

A comparison between **Phase C** and **Phase D** GROWTH TESTS

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BACKGROUND

Why should I conduct performance testing? The answer to this question is simple: you need to measure to know whether you are making progress or going backwards. If you do not measure, you cannot know how your animals are performing in terms of their efficiency. Your bull has by far the greatest impact on the genetic progress of your herd - at any given moment, your breeding bull makes up to 50% of the genetics of your herd. By conducting Phase C or D tests, you can determine whether you are achieving your breeding objectives, particularly regarding the feed efficiency and daily growth traits of your animals. Due to a continuous rise in the population which is associated with an increased demand for protein, sustainable beef production is also becoming increasingly important to ensure the demand is met over the long term.



Bulls at the end of their Phase D test

Alongside the population growth, natural resources are also under pressure, requiring beef producers to achieve the proverbial “more from less”.

In South Africa, livestock production contributes substantially to food security. The livestock sector also plays a significant role in biodiversity conservation through a variety of well-adapted indigenous and non-indigenous breeds, as well as rare game species. The South African beef industry faces challenges such as globalisation, increasing volumes and competition, strong industrialization of the value chain, shortage of skilled staff and pressures to meet changing customer demands. Given these challenges, the importance of having data and information pertaining to how efficient we are and the level of the genetics of our national herd cannot be overstated.

Feed is one of the major cost drivers of beef production, and due to its high cost, it is important to have a positive feed margin. A positive feed margin can be influenced by the feed price and feed efficiency (gain/kg feed consumed). This can be achieved by improving the Average Daily Gain (ADG) and reducing the feed costs by breeding animals that utilize feed more efficiently.

The National Beef Cattle Recording and Improvement Scheme (NBRIS) was established in accordance with Section 20 of the Animal Improvement Act, 1998 (Act 62 of 1998), whereby the performance of animals is recorded, and progeny summaries are calculated.

The NBRIS of the Agricultural Research Council (ARC) has 7 phases namely.

- **Reproduction phase (Phase A1)**
- **Suckling phase (Phase A2)**
- **Post weaning phases:**
 - On-farm recordings (Phase B)
 - Central performance tests (Phase C)
 - On-farm performance tests (Phase D)
 - Feedlot recordings (Phase E1)
- **Slaughter phase (Phase E2)**

Table 1 below follows a comparison between Phase C and D.

	Phase C	Phase D
Age	151 to 250 days	Maximum age 425 days (variation within group not more than 100 day)
Adaption	28	21 – 90
Feed	Bulls receive standardised ration across all ARC testing stations.	Each breeder decides what ration he wants to use.
Weight limits at start of test	Depending on breed	Only when more than 1 breeder form part of the test.
Regularity for weighing of bulls	Weekly	Bi-weekly
Reports	Breeder receives interim reports bi-weekly	Breeder to submit weights bi-weekly to ARC
Test length	84	84 – 270
Minimum bulls per test	1	10
Traits measured		
• ADG	Yes	Yes
• FCR	Yes	No
• Kleiber	No	Yes
• Body measurements	Yes	Yes
• RTU	Yes	Yes
Individual feed intake measured	Yes	No
Merit award	Yes	No
Performance compared to	An individual bull's performance is compared to the 10-year rolling average per breed per station.	Bulls are compared within the group.

ADG – Average Daily Gain, FCR – Feed Conversion Ratio, RTU – Real Time Ultrasound scan



Bull during his Phase C test



Bull during his Phase C test

SUMMARY

Both phases C and D have advantages, as indicated in Table 1. Phase C is the only test where individual feed intake can be measured. Bulls are fed individually and weighed weekly, and feed intake is also measured weekly. Interim reports issued bi-weekly calculate the ADG and Feed Conversion Ratio (FCR). FCR is a ratio of the amount of feed consumed by the bull and the

weight gained over the test period. Currently the average FCR in SA ranges from 4.5 to 7.5 across all breeds. In Phase D tests individual feed intake cannot be measured; however, a Kleiber ratio value is calculated. The Kleiber ratio serves as a useful indicator of growth efficiency and an indirect selection criterion for feed conversion. Phase C tests are more expensive than Phase D tests because a Phase C test is an intensive test (lasting 84 days) with individual feed intake calculated.

The global trend is, however, to focus more on RFI (Residual Feed Intake) since it is phenotypically independent of growth and body weight. The trait is also moderately heritable (18-49%) which enables us to improve feed efficiency by selecting for efficient animals. RFI represents the difference between actual and predicted feed intake aligning with an animal's maintenance requirements in relation to its body weight and growth. It is suggested that it may be more desirable to select for a trait such as RFI, since, by selecting for high ADG and low FCR, may lead to larger animals with higher maintenance requirements.

Feed costs amount to 55% – 70% of the total production cost, and a 10% improvement in feed efficiency of animals may result in a feed cost saving of several hundred million rand per annum for the industry as a whole. Measuring efficiency will assist in making decisions that increase productivity without raising production costs, resulting in greater profit margins. Feedlot studies in the USA demonstrated that a 10% improvement in ADG as a result of a 7% increase in intake improved profitability by 18%, whereas a 10% improvement in feed efficiency resulted in a 43% increase in profits. Improving feed efficiency will thus significantly contribute to a more sustainable and profitable production system.