

Cattle Performance Data for the Alice Springs District

J. Bertram*, M. Oliver*, A. Phillips* and J. Coventry, Pastoral Production Officer, Alice Springs
* Formerly DPIFM

This Agnote provides an indication of some of the important beef cattle herd performance measures for Central Australia. Quantification of achievable performance measures helps predict pastoral property returns and provides a yardstick against which to compare herd performance of individual properties. The figures in this Agnote are based on trials, herd health programs, pastoralist feedback and surveys over a number of years.

Beef cattle performance in the Alice Springs district is largely dependent on seasonal conditions, rangeland pasture type (grasses, forbs, topfeeds), and class of cattle.

Climatically, the district is an arid to semi-arid region with an annual rainfall of between 100-350 mm and increasing summer dominance towards the north of the district. Pasture growth closely follows the rainfall pattern. Rapid increase in essential nutrients contained by the pasture plants (protein, energy, phosphorus, sulphur) occurs soon after rain. Dry matter digestibility of the pasture also improves. Within four to eight weeks of rain, plant phosphorus levels rapidly decline again. Slower declines follow in plant protein content and even slower declines follow in plant digestibility.

Cattle graze selectively when they have access to a range of grasses, forbs and topfeeds of varying nutritional levels. Selective grazing enables the cattle to attain more nutrients from the rangeland pasture and perform (grow, reproduce) at a higher rate than may be otherwise indicated from a subjective, visual appraisal of that pasture or from laboratory analysis of pasture plant samples.

Cattle performance is also influenced by management practices, such as supplementary feeding, rate of stocking, weaning, parasite control, rotational grazing and, in the past, growth promotants.

CARRYING CAPACITY/ ANIMAL EQUIVALENTS

The carrying capacity of district properties has traditionally been assessed as a certain number of animal/km². A serious limitation of this approach is that no account is taken of feed requirements of various classes of cattle, such as a herd of 500 breeding cows will require more feed than 500 weaner steers.



In order to compare feed requirements of various classes of cattle and relate them to the carrying capacity of grazing land, calculations can be made using animal equivalents (AEs) that are based on the annual dry matter intake of a 420 kg dry cow.

One AE is the intake of an adult dry cow consuming enough feed to maintain a constant body weight of 420 kg from one year to the next. Using this feed intake as a benchmark, other classes of cattle can be rated in AEs, according to the amount of feed they eat.

Table 1 provides a guide to AEs for class and age categories of cattle.

It is important to note that the AE of a breeding cow is for the cow alone, not for a cow/calf unit. When breeders have calves at foot, the calves must be accounted for separately.

Maintenance requirements also vary between individuals within a breed and vary between breeds of different sizes. Larger breeds such as Charolais have higher maintenance requirements than medium breeds such as Hereford.

Adult equivalents should be used for estimating the carrying capacity of the land. Estimated carrying capacities of the major pasture types in the Alice Springs district (based on producer experience) are shown in Table 2. This table can be related to the descriptions in Agnote G4 "Rangeland Pastures of the Alice Springs District".

Table 1. AE estimates for medium-sized cattle

Age Years	Cattle class			
	Breeding heifers and cows	Spayed heifers and cows	Steers and bullocks	Bulls
0-1 (calf)	0.29	-	0.29	0.47
1-2	0.66	0.64	0.66	0.80
2-3	0.94	0.94	0.94	1.17
3-4	1.00	1.05	1.07	1.45
4-5	1.05	1.10	1.20	1.60
5-6	1.06	1.12	1.22	1.70
6-7	1.06	1.12	1.26	1.70
7-8	1.03	1.15		
8+	0.97	1.15		

Table 2. Carrying capacity estimates for different rangeland pasture-types

Rangeland pasture-type	Carrying capacity (AE/km ²)
Open woodland	3 to 5
Mulga shrublands	0.5 to 2.5
Gidyea woodlands	1 to 4
Calcareous shrubby grasslands	1 to 3
Chenopod shrublands	1.5 to 2
Clayey stoney slopes	1 to 3
Mitchell grass plains	3 to 8
Aluvial plains	2.5 to 8
Spinnifex sand dunes and fields	0.4 to 1
Small hills	0.8 to 3

EXAMPLE

If an area of 50 km² of alluvial plains can carry 6 AE/km² throughout the year then total carrying capacity equals 300 AEs (i.e. 6 x 50). A possible break down of the various classes of cattle that could be carried on this 50 km² area is as follows:-

Cattle class	Age (years)	Head	AE/animal	AE/group
Breeder	2-3	80	x 0.94	= 75
	3-4	100	x 1.00	= 100
	4-5	50	x 1.05	= 52
Calves	0-1	184	x 0.29	= 53
Bulls	4-5	12	x 1.60	= 19
TOTAL				299

