BREEDPLAN Tips

# ***Interpreting BREEDPLAN EBVs***

You are presented with a detailed set of BREEDPLAN EBVs for a particular animal. How do you assess whether the EBVs are good or not?? This pamphlet provides a simple set of instructions regarding how to interpret this information.

For the purposes of demonstration, please consider the following set of EBVs for an individual animal.

| | Gest. Length (Days) | Birth Weight (kg) | Milk (kg) | 200D Growth (kg) | 400D Growth (kg) | 600D Growth (kg) | Mature Weight (kg) |
|---|---|---|---|---|---|---|---|
| EBV | +0.1 | +3.4 | +3 | +17 | +33 | +41 | +48 |
| ACC | 59% | 65% | 58% | 73% | 72% | 72% | 63% |

## 1. What does the EBV mean?

EBVs are expressed as the difference between an individual animal's genetics and the genetic base to which the animal is compared. The "genetic base" can roughly be described as the historical genetic level of that particular breed. For most breeds, their genetic base will have been set in the mid 1990's. **Importantly, the genetic base for each breed will be different, so only EBVs for animals within a particular analysis can be directly compared.**

Therefore, in the above example, a 600 day weight EBV of +41 kg means the animal is 41 kg genetically heavier at 600 days compared with the genetic base of the relevant cattle population. On average, half of this difference will be passed on to the animal's progeny.

## 2. Compare with the current breed average

As most breeds have experienced significant changes in their genetic merit for most traits since the mid 1990's (ie. their genetic base), the first step when interpreting an EBV should be to compare it to the current breed average EBVs for the breed. This will give you an indication of how the animal compares with the current genetic level for the breed for each trait.

A set of breed average EBVs should be enclosed in all BREEDPLAN reports, sale catalogues etc. and will look similar to the table below.

Breed average EBVs for 2007 drop calves in the 2009 GROUP BREEDPLAN analysis

| Gest Length EBV | Birth Weight EBV | Milk EBV | 200-Day Growth EBV | 400-Day Weight EBV | 600-Day Weight EBV | Mature Weight EBV |
|---|---|---|---|---|---|---|
| 0.0 | +2.2 | +3 | +13 | +20 | +30 | +31 |

If we consider the animal in the above example, comparison of its 600 day weight EBV of +41 with the breed average 600 day weight EBV of +30 indicates that the animal is genetically superior than the current genetic level of the breed for growth to 600 days. Taking this further, it can be calculated that the animal is actually 11 kg (ie. 41 -30) genetically heavier at 600 days compared with the current genetic level of the breed.

## 3. Compare with the Percentile Bands Table

Comparison with the breed average EBVs allows you to establish whether an animal is above or below the current genetic level of the breed. This can be taken further by comparing the animal's EBVs to the Percentile Bands Table to assess exactly where the animal ranks within the breed for each trait.

As with the breed average EBVs, a Percentile Bands Table should be enclosed in all BREEDPLAN reports, sale catalogues etc. and will look similar to the table below.

**Example Percentile Bands Table**

| | Calving Ease DIR (%) | Calving Ease DTRS (%) | Gestation Length (days) | Birth Weight (kg) | Milk (kg) | 200-Day Growth (kg) | 400-Day Weight (kg) | 600-Day Weight (kg) | Mature Cow Wt. (kg) |
|---|---|---|---|---|---|---|---|---|---|
| Top 5% | +3.6 | +0.6 | -2.0 | -0.2 | +7 | +24 | +37 | +54 | +57 |
| Top 10% | +2.8 | +0.3 | -1.5 | +0.5 | +6 | +21 | +33 | +48 | +50 |
| Top 20% | +1.8 | -0.1 | -0.9 | +1.1 | +5 | +18 | +28 | +41 | +43 |
| Top 30% | +1.1 | -0.3 | -0.5 | +1.5 | +4 | +16 | +25 | +37 | +38 |
| Top 40% | +0.5 | -0.6 | -0.2 | +1.9 | +4 | +14 | +22 | +33 | +34 |
| Top 50% | +0.0 | -0.8 | +0.0 | +2.2 | +3 | +13 | +20 | +30 | +30 |
| Top 60% | -0.6 | -1.2 | +0.3 | +2.6 | +3 | +11 | +17 | +26 | +26 |
| Top 70% | -1.3 | -1.6 | +0.5 | +3.0 | +2 | +9 | +15 | +23 | +23 |
| Top 80% | -2.2 | -2.2 | +0.8 | +3.4 | +1 | +7 | +12 | +19 | +18 |
| Top 90% | -3.4 | -3.0 | +1.2 | +4.1 | +0 | +5 | +9 | +14 | +13 |

If we consider the animal in the above example with the 600 day weight EBV of +41, comparison with the Percentile Bands Table indicates that the animal is in fact ranked in the top 20% of the breed for growth to 600 days (see circled information).

## 4. Compare EBVs to estimate the difference in output from two sires

In the above example, we have determined the animal is ranked in the top 20% of the breed for 600 day weight. But what does that mean in real terms? EBVs can also be used to predict the difference in output that will be observed if 2 different sires are used in a herd.

To demonstrate this, let's compare the animal to another bull. The first bull has a 600 day weight EBV of +41, while the second bull has a 600 day weight EBV of +21. Comparing these animals shows a difference in 600 day weight EBV of 20 kg. As on average half of this difference will be passed on to the progeny of each sire, it can be estimated that calves from the first bull would be on average, 10 kg heavier than those from the second bull at 600 days. Extending this to a single year's drop of 50 calves, this difference equates to a potential production difference of 500 kg in live weight by the time the calves reach 600 days of age.

It is important to note that in the above example we are assuming both bulls are used over dams of similar genetic value/breed and their progeny are run under similar conditions.

## 5. EBV accuracy

When evaluating any EBV, it is also important to consider the EBV "accuracy". By definition, an EBV is an estimate of an animal's true breeding value. To provide breeders with a measure of the reliability of the estimate, BREEDPLAN produces an "accuracy" figure with each 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 change in the animal's EBV as more information is analysed for that animal, its progeny or its relatives.

The following guide may be useful for interpreting accuracy:

**less than 50% accuracy** - the EBVs are preliminary. EBVs in this range will have been calculated based on very little information. These EBVs could change substantially as more direct performance information becomes available on the animal.

**50-74% accuracy** - the EBVs are of medium accuracy. EBVs in this range will usually have been calculated based on the animal's own performance and some limited pedigree information.

**75-90% accuracy** - the EBVs are of medium-high accuracy. EBVs in this range will usually have been calculated based on the animal's own performance coupled with the performance for a small number of the animal's progeny. .

**more than 90% accuracy** - the EBVs are a high accuracy estimate of the animal's true breeding value. It is unlikely that EBVs will change considerably with addition of more progeny data

Although the accuracy of an EBV should be considered, animals should be compared on EBVs regardless of accuracy. Where two animals have the same EBV however, the animal with the higher accuracy would normally be used more heavily than the bull with the lower accuracy because the results can be predicted with more confidence.

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## 6. Visual appraisal

Although EBVs provide an estimate of an animal's genetic merit for a wide range of traits, they do not provide information for all the traits that must be considered during the selection of functional cattle. In all situations, EBVs should be used in conjunction with visual assessment for other traits of importance (eg. structural soundness, temperament).

For more information regarding the interpretation of EBVs, please contact staff at BREEDPLAN.