

THE EFFECT OF THE BACTERIAL INOCULANT ON THE ENSILED LUCERNE FERMENTATION CHARACTERISTICS, MICROBIAL POPULATION AND THE AEROBIC STABILITY IN THE MINI-SILOS

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Abstract. The aim of this study was to determine the effect of the inoculants containing homo-fermentative and hetero-fermentative lactic acid bacteria *Lactococcus lactis* and *Lactobacillus buchneri* on the ensiled in laboratory silo lucerne fermentation characteristics, microbial population and the aerobic stability. Combination of ensiled material and the inoculant was replicated five times when determining the chemical composition and aerobic stability in the silage. Addition of the inoculant resulted in a higher dry matter (DM) content ($P<0.01$), higher crude protein content ($P<0.05$) and a higher ($P<0.01$) total fermentation acids concentration. Lactic and acetic acids concentration were significantly higher ($P<0.01$) in inoculated silage when compare with the control silage. The inoculant has decreased ($P<0.01$) the levels of undesirable fermentation products such as the butyric acid, ammonia-N and ethanol and significantly ($P<0.01$) decreased dry matter loss. The inoculation significantly lowered the yeasts ($P<0.05$) and moulds count ($P<0.01$) and significantly increased lactic acid bacteria (LAB) count ($P<0.01$) compared to the control silage 120 days after ensiling as well as after 30 days of the aerobic exposure. Inoculated silage was more ($P<0.05$) resistant to aerobic deterioration.

Keywords: aerobic stability, fermentation, inoculant, lucerne, silage.