

The Charolais GROUP BREEDPLAN Herd Report

1. INTRODUCTION

This GROUP BREEDPLAN analysis has been processed by the ABRI from the integrated pedigree/performance databases of the Charolais Society of Australia and Charolais Breeders New Zealand. GROUP BREEDPLAN EBVs and INTERIM BREEDPLAN EBVs allow for the direct comparison between performance-recorded Charolais herds in Australia and New Zealand.

The EBVs contained in this report have been calculated using the BREEDPLAN genetic evaluation system. This utilises Best Linear Unbiased Prediction (BLUP) methodology on a full animal, multi-trait model in which all animals, their relatives and ancestors are analysed with the performance information at the same time. Known genetic and non-genetic relationships (correlations) between the various birth, growth, carcass and fertility traits are accounted for within the analysis.

The Animal Genetics and Breeding Unit (AGBU) derived the genetic and phenotypic parameters used for this analysis from selected research databases.

2. THE EBVs

Charolais GROUP BREEDPLAN EBVs are calculated from the records of individual herds stored on the databases of the CSA and CBNZ. These records include:

- the animal's own performance
- the relationship between different traits
- the performance of **all known relatives** in the herd
- the performance of **all animals** in the herd over all years of recording

For across herd comparisons, a full data set is needed. The more information that is available, the more accurate the EBVs will be. BREEDPLAN requires the whole progeny drop and full pedigree information to provide the best and most valid comparisons.

As GROUP EBVs incorporate genetic information from all relatives, it is crucial that the pedigree records of animals are accurate. Therefore please check the pedigree details of animals listed in your reports and if you have any concerns contact the CSA office. If you have any concerns over missing animals or missing performance for animals, please contact Charolais BREEDPLAN.

GROUP BREEDPLAN EBVs for a number of economically important traits are included in this report. The traits that are potentially reported are birth weight, milk, 200 day growth, 400 day weight, 600 day weight, mature cow weight, scrotal size, carcass weight, carcass eye muscle area, carcass rib fat, carcass rump fat, retail beef yield percent and intramuscular fat percent.

The **current breed-average EBVs** are a very useful benchmark that approximates the current genetic level for the breed (and are presented at the bottom of each page in the reports). The average EBVs can be used to help assess the relative ranking of animals for the various traits.

The Percentile Report (last page of the report) can be used as a guide for the ranking of animals on GROUP BREEDPLAN EBVs across herds. By referring to this report it is possible to determine where animal(s) rank on EBV compared to other animals included in the GROUP BREEDPLAN analysis.

3. ACCURACY

By definition, an EBV is an estimate of an animal's true breeding value and it may therefore change with the addition of more pedigree and performance information. An accuracy value is presented with every EBV. The *accuracy* provides a measure of the stability of the EBV and gives an indication of the amount of information that has been used in the calculation of that EBV. The higher the accuracy the lower the likelihood of changes in the animal's EBV as more information is analysed for that animal, it's progeny or it's relatives.

BREEDPLAN uses all available information to calculate EBVs and estimates EBVs of related (correlated) traits via indirect observations eg the EBVs for carcase trait are estimated from live animal scanning measurements. These correlated estimates will have lower accuracy.

Accuracy cannot account for breeder-influenced data quality issues, such as how well management groups are defined.

The following guide may be useful for interpreting accuracy:

Accuracy range	Interpretation
less than 50%	- EBVs are preliminary and could change substantially as more performance information becomes available.
50 - 74%	- medium accuracy, usually based on the animal's own records and pedigree.
75 - 90%	- medium-high accuracy. Some progeny information included.
more than 90%	- high accuracy estimate of the animal's true breeding value. It is unlikely that EBVs will change much with addition of more progeny data.

EBVs with less than 20% accuracy will not be reported.

It is important to keep accuracy in perspective. Accuracy and genetic merit are not the same things. It is possible for animals to have very low EBVs, but for these EBVs to be highly accurate. Conversely, animals may have high EBVs with low accuracy.

Animals should be compared on EBVs regardless of accuracy. However, where two animals have the same EBV, the animal with the higher accuracy would normally be used more heavily than the animal with the lower accuracy because the results are more predictable.

4. REPORTABILITY OF EBVs

The BREEDPLAN genetic evaluation is a multi-trait analysis. That is, all animals that are included in the analysis have all traits analysed and therefore have all EBVs calculated. However, EBVs must meet certain criteria before they are released to breeders and the commercial industry.

The reportability of EBVs relates to a series of options that are applied to each trait. In general, EBVs are reportable:

- if the animal has been analysed for the relevant trait, or the animal has progeny analysed for the relevant trait, and the accuracy value is above 20%
OR
- if the animal has not been analysed for the relevant trait and the animal has no progeny analysed for the relevant trait, but the accuracy of the EBV is above a set minimum level (above 20%). The minimum reporting accuracy value for non-observed animals differs for different traits eg the minimum for the growth traits is 50%.

