

# **Interbull Scientific Advisory Committee (SAC)**

## **Annual report (2008-2009) to the Interbull Steering Committee**

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### **1. INTRODUCTION**

Since the 2008 Interbull meeting in Niagara Falls, NY, USA, the four SAC members have engaged in e-mail discussions on issues related with the future of (inter)national genetic evaluations. Ducrocq and Banos, also members of the Interbull Task Force on genomic evaluations, attended the two Task Force meetings in Paris (December 11-12, 2008) and London (June 2-3, 2009). Ducrocq, Goddard and Banos attended the workshop on genomic evaluations in Uppsala (January 26-29, 2009) and participated in the strategic session of Interbull held immediately afterwards, where the future of the organisation was discussed. Schaeffer worked on a simulation demonstrating the robustness of BLUP under genomic pre-selection and shared results for discussion.

Discussions among SAC members featured genomic evaluations, expansion of services to include new countries, and new trait recording.

### **2. GENOMIC EVALUATIONS**

National genomic evaluations are already in place in some countries with more to come. However, several technical and operational issues still need to be addressed, as identified and elaborated upon by the relevant Interbull Task Force. The best methodology for using genomic data is not known yet.

Probably contrary to the original belief, the bigger a role genomic evaluations play in genetic improvement the more important phenotypic records become. The latter is an ongoing investment, paid for mostly by farmers (members of ICAR/Interbull), crucial for the valuation and continuous validation of genomic data and accurate genomic evaluations. The importance of such a resource needs to be highlighted and duly recognised by everybody involved.

At this stage, the SAC has identified the following areas of recommended Interbull involvement, at technical, operational and strategic level:

#### Technical

- monitor pertinent developments internationally; a new DNA array of 600K SNP will become available in the near future; the necessity of combining new results with those from the current 50K array will arise; methods to infer dense genotypes from sparse genotyping procedures will become ever more pertinent;
- work towards an agreement on the preferred method for genomic evaluation; currently several methods are being used internationally (Bayes A, B, C, C\_pi, D, BLUP) and convergence towards a widely accepted preferred method would be desirable;
- complete the development and testing of methods for international comparisons of genomic results.

#### Operational

- invest resources to the application of genomic comparisons for the development of new services; do not get sidetracked from the current service which is the main income generator and will probably continue to be relevant even if genomic evaluations become the norm;

- prepare for the potential influx of substantial amounts of new types of data (genomic results);
- set-up a dynamic service mechanism that may be expanded and adapted as technology develops into denser DNA chips, sequencing and actual gene arrays; the main principals for data analysis and exploitation of genomic variation will still apply.

#### Strategic

- communicate and emphasise benefits of international genomic evaluations to organisations reluctant to share genomic data; bilateral agreements are already taking place suggesting that individual countries/companies appreciate the value/necessity of collaboration; Interbull can be the leading force coordinating/monitoring such activities;
- seek involvement in/coordination of pertinent collaborative research projects funded by international sources; Interbull's profile of an independent global service provider renders it a desirable partner;
- maintain an understanding of patent developments that may affect future services;
- ensure that any new activity and investment is always directed towards the enhancement of the service portfolio.

### **3. EXPANSION OF SERVICES – SOLICITING NEW COUNTRIES**

Currently, there are ICAR members in 47 countries worldwide of which 42 are also members of Interbull. Recipients of routine international genetic evaluation services are in 27 countries; admittedly these are countries with the most active breeding programs. Many (most of the) countries that do not participate in Interbull evaluation services do not have national genetic evaluation systems in place, yet. However, they do import semen and embryos from the international market.

A new service could be designed and launched targeting these countries, possibly expressing international genetic evaluations on some global scale and base. Perhaps market diversity will warrant the development of multiple such scales, depending on the magnitude of genotype-by-environment interaction and estimated (assumed) genetic correlations among countries. Lists of top bulls expressed on a global scale will be of great interest to these countries. Research will be probably needed to identify the best alternatives. There is a potential here for an increase in service subscriptions by more than 50%.

At the same time, some countries may already have a certain amount of data in place and plan a national genetic evaluation in the future, and would benefit from interaction with Interbull in order to address technical issues, data quality/validation and preparation for international genetic evaluations.

### **4. NEW TRAIT RECORDING**

Another issue discussed was related to new traits of economic importance that are difficult to record, such as lameness, feed efficiency, energy balance, health etc. There may be limited data for such traits in each country separately, possibly in the context of research populations and/or pilot studies, but data could be adequate if pooled across country. Interbull, working with ICAR, may coordinate data collection across country for the development of a global database suitable for genetic evaluations. This initiative, coupled with coordinated genotype swapping, will also be useful for SNP effect calculation and genomic predictions.

Issues to address here include different methods of data collection, trait definition, and censored recording (e.g. diseases). In some countries data belong to independently funded resource populations so issues of data protection and access will need to be resolved.