

Embryo Transfer (ET) Calves: BREEDPLAN Considerations



TIP SHEET

There are now a considerable number of seedstock producers using embryo transfer (ET) within their breeding programs. This tip sheet outlines the main considerations that breeders undertaking ET programs should make to ensure that they obtain the most effective BREEDPLAN EBVs for the resulting progeny.

CAN BREEDPLAN CALCULATE EBVS FOR ET CALVES?

Yes! BREEDPLAN has the ability to calculate EBVs for ET calves.

HOW DOES THE ANALYSIS OF ET CALVES DIFFER FROM THOSE CALVES THAT RESULT FROM NATURAL MATING AND/OR AI PROGRAMS?

While the performance of ET calves is essentially analysed in a similar manner to the performance of calves resulting from natural mating and/or artificial insemination (AI) calves, the calculation of BREEDPLAN EBVs for ET calves is more complex as the maternal effect of the recipient dam on the performance of the ET calf needs to be taken into consideration.

To enable the calculation of effective EBVs for ET calves, BREEDPLAN requires information about the recipient dam to have been recorded.

WHY DOES THE RECIPIENT DAM HAVE TO BE TAKEN INTO ACCOUNT WHEN CALCULATING BREEDPLAN EBVS FOR AN ET CALF?

While the recipient dam doesn't influence the genetics of the ET calf, there are maternal effects on the embryo and the resulting ET calf that are attributable to the recipient dam. BREEDPLAN requires recipient dam information so that these maternal effects can be accounted for when analysing the performance of ET calves.

For example, consider a situation where two full-sibling embryos are implanted into recipient

dams of different breeds. One embryo is implanted into a purebred beef breed cow (e.g. Hereford) while the other embryo is implanted into a purebred dairy breed cow (e.g. Holstein). These recipient dams are run together in the same paddock through their pregnancy, over calving and up to weaning of the resulting ET calves. At weaning, the ET calf reared by the dairy breed recipient dam is considerably heavier than the calf reared by the beef breed recipient dam. As these two full-sibling ET calves are of similar genetic merit and raised in the same environment, the difference in their weights is more likely due to the greater maternal ability (including milk production) of the dairy cow recipient, than due to the genetics of the calf.

HOW DOES BREEDPLAN TAKE ACCOUNT OF THE MATERNAL EFFECT OF THE RECIPIENT DAM?

BREEDPLAN takes account of the maternal effect of the recipient dam on the performance of the ET calf through two main steps.

Firstly, **ET calves will only be analysed in a contemporary group with other ET calves.** That is, the performance of ET calves is **never** directly compared with the performance of calves conceived from natural matings and/or AI programs.

Secondly, BREEDPLAN will account for the maternal effect of the recipient dams by either:

- Further breaking up the ET calves into groups of calves that have all been reared by **recipient dams of the same breed** (which have made a similar maternal contribution). For example, ET calves out of Brahman recipient dams could be placed into the same contemporary group; however, they could not be placed into the same contemporary group with ET calves out of Hereford recipient dams. This method is currently used in the **vast majority** of BREEDPLAN analyses.

- b. Analysing all ET calves in the same contemporary group, but with **adjustments** to the performance of the ET calves to account for differences in the maternal effect of their recipient dam. These adjustments are made based on the breed of the recipient dam. This method is currently only used in a **minority** of BREEDPLAN analyses.

WHAT RECIPIENT DAM INFORMATION DOES BREEDPLAN REQUIRE?

For calculation of effective EBVs for ET calves, BREEDPLAN requires that, at a minimum, both the ident and breed of the recipient dam be recorded. The specific breed of the recipient is required (e.g. Murray Grey/Hereford) rather than a generic breed (e.g. Murray Grey cross).

In addition, it is recommended that breeders also submit an approximate year of birth for each recipient dam. This is important as BREEDPLAN makes adjustments to the performance of a calf based on the age of their recipient dam.

HOW DO I RECORD RECIPIENT DAM INFORMATION?

Recipient dam details should be recorded with your breed society when you are recording the ET progeny. As such, you should contact your breed society for information regarding their particular recording requirements.

WHAT STRATEGIES CAN BE USED TO OPTIMISE THE EFFECTIVENESS OF PERFORMANCE RECORDING FOR ET CALVES??

- It is imperative that breeders undertaking ET programs record recipient dam information for their ET calves. If recipient dam information is not recorded for an ET calf, its own performance will not be used in the calculation of its EBVs. Instead, the EBVs calculated for the ET calf will simply be mid-parent values based on the EBVs of its sire and donor dam (e.g. biological dam).
- As, in the majority of analyses, BREEDPLAN will only directly compare the performance of ET calves that have been reared by recipient dams of the same breed (depending on the

method used to account for the maternal effect of the recipient dam), the choice of recipient dams should be carefully considered before undertaking an ET program. If recipient dams of multiple breeds are used, the performance of the ET calves will potentially be split into a number of small contemporary groups. This can significantly inhibit the usefulness of this information to the BREEDPLAN analysis. Therefore, **breeders are strongly encouraged to select recipient dams of the same breed.** Doing so will maximise the number of ET calves being analysed in the same contemporary group.

- Ideally, recipient dams that have been performance recorded previously would be selected (e.g. ex-stud cows). In this situation, BREEDPLAN already has information regarding the maternal attributes of the cow, which enables the maternal effect of the recipient on the performance of the ET calf to be more accurately identified.

For further information regarding the analysis of embryo transfer calves, please contact staff at your BREEDPLAN processing centre.

