Interbull Centre Activity Report 1999/2000[1]

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INTRODUCTION

This document describes the activities at the Interbull Centre since the last annual meeting of Interbull (August 26-27, 1999, Zurich, Switzerland). Workplans and future activities are also presented.

BUDGETS AND FINANCES

Financial statements are in APPENDIX I. Budgets will be official pending approval by the Interbull Steering Committee on May 14, 2000.

Income from service fees has increased by about 63% since 1997 due to both increased number of participating countries and the new fee structure (effective 1998). Budgets for 2000 and 2001 follow previous plans and assume no further changes in the fee structure. For the latter half of year 2000 service fees are also charged for the Holstein conformation evaluations. Full conformation fees will apply as of 2001.

Interbull membership fees are handled directly by the ICAR office, Rome, Italy, and reported at the biennial meetings of ICAR. For 1999 the membership income of Interbull amounted to CHF 44,000. A similar amount is anticipated for 2000. Membership income is used to cover overhead costs for ICAR/Interbull, some travels, publications and development work. The Interbull Centre also contributes CHF 10,000 from service fees to cover these costs. Future membership income will depend on the outcome of the ongoing strategic review of ICAR.

Following decision of ICAR, the European Union currency (Euro) will replace the Swiss Franc in all ICAR/Interbull invoices and financial statements as of 2000.

PERSONNEL

Jan-Olov Stensjö, was hired at the Interbull Centre to fill the computer programmer opening. Jan-Olov is a biology graduate from the University of Uppsala with experience in computing and genetics. He was appointed on October 15, 1999, initially for one year. Funds for this position were made available from Georgios Banos' 1999/2000 partial sabbatical leave.

SERVICE ISSUES

Participation

International genetic evaluations for production and conformation (Holstein) traits were computed as scheduled in November 1999 and February and May 2000. New entries to production evaluations were Hungary, Poland and the South African Republic; first time participants in Holstein conformation evaluations were Belgium, Sweden and Switzerland. Total number of countries currently in the Interbull genetic evaluation service are as follows:

	Production	Conformation
Total number of countries subscribing	25	17
Number of countries submitting own data	25	13

[1] *Presented at the 2000 Interbull Meeting, Bled, Slovenia, May 14-15, 2000*

Following agreement between ICAR/Interbull and a North American consortium, conformation evaluations are computed at the Holstein Association, Vermont, USA. One year has been completed of this arrangement which seems to work very well. A full review is planned between April and June 2001.

National data issues

In the November 1999 and February 2000 evaluations some individual country data had to be excluded because they were not consistent with data submitted by these countries to previous Interbull evaluations and the new data had not been examined in an Interbull test-run. In all cases, data from these countries submitted to the immediately previous Interbull routine evaluation were included. It should be acknowledged that, on some occasions, newly submitted data were results of improved national genetic evaluation procedures. However, rules explained in the Interbull service documents and code of practice should apply. The basic principles behind these roles are stated below:

1. National genetic evaluation data that result from modified procedures must be always included in an Interbull test-run before being accepted to an Interbull routine evaluation
2. Data edits described in the service document (with amendments) are applied at the Interbull Centre only; individual countries must not implement any arbitrary data edit.

Sometimes modifications to national evaluation procedures are considered "minor" at the national level. Results, however, may have major impact on international comparisons. The Interbull Centre has made available software and application instructions for individual countries to test the effect of their modification on genetic variance estimates that are used in Interbull evaluations.

In previous evaluations, problems described above were being detected after the deadline for new data submission. The Interbull Centre has now changed the procedure and first tests will be taking place as soon as data from an individual country arrive at the Centre.

RESEARCH AND DEVELOPMENT ISSUES

The following considers both projects conducted at the Interbull Centre and projects conducted elsewhere in co-operation with Interbull. It is explained which institutes are mainly involved in each project.

New weighing factors

Research on this topic, conducted mainly by Freddy Fikse at the Interbull Centre, was presented at the 1998 and 1999 Interbull meetings. Following this work, a procedure yielding new weighing factors for each bull per country was developed, considering the number of daughters and lactations in a country, contemporary group structure and the bull´s mate effect. The general formula may apply, with appropriate modifications, to national data from both single-trait and multiple-trait (including test-day) genetic evaluation models. The formula, accompanied by application instructions and examples, was distributed to all countries participating in Interbull evaluations. At the same time a data request was issued for pilot studies and an Interbull test-run.

