S. Afr. J. Anim. Sci. 8, 15-18 (1978)

THE PERFORMANCE OF A BEEF BREEDING HERD SUBJECTED TO CONTINUOUS MATING IN THE VALLEY BUSHVELD OF THE EASTERN CAPE

Receipt of MS. 16.2.1977

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(Key words: *Beef herd, continuous mating)*
(Sleutelwoorde: *Beeskudde, voortdurende paring)*

OPSOMMING: DIE PRESTASIE VAN 'N VLEISBEESTEELKUDDE ONDER TOESTANDE VAN VOORTDURENDE PARING IN DIE VALLEIBOSVELD VAN DIE OOS-KAAP.

Gedurende 'n vyfjaar studie met vleisraskoeie in die Visriviervallei van die Oos-Kaap is 'n gemiddelde kalfpersentasie van 80,3 verkry. Bulle is voortdurend by die koeie gehou. 'n Positiewe korrelasie tussen jaarlikse kalfpersentasie en die reënval gedurende die vorige jaar is verkry. 'n Neiging dat hoogtepunte in die getal kalfgeboortes van jaar tot jaar later plaasgevind het is waargeneem behalwe waar 'n goeie reënval gedurende sodanige hoogtepunt aangeteken is. Wanneer koeie tydens die periode Augustus–November gekalf het, het dit die beste kombinasie van kalfspeenmassa en koeiherbevrugting tot gevolg gehad. Die periode April–Mei was die tweede beste in hierdie opsig.

SUMMARY:

In a five-year study made on beef cows ranched in the Fish River valley of the Eastern Cape with bulls being run continously with the cows, an average calving percentage of 80,3 was achieved. Yearly calving percentages were positively correlated with rainfall during the previous year. Calving peaks tended to occur later each year except when very good rains fell during a preceding calving peak. When calving took place during the periods August–November and April–May this resulted in the best and second best combinations of calf weaning mass and cow reconception rate.

Introduction

It is generally accepted that restricted mating seasons should be practised by the beef breeder. There are many sound reasons for this practice. For example, management practices such as weaning, supplementation, dehorning, pregnancy testing, castration, disease protection and marketing can be greatly simplified. On the other hand, there are several factors which indicate that a policy of restricted or controlled mating seasons should be neither blindly accepted nor advocated. Under certain circumstances there is apparently very little information that restricted mating seasons increase calving percentages. In fact, available evidence indicates that calving percentages can indeed be reduced by restricted mating seasons.

Plasto & Hall (1970) found that under ranching conditions in Queensland all-year mating, using natural service, resulted in 83% calving whereas a restricted mating season of nine weeks resulted in 63% calving. The reasons for this state of affairs could be due to factors such as the number of bulls used or lactational anoestrus in the beef cow. It is widely reported that plane of nutrition or body condition greatly influences the time lag between calving and first post-calving oestrus (Lamond, 1970). Dairy cows receiving a high plane of nutrition averaged 32 days between calving and subsequent oestrus, while beef cows under stress of drought averaged 187 days (Bishop & Kotze, 1965; Bishop, 1966). The delayed onset of post-calving oestrus results in cows not being mated during restricted breeding seasons. However, when continuous mating is applied, service can take place as soon as the onset of oestrus occurs. Mating pressure on bulls is not so great as when a short restricted mating season is practised and a reduction of bull numbers and cost can therefore be effected.

The Xerophytic Fish River scrub and Addo bush variations of the Valley Bushveld of the Eastern Cape are influenced by winter rainfall, and the seasonal pattern of precipitation tends to be erratic. Plant growth is adapted to these conditions and tends to produce edible herbage during any time of the year. This problem is illustrated by the fact that in a local study group consisting of 34 farmers, 27 (80%) applied continuous mating because of variable and unpredictable grazing conditions.

