

## Impact of length of straw by the use of a straw mill on the selective feeding of young cattle and their effects for the cattle

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### Introduction

When feeding high quality silage to heifers from the age of two, there is a risk of energy oversupply. Depending on the feeding value or scarce availability of silage or corn silage diets with high proportions of straw is often incorporated. For an energetically standardized young cattle supply of straw proportion can be more than 20 % of dry matter. But with an increasing proportion of straw leave the animals increasingly the straw on the feeding barn. This can also be observed in limited feeding systems and a multi-day leave the straw in the manger is to be rejected from feeding hygienic point of view. The calculated energy and nutrient intake does not match the recorded. For this reason, it was investigated whether the grinding of straw with the straw mill selective feeding significantly limits.

### Material and methods

The investigation has been carried out with young cattle in the second year. 78 animals were kept and fed under similar conditions in two groups. The experimental group (EG) consisted of cattle 12 to 15 months and in the control group (CG), the cattle were 15 to 20 months old. Both groups have been supplied with a ration ad libitum during a two-week previous period. The straw in this ration was pressed with rotor-cut. The experimental feeding took place in five days feed distribution and residual feed were weighed. The ration of EG contained ground with the straw mill straw and CG was further fed rotor-cut pressed straw. The mean particle length of the straw after pressing with rotor-cut was 7.5 cm. The grinding of the straw, the average particle length has been reduced to 1.5 cm. components of TMR, filling quantity and mixing time of the feed mixer were the same for both groups.

To determine the selective seizure samples of feed distribution and the remaining food with the particle separator box and the crude protein- and energy-content have been determined. The ration was built by nutrient requirement directed 350 to 450 kg at 750 g/d daily live weight gain to the needs of young cattle by DLG (1999). It was fed to 5 % residual feed proportion. Table 1 show selected intake and Table 2 lists the components of Total Mixed Ration (TMR) are shown.

Table 1: Requirement of energy and protein by recommendations of DLG (1999) and results of intake by heifers in the experiment

	DLG (1999)	EG and CG
Dry matter intake (kg)	8.0	8.4
Energy intake (ME)	75	77
Intake of crude protein (g)	825	950

Table 2: Total mix ration of heifers in EG and CG

	kg/heifer/d	% T
Alfalfa-grass-silage, 4 cm length	12.0	55.9

Feeding straw	2.8	27.4
Crop silage (maize), 1 cm length	4.0	15.9
Mineral supplementation	0.1	0.1

## Results

The grinding of the straw increases the feed intake. In the EG an increase in feed intake was observed by the grinding of the straw. Feed intake directly on the day for changing the diet of long on ground straw increased by more than 2.0 kg of DM per animal. In the following days, the feed intake was increased by 0.9 kg DM per animal and day on average. This represents an increase of 12.2% (Table 3).

Tab. 3: Dry mater intake of heifers during the pre-period (3 days) and the experimental period (5 days measurement of feed intake)

		EG	CG
Pre-period	kg/TM/d	7.4	8.7
Experimental period	kg/TM/d	8.3	8.8
Differences	%	12.2	1.1

Table 4 lists the results from particle separator box the feed distribution and the residual feeds are presented. Between the EG and CG the sieved mass fractions of the feed distribution reflect the effect of grinding resist. The Group share of more than 19 mm in the EG 10%, whereas in the CG 23%. The results of the screen distribution of residual feed point to a differentiated feeding behavior between the groups. In the EG the particle length of the residual feed to a large extent with the template matches.

Table 4: Measurement of the particle length of TMR (fresh feed) and the residual feed rations (RFR) between the EG and CG

	EG		CG	
	TMR	RFR	TMR	RFR
Riddle 1 (>19 mm)	10 %	11 %	23 %	74 %
Riddle 2 (19 - 8mm)	49 %	56 %	39 %	21 %
Collecting tray (< 8mm)	41 %	33 %	38 %	5 %

The acid-base-balance (NSBA) values of EG are within normal limits (table 5). In comparison, the regulation effort is increased for maintaining acid and base balance in the CG. This is mainly due to the excess of bases. A preferred feeding on alfalfa-grass-silage in connection with the selecting of the straw from the TMR shifts the dietary-anion-cation-balance (DCAB) the ration of CG in basic direction. Also a possible intense rumination of the longer straw CG acts in the rumen basic. Both may have caused the increase in the NSBA of heifers in CG. For young cattle, this increase is not considered harmful to health.

Table 5: NSBA in urine of heifers in CG and EG

	NSBA (mmol/l)	Acid (mmol/l)	base (mmol/l)
Norm <sup>1</sup>	60-200	50-100	150-250
Control Group	220	67	293
Experimental Group	174	62	241

<sup>1</sup> by STAUFENBIEL et al. (2006)

## Conclusion

If straw shares of 25% and more are fed in rations to young cattle (heifers), the particle length of straw has a significant impact on the selective feeding behavior. A particle length of 1.5 cm compared to 7.5 cm long prevented straw certainly a discarding of the straw on the feeding barn. The feed intake increases when short straw is mixed into the TMR.