A pilot study is planned at the Interbull Centre for the first half of 2000 using individual country data. Pilot results will be reviewed by participants. This is viewed as the first large-scale implementation of the procedure and a useful prelude to a full-scale test-run. The latter is scheduled for September 2000.

Comparison between parameter estimation procedures

This project was initiated in light of research work at the University of Guelph, Canada, presented at the 1999 Interbull meeting. The research showed possibilities of improving the genetic (sire) variance estimation procedure by changing the way genetic groups are treated in international genetic evaluations. The objective

of the project was to compare the method currently used by Interbull with the new method from Canada. Freddy Fikse of Interbull and Pete Sullivan of the University of Guelph were the principal investigators in this project.

The two approaches were compared based on simulated data analyses where true parameters were known. In general, the two procedures yielded similar results with relatively well-balanced and homogeneous simulated data. Admittedly, the University of Guelph method has better theoretical foundation than the current method; it also enables monitoring Mendelian sampling variance over time, which is useful in the context of data quality.

The Interbull Centre and an Interbull Steering Committee subgroup are now reviewing results of the analysis and simulation study. It would be desirable to extend the method to the estimation of both sire variance and genetic correlation between countries. ***(Recommendation pending final comments of the reviewing group).***

Data connectedness and genetic correlation estimation

Estimates of genetic correlations between countries considerably influence international genetic evaluations. Estimation of genetic correlation depends on adequate connections and links between data from different countries. The objective of this project is to find ways to improve the genetic correlation estimation process in international genetic evaluations, paying particular attention to the issue of data connectedness. Dr Hossein Jorjani of the Interbull Centre is the principal investigator in this project.

Work has thus far focused on the development of two measures of statistical connectedness in international genetic evaluations. The first is based on the examination of the distribution of a bull's daughters in two countries at a time (the "genetic similarity" concept introduced by University of Wisconsin-Madison researchers at the 1999 Interbull meeting). The second is an extension of the first method and is based on the examination of the distribution of a bull's daughters in all countries. Both measures are investigated in relation to desirable properties of the ideal measure, as listed below:

1. The measure should be quantitative, preferably bound between 0 and 1.
2. It should use information related to the number of daughters, national reliability, pedigree information, population parameters such as genetic/phenotypic (co)variance or a combination of the above.
3. It should take into account information available through the relationship matrix, or its inverse, as well as the prediction error variance of international estimates.

Regarding estimation of genetic correlations between countries, Dr. Jorjani has been examining the use of the numerator relationship matrix in a sire-maternal grandsire and an animal model. He has been also examining fourteen (14) structural and operational parameters emerged from his survey of national genetic evaluation models (see below) in relation to genetic parameter estimation. This can lead to the identification of appropriate factors in the implementation of a structural model for genetic covariance estimation.

Workplans in relation to this project are to:

1. continue the development of a data connectedness measure with the desired properties and use it to assess data connectedness and identify the most informative subsets for genetic correlation estimation in international evaluations;
2. continue work on genetic correlation estimation based on structural models for genetic covariances; priority will be given to the identification and evaluation of factors that may affect the estimated correlation among countries (climate, geography, production systems, recording and national evaluation procedures).

A progress report is scheduled for the 2000 Interbull meeting by Hossein Jorjani.

Research on international evaluations for milk somatic cell count

Research is being conducted on the feasibility of international genetic evaluations for milk somatic cell count at the Swedish University of Agricultural Sciences in co-operation with the Interbull Centre. Early genetic correlation estimates between different countries look very promising, leading the way to future extension of the current international genetic evaluation service to include milk somatic cell count. The Interbull Centre and countries participating with own data in the project are currently reviewing results. A progress report is scheduled for the 2000 Interbull meeting by Thomas Mark (presently at the Danish Agricultural Advisory Centre).

International genetic evaluations for milk somatic cell count will be one of the topics of an Interbull technical workshop scheduled for October 22-23, 2000, in Verden, Germany.

International genetic evaluation animal model

International genetic evaluations are currently based on national evaluation results; hence, they depend on national genetic evaluation procedures. Despite standardisation efforts, the latter still vary from country to country thereby introducing sources of inconsistency in international evaluations. In addition, only bulls can be included in the current analysis and receive international breeding values. Demands for international evaluation and selection of cows, mostly to be used as bull dams, increase. International genetic evaluation based on individual performance records could alleviate these problems. The objectives of this project are to assess the feasibility and merit of an international genetic evaluation based on cow performance records, develop methods for genetic parameter estimation and conduct a pilot study analysing field data of Guernsey cows from several countries. Freddy Fikse is the principal investigator in this project and is spending the first half of 2000 at the University of Wisconsin-Madison, USA, in co-operation with Drs Kent Weigel, Romdhane Rekaya and Dan Gianola.

