

# OPTIMIZE THE LIFE FUNCTION OF CATTLE BY SELECTING FOR ADAPTABILITY

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TT11-41 with her bull calf - she is now pregnant with her 12th calf  
Age First Calf 25mths  
Average Inter Calving Period = 346 days

If your objectives are to optimally utilise your available grazing veld with minimal inputs in a cattle production system, then you should select and breed cattle for adaptability.

While the choice of breed or eco-type may be well-adapted to a particular environment, selecting and breeding well-adapted cattle within your herd is highly advantageous. Cattle producers should both breed and select for adaptability to increase herd productivity.

Understanding which observable characteristics to look for, and why they matter, will help us recognise the adapted animal and its qualities. These qualities affect appetite, behaviour, happiness and the overall positivity of the cattle as well as the efficiency of their life functions and the productivity of your herd and veld.

## ADAPTABILITY

Adaptation refers to the interactions of an individual's genetics, physiology, and anatomy within an environment, expressing the conformation and observable characteristics indicative of functional efficiency.

Functional efficiency in cattle production essentially involves cattle that are capable of optimally functioning in respect of all of their life functions, in harmony with the environment and its available resources.

The functional efficiency of cattle depends on their adaptability to the overall environment!

An adapted animal will mature early to timely fulfil its life functions. It will reflect hormonal balance and body condition relative to its age, the season and environmental conditions. Hormones control many different bodily processes and functions, such as metabolism, blood pressure, sugar levels, body temperature, body fat, muscle distribution, growth, development, sexual function, and more.

Hormones are influenced by both nutrition and the environment. These influences, and their consequential

interactions within the animal, will influence the individual's efficiency.

The environment consists of several factors beyond nutritional resources. These include climate and seasonal conditions such as light, temperature, wind, and rainfall etc. Seasonal length of daylight provides a reliable constant. The continuous variation in the length of the day in a 365-day cycle consistently influences both the environment and the interactions within it, including among others, sexual behaviour and the many complexities of reproduction.

Hence, it can be assumed that the well-adapted organisms will optimally produce and reproduce at specific times and seasons aligning their reproductive and growth cycles with the environmental and seasonal variations.

The well-adapted, functionally efficient animal will have a low maintenance requirement, coupled with a high production yield that is in accordance with its natural life functions, (expressing the ability that the environment enables with the respective interactions of the animal's physiology, anatomy, and genetic composition).

Additionally, management practices play an important role in shaping the animal's "environment" and these interactions will also play a role in the individual's efficiency or lack thereof.

## OPTIMAL GROWTH "DEVELOPMENT"

Growth and mass can often be the livestock producers' Achilles' heel. While growth is economically important, it is not uncommon to find that certain individuals who excel in growth may suffer from hormonal imbalances, sub-fertility, or high maintenance requirements resulting in adverse economic influences on production. Similarly, this applies to underperforming individuals.

However, well-adapted, hormonally balanced cattle are of high economic importance due to their optimal growth relative to their function, reproduction, functional efficiency, disease and parasite resistance, efficient



**This close up image of a heifer's coat indicates the smooth and defined coat with an oily shine.**

utilisation of the environment, feed conversion, energy flow and ultimately, the producer's herd production efficiency, sustainability, and input management. This contributes to an increase in live mass as a whole, per available hectare of grazing veld.

While an individual's growth should be measured and cow/calf ratios be determined, optimal growth relative to life function from the veldt is a result of adaptation and functional efficiency. It should be considered within the context of sustainable live mass increase from the available resource or per hectare of acceptable grazing. Remember, "BIGGER is not always BETTER, and LESS may result in MORE."

## **OBSERVATION / SELECTION**

Adaptability is highly hereditary as it encompasses a variety of directly heritable genetic components.. In the context of adaptability, fertility is expected and therefore high heritability. It should not be viewed as a single trait, but rather as a combination of observable characteristics.

Adaptation is the evidence of the ability to adapt. The "ability" within the herd can be improved through

proper breeding and selection for adaptability. Good performers, that can timely duplicate themselves or improve on their own performance within the same timeframe and environmental conditions, should reflect the qualities of adaptability. As Prof. Jan Bonsma aptly stated, "Form follows function".

Selecting well-adapted cattle within a herd should start with individual visual appraisals of their behaviour, functional conformation, and phenotypical attributes. Comparing and scoring the observable strengths and weaknesses of each animal against one another will help in a selection process. Thereafter, one should evaluate any relevant performance data and consider potential possible positive or negative hidden genes (recessive) and / or genetic merits.

Adaptability will reflect Functional Efficiency, which in turn will be reflected in Attractive Performance Indices. Adaptation will result in meeting all realistic production and reproduction requirements relative to the animal's life functions.

Our challenge is to recognise and embrace the observable characteristics that optimise life function and select accordingly.

While visual appraisal is subjective, an applied knowledge and understanding of the animal's life function, genetics, endocrinology, physiology, overall animal behaviour, the total environment, and their respective interactions are important. Naturally, the above, coupled with good management, routine, insightful observations, and correctly making use of accurate and relevant herd performance data, will help us in the selection and breeding of adapted and functionally efficient cattle.

Nature's energy flow is finely tuned and well calibrated. The well-adapted interact and calibrate themselves with nature and the environment. The livestock producer's "interaction" should likewise calibrate their production system and expectations with our livestock's life functions and the environment when looking for cattle and herd productivity that require minimal inputs.

## FOOD FOR THOUGHT

By selecting for cattle, we have more beef. By selecting for beef, we may have less cattle.

These are two paths leading to separate destinations or outcomes.

Our selection of breeding stock should stay focused on adaptability. Form should follow efficient life functions. The animals deemed terminal in the production system can be leveraged with the help of timely and more intensive value adding inputs that offer worthwhile returns. Form may then follow a different function (or path) – that of a terminal objective and for consumption.

**My personal deduction and extracts from  
Prof. Jan Bonsma "LIVESTOCK PRODUCTION"**

