INTERBULL Centre

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INTERBULL CENTRE ACTIVITY REPORT 2008/2009[1]

INTRODUCTION

The era of genomics has started for bovine breeding. This was made clear by the Interbull Scientific Advisory Committee (SAC) and the invited speakers at the Interbull-ICAR joint session on the use of genomic tools in animal breeding, at the Niagara Falls annual meeting in June 2008. The pending question at that point was: will Interbull continue to have a role in international genetics or will genomic information provide the means to facilitate international comparisons without the need for a centralized organization to evaluate animals in different environments? The year 2008/2009 was plenty of debates and developments which have indicated that Interbull is more necessary than ever, given the organization responds quickly to the new challenges ahead.
This document describes the activities at the Interbull Centre since the last annual meeting of Interbull (June 16-19, 2008, Niagara Falls, US). Work plans, budgets and future activities are also presented.

BUDGETS AND FINANCES

A complete financial report can be found in Appendix I-III. Budgets will be official pending approval by the Interbull Steering Committee on August 21, 2009. The result for 2008 showed almost a zero result which was better than expected, mainly due to the changes in exchange rate as the Euro gained against SEK. Swedish borne costs were generally slightly lower than budgeted whereas outsourced activities were more costly. During 2008 João Dürr was recruited as new Centre Director and the costs for recruitment were taken by SLU. An agreement was also made with Helsinki University for employment of Dr. Jarmo Juga as project leader for development of a new data base aimed for both dairy and beef data at the Interbull Centre. The costs for this development have been taken by SLU. The outsourced activities included computation of MACE for conformation traits by the North America Consortium and the last year of a two-year research agreement with MTT in Finland. For 2009 (revised according to the actual situation) the financial prognosis indicates a balanced result. The budget for 2010 includes many uncertainties but indicates a small deficit. Due to the developments in genomic evaluation new activities will be added, partly financed by EU, partly by member organizations and partly by SLU. Modifications of the fee structure may be required, but have not been possible to consider at this stage.

Thus, the service fees for 2009 – 2011 were computed according to the current fee structure. The level of service fees has not changed since 1999 and no change in total service fees is proposed for 2010. The EU commission has continued their support of the Interbull Centre. For 2008 the contribution increased to € 90,000, and an increase to € 91,000 has been decided for 2009. For 2010 an extra €60,000 is envisaged for the work with inclusion of genomic information.

[1] Presented at the 2009 Interbull Meeting, Barcelona, Spain, August 21-23, 2009

Starting 2007, Interbull Centre leads a pilot project for development of a system for routine international genetic evaluations of beef breeds and traits (Interbeef). Funding has been agreed for three years, and amounts to € 85,000 per year.

ICAR membership fees are handled directly by the ICAR office, Rome, Italy, and reported at the official meetings of ICAR. The Interbull Centre contributed € 6,953 in 2008 from service fees to cover overhead costs of ICAR.

PERSONNEL

João Walter Dürr started to work as Interbull Centre director August 25, 2008.
The staff employed at the Interbull Centre consists of seven scientists, of which one is a PhD Sudent, Anne Loberg, working on genomic evaluations, 0.5 programmers and 0.4 secretaries. Furthermore, there are currently two externally financed Ph.D. students at SLU related to Interbull Centre: Mohammad A. Nilforooshan, working on multi-trait MACE and Thierry Pabiou, working on national and international genetic evaluations for Irish beef cattle. The Department of Animal Breeding and Genetics of SLU has hired Dr. Jarmo Juga part time since September 2008 to be the database project manager, and also Mr. Alejandro Engelmann, who is the programmer for the database.
Three international students have been spending time at Interbull Centre during this period: Sahereh Joezy, from Iran, investigating the impact of genomically selected young bulls on the breeding program of an importing country; Marieke Meeuwes, from the Netherlands, estimating genetic correlations between longevity and claw health; and Marco Belloni, from Italy, looking at the trends between genetic correlations and common bulls over the years.
We also had a fellow scientist from Kenya (ILRI) in Uppsala for three weeks, Dr. Julie Ojango, and Dr. Roger Cue, from Canada (McGill), spent one week at Interbull Centre in May 2009. Dr. Anna-Maria Tyrisevä, from MTT Agrifood Research Finland, who is working on a cooperative project with Interbull Centre to improve efficiency of Multiple Trait Across Country Evaluation (MACE) methodology, spent a week at the centre in May.
Frank Armitage, representing the ICAR Secretariat, visited the Interbull Centre in July 2009 to discuss matters of mutual interest. The major topic discussed was the ICAR Certificate of Quality for genetic evaluation.

