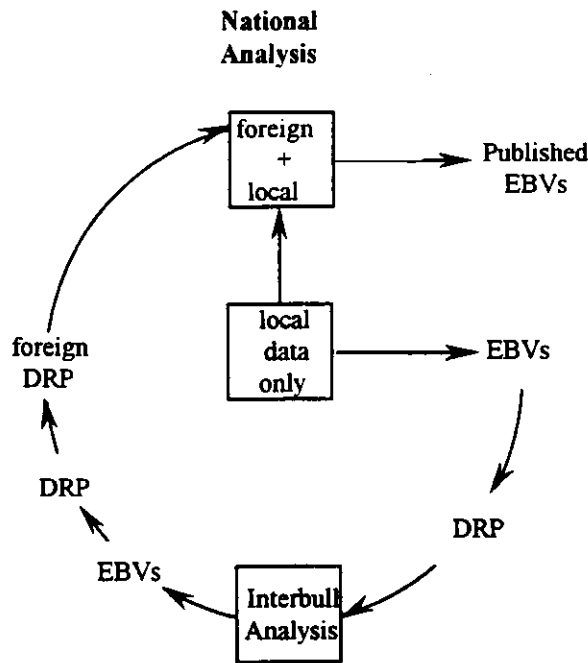


Integration of National and International EBVs

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The international EBVs calculated by Interbull should be more accurate than national EBVs because they use additional data. However, most countries will continue to calculate and publish national EBVs because they can control the timing of their release and they include EBVs for cows. It is desirable that the national EBVs are as accurate as possible which means they should incorporate the information from other countries. This information should be fully included in the BLUP model so that its influence affects not only imported sires, but their sons and daughters and daughters' contemporaries. Since information from the national evaluations are the input data to the Interbull evaluation we need to be careful that the data supplied from a country reflects only lactations occurring in that country, i.e. there is no double-counting. A method is proposed here to achieve this while using all data (local + foreign) in the national evaluation.

The proposed method is as follows. The national analysis initially uses only local data to produce EBVs which are deregressed to produce deregressed proofs (DRPs). Almost equivalently the analysis could produce daughter yield deviations (DYDs) directly. The DRPs from all countries are combined by Interbull to produce international EBVs. Since Interbull uses a multi-trait model there are a set of EBVs produced for performance in each country. The Interbull EBVs for the country under consideration are converted to DRPs. These are conceptually equivalent to DYDs. Since we know the DRPs or DYDs that were input for this country to the Interbull analysis we can remove these from the total DRPs to obtain the equivalent of DYDs which have been contributed from other countries. These foreign DYDs can be included in the national analysis and some additional iterations run to produce the EBVs which are published.



The Interbull method of deregressing EBVs takes account of the relationships between bulls so the DRPs, like DYDs, do not contain information from other relatives such as sire. Consequently, there is no re-using of relationship information which has already been used. The DRPs have the property that, if they were the only information available, when they were used as input to a BLUP the resulting EBVs would be the same as the EBVs from which the DRPs were calculated. The foreign DRPs are not daughter yield deviations from literal cows because the foreign cows lactation yields are a different, although correlated trait. However, these foreign DRPs are still a convenient, if approximate, way of summarising the information on a bull's daughters producing in other countries. Use of DRPs by Interbull or by the National analysis requires a measure of their accuracy. We should plan to compute this accuracy figure and transmit it with the DRPs. In the case of DRPs calculated from Interbull EBVs, the accuracy would be based on the accuracy of the Interbull EBV adjusted for the information obtained from other relatives of a bull such as sire.

The outcome of the use of this method would be that National and Interbull EBVs would be consistent. They would differ only due to new data which was added between one run and the next, just as National EBVs change between runs. (If National and Interbull analyses excluded different data this would be another cause of discrepancy). I believe this consistency will be very important in avoiding confusion in the minds of users of EBVs. The timing of National analysis could be chosen to suit an individual country. It might be carried out immediately prior to the Interbull run so that Interbull EBVs were as up to date as possible or soon after the Interbull run so that National EBVs are as up to date as possible or in between Interbull runs so that there are effectively 4 EBV releases per year.