

Feasibility evaluation of utilizing by-products of gac fruit (*Momordica cochinchinensis*) as silage ⁽¹⁾

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Abstract

This experiment used the by-products of the gac fruit (*Momordica cochinchinensis*) to make silage, in attempt to increase additional value of gac fruit and reduce the environmental problems caused by agricultural waste. The experiment mixed different proportions of gac fruit by-products, wheat bran and brewer's grains as silage raw materials, and conducted a total of 5 treatments, including A (10:0:0), B (9:1:0), C (8:2:0), D (5:1:4), and E (4.5:1:4.5). Silos were opened after 30 and 90 days of storage. The results show that different treatments all had an impact on the nutritional content and organic acid composition of the silage. Adding wheat bran or brewer's grains to gac fruit by-products could increase the dry matter (DM) and crude protein (CP) of silage while reducing the acid-detergent fiber (ADF). Among the treatments, the neutral-detergent fiber (NDF) and ADF contents after silage were higher than those before silage. The lactic acid content and lactic acid/acetic acid ratio of treatments A, B, and C were significantly higher than those of treatments D and E with a high proportion of brewer's grains. Moreover, the pH values of treatments A, B, and C were significantly lower than those of treatments D and E. The silage quality of 5 treatments after opening were all above the acceptable level (41 score) of Flieg's score for silage, while treatments A, B, and C reach the excellent level. To sum up the above, the by-products of gac fruit could be preserved through silage. The use of silage could also increase the value of silage. Adding wheat bran and brewer's grains not only adjusted the moisture content of silage but also improved the nutritional composition of silage. Taking into account the operating cost and silage quality, the addition of 10% wheat bran would be the optimal treatment combination.

Key words: *Momordica cochinchinensis*, By-products, Silage.

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