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Research article

Effect of bacterial inoculants and their combination with enzymes and chemical additives on fermentation characteristics and ensiling period of maize silage

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Abstract

The study aimed to investigate effect of bacterial inoculants and their combinations with exogenous enzymes and chemical additives on the fermentation characteristics of maize silage at various ensiling periods. Five treatments were prepared *viz*., bacterial inoculant *Lactobacillus plantarum* (LP) and *Lactobacillus fermentum* (LF) (control), combination of LP+LF with xylanase enzyme (X), combination of LP+LF with cellulase enzyme (C), combination of LP+LF with X+C and combination of LP+LF with propionic acid (PA). Among the treatments, LP+LF+X+C additive treated silage had minimum dry matter loss throughout ensiling period. There was no significant difference in pH between LP+LF+X+C and LP+LF+X treated silage, but numerically pH value was lower in LP+LF+X+C treated silage. Lactic acid content significantly declined as ensiling period progresses but there was no significant difference among LP+LF+X+C, LP+LF+X treated silage and 15th, 25th days of ensiling. Lactic acid to acetic acid ratio was significantly improved in LP+LF+X+C treated silage as compared to other treatment combinations. The microbial count of silage was increased up to the 15th day of ensiling. This study concluded that desirable pH, lactic acid and flieg point required for good quality silage could be achieved on 15th day of ensiling in silages treated with LP+LF+X+C and LP+LF+X additive combination.

Keywords: Bacterial inoculant, Chemical additive, Exogenous enzyme, Maize silage