

Reproductive performance of 50% *Bos Indicus*
cattle grazing the Mitchell grasslands of north Queensland

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Summary

The reproductive performance was measured in a beef breeding herd, of 50% *Bos Indicus*, grazing the Mitchell (*Astrebla* spp.) grasslands of north Queensland from 1973 to 1980.

The mean pregnancy rate over the eight years (1973 to 1980) was 91.4% ranging from 79.0% to 96.0%. Mean pregnancy rates and ranges for various age groups were (i) 2 year old helpers, 93.4% (86.2 - 97.6%), (ii) wet 3 year old cows, 79.6% (41.4 - 94.4%), (iii) wet 4 year old and older cows, 92.4% (74.4 - 96.6%). Generally, dry cows had higher conception rates than wet cows. Lactation failures (cows pregnant one year but dry at the following year's pregnancy test) were 9.3% (range 4.7 - 15.8%). Age of dam had no effect on prevalence of lactation failures. Body condition levels were dependent on seasonal conditions and the mean herd body condition varied from 4.8 (backward store-store) to 7.5 (prime-fat).

Introduction

Mitchell grasslands supported approximately 50% of the states sheep and 6% of the states cattle in the early 1970's (ABS statistics, 1973). Since then, there has been a trend to replace sheep with cattle especially in the northern portion of these grasslands.

There is little published information on the reproductive performance of cattle on these treeless grasslands. Reproductive rates of sheep in these areas are low with average lamb marking percentage for 1946-65 being 41% (Murray 1969) with heat induced seminal degeneration as a contributing factor (Entwistle, 1972). This and neonatal hyperthermia in calves (Entwistle, 1974) could be a cause of lowered reproductive performance of cattle in this environment.

Materials and Methods

This paper reports on the reproductive performance of cattle over 8 years on "Katandra", 90 km southwest of Hughenden. The country is gently undulating, relatively treeless with Mitchell (*Astrebla* spp.) and Flinders (*Lsellemma* spp.) grasses predominating. Soils are of moderate to high nutrient status both in N and P. The property lies within the 450 mm Isohyet with 70% of rain from December to March. Mean maximum and minimum summer temperatures are 36.3°C and 21.6°C but daily maxima may reach 45°C. For winter, maximum and minimum temperatures are 25.9°C and 9.2°C respectively (Anon. 1970).

Droughtmaster (50% *Bos indicus*) cows, mainly 2 and 3 year old, were introduced in November 1971, October 1972 and October 1973, with the cow herd size ranging from 572 to 853 over the years.

Stocking rate was 1 AE per 12 to 15 ha. Cows were mated each year commencing late January to early March for 70 to 115 days with 3 to 5% Droughtmaster bulls. Calves were branded when bulls were removed from the herd. Most calves were weaned late June - early August with some smaller calves being weaned in October.

Each year, cows were pregnancy tested June to August with an additional test in October 1973-76 inclusive. Foetal and calf losses from pregnancy test to weaning were determined by lactation failures. This refers to cows pregnant one year but dry at the following years pregnancy test.

Cows were culled each year for failure to conceive when dry; failure to rear a calf to weaning; age (10 years); physical defects and conformation.

Results and Discussion

The study encompassed a range of seasonal conditions. Years were classified as good, average or poor assessed by both total and distribution of rainfall (Table 1).

Table 1. Annual rainfall and type of year at "Katandra"

Year	Annual rainfall (mm)	Type of year
1972-73	551	good
1973-74	1077	average
1974-75	554	good
1975-76	541	good
1976-77	482	poor
1977-78	340	poor
1978-79	572	good
1979-80	252	average
40 year mean (Hughenden)	444	

The mean pregnancy rate over the eight years (1973-80) was 91.4% ranging from 79.0% to 96.0%. Mean pregnancy rates and ranges for various age groups were:-