A simulation study is currently being designed to assess the relative merit of an international genetic evaluation based on cow performance records, compared to the method currently used. At the same time, Guernsey lactation and pedigree records are being solicited from individual countries for field data analyses. Five countries have already submitted data. A progress report is scheduled for the 2000 Interbull meeting by Freddy Fikse.

The project is expected to continue over the next 2 years. Several factors will be examined including, but not being limited to, genetic trend in cattle populations, genetic variance, genetic evaluation models (nationally and internationally) and population structure. The project will also consider investigation of the herd clustering technique developed at the University of Wisconsin-Madison.

In a parallel project at the University of Wisconsin-Madison, applications of international animal models to Holstein production data from several countries are being investigated. At least 15 countries are participating in this project. A progress report is scheduled for the 2000 Interbull meeting by Kent Weigel of the University of Wisconsin-Madison.

Conformation traits for the Jersey breed

Following an inquiry by the World Jersey Cattle Bureau, the Interbull Centre responded expressing support for future international genetic evaluations for conformation traits for the Jersey breed. Pertinent research is being currently conducted at the US Holstein Association based on a platform similar to the one developed for Holstein evaluations (currently in routine Interbull evaluations). A progress report is scheduled for the 2000 Interbull meeting by Bert Klei of the US Holstein Association.

Faster estimation procedures in international evaluations

In a study conducted by the Animal Improvement Programs Laboratory of the USDA, in co-operation with the Interbull Centre, methods to reduce computing time for international genetic evaluations with MACE are being investigated. Data from 8 countries have been collected to test these methods. A progress report is scheduled for the 2000 Interbull meeting by Rex Powell of the USDA.

Survey of national genetic evaluation procedures

The survey, conducted by Dr Hossein Jorjani of the Interbull Centre, has been completed and results have been published in Interbull Bulletin No. 24 and posted on the web site of Interbull (www.interbull.org). Following up on this project, Interbull guidelines for national genetic evaluation procedures are currently being revised and will be one of the topics of the Interbull technical workshop on October 22-23, 2000, Verden , Germany.

National data quality

A joint project is being initiated between the Interbull Centre and the University of Göttingen, Germany. The objective is to develop flexible genetic evaluation software and assess its suitability for different data structures and genetic evaluation models, as follow-up on the work of the Interbull Audit Group. A position announcement has been distributed for a scientist to take on this project under the supervision of Dr Hermann Swalve in Germany, in co-operation with the Interbull Centre. The project will be funded jointly by Interbull and German funds.

R&D funding

In addition to funds raised from service fees, research and development at the Interbull Centre is financed by grants from the Swedish University of Agricultural Sciences, National Association of Animal Breeders (NAAB) and the United States Department of Agriculture (USDA), the European Union and the World Guernsey Federation. A review of the Interbull Centre research programme that is funded by the USDA and NAAB was conducted in September 1999.

Contributions of the above organisations to the future development of Interbull services are gratefully acknowledged.

OPERATIONAL ISSUES

Base change co-ordination

Following member inquiries, a reminder of earlier guidelines was issued by the Interbull Centre on November 8, 1999. The guidelines were calling for stepwise reference bases changing every five years. It was acknowledged that introduction of quarterly international genetic evaluations expressed on the base of each participating country has diminished the need for harmonising reference base definitions. The base used in national evaluations, as stated by each country, is now presented in the service report after each routine international genetic evaluation. A standardisation of the nomenclature used is, however, needed if this information should be useful.

Changes in animal identification in individual countries

Animal identifications are changing in several European countries, mostly in compliance with European Union regulations. Such changes have been dealt with at the Interbull Centre in close co-operation with

individual countries. In order to improve preparations for future animal identification changes, the Centre issued a statement on April 6, 2000, to all members.

Advertising guidelines

On November 24, 1999, the Interbull Centre issued a set of guidelines for bull merit advertisements. The guidelines were distributed to Interbull members and were also posted on the web site of Interbull. According to these guidelines, any advertisement of the genetic merit of a bull should at least include the source and date of genetic evaluation, reference base, expression (EBV or ETA), unit and reliability. Only the official scale for genetic evaluations in each country should be used in publications.

