

# **Is a 35-day feeding test with automatic daily weighting good enough for evaluating beef cattle for feed efficiency traits?**

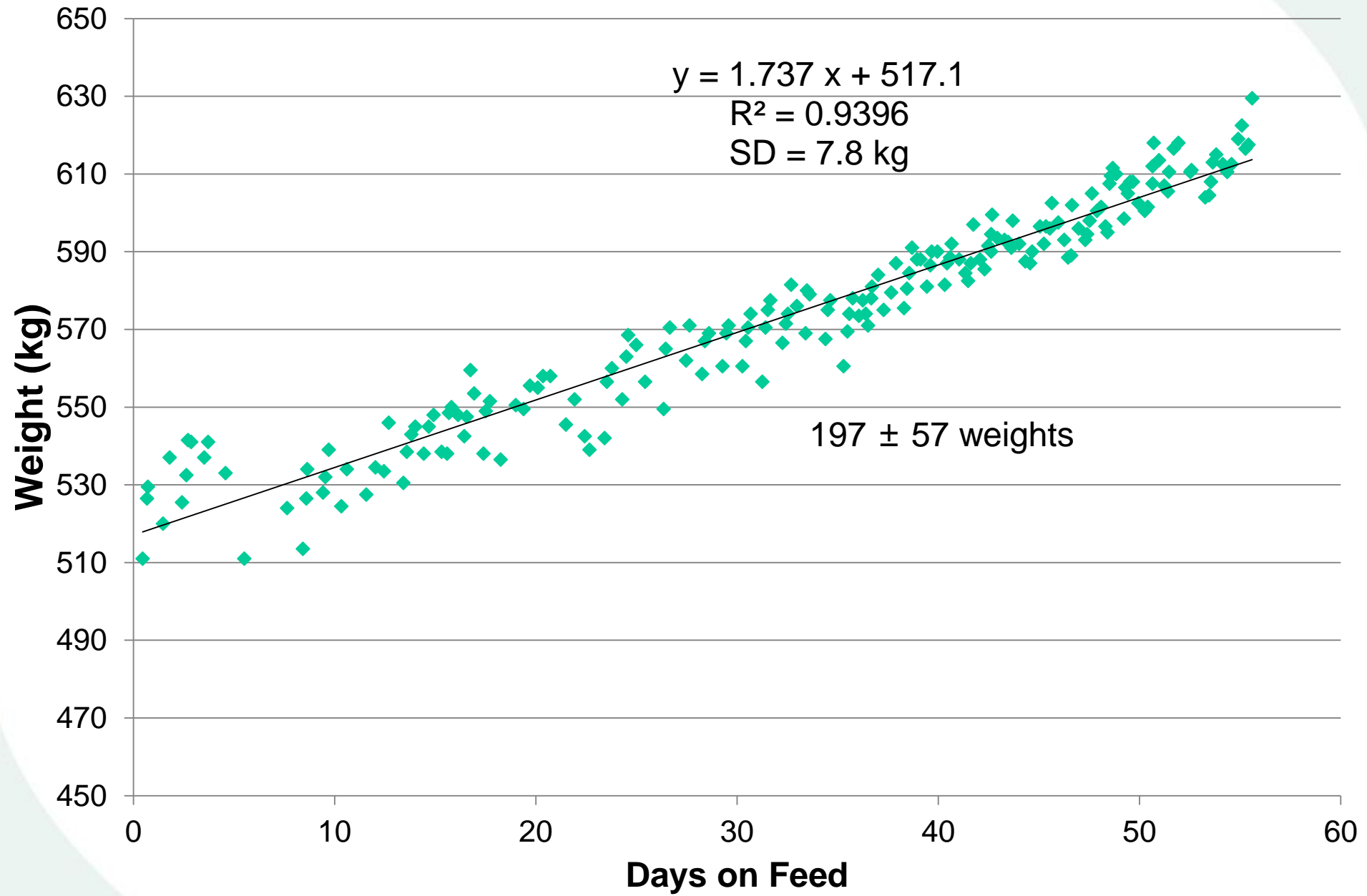
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# Standard Error of Computed Gain

- (Final weight – Initial weight )/number days on feed for 70 days

$$\text{SE of gain} = (2)^{0.5} * 7.8 / 70 = \mathbf{0.157 \text{ kg.day}^{-1}} \text{ (0.098 kg.day}^{-1}\text{)}$$

