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Developing Target Turn-Offs and Production Rates for the Barkly District

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Introduction

The aims of this project were twofold. Firstly, to assess the relative importance of branding and mortality rates as the major areas of production loss in the Barkly district. Secondly, to estimate the relationship between various production parameters, branding percentages, and mortality rates.

Materials and Methods

1. A herd with 9400 breeders was constructed using actual property figures from the Barkly Tablelands. The herd was allotted a set branding percentage and mortality rate, and run for twenty "variable" years so as to represent seasonal conditions typical of the Barkly district. This run of variable years was: 1 okay year, 2 bad years, 2 poor years, 1 good year, 2 okay years, 2 good years, 2 poor years, 4 okay years, 1 poor year, and 3 okay years. The intention of using this sequence was to ensure that any conclusions were not affected by just using average years; a future development would be to repeat the exercise with a variety of other year sequences. This herd stabilised at a total herd number of 21,000.
2. This herd model was replicated using various branding and mortality rates.

Results

The relevant results are summarised in Table 1.

Table 1. Production parameters for a herd on the Barkly Tablelands in any given year

MORTALITY RATE	BRANDING	AVERAGE TOTAL NO. SOLD	NO. OF HEIFER REPLACEMENTS
3%	70%	4563	1275
	65%	4408	1325
	55%	3804	1500
6%	70%	4368	1425
	65%	4161	1475
	55%	3567	1700
10%	70%	3940	1700
	65%	3806	1780
	55%	2956	2050

Discussion

Table 1 shows the increase required in heifer replacement numbers to maintain a stable herd at three mortality rates, and three branding rates. It is apparent from the figures that, as branding rate decreases, an associated increase in heifer replacement numbers is required to maintain a stable herd. Similarly, as mortality rate increases, the number of heifer replacements also increases in order to maintain a stable herd.

From Table 2 it would appear that mortality rate is of more importance than branding rate, as an increase in mortality rate from 3% to 10% results in a doubling of the average total deaths per annum. However, the significance of this finding depends on how much each rate varies in the real world, and how difficult it is for management to affect it. From unpublished work carried out on the Barkly, it is my belief that mortality rates vary only marginally, and that the actual mortality rate is approximately 3% per year, notwithstanding a major disease outbreak and/or severe drought.

Therefore, given that the mortality rate does not vary much around the figure of 3%, the results show that it would be far more beneficial to concentrate on branding percentages. With a mortality rate of 3% and a branding rate of 70% total births are 4,895, heifer replacements 1,275 and total average sales are 4,563. If the branding rate drops to 55%, total births fall to 4,282, heifer replacements increase to 1,500 and total sales fall to 3,804, a difference of 613 in births, 225 in heifer replacements and 759 in sales.

In dollar terms, this is a loss in potential income of \$227,700, assuming a value of \$300 per head sold. In terms of births, if we assume 50% of the potential births are male, and

50% are female and the sale value of the male is \$250, there is a potential loss of income of \$76,625. If the value of the females as breeders is assumed to be \$650, this is

a further potential loss in income of \$394,550, not to mention the potential loss in the value of offspring. **In total, this is a potential loss in income of \$698,875.**

Hence it is very important to maintain or increase branding percentages, assuming mortality rate is low. If, however, mortality rate varies considerably, or is in the vicinity of 10%, management needs to concentrate on reducing mortality rate.

In summary, assuming a set mortality rate of either 3%, 6% or 10%, and variable branding percentages;

- (1) Total deaths vary by less than 20 head for a given mortality rate, implying that deaths are remaining constant despite either an increase or decrease in branding percentages.
- (2) Total births vary by over 600, with a potential loss in income of \$471,175.
- (3) Heifer replacements must increase by over 200 to maintain a stable herd, resulting in a potential loss of income in the sale of cull heifers.
- (4) The total turn-off varies by 759, a potential loss of income of \$227,700.
- (5) The total potential loss in income between the best and worse case is \$698,875.

Table 2 gives the approximate turn-off to be expected for a property with a total herd number of approximately 21,000 and a variety of biological rates. This type of table enables departmental officers to visit stations and assess pastoralists' production estimates to give them "ball park" figures as to what they should be achieving. The potential loss can be calculated in dollar terms as above, and so becomes more meaningful, and more likely to be noticed.

Table 2. Expected average production parameters for herds with various assumed biological rates on the Barkly Tablelands, given a run of variable years.

Mortality rate	3%			6%			10%		
Branding rate	70%	65%	55%	70%	65%	55%	70%	65%	55%
Total no.	21274	21180	20562	21284	21112	20571	21088	21222	19413
Births p.a.	4895	4777	4282	4886	4723	4279	4838	4784	4014
Deaths p.a.	645	651	639	853	854	870	1216	1239	1216
Heifer replacements needed	1275	1325	1500	1425	1475	1700	1700	1780	2050
Total no. sold p.a.	4563	4408	3804	4368	4161	3567	3940	3806	2956
No. cows sold	1051	1061	1116	981	992	1035	855	869	869
No. heifers sold	1112	1006	609	978	850	452	704	599	132

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