SERVICE AND OPERATIONS

Test evaluation runs were performed in September 2008 and May 2009. Many changes in national evaluations have been introduced during this period, and are all described in the service reports published on www.interbull.org after each routine evaluation. The May 2009 test evaluation was also used to implement streamlined operations at Interbull Centre, which reduced significantly manual intervention during evaluations and standardized flows and formats between trait groups. This change in workflow was for the time being implemented for production, udder health, longevity, calving, female fertility, and workability traits. Since some differences in EBVs were observed with the new implementation in relation to the old one, further comparisons will be carried out during the September 2009 test run before adopting the new work flow in routine runs.
Routine international genetic evaluations for production traits were computed as scheduled in August 2008 and January and April 2009. In August 2008, USA included Milking Shorthorn bulls in the RDC analysis. In the January 2009 run, Swedish Jerseys were included for the first time by DFS, UK included records from Jersey Island and Slovak Republic participated for the first time in a routine run with Holstein and Simmental data.
International genetic evaluations for Brown Swiss, Guernsey, Holstein, Jersey and Red Dairy cattle conformation traits were computed according to the same schedule as for production traits. Locomotion and body condition score has been added to the service portfolio for conformation traits for the Holstein breed and the first routine run for these traits took place in January 2009, including data from 10 countries for locomotion and from 11 countries for body condition score.

Udder health evaluations for Brown Swiss, Guernsey, Holstein, Jersey, Red Dairy Cattle and Simmental were also computed according to the same schedule.
Longevity evaluations for Brown Swiss, Guernsey, Holstein, Jersey, Red Dairy Cattle and Simmental were computed according to the same schedule as for production traits. Italy and France participated for the first time with Brown Swiss data in August 2008 and Switzerland participated for the first time with RHOL from January 2009.
Calving trait evaluations for Brown Swiss, Holstein and Red Dairy cattle were computed according to the same schedule as for production traits. Denmark, Finland and Sweden submitted joint evaluations for Red Dairy Cattle from August 2008.
Female fertility evaluations for Holstein were computed according to the same schedule as for production traits. Germany-Austria reentered the evaluation for Brown Swiss in January 2009.
In January 2009, official international evaluations for a new trait group, workability, started to be produced by the Interbull Centre. International genetic evaluations for Brown Swiss, Holstein, Jersey and Red Dairy Cattle workability traits were computed according to the same schedule as for production traits.

Table 1 - The total numbers of populations in the most recent (April 2009) routine Interbull genetic evaluation services were as follows:

Breed group	Production	Conformation	Udder health	Longevity	Calving	Female fertility	Workability
Brown Swiss	9	7	8	8	5	6	5
Guernsey	6	4	5	5	-	4	-
Holstein	26	21	23	20	9	16	5
Jersey	10	9	8	7	-	6	3
Red Dairy Cattle	11	8	10	9	3	7	4
Simmental	11	-	8	2	-	2	-
Total	73	49	62	51	17	41	17

DATABASE DEVELOPMENTS

Interbull is investing in the development of a database system to improve quality of data and handling of incoming and outgoing data. The development has been divided into different phases: Phase 1 - development of permanent database for pedigree information; Phase 2 - development of a reloaded database for EBV data; Phase 3- retrieving of data via the database. The development of a permanent database for pedigree information is almost completed. It includes a set of data quality checks performed both at national level and at the ITBC. An automatic way to handle cross-reference files has been implemented: any foreign animals submitted by a given country will automatically be redirected to their own authoritative organization that will validate their pedigree information.
Countries were asked to provide a sire-dam pedigree by middle of May and all the features implemented in the phase 1 were internally tested against the data received. The testing was successful and Interbull Centre is now working for an implementation of the pedigree handling part of the database during the September test run As soon as the phase 1 will be completed the implementation of phase 2 and 3 will start. A functional system design for these parts is already in place.

MODIFICATIONS IN INTERNATIONAL EVALUATION PROCEDURES

Two different software packages have been in use at the Interbull Centre. For estimation of genetic correlations (and based on the decisions made at the Interbull Technical Workshop, January 2004, Uppsala) the MACE

package developed at Holstein Association, USA (HA-MACE) has been used for all traits. For estimation of breeding values the Interbull's own MACE package (ITB-MACE) has been used for production, udder health, longevity and calving traits. For estimation of breeding values for fertility and workability traits the HA-MACE package has been used.
In order to maintain one single software package only and to harmonize files distributed back to national evaluation centers it has been decided to move breeding value prediction for all trait groups to the HA-MACE software package.
To create a system that is more stable, more traceable, and less manpower demanding it was decided to streamline the Interbull's genetic evaluation system in its entirety.
For the May test run (2009) all analyses were performed by the streamlined package. This speeds up the workflow and reduces the manual labor.
The new streamlined HA-MACE and the ITB-MACE packages use the same algorithms. Therefore, the numerical results should be the same as before. However, in the new streamlined package all values in the temporary files are stored with a higher precision (i.e. six decimal places as opposed to 4 decimal places).
Further, all correlation estimations have been carried out on a 64-bit computer (as opposed to an older 32-bit server). These changes have produced results that might be marginally different from before.
However, there are two more differences between the ITB-MACE and the HA-MACE packages. First, the ITB-MACE package uses two generations of pedigree while the HA-MACE uses pedigree as far back as possible. Second, phantom parent groups in the ITB-MACE package were formed manually for production and udder health while phantom parent groups now are formed automatically with a group size of 30 for all traits and breeds.
Approximate reliabilities are still computed from the EDCs provided from the national evaluation centers and used for the International Genetic Evaluations but now also an editing rule of the national reliability being larger than zero has been implemented.
Another change is related to the harmonization of across-trait distribution and documentation files. All traits will have the same layout from the May 2009 test run (except conformation traits, which will have formats standardized during the September 2009 test run).

