



Turning DAIRY DATA into better decisions

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Modern dairy farming operates at the intersection of biology, technology and economics. This means understanding biological limits and variation within a herd, and managing and selecting animals in a way that allows them to perform efficiently within the constraints of the environment and what is required in the production chain.

In practical terms, this always begins with measurement. Nature provides variation between animals, by means of genetic differences, but also due to environmental triggers. Recording systems allow farmers to identify which animals convert feed, health and fertility into sustainable production. This principle lies at the core of the work performed by SA Stud Book and its Logix system.

Recording: The foundation of improvement

Every improvement in dairy production starts with reliable recording. Milk yield, butterfat and protein percentages, somatic cell counts, fertility measures, longevity and functional traits are not merely statistics. These properties with their underlying traits or trait-groups describe how well an animal

functions biologically within a specific production system.

Without objective recording, selection decisions tend to favour visible or short-term traits. Over time this often leads to animals that require increased management input to maintain performance. Recording allows the opposite approach, namely, to identifying cows that naturally maintain production, fertility and health under existing conditions.

For dairy farmers, these records serve two purposes. Firstly, they provide daily management information. Secondly, they enable informed breeding decisions. A drop in production, changes in milk components or deviations in activity patterns often signal problems long before clinical symptoms appear. Recording allows farmers to respond to biological signals rather than react to failures.

From records to management decisions

Historically, recording occurred at intervals. Today, technological developments have transformed recording into continuous monitoring. Automated milk meters in parlours, activity monitors, rumination sensors and bodyweight estimation systems now generate large volumes of data during normal farm operations.

The value of these technologies lies not in the hardware itself, but in their ability to measure the cow's biological response to feeding, climate and management conditions. When integrated into central databases such as Logix, this information becomes immediately useful for management decisions.

Early identification of cows under stress, declining fertility or emerging health problems allows timely intervention. At herd level, trends become visible that assist farmers in adjusting feeding strategies, grouping animals more effectively or managing seasonal challenges such as heat stress. Technology therefore extends observation capacity, enabling farmers to work with biological processes instead of against them.

Genetic evaluation: Making nature predictable

Recording alone does not improve genetics. Its value lies in enabling accurate genetic evaluation.

Modern evaluation methods such as the genomic BLUP (gBLUP) predictions performed by SA Stud Book combine performance records with genomic information to predict an animal's breeding value with greater accuracy at an earlier age. This allows farmers to identify genetically superior animals more accurately, sooner, and shorten the generation interval.

An important recent development in South African dairy evaluations is the incorporation of SNP genotype information from foreign artificial insemination (AI) bulls into the local SA Stud Book genomic evaluation. Many

