

final report

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Feed intake measurement of cattle in the Tullimba R&D Feedlot BIN Project – Angus 2017/18

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Executive summary

This report covers the 593 Angus steers that had feed intake and weight gain recorded on them in UNE's Tullimba feedlot in 2017/18. All data has been delivered to BreedPlan.

The first group of steers began feed intake testing at Tullimba on 11/09/2018. The final group finished in the feedlot on 11/04/2018. Cattle have generally performed well and have averaged around 14 kg/day feed intake for the 77 day full feed period. Trial average weight gain has been 1.60 kg/day weight gain during the 70 day test period after adaptation to the feeders. Retrieval of valid daily feed intake data will allow robust estimates of NFI and EBVs. Feed intake and live weight data from manual weighing have been supplied to BreedPlan via Jim Cook.

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1 Background

Feed is the largest recurring input cost in beef cattle production systems. Residual feed intake (RFI, also called ' net feed intake ' or NFI in Australia) is a measure of feed use efficiency and can be used to help manage the utilisation of feed on farm and in the feedlot. Net feed intake is calculated as the difference between the actual feed intake by an animal over a test period minus that expected or predicted based on its size and growth rate (Herd et al. 2003a). An animal with a lower feed intake than expected is considered more efficient. Selective breeding for low-RFI animals offers the potential to produce progeny that will eat less with no compromise in size or growth performance (Archer et al. 1999). There has been shown to be genetic variation for NFI with moderate Heritability in growing cattle being reported (Arthur and Herd 2012). However, the opportunity to improve profitability in the feedlot through animal breeding for lower RFI is dependent not only on the existence of genetic variation in RFI, but also on the magnitude of genetic associations with other key production traits. For feedlot cattle, these traits include growth rate, feed conversion ratio (FCR), and carcass and meat quality traits, many with tight market specifications and penalties for noncompliance. Genetic merit of cattle for breeding purposes is described by estimated breeding values (EBV; BREEDPLAN 2010), with trial RFI-EBV first becoming available in Australia in 2002 in the Angus breed (Angus Society of Australia 2002), and BREEDPLAN RFI-EBV becoming available at the end of 2013 for Angus cattle (Herd et al. 2014).

To Gain the information regarding NFI standards for the collection of good data have been described. In general the amount of time required to collect stable data is the biggest influence on NFI testing. The length of a RFI test and the amount of data collected needs to be optimized to reduce the cost of testing animals. The current recommendation to the Australian industry for a 70-d RFI test is based on the results reported by Archer et al. (1997). They showed that for British breed cattle tested for RFI, with feed intake recorded daily and animal BW measured weekly, that while 35 d was adequate to measure feed intake, 70 d was required to accurately measure growth and RFI. Archer and Bergh (2000) analyzed data from centralized tests in South Africa for young bulls from five breeds and four biological types to conclude that while a test of between 42 and 56 d was sufficient for measurement of growth rate, feed intake required 56 to 70 d to measure accurately, and RFI required around 70 to 84 d. Some work has begun to examine the test length utilising the data that has been collected in this and previous trials to see if there are any alternatives to the 70 day test period. The data collected in this project (along with data from previous cohorts) is providing a great foundation for additional research regarding the relationship between feed intake and production.

2 Project objectives

- 1. To measure and report on the feed intake of Angus Beef Information Nucleus (BIN) Livestock at UNE Tullimba Feedlot Research Facility including provision of Reports containing data
- 2. To collect and store the data from this Project as well as other data generated by GrowSafe and other recording equipment. This data will be stored in a database accessible by UNE researchers subject to Clause 8.9 of the Head Agreement.

3 Methodology

The Research Organisation will collect feed intake data on individual Angus cattle for MLA at the Tullimba Feedlot Research Facility in respect of Angus BIN Livestock supplied by The Angus Society of Australia:

- Taking and recording the measurements of the individual animal daily feed intake and body weight across a standard test period of 77 days, plus a 21 day adjustment period (as per Standards Manual developed by NSW DPI) such industry standard periods to be varied by written agreement between the parties.
- 2. Supplying to MLA all raw data and summaries of the data provided by the GrowSafe system.
- 3. Routine monitoring of data quality and ensuring data meets high quality standards

Number of Angus steers in each cohort:

Cohort 1: 645

Date of arrival at Tullimba (conditioning):

Cohort 1: October 2017

Date of entry to feed period:

Cohort 1: October 2017

Length of feed intake measurement period (days):

Cohort 1: 70 (+7 as stated above)

Date of completion of test period:

Cohort 1: 29th March 2018

4 Results

Head count 608 – 15 removed for management reasons= 593

Number of groups 6

First group full feed date = 11/09/2017

Last full feed date = 11/04/2018

Average number of full feed days = 77

Average Feed Intake (g) = 14,139 (13,395	5 – 14,511)
Average Start Weight (kg) (Fitted) = 512	(447 - 562)
Average End Weight (kg) (Fitted) = 626	(565 - 677)
Average of ADG (kg) = 1.60	(1.35- 2.00)

The table below summarises the completed cohort.

Breed	Number	\$	Average days on feeders	cost head/day	
Angus	593	\$91,322	77		\$2

5 Discussion

The project proceeded as planned though anticipated completion dates were later due to delays in feeder availability and Angus Society supply of cattle. Please note that there has been a slight discrepancy between planned numbers of animals and the final numbers due to management factors (i.e. sickness, injury and environmental factors (drought)).

The data collected in this project, along with previous cohorts, is now becoming the backbone for R and D regarding the relationship between feed intake and production in beef cattle. Recording Feed intake information is essential to maintain a balance between production and the costs associated with increases in productivity.

6 Conclusions/recommendations

This project, along with data from previous cohorts, allows for a greater understanding of the relationship between feed intake and production. The data collected, upon submission to BREEDPLAN, allows producers to select for Net Feed Intake (NFI). It is important to note that this would not be possible without projects such as this.

Guidelines (please don't type in this section, guidelines must be removed before submission by highlighting this section and then deleting): This section should summarise key insights and implications from the project with a particular focus on how this relates to the red meat industry.

This section should include clear and concise recommendations for:

- Future R&D;
- Practical application of the project's insights and implications to the red meat industry; and

• Development and adoption activities which would ensure the red meat industry achieves full value from the project's findings.

7 Key messages

The Growsafe facility at Tullimba is a valuable industry resource for RFI testing. The data collected from the project is underpinning the NFI EBV that can be utilised by breeders to select for feed efficiency.

To be maintained, the facility needs a regular flow of cattle though it to help fund any repairs and maintenance and for future upgrading of the facility.

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