

PRELIMINARY STUDY ON MILK YIELD AND GROWTH OF GELBVIEH, FLECKVIEH AND SCHWARZBUNTEN CATTLE IN ANGOLA

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As was pointed out by Freeden (1966) the failure of our purebred cattle to make satisfactory genetic gains in net merit reflects a plateauing in respect of our breeders and not our breed populations. The challenge facing the commercial producer, purebred and F₁ breeder and the breed associations has been discussed by Cartwright (1970). According to Cartwright, specialisation is likely whereby F₁'s will be recognised and merchandised similarly to registered purebreds. Purebred associations may introduce genes from exotic and dairy sources in order to broaden their genetic base and thereby enhance the tempo of specialisation.

A further consideration is that the main body of experimental work on selection criteria in beef and dairy cattle has tended to emphasise biological rather than economic considerations. There is a need for a more "operations research" approach to animal breeding to ensure that business decisions can be made that improve the efficiency of the actual operation (Waddington, 1951).

Attempts at developing new types of crossbred cattle more adaptable to less favourable conditions in Angola were initiated some years ago by crossing Red Danish cows with Santa Gertrudis bulls and Charolais cows with Brahman bulls. The F₁ Santa Gertrudis x Red Danish cows produced an average of 3 600 kg of milk in 280 days during their first lactation. The cows weighed between 550 and 650 kg and were of good milking temperament.

The exploitation of dual-purpose cattle began in Angola with the importation of the Brown Swiss from Switzerland and the Simmenthaler from South West Africa. The recent importation of the Gelbvieh and Schwarzbunten for the present studies constitutes the first introduction of these breeds to Angola. In view of the steadily increasing demand for lean meat, the exploitation of dual purpose breeds for crossing with unimproved African cattle appears to hold considerable promise for increasing the level of productivity under the existing conditions of high ambient temperatures.

The objective of the present study is first to establish the performance of the Fleckvieh, Gelbvieh and Schwarzbunten breeds as purebreds under local conditions. Having established the behaviour and production performance of these breeds, they will be used for crossing with Zebu Cattle (Gyr and Africander) with a view to developing an adapted and improved type of crossbred bull for use under the extensive conditions in the lowveld of Angola and in other hot and semi-arid countries.

Forty five cows, comprising equal numbers of Fleckvieh, Schwarzbunten and Gelbvieh cows, were imported from the Federal Republic of Germany. The cows were run on cultivated tropical pastures at the Faculty of Veterinary Science situated in Nova Lisboa. The pastures comprised

Pennisetum purpureum, *Panicum maximum* and *Tripsacum laxum* and were divided into small camps. A concentrate mixture consisting of maize meal, ground nuts and minerals was fed to the cows in order to provide for the lactation requirements of the cows and maintain them in good condition.

The mean annual temperature at Nova Lisboa is 19°C with a maximum of 28°C over a few days in summer and a minimum of 4°C which generally occurs over a number of days in May. The high annual precipitation of more than 1 500 mm occurs mainly during the summer period (October to April) and is associated with a low atmospheric humidity.

A problem was encountered with respiratory infections in the cattle and the mortality rate in calves was high. This aspect is being investigated but falls outside of the scope of this paper.

The growth of the calves in each of the breed groups is summarised in Tables 1, 2 and 3 while the lactation records are presented in Tables 4, 5 and 6. For convenience these results will be discussed separately for each breed.

Deutsche Fleckvieh

This breed has been proved under range conditions in Angola but there was a lack of information on the milk production and beef potential under more intensive production situations involving cultivated pastures and supplementary concentrate feeding.

The average milk production per cow for the 15 cows during the first lactation averaged 9,9 kg of milk per day, but the maximum yield was 4 077 kg of milk in 365 days (11,1 kg per cow per day). The maximum weight of young bulls was 482 kg at 12 months while a minimum weight of 339 kg was achieved in females at the same age. Cow weights at 41-45 months ranged from 573 kg to 737 kg. These cows are now being mated with Gyr bulls with a view to developing a more productive breed for the less favourable range areas which are characterised by high temperatures, sparse vegetation and erratic rainfall. The first calves are being dropped at the present time.

Deutsche Schwarzbunten

This German black-and-white breed is a dual-purpose breed of cattle with the emphasis on milk. The breed has performed successfully under widely differing conditions of climate and soils, and both on pastures and under confinement. Due to the good growth rate of calves this breed can be used for both milk production and intensive beef production.

During the first lactation the cows averaged 11,4 kg of milk per day with an average of 13,6 kg for the top 5

Table 1*Calf weights (kg) – Gelbvieh Breed*

Animal No.	Sex	Weight at birth	Weight at 8 months	Weight at 12 months	Daily weight gain	Weight at 16 months	Weight at 18 months
18	F	45	294	452	1,316	474	561
19	M	36	362	362	1,316	453	558
20	F	38	172	288	0,966	323	370
21	M	41	299	460	1,341	540	–
22	F	42	284	428	1,200	445	–
23	M	39	244	410	1,383	500	–
26	F	39	–	410	1,155	494	–
28	M	46	–	454	1,394	566	–
30	F	32	270	300	0,250	–	–