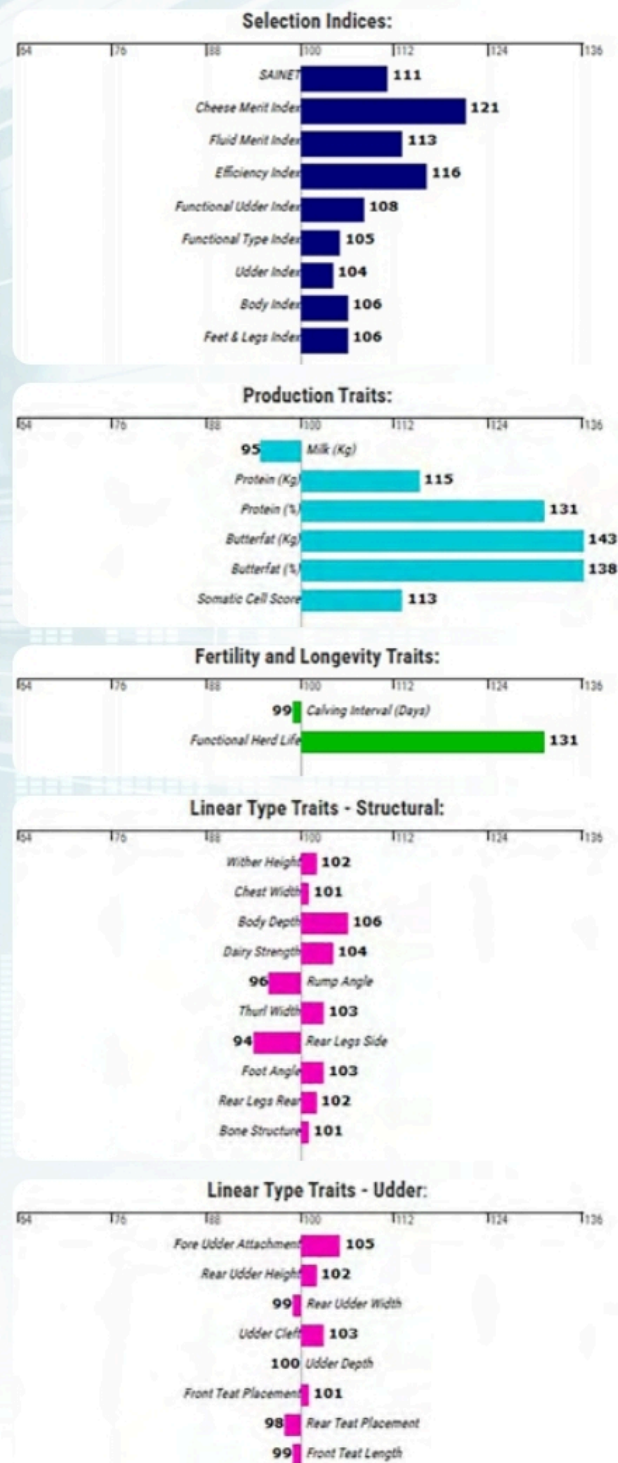


Figure 1. gBLUP genetic merit, on the South African scale, for a top AI Jersey bull (source: SADairyBulls.com)

dairy herds rely extensively on imported genetics, but historically the genetic merit of foreign bulls could be difficult to interpret under local conditions. Performance figures generated in high-input environments do not always translate directly to South African production systems, where climate, feeding regimes and management differ substantially.

By incorporating SNP genotypes of foreign AI bulls into the local gBLUP evaluation, these bulls are genetically connected directly to the South African reference population. This improves the estimation precision of their breeding values within the local environment and allows a more realistic prediction of how their daughters are likely to perform in South African herds.

This process is further strengthened using the Interbull multiple across country evaluation (MACE) and, increasingly, genomic MACE (gMACE). These approaches use international data, while accounting for genotype-by-environment interactions between countries. The result is a more

accurate reflection of genetic merit across different production systems. For South African dairy farmers, this means imported genetics can be evaluated not only on overseas performance, but on expected performance under local environmental and management conditions.

These values are made available on the SABairyBulls.com website for all dairy producers and their genetic service providers.

Working with nature in this context means selecting genetics that fit the production environment, rather than attempting to compensate for genetic mismatch through additional inputs.

