

FERMENTATION QUALITY OF RYE SILAGE AFTER MICROBIAL ADDITIVE SUPPLEMENTATION

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Abstract

The production of ruminants and its efficiency is largely influenced by the quality of silage, and one of the possibilities of improving the quality of silage is the addition of additives. The aim of this study was to demonstrate the impact of microbial additive from the homofermentative strains of lactic acid bacteria (*Pediococcus acidilactici*, *Lactobacillus paracasei* and *Lactococcus lactis*), on the fermentation profile of silage from whole-crop rye.

After wilting and chopping rye, the mass was ensiled into bags, with two forms of silage: variant C (control silage) and variant I (silage with inoculant addition). 2 g of additive, mixed with 25 ml of water were added to 1 t of mass. The average samples were collected after 18 months of storage, and the corresponding methods were performed to analyze dry matter content (after drying at 103 ± 2 °C), concentration of fermentation acids (ion electrophoresis) and products (formula (FP) = volatile fatty acids + lactic acid + alcohols), pH (microdiffusion method), acidity of water extract (alkalimetric titration), and the degree of proteolysis (formula (DP) = $(\text{NH}_3\text{-N} / \text{N total}) \times 100$). ANOVA and Tukey test were used to determine the differences between mean values and the level of statistical significance ($P < 0.05$) between differences.

Statistically significant ($P < 0.05$) higher value lactic acid, fermentation products and acidity of water extract, was found in a silage treated with inoculant. On the contrary, the concentration of acetic acid, alcohols, pH value and degree of proteolysis was statistically significant ($P < 0.05$) lower in silage with additive supplementation.

The results showed that addition of inoculant had desirable response on fermentation profile of rye silage and could be applied on ensilaged matter of this character.

Key words: Whole-crop rye, Silage quality, Microbial additive.