

INTERBULL Centre

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INTERBULL is a sub-committee of the
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Interbull Centre Activity Report 2006/2007¹

INTRODUCTION

After the recent additions of longevity in 2004 and calving traits in 2005, the first routine evaluation for female fertility took place in 2007. Together with the other trait groups (production, conformation and udder health), international genetic evaluations are now available for the economically most important traits. It is up to breeding organizations to make good use of these evaluations, combining them in total merit indices that reflect the economic situation in each country and publishing results for all bulls to the end users! Female fertility is a complex trait, both in terms of its biology and when it comes to data recording, why discussions and research has continued after it has been added to the service portfolio. Besides expanding the activities, efforts are also directed towards improvements of ongoing activities. Implementation of incorporating bulldam pedigree in MACE has been started, and research on novel approaches for estimation genetic correlations is continued. It is also rewarding to observe that since the workshop in Wageningen an increasing number of countries provide results of verification of the national genetic evaluation results when submitting data, increasing the quality of Interbull evaluations!

This document describes the activities at the Interbull Centre since the last annual meeting of Interbull (June 4-6, 2006, Kuopio, Finland). Workplans 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 23, 2007. The result for 2006 was positive and better than the budget. For 2007 (revised according to the actual situation) the prognosis shows a deficit, mainly due to the planned use of reservations from 2005 and 2006 for the creation of a junior scientist position and a two-year research agreement with MTT in Finland. The budget for 2008 shows a deficit for the same reason, whereas the budget for 2009 is in balance.

The service fees for 2007 – 2009 were computed according to the current fee structure. The level of service fees has not changed since 1999 and no change in service fee is proposed for 2008. The EU commission has continued their support of the Interbull Centre. For 2006 the contribution was equal to €65,000, and an increase to €80,000 has been decided for 2007. Starting 2007, Interbull Centre leads the development of a system for routine international genetic evaluations of beef breeds and traits (Interbeef). Funding has been secured for three years, and amounts to €80,000 per year.

Interbull membership fees are handled directly by the ICAR office, Rome, Italy, and reported at the official meetings of ICAR. For 2006 the membership income of Interbull amounted to €48,953, and the amount of €49,614 is anticipated for 2007. Membership income is used to cover overhead costs for ICAR/Interbull, some travel expenses, publications and information. The Interbull Centre also contributes €6,930 from service fees to cover these costs.

¹ Presented at the 2007 Interbull Meeting, Dublin, Ireland, August 23-25, 2007

PERSONNEL

Valentina Palucci started at the Interbull Centre in March 2007 for a period of three years. The position was financed by the Interbeef project. Valentina completed her MSc in animal breeding and genetics at the Centre for Genetic Improvement of Livestock (CGIL) at the University of Guelph in Canada, in November 2005. From January 2006 to February 2007 she worked for CGIL and Beef Improvement Ontario on a project about genetic improvement of maternally influenced traits in sheep. Valentina will work 50% for the Interbeef project and 50% for the dairy international evaluation service. **Flavio Forabosco** will also work 50% for the Interbeef project and function as project leader.

Anne Torsell completed a MSc thesis entitled “Prospects of performing multiple-country comparison of dairy sires for countries not participating in Interbull international genetic evaluations”. Anne is since March 2007 part of the Interbull Centre staff on funds initially allocated for a 1½-2 year post-doc position and will start a PhD on international evaluations for female fertility. In addition Anne will provide support to delivery of Interbull services.

Maria del Pilar Schneider, worked for six months at the Interbull Centre. Her post-doc position was financed by the part-time leaves of Hossein Jorjani and Freddy Fikse in 2006. Topic of Pilar’s research was estimation of genetic correlations using factor analytical approaches.

The complete permanent staff of the Interbull Centre consists of 5.1 scientists, 0.5 programmers and 0.4 secretaries. Temporary staff amounts to approximately two full-time equivalents.

Giovanni Capuzzello (Perugia University, Italy) stayed at the Centre in March and April 2007. He has been working on a project studying the ability of Interbull evaluations based on foreign daughters to predict future domestic evaluations.