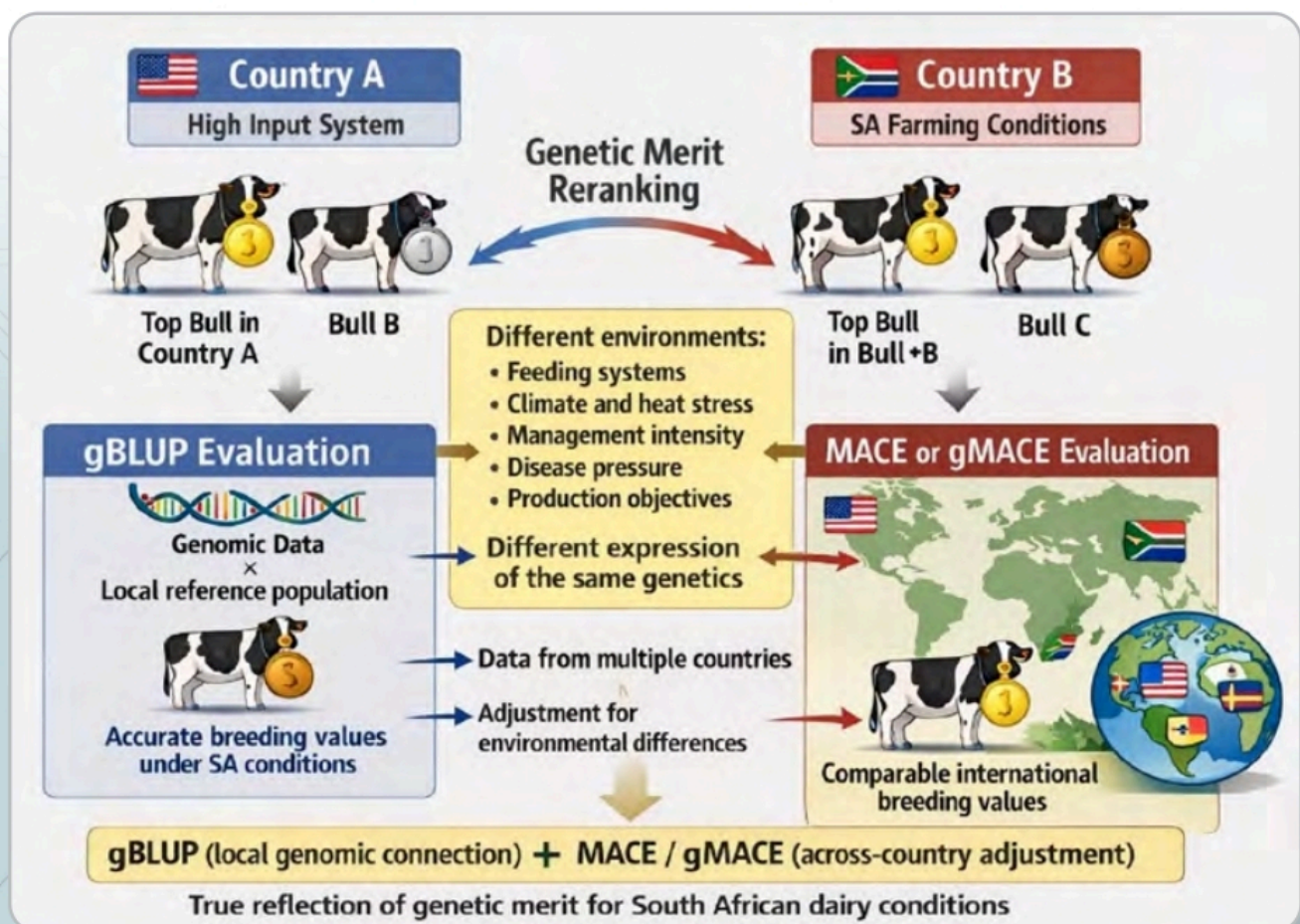


Figure 2. Illustration of the genetic tools (gBLUP, MACE and gMACE) for correct reranking and more precise genetic merit predictions where their daughters must produce.

Bull selection and replacement females

Bull selection remains one of the most powerful tools available to dairy farmers. Each bull influences a very large portion of future herd genetics, making accurate information essential. Increasingly, successful breeding strategies place a more balanced emphasis on fertility, health, longevity and functional efficiency alongside milk production. Typical examples are the SAINET (Jersey) and Logix Merit Index (Ayrshire and Friesland/Holstein types) and indices or sub-indices aimed at specific needs such as the Fluid Merit Index, Cheese Merit Index, Efficiency Index, and others.

The incorporation of genomic information and international evaluation data enables farmers to select both foreign and local bulls on a comparable basis. This allows bulls to be chosen not only for production potential, but also for their ability to transmit robustness, fertility and adaptability under South African conditions.

