

SCIENTIFIC BREEDING

IS SCIENTIFIC BREEDING CONTRADICTORY TO VELD PRODUCTIVITY?

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There is a perception that placing the emphasis on science in the breeding of beef cattle will have a negative effect. It is said that performance testing, growth tests, Breeding values and genomics is negatively correlated to veld productivity, inherent body condition, adaptation to feeding, disease and parasite resistance.

Performance recordings and measurements are objective scientific measurements. They exploit the variation for different traits so that an index and Breeding value may be calculated. The breeder may according to his aim and discretion use the measurements and calculations as an aid in selection decisions.

Visual evaluation with the emphasis on functional efficiency and adaptability are sound subjective evaluations that may be combined with the indices and Breeding value to make sound selection decisions. Veld productivity and homeostasis (balance of animals to internal environment) are important because Nguni cattle are basically 100 percent on natural grazing.

These traits are important, but to say that utilizing scientific measurement and evaluation of beef cattle is wrong, cannot be supported.

Each calf crop entails variation for the traits that the cattle breeder is interested in. **Measuring the different traits determining an Index and Breeding value is a scientific process that provides sound objective information.** The application of the data in the breeding herd depends entirely on the breeder and what his aim with the herd is. No scientist has ever said that the fastest grower, or tallest bull or the best performer for any trait must be used in the breeding program. **Scientists have always emphasised a balanced approach between traits and a balance with the particular environment.** The Society will inspect the young group of animals and those that are passed may be selected for the breeding herd according to the discretion of the breeder. Certain animals may not be acceptable to the breeder irrespective of performance. The sound judgment of a breeder is always respected.

An advantage of measurements is that the improvement or genetic change of the herd and breed may be quantified over time.

A breeder gets to know his cattle better if they are visually evaluated and their production is objectively measured and available.

Nguni cattle are evaluated in different environments on natural grazing. The animals that meet the requirements of the Society and breeder are selected. The possibility of losing veld productivity, adaptation and resistance to diseases and parasite even if they are objectively measured is negligible.

GROWTH TESTS OF YOUNG BULLS

The purpose of growth tests is to determine genetic differences of young bull calves for economically important traits within a standardised environment. The traits measured include post weaning growth rate (ADG) Kleiber ratio (similar to feed conversion), scrotal circumference, height, length and skin thickness. Ultrasonic measurements are an option and include eye muscle area, external fat covering and marbling.

TABLE 1: Weaning weight of calves in a non-dip situation versus dipping every three weeks

Growth tests may be run on grazing or semi-intensively with extra feed to enhance growth rate over a shorter test period or intensively with a growth ration.

Growth tests on the farm have the advantage that a breeder may observe the variation present in his herd not only for growth rate, but for various other traits such as hooves, bone structure, depth of body, masculinity and scrotal size and shape. The calves of different bulls bring insight into how they breed. In other words, **growth tests bring you as a breeder closer to your cattle. It is a worthwhile exercise.**

At the Vaalharts Research Centre a group of 65 Nguni bull calves were subjected to a low energy ration. The ADG of the group was 1280g per day. The best 25% (15 bull calves) grew at a rate of 1590g per day which is an acceptable growth rate for any feedlot. The poorest 25% had an ADG of 980g which is not an economic growth rate under any circumstances. There are Nguni herds that have weaner calves accepted by feedlots.

The best growers are seldom selected for herd sires if a balance between the different traits and the particular environment are emphasized. This includes adaptability and functional traits of importance.

RESISTANCE TO EXTERNAL PARASITES

The Nguni cattle breed is found in many different grazing areas of Southern Africa, where summer temperatures may exceed 35°C and where a variety of ticks and tick borne diseases are present. **Research has shown that the Nguni is the most tick resistant of all breeds found in Southern Africa.**

Tick infestation will reduce weight gains and milk yield of cows. A study was conducted at the Groblersdal Research Centre of the ARC, determining the effect of tick infestation on the subsequent performance of the Nguni, Bonsmara and Hereford breeds in particular on weaning weight.

A comparison of dipping every three weeks versus non-dipping is presented in Table 1.

BREED	NO DIP (kg)	DIP (kg)	DIFFERENCE (kg)	%
Hereford	137	167	29.5	22
Bonsmara	167	184	17.6	10
Nguni	165	169	4.4	2

(Source: Onderstepoort Jnl.Vet.Res. 1991)

SCIENCE — *is the* —
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Dipping resulted in a significant increase in the 205 day weaning weight of calves from the Hereford (29.5kg), Bonsmara (175kg) and Nguni (4.4kg) breeds. On average the difference was 17kg for the three breeds. If 100 calves were sold at weaning at R35 per kg the difference between no dip and dip would be close to R6000. The difference in income for the Herefords would be R10 325. The mean number of ticks per count for the 205 day period is presented in Table 2.

TABLE 2: Number of engorged female ticks on each breed during lactation and the effect of each tick on the weaning weight of the calves.

BREED	NO OF ONE-HOST TICKS	NO OF MULTI-HOST TICKS	EFFECT OF ONE ENGORGED FEMALE TICK
Hereford	3137	164	8.9
Bonsmara	2030	164	8.0
Nguni	431	82	8.6

It was estimated that each engorged female tick caused a reduction of 8.9g in the weaning weight of the Hereford calves, 8.0g in the Bonsmara calves and 8.6g in the Nguni calves.

