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Effect of grass/legume silage treated with SILOSOLVE® FC on aerobic stability of total-mixed ration.

By: Ivan Eisner,
Senior Product Manager, Silage Inoculants

Take home message

Total-mixed rations are prone to heat already after a few hours if they contain silages prepared without additives improving the aerobic stability.

Introduction

Excellent compaction, sealing and a fast feed out rate makes it possible to keep silage cool in the bunker at least till time of ration mixing. However, the problems may occur later in the barn. Very often the feed starts to heat already after a few hours after mixing. It negatively affects the feed intake, performance and health of the animals. High amounts of feed residuals containing not only silages but also more expensive ingredients such vitamins and concentrates end up on the muck heap.

Sometimes, due to feed shortage, farmers need to open the silage bunker early. Those silages are prone to fast aerobic deterioration. The poor aerobic stability of the silages will impact the quality of the total-mixed ration (TMR) and subsequently the animal performance. Silage inoculants can be used for enhancing hygiene and aerobic stability of the silages. Usually, ensiling trials investigate the effect of silage additives on fermentation and aerobic stability of silages only. The objective of the recent studies of Copani *et al.* (2019a, 2019b) was to evaluate the effects of a silage inoculant on hygiene, aerobic stability, and subsequent impact on TMR stability after 8 or 120 days of silage fermentation, respectively.

Trial results

Wilted grass/legume mixture was ensiled into big bales and wrapped in 6 layers of plastic film. The control bales with no inoculant, and the experimental bales, inoculated with SILOSOLVE® FC containing 50:50 of *L. buchneri* (DSM22501) and *Lactococcus lactis* (DSM11037), were stored outside for 8 d or 120 days. Bales were tested for fermentation parameters, hygiene and aerobic stability. The aerobic stability was performed on unwrapped bales by monitoring the temperature increase inside the mass until they reached +3°C above T ambient. TMRs containing 54% treated or untreated silage and 46% compound feed on dry matter basis were prepared after 1, 3, and 5 days of aerobic exposure of the bales, respectively.

The aim of the trial design should simulate situations in the field when the silage removal from the bunker happens from the total front daily or partially day by day along the bunker face. TMR temperature was monitored for 24 h. Compared with untreated bales, SILOSOLVE® FC treated bales reported higher acetate level and lower yeast and molds. Temperature measured for 24 hours in TMR prepared from silages after 8 days of fermentation and opened for 1, 3 and 5 days is shown in the Figures 1-3. SILOSOLVE® FC improved the aerobic stability of the TMR after 3 and 5 days of aerobic exposure of the bales, while no differences were observed on temperature of the silages themselves before TMR preparation. These results demonstrate that the use of SILOSOLVE® FC improves silage hygiene and TMR stability after a short period of fermentation. Similar results were achieved when the silages were fermented for 120 days.

Additionally, the data demonstrate that a low temperature of the silage in the bunker does not ensure stable TMR, if the silage was prepared without the additive for improved aerobic stability. This study suggests that even less optimal bunker face management allows a stable TMR if silage is inoculated with SILOSOLVE® FC.

Figure 1: Temperature of TMR prepared from silage immediately after unwrapping

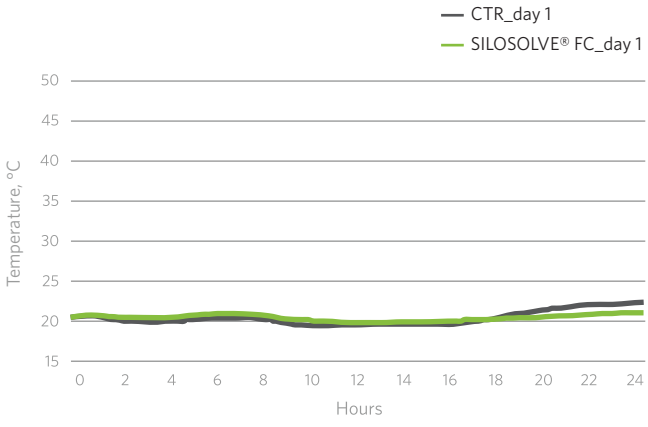


Figure 2: Temperature of TMR prepared from silage after 3 days of aerobic exposure

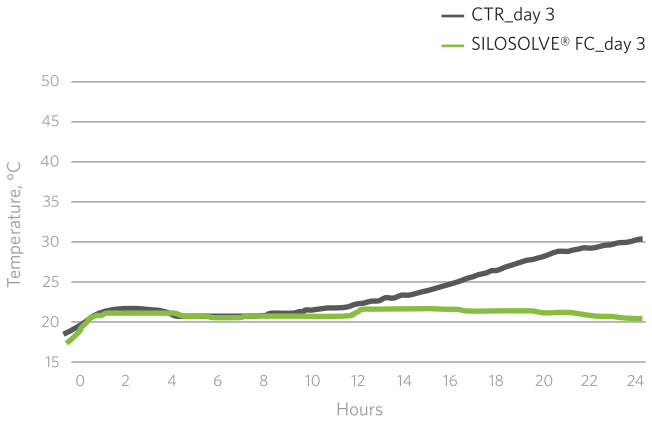
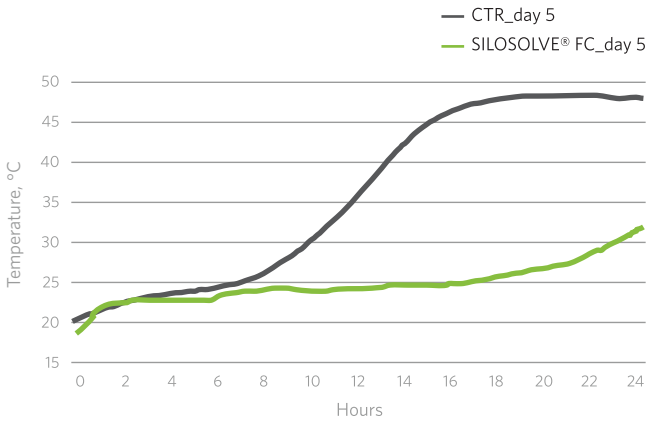


Figure 3: Temperature of TMR prepared from silage after 5 days of aerobic exposure



References

Copani, G., Witt, K., Eisner, I., Vrotniakiene, V., Jatkauskas, J. 2019a. The effects of a silage inoculant on aerobic stability and quality of grass/legume mixture fermented for 8 days and the impact on total mixed ration stability. J. Dairy Sci., 102 (1), 104.

Copani, G., Eisner, I., Segura, A., Witt, K., Vrotniakiene, V., Jatkauskas, J. 2019b. Effects of applying lactic acid bacteria on fermentation quality and aerobic stability of forage-based total mixed ration silage. International Symposium on Forage Quality and Conservation, Brazil.