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INTERBULL CENTRE ACTIVITY REPORT 2011/2012[1]

Contents

[1] Presented at the 2012 Interbull Meeting, Cork, Ireland, May 27-31, 2012

INTRODUCTION

The Interbull Centre is an administrative section of the Department of Animal Breeding and Genetics of the Swedish University of Agricultural Sciences (SLU), and acts as the operational unit for Interbull and Interbeef, respectively a permanent subcommittee and a working group of the International Committee for Animal Recording (ICAR). Additionally, the Interbull Centre holds the status of the European Union Reference Laboratory for Zootechnics. A significant increase in the workload of the center has taken place during the past five years, both by the expansion of the international genetic evaluations to include new populations and new traits and by the addition of new items to the service portfolio. The new scale of activities and responsibilities required a severe reorganization of the operation in order to respond to the new demands and be able to deliver world class services. Investments were made to streamline operations and to implement a quality assurance system, besides developing the new services demanded by customers. The transition is still undergoing, not only due to its permanent nature, but also because it requires a cultural change among staff members, stakeholders and customers, which is a slow process. Nevertheless, significant achievements in the right direction have been made and this stimulates the Interbull Centre to continue pursuing its goal: providing genetic information services and applied research for improvement of livestock to a worldwide network and fulfilling its mandate as a reference laboratory for the European Union.

This document describes the activities at the Interbull Centre since the last annual meeting of Interbull (Stavanger, Norway, August 26-28, 2011). Work plans, budgets and future activities are also presented.

SUMMARY OF BUDGETS AND FINANCES

A complete financial report can be found in Appendixes I-III. The report includes both Interbull and Interbeef activities. Although both Interbull and Interbeef are ICAR activities, they are managed separately, with distinct governances, work plans and budgets, and therefore specific clarifications are provided separately.

Interbull

The Interbull Centre budgets and financial report for Interbull will be official pending approval by the Interbull Steering Committee after review by the 2012 Interbull business meeting in Cork. For 2012 and onwards a revised fee structure, increasing the basic fee from €3000 to €4000 and also including a new service fee for the GEBV test validation.

The result for 2011 showed a deficit of € 191,930 instead of the budgeted deficit of 42,000. The total income increased compared with budget mainly owing to an increase in service fees due to higher participation rate (two more countries added (Portugal, since April 2011 and Republic of Korea, since December 2011) and some countries added traits). Owing to a new internal resource allocation system within SLU and the department, based on publications, PhDs produced and attracted external research funding, the allocation from SLU decreased. The EU commission has continued its support of the Interbull Centre with € 150 000, as well as the World Guernsey Cattle Federation with £5000. The income from Intergenomics was not received during 2011 due to late invoicing, but has come during 2012.

Total costs were higher than budgeted. To a large extent this was due to higher personnel costs than budgeted. There was no income for the Interbeef project during 2011 and ITBC personnel thus had to be fully charged to the Interbull (dairy) budget. From 2011 onwards, the financial reports and budgets have the office rent costs separated from the overhead costs (OH), to make the description clearer. As requested at the Stavanger Steering Committee meeting, the OH are now presented as they are charged within SLU, i.e., by an add-on of 15%, 5% and 13% for the university, faculty and department levels, respectively. These percentages are multiplied by the total salary cost in item 8. Outsourced activities are no longer used when calculating OH. Outsourced activities included computation of MACE for conformation traits by the North-American consortium, Gerald Jansen's consultancy, QP Projects AB consultancy on quality management and data base development services by the SLU IT department.

For 2012 (projected in May 2012) the financial prognosis indicates a positive result of about € 62 000, which is less than expected in August 2011. The incomes are approximately as expected, but there was a lower service fee income because fees were not increased as much as was assumed when the budget was first presented. On the other hand, 2011 and 2012 payments for the Intergenomics projects are both under 2012. The EU commission will continue its support of the Interbull Centre with € 150 000 and the World Guernsey Cattle Federation grant is expected to be maintained. SLU's financial support to the Interbull Centre has been discussed with the Dean of the Faculty of Veterinary Medicine and Animal Science, and from 2012 onwards an "ear-marked" value of SEK 600 000 has been guaranteed, which is the average value practiced before 2011. Furthermore, from 2012 onwards, the Department of Animal Breeding and Genetics is taking over financial responsibility for one former Interbull Centre researcher, one researcher/PhD-student is on parental leave and a new PhD scientist has been recruited to start in June (about 7 mo cost).

For 2013, there is a good perspective of having two more countries participating on the MACE evaluations (Argentina and Uruguay) and this would increase the service fee income accordingly. All other incomes are assumed to stay the same as in 2012. The salary costs are higher than for 2012 because of regular salary increases, the full cost of the new PhD scientist and the return of the PhD student from maternity leave.

Interbeef

The Interbeef working group has established a new service/research agreement in 2012, and the Interbull Centre is once again contracted to be the operational unit. Management of the finances will follow a different model than Interbull, being under the responsibility of Service ICAR instead of the Interbull Centre. Service fees are therefore not defined/handled by the Interbull Centre, which instead invoices Service ICAR for the full year for a value agreed on €100 000 for 2012 and 2013. For this reason, the Interbeef income is included in the overall budget of the Interbull Centre. A detailed budget justifying the costs with the services is presented on Appendix III.

