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# TechTalk

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## Understanding BREEDPLAN Contemporary Groups

An animal's performance for all of the traits analysed by BREEDPLAN are affected not just by the genetics of the animal, but also by the environment the animal is in. To account for these environmental effects when calculating the genetic merit or EBV of an individual animal, it is important that an animal's performance is only directly compared with those of its peers that have been raised in a similar environment and thus have had an equal opportunity to perform.

To do this the BREEDPLAN analysis creates contemporary groups, groups of animals raised in the same environment which are considered to have had an equal opportunity to perform. Contemporary groups allow BREEDPLAN to remove the effect of as many environmental or non-genetic effects as possible, such as feeding differences, year differences and season differences.

If the contemporary groups are not correctly formed, the EBVs calculated will be less accurate and possibly misleading. For example, consider the situation where a breeder feeds half of his male calves for a show. If both the show calves and the non show calves are recorded by the breeder as belonging to one management group, rather than two, then they would be analysed together by BREEDPLAN. In this situation the calves fed for the show may be heavier, and thus appear to perform better than those calves which were not fed for the show. As the two groups of calves were not given an equal opportunity to perform, this would bias the resulting growth EBVs for these animals. In contrast, if the show calves are placed into a separate management group to the non show calves by the breeder, then each group would be analysed separately and the growth EBVs would not be biased.

Many of the problems that breeders encounter in "believing" their BREEDPLAN EBVs can be traced back to incorrect contemporary grouping – either calves being fragmented into isolated groups of only one or two animals (thereby virtually eliminating those calves from any comparison with their peers) or by not differentiating between calves that have different levels of management or breeding.

Importantly, the breeder has a major influence on deciding which animals will be directly compared within each contemporary group. This is through both their on farm management decisions and also through the submission of management group information to BREEDPLAN. Therefore it is vital that breeders understand the factors that influence the formation of contemporary groups. This will ensure that breeders maximise the effectiveness of their BREEDPLAN recording.

### BREEDPLAN CONTEMPORARY GROUPS

Table 1 provides an indication of the criteria used by BREEDPLAN to form contemporary groups of animals for comparison. NOTE – The criteria does vary between traits and in some cases, may vary between breeds.





**Table 1. Division of Performance Data in BREEDPLAN**

Automatic	Automatic (Breeder Influenced)	Breeder Supplied
Herd	Breed	Breeder Defined Management Groups - Birth
Calving Year	Weight Date	Breeder Defined Management Groups - Post Birth
Sex (Male vs Female)	Calf Age (Slicing)	
Birth Number (Twin vs Single Births)		
Birth Status (ET vs Natural Matings)		
Dam Age		

**1. Herd**

Only calves bred and weighed in the same herd will be directly compared in the same contemporary group. This herd definition can be extended to include “associated herds” which have calves bred and managed as part of a larger herd. The most common example is where members of a family (eg. children) have a small number of animals registered in their own name that run as part of the main herd on the property.

**2. Calving Year**

Only animals born in the same “calving year” will be compared together in the same contemporary group. Usually the calving year is the same as the year of birth of the calf. However, for herds whose calving period runs into the next calendar year (eg. from November through to March), “calving year” can be specified to span the period running across two different calendar years. This may be applicable to herds in northern Australia that calve over the summer months. In these cases, a financial year is more appropriately used as the “calving year”.

**3. Sex (Male vs Female)**

Only calves of the same sex at measurement will be directly compared in the same contemporary group (ie. bulls with bulls, heifers with heifers, steers with steers). Note that males that are weighed initially as bulls and then castrated will have their first weight compared with all the

other males and their second weight only with the steers.

**4. Birth Number (Twin vs Single Births)**

Only calves of the same birth number will be compared together in the same contemporary group. In other words, single calves will not be compared with twins. While twins can potentially be compared with other twins, the low occurrence of twin births generally means that very little performance information from twins is used in the BREEDPLAN analysis.

**5. Birth Status (ET vs Natural Matings)**

Calves conceived naturally or by AI will be directly compared together in the same contemporary group but they will not be compared with embryo transfer (ET) calves. In other words, ET calves will be analysed in a separate contemporary group. Furthermore, the amount of information available on the recipient dam will then determine the formation of the contemporary group for ET calves. In some analyses, ET calves are analysed in the same contemporary group and adjustments made for any differences in the breed of their recipients, whereas in other analyses, ET calves will only be directly compared with other ET calves that have been reared by recipient dams of the same breed (and the recipient dam information has been recorded with the Breed Society/Association).



### 6. Dam Age

The birth performance records for calves out of first calf heifers (up to 3.5 years of age) are not compared with birth performance records for calves out of other cows. NOTE - This heifer/cow distinction is only used for birth performance traits (e.g. Birth weight, gestation length calving ease).

### 7. Breed

In some BREEDPLAN analyses, only the performance records for calves of the same breed will be compared together in the same contemporary group. NOTE - The breed of an animal is only used in the formation of contemporary groups in some BREEDPLAN analyses. In other BREEDPLAN analyses, either a) only the performance for pure bred animals is included or b) the performance from cross bred animals is included in the same contemporary group and adjustments for heterosis are made.

### 8. Weight Date

Only animals weighed on the same date will be compared together in the same contemporary group. In addition, only animals with the same weighing history will be directly compared. For example, the 400 day weight performance for two animals will only potentially be directly compared if :

- both the 400 day weights were recorded on the same day

- any weights previously submitted to BREEDPLAN for these animals (eg. 200 day weights) had also been recorded on the same day.