There is a paucity of reliable data on the performance of beef breeding herds in this area and information concerning the most suitable mating seasons is limited to variable farmer opinion and experience. It was therefore considered that added information on this aspect could be of value in measuring performance patterns and/or determining which seasons may lend themselves to restricted mating.

Procedure

This study was carried out on a private 5 800 ha farm situated in the Fish River valley of the Grahamstown district, 10 km from Fort Brown. The veld type is the Fish River scrub (Region 23 – Acocks, 1953) with an estimated average annual rainfall of 375 mm. Approximately 20% of this rain falls in the winter months. The summers are warm to hot and the winters mild with occasional frost.

Data was recorded during a five-year period (July 1970–June 1975) on a ranched beef breeding herd of Afrikaner-Hereford cows which increased in size from 124 to 160 females during this period. Cattle were brought to the kraals monthly, at which time 7-month weaning mass of cows and calves and condition rating of cows at weaning were recorded. Condition rating was done by eye, according to condition that was considered to be consistent with the control market beef grading system, i.e.

Apparent market grade	Description	Rating
Grade 1	Fat	1
Grade 2	Fair to good	2
Grade 3	Lean	3
Grade 4	Thin to very thin	4

In order to allow for unequal numbers of male and female calves the mass of female calves was corrected to that of a male calf. This was done using a correction factor which was calculated for each separate year of study. A year consisted of the 12 month period from the 1st of July to the 30th of June in the following year. This period coincided with the farmer's record system. The calving percentage was calculated by dividing the number of cows which calved by the total number of females which were run with the bulls and which qualified to produce a calf during the year.

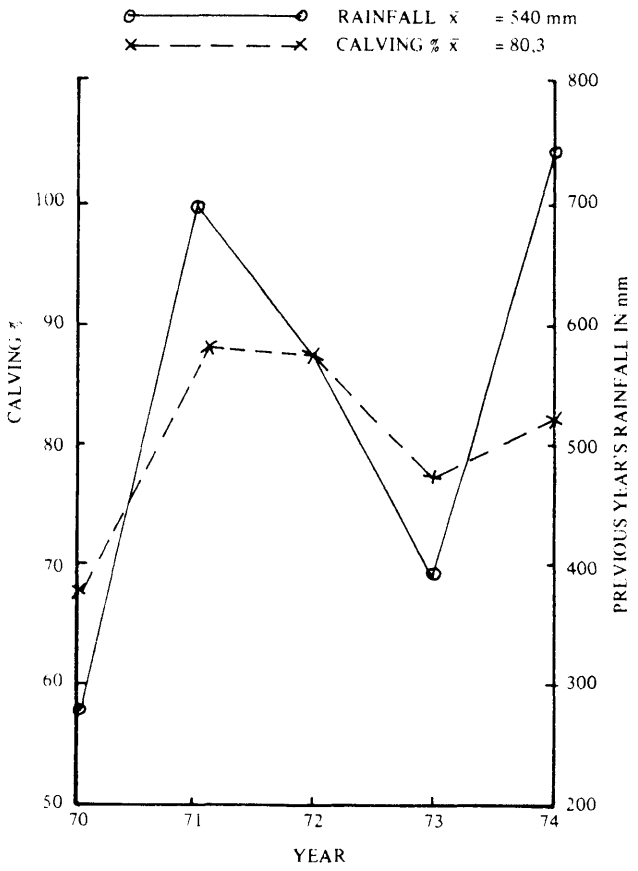
Stock, including Angora goats, Dorper sheep and beef cattle were run at the rate of 5,10 ha per LSU. A rotational multi-camp grazing system was applied with animals being moved after visual observation of vegetal cover. Mineral licks were not supplied due to non-acceptance by stock, and no other supplementary feed was supplied to the cows.

Heffers were introduced into the breeding herd at roughly 3-monthly intervals when their live mass exceeded 330 kg. Continuous or unrestricted mating in a multi-sire herd was applied using one bull per 30–40 females. Cows were culled for the normal debilitating factors and for infertility after pregnancy testing twice a year. Females which had 2 consecutive negative pregnancy tests were culled.