The Irish Agricultural and Food Development Authority Teagasc approved a four-year fellowship for an Irish-Swedish research project on national and international evaluation of Irish beef cattle. **Thierry Pabiou** has been selected as post-graduate student and will enrol in the PhD program of the Swedish University of Agricultural Sciences (host of the Interbull Centre). Thierry will conduct his studies partly in Ireland (Irish Cattle Breeding Federation, ICBF) and partly in Sweden (Interbull Centre).

Mohammad Ali Nilforooshan is a newly admitted post-graduate student at the department of Animal Breeding and Genetics, Swedish University of Agricultural Sciences. He will be working with the Interbull Centre team on the subject of international genetic evaluation of female fertility traits, using multiple-trait MACE methodology. After obtaining an MSc degree in animal breeding in Iran, Mohammad worked on comparing the impact of domestic and imported semen on milk production traits in Iranian Holstein. Mohammed finances his PhD studies from private funds.

SERVICE AND OPERATION

Routine international genetic evaluations for production traits were computed as scheduled in August and November 2006, and in February, May and August 2007. Test evaluation runs were performed in September 2006 and March 2007. Latvia participated for the first time in the evaluations for Holstein and Red Dairy cattle in May 2007. Many changes in national evaluations have also been introduced during this period, and are all described in the service reports published on www.interbull.org after each routine evaluation.

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.

Udder health evaluations for Brown Swiss, Guernsey, Holstein, Jersey, Red Dairy cattle and Simmental were also computed according to the same schedule. Denmark, Finland and Sweden

participated with Holstein, Jersey and Red Dairy cattle data from a joint evaluation in the November 2006 routine evaluation. A new population in these evaluations was Italy for the Brown Swiss breed.

Longevity evaluations for Brown Swiss, Guernsey, Holstein, Jersey, Red Dairy cattle and Simmental were computed according to the same schedule as for production traits. Hungary participated with Holstein longevity data for the first time in the routine evaluation of November 2006.

Calving trait evaluations for Holstein and Red Dairy cattle were computed according to the same schedule as for production traits. In November 2006, the first routine evaluation for Brown Swiss was conducted, including data from Germany-Austria, Switzerland, The Netherlands and USA. The traits considered were direct and maternal genetic effects for calving performance but not yet stillbirth.

The international genetic evaluation service for female fertility for Holstein was started with the test evaluation in September 2006 and continued with routine evaluation according to the same schedule as for production traits from February 2007. The services comprises of five traits that reflect: ability to conceive (maiden heifers and lactating cows), ability to start cycling (lactating cows) and interval calving-conception. The first routine evaluation included data from 11 populations and since then 3 more have been added.

The total numbers of populations in the most recent (August 2007) routine Interbull genetic evaluation services were as follows:

Breed group	Production	Conformation	Udder health	Longevity	Calving	Female fertility
Brown Swiss	9	7	8	6	4	-
Guernsey	6	4	5	5	-	-
Holstein	25	20	23	19	12	14
Jersey	10	9	8	7	-	-
Red Dairy Cattle	11	8	10	9	5	-
Simmental	10	-	8	2	-	-
Total	71	48	62	48	21	14

Modifications in international evaluation procedures

The breed group formerly referred to as Ayrshire has been renamed to Red Dairy cattle breed group (RDC) since the September 2006 test evaluation.

A modified file format for distribution of international evaluation results for production traits has been used since the test evaluation of March 2007 to include number of herds, daughters, EDC and reliabilities for all three production traits. Pedigree information is no longer in the file with evaluation results for production traits; separate, more complete pedigree files have been provided to countries for a long time already. Several other changes were made in the format for the file with evaluation results for production traits such to have similar formats for all trait groups.

The procedure to obtain conversion coefficients has been modified during the test evaluation of March 2007 such that conversion equations are produced for all traits and country combinations. Theoretical b-values and empirical a-values are computed for those cases (country combinations) that used to be missing (because too few bulls met the original criteria to be included for estimation of conversion equations).

