

European Union Reference Laboratory for Zootechnics Work Plan 2015

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

8/28/2014



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

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European Union Reference Laboratory for Zootechnics (Bovine Breeding) Work Plan 2015

The following work plan presents the work programme for the period January to December 2015, according to the Commission Implementation Decision SANCO/10932/2014 and the Regulation EU/652/2014. 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.

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 official GMACE routine evaluations have been implemented in August 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; 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. In order to address these needs the Interbull Steering Committee has decided during the 2014 ICAR/Interbull meetings in Berlin, Germany, that Interbull will implement immediately the International Genotype Exchange Platform (GENOEX). The objectives of the GENOEX project are: a. establishing the infrastructure necessary for international cooperation based on SNP data; b. optimizing customer investments in genotyping by avoiding duplication; c. establishing standard protocols for genomic data exchange; d. becoming the international source of bovine parentage SNPs; e. facilitating multilateral SNP data exchange by establishing a common repository and customer driven access rules; and f. providing affordable genomic data storage for small populations. The services to be provided through the implementation of GENOEX platform at the Interbull Centre are differentiated into three categories: parentage SNP exchange service (PSE), genomic data exchange service (GDE) and customized genomic repository service (CGR). A step-wise implementation process will be adopted, starting by PSE followed by GDE and CGR.

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 EURLZ activities have basically doubled the amount of work and also the responsibilities of the EURLZ in an extremely short period of time. **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 2015, 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.**

Table 1 – Work programme for the European Union Reference Laboratory for Zootechnics (Bovine Breeding) in 2015. 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	13.0	53
		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		1.0	4
	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)	Number of population-trait-method combinations to be validated (% of all combinations)	0.7	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 runs	Number of test evaluations performed by the EURL (breed-population-trait combinations) to evaluate changes/updates in NRL methodologies	5.6	23
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	Truncated MACE, beef new traits	Number of new methods tested with participation of the NRLs	4.9	20
		2.1.2. Promote the harmonization 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	10.8	44

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 new modules in existing database and a full platform for genotype storage and exchange	Number of protocols published or reviewed	14.7	60
		3.1.2. Develop and implement formal protocols for publication of results	Implement new business rules for exchange of parentage SNP data		2.4	10
	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 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.	9.8	40
		3.2.2. Carry out routine genetic evaluations of beef breeds	September run		4.4	18
		3.2.3. Carry out routine genomic evaluations of dairy breeds	April, August, December runs		4.4	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 routine runs + January and September test runs	Number of international breeding values distributed in each Member State scale	3.4	14
	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 routine runs + January and September test runs	Number of articles from the EURL published in the Interbull Bulletin	1.2	5
		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		1.7	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, Orlando, FL, USA, July 8 to 12, 2015	Number of participating NRLs in the annual workshop (attendance rate)	7.8	32	
		Interbull technical workshop and industry meeting, Verden, Germany, February 24-25, 2015		4.2	17	
	4.2. Organize issue specific technical workshops	Participating Member States are expected to join evaluations for additional breed-trait combinations	Number of NRLs joining evaluations for additional breed-trait combinations	1.7	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	0.7	3
		4.5. Promote harmonisation of evaluations for health, reproduction and other functional traits	Implement new methodology for overall conformation comparisons		1.7	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 the new Mendelian Sampling validation test	Number of NRLs adopting the recommended new methods	2.4	10
		5.2. Investigate problems in harmonisation of methods	Implement new verification tests for acceptance of incoming national data		2.9	12
Total (%):					100	
Total (d):						409

Uppsala, August 28, 2014.

H. Jorjani
Hossein Jorjani
Interbull Centre Interim Director

ANNEX I a)

Activity-based budget.

	Global staff costs		Capital Equipment	Consumables	Shipment of samples for comparative tests	Missions	Training activities	Meeting costs		TOTAL
	Staff costs	Subcontracting						Workshops	Expert Meetings	
Activity 1										
Sub-activity 1.1	151686	0	0	0	0	0	0	0	0	151686
Sub-activity 1.2	71446	0	0	0	0	0	0	0	0	71446
Total activity 1	223132	0	0	0	0	0	0	0	0	223132
Activity 2										
Sub-activity 2.1	192659	0	0	0	0	0	0	0	0	192659
Total activity 2	192659	0	0	0	0	0	0	0	0	192659
Activity 3										
Sub-activity 3.1	194748	0	0	0	0	0	0	0	0	194748
Sub-activity 3.2	209150	0	0	119421	0	0	0	0	0	328570
Sub-activity 3.3	38794	0	0	0	0	0	0	0	0	38794
Sub-activity 3.4	35803	0	0	0	0	0	0	0	0	35802
Total activity 3	478495	0	0	119421	0	0	0	0	0	597915
Activity 4										
Total activity 4	209583	0	0	0	0	0	0	0	0	209583
Activity 5										
Total activity 5	65320	0	0	0	0	0	0	0	0	65320
TOTAL	1169189	0	0	119421	0	0	0	0	0	1288610

Estimated budget per activity and staff member.

