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SHORT COMMUNICATION

GROWTH PERFORMANCE OF GROWING DAIRY HEIFERS FED FRESH MULATO II (*Brachiaria ruziziensis* x *B. decumbens* x *B. brizantha*) AND MOMBASA (*Panicum maximum* Jacq. cv. Mombasa) COMPARED TO NAPIER (*Pennisetum purpureum* Schum.)

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ABSTRACT

Fresh Mulato II, Mombasa and Napier grasses were fed to three groups of growing heifers to compare the average daily gain (ADG), average daily dry matter intake (DMI), body condition scores (BCS), wither height and hip height after 120 days feeding period. Total protein and phosphorus intakes were highest in Napier-fed animals while highest total fat intake was obtained from Mombasa. However, results showed no significant differences in the ADG, average daily DMI, wither height and hip height among the three groups of animals fed with the three grasses. Significant differences between the beginning and ending BCS of the animals per treatment were noted. The present study showed that any of the three grasses may be fed to growing dairy heifers without any negative effect on growth performance.

Key words: ADG, body condition score, growing dairy heifers, Mulato II, Mombasa, Napier grass

The provision of consistent quality feed to growing heifers plays an important role in their growth and development which are reflected in the milk production and reproductive performance of these animals (Heinrichs *et al*., 1970). Heifers that grow slow will enter the milk line late and hence, contribute to farm losses.

Forages are considered as the cheapest feed resource for ruminants, such as cattle, goats and buffaloes, wherein they consume 60% - 80% forages in their diet. Mulato II and Mombasa are relatively new improved grasses in the country. Mulato II has shown high tolerance in prolonged periods of drought (Hare *et al*., 2009) as well as tolerance of soil acidity (Argel *et al*., 2007). It also produces significantly more green leaf during the dry season (Hare *et al*., 2013a). Mombasa is a tall and leafy cultivar of Guinea grass with good drought and cold tolerance (Hare *et al*., 2013b). Currently, there is limited information on the performance of dairy animals fed with these two grasses. A comparison of these

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new improved grasses with Napier grass, the common forage fed under stall feeding system (Kabirizi *et al*., 2013), with regard to their effects on the feed intake, weight gain and body condition of growing dairy heifers was necessary.

Twelve (growing heifers were blocked by initial body weight and were randomly distributed to three treatments: Treatment 1 – Napier grass, Treatment 2 – Mulato II grass and Treatment 3 – Mombasa grass. The animals were individually-stalled for 120 days with a 20-day transition period (total of 140 feeding days). The animals were weighed weekly using a digital weighing scale while wither and hip height measurement and BCS were obtained bi-monthly. Wither height and hip height were measured using a measuring stick and level bar while body condition scoring was performed following the method described by Penn State University. The amount of feeds offered (dry matter of roughage and concentrates) was 3% of the body weight of each animal. Roughage was harvested and chopped every morning and fed twice daily to the animals while concentrates were fed every morning. Water was made available at all times.

Refusals were weighed and recorded every morning. The feed offered were analyzed for crude protein, neutral detergent fiber, crude fat, calcium and phosphorus contents from weekly pooled samples. The total intake of these nutrients was computed based on the resulting values determined through laboratory analyses.

Average daily DMI, ADG, wither height, hip height data and nutrient intake were subjected to Analysis of Variance while BCS was analyzed using paired t-test.

Presented in Table 1 are the growth parameters used in the evaluation of the performance of growing dairy heifers and the total nutrient intake fed with the three grasses. There were no significant differences in the ADG, average daily DMI, increase in wither height and hip height after the 90 day-feeding period in animals fed with Napier, Mulato II and Mombasa grass. The total nutrient intake of the animals from the three treatments were comparable for neutral detergent fiber (NDF) and calcium (Ca). Total crude protein (CP), fat and phosphorus (P) intake was, however, significantly different ($P<0.05$). Growing animals fed with Napier grass had the highest total protein and total phosphorus intake compared to the other two grasses while those fed with Mombasa grass had the highest total fat intake.

Significant differences were found in the BCS of growing dairy heifers per treatment wherein the BCS was improved during feeding per treatment (Table 2). Therefore, Mulato II and Mombasa grasses can be used as replacement for Napier grass since the performance of growing dairy heifers were at par with the control.

The growth performance of growing dairy heifers fed with Mulato II and Mombasa were comparable to those animals fed with Napier grass. Therefore, the two newly-introduced grasses may be fed to growing dairy heifers without reducing their growth performance.

Table 1. Growth performance analyses and total nutrient intake of growing dairy heifers fed with Napier, Mulato II and Mombasa grasses.

Parameters	Napier Grass	Mulato II Grass	Mombasa Grass	*P*-Value
Average daily gain, kg^{ns}	0.51 ± 0.03	0.46 ± 0.02	0.50 ± 0.07	0.5930
Increase in wither height, cm^{ns}	11.10 ± 0.75	9.30 ± 1.80	10.40 ± 1.28	0.6797
Increase in hip height, cm^{ns}	12.63 ± 1.42	12.13 ± 0.88	12.03 ± 0.19	0.8037
Average daily DMI, kg^{ns}	3.54 ± 0.33	3.15 ± 0.23	3.69 ± 0.29	0.1317
Total protein intake, kg	182.73 ± 17.21^{a}	133.42 ± 9.75^{b}	144.76 ± 11.42^{b}	0.0100
Total fat intake, kg	51.01 ± 4.80^{b}	50.34 ± 3.68^{b}	73.38 ± 5.79^{a}	0.0021
Total NDF intake, kg^{ns}	1259.46 ± 118.64	1129.15 ± 82.50	1301.65 ± 102.65	0.1767
Total calcium intake, kg^{ns}	7.41 ± 0.70	6.47 ±0.47	6.81 ± 0.54	0.2076
Total phosphorus intake, kg	6.41 ± 0.60^{a}	5.04 ± 0.37^{b}	5.59 ± 0.44^{ab}	0.0362

^{ab}means with different superscripts are significantly different (*P*-value<0.05)

^{ns}not significant

Table 2. Body condition scores per treatment of growing dairy heifers fed with Napier, Mulato II and Mombasa grasses.

Treatment	Beginning BCS	Ending BCS	*P*-Value
Napier	3.69 ± 0.19^{a}	4.00 ± 0.14^{b}	0.0154
Mulato II	3.19 ± 0.19^{a}	3.88 ± 0.13^{b}	0.0351
Mombasa	3.31 ± 0.19^{a}	3.94 ± 0.06^{b}	0.0304

^{ab}means with different superscripts are significantly different (*P*<0.05)

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