Data quality

A positive outcome from the Interbull Technical workshop in March 2006 (Wageningen, The Netherlands) has been that an increasing number of countries use the Interbull data verification

software before submitting data for routine and test evaluations. Interbull has further developed the software that is available on the web-site of Interbull.

The Interbull Centre has further improved the routines for quality assurance of international evaluation results. International breeding values for all traits and breed groups are verified with a procedure similar to the one applied to national evaluation results. In addition, a list of critical control points in the international evaluation procedure has been compiled and is checked by at least two persons before results are released to participating countries.

Information activities

The web-site of Interbull has been updated at several places. Two Interbull Bulletins, proceedings from the Interbull Open Meeting in Kuopio and the Interbull Technical Workshop in Paris, have been added. Interbull printed two issues of the newsletter, Interbulletin, since last year's Interbull Meeting, and these newsletters are also available on the web-site of Interbull.

After the WCGALP in Brazil Flavio Forabosco and Jette Jakobsen spent several days in Argentina and Brazil to inform about Interbull activities in general and the international genetic evaluation service in particular, and to learn about the organization of dairy cattle breeding in these countries. Closer involvement in Interbull and options for research collaboration were also discussed.

RESEARCH AND DEVELOPMENT

A document listing research priorities in the field of international genetic evaluation, as identified by the Scientific Advisory Committee and endorsed by the Interbull Steering Committee, is available on the web-site of Interbull under "Publications and Documentation | General information". One of the purposes of the document is to list ongoing research projects. 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 2006.

Validation of national evaluations

Estimated sire variances have a large influence on international genetic evaluations. The presence of any trends in genetic variances therefore make international evaluation sensitive to time period of data used for estimation of sire variances. A procedure to validate the trends in genetic variances has been finalized by a working group consisting of Freddy Fikse, Zengting Liu and Pete Sullivan, and a software package has been prepared. Countries participating in the routine international evaluation have been asked to apply the procedure, results of which are under review.

Female pedigree in MACE

A research study comparing the use of sire-dam pedigree in stead of sire-MGS pedigree was completed by NRS in 2005. The research indicated an increase in predictability and a realistic increase in computing time when using sire-dam pedigree in prediction of breeding values and sire-MGS pedigree in estimation of correlations. ITC recommended implementation of this approach, and a full-scale research run for all traits and all breeds was initiated at the Interbull Centre. Countries submitted pedigree information for bulldams in February 2007. The software developed by NRS has been installed and tested on the Interbull computers. The project is ongoing.

Estimation of genetic correlations

Following the successful application of an approximate factor analysis to estimate genetic correlations for production traits, the approach was tested to estimate genetic correlations for conformation traits. Factor analysis is based on the assumption that a limited number of factors (combination of countries) can describe the correlation matrix for all countries. Using actual data (deregressed breeding values) for stature it turned out to be difficult to determine a combination of countries yielding genetic correlations with acceptably small differences in comparison with the classical method of estimating

genetic correlations. Nevertheless, computation of eigenvectors and λ -values of the genetic correlation matrix used in a routine evaluation revealed interesting information about degree of harmonization of the various conformation traits and the countries with deviating trait definitions. The principal investigator of this project was Pilar Schneider. Results of this study will be presented at the 2007 Interbull Meeting and the 58th EAAP meeting in Dublin.

Prediction of international breeding values for missing traits

National genetic evaluation results included in MACE evaluations provide comparisons between all bulls for each country scale, but can also be used to predict breeding values for traits not (yet) included. Examples of the latter are clinical mastitis in the USA or milk yield in Kenya. Genetic correlations between available indicator traits and the missing trait are needed for prediction of breeding values for missing traits. The research focussed on approaches to obtain these genetic correlations using information about climate, production system and national genetic evaluation system, and to assess the sensitivity of bull rankings to the choice of genetic correlations. A manuscript, with clinical mastitis in the USA as case study trait, has been accepted for publication in Journal of Dairy Science, and results of another study with milk yield in Argentina as example of missing trait will be presented at the 2007 Interbull Meeting in Dublin.