The same principle applies to the selection of replacement females. Recording systems enable farmers to identify cow families that remain productive for longer, conceive consistently and maintain good udder health. Retaining daughters from these cows gradually develops a herd that requires less intervention and delivers more reliable performance.

Lower replacement rates, reduced total costs and improved lifetime productivity are direct outcomes of selecting animals that are biologically suited to their owners' production systems and, ultimately, to their physical environment.

Technology, data exchange and benchmarking

One of the most significant developments in recent years has been the automated exchange of data between milking systems, farm software and central databases. Information captured during routine milking or daily activity is transferred automatically to platforms such as Logix, reducing administrative workload while improving data accuracy. Logix Sync is one such automated process and helps Logix Milk participants make timely, informed management decisions.

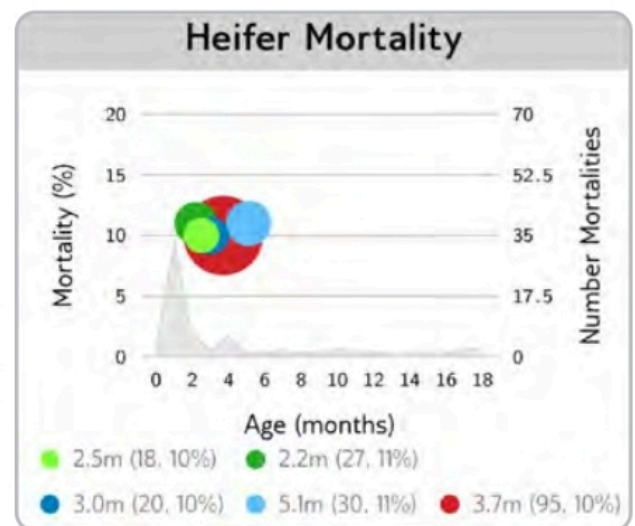


Figure 3. Example from a Logix Milk report reflecting heifer mortalities in a specific herd

At an industry level, this enables meaningful benchmarking. Farmers can compare herd performance with regional or national averages, allowing them to identify strengths and areas for improvement under comparable production conditions. Benchmarking provides realistic targets grounded in actual biological performance rather than theoretical ideals. This shared data environment benefits the entire industry: individual farm records feed into national genetic evaluations, while farmers gain access to more accurate selection tools and deeper management insights.

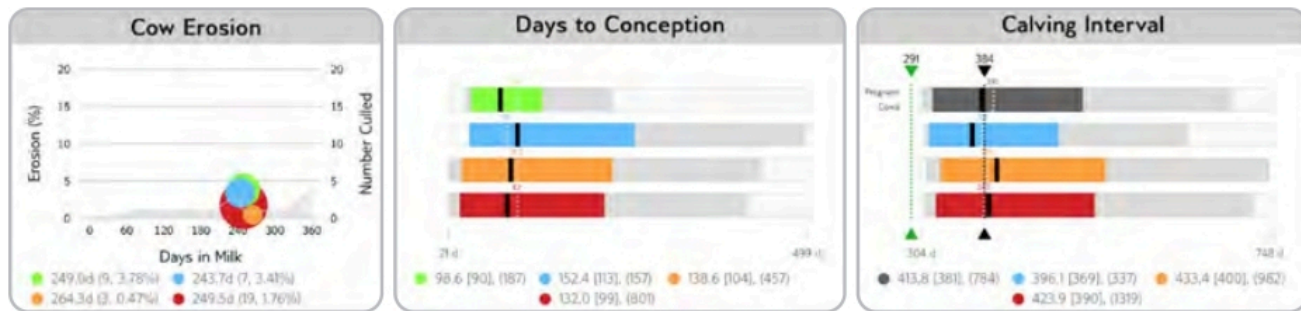


Figure 4. Example from a Logix Milk Report depicting Cow Erosion, Days to Conception and Calving Interval with benchmarks

Sustainable progress through biological efficiency

The future of dairy farming will increasingly depend on efficiency rather than expansion. Rising input costs, environmental pressures and climatic variability demand production systems that are both resilient and adaptable.