INFORMATION ACTIVITIES

The web-site of Interbull has been updated at several places. Two Interbull Bulletins, proceedings from the Interbull Open Meeting in Niagara Falls and from the Technical Workshop in Uppsala, have been added. New on the web-site is a separate page with information on the status of Interbull Centre as European Community Reference Laboratory for Zootechnics (Bovine Breeding) at http://www.interbull.org/EU/framesida-centre.htm. A completely new web page for Interbull is under construction and expected to be fully operational by the end of 2009.

Interbull Centre carried out a survey on cloning among participating organizations by the end of 2008. There was a request from the EC about the number of cloned bulls and respective offspring used by countries included in the Interbull evaluations motivated by the ongoing discussion within EU on the use of clones in the food chain. The survey revealed that the number of clones used in international dairy cattle populations was negligible and should not be a reason of concern to dairy products consumers.

In March 31, 2009, the Interbull Centre organized a one day seminar at the Department of Animal Breeding and Genetics of SLU to share the major conclusions from the January 2009 Interbull Technical Workshop on the role of genomics in international genetic evaluations with academic staff and graduate students.

The Interbull Centre holds the status of Community Reference Laboratory for Zootechnics within the European Community since 1996. In June 2009, a mission of evaluators visited Uppsala as part of an overall evaluation of the CRLs promoted by DG SANCO. The result of the evaluation was highly positive, with a strong recommendation that the centre speeds up the implementation of the quality assurance program based on ISO9001.

RESEARCH AND DEVELOPMENT

The following is a brief summary of research activities conducted at the Interbull Centre or with the involvement of the Interbull Centre staff since June 2008.

INTERNATIONAL EVALUATIONS FOR NEW TRAITS

Following the research study conducted by the colleagues at the Italian Brown Swiss organization (ANARB), a full scale pilot study on workability traits (milking speed and temperament) was carried out at the Interbull Centre during May 2008. Results of the Interbull study indicated that an international genetic evaluation for milking speed is feasible for BSW, HOL, JER and RDC populations. For temperament there seemed to be some trait definition differences that made the international genetic evaluation feasible only for HOL and RDC populations. Consequently, a full scale test run for workability was approved by the Interbull Steering Committee for September Test Run 2008, results of which were the basis of first official evaluation in January 2009.
Locomotion and body condition score (BCS) were also added as new conformation traits in January 2009.

FEMALE PEDIGREE IN MACE

Earlier studies (e.g. De Jong, 2003) have indicated that international genetic evaluations are sensitive to definition of genetic groups. De Jong (2003) suggested using sire-dam pedigree instead of sire-MGS pedigree in order to get the phantom parent groups further away from the animals with data. Based on this hypothesis Van der Linde et al (2005) collected sire-dam pedigree, made appropriate changes to the HA-USA MACE software (Klei, 1998; Klei & Weigel, 1998) and conducted a pilot study for seven countries participating in the evaluation for the Holstein breed for protein yield. Van der Linde et al (2005) estimated genetic correlations and predicted breeding values using both the sire-dam pedigree and the sire-MGS pedigree. The genetic correlations were rather similar independent of the pedigree structure (average decrease of 0.017) while the CPU time increased with a factor 28. For breeding value prediction the computing time changed with a factor 9 when changing the pedigree structure. Van der Linde et al (2005) also looked at predictability of proofs and found an increase in predictive ability when using the sire-dam pedigree compared to the sire-MGS pedigree.

Based on these findings, the Interbull Technical Committee (ITC) recommended implementation of sire-dam pedigree for prediction of breeding values, but not for estimation of genetic correlations.

Initially the aims of this study were to collect sire-dam pedigree for all bulls currently participating in international genetic evaluation, to study performance for high and low heritability traits and, in order to check feasibility with respect to hard ware and soft ware, to extend the size of the study to include the 25 countries that were participating in the Interbull test run in March 2007. During the study the aims evolved to include the need of improving the software, but also to look at different depth of pedigree and connectedness. Furthermore, the change in reliability was also investigated to quantify the improvement when changing pedigree structure.

