

## Effects of physical form of total mixed rations on feed intake and eating rate in lactating dairy cattle

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**Introduction** Nowadays total mixed ration (TMR) is commonly provided to lactating cows rather than separate feeding of concentrate and forage (DeVries *et al.*, 2007). However, complete ingestion of feeds in proportion to dietary concentration is not taken due to sorting undertaken by cow. When diets are closely formulated to minimum recommendations, sorting could reduce intake of long particles and NDF intake which in turn results in decreasing chewing activity, rumen pH, and milk fat test. It seems that no relevant data are available on sorting activity of lactating dairy cattle fed a TMR. Cows have shown that they preferentially sort for the grain component of a TMR and discriminate against the longer forage components (Leonardi and Armentano, 2003). As pointed out by Osafo *et al.*, 1997, sorting by dairy cattle could also be affected by physical processing. The main objective of the present research was to determine effects of different physical forms of total mixed ration on feed intake and eating rate in lactating dairy cows.

**Material and methods** Three ruminal cannulated primiparous Brown Swiss cows with average days in milk 130, body weight 560 kg and daily milk yield 20 kg were randomly assigned to a 3\*3 Latin square. Three 21d periods were considered in the experiment. During each period (including 14d for adaptation and 7d for record collection) the animals were offered one of three TMRs. Ingredients and chemical composition were the same over the experimental diets (NE<sub>1</sub> 7.10 MJ/kg, CP 160 g/kg and NDF 365 g/kg). the diets were 1. TMR with mash concentrate 2. TMR with pellet concentrate and 3. Cubed TMR. The cows were fed at hours 08:00 and 20:00 *ad libitum*. Feed intake were measured daily during the each 7-d period of the collection. Orts from individual cows were collected daily for calculation of DMI and NDFI (NDF intake). On days 5 and 6 of each period, feed bunk contents of each animal were weighed at 0, 2, 4, 8, and 12 h after a.m. feeding to determine DMI, and NDFI.

**Result** There was no significant difference among the different treatments regarding DMI and NDFI. Cows fed with cube TMR showed higher DMI and NDFI compared to other treatments (Table 1). Intake of DM at 2, 4, 8 and 12 h postfeeding are presented in Table 2.

**Table 1** Effects of TMR physical form on DMI and NDFI

Case	Diets Mash	Pellet	Cube	SEM
DMI <sub>kg/day</sub>	19.31	18.45	19.99	0.412
NDFI <sub>kg/day</sub>	6.47	6.02	6.91	0.181

**Table 2** Effects of TMR physical form on DMI at 2, 4, 8, and 12 h post-feeding

Hour	Diets Mash	Pellet	Cube	SEM
2	5.03 <sup>a</sup>	7.82 <sup>b</sup>	5.03 <sup>a</sup>	0.326
4	6.75 <sup>a</sup>	9.16 <sup>b</sup>	7.15 <sup>a</sup>	0.329
8	10.15	10.87	9.87	0.329
12	12.09	12.36	12.71	0.326

Means within the same row with differing superscripts are significantly different P<0.05.

**Conclusion** It is concluded that cubed rations may increase DMI of lactating dairy cattle revealing the fact that increasing particle size of feed may increase sorting behaviour of the animal. Using pellet TMR could increase feed intake at early feeding hours.

### Reference

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