Name	Category	Annual Salary (SEK) ¹		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			
Under recruitment ²	Centre Director, PhD in Genetics (UR1)	963540	Eligible costs (SEK)	0	0	8166	20415	0	0	4083	61245	8166	102075
			Time spent (d)	0	0	2	5	0	0	1	14	2	23
Hossein Jorjani	Senior scientist, PhD in Genetics (HJI)	829235	Eligible costs (SEK)	0	10542	31624	17569	31624	7028	10542	52708	17569	179207
			Time spent (d)	0	3	8	5	8	2	3	14	5	48
Mohammad Nilforooshan	Senior scientist, PhD in Genetics (MNI)	637300	Eligible costs (SEK)	29706	16203	13503	0	51311	8101	5401	13503	5401	143128
			Time spent (d)	10	6	5	0	18	3	2	5	2	49
Eva Hjerpe	Junior scientist, MSc in Genetics (EHE)	620529	Eligible costs (SEK)	28924	13147	13147	0	49960	7889	5259	23665	5259	147251
			Time spent (d)	10	5	5	0	18	3	2	8	2	52
Valentina Palucci	Junior scientist, MSc in Genetics (VPI)	620529	Eligible costs (SEK)	36812	18406	0	13147	26295	7889	5259	23665	23665	155139
			Time spent (d)	13	7	0	5	9	3	2	8	9	55
Under recruitment 2	Junior scientist, MSc in Genetics (UR2)	620529	Eligible costs (SEK)	28924	13147	13147	0	49960	7889	5259	18406	5259	141992
			Time spent (d)	10	5	5	0	18	3	2	7	2	50
Carl Wasserman	IT Manager (CWN)	689477	Eligible costs (SEK)	14608	0	87649	29216	0	0	0	8765	0	140238
			Time spent (d)	5	0	28	10	0	0	0	3	0	45
Petri Penannen	Programmer (PPN)	599940	Eligible costs (SEK)	12711	0	25422	114400	0	0	0	7627	0	160160
			Time spent (d)	5	0	9	42	0	0	0	3	0	59
Eligible costs/Sub-activity (SEK):				151686	71446	192659	194748	209150	37794	35803	209583	65320	1169189
Time spent/Sub-activity (d):				53	24	62	65	71	13	11	62	21	381

¹ Figures include salary, social costs, vacations and pensions.

² There are currently two vacant positions at the Interbull Centre, Centre Director and Junior Geneticist. Both have already been advertised and the selection process will take place in September 2014.

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
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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 € : 9.15 SEK

1a. STAFF

CATEGORY	STATUS	GROSS MONTHLY SALARY	TIME SPENT ON PROJECT (number of days)	TOTAL ELIGIBLE COSTS
Centre Director, PhD in Genetics (UR1)	Official	963540	23	102074
Senior scientist, PhD in Genetics (HJI)	Official	829235	48	179207
Senior scientist, PhD in Genetics (MNI)	Official	637300	49	143128
Junior scientist, MSc in Genetics (EHE)	Official	620529	52	147251
Junior scientist, MSc in Genetics (VPI)	Official	620529	55	155139
Junior scientist, MSc in Genetics (UR2)	Official	620529	50	141992
IT Manager (CWN)	Official	689477	45	140238
Programmer (PPN)	Official	599940	59	160160
TOTAL:		5581079	381	1169189

Percentage of the laboratory's overall budget: 84.8%

1b. SUBCONTRACTING

DESCRIPTION	COST EXCLUDING VAT	VAT	TOTAL COST

Percentage of the laboratory's overall budget: 0%

2. CAPITAL EQUIPMENT

	DESCRIPTION	COST / VALUE EXCL. VAT	VAT	TOTAL COST / VALUE	DATE OF PURCHASE OR RENTAL	DATE OF DELIVERY	DEPRECIATION PERIOD (36 or 60 months)	% USE FOR PROJECT	ANNUAL DEPRECIATION COST
3.1.	Equipment to be acquired during the period in question								
3.2.	Equipment acquired before the period in question								

Percentage of the laboratory's overall budget: 0%

3. CONSUMABLES			
DESCRIPTION BY TYPE	COST EXCLUDING VAT	VAT	TOTAL COST
Software license (Mix99)	128100	0	119421
TOTAL:			119421

Percentage of the laboratory's overall budget: 8.7%

4. SHIPMENT OF SAMPLES FOR COMPARATIVE TESTS			
DESCRIPTION	COST EXCLUDING VAT	VAT	TOTAL COST

Percentage of the laboratory's overall budget: 0%

5. MISSIONS				
DESCRIPTION	TRAVEL EXPENSES	HOTEL EXPENSES	DAILY ALLOWANCES	TOTAL

Percentage of the laboratory's overall budget: 0%

6. MEETINGS

6a. WORKSHOPS		COST
PARTICIPANTS' TRAVEL EXPENSES:		
HOTEL EXPENSES		
PARTICIPANTS' DAILY ALLOWANCES:		
TOTAL EXPENDITURE FOR TRAINING ACTIVITIES:		

Percentage of the laboratory's overall budget: 0%

6b. EXPERT MEETINGS				
DESCRIPTION	TRAVEL EXPENSES	HOTEL EXPENSES	DAILY ALLOWANCES	TOTAL

Percentage of the laboratory's overall budget: 0%

7. TRAINING ACTIVITIES		COST
PARTICIPANTS' TRAVEL EXPENSES:		
HOTEL EXPENSES		
PARTICIPANTS' DAILY ALLOWANCES:		
TOTAL EXPENDITURE FOR TRAINING ACTIVITIES:		

Percentage of the laboratory's overall budget: 0%

8. OVERHEADS AND TOTAL EXPENDITURE FOR ACTIVITIES	
TOTAL EXPENDITURE (total items 1 to 7):	1288610
OVERHEADS: 7%	990203
TOTAL EXPENDITURE FOR ACTIVITIES:	1378813

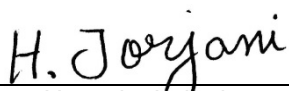
Certification by the laboratory:

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 28, 2014

Date: August 28, 2014



Hossein Jorjani
Dept. Animal Breeding and Genetics Head,
Interbull Centre Interim Director



Erling Strandberg
Interbull Secretary