Working with nature does not mean producing less, it means producing more efficiently by aligning genetics, management and the environment. Recording systems, genetic evaluation and modern data technologies provide the tools needed to achieve this alignment.

Through the systematic recording and evaluation of economically important traits, SA Stud Book supports dairy farmers

in making decisions that improve both productivity and long-term sustainability. By understanding how cows naturally perform under local conditions, and selecting accordingly, farmers can build herds that thrive not because they are pushed harder, but because they are better matched to the production systems in which they operate.

Modern dairy production demonstrates that technology and nature are not opposing forces. When applied correctly, technology helps farmers understand biological reality more clearly, enabling breeding and management decisions that work with nature rather than against it.

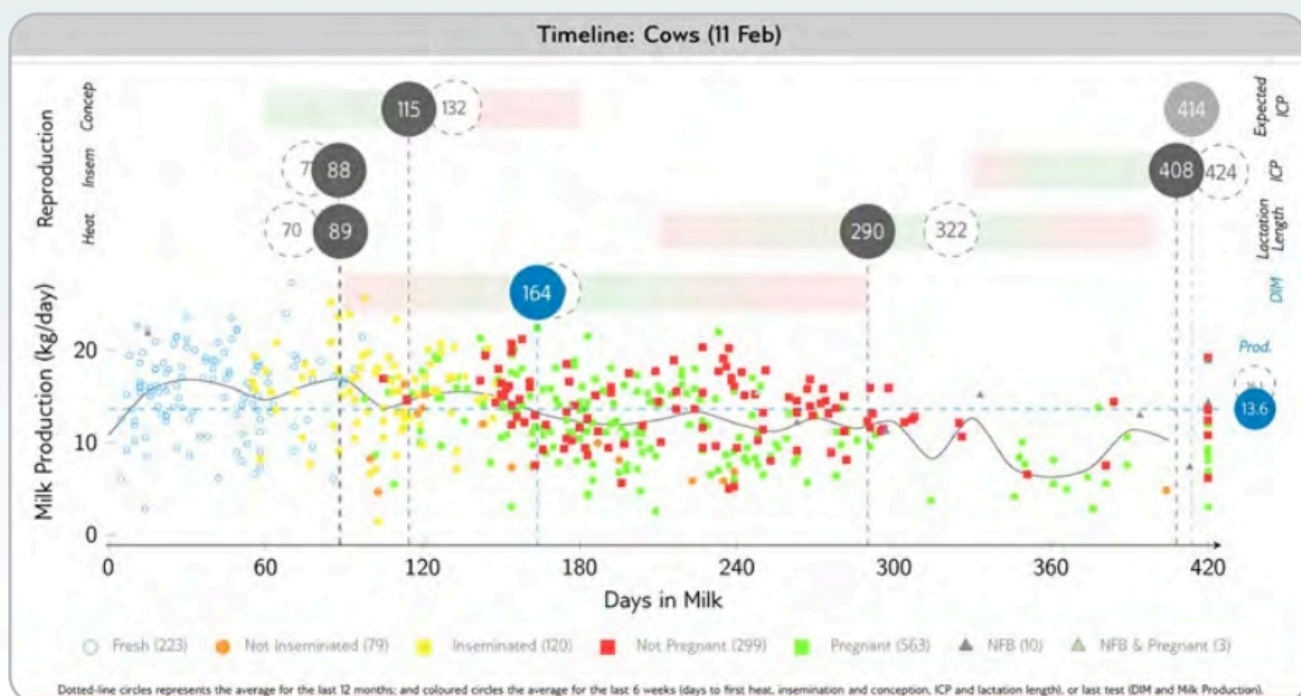


Figure 5. Example from a Logix Milk report giving a precise picture of production and reproduction statistics enabling precise management interventions