

***In sacco* and *in vivo* evaluation of marula (*Sclerocarya birrea*) seed cake as a protein source in commercial cattle fattening diets**

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Abstract

The deciduous marula (*Sclerocarya birrea* subspecies *caffra*) trees are abundant in the lowveld of Swaziland where the ripe fruits are used to make a local alcoholic beverage (buganu). Marula seed cake (MSC) is a residue remaining after the extraction of oil from marula kernels. Although it is generally accepted that MSC is rich in protein, the quality of this protein and hence its nutritional value to ruminant animals is largely unknown. This study, therefore, evaluated the *in sacco* degradability of MSC protein and its potential as a protein source in fattening rations for feedlot cattle.

In the first experiment the *in sacco* degradability of MSC protein was evaluated by incubating MSC-containing nylon bags in the rumen of goats. The effect of particle size on degradability of MSC protein was also assessed by incubating unmilled and milled MSC. An increase in the immediately degradable fraction (a) was observed in milled MSC. However, milling reduced ($P < 0.05$) the slowly degradable (b), potential degradable (PD) and effectively degradable (ED) fractions of dry matter and nitrogen in MSC. In the second experiment, three iso-nitrogenous diets were evaluated *in vivo* using dairy weaners reared in feedlots. Weaners were offered a commercial fattening ration (with urea as a N source) (CFR-U), commercial fattening ration in which urea was wholly replaced with MSC (CFR-MSC) or commercial fattening ration in which MSC and urea contributed equal amounts of N (CFR-MSC+U). The growth rate, total feed intake and feed conversion efficiency of dairy weaners did not differ ($P > 0.05$) between the 3 diets. CFR-U, CFR-MSC and CFR-MSC+U promoted similar average daily gains of 1.62, 1.75 and 1.82 kg, respectively. It was concluded that replacing urea, as a source of N, with MSC did not reduce the feed value of commercial fattening ration, therefore MSC can be used in place of urea in resource-poor communities to reduce feed costs and possible incidences of urea poisoning in feedlot animals.

Key words: dairy weaners, feedlot cattle, growth performance, particle size, rumen degradability