

EFFECT OF LACTIC ACID PALM LACTIC BACTERIA ON SILAGE QUALITY

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INTISARI

Kualitas silase dipengaruhi berbagai faktor, termasuk bakteri asam laktat sebagai starter dalam proses fermentasi. Tujuan penelitian ini adalah untuk mengetahui pengaruh isolat bakteri asam laktat dari nira lontar terhadap kualitas silase. Metode yang digunakan dalam penelitian ini adalah pembuatan probiotik, pembuatan silase dan pengujian kualitas silase. Penelitian ini dilakukan dalam 5 perlakuan yang diulang sebanyak 3 kali dan menggunakan bahan utama pembuatan silase yaitu seluruh tanaman jagung. Data yang diperoleh dianalisis secara deskriptif dan disajikan dalam bentuk gambar. Hasil penelitian menunjukkan bahwa silase berwarna hijau kecokelatan, memiliki aroma segar, adanya kerusakan silase kurang dari 1%, dan terjadi penurunan derajat keasaman (pH) pada perlakuan. Berdasarkan hasil penelitian dapat disimpulkan bakteri asam laktat dari nira lontar yang digunakan sebagai starter memberikan efek yang baik terhadap kualitas silase jagung.

Kata kunci : bakteri asam laktat, nira lontar, silage, fermentation.

INTRODUCTION

Lactic acid bacteria are a group of Gram-positive bacteria, which are not spore, catalase negative, tolerant of acids and produce lactic acid as the main end product of the fermentation process (Sandi & Salasia, 2016). The lactic acid bacteria generally exist in an environment and a decrease in pH due to the production of lactic acid (Suryani et al., 2014). The pH of

food can drop below 4.0 which is low enough to inhibit the growth of most other microorganisms including pathogenic microbes, thus extending the shelf life of the product (Sadiq et al., 2014).

Lactic acid bacteria can inhibit the growth of other bacteria by producing a protein called Bacteriocin (A. Detha et al., 2020; Hernández-Aquino et al., 2019).

Acid formation in the metabolic products of lactic acid bacteria can reduce the pH value, and result in inhibition of the growth of pathogenic microbes and destroyers that cannot stand the atmosphere (Datta *et al.*, 2019; Detha *et al.*, 2019; Detha *et al.*, 2018). Lactic acid bacteria can be used as a starter for the manufacture of corn silage (Ávila *et al.*, 2014; Bernardes *et al.*, 2018; Ferraretto *et al.*, 2018; Foeh *et al.*, 2019). Silage is the process of preserving animal feed with a

fermentation process to preserve the fruit which has a long shelf life (Allen *et al.*, 2015; Broberg *et al.*, 2007; Elferink *et al.*, 2000; Moran, 2004; Santi *et al.*, 2015). This research was conducted with the aim of detecting the lactic acid bacteria isolated from palm sap can be used as a starter in the manufacture of maize forage silage, and to determine the quality of maize silage given lactic acid bacteria isolated from palm sap with stratified concentrations.

METHOD

The research was carried out from July 2018 to January 2019 which included the use of lactic acid bacteria from palm sap in corn silage fermentation, organoleptic testing and testing of dry silage materials. This research was conducted at the Dryland Integrated Laboratory of the University of Nusa Cendana for the chopping process of maize plants. Utilization of lactic acid bacteria from lontar sap in corn silage fermentation, organoleptic testing at the Laboratory of Animal Disease and Veterinary Public Health, Faculty of Veterinary Medicine, Nusa Cendana University and dry matter testing at the Bio-Science Laboratory of Nusa Cendana University.

This type of research uses observational and experimental methods. Where in this study an observation method will be carried out regarding the quality of silage

based on color and aroma while the experimental method includes observations on changes in the degree of acidity (pH), the level of silage damage and measurement of dry matter weight. This study used a completely randomized design with 5 treatments and 3 repetitions for each treatment. T0 = Control treatment (without lactic acid bacteria), T1 = 5% concentration of lactic acid bacteria, T2 = 10% concentration of lactic acid bacteria, T3 = 15% concentration of lactic acid bacteria, T4 = 20% concentration of bacteria Lactic acid palm sap

Preparation of Prebiotics and Concentration of Lactic Acid Bacteria by Type of Treatment

The prebiotics used are derived from palm oil. To make 1 L of lontar juice diluent is to weigh as much as 100 mL of lontar juice then

mix it with 900 mL of sterile distilled water. Prebiotics are obtained by mixing lactic acid bacteria from palm juice with lontar juice thinner. Then, the concentration of prebiotics was divided according to the type of treatment in silage, namely in the concentrations of 5%, 10%, 15%, and 20%. Preparation of a 5% prebiotic concentration was carried out by mixing 50 mL of lontar palm sap as a starter with 950 mL of lontar juice diluent. Furthermore, to make a

10% prebiotic concentration, 100 mL of lontar palm juice lactic acid bacteria are mixed with 900 mL of lontar juice diluent. After that, the preparation of a 15% prebiotic concentration was carried out by mixing 150 mL of lontar juice lactic acid bacteria with 850 mL of lontar juice diluent, and making a 20% prebiotic concentration of 200 mL of lactic acid bacteria mixed with 800 mL of lontar juice diluent.

RESULT AND DISCUSSION

Quality Color of Silage

The color of the silage can indicate a change in the fermentation process so that it can be used as an indicator in organoleptic silage testing. The results of the observation of the mean value given by 4 respondents to the silage color test were treated with different concentrations of lontar palm juice lactic acid bacteria. The average value at T0 is 2.8, T1 is 2.9, T2 is 3.0, T3 is 2.6, T4 is 2.3. The color range of corn plant silage is yellowish green and brownish green which indicates a good quality silage color (Dunière et al., 2013). Good quality silage color close to the original color. So that there is a yellowish color in this study due to the color of the corn kernels which are used as the basic material for making silage.

