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Evaluation of Fermentation Quality of the Rice Straw Silage Made by Using Lactic Acid Bacteria and Hay Bacillus

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[Introduction]

Our government has been encouraging the stock farm to use coarse fodder such as rice and grass in order to resolve instability of supply and demand and supply high quality fodder. The production of a high quality silage is a chance to increase competitiveness of domestic fodder. So, it is necessary to produce a good silage. In general, lactic acid has been used for a production of silage. It could decrease pH of gross fodder under 4 to restrain bad strain growth at an anaerobic state. Therefore, the objective of this trial was to select elite strain suitable to silage production of rice straw among lactic acid and hay bacillus.

[Materials and Methods]

The rice straw used in this study was obtained from Korea farmer, which were harvested in 2016. The silage from rice straw was produced and analyzed every 10 days until 60 days. The strains were obtained from Agri-Food Pprocessing Lab of JARES. It consists of 7 lactic acids and 5 hay bacillus. Among them, the Cheong Mi Rak To is a Control. The color of silage was measured using a colorimeter. The pH values was determined by using a digital pH meter. The protein content was analyzed using Kjeldal method. A sensory evaluation, smell, was performed by using the guidelines and procedure.

[Results and Discussions]

In the present study, we produced silage of rice straw by using lactic acid bacteria (7) and hay bacillus (5). Since then, we analyzed the silages every 10 days until 60 days. As to color, there was no difference among samples compared to Control (Cheong Mi Rak To, yellowish) except M17 showing pale brown (lactic acid) with naked eyes in 10 days. The hay bacillus was an aerobe. So, an air was injected while making silage of rice. It made silage discolored from yellowish to dark. From this result, we thought that bacillus spp. was not suitable to produce silage of rice straw. About smell, Cheong Mi Rak To showed the best record from the beginning to last day and followed by M17 of lactic acid. The bacillus spp. given off bad smell. The pH of silage was pretty similar among samples made by lactic acid and silage's pH produced by bacillus spp. was higher than that of former. As for Hunter's color, the sample untreated with strain recorded 3.85 and samples treated with strain such as lactic acid bacteria and bacillus spp showed a range of 5.33~6.01. The protein content (%) in M17 strain was 4.86, which was higher than that of Cheong Mi Rak To (4.75). It is a significant difference at 5%. As a result to date, a strain-innoculation resulted in physicochemical changes of silage and demonstrated that M17 can be used as silage additive for rice straw instead of Cheong Mi Rak To. From now on, relative feed value and organic acid were analyzed to select the best strain to replace Cheong Mi Rak To.

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