

# INVESTIGATION INTO THE PRECISION FEEDING AND PERFORMANCE OF NGUNI CATTLE IN A FEEDLOT ENVIRONMENT

## Introduction and background

The Nguni breed is well-known in South-Africa especially for their low production cost and ability to market a good grade carcass off the veld. Feedlots prefer medium- to late maturing breeds and discriminate against Nguni cattle, which is an early maturing breed. They pay less per kilogram live mass than for other breeds. Major feedlots are either not accepting Nguni weaner calves or pay significantly less for them.

**The aim** of this study was to determine the most suitable ration and performance for Nguni calves under feedlot conditions.

The trial was run at Sernick feedlot, near Edenville. 200 Nguni young male calves were sourced from 24 breeders from five provinces and divided into four groups of 50 each. Each group were fed a different feeding regime: Starter (high roughage), grower (medium roughage), finisher (low roughage) and a feedlot grower commercial (low roughage) ration. They were backgrounded in the pre-conditioning phase for 32 days and received *ad lib* *Eragrostis* grass. After 105, 120 and 135 days these calves were slaughtered when they reached acceptable carcass subcutaneous fat classification (A2) according to their weight, body condition and visual appearance.

## Rations

Chemical composition of rations on dry matter intake (DMI) basis:

	Commercial low roughage diet (Control)	Low roughage diet	Medium roughage diet	High roughage diet
	Green Group	Yellow group	Orange Group	White Group
Dry material (%)	87	86	86	86
Metabolizable energy (MJ/kg)	11.6	11.5	10.9	10.4
Crude protein (CP)	14.3	14.2	14.7	14.4
Neutral resistant fibre (%)	22.5	23.3	28.5	33.6
Fat (%)	4.7	4.4	4.1	4.0
Calcium (%)	0.75	0.71	0.72	0.74
Phosphorus (%)	0.37	0.37	0.36	0.35

Raw material composition of rations:

	Low roughage diet (Yellow Group)	Medium roughage diet (Orange Group)	High roughage diet (White Group)
Maize meal	40 200	32 000	24 800
Hominy Chop	20 800	20 800	20 800
Feedmol	10 300	10 300	10 300
Finishing-off concentrate	15 000	15 000	15 000
Eragrostis	8 600	16 500	23 700

### Results: Rations

The low roughage group had the lowest average intake per animal per day, while the high and medium roughage groups had the highest average intake per day.

	<b>Intake (kg/day)</b>
High roughage intake	9.31
Medium roughage intake	9.24
Low roughage intake	8.80
Commercial low roughage	9.10

Calves on the commercial ration did significantly better than the calves on the other rations for ADG (average daily gain) at slaughter (1.34 vs 1.24-1.27), total gain at slaughter (159 vs 147-150), end weight (7 to 11 kg heavier) and carcass weight of 204 kg vs 196 – 198 kg for the other rations.

	<b>Ration cost (R/ton )</b>
High roughage intake	3 530
Medium roughage intake	3 641
Low roughage intake	3 773
Commercial low roughage	3 745

Although the low roughage and commercial rations were more expensive per ton, the animals fed on them were the most profitable.

### Results: Carcass

- The heavier animals at arrival were slaughtered first at 105 days.
- The 105 day group was significantly heavier, but not significantly older than the other groups at the start of the test.
- The 120 & 135 day groups never reached the weights of the first slaughter group despite growing for 2-4 weeks longer.

	<b>ADG (kg/day )</b>
105 days	1.51
120 days	1.23
135 days	1.10

### Results: RTU measurements – Jani de Vos, University of Pretoria

- The aim was to determine whether RTU measurements can be a sufficient predictor for carcass traits in Nguni cattle raised in feedlots.
- Real time ultrasound measurements:
  - Marbling (intra muscular fat)
  - Fat depth (inter muscular fat)
  - Eye muscle area (EMA)
- Rib fat, eye muscle area (EMA) and rump fat was measured at 72 and 91 days
- Animals slaughtered at 105 days was at A2 carcass grade

<b>VARIABLE</b>	<b>MEAN ± SE</b>	<b>MINIMUM</b>	<b>MAXIMUM</b>
Start weight (kg)	225.3 ± 2.9	184	288
Slaughter weight (kg)	378.7 ± 2.5	325.5	444.0
ADG (kg/day)	1.6 ± 0.1	1.2	2.0

<b>VARIABLE</b>	<b>MEAN</b>	<b>MINIMUM</b>	<b>MAXIMUM</b>
Rump fat (mm)	6.0 ± 0.1	3.5	8.8
Rib fat (mm)	3.9 ± 0.1	2.1	6.6
EMA (cm <sup>2</sup> )	56.0 ± 0.5	44.0	69.0

	<b>Current study</b>	<b>Comparative Nguni studies</b>	<b>Other breeds</b>
Slaughter weight (kg)	225.3	220 - 390	413 - 440
ADG (kg/day)	1.6	1.08 – 1.5	1.28 – 1.8
EMA (cm <sup>2</sup> )	56.0	68.1 – 70.2	75.9 – 84.8

## **Conclusion**

- The heavier calves at the beginning of the feedlot phase, had a shorter feeding period and reached marketability quicker. The ADG is better and the carcass weight are heavier.
- Nguni calves performed the best in the group with the most expensive ration (Low roughage and commercial rations) and also made the biggest profit due to the shorter feeding time and faster growth.
- Nguni cattle can be fed profitable in the feedlots with a low- and commercial roughage ration.
- Arrival weight had a market influence on test length and margin over feed costs, favouring the heavier calves.
- Growth and carcass weights of calves with higher arrival weights were heavier and met market requirements.
- Nguni cattle can reach acceptable performance in feedlots.
- Results indicate that the minimum weight at arrival should be close to 200kg with an absolute minimum of 180kg.
- Average slaughter weight for Nguni tend to be lower compared to composites generally used in feed lots.
- RTU measurements compared well to previous studies and could be used to predict slaughter weight of Nguni cattle.