

# European Union Reference Laboratory for Zootechnics Work Plan 2014 (Version 2)

INTERBULL CENTRE, Department of Animal Breeding and  
Genetics, SLU (Uppsala, Sweden)

12/19/2013



**European Union Reference Laboratory for Zootechnics  
(Bovine Breeding)**

**INTERBULL CENTRE**

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[www.interbull.org](http://www.interbull.org)

# European Union Reference Laboratory for Zootechnics (Bovine Breeding) Work Plan 2014

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The following work plan presents the work programme for the period January to December 2014, according to the instructions adopting performance indicators (Ref. Ares(2012)939264 – 02/08/2012). Most activities are of a continuous operational nature and follow previous work plans and activity reports. As requested, a hierarchical structure of activity, sub-activity, objectives, expected outputs and performance indicators is provided in Table 1. The performance indicators proposed for all EURLs in the field of animal health cannot be applied to the EURL in Zootechnics given the nature of the entrepreneurship, which differs substantially from the other EURLs. Therefore, a customized set of indicators was proposed (and accepted by the EC) in 2013 using as a legal reference the *96/463/EC: Council Decision of 23 July 1996 designating the reference body responsible for collaborating in rendering uniform the testing methods and the assessment of the results for pure-bred breeding animals of the bovine species.*

Developments on genomic evaluations continue to be the major topic on the dairy cattle breeding industry, both at the national and international levels. Interbull has invested significant resources to discuss and develop methodologies and strategic issues related to the incorporation of genomic information on international genetic evaluations of dairy cattle since 2009. In an effort to provide guidance to importing and exporting countries within and outside EU, Interbull has implemented an official validation of genomically enhanced breeding values (GEBVs) in August 2010. This initiative establishes ground according to the requirements of the EC regulation 427/2006 for evaluation of the genetic merit and the correspondent reliability for young bulls without progeny which have been genomically evaluated. The procedure was officially acknowledged by communication from the Director Bernhard Van Goethem of October 25, 2010, to all member states (D1/SPG/eg (10) D/764080/Ars(2010)789624) and has been instrumental for the commercialization of semen from genomically proven bulls within Europe.

Another major genomic-related area that the EURLZ is involved with is the development of tools that can handle genomic data coming from many different sources and in different formats. This has been referred to as genomic multi-trait across country evaluations (GMACE), which is a modification of the method used by the EURLZ for international comparisons of conventional breeding values. A procedure to compare young bulls (without progeny) using GMACE methodologies was scheduled to be implemented in the April 2013 routine evaluation, but plans have changed to allow more time for the participating organizations to understand the new methodology, evaluate the impact on the national contexts and communicate the changes to the farmers who are the final beneficiaries of the international comparisons. Therefore, the GMACE evaluations have been implemented in August 2013 but with a relaxation of the publication mutual agreement in order to assure a smooth transition into regular services. The first official GMACE routine evaluation is now scheduled for April 2014.

The project referred to as “Intergenomics” has the objective of improving the prediction ability of the genomic equations which is particularly important for minor breeds by creating an international shared genotype database for cattle at the Interbull Centre, based on the fact that genomic predictions are highly dependent on the size of the reference populations. The Brown Swiss breed is being used as the pilot population given the diligent cooperation established among the breed representatives worldwide, and the routine international genomic evaluations for Brown Swiss cattle started already on December 2011. This is a key project to enable the EURLZ to continue providing guidance and cutting-edge methodologies to access genetic value of breeding livestock.

There has been a clear evolution on the concept of sharing genotypes internationally, and most countries recognize now the need of a common repository of bovine genotypes at the Interbull Centre as the means to:

- Reduce costs and optimize investments on genotyping bovine animals
- Improve reference populations for prediction of genomically enhanced genetic merit, especially for low heritability health and functional traits, such as somatic cell count, mastitis, calving difficulty, longevity and female fertility.
- Make it possible to screen large populations for recessive alleles detection (recent study from North America identified 5 lethal recessives using this type of data – VanRaden et al., 2011<sup>1</sup>)
- Maintain a worldwide parentage verification data base, using the SNP based methods that are about to be officially recommended by ISAG and ICAR
- Use the genomic data to study diversity within the bovine populations in a more complete way than is possible with the methods based on pedigree information only.

