

## Understanding BREEDPLAN Management Groups

The recording of management group information is one of the most important aspects of BREEDPLAN. This document provides detailed information regarding management groups and the role they play in the BREEDPLAN analysis.

### Introduction

BREEDPLAN analyses cattle in contemporary groups to take out the influence of as many of the non-genetic effects as possible (eg. feeding, years, seasons). The underlying principle is that only animals that have had an equal opportunity to perform are directly compared together within each contemporary group.

If the contemporary groups are not correctly formed, the EBVs calculated will be less accurate and possibly misleading. Most 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 (and thereby virtually eliminating those calves from any comparison with their peers) or by not differentiating between calves that have had different levels of management or feeding.

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

### Background Information

BREEDPLAN automatically creates the contemporary groups of animals for comparison based on the criteria outlined below.

**Table 1: Aspects of the Division of Data in BREEDPLAN**

| AUTOMATIC            | AUTOMATIC, BUT CAN BE BREEDER INFLUENCED | BREEDER SUPPLIED                      |
|----------------------|--|---------------------------------------|
| 1. Herd              | 7. Breed                                 | 10. Breeder Defined Management Groups |
| 2. Calving Year      | 8. Weight Date                           | - birth                               |
| 3. Sex of Calf       | 9. Calf Age (Slicing)                    | - post-birth                          |
| 4. Twins/Single      |  |                                       |
| 5. Birth Status (ET) |  |                                       |
| 6. Dam Age           |  |                                       |

The following section provides more detail regarding each of these criteria.



### **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 of Calf**

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. Number in Birth (Singles/Twins)**

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/Natural)**

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. More specifically, 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 (Parity)**

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 (ie. birth weight, gestation length, days to calving).

## **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**

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. The following table provides an indication of the standard age slices used by BREEDPLAN.

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

| Trait              | Age Range (days)   | Standard Age (days) # | Slicing  |
|--------------------|--------------------|-----------------------|----------|
| + Gestation Length | 520-(20yrs)        | -                     | 6 months |
| Birth Weight       | 0                  | -                     | 45 days  |
| ⊕ 200 Day Milk     | 760 days -(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  | 600-3650           | -                     | 6 months |
| Scan Fat           | 300-800            | 500                   | 60 days  |
| Scan EMA           | 300-800            | 500                   | 60 days  |
| + Calving Ease     | 600-(5 yrs)⊗       | -                     | 4 months |

- # Each trait is adjusted to a standard age before comparisons are done.
- + These are measures on the cow when the calf is born.
- ⊗ For calving ease, all cows older than 1900 days are treated as “mature cows”.
- ⊕ The 200 day milk EBV of the cow is estimated from the 200 day weight of the calf. Cows older than 12 years are treated as mature cows.

**10. Breeder Defined Management Group**

Only animals in the same breeder defined “management group” will be directly compared in the same contemporary group.

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).

Providing BREEDPLAN with management group information is the responsibility of the breeder. By assigning animals into management groups, breeders are acting as “eyes” for the BREEDPLAN evaluation.

**Contemporary Groups in Practical Terms**

In practical terms, there are several main areas that breeders need to consider in regards to the formation of contemporary groups to ensure the effective use of their performance data by BREEDPLAN.

- (i) Assign management groups where applicable.
- (ii) Maximise contemporary group size
- (iii) Maintain genetic comparisons within/between contemporary groups



### **(i) Assigning Management Groups**

As stated previously, by assigning animals into management groups, breeders are acting as “eyes” for the BREEDPLAN evaluation. Animals should be assigned 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.

Some examples of where animals should be recorded in separate management groups are:

- sickness gives some calves a permanent set back;
- some animals are fed for show or sale;
- grain fed animals versus paddock reared animals;
- some animals being given growth promotants;
- animals reared in different paddocks in which feed is of different nutritional value;
- a bull has been fighting and clearly lost weight prior to recording;
- yearling bulls used as sires compared to those not used as sires;
- different stages of pregnancy for heifers (try to weigh before joining and certainly before two months);
- spayed heifers as compared to non-spayed heifers;
- calves weighed on different scales;
- calves weighed straight from the paddock as compared to those off feed for say three hours or more.

Importantly, if you are in any doubt as to the correct management grouping of your animals, please contact staff at BREEDPLAN. Remember, providing BREEDPLAN with management group information is the responsibility of the breeder and a very important part of a herd’s performance recording.

### **(ii) Maximising Contemporary Group Size**

It is imperative that breeders try to maximise the number of their calves represented within each contemporary group to optimise the results from their performance recording. There are a number of strategies that can be implemented to achieve this:

- **Restrict calving periods**

As calves are only included in the same contemporary group if they are born within 45 or 60 days of one another, it is preferable if herds have as shorter calving period as practical. A calving period of 6 - 8 weeks is ideal.

- **Weigh all animals on the same day**

As calves are only included in the same contemporary group if they are weighed on the same date, all animals within the same management group should be weighed 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
- weigh all calves/yearlings before taking out the show team for special feeding

- If you need to divide animals, try to use the “automatic” grouping criteria. For example:

- sex of calf
- age of calf
- ET calves vs non-ET
- prior management groups (eg. if you need to split the yearling calves, use the weaning management groups as a basis for this)

- Use recipient dams of same breed

As embryo transfer calves are only included in the same contemporary group if they are reared by a recipient dam of the same breed, it is preferable if the recipient dams used are all the same breed.

- Run animals in as large a group as possible

### **(iii) 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 we use the pedigree links to compare between the groups. Both sires and dams contribute to these pedigree links.

Therefore, try to:

- Remix your cows from one year’s joining to the next (ie don’t keep cows in the same mob every year);
- Replace sires gradually. That is, ensure you can directly compare the progeny of the new sire(s) with progeny of a sire used previously. To put it another way, don’t replace all your sires in one year.
- Split a sire’s heifer progeny between several bulls when these heifers are being mated. This is important for the estimation of the Milk EBVs.

*For further information regarding contemporary groups or the recording of management group information, please contact staff at BREEDPLAN*