PERSONNEL

The Interbull Centre staff is employed by the Department of Animal Breeding and Genetics of the Swedish University of Agricultural Sciences (SLU) even though the work plans and budgets for the Centre and the Interbull Secretariat require the approval of the Interbull Steering Committee, the Interbeef working group and the European Commission.

The staff employed at the Interbull Centre during the period reported herein consisted of:

- Erling Strandberg (PhD) - Interbull Secretary
- João Dürr (PhD) - Director
- Jette Jakobsen (PhD) - Senior Scientist
- Hossein Jorjani (PhD)- Senior Scientist
- Eva Hjerpe (MSc) - Scientist
- Valentina Palucci (MSc) - Scientist
- Carl Wasserman- Data Base Administrator
- Flavio Forabosco (PhD) - Scientist (until January 2012)
- Anne Loberg (MSc) - PhD student (dedication of 80%)
- Dan Englund, System Administrator (dedication of 35%)
- Monica Jansson, Secretary (dedication of 10%)
- Gerald Jansen (PhD) - consultant
- Fernanda Amaral (MSc) - trainee

During the 2011 Interbull Meeting in Stavanger, Norway, Jan Philipsson left his position as Interbull Secretary, which he held since 1983, and Erling Strandberg occupies the Secretariat ever since. There are no words capable of describing Jan's contribution to Interbull and to the Interbull Centre without leaving something behind. Therefore, the Interbull Centre simply declares its gratitude for Jan, wishing him all the best in his future challenges. At the same time, Erling is very welcome on board!
Anne Loberg's project is on "Nature of genetic correlations", under the supervision of Hossein Jorjani. Anne has been working 80% of full time as PhD student and 50% of her salary is covered by the Interbull Centre – she is in maternity leave since April 2012. Flavio Forabosco left the Interbull Centre in February 2012 to be fully dedicated to academic activities in the Department of Animal Breeding and Genetics of SLU. The Interbull Centre team is grateful for his dedication over several years and wishes him success in his new activities. Dr. Mohammad Nilforooshan was selected among a good number of applicants to replace Flavio and will start working for Interbull in June 2012. Mohammad completed his PhD at SLU in May 2011 and has had a Post-Doctoral position at the Department of Statistics, University of Nebraska-Lincoln, USA. A very positive addition to the team has been Fernanda Amaral, who started as a trainee in January 2012, for a period of six months. Fernanda has been working hard to improve the communication of the centre, from reorganizing the webpage to the implementation of the new online Interbull Bulletin.

The Interbull Centre signed a new two-year research agreement with Service ICAR to streamline the service operations and develop the Interbull data base, and Dr. Gerald Jansen, from Italy, acts now as a full time consultant in the project, performing software development and system optimization at the Interbull Centre. Dr. Jansen has worked on streamlining the MACE evaluations, development of the sire-dam pedigree in MACE programs and currently the project leader of the Interbull data base development.

Thierry Pabiou has successfully defended his PhD thesis "Genetics of carcass composition in Irish cattle exploiting carcass video image analysis" at the Department of Animal Breeding and Genetics of SLU in January 24, 2012.

Three MSc students have been working under the supervision of Interbull Centre staff during this period: Hanna Johansson, working on"Genotype by environment interactions of claw health in Swedish dairy cattle in tie stalls and loose housing", under the supervision of Jette Jakobsen; Ebba Ansin, working on "Epigenetic studies of the ageing process" and Stina Burri, working on "The role of disease resistance or disease tolerance in breeding", both under the supervision of Hossein Jorjani.

SERVICE AND OPERATIONS

MACE Evaluations

Interbull test evaluation runs were performed in September 2011 and January 2012. Many changes in national and international evaluations have been introduced during this period, and are all described in the service reports published on www.interbull.org after each routine evaluation. Table 1 shows the current number of populations and bulls included in Interbull evaluations.

Starting in the December 2011 run the pedigree source for the MACE evaluations has solely been from the Interbull Pedigree Database and no pedigree has been formed from the information in the 010-files.

The Interbull Community has decided to introduce a new MACE model including relationships on bull dams in the April 2012 official run. The background for the change is to move genetic groups further away from animals with data in order for them to have less impact on the proofs. The consequences are changes in proofs especially for bulls with no progeny test in their own country and an average increase in MACE reliabilities. The main reason for changes in proofs for this group of bulls is that the parent average of the bull is computed differently for sire-dam (SD)-MACE compared to the sire-maternal-grandsire(S-MGS)-MACE model due to the change in pedigree structure. This due to the fact that the bull dam in the SD-MACE model gets a breeding value based on the relatives she has in the system. A national breeding value of the bull dam is not included in the MACE model. The breeding value of the dam is therefore only influenced by the performance of her relatives in the MACE system. A very positive performance of a dam, solely based on her relatives, will give a boost to a parent average of a bull compared to the parent average he had in the S-MGS system. A change in the parent average of a bull will therefore impact his converted proofs to other country scales and is the main cause of changes between systems. The usage of the sire-dam pedigree gives the MACE system more information on the genetic background of a bull. In case a dam has several sons tested in several countries, better links between countries are created.

