

Milk production and grazing behaviour responses of dairy cows to partial mixed ration (PMR) supplementation

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Introduction

- Grazing dairy cows often supplemented with PMR: for which efficiency?
- **Objective : To determine the dose-response to PMR supplementation level** (few literature data).



Methods

- **Treatments: 0, 4 and 8 kg DM of PMR offered d⁻¹** (feeding : evening milking)
- PMR = 85% maize silage, 15% soyabean meal (DM basis)
- 3 × 3 Latin square design of 9 weeks in spring (April-June 2021)
- **24 multiparous Holstein cows in mid lactation**
- Temporary pastures: 80% grasses, **119 g CP** and 469 g NDF kg⁻¹ DM
- **Management: similar post-grazing sward height** (adapting pasture allowance)
- Sward height (plate meter): 15.8 cm pre-grazing and 6.5 cm post-grazing



Lifecorder Plus (accelerometer)

PMR offered, kg DM d ⁻¹	Refusals			Effect (P<)
	0	4	8	
PMR intake, kg DM d ⁻¹	0.0 ^a	3.5 ^b	6.1 ^c	0.04: Qua
Herbage allowance, kg DM d ⁻¹	20.7 ^a	16.5 ^b	14.1 ^c	0.01: Lin
Milk production, kg d ⁻¹	22.2 ^a	24.2 ^b	25.3 ^c	0.01: Lin
Milk fat, g kg ⁻¹	37.7 ^a	37.2 ^{ab}	36.5 ^b	0.02: Lin
Milk protein, g kg ⁻¹	29.2	29.4	29.5	0.07
Milk urea, mg L ⁻¹	120 ^a	140 ^b	155 ^c	0.01: Lin
Grazing time, min d ⁻¹	471 ^a	451 ^b	414 ^c	0.01: Lin
Day grazing time*, min	251 ^a	264 ^b	255 ^{ab}	0.01: Qua
Night grazing time**, min d ⁻¹	220 ^a	187 ^b	158 ^c	0.01: Lin

Average linear responses (per kg DM of PMR eaten) :

Milk production: + 0.52 kg d⁻¹
Milk fat concentration: - 0.2 g kg⁻¹
Milk urea concentration: + 6 mg L⁻¹

Grazing time: - 9 min d⁻¹
Night grazing time: - 7 min d⁻¹

* Between AM and PM milkings ** after PM milking + night

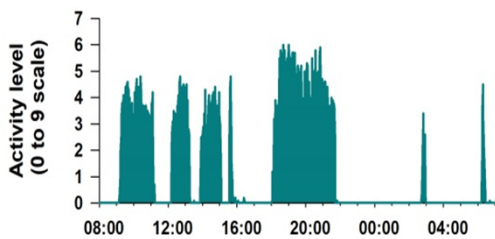


Figure 1: Example of daily pattern of grazing activity (one cow one day)

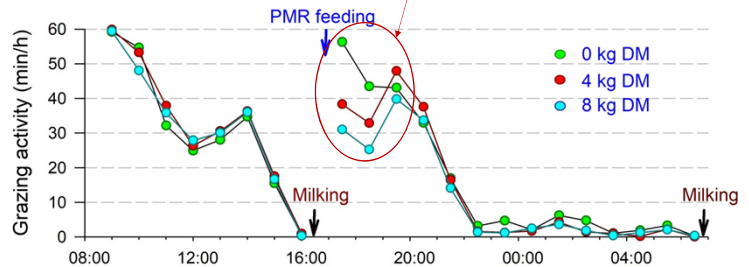


Figure 2: Daily pattern of grazing activity per treatment

Take-home message:

At similar post-grazing sward height and low herbage CP concentration → **positive and linear milk production response to PMR until 6 kg DM d⁻¹ eaten.**