benefit to this management policy and the benefits reported in animal health are inconsistent. It is necessary to question, therefore, the negative impact of this pre-calving depression in DMI and the importance placed on it as a determinant of future production.

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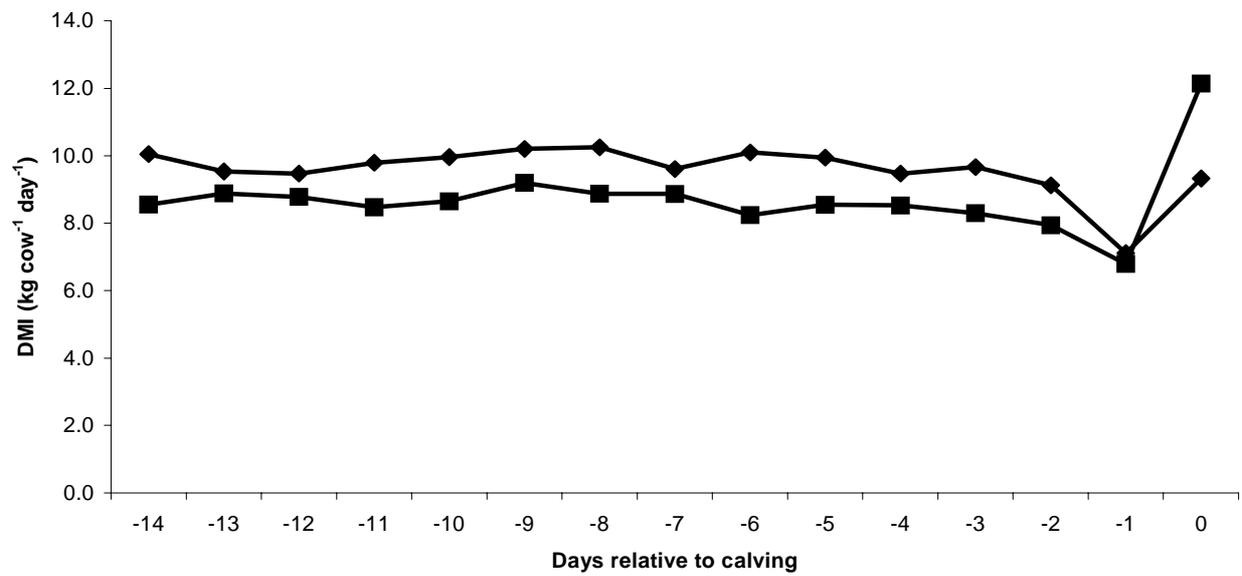


Figure 1 - Dry matter intakes (DMI) of cows offered pasture-hay and fresh pasture, either restricted (■) or *ad libitum* (◆) for two weeks prior to calving.