### 9. Calf Age (Slicing)

Only animals of similar age will be directly compared in the same contemporary group. When all the other criteria have been used to place animals into a contemporary group, the group is divided (sliced) into animals of similar ages. "Slicing" is done to ensure that the calves being compared have been run under comparable seasonal conditions. For example, if the age slicing for 200 day weight is 45 days. The first calf born in the group is the start and the contemporary group will include all animals born in the next 45 days. After this the next calf is found and this becomes the start of the next contemporary group. NOTE – This age slicing varies depending on the trait being analysed. In addition, the age slices used may vary from breed to breed. Table 2 provides an indication of the standard age slices used by BREEDPLAN.

### 10. Breeder Defined Management Groups

Only animals in the same breeder defined "management group" will be directly compared in the same contemporary group. Providing BREEDPLAN with management group information is the responsibility of the breeder.

**Table 2. Standard Age Slicing and Ages for BREEDPLAN Traits**

Trait	Age Range (days)	Standard Age (days) <sup>A</sup>	Slicing
Gestation Length <sup>B</sup>	520 - (20 yrs)	-	6 months
Birth Weight	0	-	45 days
200 Day Milk <sup>D</sup>	760 - (20 yrs)	-	-
200 Day Weight	80-300	200	45 days
400 Day Weight	301 - 500	400	60 days
600 Day Weight	501 - 900	600	60 days
Scrotal Size	300 - 700	400	60 days
Days to Calving <sup>B</sup>	270 – later	-	6 months
Scan Fat	300 – 800	500	60 days
Scan EMA	300 – 800	500	60 days
Calving Ease <sup>B</sup>	600 - (5 yrs) <sup>C</sup>	-	4 months

<sup>A</sup> Each trait is adjusted to a standard age before comparisons are done.

<sup>B</sup> These are measures on the cow when the calf is born.

<sup>C</sup> For calving ease, all cows older than 1900 days are treated as "mature cows".

<sup>D</sup> The 200 day milk EBV of the cow is estimated from the 200 day weight of the calf.

There are two different forms of breeder defined management group:

a) the “Birth Management Group” allows breeders to describe different treatments of the cows prior to the birth of the calf. For example, where one group of cows have had different feed availability that may affect the birth weight and/or calving ease and/or gestation length when the calf is born.

b) the “Post Birth Management Group” allows breeders to identify animals that have received different treatment or management following birth that has influenced their performance. This treatment may be deliberate (eg when some of your young bulls receive supplementary feeding and others do not) or accidental (eg if a calf is sick).

### ASSIGNING MANAGEMENT GROUPS

Breeders should assign animals into different management groups in any situation when either individually or as a group, they have not had equal opportunity to perform. By assigning animals into management groups, only like treated animals will be grouped together and therefore directly compared in the BREEDPLAN analysis.

Assign animals to different management groups when:

- ✓ Sickness gives some calves a permanent set back.
- ✓ Some animals are fed for show or sale.
- ✓ Some animals are grain fed and others are paddock reared.
- ✓ Some animals are being given growth promotants.
- ✓ Animals are reared in different paddocks in which feed is of different nutritional value.
- ✓ A bull has been fighting and clearly lost weight prior to recording.
- ✓ Some yearling bulls are used as sires while other yearling bulls are not.
- ✓ Heifers are at different stages of pregnancy (try to weigh before joining and certainly before two months).

- ✓ Some heifers are spayed while other heifers are not spayed.
- ✓ Calves are weighed on different scales.
- ✓ Some calves are weighed straight from the paddock while others are weighed after being off feed for several hours.



### MAXIMISING CONTEMPORARY GROUP SIZE

To optimise the results from performance recording, breeders should maximise the number of calves represented within each contemporary group. This is especially important in small herds, where the numbers of animals within a contemporary group can quickly decline without careful management.

Solutions

- ✓ Restrict calving periods. A calving period of 6 to 8 weeks is ideal as this will help prevent calves being spliced into several contemporary groups by age.
- ✓ Weigh all animals on the same day.
- ✓ Weigh all animals in a contemporary group before splitting the group. For example, weigh all males before castrating some of the bulls.
- ✓ If you need to divide animals, try to use the “automatic” grouping criteria. For example divide animals by sex of calf, by age of calf, by ET calves vs non-ET calves or by prior management groups.
- ✓ Use recipient dams of same breed.
- ✓ Run animals in as large a group as possible.



## MAINTAIN GENETIC COMPARISONS

As well as maximising the number of calves within each contemporary group, it is also important to maintain both genetic comparisons within each contemporary group and between the different contemporary groups.

### 1. Maintaining Genetic Comparisons within groups.

It is important to have more than one sire with progeny represented within each contemporary group. The performance information from a contemporary group of calves that all have the same sire contributes no information on the genetic merit of the sire.

### 2. Maintain pedigree links between groups

The more pedigree links between the different contemporary groups, the more reliable the EBVs. This is because BREEDPLAN uses the pedigree links to compare between the groups.

Both sires and dams contribute to these pedigree links.

Do:

- ✓ Remix your cow mobs from one year's joining to the next.
- ✓ Replace sires gradually. That is, ensure you can directly compare the progeny of the new sire(s) with progeny of a sire used previously.

Don't:

- ✗ Keep cows in the same mob every year.
- ✗ Replace all of your sires in one year.

For further information regarding contemporary groups or the recording of management group information, please contact staff at Southern Beef Technology Services (SBTS) or Tropical Beef Technology Services (TBTS).