Why EBVs changed for some overseas bulls

Most BREEDPLAN users will have noticed changes in the EBVs of overseas sires (and their progeny) in their latest BREEDPLAN runs. Some of these changes were due to a recent modification to the procedure for using overseas genetic information.

The modification was flagged in last year’s BREEDPLAN News (no. 14) and various breed Societies notified their members. In brief, prior to 1998, breeding values on overseas bulls were not used in BREEDPLAN, even though they may have had many progeny analysed in an overseas evaluation. In the absence of international evaluations for our breeds, the next best thing we could do was to attempt to use the published overseas information (eg. EPDs). AGBU scientists developed a new procedure and, in consultation with industry, it was decided that the overseas information should be used as a ‘starting value’ for a newly imported sire and when sufficient local data became available it should dominate the EBV. The procedure was introduced in 1998. However after a number of years, industry feedback suggested a problem and the procedure was reassessed. This revealed too much emphasis was being placed on overseas information, particular for bulls with extreme EPDs or many progeny with only mid-parent EPDs. Changes in the overseas evaluations in the past 7 years also have affected the procedure. The original methodology was developed primarily on weight traits, however with the emergence of other traits in overseas evaluations (eg. scans) the procedure had to be updated. As a result some traits now receive more weighting than others. This was based on analyses that showed the correlation between the overseas EPD and BREEDPLAN EBVs of sires with progeny measured for both was different across the traits (and breeds). Importantly for carcase traits differences can exist across countries because the overseas EPDs are expressed on an age constant basis whereas the BREEDPLAN EBVs are expressed at a 300 kg carcase weight basis.

The procedure was altered (and the imported data files modified) to ensure the desired emphasis is being achieved and this resulted in changes to the EBVs of some overseas sires (and their progeny). The latest EBVs better reflect differences between animals for the performance of their progeny measured under Australian conditions.

David Johnston

Some highlights:

- Overseas EPDs are still used as a ‘starting value’ for the BREEDPLAN EBVs.
- Overseas data contributes differently across traits (and breeds).
- If no Australian data exists for a trait then the BREEDPLAN EBV is driven by overseas data and pedigree information.
- When Australian progeny records become available the contribution of overseas data to the BREEDPLAN EBV declines eventually to zero.
- High accuracy bulls may have changed.

Accuracies reflect the (effective) number of progeny. Whereas a change to the methodology such as this will result in a change in EBVs irrespective of the accuracy.

Steve Barwick

Rates of Genetic Gain in Australia ($ per cow per year)

<table>
<thead>
<tr>
<th>Year</th>
<th>BREEDPLAN carcase and some fertility</th>
<th>Pre BREEDPLAN</th>
<th>early BREEDPLAN</th>
</tr>
</thead>
<tbody>
<tr>
<td>2001-2005</td>
<td>0.6</td>
<td>2.4</td>
<td>2.0</td>
</tr>
<tr>
<td>2005-2006</td>
<td>1.6</td>
<td>1.9</td>
<td>1.7</td>
</tr>
<tr>
<td>2006-2007</td>
<td>1.8</td>
<td>1.6</td>
<td>1.4</td>
</tr>
<tr>
<td>2007-2008</td>
<td>1.4</td>
<td>1.1</td>
<td>0.9</td>
</tr>
<tr>
<td>2008-2009</td>
<td>1.3</td>
<td>0.9</td>
<td>0.7</td>
</tr>
<tr>
<td>2009-2010</td>
<td>1.1</td>
<td>0.8</td>
<td>0.6</td>
</tr>
</tbody>
</table>

Some important points:

- Overseas EPDs are still used as a ‘starting value’ for the BREEDPLAN EBVs.
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Management Groups - VIP

Most bull breeders in BREEDPLAN, take care when performance recording. They keep scales calibrated, ensure correct I/D (easier now with electronic tags) and carefully transfer records from paper to computer if required. However many may not fully understand the importance of recording management groups correctly for the accuracy of the resulting EBVs.