A three-year ICAR project to develop a system for international evaluations of beef breeds and traits commenced in 2007 and ended in May 2010. A new compromise to ensure the continuation of the research and development project has been established between ICAR, SLU and the participating countries. This system is operating at the Interbull Centre from the beginning of 2012 and currently involves two major beef breeds: Charolais and Limousin.

All the EURL activities have basically doubled the amount of work and also the responsibilities of the EURLZ in an extremely short period of time (5 years). **It is important to notice that all the activities existent prior to the “genomic revolution” are still taken place, meaning that this is not a simple update in methods, but in fact 100% additional services.** The conventional MACE evaluations that have been provided by the EURLZ over the years as a means for international comparisons, have actually acquired a more strategic importance than ever before, since they provide the only means for countries to utilize information on foreign animals in their reference populations. In other words, national genomic evaluations are highly dependent on the international breeding values regularly supplied by the EURLZ.

The support received by the EURLZ has been extremely instrumental in developing the new methods and infrastructure (data base and genotype exchange and harmonization). At this stage, although important steps of the new developments are completed, there are still fundamental questions to be addressed for the adoption of genomic technologies in animal breeding schemes and assure that international trading of bovine genetics can count on sound methodologies and unbiased comparisons between cattle population within Europe and with other continents. The EC funding plays a key role to make these advances possible, since development costs cannot be directly transferred into service fees.

Therefore, the EURLZ is **requesting the maintenance of the financial support of € 150,000 for 2014**, in order to assure the minimum leverage needed to establish and maintain the necessary framework to quickly respond to the novel technologies being applied in bovine breeding worldwide.

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<sup>1</sup> VanRaden et al. Reporting of Haplotypes with Recessive Effects on Fertility. Proc. Interbull Meeting, Stavanger, Norway, August 26-28, 2011. Interbull Bulletin 44, 117-121.

**Table 1** – Work programme for the European Union Reference Laboratory for Zootechnics (Bovine Breeding) in 2014. Activities and sub-activities defined according to the 96/463/EC Council Decision, Annex II.

Activity	Sub-activity	Objective	Expected outputs	Performance indicators	Resources (%)	Resources (d)
1. Be the documentation and information centre for the methods of testing and assessing the genetic value of pure-bred breeding animals of the bovine species for the Member States of the European Union	1.1. Regularly receive the results of genetic assessments and the data on which they were based	1.1.1. Receive, verify and store national information	Keep the international pedigrees for dairy and beef breeds up to date; receive national dairy EBVs 5 times a year; keep the international genotype database for Intergenomics up to date; receive beef phenotypic data once a year.	Number of records added to the international database	13	46
		1.1.2. Maintain a publicly available documentation on national evaluation systems	Genetic evaluation forms containing details on national genetic evaluation system and methods are made available in the EURL home page		1	3
	1.2. Comparing the various methods of testing and assessing the genetic value of pure-bred breeding animals of the bovine species	1.2.1. Carry out validation tests to assess unbiasedness of national genetic evaluations	Validation for both national conventional EBVs and GEBVs are carried out during test runs (January and September 2013)	Number of population-trait-method combinations to be validated (% of all combinations)	1	3
		1.2.2. Carry out full test international evaluations to evaluate the impact of methodological changes implemented at the EURL and by the State Members, as well as estimate new genetic correlations among countries	January and September 2013 runs	Number of test evaluations performed by the EURL (breed-population-trait combinations) to evaluate changes/updates in NRL methodologies	5	18
2. Provide assistance in order to contribute to the harmonization of the various methods of testing and assessing the genetic value of pure-bred breeding animals of the bovine species	2.1. Recommend the calculation methods to be used	2.1.1. Develop new methodologies	GMACE, truncated MACE, beef new traits	Number of new methods tested with participation of the NRLs	5	18
		2.1.2. Promote the harmonisation of methods used among Member States	Organize a session on the annual meeting for national reports on methods improvement		0.5	2
		2.1.3. Develop of information infrastructure for data storage and exchange	Implement new modules in existing database and a full platform for genotype storage and exchange	Number of new users by database functionality	15	52