It was concluded that implementation of sire-dam pedigree in Mace is feasible for different trait groups, for traits with high and with low heritabilities and for populations with different connectedness. The increase in reliability when changing from a sire-MGS pedigree to a sire-dam pedigree was largest for well connected populations. Consistent sire-dam pedigree is a pre-requisite for a successful implementation and it is necessary to solve the inconsistencies also on the dam side. A tool to verify pedigree (in line with the Interbull verification tool for breeding values) may be helpful. The computing time decreased tremendously when pedigree was cut in 1970 and phantom parent groups were traced from then on. Product moment correlations between breeding values from analyses where pedigree was traced as far back as possible and breeding values from analyses where pedigree only was traced back to 1970 was very high.

A new pilot involving a full run with sire-dam pedigree in MACE is scheduled for the second half of 2009 , and countries have already sent the sire-dam pedigrees to be stored in the new Interbull data base.

INTERBEEF

Five national organizations participating in the Interbeef project have provided performance data on adjusted weaning weight and Interbull has checked and validated pedigrees and cross-references for international animals. Interbull has received a total of 3,118,878 performance and 3,742,857 pedigree data for the Charolais breed, and 1,973,112 performance and 2,582,960 pedigree data for the Limousin breed. Multi-country pedigree and performance files for Charolais and Limousin breeds were created and sent to INRA, France, for estimation of across country genetic correlations and breeding value estimation.

International breeding values were calculated by INRA and distributed by Interbull via the Interbeef forum to all participating countries. The feedback from the countries was positive but some issues needed further attention. In particular, the level of connectedness between countries for Charolais was low compared to the dairy cattle and complications were experienced on parameter estimation.

The Interbeef Working Group of ICAR was formally established by the ICAR Board with its first meeting being in Edinburgh on 10th April 2008. The Interbeef WG is led by a management committee with Brian Wickham (Ireland) as convener and João W. Dürr (Interbull), Isabelle Boulesteix (France), Mike Coffey (United Kingdom), Anders Fogh (Denmark) and Clara Diaz (Spain) were appointed as members of the Interbeef WG. Members of a scientific advisory committee for beef will be appointed during the next Interbeef meeting (Barcelona, 20-23 August 2009). The overall aim of the Committee is to review the scientific issues of the Interbeef project, which is an essential step for providing a high quality service to countries participating in the international genetic evaluations for beef.

A business plan for the future services will be discussed during the Barcelona meeting.

MULTIPLE-TRAIT MACE

Since June 2007, Mohammad Nilforooshan, a PhD student in the Department of Animal Breeding and Genetics, Swedish University of Agricultural Sciences, has been working on the PhD project (MT-MACE with emphasis on fertility traits) at Interbull Centre. The necessity of implementing MT-MACE was evident due to the need of countries to provide Interbull with genetic merit of bulls for successive lactations or multiple traits rather than combining them into an index. Applying MT-MACE is also necessary to distinguish between single-trait vs. multi-trait national models. Because female fertility is a complex trait and there are various measures available for female fertility, which are sometimes analyzed in multi-trait national models, the need for the implementation of MT-MACE became more evident for female fertility. Mohammad has presented a part of his studies in 59th EAAP annual meeting (August, 2008), Interbull's genomic workshop (January, 2009) and Interbull Bulletin No.39 on the application of MT-MACE for female fertility traits. His research is ongoing with the application of MT-MACE for simultaneous consideration of fertility and production traits.

VARIANCE COMPONENTS ESTIMATION FOR REDUCED RANK ACROSS COUNTRY EVALUATION

Since January 2008 the Interbull Centre cooperates with Agrifood Research Finland MTT, in a research project in which the aim is the development of an estimation procedure for variance components of a reduced rank random regression (RR) MACE model. The reduced rank MACE model would require only a fraction of the variance components to be estimated compared to what is required for the current model. Three different approaches have been tested: direct principal component (PC), bottom-up PC and factor analysis approach. The advantage of the bottom-up approach is that AIC has been implemented in the algorithm as a model selection criterion to enable the estimation of the true rank of the model directly. Approaches have been tested on protein August 2007 data set. Recently, data from the April 2009 run for SCC, longevity and protein has also been included in the tests. Based on the results, the reduced rank RR MACE model works and the results of all tested approaches are in a fairly good agreement with each other, given the valid rank has been used. Further, the true rank can be notably lower than the full rank. For SCC, the number of countries included in the analysis is 23 with the true rank of 15. The project is carried out in cooperation with Vincent Ducrocq, INRA, France, Freddy

Fikse, SLU, Sweden and Karin Meyer, University of New England, Australia. The project is scheduled to terminate end of 2009.

