

FACTORS INFLUENCING THE WEANING MASS OF AFRICANDER, HEREFORD, BONSMARA AND SIMMENTAL CALVES IN THE NORTHERN TRANSVAAL BUSHVELD.

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SUMMARY

Factors affecting preweaning growth rate were studied in four different breeds of cattle. Breed differences gave rise to significantly different preweaning growth rates. Age of cow was found to influence calf birthmass, weaning mass, mass gain from birth to weaning, ADG from birth to weaning and weaning mass of calf as percentage of cow mass at parturition. With respect to cow efficiency three year old heifers were found to be the most efficient. Calves born late in the calving period were found to have greater birthmasses than those born early in the season. Breed-age interactions were evident.

INTRODUCTION

The creation of standards for the planning and improvement, as well as a knowledge of the influences of different factors on the production potential of cattle form the basis of efficient production.

MATERIAL AND METHODS

Data were collected at the Mara Research Station, situated in the sub and subtropical bushveld, 23°09' south and 29°34' east at 894m above sea level. The production of four breeds of cattle namely, the Africander, Hereford, Bonsmara and Simmental was evaluated. A fixed management programme existed for the total duration of the experimental period, which included performance testing and a normal selection and culling programme. The least square method (Harvey 1972) for analysing multiple classified data with unequal

totals in the subgroups was used to determine the influence of different independent variables. The subjacent comparison of treatments, according to the method of Barferani (Miller 1966) was used. The basic linear model used to describe the dependent variables can be presented by the following equation:

$$Y = u + F_i + e_{ij}$$

Where u = the ij corrected average
 F_i = fixed and continuous effects
 e_{ij} = expression of error where the expected value is taken as nil.

RESULTS AND DISCUSSION

1. The influence of breed was highly significant ($P < 0,01$) for all the preweaning growth characteristics. The birth mass of calves of Africander cows was 7,5% of the parturition mass of Africanders. The corresponding figure was 8,3% in Herefords, 7,7% in Bonsmaras and 8,5% for Simmentals. Bonsmara cows averaged the highest weaning mass at 28 weeks ($216,15 \pm 2,54$ kg) followed by Simmentals ($212,25 \pm 2,62$ kg), then Africander ($189,10 \pm 2,55$ kg) and finally Herefords ($172,15 \pm 2,70$ kg). Age of cow influenced the preweaning growth of calves throughout the experimental period. There was no significant difference between the birth mass of calves from heifers and four year old cows as was the case with calves from five to eight year old cows and nine year old and older cows.

2. Cow efficiency

If cow efficiency is taken only in terms of calf mass at weaning and a percentage of the cow mass at parturition, then three year old heifers were the most efficient followed by four year old cows, five to eight year old cows and nine year old and older cows. It is assumed that there was no variation in fertility between the animals.

The tendency for cows which were not in calf the previous season to produce heavier calves at weaning was especially applicable to younger cows. Birth mass tended to increase as the calving season progressed. A levelling off, however, occurred near the end of the calving season (See figure 1).

TABLE 1: Factors influencing the pre-weaning growth of calves of different breeds.

Breed	Calf Mass		Gain Calf birth to weaning (kg)	ADG birth to weaning (kg)	Weaning mass as % of birth mass	Weaning mass as % of cow mass at partur- ition
	at birth	at wean kg±SD				
Africander n=175	32,1 ±0,53	189,1 ±2,55	153,0 ±1,95	0,78 ±0,009	578,9 ±7,50	45,8 ±0,61
Hereford n=148	33,1 ±0,56	172,1 ±2,7	135,9 ±2,2	0,69 ±0,01	510,0 ±8,53	44,9 ±0,69
Bonsmara n=197	34,7 ±0,53	216,1 ±2,5	176,9 ±1,7	0,90 ±0,008	612,6 ±6,58	49,6 ±0,53
Simmental n=162	37,9 ±0,54	212,2 ±2,6	172,4 ±1,89	0,87 ±0,009	565,3 ±7,31	50,7 ±0,59

The differences in postweaning growth as a result of differences in birth rank or season of birth could nearly always be traced back to the feeding regimes of the cows and the grazing potential, as well as the ability of the calf to utilise the milk and grazing available.

An important breed x age interaction was found. Africander and Bonsmara cows produced relatively constantly over their productive lives, while Simmentals and Herefords showed a large increase in production to maturity (22,3 and 20,6%), after which production decreased.

CONCLUSIONS

The influence of breed on preweaning growth of calves can be attributed to breed differences in cow size, milk production and the inherent weaning mass of the calf. Simmental and Bonsmara cows were superior in the weaning mass of their calves. Obvious breed differences in cow efficiency at weaning were observed. Young Bonsmara cows are the most efficient, but from the age of six years the Simmentals became the most efficient. The efficiency of Africanders and Herefords was lower and variable. The Simmentals and Herefords showed an increase in the weaning mass of their calves relative to their metabolic mass as their age increased.

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