



MURRAY *Technical* GREY

July 2002

INFORMATION FOR MURRAY GREY SOCIETY MEMBERS

CRC Research - What does it mean for breeders?

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In the February 2002 edition of the *Grey Country*, a list of take home messages from the beef CRC straightbreeding genetics research were published. In the next few issues we would like to expand on those take home messages and discuss the relevance of these results to Murray Grey breeders.

But to begin we should briefly remind readers of the design and scope of the Beef CRC genetics straightbreeding program. Genetics was but one of many different approaches to improving meat quality researched by the CRC.

The flagship of the straightbreeding genetics program was a large scale progeny test conducted on commercial properties representing seven breeds in 35 different herds. Murray Grey was one of the breeds representing cattle commonly used in temperate Australia, along with Hereford, Angus and Shorthorn. Geographically the herds covered the eastern states of Australia from the Barkley Tablelands in Northern Territory to Kingston in South Australia. Cattle were killed at three different slaughter weights representing, Domestic, Korean and Japanese. Two different finishing regimes, grain (feedlot, with different length of time on feed according to target market) and grass, were used prior to slaughter.

Three Murray Grey herds were involved in this

progeny test program. To Don and Sandy Gadd, Ralp Kuhn and Robert Wythes should go the appreciation of many who are benefiting from the results of this project.

The major industry outcome of this program has been the modification of the BREEDPLAN carcase model. At times it is easy to overlook the amount of effort behind what appears as small improvements in an existing program such as BREEDPLAN.

Behind the implementation of these new carcase EBVs are records from approximately 8000 carcasses from the Beef CRC and scans taken on over 10,000 stud heifers and bulls in seedstock herds. The stud calves were by the same sires as the commercial calves so comparisons of sire performance could be made using both scanning and carcase. To have the sires produce both commercial calves from commercial herds and stud calves in the seedstock herds was one of the major challenges faced by organizers of CRC and the participating breeders.

From analysis of this data researchers concluded a number of important points for data collection and reporting of EBVs.

• Estimated Breeding Values (EBVs) for fat depth, eye muscle area (EMA), retail beef yield (RBY) and intra-muscular fat (IMF; marbling), as a result of the Beef CRC, now use information from carcase as well as scanning to produce a single EBV for each of these important carcase traits. It was demonstrated that scanning progeny ranked



sires similarly to progeny carcass measures. Because they are strongly correlated both the measures can be combined into one EBV for fat, EMA and IMF. It would make little sense to have a scanning EBV and a carcass EBV for the same trait.

- Data was available to allow the EBVs to be corrected to a 300 kg carcass weight. Previously carcass EBVs were on an age basis. EBVs such as EMA are now effectively corrected for weight and will appear more closely related to the way cattle are marketed (generally drafted on a weight basis). They are also more closely associated with muscle score and better reflect carcass yield.

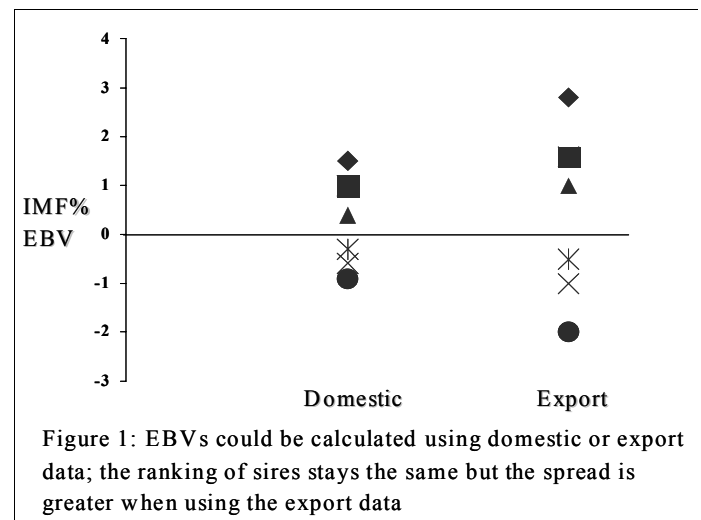
- Carcass data can be collected at any weight and the sires will rank very similarly for the four traits, fat, EMA, RBY and IMF. A sire producing fat carcasses at domestic weights will also produce fat carcasses at Japanese export weights. The importance of this is that only one set of carcass EBVs is needed i.e. we don't need fat depth EBVs at 200 kg and at 400 kg. This however does not imply that the same sire will be suitable for all market situations. You need to match your genetics to the market specifications.

