

Compact total mixed ration – effects on feed intake, rumen pH and milk production in dairy cows

Aim.

The aim of this study was to evaluate the effects of increased mixing and reduced dry matter (DM) content in a total mixed ration (TMR) on feed intake, milk production and rumen pH.

Material and methods.

Traditional TMR and compact TMR were fed to 40 mid-lactation dairy cows, including 4 rumen-cannulated cows, in a change-over experiment with randomized block-design. The two experimental periods consisted of two weeks for adaptation and one week for measurements. Dry matter content was 52% and 37% in the traditional TMR and the compact TMR, respectively. The silage:concentrate ratio was 60:40 according to organic standards and both diets contained (per kg DM): 12.5 MJ metabolizable energy, 187 g crude protein and 367 g neutral detergent fibre. Particle size was evaluated using the Penn State particle separator and rumen pH was measured manually in the cannulated cows every hour covering a 24h period.

Results.

Results of the change-over experiment on 40 lactating cows fed a traditional TMR or a compact TMR.

Presented as LSmeans and standard error of the mean (SEM)

Item	TMR	Compact TMR	SEM	P-value
DM in top sieve (> 19 mm, %)	32	6	1.7	0.001
DM intake (kg/day)	28.6	26.8	0.62	0.001
Total water intake (kg/day)	136.3	144.3	3.04	0.001
Milk yield (kg/day)	36.4	36.2	0.87	0.395
Milk fat (%)	3.83	3.71	0.01	0.239
Milk protein (%)	3.24	3.25	0.01	0.621
Rumen pH	5.8	5.7	0.11	0.638
Time below pH 5.8 (hours/day)	14.6	14.9	1.60	0.902

Conclusions.

Increased mixing time and addition of water to a TMR consisting of grass silage and concentrate (60:40) decreased particle size of the diet and decreased feed intake but did not have a significant effect on rumen pH or milk production.

Compact TMR.

In a compact TMR, water is added to the concentrate for a soaking process before forage is added and the TMR is mixed for about 30-40 minutes. The idea with soaking the concentrate is to make the small starchy particles stick better to the longer forage particles to prevent sorting of certain particles out of the mix.