Along with the change of evaluation workflow, the complete system has been streamlined and prepared for a future use of proofs and parameters uploaded to the Interbull database. Also, the new system is no longer using the submitted standardization factors but does an internal standardization based on the raw mean and standard deviations in the edited proof files. The solver that has been in use so far has been using direct inversion. However, the dramatic increase in the size of the MME caused by including females in the evaluation rendered the use of direct inversion for the evaluation of Holsteins infeasible. The solver has therefore been replaced by an iterative solver using PCG. Both correlation estimation and breeding value predictions are now moved from a 32-bit server to a 64-bit server and also the Fortran compiler has changed from Absoft to Gfortran.

Routine international genetic evaluations for Brown Swiss, Guernsey, Holstein, Jersey, Red Dairy Cattle and Simmental production traits were computed as scheduled in December 2011 and April 2012. The Republic of Korea joined the evaluation for Holstein from December 2011.

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. As they previously had a joint evaluation for Holstein, Great Britain and Ireland introduced separate evaluations in April 2012.

Udder health evaluations for Brown Swiss, Guernsey, Holstein, Jersey, Red Dairy Cattle and Simmental were also computed according to the same schedule as production traits. France participated with clinical mastitis data for Holstein for the first time in December 2011.

Direct Longevity evaluations for Brown Swiss, Guernsey, Holstein, Jersey, Red Dairy Cattle and Simmental were computed according to the same schedule as for production traits. In December 2011, the Netherlands participated for the first time in the evaluations for Red Dairy Cattle. In April 2012, South Africa participated for the first time for Jersey.

Calving traits evaluations for Brown Swiss, Holstein and Red Dairy cattle were computed according to the same schedule as for production traits. In December 2011, the Netherlands submitted direct calving ease data for the first time for Red Dairy Cattle. Germany participated for the first time in April 2012 for both Holstein and Red Dairy Cattle.

Female fertility evaluations for Brown Swiss, Guernsey, Jersey, Holstein, and Red Dairy Cattle were computed according to the same schedule as for production traits. December 2011: France participated in the evaluation for traits T1-T4 for the first time for Red Holstein and Brown Swiss; the Netherlands joined the evaluation for Red Dairy Cattle; Czech Republic decided to terminate their participation in international genetic evaluations for Simmental and the international evaluations for Simmental female fertility were discontinued for lack of sufficient participants.

International genetic evaluations for workability for Brown Swiss, Holstein, Jersey and Red Dairy Cattle were computed according to the same schedule as for production traits.

Table 1 - Total number of populations per breed-trait group combination in the most recent (April 2012) routine Interbull genetic evaluation services. The number of traits by trait group is given in parenthesis. Number of bulls with published MACE EBVs for production traits is shown in the last column.

Breed Group	Production (3)	Conformation (23)	Udder Health (2)	Longevity (1)	Calving (4)	Female Fertility (5)	Workability (2)	**TOTAL (40)**	**Number of published proofs (production)**
Brown Swiss	10	7	9	9	5	8	5	**53**	9232
Guernsey	6	4	5	5	0	4	0	**24**	1022
Holstein	29	22	27	18	14	18	6	**135**	125512
Jersey	11	9	8	8	3	7	3	**49**	10167
Red Dairy Cattle	14	8	13	8	5	9	4	**61**	13291
Simmental	11	0	9	3	0	0	0	**23**	25677
TOTAL	**81**	**50**	**71**	**51**	**27**	**47**	**18**	**345**	**184901**

Validation of Genomic EBVs

The GEBV validation test has been carried out according to the established calendar (Table 2) and results are published in the Interbull web page.

Following decision by the ICAR board, all countries that want to validate national GEBVs needed to participate in the GEBV validation test starting on April 12, 2012, for all production traits (milk, fat and protein yields). In the previous tests the official validation was applied only to protein yield.

Table 2. The GEBV validation test calendar, from the beginning:

YEAR	DATA SUBMISSION	RESULTS RELEASE
2010	July 12	August 9
2010	November 2	November 30
2011	May 9	June 6
2011	July 4	August 1
2011	October 31	November 28
2012	January 23	February 13
2012	April 12	May 7
2012	July 16	August 6
2012	October 29	November 19

Intergenomics

Intergenomics is the acronym chosen for the multi-country genomic evaluations developed at the Interbull Centre for six populations of Brown Swiss cattle. All countries benefit from a common reference population of genotyped bulls and a standard genomic BLUP methodology which uses de-

regressed MACE EBVs as phenotypic values. The development phase of the project ended in August 2011 and the first official genomic evaluation was carried out in December 2011. Intergenomics evaluations follow the same calendar as conventional MACE evaluations.