3. Provide assistance in order to permit the comparison of the results of the methods of testing and assessing the genetic value of animals in the various Member States	3.1. Develop control protocols, to enable assessments to be made in the various Member States so as to improve the relevance of results and the effectiveness of selection programmes	3.1.1. Develop and implement formal protocols for data exchange	Implement a completely new system for uploading of national EBVs and GEBVs into the EURL database	Number of protocols published or reviewed	5	18
		3.1.2. Develop and implement formal protocols for publication of results	Implement new publication rules for international GEBVs of young bulls		0.5	2
	3.2. Carry out an international assessment of livestock on the basis of the genetic assessments made in the various Member States	3.2.1. Carry out routine international genetic evaluations of dairy breeds	April, August, December 2014 runs	Number of official international evaluations performed by the EURL (breed-population-trait combinations) to provide comparisons of multi-country populations standardized to each Member State genetic base.	10	36
		3.2.2. Carry out routine genetic evaluations of beef breeds	September 2014 run		5	18
		3.2.3. Carry out routine genomic evaluations of dairy breeds	April, August, December 2014 runs		5	18
	3.3. Disseminate the individual results of the international assessments	3.3.1. Distribute results from international evaluations standardized into every Member State scale	April, August, December 2014 routine runs + January and September test runs	Number of international breeding values distributed in each Member State scale	3	11
	3.4. Publish the conversion formulae and all related genetic work	3.4.1. Publish statistics on the global status of bovine genetics	General statistics published in April, August, December 2014 routine runs + January and September test runs	Number of articles from the EURL published in the Interbull Bulletin	1	3
		3.4.2. Publish research results	The Interbull Bulletin is an online open journal maintained by the EURL, containing the proceedings of all workshops to date		2	7
4. Help the the bodies responsible for setting the rules for performance recording and assessing the genetic value and for publication of the evaluation results of pure-bred breeding animals of the bovine species appointed by Member States to take part in a comparison of the results of the assessment of genetic value at international level		4.1. Organize an annual international workshop with all participating national organizations	Interbull annual meeting, Berlin, Germany, May 19-21, 2014	Number of participating NRLs in the annual workshop (attendance rate)	8	29
		4.2. Organize issue specific technical workshops	Interbull technical workshop (venue & date to be announced)		5	17
		4.3. Assist Member States and countries which have become members of EU to improve national evaluation systems	Participating Member States are expected to join evaluations for additional breed-trait combinations	Number of NRLs joining evaluations for additional breed-trait combinations	2	7

		4.4. Publish international guidelines	Publish a review of the Interbull guidelines for the ICAR standard methods of genetic evaluation	Number of official EURL documents with recommendations reviewed	1	4
		4.5. Promote harmonisation of evaluations for health, reproduction and other functional traits	Implement new methodology for overall conformation comparisons		2	7
5. Evaluate the problems of assessing pure-bred breeding animals and attempt to resolve the problems linked to the genetic assessments carried out in the various Member States		5.1. Investigate adoption of new technologies	Implement international comparisons for genomically enhanced EBVs (GMACE)	Number of NRLs adopting the recommended new methods	8	29
		5.2. Investigate problems in harmonisation of methods	Test the new Mendelian Sampling validation test		2	7
Total (%):					100	
Total (d):						355

Uppsala, December 19, 2013.

  
**João Walter Dürr**  
 Interbull Centre Director

### ANNEX I a)

Estimated budget per activity.