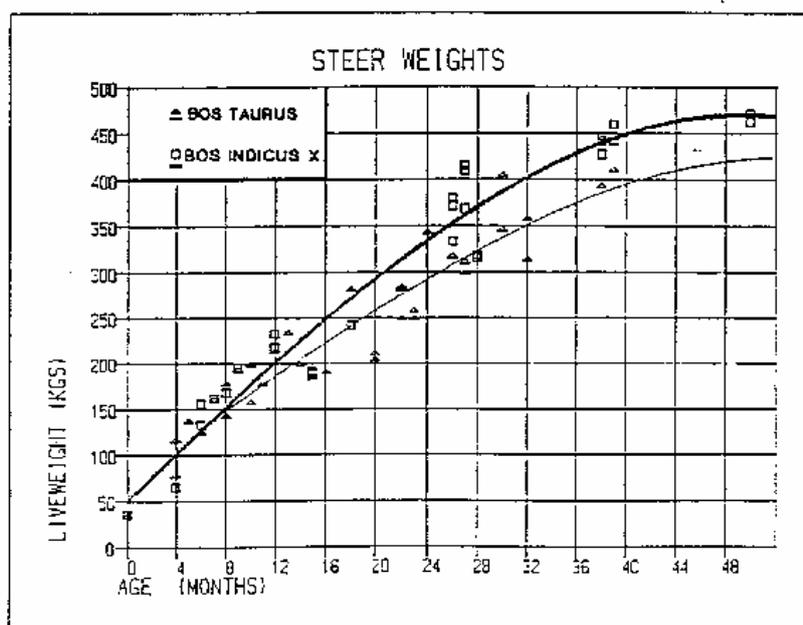


Figure 1.

AGE RELATED LIVWEIGHT GAIN

Liveweight figures have been recorded for independent groups of steers of different breeds on several rangeland pasture-types in the district. The live weights recorded have been related to an approximate age of the steers and are plotted in Figure 1.

Repeat weighing of 6- to 12-month steers in trials have shown liveweight gains of approximately 0.4 to 0.6 kg/head/day, depending on the seasonal conditions on Alice Springs district pastoral properties.

These liveweights indicate the potential growth that can be achieved in Central Australia. They may also reflect a response to rainfall as well as a possible response to hybrid vigour. First cross *Bos indicus* cattle are often heavier than *Bos taurus* cattle up to 3½ years of age.

From the trend lines in Figure 1, steer liveweights increase at a relatively constant rate from birth to between 24 and 36 months of age. Thereafter liveweights increase at diminishing rates. This suggests that beyond 36 months, the marginal or extra returns per animal per season decrease (assuming constant prices per kilogram).

BRANDING PERCENTAGES

While both cattle breed and rangeland pasture-type have a significant influence on annual calving percentages, seasonal conditions can override both. Calving percentages are estimated on pastoral properties, based on the annual branding percentages.

As a general rule *Bos indicus* cattle have lower branding percentages than *Bos taurus* cattle. Cattle grazing in spinifex country have lower branding percentages than those on sweeter or more nutritious and palatable rangeland pasture-types. Some achievable branding percentages are as follows:

Spinifex sand plains and dune fields	45-60%
Calcareous shrubby grassland	60-75%
Alluvial and Mitchell grass plains	75-90%

Local producer experience indicates that branding ranges from 55% to 60% in poor seasons up to 85% in good seasons. A long term average is 70% to 75%.

Management practices such as weaning and mineral supplementation can improve annual branding percentage.

DEATH RATES

Cattle deaths throughout the district are strongly correlated with seasonal conditions. Apart from feed shortages during prolonged droughts, plant poisoning, botulism poisoning, predation, misadventure, microbial diseases and metabolic disease have been the most commonly identified causes of losses in cattle of various ages. Metabolic problems are often precipitated by the rapid onset of very hot, dry weather, which forces cattle to walk long distances from water to feed.

Producer experience indicates that death rates across a herd are commonly 3-5%. This may increase to 10% under drought conditions. Calves, wet cows and aged cows suffer the highest death rates under drought conditions.

REFERENCES AND FURTHER READING

1. Agnote G2, No. 269, An Introduction to the Alice Springs District.
2. Agnote G4, No. 274, Rangeland Pastures of the Alice Springs District.
3. G.R.M. International Pty Ltd., Northern Territory Pastoral Industry Study 1984/85.
4. Technical Bulletin No. 31, Alice Springs District Cattle Industry Survey 1979.

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