GENOMIC CONVERSION EQUATIONS

In anticipation of the international genomic evaluation and as a temporary solution it has been suggested to use "conversion equations" for converting the available genomic breeding values (GEBV) to other country scales. The expected outcome is that the GEBV of some of the young bulls may have sufficiently high reliability to allow for official marketing of such bulls in other countries.
As such, Interbull Centre only needs a file with GEBV and reliability values from young bulls. Conversion equations calculated routinely by Interbull together with national reliabilities and genetic correlations can then be used to provide a list of converted GEBV for different country scales. Such files (the so-called C-files) were requested and four member countries (FRA, NLD, NZL and POL) submitted them at the end of April 2009.
Two underlying assumptions of using conventional conversion equations are that the a and b values in the regression equations and also across country genetic correlations are the same for GEBV and EBV. In order to make sure that these assumptions are not violated, Interbull Centre also requested to receive GEBV for older bulls (the so-called G-files), so that new sets of across country genetic correlations and conversion equations can be estimated. Three member countries (FRA, NZL and POL) submitted such files.
Results of analyzing the C- and the G-files will be distributed among the participating countries and members of the Interbull Technical Committee before the Open Meeting in Barcelona.

GENOMIC EVALUATIONS FOR BROWN SWISS

Following the Interbull Technical Workshop in January 2009, the European Brown Swiss Federation requested the Interbull Centre to run a R&D project to establish the basis of a joint genomic evaluation for the breed, including data from the members of the federation. The Interbull Centre presented a formal project and the agreement was signed for a 18 months project, starting August 1st, 2009. Funding will be shared by the European Brown Swiss Federation, SLU and the EU.

R&D FUNDING

In addition to funds raised from service fees, research and development activities at the Interbull Centre are financed by grants from the Swedish University of Agricultural Sciences (SLU), the European Union, and the World Guernsey Cattle Federation (WGCF).

Funding for the three-year project to develop a system for international genetic evaluation of beef breeds and traits is provided by ICAR, Institut de l'Elevage (France), Irish Cattle Breeding Federation (Ireland), British Limousin Cattle Society (UK) and Nordic Cattle Genetic Evaluation (Denmark, Finland and Sweden).

For the coming year investments will be made in development of methodologies for inclusion of genomic information in international genetic evaluations. A pilot project will be conducted in collaboration with the European Brown Swiss organization with support of EU.

Contributions of the above organizations to the future development of Interbull services are gratefully acknowledged. Contributions made to R&D activities in other countries and organizations leading to improved or expanded Interbull services are also much acknowledged.

INTERBULL PUBLICATIONS/PRESENTATIONS

Interbull Bulletin No. 38. Proceedings of the 2008 Interbull meeting, Niagara Falls, US, June 16-19, 2008.

Interbull Bulletin No. 39. Proceedings of the Interbull International Workshop - Genomic Information in Genetic Evaluations, Uppsala, Sweden, January 26-29, 2009.

Interbulletin. The Official Newsletter of the International Bull Evaluation Service (Interbull) August 2008.

Banos, G., Calus, M., Ducrocq, V., Dürr, J., Jorjani, H., Liu, Z., Mäntysaari, E., Sullivan, P. & VanRaden, P. Preliminary report from Interbull Task Force on the role of genomic information in genetic evaluations. Proc. Of the Interbull Workshop, Uppsala, Sweden, January 26-29, 2009. Interbull Bulletin 39, 61-66.

Fikse, W.F. 2008. Investing in international genetic evaluations. Proc. 10th World Conference on Animal Production, Cape Town, South Africa, November 23-28, 2008, 1 p.

Fikse, F. 2008. Strategies to solve MACE Mixed Model Equations. Proc. of the Interbull Open Meeting, Niagara Falls, NY, June 16-19 2008. Interbull Bulletin 38, 146-151.

Fikse, W.F. & Philipsson, J. 2008. Interbull Centre Activity Report 2007/2008. http://www-interbull.slu.se/contacts/ITBC_report_Niagara Falls_2008.pdf, 11pp.

Forabosco, F., Jakobsen, J.H. & Fikse, W.F. 2009. International genetic evaluation for direct longevity in dairy bulls J Dairy Sci 92: 2338-2347.

Fouilloux, M.N., Dassonneville, R., Minéry, S., Mattalia, S., Laloë, D. & Fikse, F. 2008. To be connected or not? Answers for dairy cattle in international genetic evaluations. Proc. of the Interbull Open Meeting, Niagara Falls, NY, June 16-19 2008. Interbull Bulletin 38, 128-132.

Holmberg, M., Fikse, W.F., Andersson-Eklund, L., Artursson, K. & Lundén, A. 2008. Genetic analysis of pathogen-specific mastitis. 59th Annual Meeting of the EAAP, Vilnius, Lithuania, August 24-27, 2008. Book of abstracts 14, p. 82.

