ABSTRACT

Purwaningsih, Ika. 2015. **The Influence of Fermentation's Duration and the Adding of Inoculum *Lactobacillus plantarum* and *Lactobacillus fermentum* Toward the Silage Quality in Kalanjana Grass (*Brachiaria mutica* (Forssk.) Stapf).** Thesis. Department of Biology, Faculty of Science and Technology, Maulana Malik Ibrahim State Islamic University of Malang. Advisor: Dr. Hj. Ulfah Utami, M.Si, Islamic Advisor: Andik Wijayanto, M. Si

Keywords: Silage, Kalanjana grass, fermentation's duration, *L. plantarum, L. fermentum,* silage quality.

One of the ways to solve the deficiency of forage on dry season is doing the preservation to material forage in a silage form. Silage is a preservation process of a forage saved in a silo on anaerobic condition. The production principle of silage is fermentation of forage of a microbe producing lactic acid. *L. plantarum* is known as a bacteria used in silage making process, like wise *L. fermentum.* The adding of inoculum *L. plantarum* and *L. fermentum* are expected to optimize the ensilage process, thus obtained the good quality of silage. Beside the adding of inoculum, the duration of fermentation also influenced on the silage quality because when fermentation process happens, the nutrient content of materials changes. The aim of this research is to know the influence of fermentation's duration and the adding of inoculum *L. plantarum* and *L. fermentum* as a single inoculum or mix inoculum toward the silage quality of Kalanjana grass.

The experimental design of this research is Completely Randomized Design with the 2 treatment factors and three times of replay. The first factor is the inoculum type consist of 4 treatment factors (K0= without adding the inoculum, K1= *L. plantarum*, K2= *L. fermentum*, and K3= the combination of *L. plantarum* and *L. fermentum*) and the second factor is fermentation's duration consist of 3 treatment factors (L1= 14 days, L2= 21 days, and L3= 28 days). The data analysis technic is using Two Way ANOVA (Analysis of Variance) and continuous test is using Duncan's Multiple Range Test (DMRT) 5%. The observation parameter of this research is the changes of color, texture, scent/odor, and the growth of yeast/mold, pH, temperature (°C), crude protein (%CP), crude fiber (%CF), and water content (%WC).

Based on the result of ANOVA, the data shows that there is a significant difference ($P<0,05$) on the variation treatment of inoculum and fermentation's duration. The treatment of K3L2 (*L. plantarum* + *L. fermentum*, 21 days) has a better result than another treatment from physical quality and chemical quality. Based on the physical quality the color is brownish green, smooth texture, scented fresh acids, and only found a bit of mold on the surface of the silo. While based on the chemical quality has crude protein 17,840%, crude fiber 12,865%, and water content 51,588%.