International evaluations for female fertility traits

Evaluation of female fertility traits is a recent addition to the list traits evaluated by the Interbull Centre and by many of Interbull's member countries. Choice of the traits, evaluation models and routines for calculation of national evaluations are still evolving and new countries are joining the Interbull services. As the result there is a continuing need for re-appraisal of different aspects of the internal genetic evaluation of fertility traits. In one research project the impact of setting the minimum number of herds to 10 or 50, and using number of daughters or effective daughter contribution on estimated genetic correlations were investigated. Results indicated that setting the minimum number of herds to 10 or 50 had negligible effects. However, using number of daughters (instead of effective daughter contribution) lead to some increase in estimated genetic correlations. In a different research project addition of auxiliary traits to the evaluation of different trait groups of fertility evaluations is assessed. Results will be presented to the Interbull Open Meeting in Dublin. In the third research project the use of multiple-trait MACE for female fertility traits is being investigated. For this project data from eight countries and 12 traits from March 2007 test run has been used. In this preliminary stage all correlations among country-trait combinations have been estimated. Results of a fourth research project on international female fertility evaluations for Brown Swiss, Guernsey, Jersey, Red Dairy Cattle and Simmental were released in February 2007.

Ability of Interbull evaluations based on foreign daughters to predict future domestic evaluations

A measure of the value of Interbull evaluations is the agreement between Interbull breeding values based on foreign (first crop) daughters and national breeding values based on domestic (second crop) daughters that resulted from the import of bull semen. In the past years several studies have been done for a number of country scales (Australia, France, Netherlands and USA). The purpose of this project was to develop software that can be used to easily perform similar studies for several countries. Using the program, France and Italy were used as case study countries. The principal investigator of this project was Giovanni Capuzzello, under supervision at the Interbull Centre staff.

Feasibility study of international evaluations for milking speed and temperament

A pilot study of international genetic evaluation for milking speed and temperament has been conducted by ANARB in Italy during the first half of 2007. Results are promising and a report of the results will be presented at the 2007 Interbull Meeting in Dublin.

Interbeef

A letter of agreement between ICAR and Institut National de la Recherche Agronomique, Irish Cattle Breeding Federation and Interbull Centre has been finalized. A letter of agreement between Interbull Centre and data providing organizations is under development.

An Interbull Technical workshop was held in March 2007 in Paris, France. At the workshop 8 countries presented the status of their national beef recording and evaluation programs. The second part of the workshop was devoted to discuss (technical) aspects of the development of a routine beef genetic evaluation service.

Collection of data to be used during this project has started with the development of guidelines for new countries joining Interbeef. The core of these guidelines, at this stage, is a brief description of pedigree handling plus file formats for data exchange and a form to describe national beef recording and evaluation.

A start has been made with the development of a data verification program (verifyBEEF). Checks to be considered in this program are: a) the quality of the incoming data, b) the difference between two consecutively submitted data files with phenotypic observations c) inconsistencies and errors.

The domain www.interbeef.org has been registered, and is automatically forwarded to the Interbeef section on the Interbull web-site.

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'Élevage (France), Irish Cattle Breeding Federation (Ireland), Meat and Livestock Commission (UK) and Nordic Cattle Genetic Evaluation (Denmark, Finland and Sweden).

Contributions of the above organisations 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

The following Interbull-related publications/presentations were produced since the 2006 Interbull meeting:

Interbull Bulletin No. 35. Proceedings of the 2006 Interbull meeting, Kuopio, Finland, June 4-6, 2006.

Interbull Bulletin No. 36. Proceedings of the Interbull Technical workshop, Paris, France, March 9-10, 2007.

Interbulletin. The Official Newsletter of the International Bull Evaluation Service (Interbull) August 2006.

Interbulletin. The Official Newsletter of the International Bull Evaluation Service (Interbull) August 2007.