These results suggest that the effect of tick infestation on the mother may be more significant on the suckling calf than the adult animal itself.

The use of indigenous breeds like the Nguni that possesses a high resistance to tick infestation has economic advantages. This trait must be maintained in the Nguni breed, particularly in the eastern parts of Southern Africa where a variety of ticks are present.

VELD PRODUCTIVITY

At the Omatjenne Research Centre in Namibia the dry matter (DM) intake of grazing Afrikaner and Simmentaler cows was determined. It was found on the sweet veld grazing that cows consumed 3.45% of DM of body weight. If the production of DM per ha per year is 400kg the number of cows per 1000 ha may be determined. This calculation for the different breeds at Omatjenne is presented in Table 3.

TABLE 3: Cow capacity per 1000 ha for each breed

BREED	AV COW WEIGHT (kg)	Kg DM/COW/YEAR	COWS ON 1000ha
Afrikaner	485	6107	65
Hereford	478	6019	66
Nguni	382	4810	83
Santa Gertrudis	492	6196	65
Simmentaler	525	6611	60

(Source:Swalurama, 1983)

The performance of the cow groups in the above table was evaluated over a 7 year period. The average calving interval, 205 day weight, calf losses to weaning and total weaning weight per herd was recorded and is presented in Table 4.

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TABLE 4: Production of weaning weight at 205 days of age

BREED	COWS	COW WEIGHT (kg)	205 DAY WEAN WEIGHT	% LOSS TO WEAN	ICP (days)	TOTAL WEAN WEIGHT (kg)	INDEX
Afrikaner	65	485	186	6.1	466	8986	85
Hereford	66	478	194	11.3	462	8968	85
Nguni	83	382	166	2.1	372	13177	124
Santa Gertrudis	65	492	204	5.1	420	10970	104
Simmentaler	60	525	225	8.7	416	10824	102
TOTAL / AV	339	472	195	6.7	426	11319	100

(Source:Swalurama,1983)

The actual 205 day weaning weight of the breeds is presented in Table 4, but in the total weaner weight calculation the % loss from birth to weaning is subtracted.

The Nguni breed had the lowest loss of 2.1% from birth to weaning and recorded the lowest intercalving

period during the seven years. The breed could therefore easily record the highest total weaning weight which was 24% higher than the average of the 5 breeds.

Within breed variation is present for all traits measured, in this case cow weight, milk-production, survival rate

and reproduction. The variation may be successfully used to select the best producing cows in a herd. This will improve the production ability of the cow herd which means a higher income.

THE NGUNI COW IN THIS EXPERIMENT PROVED THEMSELVES TO BE WELL ADAPTED MOTHERS WITH A SOUND PRODUCTION POTENTIAL.

The Nguni calves averaging at 166kg may be too light for an intensive post weaning production phase, but with a terminal sire they have in experiments **outperformed other crossbred progeny in total beef produced and therefore economic returns.**

LICK CONSUMPTION

The amount of lick consumed on natural grazing by the different breeds has economic implications. **Licks have become expensive. Breeds that consume fewer licks have an economic advantage.** On a within herd basis the average weaning weight could be taken to a slightly higher level of 180kg. In Table 5 the measured intake of licks per breed per cow is presented.

TABLE 5: Lick intake of the different breeds per cow per day

BREED	COWS	INTAKE / COW / DAY (g)	COST / COW / DAY
Afrikaner	39	165	5.3 cent
Nguni	31	115	3.7 cent
Santa Gertrudis	32	274	8.8 cent
Simmentaler	38	419	13.4 cent
TOTAL / AV	140	243	7.8 cent

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If no recording is done a herd may unknowingly be moving in a direction that is less profitable.

“If you always do what you've always done, you will always get what you always got.”

– Tony Robbins.

It is evident from Table 5 that the Nguni needs fewer licks on the sweet grazing at Omatjense than any other breed. The Nguni is a smaller cow weighing 382 kg in comparison with the heavier Simmentaler cow of 525kg. Nevertheless, the difference in body weight was 37%, but the lick intake records a difference of 364%. Where input costs have become a significant expense, the indigenous breeds have an advantage that cannot be ignored. Breeders in the past have sold stud herds of certain breeds that have become too expensive to maintain on natural pasture.

SUMMARY

The Nguni is adapted and performs well in a variety of environments in South Africa and Namibia.

The tick resistance of the Nguni surpasses that of the other breeds and therefore have a significant advantage in areas where ticks abound. Only a limited number of ticks feed to maturity on Nguni cattle. The Nguni in South Africa developed along the east coast which is climatically one of the most trying and disease-ridden areas. The Nguni cow performs well in extensive grazing areas where other breeds do not perform well. The reproductive rate even in low rainfall areas and where drought conditions prevail remains high. Nguni mothers are excellent with no calving problems even if mated to the larger breeds.

The Nguni is a low maintenance animal. It takes less grass and less time to meet their maintenance requirements than the larger, higher maintenance cows.

Smaller cows can wean a higher percentage of their own body weight than larger cows, increasing total kilograms weaned and profit.

Performance recording and measurements are assets to the breeders who record. They know their cattle better which allows breeders to breed more profitable Nguni's according to their aims. Herd progress is quantified over years for all the traits measured. If no recording is done a herd may unknowingly be moving in a direction that is less profitable. The proper balanced application of the calculated indexes and Breeding values are important. ■

