

Improving *Beef Production* with Farm Growth Tests

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INTRODUCTION

To achieve their objectives, breeders need to make informed selection decisions. Farm growth tests are one of the tools that breeders can use to improve the biological and economic efficiency of beef production. The challenge is therefore to correctly identify genetically outstanding animals, especially bulls, and to distribute their genetics through the breed. This is achieved by weighing and measuring potential breeding animals in scientifically managed growth tests. These measurements are used to estimate genetic potential (Breeding Values or EBVs), which the breeder then uses as a selection aid in breeding- and management programmes.

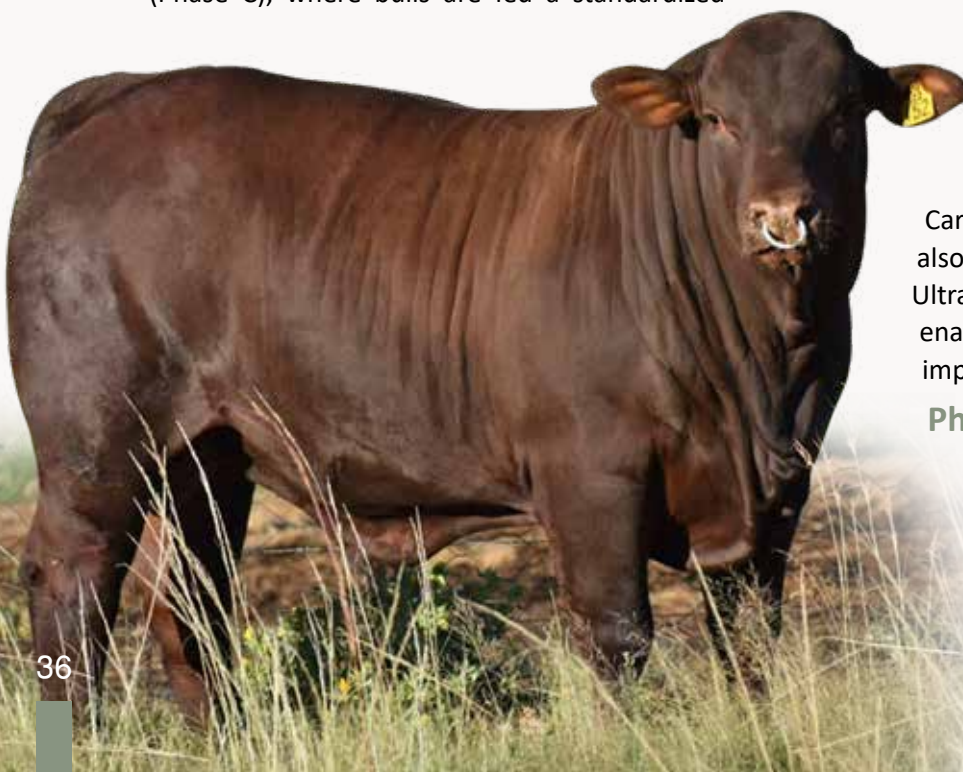
There are two types of tests which measure growth and efficiency, namely Farm Growth Tests (Phase D), where bulls are usually tested under farming conditions, and Feed Intake Growth Tests (Phase C), where bulls are fed a standardized

growth ration at a central testing centre, and each bull's intake is measured individually to accurately measure feed efficiency. Farm growth tests (Phase D) aim to determine the genetic potential for growth efficiency of beef bulls as accurately as possible under farming conditions, e.g., Extensive (veld with a lick); Semi-extensive (veld or planted pasture with supplement); Semi-intensive (sufficient concentrates with plenty of roughage in a larger camp) and Intensive (Concentrates (growth ration) in a kraal). The goal with all of these growth tests is not to achieve maximum growth, but to measure genetic differences in growth potential. It is important to use the correct ration, as these are valuable breeding bulls, and if the ration is for example too hot, it could render them unsuitable for breeding due to rumen burns, fat on the scrotum or roll claws.

In addition, traits such as scrotal size to improve male fertility and body measurements to ascertain frame size, are also measured in all growth tests. Carcass traits on the live animal can also be measured with Real-Time-Ultrasound (RTU) scanning, thereby enabling the breeder to genetically improve meat quality traits.

Phase D Growth test

For meaningful comparisons during breeding value estimation, 10 or more calves which are the progeny of two or more sires, should



be tested together. Comparable animals younger than 14 months and differing less than 100 days in age and 80kg in weight, ensure that genetic differences between bulls can easily be identified. The group should gain at least 120kg over the test with a minimum average gain of 550g/day for medium framed breeds.