DB Project: IDEA - Interbull Data Exchange Area

During early autumn 2011, a thorough assessment of the current pedigree module (developed by the IT department of SLU) was undertaken by Carl Wasserman and Gerald Jansen. A decision was made to proceed with a substantial restructuring of the DB tables/views/procedures and a complete rewrite of the web interface (i.e. the restricted area of Interbull web site) in order to achieve improvements in data integrity and efficiency of data uploads, queries and extractions, as well as to develop a cleaner and more compact code base that would be easier to maintain and extend in the future. These goals were addressed by better use of Postgresql features to ensure data integrity, by implementation of bulk loading (as opposed to current record by record uploading) and through the choice of a full-fledged web application framework, namely Web2py for the web component. The restructuring and data migration scripts have been completed and tested by comparing extracted pedigree files from the two systems. The programming for the new web interface is also essentially complete and is currently undergoing thorough testing by Interbull staff.

As part of the rewrite of the pedigree module several improvements in functionality have been introduced. These include 1) multiple logins per member organization, so users can track who uploaded which data more precisely, 2) relaxed business rules which allow users to modify/correct data they have submitted on foreign animals up to the time the definitive pedigree data is uploaded by the authoritative organization, 3) a re-worked handling of invalid animal IDs (current "limbo") and aliases and national IDs, 4) estimation of missing birth dates at loading instead of at extraction so the estimated values are available on-line, and 5) improvements in the on-line animal query with better signaling of conflicts in birth dates and better integration with the handling of potential duplicate animals.

During the re-development of the pedigree module, the EBV module has essentially been on hold. The revised file format for uploading national evaluations has been finalized and a downloadable program is available for users to test the formal correctness of their files.

Progress has been made on the web user interface but the software is not yet ready for user testing. Development of the EBV module will proceed in the coming months as work on the pedigree module is completed.

Considerable progress has instead been made on modules aimed at delivering two new services very quickly. The first is a module for exchange of genotyped animal lists, the GenoList module. A preliminary file format (733) has been developed and distributed to participants of the Robust GMACE pilot project (for Holsteins). Together with data derived from the Intergenomics project in Brown Swiss, these data will provide a test-bed for the GenoList DB. A prototype web interface, fully integrated with the new pedigree module, has been developed and used internally to load the 733 data files from these two projects. Data access will initially be restricted to national genetic evaluation centers providing data to these two projects. A prototype for generalized extraction of lists of animals genotyped by different SNP chips is currently at the stage of preliminary testing.

A simple proposal to handle additional animal information has been developed and will form the basis of the AnimInfo DB module. The data model basically consists of 4 elements, the animal ID, an information type code, the information value, and the contributing organization. This general structure would allow users to exchange information on single genes (coat color, kappa casein, recessives such as BLAD, CVM etc.), additional animal identifiers (eg. semen codes or RFIDs, short names, etc.), country of progeny test for AI bulls and potentially numerous other pieces of additional information.

Based on cumulative development experience with the pedigree and GenoList modules, this module could be ready for service delivery in a very short time frame after release of the new pedigree module.

Quality assurance

In June 2011 Interbull Centre has started working towards achieving ISO 9001 certification. Necessary documentation has been prepared together with a consultant from QP Projects, from Stockholm. A quality manual describing the processes regulating the current services offered by the Centre, at the moment conventional MACE and Intergenomics, has been prepared. A first internal auditing was carried on March 9th, which outlined few non-conformities according to the quality manual. A new management review followed by a new internal auditing is scheduled for the late summer/fall. The expectation is for the Centre to have a first external auditing by the end of the year.

Interbull Bulletin

Recently the Interbull Bulletin has moved its online publication onto the Open Journal System platform (http://www-interbull.slu.se/ojs/). The Open Journal System is a journal management tool created with the aim of not only increasing access to research but also improving the scholarly and public quality of research. The Open Journal System was developed by the Public Knowledge Project and operates through a partnership between several universities and libraries (http://pkp.sfu.ca/?q=ojs).

Using the Open Journal System, the process of receiving, editing and publishing papers has become much more efficient and straight forward. Authors submit their manuscripts online directly via the Interbull Bulletin website (http://www-interbull.slu.se/ojs/) where it can then be edited and published within days. This will vastly decrease the amount of time between a paper being presented and then published. The Interbull Bulletin will, however, still be published in print form as well as online.

All past issues of the Interbull Bulletin are now available, covering a period of over 25 years. The launch of the new online platform also coincided with two new issues being published, Proceedings from the Technical Workshop in Guelph (Bulletin 43) and the Interbull Meeting in Stavanger (Bulletin 44). Papers submitted in conjunction with the Interbull Meeting in Verona this year are also being published online as they are submitted by authors in Bulletin 45.

The Open Journal System also allows for the development of the journal in the future, with the addition of new sections or implementation of different review policies can be easily done using the new system.

