

OPTIMIZING RICE BRAN AND PADDY HUSK POWDER TO ENHANCE DRY MATTER CONTENT AND ENSILING CHARACTERISTICS OF CORN SILAGE

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The dry matter (DM) content of corn silage is crucial for dairy cow productivity as it directly influences nutritional intake. This study evaluated the impact of rice bran (RB) and paddy husk powder (PHP) as additives to enhance DM, shelf life, and cost-effectiveness of corn silage. The study was a three-factor factorial layout in a complete randomized design with four replicates. Two additives; RB and PHP were incorporated into the corn silage at three levels (5%, 7.5% and 10%). Ensiling was allowed for three distinct periods (30, 45 and 60 days). The control samples were prepared without adding additives. After designated periods, silage samples were analyzed for proximate composition and pH. Physical properties (smell, texture and color) were measured to determine the shelf life. Data were analyzed using ANOVA and regression models. Results indicated that while the type of additive and ensiling period had no significant effect on the DM of corn silage, the additive level showed a significant influence ($p < 0.001$). The two-way interaction between additive type and ensiling time had a significant effect ($p = 0.013$) on the crude protein content of corn silage. All two-way interactions significantly influenced ($p < 0.001$) crude fiber content of corn silage. Regression results revealed incorporating 1% of additive accounted for a 0.58% increase in DM ($\beta_1 = 0.58$). Analysis of physical properties revealed corn silage incorporated with RB has a shelf life of 60 days, while silage with PHP remained stable for up to 45 days. The 10% PHP-incorporated corn silage (Rs.28.20 per kg) exhibited the lowest production cost compared to the 10% RB-incorporated corn silage (Rs.38.20 per kg). This study concludes that incorporating RB and PHP enhances the DM content of corn silage, with 10% PHP being the most cost-effective option, while RB provides a longer shelf life.

Keywords: Additives, Anaerobic condition, Cost-effective, Inclusion rate