This example is perhaps a little far fetched, as I hope all BREEDPLAN users understand, that animals prepared for show or sale should always be recorded as being in a separate management group. The principle applies to any animal receiving different treatment and they should be recorded as being in separate management groups eg. a calf whose mother had mastitis. For the overall accuracies of the EBVs in a herd, it is better to record these animals in single animal management groups, rather than leaving them together with all other animals. Of course records in single animal management groups don’t get used in the analysis and the animals will end up with mid-parent EBVs.

When planning separation of animals into different groups for management reasons it is important to take as many measurements as possible before the group is split and to balance the number of progeny from each sire if practical. We don’t want to have single sire management groups, as such groups provide no data for genetic evaluation of sires. By balancing the number of progeny across sires you maximize the available information. For example, two sires in two management groups with 24 progeny of sire A and one progeny of sire B in one group and one 24 progeny in the other is much less valuable than 12 and 13 and 12 and 12, respectively.

Lack of proper management group recording not only affects the EBVs of young animals and their parents, but can introduce additional errors for maternal, and other EBVs, later in life.

A milk EBV example: Assume you have a cow with a good heifer calf at foot. With some other cows you pull them out and prepare for a show. Because of the extra care, the calves grow bigger and weigh an extra 30 kg at 7 months when you record weaning weight. Let’s assume you do not record the management group. The calf will get a higher than justified weaning weight (200d) EBV and the dam will get a couple of kg bonus in her milk EBV. The exact figures will depend on number of recorded paternal and maternal half sibs of that calf, but it will be at least 5 kg for 200d EBV. After weaning, the heifer calf is run with its drop, normally mated and has a calf in the main mob. You carefully record the weaning weight of its first calf and BREEDPLAN now identifies that the next generation calf is not as heavy as was expected from the inflated EBV of the cow. Now this is of course not a fault of the calf, but is interpreted to some extent as a lack of milk in its dam, as weaning weights are driven genetically by two components - growth genes of the calf and milk genes of the dam. So the milk EBV of the cow, which so far was a mid-parent value, will be below this estimate, very much to your disappointment.

Hans Graser
Director of AGBU

AGBU is a joint venture of NSW DPI and the University of New England. They are responsible for developing and maintaining BREEDPLAN software. For more information on AGBU: Tel: (02) 6773 2055 http://agbu.une.edu.au

Genetics Information Feast

The 16th Biannual Conference of AAABG will be at beautiful Noosa on 25-28 of September. The location alone should be sufficient reason to attend, but much more will be on offer for those more technically inclined. The 3 day meeting provides the opportunity to listen to and ask questions of latest research in animal breeding. Over 30 papers are from AGBU scientists (not all beef) along with research from other projects (and species), including the Beef CRC. International guest will be Professor John Pollak from Cornell University. John currently heads the US National Beef Cattle Evaluation Consortium.

Further Building Female Fertility

Research has started to enhance the genetic evaluation of cow performance traits. The first work in this area was investigating the effect of parity (first, second or third calf) on the female fertility trait days to calving (DC) in Angus and Herefords. Insufficient records in Herefords limited the results to Angus at this stage. Research suggests that DC is lowly heritable at all 3 joinings, but appears to be a different trait in first calf heifers. Importantly the research has also revealed that for Angus, measuring scrotal size as an indirect measure of DC, is likely to only be of benefit if measured early in life (less than 400 days). This work will be repeated with other breeds and recommendations made for performance recording and analysis.

Further research is also planned to estimate genetic correlations between all traits in the complex of maternal traits including days to calving, milk, fat, mature size and possibly net feed intake and longevity. Data from the northern CRC project will be pivotal for northern breeds (see p. 11). The project has measured 2200 Brahman and Tropical Composites for age at first CL (Corpus Luteum), using ultrasound, which is a good indicator of puberty. Complete joining, calving and culling details are available on all females, with many of the cows now being mated for their 3rd calf. The data also contains repeat measures of weight, body composition, structural and adaptive traits measured throughout the year. The newly funded Beef CRC through the Maternal Productivity project also aims to provide greater understanding of the genetics of maternal efficiency, particularly relating to cow feed intake.