

ARE HAEMOGLOBINURIA AND PHOSPHORUS STATUS IN DAIRY COWS RELATED?

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During the conduct of an experiment examining aspects of nutritional management of the transition dairy cow, 4 cows suffered from haemoglobinuria 2-4 weeks after calving, while a large number of animals demonstrated pica. Since phosphorus (P) status is considered to be a predisposing factor, we investigated the P status of the cows and their feeds in this experiment.

Seventy two cows calved with body condition scores of either 3.5-4.5 (thin) or 5.5-6.5 (fat) units on the 8-point scale of Earle (1976) during August 2002. For the last 3-4 weeks before calving, 3 diets were fed: 1) a TMR containing maize silage, barley grain, canola meal and hay, fed at 1.5% of body weight, 2) the TMR plus 4 kg (as fed) of cereal grain-based pellets, and 3) the TMR plus 3.5 kg (as fed) of soyabean meal. After calving, the cows strip-grazed annual pasture at a daily allowance of ~35 kg DM/cow until early October, and were supplemented with 6 kg DM concentrates/day. The P in supplements consumed and pasture on offer, and plasma P concentrations, were monitored. Differences between treatments were tested by analysis of variance using Genstat V.

The average P concentration in the diet was at least 0.27% DM, but this value is based on P concentrations in pastures cut to ground level, which are lower than that in pasture consumed (Kellaway *et al.* 1993). Comparing P consumption with P requirements indicated that intake was probably below requirements, with this occurring to a greater degree with fat than with thin cows. Treatment during late gestation had little effect on plasma inorganic P concentrations (Figure 1a), but thin cows generally had concentrations that were significantly higher than those in fat cows in early lactation (Figure 1b). The plasma P concentrations of the 4 cows (all fat) exhibiting haemoglobinuria declined to less than 0.3 mmol/L by 2 weeks after calving (Figure 1b).

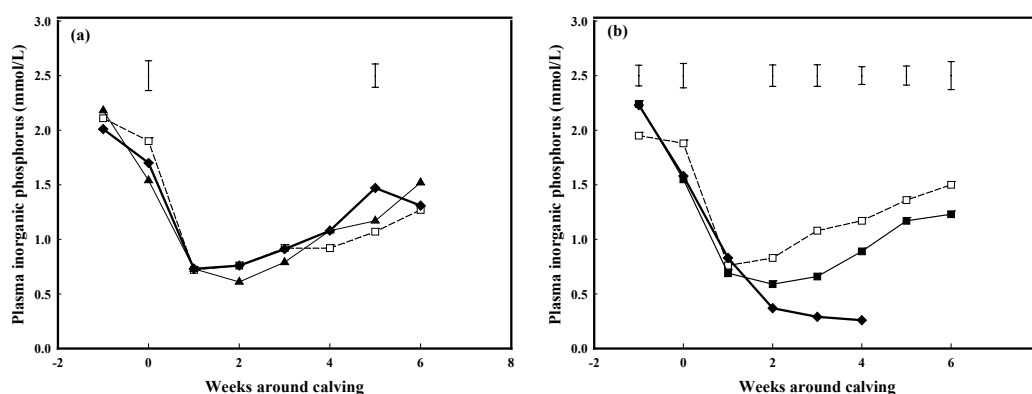


Figure 1. The effect of a) diet in late gestation (□ - TMR; ▲ - TMR plus pellets; ◆ - TMR plus soyabean meal) and b) body condition (BCS) at calving (□ - low BCS; ■ - high BCS) on concentrations of inorganic phosphorus (P) in the plasma of dairy cows. The bars are least significant differences at P=0.05. The diamonds in Figure 1b provide data for the 4 cows that suffered from haemoglobinuria.

Dietary P concentrations around 0.30% are considered marginal for lactating cows. Plasma P concentrations indicative of P deficiency are 0.8-0.9 mmol/L, whereas P concentrations in plasma are normally 1.3-2.6 mmol/L (Satter 2002). Inadequate dietary P may have predisposed cows to haemoglobinuria in this experiment, but the cause of its incidence was not really obvious.

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