Jakobsen, J. & Fikse, F. Sire-dam pedigree in MACE - results from a full-scale pilot study. Proc. Of the Interbull Workshop, Uppsala, Sweden, January 26-29, 2009. Interbull Bulletin 39, 91-98.

Jakobsen, J.H., Palucci, V. & Jorjani, H. 2008. Feasibility of International genetic evaluation for workability traits. Proc. of the Interbull Open Meeting, Niagara Falls, NY, June 16-19 2008. Interbull Bulletin 38, 101-104.

Jorjani, H. 2008. On the dilution of information. Proc. of the Interbull Open Meeting, Niagara Falls, NY, June 16-19 2008. Interbull Bulletin 38, 123-127.

Jorjani, H. Revisiting Interbull rules of data inclusion. Proc. Of the Interbull Workshop, Uppsala, Sweden, January 26-29, 2009. Interbull Bulletin 39, 103-106.

Loberg, A. & Dürr, J.W. 2009. Interbull survey on the use of genomic information. Proc. Of the Interbull Workshop, Uppsala, Sweden, January 26-29, 2009. Interbull Bulletin 39, 3-14.

Loberg, A., Jorjani. H. & Fikse, F. 2008. Prospects of performing multiple-country comparison of dairy sires for countries not participating in Interbull international genetic evaluations. 10th World Conference on Animal Production, Cape Town, South Africa. 23-28 November 2008. Book of Abstracts, p. 35.

Naeslund, S., Jakobsen, J.H., Eriksson, J-Å. & Strandberg, E. 2008. Genetic parameters for dairy cattle claw health traits recorded by claw trimmers. 59th Annual Meeting of the EAAP, Vilnius, Lithuania, August 24-27, 2008. Book of abstracts 14, p. 275.

Naeslund, S., Jakobsen, J.H., Eriksson, J-Å. & Strandberg, E. 2008. Genetic correlations between combined claw health traits measured at claw trimmings of Swedish Holsteins and Swedish Red dairy cows. 59th Annual Meeting of the EAAP, Vilnius, Lithuania, August 24-27, 2008. Book of abstracts 14, p. 276.

Nilforooshan, M.A., Fikse, W.F. & Jorjani, H. 2008. International genetic evaluations of fertility traits considering more than one trait per country. 59th Annual Meeting of the EAAP, Vilnius, Lithuania, August 24-27, 2008. Book of abstracts 14, p. 268.

Nilforooshan, M., Jakobsen, J., Fikse, W.F., Berglund, B. & Jorjani, H. International genetic evaluations for female fertility traits using multi-trait MACE. Proc. Of the Interbull Workshop, Uppsala, Sweden, January 26-29, 2009. Interbull Bulletin 39, 99-102.

Nilforooshan, M.A., Khazaeli, A. & Edriss, M.A. 2008. Effects of missing pedigree information on dairy cattle genetic evaluations. Arch. Tierz., Dummersdtorf 51, 99-110.

Pabiou, T., Fikse, W.F., Näsholm, A., Cromie, A.R., Drennan, M.D., Keane, M.G. & Berry, D.P. 2008. Genetic parameters for carcass cuts yields in Beef Cattle. Proc. of the Interbull Open Meeting, Niagara Falls, NY, June 16-19 2008. Interbull Bulletin 38, 18-24.

Philipsson, J. & Jorjani, H. 2008. The importance of recording of AI data for the genetic systems - the context of AI from service to genetic progress. 36th ICAR Session, Niagara Falls, USA, 18-20 June, 2008. ICAR Tech. Series no. 13, 8pp.

Schneider, M. del P. & Fikse, W.F. 2008. Short Communication: Exploring patterns of variation in conformation data by means of principal components analysis. J. Dairy Sci. 91, 4440-4443.

Tyrisevä, A.M., Lidauer, M.H., Ducrocq, V., Back, P., Fikse, F. & Mäntysaari, E.A.. 2008. Principal component approach in describing the across country genetic correlations. Proc. of the Interbull Open Meeting, Niagara Falls, NY, June 16-19 2008. Interbull Bulletin 38, 142-145.

Uggla, E., Jakobsen, J.H., Bergsten, C., Eriksson, J-Å. & Strandberg, E. 2008. Genetic correlations between claw health and feet and leg conformation traits in Swedish dairy cows. Proc. of the Interbull Open Meeting, Niagara Falls, NY, June 16-19 2008. Interbull Bulletin 38, 91-95.

WORKPLANS

SERVICES

Routine evaluations for production, conformation, udder health, longevity, calving, female fertility and workability traits are scheduled with the following release dates:

2010 January 12
April 6
August 17[2]
December 7

Test evaluation runs for production, conformation and udder health, longevity, calving, female fertility and workability traits:
2009 September
2010 May

RESEARCH AND DEVELOPMENT

Table 2 - Summary of current and planned research and development activities at the Interbull Centre .