Results and Discussion

The average calving percentages and previous year's rainfall are illustrated in Fig. 1 and the results indicate that on the average a reasonably good reproductive rate of 80,3 was achieved. The rainfall varied considerably, and exceptionally good precipitation was recorded in 3 of the 5 years with only one year being below what is considered to be the average annual precipitation of 375 mm. A positive and significant correlation ($r = 0{,}8355$, $P < 0{,}05$) was found between calving percentage and the previous year's rainfall.

Fig.1 *The relationship between calving percentage and the previous year's rainfall.*



One of the main objects of this study was to establish which period or periods of the year resulted in both a relatively good reproductive performance and a good calf weaning mass. Norms were not available to judge this performance so it was decided that these would be established arbitrarily taking the average or near-average (within 2% of average) of the data recorded in this study as acceptable norms. The average performance data over the 5-year period are:

Cow mass at weaning	(7 months) 423	kg
Calf mass at weaning	(7 months) 191	kg
Cow condition rating	(7 months) 2,6	
Inter-calving period	14,6	months

The average performance data for each month is given in Table 1 with double or single asterisks denoting acceptable (average or better than average) or near-acceptable (within 2% of average) performances respectively.

It will be noted from Table 1 that cow mass and cow condition do correspond to some extent, but these 2 measurements are not always linked with high weaning mass or shorter inter-calving periods.

Table 1

Average monthly performance data of cows and calves over the 5-year period of July 1970 to June 1975.

Month of calving	Cow mass at weaning (kg ± S.E.)	Cow condition rating at weaning (rating ± S.E.)	Inter-calving period (months ± S.E.)	Corrected calf mass at weaning (kg ± S.E.)	Number of cows calved
July	402 ± 7,22	3,1 ± 0,53	16,2 ± 0,64	** 196 ± 6,09	47
August	** 426 ± 12,59	3,1 ± 0,71	** 14,3 ± 0,79	** 194 ± 6,78	23
September	415 ± 6,80	** 2,5 ± 0,40	** 14,6 ± 0,47	** 206 ± 4,90	47
October	** 426 ± 5,91	** 2,4 ± 0,29	** 13,4 ± 0,27	** 198 ± 2,86	75
November	* 420 ± 6,20	** 2,5 ± 0,37	** 13,0 ± 0,30	186 ± 3,53	60
December	** 440 ± 6,01	** 2,4 ± 0,37	** 13,4 ± 0,53	183 ± 3,26	44
January	416 ± 6,83	** 2,5 ± 0,35	** 13,9 ± 0,35	173 ± 4,42	51
February	* 421 ± 8,25	2,8 ± 0,42	15,1 ± 0,58	179 ± 4,25	47
March	401 ± 16,29	2,7 ± 0,85	* 14,8 ± 0,89	183 ± 6,31	10
April	** 452 ± 17,82	** 2,2 ± 0,52	* 14,9 ± 0,70	** 194 ± 5,61	16
May	** 433 ± 6,97	** 2,6 ± 0,48	* 14,8 ± 0,71	** 196 ± 4,83	34
June	** 424 ± 7,86	** 2,3 ± 0,74	15,1 ± 0,60	** 203 ± 6,51	25

* denotes near-average performance (within 2% of average)
** denotes average or better than average performance

Table 2

Percentage monthly calving distribution

Month	Year					Average
	1970/71	1971/72	1972/73	1973/74	1974/75	
July	14,5	10,5	8,0	1,7	4,4	7,8
August	18,0*	7,2	10,5	1,2	3,7	8,7
September	12,8*	18,2*	4,5	12,6	1,5	9,9
October	9,6*	16,5*	17,1*	10,9	14,3*	13,7
November	17,0*	16,5*	22,6*	4,2	12,7*	14,6
December	6,8	8,3*	9,5*	0,8	21,1*	9,3
January	0	7,2	15,7*	17,6*	10,5*	10,2
February	2,5	1,1	4,0	20,1*	12,7	8,1
March	0,8	3,3	2,0	1,7*	2,2	2,0
April	1,7	4,9	0,5	10,9*	3,7	4,3
May	3,4	3,3	4,0	10,9	9,0	6,1
June	11,9	2,7	2,0	4,2	3,7	4,9

* denotes 4-month calving peaks in which approximately 60% of calving took place.