	Staff costs	Subcontr.	Capital Equipt	Consumables	Comparative tests	Missions	Meetings	Training activities	TOTAL
Activity 1									
Sub-activity 1.1	137642	0	0	54514	0	0	0	0	192156
Sub-activity 1.2	60608	0	0	0	0	0	0	0	60608
Total activity 1	198250	0	0	54514	0	0	0	0	252763
Activity 2									
Sub-activity 2.1	230889	0	0	0	0	0	0	0	230889
Total activity 2	230889	0	0	0	0	0	0	0	230889
Activity 3									
Sub-activity 3.1	59549	0	0	0	0	0	0	0	59549
Sub-activity 3.2	214922	0	0	0	0	0	0	0	214922
Sub-activity 3.3	32130	0	0	0	0	0	0	0	32130
Sub-activity 3.4	31933	0	0	0	0	0	0	0	31933
Total activity 3	338535	0	0	0	0	0	0	0	338535
Activity 4									
Total activity 4	235051	0	0	54514	0	0	0	0	289565
Activity 5									
Total activity 5	110511	0	0	0	0	0	0	0	110511
TOTAL	1113235	0	0	109028	0	0	0	0	1222262

Estimated budget per activity and staff member.

Name	Category	Annual Salary (SEK) <sup>i</sup>		Activity 1		Activity 2	Activity 3				Activity 4	Activity 5	Total/Staff
				Sub-act 1.1	Sub-act 1.2	Sub-act 2.1	Sub-act 3.1	Sub-act 3.2	Sub-act 3.3	Sub-act 3.4			
Carl Wasserman	Data base administrator, IT specialist	668220	Eligible costs (SEK)	27336	0	145793	30374	0	0	0	9112	0	212615
			Time spent (d)	9	0	48	10	0	0	0	3	0	70
Eva Hjerpe	Junior scientist, MSc in Genetics	601398	Eligible costs (SEK)	35537	13668	0	10935	57406	8201	2734	13668	19135	161284
			Time spent (d)	13	5	0	4	21	3	1	5	7	59
Hossein Jorjani	Senior scientist, PhD in Genetics	803670	Eligible costs (SEK)	0	10959	36530	7306	65755	7306	10959	73061	32877	244754
			Time spent (d)	0	3	10	2	18	2	3	20	9	67
João Dürr	Centre Director, PhD in Genetics	957180	Eligible costs (SEK)	0	0	26105	0	0	0	4351	108770	8702	147928
			Time spent (d)	0	0	6	0	0	0	1	25	2	34
Mohammad Nilforooshan	Senior scientist, PhD in Genetics	617652	Eligible costs (SEK)	36498	16845	22460	0	58958	8423	8423	14038	22460	188103
			Time spent (d)	13	6	8	0	21	3	3	5	8	67
Valentina Palucci	Junior scientist, MSc in Genetics	601398	Eligible costs (SEK)	38271	19135	0	10935	32804	8201	5467	16402	27336	158550
			Time spent (d)	14	7	0	4	12	3	2	6	10	58
<b>Eligible costs/Sub-activity (€):</b>				137642	60608	230889	59549	214922	32130	31933	235051	110511	1113235
<b>Time spent/Sub-activity (d):</b>				49	21	72	20	72	11	10	64	36	355

<sup>i</sup> Figures include salary, social costs, vacations and pensions.

**ANNEX I b)**

**ESTIMATED BUDGET FOR LABORATORIES' EXPENDITURE IN RESPECT OF UNION ACTIVITIES,  
INCLUDING THE ORGANISATION OF WORK SHOPS  
FROM 1 JANUARY TO 31 DECEMBER**