Meetings

2011 Interbull Meeting, August 26 to 28, 2011

The 2011 Interbull meeting took place at the Radisson Blu Atlantic Hotel, in Stavanger, Norway. A total of 52 scientific reports were presented in the Open Meeting, which represents one of the largest numbers ever in Interbull meetings. Part of the increase was due to the sessions dedicated to reports from the Robust Milk project, which dealt especially with genetics of functional traits in dairy cattle. The 2011 Interbull Meeting was particularly special because it was dedicated to show gratitude for the immensurable contributions of two colleagues: Jan Philipsson, who left the position of Interbull Secretary that he occupied since 1983, and Larry Schaeffer, who developed methods extremely important for Interbull, particularly MACE, which is used in the Interbull international comparisons. Larry was a member of the Interbull Scientific Advisory Committee. The Stavanger meeting was also the last one for Hans Wilmink as a member of the SC and chairman of the ITC since its creation. Hans was replaced in the SC by Andrew Cromie, from Ireland, and Gert Aamand Pedersen serves now as the ITC chair. As usual, two business meetings took place and the Interbull permanent committees (ITC, SAC and SC) had also working meetings during this period. On August 29, Interbull and EAAP organized two joint sessions: “Methodological developments in genomic selection”, jointly with the EAAP Animal Genetic Resources working group (12 presentations and 4 posters), and “Genomic selection - application, ownership, and economics in dairy cattle”, jointly with the EAAP Cattle Commission (8 presentations).

Interbull Technical Workshop, February 2 and 3, 2012

A total of 79 representatives from 25 countries gathered at the Centro Congressi Europa - Veronafiere, in Verona, Italy, to discuss the methods for international comparisons of genomic evaluations, as well as the logistics of the collaboration hosted by Interbull around this topic. The first day of the workshop focused on two main themes, international genomic evaluations and validation of genomically enhanced breeding values (GEBVs). Different approaches were combined to address the topic, including technical reports from the scientists working on method development, country reports on pilot results, a round table and thematic discussion groups. The overall result was a rich debate and fruitful exchange of suggestions and recommendations for the Interbull Steering Committee (SC). The second day brought up other important issues related to genomics, such as usage of SNPs for parentage verification, use of low and high density SNP chips, dealing with pre-selection bias and genomic reliabilities. The final session was dedicated to understand the changes expected from the introduction of a sire-dam pedigree structure in the computation of MACE EBVs. As usual in Interbull events, both the Interbull Technical Committee (ITC) and the Interbull Steering Committee (SC) had their ordinary meetings before and after the workshop.

Interbeef Working Group Meeting

The Interbeef working group met in January 12, 2012, at the Radisson Blu Hotel, Stansted, UK. A new service agreement was signed by ICAR, the Interbull Centre and the participating organizations (Table 3) and the meeting was dedicated to clarify administrative matters and also to detail a working plan for both services and research and development. The first step has been completed, which was the uploading of all pedigrees for beef populations (Charolais, Limousin and crosses) into the Interbull Centre pedigree data base, and the first data call for phenotypic data (adjusted weaning weight) will be launched during the ICAR meeting in Cork.

Table 3 – Organizations participating in Interbeef evaluations (May 2012).

Organization	Country
Czech Moravian Breeders´ Corporation, Inc.	Czech Republic
Knowledge Center for Agriculture	Denmark
Faba Coop.	Finland
France Génétique Elevage	France
Edinburgh Genetic Evaluation Service of Scottish Agricultural College	Great Britain
Irish Cattle Breeding Federation Society Limited	Ireland
Agricultural Research Council	South Africa
Federación Española de Criadores de Limusin	Spain
Swedish Dairy Association	Sweden

Information activities

The Interbull Centre, following recommendation of the Interbull Steering Committee, carried out an online survey on Interbull conversion equations. Results will be presented on the 2012 Interbull business meeting in Cork, Ireland.

The Interbull website has been routinely updated with service information, Interbull events details, institutional facts and news. There are more than 1200 subscribers to the Interbull newsletter who receive regular updates by email. The page layout is currently being evaluated and a major restructuring is going to take place in the second half of 2012. The main goal is to improve clarity and facilitate consultation by the users.

The Interbull Centre director, João Dürr, visited Taiwan in October 2011, to discuss the plans of the local organizations to join Interbull evaluations. João also participated as invited speaker in a seminar on “Genetic Potential of Dairy Cattle” organized at the National Pingtung University of Science and Technology.

In the end of November and beginning of December 2011, João Dürr travelled to South America for a series of meetings: in Montevideo, Uruguay, meetings were arranged with different dairy organizations to discuss the participation of the Uruguayan Holstein breed in the Interbull September 2012 test run; talks with representatives of an Uruguayan beef association about Interbeef took place as well; also in Montevideo, a meeting with representatives of the Argentinean Holstein breed settled their intention to join Interbull evaluations in the September 2012; finally, João Dürr participated as invited speaker in the FAO-ICAR-Fepale Workshop on “Animal identification and recording systems for traceability and livestock development in countries of Latin America and the Caribbean", which took place in Santiago, Chile.

Hossein Jorjani, participated in the 2011 Workshop of EU-US Animal Biotechnology Working Group held in November 8-10 in Beltsville, USA. The workshop report is under final preparations. In conjunction with this workshop, Hossein Jorjani also visited AIPL, USDA, and discussed service and research topics of mutual interest.

Jette Jakobsen gave a lecture with the title “International Genetic Comparison of Dairy Bulls” in April 15, 2012, in the post graduate course “Improvement of dairy cattle in the era of genomic selection” held at Poznan University, Poland.