Table 2*Calf weights (kg) – Schwarzbunten Breed*

Animal No.	Sex	Weight at birth	Weight at 8 months	Weight at 12 months	Daily weight gain	Weight at 16 months	Weight at 18 months
16	F	28	275	380	0,875	400	439
17	M	38	282	457	1,458	496	570
18	M	35	331	510	1,491	603	666
19	F	40	293	415	1,016	440	467
20	F	38	281	405	1,033	468	529
21	M	37	285	285	1,133	512	565
24	M	41	305	434	1,075	531	–
25	M	32	319	485	1,383	610	–
27	M	37	290	340	0,900	–	–

Table 3

Calf weights (kg) – Fleckvieh Breed

Animal No.	Sex	Weight at birth	Weight at 8 months	Weight at 12 months	Daily weight gain	Weight at 16 months	Weight at 18 months
16	F	–	277	431	1,700	465	441
18	F	40	249	370	1,008	423	469
19	M	42	310	482	1,433	530	593
20	F	38	273	339	0,550	423	496
21	M	41	173	325	1,266	416	–
22	M	29	320	460	1,166	548	–
23	F	32	260	377	0,975	438	–
25	M	32	–	440	1,094	535	–
26	M	42	–	418	1,283	520	–
27	F	34	–	416	1,166	510	–

Table 4

Milk Production – Gelbvieh 1st Lactation

No.	Days	Production (litre)	Days	Production (litre)
1	305	2 634,6	365	3 048,4
2	277	2 180,0	–	–
3	222	2 424,7	–	–
4	202	1 794,5	–	–
5	158	978,7	–	–
6	305	2 837,9	348	3 082,1
7	89	642,6	–	–
8	305	2 883,0	334	2 992,4
9	305	3 927,0	375	4 761,0
10	305	2 548,5	409	3 025,3
11	305	4 276,2	447	5 275,3
12	305	4 508,8	419	5 711,3
13	305	2 639,6	348	3 088,4
14	147	1 021,4	–	–
15	198	1 044,8	–	–
	3 733	36 342,3	5 790	30 984,2
Average 9,71 l/day		Average 10,1 l/day		

Table 5

Milk production – Schwarzbunten 1st Lactation.

No.	Days	Production (litre)	Days	Production (litre)
1	305	4 890,8	393	6 193,6
2	305	3 248,8	436	4 353,7
3	305	3 878,0	393	4 643,5
4	305	3 900,8	369	4 581,8
5	305	4 988,9	387	5 528,7
6	305	4 080,6	418	5 335,7
7	305	3 056,9	394	3 603,3
8	305	4 339,6	397	5 595,3
9	305	2 933,7	317	3 054,3
10	192	1 689,1	–	–
11	305	2 717,8	387	3 087,6
12	244	2 353,9	–	–
13	305	2 793,3	408	3 701,9
14	305	3 905,5	320	3 946,1
	4 096	48 777,7	4 619	53 625,5
Average 11,9 l/day			Average 11,6 l/day	

Table 6

Milk production – Fleckvieh 1st Lactation

No.	Days	Production (litre)	Days	Production (litre)
1	305	3 190,1	385	3 785,4
2	305	2 594,8	323	2 618,2
3	305	2 353,2	421	3 003,5
4	305	3 174,3	457	4 438,3
5	305	3 083,3	367	3 262,7
6	305	2 320,7	352	2 605,5
7	305	3 225,6	387	3 546,7
8	305	3 543,7	395	4 199,7
9	170	1 138,9	–	–
10	305	2 928,2	426	3 805,1
11	305	3 539,5	380	4 315,8
12	305	3 208,3	348	3 741,2
13	305	2 395,3	315	2 154,6
14	305	2 880,9	363	3 386,4
15	305	3 577,1	373	4 249,8
	4 440	43 153,9	5 292	49 112,9
Average 9,7 l/day			Average 9,2 l/day	

cows. The highest producer averaged 5 032 kg of milk over 332 days with an average of 15,1 kg per day. The calves maintained a growth rate of 1,55 kg between 8 to 12 months under the experimental conditions of pasture and concentrate feeding, and attained a maximum weight of 518 kg. Cow weights at 41–45 months ranged from 503 to 646 kg.

Under the existing conditions of family farms in Angola this breed promises to have considerable value for the improvement of milk production and growth rate of the local black-and-white cattle.

Deutsche Gelbvieh

This breed from Western and Southern Germany was included in the present trial on the basis of its hardiness and triple performance in terms of beef, milk and draught. The colour is a uniform yellow which makes it an attractive proposition for crossing with Africander or other native cattle without loss of uniformity.

The first lactation records showed considerable variation with the best cows producing 4 891 kg of milk in 340 days and 4 617 kg in 338 days of lactation. The production

of the group averaged 8,99 kg per day with the top 5 cows averaging 12,3 kg per day. The weight of mature cows (3–4 years) ranged from 513 kg to 825 kg. The 12-month weight of calves ranged from 288 kg to 460 kg with a daily weight gain of 1,34 kg between 8 and 12 months. This breed will be very useful for crossing with the Africander and "Indo-Brasil" for developing a new breed for the hot extensive areas of Angola. In the high-veld areas this breed can probably be used purebred on cultivated pastures for milk and intensive beef production with the emphasis on beef.

The development of cattle breeding in Angola will be based on crosses between local breeds and the improved European and Asiatic breeds. The objective is the development of cattle that will optimize returns under the existing environmental conditions. The dual purpose breeds of Central Europe investigated in this study will undoubtedly play an important role. During the course of future investigations, hamatological studies on blood groups and haemoglobin types will be conducted for characterisation and possible monitoring of progress in respect of selection and polymorphism.

References

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