- Fikse, W.F. and J. Philipsson, 2007. Development of international genetic evaluations of dairy cattle for sustainable breeding programs. *Animal Genetic Resources Information* 41, 29-43.
- Fikse, W.F., Jakobsen, J.H. & Gustafsson, C. 2006. Selection of sires in different countries for global dairy breeds. CD-volume of WCGALP-series, 8th World Congress on Genetics Applied to Livestock Production, August 13-18 2006, Belo Horizonte, MG, Brazil. Communication no 01-40, 4 pp. www.wcgalp8.org.br
- Jorjani, H. 2006. International genetic evaluation for female fertility traits. *Interbull Bull.* 35, 42-46.
- Leclerc, H., Minéry, S., Delaunay, I., Druet, T., Fikse, W.F. & Ducrocq, V. 2006. Estimation of genetic correlations among countries in international dairy sire evaluations with structural models. *J. Dairy Sci.* 89, 1792-1803.
- Mark, T. & Sullivan, P.G. 2006. Multiple-trait-multiple-country genetic evaluations for udder health traits. *J. Dairy Sci.* 89, 4874-4885.
- Mark, T., Fikse, W.F., Sullivan, P.G. & VanRaden, P.M. 2006. Prediction of international breeding values for non-measured traits: Application to clinical mastitis. CD-volume of WCGALP-series, 8th World Congress on Genetics Applied to Livestock Production, August 13-18 2006, Belo Horizonte, MG, Brazil. Communication no 01-31, 4 pp. www.wcgalp8.org.br
- Mark, T., Sullivan, P.G., Fikse, W.F. & VanRaden, P.M. 2006. Prior genetic correlations and non-measured traits. *Interbull Bull.* 35, 72-75.
- Mocquot, J.C., Fikse, W.F. & Philipsson, J. 2007. Interbull report for 2004 and 2005. In: Breeding, production recording, health and the evaluation of farm animals. Proc. of the 35th biennial Session of ICAR Kuopio, Finland, June 3-10. *EAAP publication 121*, 173-182.
- Philipsson, J., Jorjani, H., Jakobsen, J.H., Hjerpe, E., Forabosco, F. & Fikse, W.F. 2007. Breeding for health and fertility in dairy cattle. Proc. 12th World Guernsey Conference, Barossa Valley, Australia, March 19-22, 2007
- Philipsson, J., Fikse, W.F., Hjerpe, E., Jakobsen, J.H. & Jorjani, H. 2007. Reproduction and health traits in Total Merit Index – global trends in evaluation and selection. Paper presented at the International Red Cow Conference, Malmö, July 11-14, 2007
- Philipsson, J., Fikse, W.F., Hjerpe, E., Jakobsen, J.H. & Jorjani, H. 2007. Developments of international genetic evaluations and breeding programs for dairy cattle. Paper presented at the International Red Cow Conference, Malmö, July 11-14, 2007
- Sullivan, P.G., Liu, Z., Jakobsen, J.H. & Fikse, W.F. 2006. More on weighting factors for complicated models. *Interbull Bulletin* 35, 112-116.

WORKPLANS

Services

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

2007 August 13
 2008 January 15
 April 1
 August 19

Test evaluation runs for production, conformation and udder health, longevity, calving and female fertility traits:

2007 September

2008 May
September

Research

Project	Stage
Female pedigree in MACE	Implementation
Validation of genetic variance	Implementation
International genetic evaluations for female fertility	Data analysis
Multiple-trait MACE	Data analysis
Beef international genetic evaluation	Data analysis
VerifyBEEF	Data analysis
Reduced rank genetic correlation matrix for international genetic evaluations	Data analysis
Predictive ability of Interbull evaluations	Data analysis
Connectedness in international genetic evaluations	To be initiated

Meetings

Annual Interbull meeting, 2008, in conjunction with the 36th ICAR session in Niagara Falls, NY, USA, June 16-18, 2007.

Side event in conjunction with the International Technical Conference on Animal Genetic Resources in Interlaken, Switzerland, September 3-7, 2007 to discuss genetic diversity and functional traits and aspects of sustainable breeding in commercial dairy cattle breeds.