RESEARCH AND DEVELOPMENT

The following is a brief summary of research and development activities conducted at the Interbull Centre or with the involvement of the Interbull Centre staff since August 2011.

MS-trend validation

New research collaboration between the Interbull Centre, MTT and NAV has been established to address three main targets: development of a model validation test for routine use based on Mendelian sampling deviations; further development of the methodology and software for the implementation of MT-MACE evaluations; and optimization of computational implementations of international evaluation models at ITBC. Anna-Maria Tyrisevä presented the first results of the MS-trend validation project in Stavanger and will be presenting new results and recommendations at the Interbull Open Meeting in Cork. The proposal is to have a procedure ready for testing in 2012.

MACE for bulls with genomically enhanced breeding values

Research on genomic MACE (GMACE) has continued during the year. The focus in the research has been following the approach of genomic evaluation of young bulls as presented during the Interbull meeting in Stavanger, August 26-29, 2011. The results presented at the Stavanger meeting showed large variation among countries and traits in the ratios of genomic sire standard deviation to traditional sire standard deviation (SD-ratio). The hypothesis was that this could be resolved by a new data call with the requirement of submission of all genotyped bulls. Eleven different Holstein populations participated in the pilot run and results were presented during the Verona workshop February 2-3, 2012. The new data call did not resolve all cases of unexpected variance ratios and the GMACE model (GM_ms(v)) was further fine-tuned to include robust constrains on variances (rGM_ms(v)). Model validation showed that the rGM_ms(v) model out-performed the GM_ms(v) model. New technical issues that needed further attention were raised during the workshop and among these the sharing parameter (Cij). This parameter has been set to 100% among countries with shared reference populations and to 25% for countries without shared reference population. It was decided that this parameter should be computed from the data and a data call for a GenoList (file 733) indicating all bulls used in the reference population was sent to all countries participating in the pilot. Some statistics computed from the GenoList files will be presented during the Interbull BS meeting in Cork. The active co-operation of Pete Sullivan in the project is greatly appreciated.

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).

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

INTERBULL PUBLICATIONS/PRESENTATIONS

Interbull Bulletin No. 43. Proceedings from the Interbull Technical Workshop, Guelph, Canada, February 27-28, 2011.

Interbull Bulletin No. 44. Proceedings from the 2011 Interbull Meeting, Stavanger, Norway, August 26-28, 2010.

Interbull Bulletin No. 45. Proceedings of the Interbull technical workshop, Verona, Italy, February 2-3 2012

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WORKPLANS

Services

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

2012 August 14
December 4
2013 April 9*
August 13
December 3

*Moved due to the Easter holidays

Test evaluation runs for production, conformation and udder health, longevity, calving, female fertility and workability traits take place as follows:

2012 September
2013 January
September
2014 January
September

Research and Development

Table 3 - Summary of current and planned research and development activities at the Interbull Centre.

Project	Current Stage
Interbull Centre Database	Ongoing, partially implemented
MS-trend validation	Results to be presented in Cork
Robust GMACE	Partial results to be presented in Cork
Truncated MACE	Business plan to be presented in Cork
Genomic data repository	Business plan to be presented in Cork
Change in left censoring of data for MACE	January 2013 test run
Nature of genetic correlations	Anne's Loberg PhD thesis, ongoing

Meetings

The 2012 Interbull Meeting, in conjunction with the 38th ICAR Session. Cork, Ireland, May 28 to June 1st, 2012.

The 2013 Interbull meeting, in conjunction with the 64th Annual EAAP Meeting in Nantes, France, August 23-25, 2013.

The 2014 Interbull Meeting, in conjunction with the 39th ICAR Session and the IDF/ISO Analytical Week. Berlin, Germany, May 20 to 21, 2014.

Planned Publications

Interbull Bulletin No. 45. Proceedings of the 2012 Interbull Technical Workshop, Verona, Italy, February 2-3, 2012.

Interbull Bulletin No. 46. Proceedings of the Interbull Open Meeting, Cork, Ireland, May 28 to June 1st, 2012.

Appendix I

INTERBULL CENTRE FINANCES AND BUDGETS, May 2012

Comments to accounts and budgets

The financial situation of the Interbull Centre is presented in Appendix II. For 2010 and the budget for 2011, the presentation is according to the same format as approved in previous years. For actual account for 2011, and for the budgets for 2012 and 2013, extra items were included to make the table more informative. The office rent costs (item 10) were separated from OH (item 18), as well as other personnel expenses (item 9). As discussed at the Stavanger Steering Committee meeting, the overhead costs are no longer based on all costs (including outsourced activities) but are instead presented as they are charged within SLU, i.e., by an add-on of 15%, 5% and 13% for the university, faculty and department levels, respectively. These percentages are multiplied by the total salary cost in item 8.

The accounts have been audited within the normal procedures for the Swedish University of Agricultural Sciences (SLU). All figures are given in Euros. The table includes the final accounts for 2011 in comparison with the accounts for 2010 and the budget for 2012. A prognosis for 2013 is made according to the expectations as of May 2012.