Therefore, in general, traits will be reported if the herd is submitting performance for that particular trait. However, animals with less than 20% accuracy for a trait or who have not been analysed for a trait may not have that trait reported. The recommendation therefore is for all of the important traits to be measured and analysed.

One trait that causes particular concern relating to the EBV not reporting is 200-Day Milk. Until a sire has daughters in production (ie with performance-recorded calves), his EBV for Milk is determined from his parent's EBVs. The accuracy of a Milk EBV that is based strictly upon pedigree information is low and therefore some young sires will not have Milk EBV reporting until their daughters are brought into production.

5. VISUAL APPRAISAL

Although EBVs provide an estimate of an animal's genetic merit for a range of production traits, they do not provide information for all of the traits that must be considered during selection of **functional** animals. In all situations, EBVs should be used in conjunction with visual assessment for other traits of importance (structural soundness, temperament, fertility etc). A recommended practice is to firstly select replacement breeding stock based on EBVs and to then select from this group to ensure that the final selections are visually acceptable.

6. REPORT LAYOUT

Each Herd Report is made up of several sections. The first is the **Sire Report**, next is the **Dam Report** and finally the **Calf Reports** (heifers, steers and bulls). Calves (ie non-parents) are included in the report if they are active and born in the last 2 years. The sires and dams of these calves are also reported. The reports are sorted in Calving Year, Herd and Drop number order.

Note that the numbers of progeny analysed that appear in the sire and dam reports are calculated from all herds in GROUP BREEDPLAN (and so include progeny recorded in other herds and other societies).

There are a number of **Trend Reports** included at the back of your Herd Reports. The first Trend reports are for your own herd and the green sheets are Genetic Trend reports for the breed overall. **You can use the Trend reports to see how your herd has performed over the years compared to the breed average.**

The **Genetic Trend** reports show the average EBVs for each trait for animals born in your herd in the nominated year. The **Phenotypic Trend** reports show the average adjusted performance for each trait of all calves (by sex) born in your herd in the nominated year.

Also included are graphs of the Genetic Trends. The Genetic Trends for the herd and for the breed overall are graphed and also included are graphs showing the genetic trend for the herd relative to that of the breed.

The last page of the your Herd report is the **Percentile Table** listing the Percentile Bands (for all animals born 2 years prior to the GROUP run). The Percentile Report can be used as a guide for the ranking of animals on GROUP BREEDPLAN EBVs across herds. By referring to this report you will be able to determine where your animal(s) rank compared to other animals analysed in the Charolais GROUP BREEDPLAN analysis.

7. MARKETING WITH GROUP BREEDPLAN EBVs

GROUP BREEDPLAN EBVs can be used to compare animals from different herds. This means GROUP BREEDPLAN EBVs are by far the most logical choice for use in the marketing of your stock.

It is very important that **all** Charolais GROUP BREEDPLAN EBVs used in catalogues be presented with their accuracy levels. It is also important to accompany your sale catalogue with notes explaining what these EBVs and accuracy values are and how they have been calculated. An example of these explanatory notes is attached for your use. Buyers will then be in a position to purchase cattle on performance with confidence using GROUP BREEDPLAN EBVs.

8. CONTACTS FOR CHAROLAIS BREEDPLAN

If you have any questions regarding your Charolais GROUP BREEDPLAN Herd Report, publishing EBVs or interpretation of GROUP BREEDPLAN in general, please do not hesitate to contact the contacts listed below.

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EXPLANATORY NOTES FOR CATALOGUES

Only Charolais GROUP BREEDPLAN EBVs or INTERIM EBVs with Accuracy (Acc) can be validly compared between herds.

Estimated Breeding Values (EBVs)

An animal's breeding value is its genetic merit, half of which will be passed on to its progeny. While we will never know the exact breeding value, for performance traits it is possible to make good estimates. These are called Estimated Breeding Values (EBVs). The EBV is therefore the best estimate of an animal's genetic merit for that trait. EBVs are expressed as the difference between an individual animal's genetics and the genetic base to which the animal is compared.

Accuracy

An accuracy value is presented with every EBV and gives an indication of the amount of information that has been used in the calculation of that EBV. The higher the accuracy, the lower the likelihood of change in the animal's EBV as more information is analysed for that animal or its relatives.

Accuracy Range	Interpretation
Less than 50%	Low accuracy and should be considered a preliminary estimate. The EBV could change substantially as more performance information becomes available.
50 – 74%	Medium accuracy, usually based on the animal's own records and pedigree.
75 – 90%	Medium-high accuracy and usually includes some progeny information. Becoming a more reliable indicator of the animal's value as a parent.
90% and above	High accuracy. It is unlikely that the EBV will change much with the addition of more progeny data.

Calving Ease

Calving Ease EBVs are based on calving difficulty scores, birth weights and gestation length information. More positive EBVs are favourable and indicate easier calving in 2-year-old heifers.