**Name and address of the EU Reference Laboratory:**

**EURL for Zootechnics - Interbull Centre**

**Department of Animal Breeding and Genetics, SLU, Box 7023, 750 07 Uppsala, Sweden**

**Bank account to which the financial aid should be transferred:**

**Account no. 5439-1003422, SWIFT-address: ESSESESS**

**IMPORTANT:** All costs are expressed in Swedish Crowns (SEK) – Conversion used: 1 € : 8.7222 SEK

**1. STAFF**

CATEGORY	STATUS	GROSS MONTHLY SALARY	TIME SPENT ON PROJECT (number of days)	TOTAL ELIGIBLE COSTS
Centre Director, PhD in Genetics (JDR)	Official	957180	34	147928
Senior scientist, PhD in Genetics (JJN)	Official	803670	67	244754
Senior scientist, PhD in Genetics (MNI)	Official	617652	67	188103
Junior scientist, MSc in Genetics (EHE)	Official	601398	59	161284
Junior scientist, MSc in Genetics (VPI)	Official	601398	58	158550
Data base administrator, IT specialist (CWN)	Official	668220	70	212615
		4249518	355	1113235

**2. SUBCONTRACTING**

DESCRIPTION	COST EXCLUDING VAT	VAT	TOTAL COST

<b>3. CAPITAL EQUIPMENT</b>									
	DESCRIP- TION	COST / VALUE EXCL. VAT	VAT	TOTAL COST/ VALUE	DATE OF PUR- CHASE OR RENTAL	DATE OF DELIVERY	DEPRE- CIATION PERIOD (36 or 60 months)	% USE FOR PRO- JECT	ANNUAL DEPRE- CIATION COST
3.1.	Equipment to be acquired during the period in question								
3.2.	Equipment acquired before the period in question								

<b>4. CONSUMABLES</b>				
DESCRIPTION BY TYPE		COST EXCLUDING VAT	VAT	TOTAL COST
Printing information material		43611	10903	54514
Genotype database + software		43611	10903	54514

<b>5. THE SHIPMENT OF SAMPLES FOR COMPARATIVE TESTS</b>			
DESCRIPTION	COST EXCLUDING VAT	VAT	TOTAL COST

<b>6. MISSIONS</b>				
DESCRIPTION	TRAVEL COST	HOTEL	DAILY ALLOWANCE	TOTAL

<b>7. MEETINGS</b>				
DESCRIPTION	TRAVEL COST	HOTEL	DAILY ALLOWANCE	TOTAL

<b>8. TRAINING ACTIVITIES</b>	
	COST
PARTICIPANTS' TRAVEL EXPENSES:	
HOTEL EXPENSES	
PARTICIPANTS' DAILY ALLOWANCES:	
TOTAL EXPENDITURE FOR TRAINING ACTIVITIES:	

<b>9. OVERHEADS AND TOTAL EXPENDITURE FOR ACTIVITIES</b>	
TOTAL EXPENDITURE (total items 1 to 8):	1222262
OVERHEADS: 7%	85558
TOTAL EXPENDITURE FOR ACTIVITIES:	1307821

<b>10. WORKSHOPS</b>	
	COST
PARTICIPANTS' TRAVEL EXPENSES:	
HOTEL EXPENSES	
PARTICIPANTS' DAILY ALLOWANCES:	
TOTAL EXPENDITURE FOR WORKSHOP:	

<b>FINAL ESTIMATED BUDGET</b>	
TOTAL EXPENDITURE REGARDING ACTIVITIES:	1307821
TOTAL EXPENDITURE REGARDING THE WORKSHOP:	0
<b>FINAL ESTIMATED BUDGET:</b>	<b>1307821</b>

## Certification by the laboratory:

We certify that:

- the expenditure listed above will be incurred in connection with the tasks defined in the work programme and will be necessary to the performance of those tasks,
- the expenditure will actually be incurred, accurately accounted for and eligible under the provisions of this Regulation,
- all supporting documents relating to the expenditure will be available for inspection,
- no other Union contribution will be requested for the Union reference laboratories activities regarding the financial report to be submitted,
- the grant will not have the purpose or effect of producing a profit for the beneficiary regarding the financial report to be submitted.

Date: August 31, 2013

Technical director:



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João Walter Dürr

Date: December 19, 2013

Finance Officer:



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Erling Strandberg