Heterogenous variation
Technote # 22

The Heterogenous variation adjustment standardises herd data to ensure a fair comparison between animals and more accurate estimation of their true genetic merit.

DataGene's genetic evaluation system analyses dairy cow performance data from a huge number of different herds to produce Australian Breeding Values (ABVs) for 40 traits.

An animal's performance is influenced by both its genetics and environmental conditions. To ensure each animal's ABVs are an accurate reflection of their true genetic merit, adjustments are made to account for differences in environmental conditions between herds such as different management (feeding) systems, geographic and climatic conditions.

One adjustment is known as Heterogenous Variance which standardises the range in production traits between herds.

To use an example from the farm, some herd-tested herds have a wide range of Production Indexes (PI) – see box. The PI range may be from 85 to 115. In other herds, the range may be from 60 to 130.

The reasons for large range or small range are varied and can include differences in management, individual feeding systems, genetics and other environmental factors.

Heterogenous Variation refers to this *within* herd performance variation. The genetic evaluation system needs to account for it to ensure it does not over or understate a particular result. An animal shouldn't be over-rewarded or under-rewarded because of the herd she is in.

Heterogenous Variance adjustments are applied across herds and allow for more accurate comparisons of cows and the estimation of their true genetic merit.

Accounting for Heterogenous Variation

Heterogenous Variation has been included in the Australian dairy industry's genetic evaluation system for many years. It is a standard practice by genetic evaluation programs around the world to adjust for within herd variation in management. It ensures that herds are treated fairly, regardless of the spread in production of cows within the herd.

What's changed in August 2019

When the new Genetic Evaluation System was introduced in early 2019, the new platform incorporated the pre-existing Heterogenous Variance model. However, the data submitted to Interbull did not incorporate the model as the data submission was much earlier.

The full dataset submitted to Interbull for August included the heterogenous adjustment and a few bulls (and therefore cows) were more affected than others by the transition of the heterogeneous variance component between the April and August ABVs releases. For the vast majority of bulls, this improvement made little difference.

The size of the impact for a trait like Protein kg is in the order of 3-4 kg for the few affected bulls with the remaining differences in BPI coming from new Australian performance data.

More information

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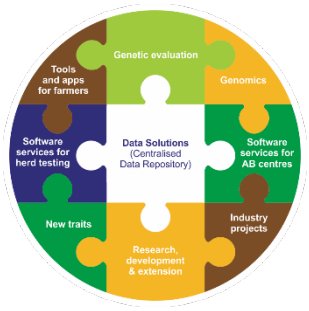
Production Index

A Production Index is a measure of the merit of a cow based on her performance in the current lactation, compared to other cows of the same breed in the same herd. It is an estimate based solely on the cow's own performance. It is not a genetic measure –it does not predict the performance of her progeny.

A production index is comparable only within a herd. A cow with a PI of 120 in one herd is not the same has a cow with 120 in another herd.

For more information refer to Tech Note 10

DataGene
Solutions for Herd Development



About DataGene

DataGene is an independent and industry-owned organisation responsible for driving genetic gain and herd improvement in the Australian dairy industry. DataGene performs pre-competitive herd improvement functions such as genetic evaluation, herd testing and herd improvement software development and data systems. DataGene is a Dairy Australia and industry collaboration.

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