- i) 2 year old heifers, 93.4% (86.2 - 97.6%)
- ii) 3 year old wet cows, 79.6% (41.4 - 94.4%)
- iii) 3 year old dry cows, 94.3% (92.3 - 100%)
- iv) 4 year old and older wet cows, 92.4% (74.4 - 96.6%)
- v) 4 year old and older dry cows, 95.0% (50.0 - 100%)

Relationships between rainfall and subsequent pregnancy rate were only of importance in heifers where pregnancy rate was influenced by rainfall from November until the end of mating ($r=0.78$ $P<0.01$). The month of pregnancy was a function of commencement of mating rather than month of rainfall. The lowest pregnancy rate occurred after 2 consecutive poor years when in 1978, 3 year old wet cow pregnancy rates dropped to 41.4% and the overall herd rate to 79.0%.

These pregnancy rates are higher than previously been reported from beef cattle in north Queensland. Holroyd et al (1979) found mean pregnancy rates of 83% in 5 herds in north-west Queensland. Although we didn't examine bulls, heat induced seminal degeneration would appear not to be a problem with bulls as in rams (Entwistle 1972) as pregnancy rates were high.

From 1973 to 1978, lactation failures (cows pregnant one year but dry at the following year's pregnancy test) were 9.3% (range 4.7 - 15.8%). Age of dam had no effect on prevalence of lactation failures. It was not possible to diagnose the cause or time of lactation failure because of the infrequency of examination. Reproductive diseases were not a problem except for leptospirosis in the initial years and this was subsequently controlled by vaccination (Holroyd and Smith 1976). Neonatal hyperthermia may have been a contributing factor. The provision of shade may contribute to improving survival rates of calves as it has for lambs. (Stephenson et al 1984).

Pregnancy rates minus lactation failures equate to weaning rates. In this case, the mean herd branding/weaning rates was about 78% (range 68 - 90%). This compares with ABS derived figures of 59% branding-rate for the Richmond and Flinders shires during comparable years.

The pasture quality was such that although body condition levels were dependent on seasonal conditions, mean herd body condition at June - August varied from 4.8 (backward store - store) to 7.5 (prime-fat). Within classes, helpers and dry cows had better condition than wet cows and generally wet 3 year old cows were comparable to older wet cows. The only significant relationship between pregnancy rate and body condition level at pregnancy test occurred in 3 year old wet cows ($r = 0.07$, $P < 0.05$).

Accurate estimates of cow deaths were not possible. It was the manager's opinion that mortality rates of these cows were less than 5%. Exceptions could be a complete absence of a wet season or some abnormal seasonal condition. In December 1976, the seasonal break was from a cyclonic influence resulting in flooding. This was followed by a cold spell causing minimal pasture growth. Boggling and starvation caused some 100 (15%) cow deaths.

Given the stocking rates experienced here, this monitoring has shown that, providing the common reproductive diseases are controlled, herd pregnancy rates in excess of 90% can be obtained over a number of years, in 50% Bos Indicus cattle grazing the Mitchell grasslands of north Queensland. Cows can be maintained in store to prime condition by mid year and that cow mortalities are generally not a problem. Although lactation failures were high in some years, it still allowed weaning rates in excess of 75%.

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References

- Anon.(1970) - Burdekin - Townsville Region. Queensland Resources Series. Climate. Department of National Development, Canberra.
- Entwistle, K.W. (1972) - Aust.vet.J. 48:395
- Entwistle, K.W. (1974) - In "Studies of the Australian Arid Zone II. Animal Production" pp.85-87 (A.D. Wilson, ed), CSIRO, Melbourne.
- Holroyd, R.G., Arthur, B.A., and Mayer, B.G. (1979) - Aust.vet.J. 55:257
- Holroyd, R.G. and Smith, P.C. (1976) - Aust.vet.J. 52:258
- Murray, R.M. (1969) - Aust.vet.J. 45:63
- Stephenson, R.G.A., Suter, G.R. and Le Feuvre, A.S. (1984). In Proceedings "Reproductive In Sheep" (D.R. Lindsay and E.T. Pearce, eds). p.223 Aust. Academy of Science, Canberra.