- Regression on weekly weights (56 days)

$$\text{SE of gain} = \frac{7.8}{\sqrt{\sum_{i=0}^{n\text{weeks}} (x_i - \bar{x})^2}} = \frac{7.8}{\sqrt{2444}} = \mathbf{0.158 \text{ kg.day}^{-1}}$$

- Regression on multiple daily weights (197 weights in 56 days)

$$\text{SE of gain} = \frac{7.8}{\sqrt{\sum_{i=1}^{n\text{measures}} (x_i - \bar{x})^2}} = \frac{7.8}{\sqrt{46,630}} = \mathbf{0.036 \text{ kg.day}^{-1}}$$

- Regression on multiple daily weights (94 weights in 35 days)

$$\text{SE of gain} = \frac{7.8}{\sqrt{\sum_{i=1}^{n\text{measures}} (x_i - \bar{x})^2}} = \frac{7.8}{\sqrt{9,460}} = \mathbf{0.080 \text{ kg.day}^{-1}}$$

- Regression on daily weights (in 35 days)

$$\text{SE of gain} = \frac{7.8}{\sqrt{\sum_{x=0}^{n\text{days}} (x - \bar{x})^2}} = \frac{7.8}{\sqrt{3885}} = \mathbf{0.125 \text{ kg.day}^{-1}}$$



# Material and Methods

- 601 Nelore Bulls from 6 test batches in 2016 and 2017
- Final Weight, Average Metabolic Weight, Average Daily Gain, Average Daily Feed Intake, Residual Feed Intake and Feed Efficiency Ratio
- Total 56 days of test and First 35 days of test.
- Contemporary group included Test Batch and Herd of Origin
- Total Pedigree of 12,785 animals
- Simple animal Model with contemporary group effect and linear effect of age within contemporary group
- Software Gibbs2f90 and Postgibbsf90



# Results and Discussion

*Table 1. Correlation and their standard-errors between 35-day and 56-day test results for the studied traits.*

<b>Trait<sup>1</sup></b>	<b>Phenotypic Correlation</b>	<b>Genetic Correlation</b>
<b>FW (kg)</b>	0.974	0.976 ± 0.007
<b>AMW (kg)</b>	0.992	0.993 ± 0.002
<b>ADG (kg d<sup>-1</sup>)</b>	0.864	0.904 ± 0.031
<b>ADFI (kg d<sup>-1</sup>)</b>	0.940	0.952 ± 0.021
<b>RFI (kg d<sup>-1</sup>)</b>	0.875	0.937 ± 0.022
<b>FER (g kg<sup>-1</sup>)</b>	0.800	0.879 ± 0.034

<sup>1</sup> FW, final weight; AMW, average metabolic weight; ADG, average daily gain; ADFI, average daily feed intake in dry matter basis; RFI, residual feed intake; FER, feed efficiency ratio.

# Results and Discussion

*Table 2. Heritability estimates and their standard-error for 35-day and 56-day test results of the studied traits.*

<b>Trait<sup>1</sup></b>	<b>35-day trait</b>	<b>56-day trait</b>
<b>FW (kg)</b>	0.541 ± 0.089	0.538 ± 0.091
<b>AMW (kg)</b>	0.561 ± 0.088	0.557 ± 0.090
<b>ADG (kg d<sup>-1</sup>)</b>	0.583 ± 0.080	0.630 ± 0.075
<b>ADFI (kg d<sup>-1</sup>)</b>	0.508 ± 0.090	0.533 ± 0.094
<b>RFI (kg d<sup>-1</sup>)</b>	0.533 ± 0.088	0.539 ± 0.095
<b>FER (g kg<sup>-1</sup>)</b>	0.603 ± 0.075	0.616 ± 0.079

<sup>1</sup> FW, final weight; AMW, average metabolic weight; ADG, average daily gain; ADFI, average daily feed intake in dry matter basis; RFI, residual feed intake; FER, feed efficiency ratio.

# Conclusion

Yes, we can reduce the test to 35 days, as the precision of gain will be high enough to enable small decrease on genetic gain for the feed efficiency measures (around 15%) and even smaller changes on rankings of proven bulls.

**Thank you**  
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