



## Effects of Two Different Chopping Lengths of Maize Silage on Silage Quality and Dairy Performance

K. Mahlkow

*Agricultural Chamber of Schleswig-Holstein, Germany*

J. Thaysen

*Agricultural Chamber of Schleswig-Holstein, Germany*

Follow this and additional works at: <https://uknowledge.uky.edu/igc>



Part of the [Agricultural Science Commons](#), [Agronomy and Crop Sciences Commons](#), [Plant Biology Commons](#), [Plant Pathology Commons](#), [Soil Science Commons](#), and the [Weed Science Commons](#)

This document is available at <https://uknowledge.uky.edu/igc/20/satellitesymposium2/59>

The XX International Grassland Congress took place in Ireland and the UK in June-July 2005.

The main congress took place in Dublin from 26 June to 1 July and was followed by post congress satellite workshops in Aberystwyth, Belfast, Cork, Glasgow and Oxford. The meeting was hosted by the Irish Grassland Association and the British Grassland Society.

Proceedings Editor: D. A. McGilloway

Publisher: Wageningen Academic Publishers, The Netherlands

© Wageningen Academic Publishers, The Netherlands, 2005

The copyright holder has granted the permission for posting the proceedings here.

# Effects of two different chopping lengths of maize silage on silage quality and dairy performance

K. Mahlkow and J. Thaysen

Agricultural Chamber of Schleswig-Holstein, 24101 Kiel, Holstenstr. 106-108, Germany Email: kmahlkow@lksh.de

**Keywords:** maize silage, chopping length, dairy performance

**Introduction** Maize silage harvested at dough stage contains less fibre structure than grass silage. Due to higher proportions of maize silage in dairy rations and due to the fact that with longer chopping length of maize silage the contribution of fibre structure increases. The objective of this study was to assess the effect of two chopping lengths in the silage on animal performance with respect to feed intake, milk yields and ingredients as well as physiological effects of digestion.

**Materials and methods** A mixture of two varieties of maize was harvested in early September 2003 at the experimental station 'Futterkamp'. One half of the maize silage was chopped with a length of 7 mm (CL 7), the other with a length of 22 mm (CL 22). The processing of the kernels during the chopping process was identical for both chopping lengths. Expecting a lower density of the stack with CL 22 mm the compaction weight was increased by nearly 90%. Both silages were consolidated identically with 0.19 t DM/m<sup>3</sup>, which was 25% below the target value. After a storage period of 120 d the silages were fed in a total mixed ration consisting of 9 kg DM/d maize silage, 3.7 kg DM/d grass silages, 10 kg DM/d energy components and 280 g/d minerals to 2 x 32 cows in the stage of early lactation. The trial was conducted over 112 d. Feed intake of each cow was recorded daily, milk yield and ingredients once per week. Physiological parameters were assessed 3 x during the experiment.

**Results** Fermentation characteristics, aerobic stability and microbial composition indicated a medium quality for both silages, and a sufficient similarity for the dairy feeding trial (Table 1). Although the compression effort of the silage CL 22 mm was enhanced, the density was below target value. Except the feed intake all items of yield and physiology including weight change of the animals (results not shown) of the dairy feeding experiment were not significantly different (Table 2). During the experiment both rations containing the differently treated maize silages were analysed for homogeneity of particle size and fibre structure. It was proven, that the applied feeding technique guaranteed the ration with both chopping lengths effectively.

**Table 1** Effect of 7 and 22 mm chopping length on mean silage parameters of maize silages<sup>1</sup>

Parameter	CL 7	CL 22
DM content (%)	36 <sup>a</sup>	37 <sup>a</sup>
pH value	3.9 <sup>a</sup>	4.0 <sup>a</sup>
Lactic/Acetic acid	7.4 <sup>a</sup>	5.7 <sup>b</sup>
NH <sub>3</sub> N/total N (%)	6 <sup>a</sup>	6 <sup>a</sup>
DM-losses (% DM)	7.5 <sup>a</sup>	7.1 <sup>a</sup>
Aerobic stability (days)	1.2 <sup>a</sup>	1.0 <sup>a</sup>
Stability losses (% DM)	11.8 <sup>a</sup>	11.7 <sup>a</sup>
Yeasts (log cfu/g FM)	6.5 <sup>a</sup>	6.6 <sup>a</sup>
Moulds (log cfu/g FM)	5.4 <sup>a</sup>	5.6 <sup>a</sup>

<sup>1</sup>different superscripts indicate statistical significant differences ( $P > 0.05$ )

**Table 2** Effect of 7 and 22 mm chopping length on mean parameters of dairy cows fed maize silages

Parameter	CL 7	CL 22
Feed intake (kg DM/day)	21.6	20.6
Milk yield (kg/day)	36.1	35.5
Milk fat (kg/day)	1.55	1.51
Milk protein (kg/day)	1.16	1.16
NSBA (mmol/L urea)	134	116
β-hydroxybutyric acid (mmol/L serum)	0.70	0.72
Bilirubin (μmol/L serum)	3.29	3.17

**Conclusions** For maize silage of >35% DM content harvested at dough stage the enhancement of the chopping length up to 22 mm had no influence on dairy performance in terms of yield and animal health. This is in agreement with data from the literature (Onetti *et al.*, 2003).

## References

Onetti, S.G., R.D. Shaver, S.L. Bertics & J.J. Grummer (2003). Influence of corn silage particle length on the performance of lactating dairy cows fed supplemental tallow. *Journal of Dairy Science* 86, 2949-2957.