Project	Current Stage
Database	On-going to be implemented
Female pedigree in MACE	Full pilot Second semester 2009
Interbeef	Implementation
MT-MACE	Data analysis
Variance components in MACE	Data analysis
Genomic conversion equations	Data analysis
Brown Swiss genomic evaluation	Planning

MEETINGS

The 2010 Interbull meeting, in conjunction with the 37th ICAR Session in Riga, Latvia, May 31st to June 3rd, 2010.
WCGALP, in Leipzig, in August 1-6 2010, with a joint Interbull dairy cattle genetics session.

WORKSHOPS

A follow-up workshop on the use of genomic information in genetic evaluations is scheduled for March 4 and 5, 2010, in Paris, in conjunction with the Agricultural Show of Paris.

[2] Decision made in the 2009 Interbull meeting in Barcelona to allow staff from Interbull Centre and national evaluation centers to attend WCGALP.

An Interbull Industry Meeting will follow the workshop on March 5, 2010.

PLANNED PUBLICATIONS

Interbull Bulletin: Proceedings Interbull Open Meeting, August 21-23, 2009, Barcelona, Spain.
Interbull Bulletin: Proceedings Interbull Workshop, March 4-5, 2010, Paris.
Interbull Bulletin: Proceedings Interbull Open Meeting, May 31-June3, 2010, Riga, Latvia.
Interbulletin August 2010.

APPENDIX I

INTERBULL CENTRE FINANCES AND BUDGETS, JULY 2009

COMMENTS TO ACCOUNTS AND BUDGETS

The financial situation of the Interbull Centre is presented in Appendix II. All figures are given in Euros. The table includes the final accounts for 2008 in comparison with the budget for 2008 and with the results for 2007. A prognosis for 2009 is made according to the expectations as of the end of June 2009. A budget for 2010 is presented for approval together with a provisional budget for 2011, in order to have an opportunity to project the economy on a longer term. However, at this stage no consideration has been taken to a possible change of the fee structure as a result of the developments of including genomic information in the evaluations.

Other than that, some other important assumptions for the budgeting procedure have been made. They will be given into some detail below, but the most important facts are:

- Services include all six breed groups for production, conformation (except Simmental), udder health, longevity and fertility, four breed groups for workability traits (Brown Swiss, Holstein, Jersey and Red Dairy Cattle), and three breed groups for calving traits (Brown Swiss, Holstein and Red Dairy Cattle).
- For expansion of the activities in the area of including genomic information a contribution of € 60,000 is expected in 2010 from EU and another € 15,000 from participating organizations. Further support by posting a post doc for the project is provided by SLU.
- Estimated costs for the activities related to the development of international beef evaluations are presented separately (Appendix III).
- The reservations made in the past years due to favorable exchange rates, publication costs covered by ICAR from the Interbull membership fees and some vacancies have been used for a junior scientist and research collaboration with MTT in Finland for a period of two years, which has now ended.

ACCOUNTS FOR 2008

The final accounts for 2008 (excl. Interbeef activities) are presented in Appendix II, according to the same format as in previous years. The accounts have been audited within the normal procedures for the Swedish University of Agricultural Sciences (SLU). The balanced result for 2008 was better than the projections in the budget because of the change in exchange rate where SEK lost in value against the Euro. The support of WGCF has been maintained, and the EU contribution increased to € 90,000, an increase of € 10,000 compared to 2007. Swedish borne costs were generally a little lower, whereas outsourced activities were higher.

Office and university administration costs were conservatively budgeted, but the actual result was close to 20% of the total costs, as has been the principle in previous years.

The result for 2008 led to a negative balance of € 1,143, which means that the accumulated balance at the end of 2008 was € 137,313.

PROGNOSIS FOR 2009

Comments refer to the numbers in the table and points at deviations or new information since last meeting. Corresponding figures for 2008 are given within parenthesis when appropriate.

1. Service fees are for production € 316,599 (317,339), conformation € 86,178 (86,448), udder health € 43,619 (42,479), longevity € 36,925 (37,027), calving traits € 25,678 (28,173), female fertility € 46,680 (46,826) and workability traits € 6,471.
2. SLU has preliminary decided to provide support for the ordinary Interbull activities at previous levels (€ 85,000), but with further support on its own account for data base development and a post doc on genomic

evaluation. Continued support (£ 5,000) by the World Guernsey Cattle Federation (WGCF) is also expected.

3. EU has decided to increase their grant for 2009 to 91,000. 70% is paid the actual year and 30% the next year after an approved report.

5. Salary costs incl. social benefits are included for on average 7 scientists, 0.5 programmers, and 0.4 secretaries. This is the same number as in the previous year.

7. Higher costs compared to 2008 are expected in 2009 because of the Task Force and workshop on genomic evaluation organized in Uppsala in January 2009, and also for the staff to attend more scientific meetings due to the rapid developments in genomic selection.

