

# Effect of zeolite A on the periparturient feed intake and mineral metabolism of dairy cows

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## Objectives

- subclinical hypocalcaemia is a common metabolic disorder of high yielding dairy cows
- different prevention strategies; the addition of zeolite A (calcium-binder) to the pre parturient ration is one of these
- each of this strategies could have negative side effects, also feeding of zeolite A
- The objectives of the presented experiments were to study the influence of different doses of zeolite A on feed intake and mineral metabolism, especially the incidence of hypocalcaemia.

## Methods

Animals: 46 (Exp. I) resp. 78 pregnant dry Holstein cows (Exp. II)

Feeding: Total mixed ration: 48 % maize silage, 32 % grass silage and 20 % concentrate on dry matter (DM) basis

Day 28 to 15 a.p. all animals feeding without zeolite A supplementation

Day 14 to 0 a.p. addition of 0 or 90 g zeolite A/kg DM (Exp. I) or 0, 12, 23 and 43 g zeolite A/kg DM (Exp. II)

Zeolite A supplementation stopped with calving

Samples: Blood 28, 14 and 7 days before calving, on the day of calving and on days 1, 2 and 7 after calving

Analyses: Ca, Mg, P in blood serum

## Results

High zeolite A doses (43 and 90 g/kg DM) reduced significantly total DM-, energy- and protein (nXP)- intake. This resulted in a significantly lower intake of minerals (calcium, magnesium and phosphorus; Table 1).

**Table 1: Influence of different zeolite A doses on DM-, energy- and nXP-intake as well as mineral intake**

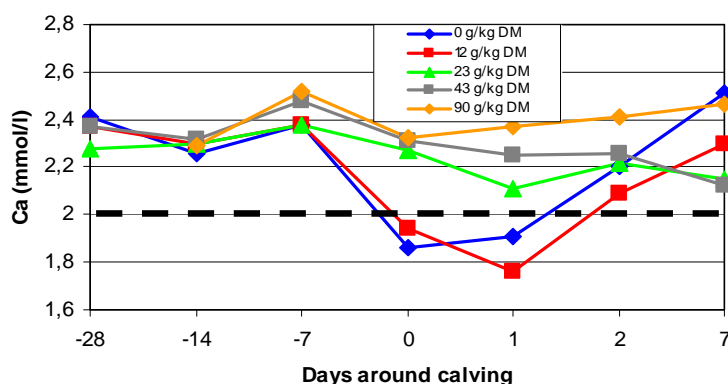
	zeolite A dose (g/kg DM)				
	0	12	23	43	90
DM (kg/d)	11.1 <sup>bc</sup>	10.9 <sup>c</sup>	9.5 <sup>b</sup>	7.3 <sup>a</sup>	6.2 <sup>a</sup>
Energy (MJ NEL/d)	61.4 <sup>cd</sup>	60.7 <sup>d</sup>	56.5 <sup>c</sup>	43.9 <sup>b</sup>	31.2 <sup>a</sup>
nXP (g/d)	1339 <sup>cd</sup>	1329 <sup>d</sup>	1224 <sup>c</sup>	928 <sup>b</sup>	732 <sup>a</sup>
Ca (g/d)	44.4 <sup>cd</sup>	46.9 <sup>d</sup>	40.4 <sup>c</sup>	30.5 <sup>b</sup>	23.5 <sup>a</sup>
Mg (g/d)	25.0 <sup>cd</sup>	26.5 <sup>d</sup>	23.1 <sup>c</sup>	17.4 <sup>b</sup>	13.3 <sup>a</sup>
P (g/d)	39.6 <sup>cd</sup>	42.9 <sup>c</sup>	36.7 <sup>b</sup>	27.7 <sup>a</sup>	23.4 <sup>a</sup>
Zeolite A (g/d)	0	131	215	310	565

Recommendations of the GfE (2001): 53,5 MJ NEL/d, 1230 g nXP/d, 34 g Ca/d, 16 g Mg/d and 22 g P/d

a, b, c, d in lines; p < 0.05

- Feeding high zeolite A-doses had a stabilising effect on periparturient serum calcium concentration (> 2 mmol/l; Figure 1); the hypocalcaemia incidence is reduced significantly (Table 2)

- Low zeolite A dose of 12 g/kg DM had no preventive effect on the incidence of subclinical hypocalcaemia

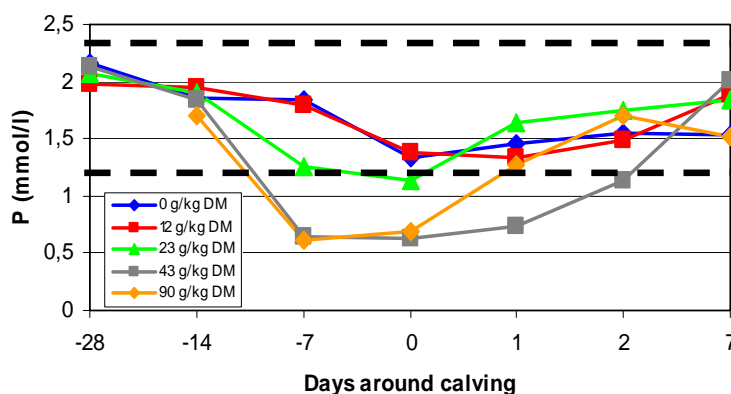


**Figure 1: Calcium concentration in blood serum around calving after different zeolite A supplementations**

**Table 2: Influence of feeding zeolite A on the incidence of subclinical hypocalcaemia**

zeolite A dose (g/kg DM)	0	12	23	43	90
Incidence of hypocalcaemia (%)	73	75	22	0	17

The phosphorus concentration in blood serum around calving was significantly reduced after addition of high zeolite A doses (43 and 90 g/kg DM; Figure 2).



**Figure 2: Phosphorus concentration in blood serum around calving after different zeolite A supplementations**

## Conclusion

A zeolite addition of 200-300 g per cow and day (20-30 g zeolite A/kg DM) seems to be the optimal dose for an effective prevention of subclinical hypocalcaemia in combination with only marginal negative side effects.