The effects of dietary energy concentration of dry period diet on the eating and rumination time of cows

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Introduction

- Restricting energy intake during dry period may alleviate metabolic problems of dairy cows after calving
  - Avoiding excessive fattening

- However, restriction of energy intake may affect eating and rumination behaviour of cows during early lactation;
  - carry-over effect to early lactation?
Materials and methods

- **Experiment** with 16 dairy cows in tie-stalls; **2 energy levels** during dry period
  - **HIGH**: grass silage ad libitum, ca 140% of energy requirement
  - **RESTR**: TMR (grass silage 55%; straw 40%; Rape seed meal 5%) ca 107% of energy requirement
  - Close-up feeding with added concentrate: 1-2 kg/d for 10 d
  - Similar feeding for all cows after calving

- Daily forage intake and eating behaviour was recorded using forage intake control system (Insentec BV).
- Daily rumination time was recorded using rumination monitoring system (Qwes-HR, Lely Industries).
- Weekly averages of measured eating and rumination parameters for each cow were used for repeated measures statistical analysis.
Dry matter and energy intake

Dry matter intake

Metabolizable energy intake

Before calving Trt: p < 0.01, trt x time: p = 0.64
After calving Trt: p = 0.12, trt x time: p = 0.72

Before calving Trt: p < 0.001, trt x time: p = 0.52
After calving Trt: p = 0.42, trt x time: p = 0.57
Neutral detergent fibre (NDF) intake and dietary NDF content

Before calving Trt: p = 0.70, trt x time: p = 0.29
After calving Trt: p = 0.71, trt x time: p = 0.56

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Rumination and eating time

Daily rumination time

Before calving Trt: p < 0.01, trt x time: p = 0.39
After calving Trt: p = 0.12, trt x time: p = 0.72

Daily eating time, dry period

Trt: p = 0.44, trt x time: p = 0.36

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**Eating behaviour**

**Number of meals, dry period**

![Graph showing number of meals over weeks relative to calving. Two lines represent different treatments: HIGH and REST. The HIGH line shows a decrease in number of meals, while the REST line shows a small increase. The Trt: p = 0.03, trt x time: p = 0.79.]

**Eating rate, dry period**

![Graph showing eating rate over weeks relative to calving. Two lines represent different treatments: HIGH and REST. The HIGH line shows an increase in eating rate, while the REST line shows a small decrease. The Trt: p < 0.01, trt x time: p = 0.76.]

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Rumination time per kg DM or per kg NDF

Before calving Trt: $p = 0.52$, trt x time: $p = 0.81$
After calving Trt: $p = 0.20$, trt x time: $p = 0.57$

Before calving Trt: $p < 0.01$, trt x time: $p = 0.82$
After calving Trt: $p = 0.16$, trt x time: $p = 0.73$
Conclusions

- Daily rumination time was primarily related to DM intake and not to dietary NDF content
  - In high-forage diets during dry period
- Inclusion of straw in the diet decreases rate of eating but it may not prevent the decrease of rumination time caused by restriction of energy intake
- Effect of particle size still have to be considered
Thank you for your attention!