

# Variation in Lifetime Annual Weaning Rate in Tropical Cattle



A major research project within the Cooperative Research Centre for Beef Genetic Technologies (Beef CRC) has provided very useful information on the success of lifetime production in Brahmans and Tropical Composites in Northern Australia. One of the primary objectives of the Beef CRC project was to investigate what effect genetics had on the lifetime annual weaning rate of females and consequently what opportunities may exist to improve fertility rates in Northern Australia through genetic improvement.

## PROJECT DESIGN

A total of 2137 cows were involved in the project (1020 Brahmans and 1117 Tropical Composites (TC)). The cows were bred on 7 co-operator properties (4 Brahman and 3 TC) and at "Belmont Research Station" which breed both Brahman and TC. Genetic linkage, across properties of origin and year within genotypes was generated by the use of AI. The cows were generated over 4 and 3 years for Brahmans and TC respectively. The cows were allocated according to genotype, property of origin and sire to one of the following four properties "Toorak" Julia Creek, "Belmont" Rockhampton, "Swans Lagoon" Ayr and "Brian Pastures" Gayndah at weaning. Belmont and Toorak ran both Brahman and TC while Brian Pastures only had TC and Swans Lagoon with the harsher environment only had Brahmans.

The project continued until all the cows were around 8.5 years of age and given the opportunity to have 6 calves and mated for the 7th time. The cows stayed in the project unless they failed to wean a calf in 2 consecutive years or were culled on management decisions (eg. temperament, udder etc). Cows were naturally mated for 12 weeks and during this period the cows were ovarian/pregnancy scanned at 4 week intervals from joining by the use of real time ultrasound by an experienced scanner. The cows were also scanned a further 4 times after mating and prior to calving. These were half way between mating and weaning, weaning, half way between weaning and pre calving and around 3 weeks



prior to calving. Other data collected at each scan was live weight, condition score and a P8 fat measurement.

## RESULTS

### *Lifetime Annual Weaning Rates*

The research showed that the lifetime annual weaning rate of the Brahman females involved in the project (1020 cows) was 60% with 72% of cows being present at the end of the project after 6 matings (717 cows). The annual weaning rate of the TC females involved in the project (1117 cows) was 73% with 83% of cows present after 6 matings (898 cows).

Further analysis of the lifetime weaning rate results revealed an annual calf loss of 10% between calving and weaning across all animals involved in the project in both the Brahman and TC females (2137 cows). When looking at only the females that were retained in the project until the end, there was an annual calf loss to weaning of 5% for both Brahmans and TC.

It must be mentioned that about 40% of the Brahman females were run on the harsher conditions at Swans Lagoon.

The calving rate and weaning rate results for both the Brahman and TC cows are displayed in Figure 1.

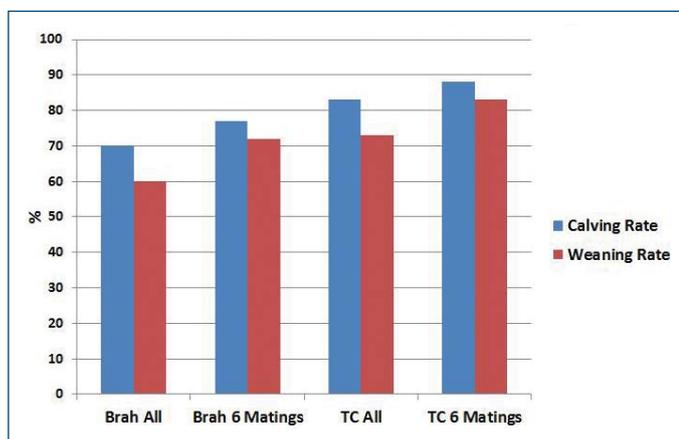


Figure 1. Calving rate and Weaning rate for all cows and those that remained in the Project at Mating 6.

### Genetic Effects

Results from the Beef CRC research indicate lifetime annual weaning rate was under some genetic control with heritability estimates for lifetime annual weaning rate of 0.11 in Brahman and 0.07 in TC. Further analysis revealed that there was a 13% difference due to genetics in lifetime annual weaning rate between the top and bottom Brahman sire included in the research trial based on the weaning rates of their daughters (as shown in Table 1). The difference in lifetime annual weaning rate between sires in TC was not as large as the Brahmans with a 4% difference between the top and bottom sires.

Total calves weaned from matings 1 and 2 were moderately to highly correlated with both lifetime calving and lifetime weaning rate in both Brahman and TC,

indicating that a considerable proportion of differences in lifetime weaning rate can be explained by differences in the weaning rate from the first two matings.

### CONCLUSIONS

The results emphasise the substantial opportunity that exists to improve lifetime annual weaning rates in tropical beef cattle breeds by focusing recording and selection on early in life female reproduction traits. Several traits recorded at the first two matings had moderate to high genetic correlation with lifetime reproduction. The measurements that are correlated with lifetime reproduction range from ultrasound scanning for conception, to manual palpation for pregnancy, to observation of a calf being born, and the number of days after mating that the calf is born.

Importantly, the results also showed that days to calving is highly correlated with these measurements and producers using Days to Calving EBVs in their selection will also improve early and lifetime reproduction program. Opportunities consequently exist to improve lifetime weaning rates in tropical cattle by collecting accurate birth and female reproductive performance information with BREEDPLAN for the calculation of Days to Calving EBVs (particularly reproductive information for maiden heifers and first calf cows), and careful consideration of Days to Calving EBVs when selecting both sires and dams for use within a breeding program.

Table 1. Difference in lifetime weaning rate EBV between top and bottom Brahman sires in % more calves per year.

