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 effecting the viability of beef production.

A very sophisticated level of beef production is enjoyed encompassing a broad mix of commercial and communal producers. Comprehensive breed evaluation studies at Omatjene 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 approximately 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 Omatjene 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 discussed.

MATERIAL AND METHODS

The Sanga and Nguni represented small frame indigenous breeds, the Afrikaner and Hereford medium frame indigenous and exotic 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 17kg cow biomass/ha/year. This research was conducted at the Omatjene 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 395mm.

RESULTS AND DISCUSSION

Data is given as means during different periods as statistical analysis have not yet been completed (Lepen 1992). The periods represent the years of participation of 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 various breeds is presented in Table 1. The Afrikaner and Hereford had the lowest calving percentages of, 76.1% and 77.3% respectively.

The Santa Gertrudis and Simmentaler performed intermediate (82.1 & 80.2%), while the Nguni and Sanga were the most fertile breeds, with calve percentages of, 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).

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

Breed	Calving (%)			
	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

FETAL DYSTOCIA AND PREWEANING PERFORMANCE

The importance of birth weight 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 of 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 dystocia at birth 0.7 and 1.6% respectively. Table 3 indicates the birth weight ratios of the different breeds which are well within the accepted norm of 7 to 8% of fetal weight expressed as a percentage of maternal weight. It is interesting to note the Santa Gertrudis which is regarded as a large frame breed in Namibia, had the most favourable birth weight ration of 6.4%.

Table 2: Percentage fetal dystocia (1978- 90)

Breed	Dystocia (%)			
	85 - 88	77 - 88	85 - 89	77 - 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 weight ratio (1984 - 90)

Breed	Birth weight ratio (%)		
	cow weight at calving	birth weight	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

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 days weaning weight of 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 Herefords and Afrikaner cows. Simmentaler cows weaned exceptionally heavy male calves (266kg). 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).

Table 4: Corrected weaning weights of bull and heifer calves (1978- 90)

Breed	Weaning weight (kg)*			
	85 - 88	77 - 88	85 - 89	77 - 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 (239.0)

**Heifer calve weight is in brackets*

COW PERFORMANCE

Cow productivity generally relates to the quantity of weaning weight produced per cow per year, thus incorporating both fertility and milk production (Van Zyl, 1990). The weaning productivity of different breeds was calculated and expressed as kg calf weaned per 100kg 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 (30.9kg) than Simmentaler (32.3kg) and Hereford cows (32.8kg). The Santa Gertrudis cows were extremely productive and managed to produce 36 kg beef per 100kg cow weight mated. Nguni and Sanga cows, having 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 corresponds closely to the figures reported by Hetzel (1988) for indigenous breeds.

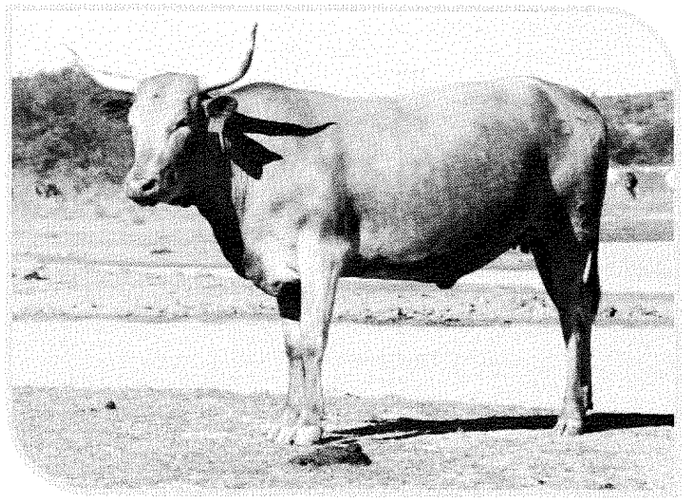

Table 5: Weaning weight produced per 100kg cow weight mated

Breed	weaning weight / 100kg cow weight mated			
	85 - 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

POST-WEANING VELD PERFORMANCE

Oxen were slaughtered on an age constant basis (27months 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 & 221kg), the Hereford and Afrikaner produced intermediate carcass weights (221 & 204kg), 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 Sanga (53.7%) while the Nguni (53.9%) obtained the highest dressing percentages.

Table 6: Live weight & carcass weight of oxen at 27 months (1983- 91)

Breed	Weight (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 weight in brackets*

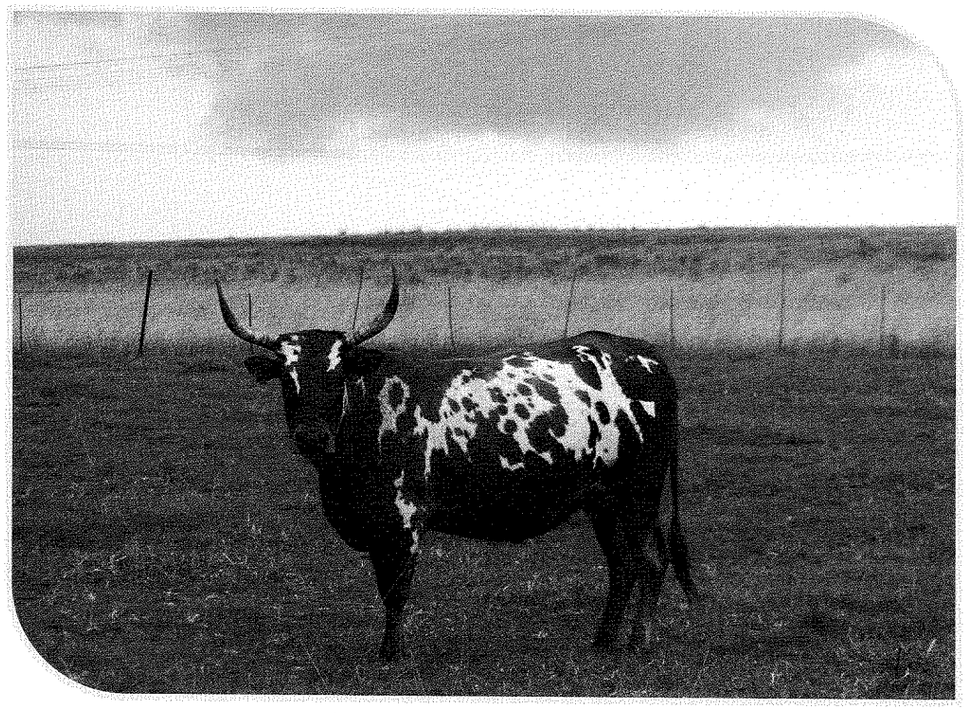

Table 7: Dressing percentage of oxen slaughtered at 27 months

Breed	Dressing (%)	
	83 - 99	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	51.0

CONCLUSION

The results of 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, very 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 northern 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) recommended further investigation into the role indigenous breeds may play in cross breeding systems in order to increase efficiency of production.

The performance of 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 (1988) and Van Zyl (1990). As purebred, Simmentalers are therefore best suited for weaner production.