Aroma Silage

The aroma of silage has a

close relationship in the ensilage process, so that it can be used as an indicator of organoleptic testing on silage. The results of the average value given by 4 respondents to the silage aroma test were treated with different concentrations of lontar palm juice lactic acid bacteria. The average value at T0 is 1.8, T1 is 2.4, T2 is 2.6, T3 is 2.8, T4 is 2.8. In Table 9, the average value at T0 is 1.4, T1 is 2.3, T2 is 2.4, T3 is 2.6 and T4 is 2.6. This is possible because, in the T0 treatment, lactic acid bacteria were not added so that there was no formation of lactic acid. The aroma of good quality silage is a fresh sour aroma which is characteristic of high lactic acid, but if there is decay in the silage it can cause the smell of butyric-smelling silage (Detha et al., 2019).

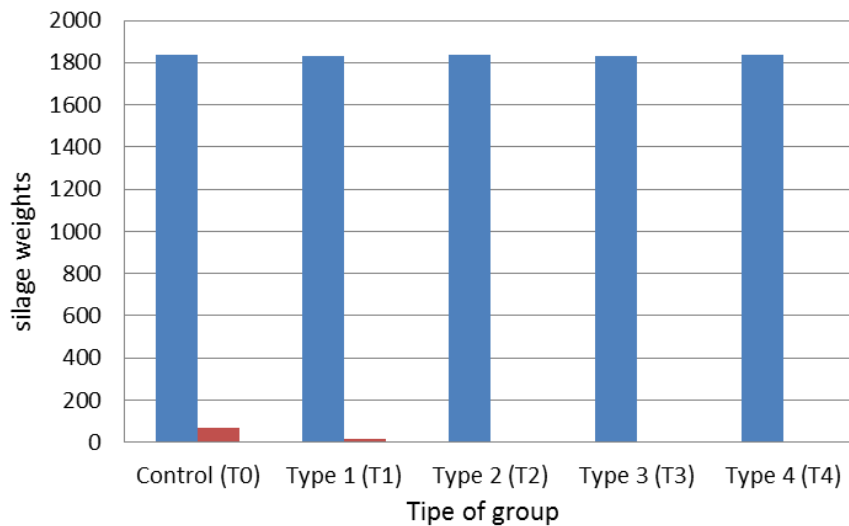
Silage Damage Presentation

The value of the percentage of silage damage was calculated

from the total silage that had fungal contamination. Fungal contamination of the silage was found on the surface of the plastic jar. The results of the presentation of silage damage can be seen in Table 1. Based on the results of the calculation of the percentage of silage damage in Table 10, it shows that the average damage is still small at T0 (0.67 gr) and T1 (0.17) with a percentage calculation

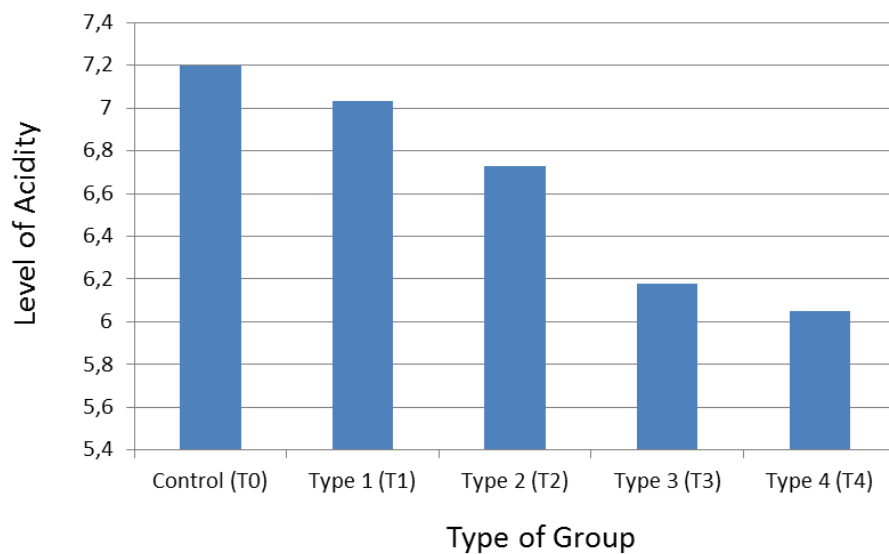
of 0.00%, so that overall the presence of fungi in the silage of maize plants still a little moldy. Good silage has a soft surface and is not moldy. The less dense packing process during silage storage can allow air to enter and aerobic bacteria growth will occur so that it will form a rotten and moldy surface layer.

Figure 1. Results of Silage Damage



Degree of Acidity (pH)

Figure 2. Level of Acidity in group (pH)



Testing the acidity of silage is very important in the main assessment of the success of making silage. The results of the average value of silage pH testing with the treatment of different concentrations of lontar palm juice lactic acid

bacteria in silage. Based on the results showed that there was a significant effect ($p < 0.05$) on the pH test of silage with different concentrations of lactic acid bacteria from palm sap on silage. The best pH value in Table 2 is at T4 (6.05).

CONCLUSION

Based on the results of this study, it can be concluded that the lactic acid bacteria contained in palm sap can be used as a starter in the manufacture of green maize silage which is indicated by the presence of brownish green silage color and the aroma of silage which shows a fresh sour aroma; maize forage silage

given lactic acid bacteria isolated from palm sap with a concentration of 15%, gave the best silage quality compared to other treatments shown in organoleptic testing both color and aroma, damage testing on silage, testing dry matter and the degree of acidity (pH).

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