Accounts for 2011

The result for 2011 showed a deficit of € 191,930 instead of the budgeted deficit of 42,000 (item 20). The total income increased compared with budget mainly owing to an increase in service fees due to higher participation rate (two more countries added (Portugal, since April 2011 and Republic of Korea, since December 2011) and some countries added traits). In detail the service fees per trait group were as follows (with figures for 2010 within parenthesis):

Production € 340,685 (324,950), conformation € 89,175 (86,249), udder health € 50,117 (43,560), longevity € 38,571 (37,057), calving traits € 29,015 (28,957), female fertility € 52,758 (49,247) and workability traits € 6,494 (6,461), adding up to € 606,815[2]. In total 31 countries participate in the Interbull evaluations. The total service fees increased in 2011 (€607,138) compared to 2010 (€576,481) despite fewer recorded cows and that the fees are dependent on these numbers. The EU commission has continued its support of the Interbull Centre with € 150 000, as well as the World Guernsey Cattle Federation with £5000. The income from Intergenomics was not received during 2011, but has come during 2012.

Research grants, however, were not at the budgeted level but only about half. Owing to a new internal resource allocation system within SLU and the department, based on publications, PhDs produced and attracted external research funding, the allocation from SLU decreased. Compared with other pure research sections within the department, ITBC has lower performance on these indicators, as expected. However, the department is strongly encouraged to use the same allocation

[2] This total was obtained by summing up the nominal values printed in the service invoices, while the item 1 in Appendix II (Service fees) is the result applying the currency exchange rate SEK:€ of December 31, 2011 to the actual value of payments received in SLU's official accounts. This is the explanation for the difference of € 323.

indicators within the department as the faculty does for allocation to departments. The World Guernsey Cattle Federation (WGCF) has continued its valuable support.

Total costs were higher than budgeted. To a large extent this was due to higher personnel costs than budgeted. There was no income for the Interbeef project during 2011 and ITBC personnel thus had to be fully charged to the Interbull (dairy) budget. From 2011 onwards, the financial reports and budgets have the office rent costs (item 10) separated from the overhead costs (OH, item 18), to make the description clearer. As requested at the Stavanger Steering Committee meeting, the overhead costs are now presented as they are charged within SLU, i.e., by an add-on of 15%, 5% and 13% for the university, faculty and department levels, respectively. These percentages are multiplied by the total salary cost in item 8. Outsourced activities are no longer used when calculating OH. Outsourced activities included computation of MACE for conformation traits by the North-American consortium, Gerald Jansen's consultancy, QP Projects AB consultancy on quality management and data base development services by the SLU IT department. ICAR has taken some costs for publication according to earlier commitment, approximately of the same size as the fee to ICAR. Interbull membership fees to ICAR are handled directly by the ICAR office, Rome, Italy, and reported at the official meetings of ICAR. Membership income is used to cover overhead costs for ICAR/Interbull, some travel expenses, publications and information. The Interbull Centre also contributed € 6,934 in 2011 from service fees to cover these costs.

Prognosis for 2012

For 2012 (projected in May 2012) the financial prognosis indicates a positive result of about € 62 000, which is less than expected in August 2011. The incomes are more or less as expected; there was a lower service fee income because fees were not increased as much as was assumed when the budget was first presented. On the other hand, 2011 and 2012 payments for the Intergenomics projects are both under 2012, due to late invoicing. The EU commission continues its support of the Interbull Centre with € 150 000. In the case of SLU's financial support to the Interbull Centre, is has been agreed with the Dean of the Faculty of Veterinary Medicine and Animal Science that from 2012 onwards an "ear-marked" value of SEK 600 000 is guaranteed, which is the average value practiced before 2011. Furthermore, from 2012 onwards, the Department of Animal Breeding and Genetics is taking over financial responsibility for one former Interbull Centre researcher, one researcher/PhD-student is on parental leave and a new PhD scientist has been recruited to start in June (about 7 months cost).

For 2012 a new fee structure accommodating for validations and evaluations including genomic information was initiated.

Service fees per trait group for 2012 are expected as follows: Production traits €367,267, conformation €92,678, udder health €52,618, longevity €52,618, calving traits €31,415, female fertility €54,494, workability traits €7,044 and the GEBV validation test €49,830. In total 31 countries participate in the Interbull evaluations during 2012 and the total service fees are expected to € 695 068.

Budget for 2013

For 2013, there is a good perspective of having two more countries participating on the MACE evaluations (Argentina and Uruguay) and this would increase the service fee income accordingly. All other incomes are assumed to stay the same as in 2012. The salary costs are higher than for 2012

because of regular salary increases, the full cost of the new PhD scientist and the return of the PhD student from maternity leave (50%). The level of the EU contribution is expected to continue, as well as the continued support by SLU, WGCF and Intergenomics.

All costs are assumed to follow the same pattern as in 2012.