Workshops

A one-day seminar/workshop with AI industry and world breed societies will be organized in conjunction with the World Dairy Expo in Madison, WI, USA (October 4, 2007). Purpose of the workshop is to intensify the dialogue with the cattle breeding industry about Interbull and Interbull evaluations.

Planned Publications

Interbull Bulletin: Proceedings Interbull Open Meeting, August 23-25, 2007, Dublin, Ireland.

Interbull Centre Finances and Budgets, August 2007

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 2006 in comparison with the budget for 2006 and with the results for 2005. A prognosis for 2007 is made according to the expectations as of the end of July 2007. A budget for 2008 is presented for approval together with a provisional budget for 2009, in order to have an opportunity to project the economy on a longer term.

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

- Services now include all six breed groups for production, conformation, udder health, and longevity, three breed groups for calving (Brown Swiss, Holstein and Red Dairy Cattle) and one for fertility (Holstein). The service for female fertility will expand with a test evaluation in September 2007 for four more breed groups. The first routine evaluation for these breed groups will take place in January 2008, pending the outcome of the test evaluation.
- More countries are expected to join the Interbull evaluations for production and female fertility.
- Expansion of the service portfolio to include workability traits (milking speed and temperament) as well as the outcome of the review of the conformation subcontract are not considered in the budgets presented.
- Estimated costs for the activities related to the development of international beef evaluations are presented separately (Appendix II).
- The reservations made in the past years due to favourable 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.

Accounts for 2006

The final accounts for 2006 are presented in Appendix II, according to the same format as in previous years. The accounts have also been audited within the normal procedures for the Swedish University of Agricultural Sciences (SLU). The result for 2006 was better than the projections in the budget despite that income was somewhat lower than expected. The support of WGCF has been maintained and the support from Swedish organizations was somewhat lower than budgeted. The EU contribution was with €65,000 the same as in 2005. Costs were considerably lower than expected, in particular the salary costs because the delayed appointment of new personnel. Publications and phone, fax, postage could be kept at a low level because Interbull membership fees were utilized to cover costs for printing and distribution of Interbull Bulletins 34 and 35.

The result for 2006 led to a positive balance of €4,395, which means that the accumulated balance at the end of 2006 was €158,134.

Prognosis for 2007

Comments refer to the numbers in the table and points at deviations or new information since last meeting. Corresponding figures for 2006 are given within parenthesis when appropriate.

1. Service fees are for production 310,317 (304,404), conformation 87,160 (87,186), udder health 42,909 (44,553), longevity 37,382 (36,087), calving traits 28,318 (27,470) and female fertility 37,988 (12,107; ¼ of the fee for a full year).
2. SLU has preliminary decided to provide support amounting about €55,000. Continued support (£ 5,000) by the World Guernsey Cattle Federation (WGCF) is also expected.
3. EU has decided to increase their grant for 2007 to 80,000. 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 6.1 (5.1) scientists, 0.5 programmers, and 0.4 secretaries. This is an increase of 0.5 scientists compared with the previous budget and includes a junior scientist position.
7. Lower costs compared to 2006 are expected in 2007 because there is one main conference (Interbull Meeting in Dublin, Ireland); in 2006 the Interbull Centre staff participated in the Interbull Technical workshop in Wageningen (The Netherlands), the ICAR and Interbull meeting in Kuopio (Finland) and the WCGALP in Brazil.
8. Publication costs are expected to be similar for 2006 and 2007, because, as in 2006, two Interbull Bulletins and one Interbulletin (newsletter) will be published in 2007. Since 2005, part of the Interbull membership income is used to cover publication costs.
9. Phone, fax and postage are expected to be similar for 2006 and 2007, because, as in 2006, two Interbull Bulletins and one Interbulletin (newsletter) will be published in 2007. Since 2005, part of the Interbull membership income is used to cover postage costs.
12. The contract established between Interbull and the North-American consortium on outsourcing the conformation evaluations, assumes an annual basic fee of 50,000. Costs for outsourced activities also include the research collaboration with MTT in Finland.

