

BREED CHARACTERIZATION STUDIES IN NAMIBIA

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INTRODUCTION

Beef cattle production is the most important agricultural activity in Namibia today. Gross cattle numbers vary between 1.8 and 2.5 million as a result of fluctuating rainfall patterns affecting the viability of beef production.

A very sophisticated level of beef production is enjoyed encompassing a broad mix of commercial and communal ~~Omatjenne Research Station since 1951~~ ^{Omatjenne Research Station since 1951}, classifying and characterizing various breeds according to their entire spectrum of production traits, contributed enormously to the fact that well adapted and highly productive exotic and indigenous breeds represent the seed stock industry in Namibia today.

Generally speaking, production is relatively high in the commercial sector and comparable with developed countries. Commercial production is based on cross breeding, using predominantly *Bos indicus* breeds and their crosses as dams. The commercial sector mainly produces beef for the export market which is crucial for Namibia's export economy whereas in the communal sector, beef cattle in particular, plays a number of important roles in the economy of this sector.

It has only been in the early seventies that Namibian animal scientists acknowledged the ability of the approximate 400 000 indigenous Sanga cattle in the harsh and relatively undeveloped northern parts of Namibia to survive and reproduce under conditions that have prevented many other exotic cattle breeds from prospering. Consequently, this led to the inclusion of the indigenous Sanga breed in the breed characterization studies at Omatjenne Research Station in 1972.

The performance of six beef cattle breeds of three different frame sizes over a period of 14 years (1977 to 1990) will thus be presented in this paper.

MATERIAL AND METHODS

The Sanga and Nguni represented small frame indigenous breeds, the Afrikaner and Hereford medium frame indigenous and beef breeds respectively and, the Santa Gertrudis and Simmentaler large frame composite and dual purpose breeds respectively. The different breeds were evaluated under comparable nutritional and management conditions. Comparisons since 1984 have been based on approximately 17 kg cow biomass/ha/year. This research was conducted at the Omatjenne Research Station (20° 24' S latitude, 16° 29' E longitude) situated in a sweet bushveld savanna in the central parts of Namibia. The average annual rainfall is 395 mm.

RESULTS AND DISCUSSION

Data is given as means during different periods as statistical analyses have not yet been completed (Lepen, 1992). The periods represent the years of participation of the different breeds in the study.

REPRODUCTIVE EFFICIENCY

The single most important avenue for increased productivity is reproductive efficiency, of which calving percentage surely should be emphasized (Swanepoel & Hoogenboezem, 1993). The reproductive performance of the various breeds is presented in Table 1. The Afrikaner and Hereford had the lowest calving percentages, 76.1 and 77.3 % respectively. The Santa Gertrudis and Simmentaler and Sanga were the most fertile breeds, 86.7 and 91.6 % respectively. The exceptionally high fertility of Sanga cattle could be the result of natural selection over many years (Scholtz, 1988). Concerning the Afrikaner, the lower calving rates are in agreement with results of several other studies in Africa as reviewed by Hetzel (1988).

FETAL DYSTOCIA AND PRE-WEANING PERFORMANCE

The importance of birth mass as selection parameter cannot be over emphasized because of its association with dystocia and subsequent reduction in productivity (Bellows, Short, Anderson, Knapp & Pahnish, 1971). The percentage dystocia observed in each breed is given in Table 2. The Hereford and Simmentaler showed the highest incidence of fetal dystocia, 5.9 and 5.7% respectively. The Afrikaner and Santa Gertrudis were intermediate (2.1 & 3.1%), whereas the Nguni and Sanga experienced limited cases of fetal deaths at birth, 0.7 and 1.6 % respectively. Table 3 indicates the birth mass ratios of the different breeds which are all well in the accepted norm of 7 to 8% of fetal mass expressed as a percentage of maternal mass. It is interesting to note that the Santa Gertrudis which is regarded as a large frame breed in Namibia, had the most favourable birth mass ratio of 6.4 %.

WEANING PERFORMANCE

The importance of weaning mass with regard to the overall economic efficiency in beef production is well documented (Bosman & Harwin, 1966; Venter, 1977; Dinkel & Brown 1978). The corrected 205 day weaning mass of the various breeds is summarized in Table 4. At weaning, calves of Nguni and Sanga cows were lighter, and calves of Santa Gertrudis and Simmentaler cows heavier, than calves of Hereford and Afrikaner cows. Simmentaler cows weaned exceptionally heavy male calves (266 kg). Although the growth rate of Sanga cattle is rather low, the growth rate of males if compared under intensive conditions, compared favourably with the Afrikaner and Brahman (Scholtz, 1988).

COW PERFORMANCE

Cow productivity generally relates to the quantity of weaning mass produced per cow per year, thus incorporating both fertility and milk production (Van Zyl, 1990). The weaning productivity of the different breeds was calculated and expressed as kg calf weaned per 100 kg of cow exposed

(Table 5). This ratio is preferred for purposes of comparisons as it takes into account both differences in fertility and cow maintenance, due to differences in size (Scholtz, 1988). Afrikaner cows were less productive (30.9 kg) than Simmentaler (32.3 kg) and Hereford cows (32.8 kg). The Santa Gertrudis cows were extremely productive and achieved to produce 36 kg beef per 100 kg cow mass mated. Nguni and Sanga cows, having the highest reproductive performance and lowest pre-weaning growth rate of progeny, proved to be the most productive, 37.6 and 36.0 kg respectively. This high efficiency of Sanga and Nguni cows correspond closely to the figures reported by Hetzel (1988) for indigenous breeds.