Pedigree files

On February 14, 2000, the Interbull Centre made pedigree files, including records on young bulls, available to countries participating in the service for review. Information collected from individual countries was used to develop these files; most but not all countries took the opportunity to submit information on young bulls. The objective of this project is to ensure the correct pedigree of all bulls is used in international genetic evaluations. Making such files available at an early stage would enable us to remedy any problems before the young bulls are included in an international genetic evaluation.

Documentation on genetic trend validation procedure

The Interbull Steering Committee decided that a full description of the trend validation procedure should be posted on the web site of Interbull. The Interbull Centre is working on this project.

INTERBULL PUBLICATIONS/PRESENTATIONS

The following Interbull-related publications were produced since the 1999 Interbull meeting:

Interbull Bulletin No. 21. Proceedings international workshop on EU concerted action genetic improvement of functional traits in cattle (GIFT); Longevity Jouy-En-Josas, France May 1999.

Interbull Bulletin No. 22. Proceedings of the 1999 INTERBULL Meeting Zurich, Switzerland August 26-27, 1999.

Interbull Bulletin No. 23. Proceedings international workshop on EU concerted action genetic improvement of functional traits in cattle (GIFT); Breeding goals and selection schemes Wageningen, The Netherlands November 7-9, 1999.

Interbull Bulletin No. 24. National genetic evaluation programmes for dairy production traits practised in Interbull member countries 1999-2000.

R.L. Powell, H.D. Norman and G. Banos. 2000. “Improving prediction of national evaluations by use of data from other countries” J. Dairy Sci. 83:368 (full article on-line http://www.adsa.org).

J. Philipsson, G. Banos and U. Emanuelson. 2000. “Development of international genetic evaluation of dairy cattle for a new millennium” British Cattle Breeders Club Meeting, January 10-12, 2000, Stoke-on-Trent, UK.

G. Banos. 1999. “From research to application: A summary of scientific developments and possible implementation to the genetic improvement for functional traits” Proc. International Workshop on Genetic Improvement of Functional Traits in Cattle, the Netherlands, pp. 65-74.

G. Banos. 1999. “Identifying genetically superior stock across country” Proc. International Symposium on Animal Breeding and Genetics, Brazil, pp. 21-34.

U. Emanuelson, G. Banos, W.F. Fikse, H. Jorjani and J. Philipsson. 1999. “International genetic evaluation in focus” Proc. Husdjusgenetik i Utveckling, Sweden, p. 42 (in Swedish).

H. Jorjani. 1999. “International genetic evaluation of sires in dairy cattle populations” Proc. Animal Science Congress 99, Izmir Turkey, September 21-24, 1999, pp 1-9.

INTERBULL STRATEGIC DIRECTION

Following up on last year’s business meeting, the Interbull Steering Committee appointed a subgroup to work with the Interbull Centre and the ICAR Executive Board to develop strategy recommendations. The ICAR Secretariat distributed copies of a report to all members on April 21, 2000. Discussion is scheduled for the 2000 Interbull Business meeting.

INTERBULL STEERING COMMITTEE MEMBERSHIP

As of May 2000 Brian Wickham, Interbull Chairman, is leaving his post after having served the maximum allowed by the ICAR constitution, and will be replaced by Jean-Claude Mocquot. The departing chairman’s contribution to the establishment and development of the Interbull Centre has been of paramount importance and is gratefully appreciated. The new chairman has been a member of the Steering Committee since 1983 and brings in valuable experience and insight. The Interbull Centre is looking forward to working with the new Chairman and the new Steering Committee members.

As of August 1999, Jarmo Juga (Finland) has replaced Lars Gjol Christensen (Denmark) as representative of Northern Europe. Starting May 2000, Reinhard Reents (Germany) will replace Gottfried Averdunk (Germany) as representative of the German speaking countries. The contribution of the two departing members to the Interbull Centre workings is gratefully appreciated.

A proposal for filling the vacancy of a Central and Eastern Europe representative is currently being finalised.

WORKPLANS

Services

Routine evaluations, production & conformation
Release dates (second Monday each of the following months):

2000	August 14
	November 13
2001	February 12
	May 14
	August 13
	November 12

Test runs, production & conformation:

2000	September: introduction of new weighing factors
2001	March and September

Test runs for international genetic evaluations for somatic cell count in 2001, pending the outcome of current research and the technical workshop in Verden, Germany, October 22-23, 2000.