12. The contract established between Interbull and the North-American consortium on outsourcing the conformation evaluations, assumes an annual basic fee of € 51,000.

It is expected that the 2009 result will be balanced. The primary reason is the further change in exchange rate that keeps costs at a slightly reduced level. However, the effects of fluctuations in the financial market provide some uncertainties in estimating the costs.

BUDGET FOR 2010 AND PROVISIONAL BUDGET FOR 2011

Specific comments are given when essential deviations from previous years are expected. No change in service fees for 2010 is proposed, although some modifications of the fee structure may be requested as a result of the developments of genomic evaluations.

2. Research grants from SLU, the WGCF and other sources will be applied for and are expected to be unchanged. Brown Swiss organizations are expected to contribute with € 15,000 for 2010.

3. EU is expected to provide an extra grant of € 60,000 for developments to include genomic information.

4. Salary costs are included for an unchanged number of staff compared to 2009

7. Slightly lower costs compared to 2009 are expected in 2010 and accounts for three meetings, the ICAR and Interbull meetings in Latvia and one workshop and an industry meeting.

12. For 2010, costs for outsourced activities just includes the subcontract for the conformation evaluations.

It is expected that 2010 will yield a small deficit and 2011 the same, but they can readily be managed by the accumulated balance without changing the service fees.

APPENDIX II

INTERBULL CENTRE FINANCES AND BUDGETS (EURO), JULY 2009 (EXCL. INTERBEEF)

	2007	2008		2009		2010	2010
	Actual	**Budget**	**Actual**	**Budget** (original)	**Projected result**	**Budget**	**Prov. Budget**
INCOME							
1. Service fees	544,074	564,100	559,079	567,200	562,580	563,000	563,000
2. Research grants	87,290	73,000	79,393	90,000	91,300	106,000	91,000
3. EU grants	80,000	80,000	90,000	90,000	91,000	151,000	91,000
4. Other income	5,500	-	1,630	-	7,250	-	-
Total	**716,864**	**717,100**	**730,102**	**747,200**	**752,130**	**820,000**	**745,000**
Expenses							
5. Salary costs	400,642	402,600	396,015	420,200	385,000	395,000	400,000
6. Computer costs	45,443	45,000	35,561	45,000	45,000	45,000	45,000
7. Travels, conferences	41,105	40,000	39,708	45,000	60,000	50,000	50,000
8. Publications	9,671	10,000	10,500	10,000	10,000	10,000	10,000
9. Phone, fax, postage	9,630	10,000	10,628	10,000	12,000	12,000	12,000
10.ICAR	6,854	8,000	6,930	8,000	6,930	6,930	6,930
11.Miscellaneous	5,482	5,000	9,584	5,000	20,000	20,000	20,000
12.Outsourced activities	73,321	74,100	82,153	50,000	60,000	120,000	60,000
13.Office and univ. adm. costs	144,403	135,000	140,166	148,000	150,000	165,000	150,000
Total	**736,551**	**729,700**	**731,245**	**741,200**	**748,930**	**823,930**	**753,930**
Balance	**-19,687**	**-12,600**	**-1,143**	**6,000**	**3,200**	**-3,930**	**- 8,930**
Accum. Balance	**138,456**	**125,856**	**137,313**	**143,290**	**140,513**	**136,583**	**127,653**

Note: ICAR membership fees are not included in this table because they are handled directly by the ICAR office, Rome, Italy, and reported at the biennial meetings of ICAR. The Interbull Centre also contributes (EUR 6,930) annually to ICAR from service fees to cover overhead costs.

APPENDIX III

FINANCES AND BUDGETS FOR THE INTERBEEF PILOT PROJECT

Through the agreement with ICAR and a number of national organizations an annual amount of € 85,000 is available for a period of three years. One of the partners has not paid its agreed annual contribution of € 10,000 for 2008, but is expected to do so.

Salary costs incl. social benefits are included for one scientist. Activities for the Interbeef project did not officially start until June 2007, hence the salary costs pertain to 7 months in 2007, and an extra 5 months are considered for 2010. On average, the costs are € 94,000 per year. The management committee of the project needs to secure the remaining resources. Beyond what is reported in the table SLU is providing resources for the data base development.

	2007		**2008**	**2008**	**2009**	**2010**
	Budget	**Actual**	**Budget**	**Actual**	**Prognosis**	**Budget**
Expenses						
Salary costs	45,000	31,369	54,100	52,955	53,000	27,000
Computer costs	8,000	7,558	8,000	10,778	9,000	5,000
Travels, conferences	4,500	11,265	5,500	5,109	5,000	3,000
Miscellaneous	1,000	648	1,000	1,645	1,000	1,000
Office and univ. adm. costs	15,000	14,229	16,000	17,846	17,000	8,000
Total	**73,500**	**65,069**	**84,600**	**88,333**	**85,000**	**44,000**