It is expected that the 2007 results will be negative. The primary reason is the planned use of reservations from 2005 and 2006 for creation of a junior scientist position and the research agreement with MTT in Finland. The accumulated balance is still expected to be higher than the one originally approved for 2007.

Budget for 2008 and provisional budget for 2009

Specific comments are given when essential deviations from previous years are expected. No change in service fees for 2008 is proposed.

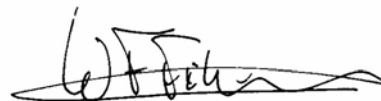
1. Service fees in 2008 for production are expected to 320,735, for conformation to 87,161, for udder health to 42,911, for longevity traits 37,383, for calving traits 25,806, and for female fertility traits 50,075.
2. Research grants from SLU, the WGCF and other sources will be applied for.
4. Salary costs are included for 6.1 scientists, 0.5 programmers, and 0.4 secretaries for 2008 and 2009.
7. Similar costs compared to 2007 are expected in 2008 and accounts for two meetings, the ICAR and Interbull meeting in the USA and one workshop.
12. For 2008, costs for outsourced activities also include the research collaboration with MTT in Finland.

It is expected that both 2008 will yield a deficit, which will be balanced with accumulated reserves, and that 2009 will be in balance.

Uppsala, August 14, 2007



Jan Philipsson
Interbull Secretary



Freddy Fikse
Interbull Centre Director

Interbull Centre Finances and Budgets (Euro), August 2007

	2005	2006		2007		2008	2009
	Actual	Budget	Actual	Budget (original)	Projected result	Budget	Prov. Budget
<i>Income</i>							
1. Service fees	507,323	514,600	511,807	551,700	544,074	564,100	564,100
2. Research grants	64,140	83,300	67,605	67,400	66,000	73,000	70,000
3. EU grants	65,000	65,000	65,000	65,000	80,000	80,000	80,000
4. Other income	6,334	-	-	-	-	-	-
Total	642,797	662,900	644,412	684,100	690,074	717,100	714,100
<i>Expenses</i>							
5. Salary costs	338,015	373,700	339,665	392,100	378,600	402,600	416,700
6. Computer costs	49,275	45,000	44,421	45,000	45,000	45,000	45,000
7. Travels, conferences	26,127	40,000	43,792	35,000	35,000	40,000	35,000
8. Publications	8,084	10,000	6,739	10,000	10,000	10,000	10,000
9. Phone, fax, postage	5,135	10,000	10,839	10,000	10,000	10,000	10,000
10. Steering Comm. and ICAR	6,300	7,000	7,025	7,000	7,000	8,000	8,000
11. Miscellaneous	7,645	8,000	4,052	8,000	8,000	5,000	5,000
12. Outsourced activities	59,552	50,000	50,000	50,000	74,100	74,100	50,000
13. Office and univ. adm. costs	126,852	132,000	133,484	135,000	135,000	135,000	135,000
Total	626,985	675,700	640,017	692,100	702,700	729,700	714,700
Balance	15,812	-12,800	4,395	-8,000	-12,626	-12,600	-600
Accum. Balance	153,748	140,948	158,143	150,143	145,517	132,917	132,317

Note: Interbull 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. For 2006 the membership income of Interbull amounted to €48,953 and for 2007 membership fees are budgeted at €49,614. They contribute to cover overhead costs for ICAR/Interbull, some travels, publications and information work. The Interbull Centre also contributes (EUR 6,930) annually to ICAR from service fees to cover these costs.

Estimated Costs for the Interbeef project

Through the agreement with ICAR an annual amount of €80,000 is available for a period of three years. Salary costs incl. social benefits are included for one scientist. The person hired to work on the Interbeef project started in March 2007, hence the salary costs pertain to 10 months. On average, the costs are €80,200 per year.

	2007	2008	2009
<i>Expenses</i>			
Salary costs	45,000	53,200	54,800
Computer costs	8,000	8,000	8,000
Travels, conferences	4,500	5,500	5,500
Miscellaneous	1,000	1,000	1,000
Office and univ. adm. costs	15,000	15,000	15,000
Total	73,500	82,700	84,300