POST-WEANING VELD PERFORMANCE

Oxen were slaughtered on an age constant basis (27 months of age). The live and carcass weights of oxen slaughtered are shown in Table 6. Sanga and Nguni oxen achieved the lowest carcass weights (211 & 221 kg), the Hereford and Afrikaner produced intermediate carcass-weights (221 & 204 kg), while Simmentaler and Santa Gertrudis breeds produced the highest carcass weights (265 & 273 kg). Table 7 summarizes the dressing percentage of oxen. The Afrikaner (53.2%), was followed by the Sanga (53.7%) while the Nguni (53.9%) obtained the highest dressing percentages.

CONCLUSION

The results in this study clearly demonstrates the favourable reproductive characteristics and excellent productivity of indigenous breeds and correspond closely to the comprehensive report by Hetzel (1988) concerning the performance of indigenous cattle in Africa. All the available evidence indicate that the relatively small-framed, well-adapted and highly fertile indigenous breeds, with their long history of natural selection, should play a prominent role in livestock development programmes in the harsh and relatively undeveloped areas in Namibia in particular, and in Southern Africa in general (Trail *et al*, 1977; Hetzel, 1988; Scholtz, 1988; Schoeman, 1989; Lepen, 1992). Cartwright (1970a) outlined a system whereby distinct dam and sire lines should be developed for the production of slaughter cattle. It is in this regard that Hetzel (1988), Scholtz (1988) and Schoeman (1989) recommend further investigation into the role indigenous breeds may play in cross breeding systems in order to increase efficiency of production.

The performance of the Santa Gertrudis possibly indicates the role the breed may play as a sire line in terminal cross breeding, due to its small calves at birth, superior growth rate on the veld, heavy carcasses and outstanding grading results. As purebred the Santa Gertrudis breed demands a high level of nutrition and management, before the potentially high production performance can be utilized.

The exceptionally high milk production potential and pre-weaning growth performance of the Simmentaler breed were once again emphasized, and is in agreement with reports by (Els, D.C., 1988) and (van Zyl, G.E., 1990). As purebred, Simmentalers are therefore best suited for weaner production.

Table 1: Calving percentage of cows (1977-90)

Breed	Calf (%)			
	85-88	77-88	85-89	77-90
Afrikaner	80.2	76.2	79.1	76.1
Hereford	87.4	77.3	-	-
Nguni	86.4	-	86.7	-
Sanga	92.1	90.8	92.1	90.8
Santa Gertrudis	84.6	82.1	-	-
Simmentaler	80.1	78.6	81.6	80.2

Table 2: Percentage fetal dystocia (1978-90)

Breed	Dystocia (%)			
	85-88	78-88	85-89	78-90
Afrikaner	3.5	1.7	2.2	2.1
Hereford	8.3	5.9	-	-
Nguni	0.0	-	0.7	-
Sanga	0.0	1.9	0.6	1.6
Santa Gertrudis	4.8	3.1	-	-
Simmentaler	6.3	5.3	6.1	5.7

Table 3: Birth mass ratio (1984-90)

Breed	Birth mass ratio (%)		
	Cow mass at calving	Birth mass	Ratio (%)
Afrikaner	493	34.8	7.1
Hereford	517	36.7	7.1
Nguni	400	29.9	7.5
Sanga	404	29.6	7.2
Santa Gertrudis	556	35.6	6.4
Simmentaler	590	44.4	7.5

Table 4: Corrected weaning masses of bull calves and heifers (1978-90)

Breed	Weaning mass (kg)			
	85-88	78-88	85-89	78-90
Afrikaner	209.5 (186.2)	205.4 (190.8)	208.1 (187.3)	205.1 (188.3)
Hereford	211.7 (192.3)	210.2 (195.5)	-	-
Nguni	183.5 (171.5)	-	183.8 (171.5)	-
Sanga	184.5 (162.0)	185.7 (164.7)	186.0 (161.8)	185.8 (164.8)
Santa Gertrudis	244.2 (215.9)	240.2 (218.2)	-	-
Simmentaler	271.5 (240.9)	268.9 (237.8)	272.6 (242.2)	266.0 (239)

() = Weaning mass of heifers

Table 5: Weaning mass produced per 100 kg cow mass mated

Breed	Weaning mass/100 kg cow mass mated			
	86-88	84-88	86-89	84-90
Afrikaner	32.9	31.0	32.6	30.9
Hereford	35.1	32.8	-	-
Nguni	37.2	-	37.6	-
Sanga	37.2	36.0	36.9	35.4
Santa Gertrudis	33.9	36.0	-	-
Simmentaler	30.9	30.9	31.3	32.3

Table 6: Live mass and carcass mass of oxen at 27 months (1983-91)

Breed	Mass (Kg)	
	83-89	83-91
Afrikaner	423 (224)	435 (229)
Hereford	430 (222)	-
Nguni	410 (221)	-
Sanga	380 (204)	394 (211)
Santa Gertrudis	517 (273)	-
Simmentaler	513 (265)	524 (269)

() = Carcass mass

Table 7: Dressing percentage of oxen slaughtered at 27 months

Breed	Dressing (%)	
	83-89	83-91
Afrikaner	53.2	52.8
Hereford	51.5	-
Nguni	53.9	-
Sanga	53.7	53.6
Santa Gertrudis	52.8	-
Simmentaler	51.6	51.

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