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Improving food & health

SiloSolve® FC beats the heat and decreases DM loss in maize silage

Introduction

Heating is one of the most common problems in silage. Particularly at feed out it is difficult to control the heating as air enables the aerobic yeasts and molds to grow. *Lactococcus lactis* O224 has proven to reduce oxygen much faster than any other known bacterial strains, and thereby facilitates the inhibition of spoilage microorganisms. Growth of yeasts and molds will result in heating of silage due to breakdown of dry matter. Certain yeasts and molds are reduced by acetic acid. *Lactobacillus buchneri* DSM22501 is well-known for its ability to produce both lactic and acetic acid. Together these two strains serve well at improving aerobic stability at feed out.

Research objective

The objective of this study was to determine the effect of SiloSolve® FC on the aerobic stability in maize silage.

Materials and methods

A research trial was conducted at the Institute of Animal Science LVA, Lithuania, to evaluate the efficacy of SiloSolve® FC on fermentation and aerobic stability of maize silage. Maize with a dry matter content of 32,6% was chopped by a forage harvester under farm conditions to a length of 2 cm and ensiled in mini silos. Two treatments each of five replicates were included in the trial. Untreated corn and corn inoculated with SiloSolve® FC at a dose of 150.000 CFU/g of fresh forage. Within 2 hours from crop preparation, mini silos were filled with approximately 3 kg fresh cut maize, sealed and fermented for 90 days at a constant temperature of 20°C. At day 90 the DM content was determined and a 30-day aerobic stability test was performed. Aerobic stability is determined by monitoring the temperature increase in silages stored in insulated PVC-tubes at 20°C ambient temperature.

Results and discussion

SiloSolve® FC contains *L. buchneri* DSM22501 which provides a controlled level of acetic acid. This leads to inhibited growth of yeasts and molds (Table 1). If yeasts and molds are not controlled, the temperature of the silage will increase when the silage is exposed to air (at feed out). Aerobic stability is determined by the amount of time it takes the silage temperature to exceed the ambient temperature with more than 3°C. Heat is created due to breakdown of nutrients by spoilage microorganisms. The untreated silages were the first to exceed ambient temperature, 236 hours after aerobic exposure. The temperature for the SiloSolve® FC treated silage did not exceed the ambient temperature throughout the 30 day aerobic exposure challenge (Figure 1). The benefit from improved aerobic stability is a decrease in DM loss. In this study there is a 4% point decrease in DM loss for the treated silage compared with the untreated silage (Table 2).

Table 1. Fungi in silage, 90 days of fermentation

TREATMENT	MOLDS, LOG CFU/G	YEASTS, LOG CFU/G
Untreated	3,32	3,63
SiloSolve® FC	1,25*	1,41*

*Significant difference for treated vs. untreated (P<0,05).

Figure 1. Effect on aerobic stability

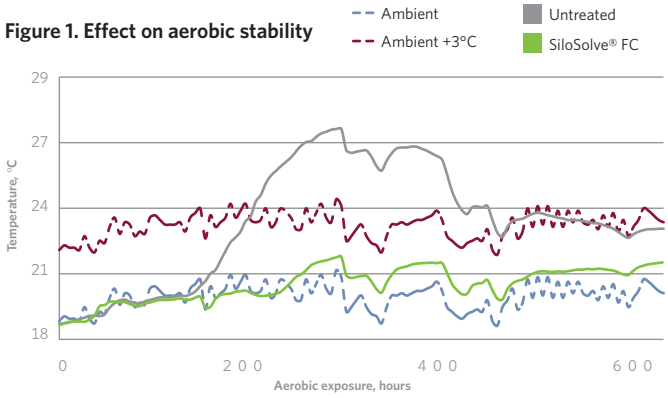

Table 2. DM loss in the silage on day 90

TREATMENT	DM LOSS (%)
Untreated	10,22
SiloSolve® FC	6,2*

*Significant difference for treated vs. untreated (P<0,05).

Conclusion

SiloSolve® FC reduces the number of spoilage microorganisms such as yeasts and molds, shown immediately as an improvement of the aerobic stability. The indirect effect of inhibiting yeasts an molds is a decreased dry matter loss, preserving the high quality nutrients for the dairy cows. Therefore, addition of SiloSolve® FC could be an economic advantage for dairy producers around the world.

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