- Similarly carcass data can be collected from grainfed or grassfed carcasses. There is no need for an IMF-Feedlot distinct from an IMF-Grassfed EBV.

- Relationships between the carcass traits were calculated such that even when a trait is not measured directly (eg. retail beef yield), it can be estimated from the known genetic relationship with all other EBVs, in the case of RBY the most important EBVs are fat and EMA.

To explore a little further the ranking of sires when evaluated under different market endpoints we should look at the following diagram. Each different shape in the graph represent an EBV for IMF for a sire calculated using either information from domestic weight carcasses or from export weight carcasses. Each shape represents a different sire. The important point is that while at the domestic weights the points are closer together the order (ranking) is the same. The sire that produced the carcasses with the highest average IMF at export weights also produced the highest marbling carcasses when measured at domestic

weights. A point of clarification is necessary at this point; the EBVs shown in figure 1 are experimental EBVs, not BREEDPLAN EBVs; the EBV presented in BREEDPLAN is one which uses data from both the export and the domestic slaughter endpoints, adjusted to 300 kg carcass weight.



A further result of this project is that the current version of BREEDPLAN is able to correct for the differences in the spread so there is no disadvantage to those evaluated at domestic weights.

Similar results were obtained when EBVs based on data from pasture fed cattle were compared to EBVs based on data from grain finished cattle. The grain finished cattle tended to be fatter and had higher levels of marbling. There was a greater spread in the sires when based on feedlot finished data but the ranking was the same. Again BREEDPLAN corrects for the greater variation so that no sire is disadvantaged by being evaluated on feedlot or grassfed data alone.

With the assistance of your breeders who participated in this trial, a most valuable data set has now been accumulated. From this dataset you can start to estimate what EBV values mean in production terms. When based on averages of all CRC Murray Grey sires over all years and all herds this comparison is reasonably robust.

As shown in table 1, Murray Grey sires used in the CRC were above current breed average for the fatness traits but behind a little for EMA and RBY. The fact that the sires that were used in CRC are so well recorded and known in Murray Grey BREEDPLAN, enhances the value of the information.

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Table 1: Carcase EBVs for sires used in CRC compared to breed average for 2000 drop calves.

| EBV | MA | RIB | RUMP | RBV% | IMF% |
|--------------------|-----|-----|------|------|------|
| Av CRC Sires | 0.6 | 0.4 | 0.6 | 0.0 | 0.3 |
| Breed Av 2000 drop | 0.7 | 0.0 | 0.0 | 0.3 | 0.0 |

When CRC averages for fat and IMF are matched to the average EBVs of sires you can start to make some assumptions about the performance of the genetics. For example an EBV value of 0.6 for rump fat roughly equates to 8.2 mm of fat on domestic weight carcasses finished on pasture under the CRC production system. The average performance for fat and IMF under grain or grass finishing, at the three different slaughter end points, Domestic, Korean and Japanese are shown in table 2.

The averages for the different market end points

and the different finish systems are as might be expected. Feedlot finished cattle were fatter and had higher IMF%. Heavier carcass weights (the heavier cattle also tended to be older) also resulted in more fat and higher levels of IMF.

Under the production systems of the Beef CRC the EBVs of the sires used appeared to produce carcasses with acceptable carcass fatness and adequate IMF%. But what is the scope for genetic improvement given the range in EBVs to be found. This discussion point will be expanded in the next issue.

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Table 2: P8 Fat Depth and IMF% at different market end points and for different finishing systems.

| Finish system | P8 Fat Depth (mm) | | | | IMF (%) | | | Average All Markets |
|-----------------------------|-------------------|--------|----------|---------------------|----------|--------|----------|---------------------|
| | Market | | | Average All Markets | Market | | | |
| | Domestic | Korean | Japanese | | Domestic | Korean | Japanese | |
| Feedlot | 9.3 | 11.5 | 12.6 | 11.1 | 4.9 | 6.2 | 8.2 | 6.4 |
| Pasture | 8.2 | 10.6 | 9.6 | 9.6 | 4.1 | 5.1 | 5.2 | 4.8 |
| Average both Finish Systems | 8.7 | 11.1 | 11.3 | 10.4 | 4.5 | 5.7 | 6.7 | 5.6 |