Direct calving ease indicates how this animal influences the birth of its progeny from 2-year-old heifers.

Daughter's calving ease indicates how well the animal produces daughters that have easier calving as 2-year-old heifers.

Birth

Gestation Length EBV (days) is based on AI and hand mating records. Lower (negative) GL EBVs indicate easier calving and increased growth after birth.

Birth Weight EBV (kg) is based on the measured birth weight of animals, adjusted for dam age. The lower the value the lighter the calf at birth and the lower the likelihood of a difficult birth. This is particularly important when selecting sires for use over heifers.

Fertility

Scrotal Size EBV (cm) is an indicator of male fertility in regards to semen quality and quantity. Higher (positive) EBVs indicate larger scrotal size. Increased scrotal size is also positively associated with increased fertility in male progeny and with earlier age at puberty of male and female progeny.

Growth

200-Day Milk EBV (kg) is an estimate of an animal's milking ability. For sires, this EBV is indicative of their daughter's milking ability as it affects the 200-day weight of their calves.

200-Day Growth EBV (kg) is calculated from the weight of animals taken between 80 and 300 days of age. Values are adjusted to 200 days and for age of dam. This EBV is the best single estimate of an animal's genetic merit for growth to early ages.

400-Day Weight EBV (kg) is calculated from the weight of progeny taken between 301 and 500 days of age, adjusted to 400 days and for age of dam. This EBV is the best single estimate of an animal's genetic merit for yearling weight.

600-Day Weight EBV (kg) is calculated from the weight of progeny taken between 501 and 900 days of age, adjusted to 600 days and for age of dam. This EBV is the best single estimate of an animal's genetic merit for growth beyond yearling age.

Mature Cow Weight EBV (kg) is an estimate of the genetic difference in cow weight at 5 years of age. Moderate EBVs are generally more favourable.

Carcase

Carcase Weight EBV (kg) estimates the genetic difference in carcass weight at a standard age of 650 days.

Eye Muscle Area EBV (cm²) estimates genetic differences in eye muscle area at the 12/13th rib site of a 300kg dressed carcass. More positive EBVs indicate larger eye muscle area and therefore higher retail beef yields.

Rib Fat EBV (mm) estimates the genetic differences in fat depth at the 12/13th rib in a 300kg dressed carcass. More positive EBVs indicate more subcutaneous fat and earlier maturity.

Rump Fat EBV (mm) estimates the genetic differences in fat depth at the P8 site of a 300kg dressed carcass. More positive EBVs indicate more subcutaneous fat and earlier maturity.

Retail Beef Yield Percent EBV (%) represents total (boned out) meat yield as a percentage of a 300kg dressed carcass. A more positive EBV indicates higher percentage yield for the 300kg carcass weight.

Intra-Muscular Fat EBV (%) estimates the genetic difference in the percentage of intra-muscular fat at the 12/13th rib site in a 300kg carcass. Depending on market targets, larger, more positive EBVs are generally more favourable.

Selection Indices

A selection index combines the EBVs with economic information (costs and returns) for specific market and production systems to rank animals based on relative profit values. Note that different types of animals can give similar profit values, so consideration should be given to both the index and the component EBVs when selecting animals for a particular production system.

Domestic Index estimates the genetic differences between animals in net profitability per cow joined for an example commercial herd with a British-breed cow base (eg Angus) targeting grass-finished production for the domestic trade. This Index assumes pasture grown & finished steers weighing 430 kg (240 kg HSCW and 6 mm P8 fat depth) at 12 months. Daughters are retained or sold for breeding therefore maternal traits are of importance. In response to industry feedback, positive emphasis has been placed on finishing ability.

Export Index estimates the genetic differences between animals in net profitability per cow joined for an example commercial herd with a British-breed cow base (eg Angus) targeting the production of steers for export markets. This Index assumes pasture grown & finished steers weighing 700 kg (380 kg HSCW and 9 mm P8 fat depth) at 29 months. Daughters are retained or sold for breeding therefore maternal traits are of importance. In response to industry feedback, positive emphasis has been placed on finishing ability.

Live Export Index estimates the genetic differences between animals in net profitability per cow joined for an example commercial herd in Northern Australia (eg Brahman cows) targeting the production of steers and heifers for the live export markets eg Indonesia). This Index assumes that animals are sold at 400 kg to the boat trade and subsequently fed for 100 days at point of destination before slaughter at 550 kg (300 kg HSC) at 24 months. All progeny are slaughtered.

The following disclaimer should also be included in your sale catalogue:

<p>Charolais GROUP BREEDPLAN Estimated Breeding Values contained in this Sale Catalogue were compiled by the Agricultural Business Research Institute (ABRI) from data supplied by the breeders. Neither the Charolais Society of Australia nor the ABRI oversees or audits the collection of this data.</p>
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