

A. Steinwigger, E. Zeiler, T. Guggenberge, J. Häusler, A. Schauer and L. Gruber (2003): **Effect of particle size and dry matter content of grass silage at different concentrate levels on feed intake, digestibility and ruminal fermentation patterns** 2nd Note: Feed intake and nutrient supply of dairy cows as well as discussion of total experiment (1st and 2nd communication) (in German). *Züchtungskunde*, 75, (3), 190-203.

### Summary

In a 3 factorial feeding experiment the effects of particle size (H, K, L) and DM content of grass silage (T35, T50) at different concentrate levels (K25, K55) on the feed intake and nutrient supply of dairy cows were studied. The experiment was conducted in two Latin squares (KF25 and KF55) over 6 periods of 14 days each. The different particle lengths of grass silages were achieved by using different harvesting techniques (H = crop chopper, S = short cut silage trailer, L = long cut silage trailer). The increase of the DM content of the grass silages from 35 % (T35) to 50 % (T50) was achieved by a longer field wilting period. The forage ration consisted of 60 % grass silage and 40 % corn silage and was supplemented by 25 % (K25) or 55 % (K55) concentrate. The effect of the DM content of the grass silage was only studied at high concentrate level.

The mean particle length of T35 grass silage (T35) was 38, 62 and 148 mm and that of T50 was 32, 61 and 141 mm in the groups H, K and L respectively. On an average the mean particle length of the total ration, regarding both grass silages (T35 and T50), was 20, 31 and 69 mm at low concentrate level (K25) and 13, 20 and 42 mm at high concentrate level (K55) in the groups H, K and L.

Feed intake, nutrient supply, milk yield and blood parameters were not influenced by either the particle size or the harvest techniques (H, K, L) of the grass silages. The increase of the dry matter content of the grass silage (groups T35 and T50) reduced the grass silage and forage intake significantly. In the groups T35 and T50 the forage intake was 12.5 and 11.3 kg DM, respectively. On the other hand the intake of concentrate and corn silage was higher in group T50 than in group T35. The total feed intake and energy intake were on the same level in both groups. In group T50 the milk yield tended to be higher than in group T35. The milk protein content as well as the yield of milk protein and lactose were higher in group T50. With the exception of  $\beta$ -hydroxy-butyric acid no significant effect of the DM content of the grass silage on blood parameters were found.

The increase of the concentrate level from 25 to 55 % of the total ration reduced the forage intake from 14.2 to 9.6 kg DM and increased the total feed intake from 19.8 to 21.8 kg DM. The energy concentration increased from 6.4 to 6.9 MJ NEL per kg DM. The XF, NDF and ADF content amounted to 19, 40 and 23 % in group K25 and 16, 34 and 19 % in group K55, respectively. The structure value was significantly reduced (1.8 or 1.2). Milk yield and milk composition did not significantly differ between the concentrate levels (25.7 and 27.9). The decrease of milk fat content from 4.77 to 4.24 % was nearly significant. The milk protein content was 3.42 and 3.65 %, respectively. The blood parameters were not influenced by the concentrate level.

**Keywords:** particle size, feed intake, milk yield, dairy cattle

### Zitat (Deutsch):

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