



The Platform for Africa Dairy Genetics Gain (ADGG)

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New Index for dairy cattle in Tanzania and guidelines on its use

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Background

When rearing dairy cattle, the cost of feed is proportionately the most important variable cost. Feed consumed is used for production of milk, influences the composition of the milk, and for body maintenance. About one third of the feed consumed is used for body maintenance and this is directly related to the body size of an animal. Heavier cows need more feed and water for body maintenance. In small holder systems where feed is a major limiting factor, an important goal is to get as much milk as possible from the little feed available. Additionally, with the changing climates, it is important to produce milk while emitting as little greenhouse gases as possible.

Countries such as the New Zealand, Netherlands, Finland and the UK have now developed indices for selecting dairy cattle that reduce feed intake through constraining body size. The **Saved Feed Cost Maintenance** sub-index in the Netherlands accounts for 5% of the Dutch **Total Merit index** called **NVI**.

The Index

In the current genomic prediction for Tanzania, body weight of the mature animals has been evaluated for the first time, resulting in **GEBVs** (Genomic Estimated Breeding Values) for body weight.

Using results from the GEBV for milk production and for body weight, the ADGG has developed an **Index** to allow selection of animals to be used for breeding that **improves the rate of milk production but keeps body weight constant**.

The index is based on both the genetic and phenotypic relationship between milk yield and body weight. The emphasis to be placed on the GEBV for each trait in the index is termed the **Index weight**.

Index weights derived are **1.00062** for milk and **-0.0189** for body weight.

This means that animals with heavy body weight will be penalized since the aim is to improve efficiency of milk production. Animals should produce more milk with less feed for maintenance.

The index allows us to rank, select and promote more efficient dairy bulls, cows and future cows that produce more milk without increasing the amount of feed consumed.

In the results shared, All bulls and cows have been ranked, **firstly on milk GEBVs** and secondly on the **NEW INDEX** that restricts changes in body weight while improving milk production potential.

Note

- Farmers/producers who do not mind keeping or feeding heavier cows can choose bulls based on **milk yield only**.
- Farmers/ producers who are interested in higher efficiency will select bulls based on the **index**.

In future, as we receive more data, including data on reproductive performance such as calving intervals; milk components such as fat and protein contents and quality e.g. packed cell volumes, we will develop a more elaborate index that will enable NAIC and natural service bulls to be ranked based on appropriate total merits. In so doing ADGG will be supporting NAIC to routinely select Tanzanian bred AI bulls using the appropriate criteria. This way, the need to import live bulls from foreign country will be minimized and hopefully, eventually become unnecessary.

Guidelines for the use of Evaluation Results

Genetic improvement is a result of using top ranking animals as parents of the next generation. The top ranking bulls and cows produced from the July 2020 run of the Tanzania data provides a practical basis to build on the progress for genetic improvement that commenced from the 2019 evaluation run. Below are some steps guide the use of these top bulls and cows.

TOP Bulls

Deliberate steps should be taken to enroll the top-ranked bulls from the evaluations in the **AI** to be part of the team of animals for semen production at NAIC. This will ensure a wider dispersion of the better genes suited for milk production and efficiency in the country

In the cases where bulls are used for natural mating, farmers should be advised ***not to use any of the bulls that have NEGATIVE GEBVs*** but be encouraged to use bulls in the top ranking category.

This may require a proper dialogue with village leaders, especially in cases where two of the evaluated bulls are from the same village and one has a negative GEBVs while the other is positive.

Using Cows GEBVs

Farmers should be advised:

- i) when looking to ***replace a cow*** in their herd, the cows with the poorest GEBVs should be the ones to sell off
- ii) when looking for bulls to be used for mating, select bulls with GEBVs higher than the average GEBV for their herd, or ensure the GEBV for the bull is higher than that for the cow to which the bull will be mated.