Before the start of the test, there is an adjustment period of 1 to 3 months in which animals are gradually fed the same ration as during the test, to ensure that rumen microbes are present in the desired populations for the given ration. The growth test begins when bulls start to gain weight. Farm growth tests lasts between 84 and 270 days (\pm 3 to 9 months) and animals are weighed every two to four weeks. The SA Stud Book Technical Advisor (or representative) is present at the completion of the test and takes the final weights and body measurements and processes the test results, which are made available to the breeder after the test. Actual and corrected body measurements and corrected scrotal circumference, as well as ADG (Average Daily Gain or growth on test) and GDA (gain per day of age) are expressed in unit of measurement as well as an index within the contemporary group. The information is used for inspection purposes. The test results are also loaded onto the Logix Beef Cattle System so that reports can be generated and the recorded data can be included in genetic evaluations for breeding value estimation. All

growth tests and evaluations are strictly governed by ICAR (International Committee on Animal Recording) guidelines.

EXAMPLE TEST

The data from a Santa Gertrudis Phase D test that took place at Kroonstad, was analysed. Six breeders from the North-West and Free State participated and twenty animals, the progeny of twelve sires, were entered. To give all the calves an equal start in the test, all the calves were backgrounded for 21 days, before the test started. The bulls were on average 8 months old at the start of the test, which lasted for a period of 84 days. They were fed a balanced Phase D ration. RTU measurements (real time ultrasound) were also done, adding valuable carcass data to the breed.

The start and end weights determine the average daily weight gain (ADG) for the period and the index is used to rank the bulls within their contemporary groups. An index of 100 is equal to the average of the group which means that if a bull has an ADG index higher than 100, then its ADG is that percent higher than the average of his contemporaries. Breeding values are also expressed as indices, ranking animals within breed, rather than within the test. From Table 1, the variance in growth and growth rate between the bulls can be seen.

» **Table 1:** General statistics for the Example Test, as well as the Breed Average for 85 Santa Gertrudis bulls that were tested in Phase D tests during 2022. Please note that conditions and environments for the Example test are not the same as those of the Breed tests.

Traits	Example Test Measurements				Example Test Breeding Values (EBVi)			Breed Average Measurements*
	Avg	Std.Dev	Min	Max	Avg	Min	Max	
Birth weight (kg)	39	3.29	33	43	97	86	120	36
Adj. Weaning weight (kg) Bull calves	236	19.7	188	302	105	83	120	231
Weight at end of test (kg)	406	29.5	342	460	107	78	135	383
Age at end of test (days)	332	20	293	354	-	-	-	-
ADG (g/day)	1835	226	1440	2238	106	63	145	1475
Corr. Scrotal circumference (mm)	311	20.4	285	347	104	76	130	315
Corr. Shoulder Height (mm)	1154	20.6	1110	1190	103	70	134	1224
Corr. Body length (mm)	1380	40.8	1280	1440	107	86	132	1357
Rib Fat (mm)	3.0	0.88	2.6	6.5	101	77	153	3.5
Eye muscle area (cm ²)	65	5.92	50	75	103	72	132	62
Marbling (%)	2.3	0.61	1.3	3.6	95	60	127	1.9

*Santa Gertrudis Annual Report 2023. Avg of 85 Santa Gertrudis bulls in Phase D tests between 01 Jan 2022 - 31 Dec 2022.

In Table 2 the difference in profitability of two bulls from the same herd and age at the start of the example test are shown. Although the same age, Bull A already weighs 20kg more than Bull B at the start of the test, and grows better than Bull B, gaining 60kg more than bull B by the end of the test.

By testing bulls in the same growth test under the same conditions and rations, genetic differences

B, 145 versus 87, and would be the better choice for breeding profitable calves, should his other breeding values and his functional efficiency also be up to standard.

Conclusion

Every cattle breeder can benefit from participating in growth tests for more accurate selection, increased efficiency and more profitable beef

» **Table 2:** Comparison of performance of two of the bulls that were measured in the Example Test.

Bull	Age at start of test	Weight at start of test	Weight at end of test	ADG	Weight gain	EBVi ADG
A	246	278	460	2167	182kg	145
B	246	258	380	1452	122kg	87
Difference	0	20kg	80kg	715g/day	60kg	

can be determined, and, when combined with performance of related animals, reflects on the genetic merit of each bull in its breeding value. From Table 2 it can be seen that Bull A has a much higher genetic merit for growth than Bull

production. This can improve the genetic merit of the herd, whereby the best performing animals are identified. To measure is to know.



SANVORS

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AND GROWTH