Table 3

The percentage of cows with inter-calving periods of less than 12 months, monthly calving shift and average inter-calving period

Year	Cows with an inter-calving period of less than 12 months %	Shift months	Average inter-calving period months
1970/71	3	–	16,1
1971/72	18	+1	14,0
1972/73	24	+1	12,9
1973/74	6	+3	15,1
1974/75	38	–3	13,4

In view of the fact that reconception rate and calf mass are of direct economic significance, inter-calving period and weaning mass were considered to be the most important criteria on which performance should be based. It is apparent from Table 1 that on the basis of these two factors the best performance was achieved in August–November with April–May also being acceptable. In the event of restricted mating being applied, these two periods could be considered as most suitable as first and second calving seasons with suitable mating periods of November–February and July–August respectively.

The lighter calf weaning masses were recorded from December to March. This phenomenon has previously been observed in the Eastern Cape (Bishop, 1963) where it was found that there was a marked difference between calves born in September and those born later in the season. The reasons for this phenomenon were not established, but are considered to be due to heat and possible parasite stress, rather than nutritional shortcomings.

The data in Table 1 shows that although there was a variation in cow performance and calf weaning mass, the differences were not large. This fact tends to lend some measure of support to local farmer opinion that mating can be practised on an unrestricted basis.

A study of the calving pattern over the 5-year period indicates definite peak periods which shift from year to year. This can be seen in Table 2 where asterisks denote 4-month peak periods during which approximately 60% of the calves were born.

In the first 4 years of this study, calving peaks occurred later each consecutive year. This appears logical when it is considered that inter-calving periods exceed twelve months. However, the peak in 1974/75 does not follow this pattern and occurs 3 months earlier than the previous peak. This forward shift is associated with a reduced average inter-calving period, a pattern which had occurred previously in 1972/73 without such a marked effect.

The main reason for the forward shift of the 1974/75 calving peak was probably due to exceptional nutritional conditions during the previous calving peak of 1973/74 when very good rains were recorded. This apparently resulted in a large proportion of freshly calved cows from the 1973/74 peak with inter-calving periods of less than 12 months. This is illustrated in Table 3 in which the percentage of cows with inter-calving periods of less than 12 months is presented.

From the results in Table 3 it is evident that the aforementioned shift is less influenced by the average yearly inter-calving period.

The fact that this study only covered a 5-year period and that during this period the average precipitation was higher than normal could have influenced the results obtained. The results and conclusions must therefore be viewed in this light.

Acknowledgements

The author wishes to thank Messrs A.L. Johnson and L.G. Walsh, farm owner and manager, respectively, for their efforts, good records and excellent co-operation.

References

ACOCKS, J.P.H., 1953. Veld types of South Africa. *Mem. Bot. Surv. S. Afr.* No. 28. Pretoria: Govt. Printer.
BISHOP, E.J.B., 1963. Spring calving for beef cows. *Fmg S. Afr.* 39 (4) 39.
BISHOP, E.J.B. & KOTZE, J.J.J., 1965. Good strategy with beef cows. *Fmg S. Afr.* 41 (26) 6.
BISHOP, E.J.B., 1966. Unpublished data. Dohne Res. Inst.
LAMOND, D.R., 1970. The influence of undernutrition on reproduction in the cow. *Anim. Breed Abs.* 38, 359.