Research

"Data connectedness and genetic correlation estimation" project: work in progress.

"International genetic evaluation based on individual performance records" project: work in progress.

"International genetic evaluations for somatic cell count" project: work in progress.

"International genetic evaluations for conformation traits for the Jersey breed project": work in progress at the US Holstein Association.

"Software development for national evaluation auditing purposes" project: hiring in progress.

Meetings

Interbull workshop October 22-23, 2000, Verden, Germany (hosted by VIT); Interbull Steering Committee meeting before and after the workshop. Proposed themes:

1. Interbull guidelines and national data quality including data edits, record extension, evaluation models, result expression etc.
2. International genetic evaluations for milk somatic cell count and mastitis.

Annual Interbull meeting, 2001, in conjunction with the EAAP meeting in Hungary, August 26-29, 2001.

Annual Interbull meeting, 2002, in conjunction with the ICAR meeting in Switzerland, May 26-31, 2002. In the same year the 7th World Congress on Genetics Applied to Livestock Production (WCGALP) is scheduled in France (August 19-23, 2002, in Montpelier). A possible Interbull workshop in connection with this congress may be planned.

Planned Publications

Interbull Bulletin: Proceedings Interbull Open Meeting May 14-15, 2000, Slovenia.
Interbull Newsletter (Interbulletin) following the 2000 Annual Meeting.

APPENDIX I

INTERBULL CENTRE FINANCES AND BUDGETS

CHF = Swiss Francs (years 1997, 1998, 1999, 2000)
EUR = Euro (years 2000, 2001)

1CHF = 0.65 EUR (4 May 2000)

	Actual 1997 CHF	*Actual* 1998 CHF	*Budget* 1999 CHF	*Actual* 1999 CHF	*Budget* 2000 CHF	*Budget* 2000 EUR	*Budget* 2001 EUR
Income							
Service fees	303,902	364,233	472,000	495,307	530,000[6]	344,500	377,000
Research grants[1]	-	19,830	160,000	136,181	165,000	107,250	108,000
Other grants (EU)	-	32,000[2]	64,000	64,000[3]	80,000	52,000	52,000
Total CHF	**303,902**	**416,063**	**696,000**	**695,488**	**775,000**	**503,750**	**537,000**
Expenses							
Salary costs	159,239	212,740	385,000	378,018[4]	405,000	263,250	270,000
Computer costs	21,657	36,684	50,000	41,372	50,000	32,500	33,000
Travels, conferences	27,635	34,630	40,000	46,208	45,000	29,250	30,000
Publications	3,865	12,542	20,000	19,021	20,000	13,000	13,000
Phone, fax, postage	15,487	21,499	30,000	25,494	25,000	16,250	16,000
Steering committee and ICAR	10,000	10,000	10,000	12,320	15,000	9,750	10,000
Miscellaneous	1,381	1,338	5,000	3,617	5,000	3,250	3,000
Outsourced activities	-	-	20,000[5]	-	60,000[7]	39,000	62,000
Office and university admin. costs	59,800	82,300	136,000	131,500	150,000	97,500	100,000
Total CHF	**299,064**	**411,733**	**696,000**	**657,550**	**775,000**	**503,750**	**537,000**
Balance	**-3,642**[8]	**688**		**38,626**			

Note: Interbull membership fees are handled directly by the ICAR office, Rome, Italy, and reported at the biennial meetings of ICAR. For 1999 the membership income of Interbull amounted to CHF 44,000 (EUR 28,600). A similar amount is anticipated for 2000. Membership income is used to cover overhead costs for ICAR/Interbull, some travels, publications and development work. The Interbull Centre also contributes CHF 10,000 (EUR 6,500) from service fees to cover these costs. Future membership income will depend on the outcome of the decisions resulting from the strategic review of ICAR

1 NAAB/USDA and SLU supported research
2 EU support for 1998 paid June -99
3 EU support for 1999 decided July -99, yet to be paid
4 Salary costs including social benefits for on average 3.9 scientists 0.7 programmer and 0.3 secretary
5 Planned for auditing program development - delayed to 2000
6 Includes 52,000 from conformation evaluation service fees
7 Includes 36,000 from outsourcing conformation evaluation computations
8 Includes a deficit from 1996 of 8,480