

## RESEARCH NOTE

## POST-WEANING BODY MASS GAIN OF FOUR BREEDS OF STEERS ON DIFFERENT NUTRITIONAL LEVELS

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In South Africa there are 20 breeds of cattle which are mainly kept for the purpose of beef production (van Marle, 1974). Each one of these possesses desirable as well as less desirable characteristics and is better adapted to a certain set of environmental conditions and production systems than to others. Alan Robertson (1958) summed up the situation as follows: "The only reasonable argument for the existence of so many breeds is that each has one specific job that it can do better than any other breed".

At the Mara Research Station 4 cattle breeds of divergent types and characteristics viz., the Afrikaner, the Hereford, the Simmentaler and the Bonsmara are being studied. Their performances in different production systems are being compared in order to attain an indication of the purpose and the type of environmental conditions to which each of the breeds is best suited.

The post-weaning gain in mass of steers of the said breeds has been compared on 4 different nutritional levels.

For 2 consecutive years small, random samples of the 4 breeds were compared on poor retrogressed

veld of the Mara Research Station. This veld was in a pioneer stage of succession and was lacking both in quantity and quality.

For 3 years the post-weaning gains of steers were determined on high quality sweet veld at Mara. For 2 out of the 3 years some of the steers received a concentrate ration consisting of 2,27 kg of yellow maize meal and 0,04 kg of urea per animal per day on veld at the start of the experiment. As the animals gained in mass the amount was increased accordingly to an ultimate level of 2,96 kg maize meal/urea mixture per animal.

For 3 years weaners were compared in the feed-stall on an intensive finishing ration consisting of 66% yellow maize meal, 30% cowpea hay (milled), 3% peanut oil cake meal and 1% degelatinised bonemeal. This was supplied *ad lib*.

At all times all animals had free access to a salt/bonemeal lick.

Table 1 shows the mean daily gains of steers on poor veld for 52 weeks after weaning.

On poor veld the 2 indigenous breeds performed better than the 2 exotic breeds. It is reasonable to ex-

Table 1

*Post-weaning gain of steers on poor veld*

Breed	n	Weaning mass kg	Mass 52 weeks after weaning kg	Mean daily gain kg x 10 <sup>-3</sup>	Coefficient of variation %
Afrikaner	11	189	255	182 ± 42	23
Hereford	7	188	232	120 ± 35	29
Bonsmara	12	225	298	200 ± 52	26
Simmentaler	9	234	288	149 ± 42	28

Table 2

*Gain in body mass of steers on unsupplemented, good veld*

Breed	n	Weaning mass kg	Mass 52 weeks after weaning kg	Mean daily gain kg x 10 <sup>-3</sup>	Coefficient of variation %
Afrikaner	27	200	331	360 ± 47	13
Hereford	25	193	314	332 ± 58	17
Bonsmara	27	223	357	367 ± 44	12
Simmentaler	24	257	407	411 ± 64	16

**Table 3**

*Gain in body mass of steers on good veld plus concentrates*

Breed	n	Weaning mass kg	Mass at attainment of Grade 1 con- dition kg	Mean daily gain ± SD kg x 10 <sup>-3</sup>	Coefficient of variation %
Afrikaner	12	202	374	531 ± 68	13
Hereford	14	188	345	450 ± 92	20
Bonsmara	13	228	400	501 ± 44	9
Simmentaler	14	248	412	608 ± 48	8

pect that large animals, due to their higher maintenance requirements, will suffer more than small ones when quantity of feed is lacking. From the data in Table 1 it is quite clear, however, that in this case, body size was not the only determining factor. From our experience with cows of the same 4 breeds under similar conditions, it seems improbable that the inferior performance of the 2 exotic breeds is the result of less heat resistance or poorer walking ability.

In Table 2 the mean daily gains of weaner steers on good veld without supplementary feed are shown. These were recorded in 3 consecutive years for a period of 52 weeks after weaning.

In Table 3 the mean daily gains of weaner steers, found over a period of 2 years, on good veld grazing supplemented by a concentrate mixture as described earlier on are presented. These results cover the period from weaning onwards until the Grade 1 condition was attained by the steers.

On good veld grazing, as well as on good veld supplemented by a concentrate mixture, the Simmentaler showed the highest daily gains while the Hereford made the poorest gains. In one case they were compared over a constant period while in the other they were compared until the same condition (fat covering) was attained. Very little difference was found between the 2 indigenous breeds. The nutritional level differed in the 2 comparisons but in both cases the main ingredient of their diet was good roughage.

On a high concentrate/low roughage ration the relative performance of the Hereford and Simmentaler is reversed. Table 4 shows the mean daily gains in body

mass of weaner steers that were finished-off intensively in feed stalls. The ration was described earlier in the paper. The data given represent results over 3 years. The feeding period extended from weaning onwards until the steers had acquired the Super carcass condition.

On a high nutritional level, which was represented by a ration consisting mostly of concentrates (69%), the Hereford came to its own and showed the best post-weaning gains, in spite of the fact that the Hereford steers had the lowest initial body mass. A considerable difference now appeared between the mean daily gains of the Afrikaner and Bonsmara steers.

As these findings emanated from small numbers of animals, especially those presented in Table 1, and as large variations were found within each breed, these results should be interpreted with caution. The findings are regarded as interesting indications which could serve as an incentive for further research. However, the following general conclusions seem justified:

1. The difference between the breed with the highest mean daily gain and that with the lowest mean was relatively larger on the lowest plane of nutrition than on the higher planes.
2. As the plane of nutrition increased from unsupplemented good quality veld to veld supplemented by a concentrate and further to a finishing ration, the breed differences were found to increase accordingly.
3. The results indicated that a breed showing the best gain in mass on a ration consisting mainly of con-

**Table 4**

*Gain in body mass of steers on a high concentrate ration*

Breed	n	Weaning mass kg	Mass at attainment of Super condition kg	Mean daily gain kg x 10 <sup>-3</sup>	Coefficient of variation %
Afrikaner	32	192	322	652 ± 146	22
Hereford	28	185	327	978 ± 119	12
Bonsmara	41	226	358	795 ± 165	21
Simmentaler	31	228	409	906 ± 119	13

centrates will not necessarily show the best gains on good quality roughage (veld), and vice versa.

4. The high S.D. values are partly due to the small

number of animals available for these comparisons but also to the large variation existing within the different breeds.

#### References

- ROBERTSON, A., 1958. Modern trends in animal breeding. *Agric. Progress* 33, 6.
- VAN MARLE, J., 1974. The breeding of beef cattle in South Africa: Past, present and future. *S. Afr. J. Anim. Sci.* 4, 297.