

Effects of different treatments on the quality of pangolagrass haylage in medium-size bales covered with plastic membranes ⁽¹⁾

Shu-Min Wang ⁽²⁾⁽³⁾ Tsui-Huang Yu ⁽²⁾ and Chia-Sheng Chen ⁽²⁾

Received: Jun. 13, 2022; Accepted: Nov. 7, 2022

Abstract

The purpose of this study was to investigate the effects of dry matter content, inoculation and storage period on the quality of pangolagrass haylage in medium-size baled covered with plastic membranes. Each factor had two levels as follows: low dry matter content (below 40%, haylage processing in the morning) vs. high dry matter content (above 40%, haylage processing in the afternoon); control (no inoculation) vs. inoculation (commercial inoculum, *Lactobacillus plantarum*, *Lactobacillus casei*, 2×10^8 cfu/kg), and short-term storage (within 2 months) vs. long-term storage (6 months and above), for the comparison of fermentation performance. Each treatment processes 4 plastic membranes. The results showed that there was major significant effect regardless of the inoculation, the level of dry matter content, and storage time. There was no significantly individual interaction effect other than the acetic acid content. The inoculation treatment could increase the ratios of lactic acid/acetic acid and reduce the butyric acid contents of pangolagrass haylage. The lactic acid/acetic acid ratios of inoculation treatment increased from 2.8 to 7.3 and from 5.2 to 9.2, and the percentages of equivalent butyric acid in the total volatile fatty acid (VFA) decreased from 6.4% to 0.7% and from 1.4% to 0.5% under low dry matter and high dry matter rates, respectively. The inoculation treatment could achieve better preservation effect. From the comparison of storage period, the results showed that the lactic acid/acetic acid ratios of the control treatment (without inoculation) decreased from 4.3 to 1.3, and the percentages of equivalent butyric acid in the total VFA increased from 3.4% to 9.3% at low dry matter content 6 months after storage, respectively. The results indicated that the fermentation quality was reduced, while the inoculation treatment could reduce the degree of poor fermentation. According to the results, the fermentation quality of pangolagrass haylage in medium-size bale covered with plastic membrane was better when the dry matter content was adjusted to 35 - 65% after a short period of wilting. However, considering the changes of weather and the flexibility of hay processing, the grass could be wrapped directly after cutting. The lactic acid bacteria inoculation was recommended and used as soon as possible. The diameter of the medium-size haylage bale was 90 cm, and the weight of the whole bale was 160 - 200 kg, which was 30 - 40% of the original hay bales with diameter 120 cm. Haylage bales with such size were easier to be operated on small herbivore such as goat or deer farm for less loss on less feeding.

Key words: Pangolagrass, Haylage, Fermentation quality.

(1) Contribution No. 2721 from Livestock Research Institute, Council of Agriculture, Executive Yuan.

(2) Hengchun Branch, COA-LRI, Pingtung 94644, Taiwan, R. O. C.

(3) Corresponding author, E-mail: smwang@mail.tlri.gov.tw.