Alexandria Station Supplementation Trial

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A four-year supplementation trial run on the Barkly Tableland breeding property, Alexandria Station, has recently finished and is producing some interesting results. This is the first supplementation research for this region of the Northern Territory since 1965. Using the traditional method of supplementation as the benchmark, two alternative supplement strategies were found to halve the cost of supplementation while maintaining high levels of productivity.

Four herds of Alexandria composite-bred cattle running on typical Barkly Tableland downs country, were closely monitored for reproductive performance. A strong emphasis was placed on rangeland condition assessment, water quality, soil status, rainfall patterns, supplement intake and the relationships with animal performance. Along with Meat and Livestock Australia, the involvement of The North Australian Pastoral Company, the NT Government and Ridley Agri-Products has contributed to many more beneficial outcomes from this project than expected.

Across the four years of the project, over 10,000 individual breeder performance records were collected, as well as progeny performance to weaning. The average pregnancy rates for the 4-month joining period are shown below in Figure 1. Of particular note is the performance of the second-calf heifers (breeders that are rearing their first calf and have conceived the second calf). As the most sensitive group of breeders to nutritional stress, second-calf heifer performance in northern Australia is traditionally an area of lost production, with figures of 40 – 50% pregnancy occasionally quoted. As Figure 1 shows, second-calf heifer performance in these herds at Alexandria is exceptional. The average weight of second calf heifers at weaning of their first calf was 498.2 Kg, with an average body condition score of 6.2 (using a 9 point scale).

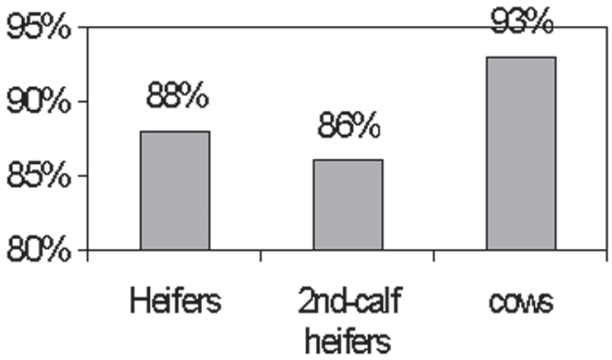

Figure 1. Average pregnancy rates (4 month joining period) across 4 years.

Three supplement programs were investigated in this trial. The original supplementation practice (Program A) for Alexandria Station and two alternative feeding programs were examined. The original supplementation practice involved using one type of supplement block for most of the dry season. One of the alternative strategies also involved dry-season-only feeding (Program B). Program B involved using a supplement block that delivered lower nutrient intakes for the early part of the dry season and returning to higher nutrient intakes toward the end of the dry season as pasture quality deteriorated and joining periods began. The third supplement program (Program C) involved wet season supplementation with minimal dry season supplementation. Overall nutrient intakes for the three programs are seen in Figure 2.

The new, more cost-efficient supplement strategies involve targeting nutrient intake to match the seasonal conditions, measured as pasture or diet quality. The two new strategies, although quite different in approach, are very similar in cost and appear to provide similar production outcomes under good seasonal conditions.

All four years of the trial experienced above average seasonal rainfall, with 2000 experiencing the highest rainfall on record with 1317mm. The results of such seasonal conditions was an abundance of available feed. However, while the quantity of pasture was excellent, the quality varied significantly ($p < 0.05$) between years and was heavily influenced by the timing of rainfall rather than the amount of rainfall.

Importantly, no significant difference in pasture quality between any of the trial paddocks was found.

Pasture and faecal samples were collected every month (refer Figure 3) and analysed for protein and phosphorus levels. Pasture biomass, cover and composition was assessed at the end of every dry season and wet season

Intake (Kg/cow/yr)	Protein	Urea	Phosphorus
Program A	12.8	3.4	1.7
Program B	6.3	2.1	0.8
Program C	8.1	3.0	1.3

* Detailed nutrient composition of the supplements fed can be found at the end of this article.

Figure 2. Average annual nutrient intake from supplementation*

(twice yearly). Timing, intensity and duration of rainfall was also measured using pluviometers (tipping bucket rain gauges) in the trial paddocks and supplement intake was recorded weekly. Monthly faecal samples were also sent across to CSIRO Laboratory in Townsville for NIRS (Near Infra-red Reflectance Spectroscopy) analysis of diet quality.

Average production for the three herds, A, B and C was measured at 154, 148 and 141 Kg calf weaned/cow/year respectively. More specifically, second-calf heifers subject to supplement program B dropped in production with pregnancy rates dropping to 79% in 1999. It is interesting to observe that the drop in second-calf heifer performance for this herd was associated with relatively low pasture quality. As can be seen in Figure 3, 1999 measured pasture quality to be lowest for the longest period of time (7 months) due to a short 1998/1999 wet season. In contrast, production of cattle on supplement program A was consistently high throughout the trial period regardless of pasture quality variations and breeder age-group.

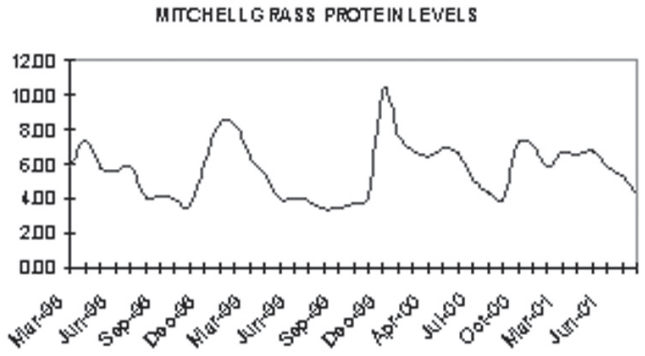

Figure 3. Monthly Mitchell grass quality sampling results.

This project has emphasized the importance of monitoring pasture and diet quality as a means to determining the timing and level of supplementation. Two interesting points to arise from this research are that while there may be no observable production benefit from supplementation in exceptional years such as that experienced in 2000, this trial has shown that there can be considerable benefit from strategic supplementation of breeders during seasons of above average rainfall.

This project is being used by Darryl Savage of DBIRD Tennant Creek, as a PhD thesis through the University of Queensland.

BLOCK NAME	pack wt. kg	Estimated daily intake (grams)	urea %	protein equiv. %	P %	Ca %	S %	Mg %	salt %	molas. %	Cu %	Co %	I %	Zn %	Fe %	Mn %	Se %
Maxibreed	20/100	85 / 150	10.5	30	6	8	0.5	3.5	10	40	0.004	0.0004	0.0004	0.014	0.0102	0.0032	0.0002
Cattleblock	18	150	8	30	4	8	2	0.2	25	0	0.03	0.003	0.003	0.05			
Fosforlic 45	20	85	15.7	40	5	7.5	3	0	48.4	0.5	0.03	0.003	0.003	0.05	0.0051	0.0001	0.00025