Selection index for prediction of dressing percentage in Nguni cattle using RTU measurements

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Introduction

The Nguni is an indigenous small framed breed adapted to sub-tropical conditions and mostly farmed under extensive production systems. In order to add value to the use of the breed, a trail was conducted to evaluate growth and carcass traits in Nguni cattle finished under feedlot conditions. Real time ultrasound (RTU) measurements are routinely used for prediction of carcass traits on the live animal. It is a cost effective and non-invasive measurement compared to methods such as post slaughter evaluations

Selection Index at 72 days:

DP = 51.4 + 0.15 EMA + 0.14 BF - 0.01 SLAUGHTERWEIGHT

R^2 = 0.27

Selection Index at 91 days:

DP = 52.3 + 0.12 EMA + 0.17 BF - 0.0008 SLAUGHTERWEIGHT

R^2= 0.17

Aim

To compile a selection index for predicting **Dressing Percentage (DP)** at a 120 days slaughter (A2 grade) based on RTU measurements.

Material and methods

- Data was provided from the trail with consent of the Nguni breed society and Ethical approval (EC170627-135)
- 200 Nguni bulls were finished in a commercial feedlot using a standard feedlot ration
- RTU measurements were recorded at 72 and 91 days on test
- RTU measurements included back fat (BF) and eye muscle area (EMA)
- Live weight, slaughter weight and warm carcass weight were recorded at slaughter
- Statistical analyses was performed using SAS (9.4) Enterprise guide, selection indices were constructed as a mixed model using regression and ANOVA
- Fit diagnostics were used to test whether the models fit - compares predicted values with actual values

Results

Table 1 Summary statistics of traits measured

Measured traits		Mean	SD
Slaughter age (days)		429	44.3
Slaughter weight (kg)		347	33.7
Dressing percentage		56.1	0.12
EMA (cm^2):	72 days	49.2	0.5
	91 days	52.4	5.7
Back fat (mm):	72 days	3.2	0.1
	91 days	3.5	0.9

- Two selection indices were constructed to predict the dressing percentage
- The selection indices accounts for differences in measurements at 72 days on test and 92 days on test
- Selection indices are applicable when animals are slaughtered at 120 days on test

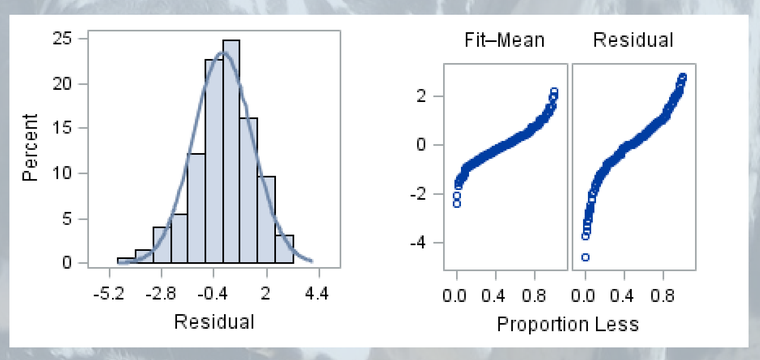

Figure 1 Model validation graphs for predicting DP at 72 days on test. On the left is a histogram displaying the normal distribution of the residuals. Next is the R-F spread plot. From these two graphs it can be concluded that this model fits and can be used as a sufficient predictor

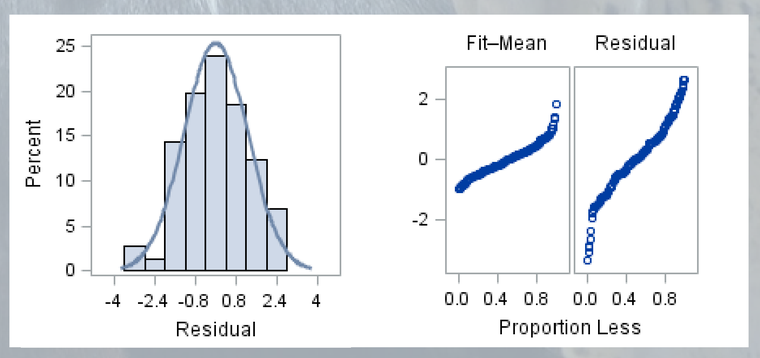

Figure 2 Model validation graphs for predicting DP at 91 days on test. On the left is a histogram displaying the normal distribution of the residuals. Next is the R-F spread plot. From these two graphs it can be concluded that this model fits and can be used as a sufficient predictor.

Conclusion

- RTU measurements at 72 days on test improved the prediction compared to the RTU measured at 91 days.
- The results suggest that the earlier RTU measurements are better predictors of dressing percentage for Nguni cattle in a feedlot compared to measurements closer to slaughter
- Other studies have shown that real-time ultrasound measurements are good predictors of meat yield.
- It has also been reported that accuracy of prediction tends to decrease with RTU measurements recorded closer to slaughter, similar to this study.

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