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Fermentative profile of soybean silages treated with molasses and microbial inoculant

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Key words: acetic acid, butyric acid, lactic acid, NH₃-N, pH

Introduction Legume silages can be interesting alternatives for animal feed, mainly in times of high prices of concentrates. Nevertheless, legumes were regarded as being unsuitable for ensiling as the fermentation was invariably dominated by clostridia leading to a butyrate-type silage (McDonald et al., 1991). The addition of microbial inoculant in association with carbohydrate-rich additives can stimulate the lactic acid bacteria development, reduce losses and improve the fermentation quality of the silage.

Material and methods The study was located at the Federal University of Viçosa, Brazil (20°45'40" S and 42°51'40" W) from February 2007 to May 2007. After harvest, soybean plants were chopped and ensiled in 2 kg PVC silos. A 6 × 4 factorial arrangement (six fermentation periods × four additives) was used in a complete randomized design, with three replications. The fermentation periods were 1, 3, 7, 14, 28 and 56 days. Four additives were evaluated: 1-control (no additive); 2-microbial inoculant (I; Sil All of Alltech); 3-I + molasses (2,5%); 4-molasses (2,5%). It was evaluated silages pH and concentrations of NH₃-N, acetic acid and butyric acid.

Results and discussion There was effect (P < 0.05) of fermentation periods and additives for pH, while the NH₃-N and the organic acids contents were affected by the interaction of these factors. The pH values decreased exponentially as fermentation period increased (Figure 1a). However, the pH decreasing rate is lower than those recorded by Pereira et al. (2007) in tropical grass silages. It can be attributed to high buffer capacity of legumes as compared to grasses. The butyric (Figure 1b), acetic and lactic acids contents increased linearly with the fermentation.

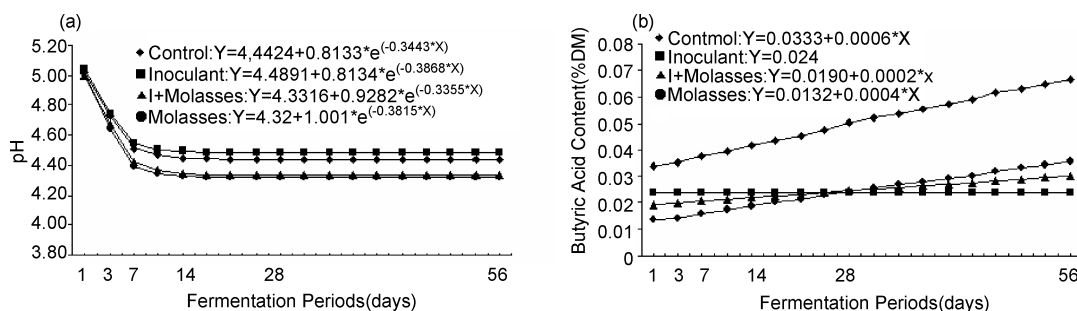


Figure 1 Estimated values of pH (a) and butyric acid content (b) in soybean silages treated with different additives in six periods of fermentation.

Conclusions The use of microbial inoculants and molasses, associated or not, improves the fermentation quality of soybean silages. However, the uses of molasses depend on economic factors.

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