Interbeef

The specific budget for Interbeef is shown on Appendix III. The initial pilot project period started June 2007 and ended May 2010. At the end of the project there was an accumulated deficit of 37,793€. This deficit was picked up by SLU in a revised budget for 2010, assuming a two year prolongation of the project with full cost financing by the ICAR customers (100,000€ per year for 2011 and 2012). This was delayed but for 2012 there is an expected income of 100,000€ for Interbeef, since the Interbeef working group has established a new service/research agreement in 2012, and the Interbull Centre is once again contracted to be the operational unit. Management of the finances will follow a different model than Interbull, being under the responsibility of Service ICAR instead of the Interbull Centre. Service fees are therefore not defined/handled by the Interbull Centre, which instead invoices Service ICAR for the full year for a value agreed on €100 000 for 2012 and 2013. For this reason, the Interbeef income and costs are included in the overall budget of the Interbull Centre.

Among the costs related to the Interbeef operation (Appendix III) salaries are estimated as being 20% of the center's director salary and 30% of two scientists from the service team, which are directly involved with data reception, programming, genetic evaluations and data preparation for research partners. The other costs are either a function of the salaries or a proportion of the total budget.

Appendix II

Interbull Centre Finances and Budgets (€), May 2012

Exchange rate SEK:€ in Dec. 2010 was 9.57:1, in Dec. 2011 8.91:1, and in May 2012 it is 9.03:1.

		2010	2011		2012		2013
		Actual account	Budget (May 2010)	Actual Account	Budget (August 2011)	Projected result (May 2012)	Proposed budget
	Income						
1)	Service fees[a]	576 481	550 000	607 138	738 085	695 068	715 193
2)	SLU grants	63 604	64 200	33 305	60 250	66 445	66 445
3)	WGCF grant[b]	8 349	5 800	6 091	5 750	5 750	5 750
4)	Intergenomics[c]	17 500	0	0	30 000	60 000	30 000
5)	EU grants[d]	151 000	151 000	150 000	150 000	150 000	150 000
6)	Interbeef		0	0	100 000	100 000	100 000
7)	**Total:**	**816 934**	**771 000**	**796 534**	**1 084 085**	**1 077 263**	**1 067 388**
	Costs						
8)	Salaries + social costs	416 711	428 000	511 731	556 000	512 053	568 332
9)	Other personnel expenses[e]			26 611		25 603	28 417
10)	Office rent			76 769		76 808	85 250
11)	Computer costs	46 981	55 000	3 556	55 000	55 000	55 000
12)	Travels, conferences, training	37 543	55 000	33 573	40 000	40 000	40 000
13)	Publications	803	7 000	5 330[f]	3 000	3 000	3 000
14)	Phone, fax, post	3 253	8 000	4 580	5 000	5 000	5 000
15)	ICAR	6 930	7 000	6 934	6 930	6 930	6 930
16)	Miscellaneous	14 180	10 000	16 043	10 000	10 000	10 000
17)	Outsourced activities[g]	129 104	81 000	134 466	103 000	111 350	111 350
18)	Overheads[h]	152 556	162 000	168 871	195 000	168 978	187 549
19)	**Total:**	**808 061**	**813 000**	**988 464**	**973 930**	**1 014 721**	**1 100 827**
20)	*Balance*	*8 873*	*-42 000*	*-191 930*	*110 155*	*62 542*	*-33 439*
21)	*Accum. Balance:*	*149 873*	*107 873*	*-42 057*	*68 098*	*20 485*	*-12 955*

a. 2010 and 2011: basic fee of €3000 + MACE related fees; 2012 and 2013: basic fee of €4000 + MACE related fees + GEBV test fees

b. £5000

c. 2011 fees were invoiced in 2012

d. The Interbull Centre holds the status of European Union Reference Laboratory for Zootechnics (96/463/EC: Council Decision of 23 July 1996)

e. Other personnel expenses include travel allowances, expenses with people not employed by SLU, medical expenses, etc.

f. ICAR has taken a further cost of € 2522.

g. Gerald Jansen's consultancy, QP Projects AB, MTT/Agrifood Research Finland, SLU IT Department and Holstein Association USA

h. 15%, 5% and 13% (multiplied by item 8) for the university, faculty and department levels, respectively

Appendix III

Interbeef Budgets (€), May 2012

These budgets are extracted from the overall budget for the Interbull Centre (Appendix III) to illustrate to the Interbeef service users how the incoming service fees will be spent.

		2012 Budget €	2013 Budget €
	Income		
1)	Service fees	100 000	100 000
2)	**Total:**	**100 000**	**100 000**
	Costs		
3)	Salaries + social costs[a]	58 439	61 017
4)	Other personnel expenses[b]	2 922	3 051
5)	Rents[c]	8 766	9 152
6)	Computer costs[d]	5 500	5 500
7)	Travels, conferences, training[d]	4 000	4 000
8)	Publications[d]	300	300
9)	Phone, fax, post[d]	500	500
10)	Miscelaneous[d]	1 000	1 000
11)	Overheads[e]	19 285	20 135
12)	**Total:**	**100 712**	**104 655**
13)	**Balance:**	**-712**	**-4 655**

a. 20% manager + 30% scientist 1 + 30% scientist 2
b. 5% of salaries
c. 15% of salaries
d. 10% of total budget
e. 33% of salaries