

EFFECTIVENESS OF ALKALINE TREATED, WHOLE MAIZE FOR EARLY WEANED *BOS INDICUS*-CROSS CALVES

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Schlink *et al.* (1988) showed that early weaning reduced lactational anoestrous, and calves weighing 50-60 kg at weaning could be successfully reared using maize-based supplements. Calves fed milled maize have a higher rate of liveweight gain compared with calves fed the equivalent amount of molasses (Schlink 2002). However, most cattle properties do not have grain-crushing equipment. Schlink (1990) reported that short-term alkaline treatment (sodium hydroxide; NaOH) of whole grain maize significantly improved the rate of DM disappearance from nylon bags. The present experiment examined the potential of short-term alkaline treatment to improve the efficiency of utilisation of whole grain maize when fed to early weaned *Bos indicus*-cross calves.

The experiment was carried out in covered pens at Lansdowne Research Station (19°40'S, 146°48'E). Twenty four early weaned *Bos indicus*-cross steer calves (61 kg mean liveweight) were housed, 2 to a pen, and allocated 1 of 3 diets. The maize-based diets (with either whole, milled or NaOH treated grain) consisted of 18.4% hammer milled *Stylosanthes hamata*/grass hay, 50.6% maize, 23.4% formaldehyde treated sunflower seed meal, 4.6% molasses, 0.45% mineral mix and 0.4% limestone on an as-fed basis. Sodium chloride was added to the whole and milled grain diets to ensure they were iso-sodic with the NaOH treated grain diet. The NaOH treated grain was prepared 24 hours prior to feeding by soaking whole grain in 0.65 L of 0.06% NaOH/kg of maize, and mixed with the other components of the diet immediately prior to feeding. All diets were fed at approximately 120% of expected daily intake, and water was available *ad libitum*. Weekly measurements of liveweight and intake were made. Prior to weighing on day 84, rumen samples were collected and analysed for volatile fatty acids. After the 84-day growth phase, the calves were individually housed to determine apparent DM, OM and starch digestibilities.

Table 1. Mean (\pm se) liveweight, daily DM intake, ratio of intake to liveweight gain (intake:gain), and DM, OM and starch digestion for calves fed whole, milled or sodium hydroxide (NaOH) treated whole grain.

Diet	Whole grain	Milled grain	NaOH treated grain
Day 84 weight (kg)	122 \pm 10	132 \pm 4	125 \pm 10
Dry matter intake (kg)	2.70 \pm 0.3	3.26 \pm 0.26	2.54 \pm 0.18
Intake:gain ratio	3.75 \pm 0.07 ^a	3.88 \pm 0.11 ^a	3.36 \pm 0.08 ^b
Dry matter digestion (%)	65.4 \pm 0.9 ^a	61.4 \pm 0.7 ^b	64.0 \pm 0.9 ^a
Organic matter digestion (%)	66.4 \pm 0.9 ^a	62.1 \pm 0.8 ^b	65.2 \pm 0.9 ^a
Starch digestion (%)	68.7 \pm 0.7	61.7 \pm 0.7	60.2 \pm 4.6

Means in the same row with different superscripts are significantly different (P<0.05)

Liveweight change and DM intake were similar regardless of grain treatment (Table 1). However, alkaline-treatment of grain did significantly improve the efficiency of use of maize compared with whole or milled maize grain. Milling of grain significantly reduced DM and OM digestibilities (Table 1) compared with both forms of whole maize grain. Acetic, propionic, and butyric and valeric acid concentrations in rumen fluid were not significantly affected by the form of maize grain in the diet.

This experiment shows that early weaned calves can be successfully weaned onto diets that use short-term alkaline treated maize that lead to a significant improvement in feed efficiency.

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