

INTERBULL CENTRE

ANNUAL OPERATING PLAN 2022



JANUARY 2022

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1 ABOUT INTERBULL

<p>OUR MISSION</p> <p>To enhance livestock genetic improvement through international data exchange and best methods development.</p>	<p>OUR VISION</p> <p>To be the worldwide network providing information services for the genetic improvement of livestock.</p>
<p>Interbull comprises Interbull Centre, an operational unit that provides services to its members and service users, and is governed by the Interbull Steering Committee, which is a permanent sub-committee of the International Committee for Animal Recording (ICAR).</p>	<p>OUR OBJECTIVE</p> <p>To support the cattle industry with accurate genetic information on bulls of the major breeds for use by importers and exporters, thereby facilitating selection of the best genetics for different countries, environments, or breeding goals.</p>

2 INTRODUCTION

The Interbull 2020-2023 Strategic Plan outlines the changes Interbull envisages during the considered three years. The plan sets out how Interbull will perform its activities towards its mission to enhance livestock genetic improvement through international data exchange and best methods development by focusing on six strategic goals.

1. Meeting future data service needs
2. Defining a new traits pipeline
3. Providing international evaluations in the genomic era
4. Continuously improve core services
5. Strengthening governance
6. Driving branding and marketing

This Annual Operating Plan (AOP) describes Interbull’s focus activities, projects, and outputs for achieving its goals. This AOP 2022 is the second AOP that is written on the basis of the Interbull 2020-2023 Strategic Plan. AOP 2022 specifies the forecast expenditure on the activities and projects that will deliver on the 2020-2023 Strategic Plan, during the 2022 calendar year, by the Interbull Centre, the Interbull’s operational unit.

This AOP also includes the activities pertaining to Interbull Centre regarding Interbeef and EU Reference Centre. Interbull continues to engage with representatives from the Interbull Steering Committee (SC), the Interbull Technical Committee (ITC), ICAR and ICAR Groups, the Interbull Centre, and Interbeef as well as Interbull Service Users to develop the research, services and capability that will deliver against these strategic goals.

INTERBULL STRATEGY 2020 -2023

OUR VISION: To be the worldwide network providing information services for the genetic improvement of livestock.



Meeting future data service needs

OBJECTIVES

- Maintain existing data exchange services
- Expand data sharing
- Understand and meet future data needs

ACTIVITIES

- Deliver and improve data exchange services
- Conduct a needs analysis
- Expand services where a compelling business case exists
- Collaborate with big data users



Defining a new traits pipeline

OBJECTIVES

- Identify key decision factors
- Define the service need
- Define and maintain relevant business models and fee structures

ACTIVITIES

- Appoint a Working Group
- Identify key decision factors for implementing any trait
- Define infrastructure needed and programs /methodology
- Develop business model, Business Plan and appropriate fee structure



Providing international evaluations in the genomic era

OBJECTIVES

- Provide international genomic information
- Develop a system where all data can be used in one single step model
- Develop new methodologies

ACTIVITIES

- Provide input into genomic evaluation and SNPMap implementation
- Develop system for optimal use of genomic and conventional information
- Develop new methodologies and validations



Continuously improving core services

OBJECTIVES

- Maintain high levels of service user satisfaction
- Maintain relevant and accurate methods and tools

ACTIVITIES

- Assess customers' satisfaction, needs and demands
- Regularly review and adjust methods and tools
- Regularly review results and update programming if required



Strengthening governance

OBJECTIVES

- Responsive and transparent decision-making
- Maintain a fit-for-purpose governance structure

ACTIVITIES

- Document and review existing governance model
- Better define relationship between ICAR and Interbull groups
- Ensure Interbull Centre is appropriately resourced
- Ensure best-practice systems, processes and reporting are in place



Driving branding and marketing

OBJECTIVES

- A clearly understood value proposition for Interbull
- Timely and sufficient communication and marketing

ACTIVITIES

- Better define services offered
- Clearly define the value proposition
- Specify target markets or audiences
- Develop a communication and marketing plan
- Stakeholder surveys or interviews where appropriate

Customer orientated

Accurate

Unbiased

Independent

Integrity

Transparent

Cost-effective

Innovative & leading-edge services

3 INTERBULL CENTRE PRIORITIES FOR 2022

Interbull Centre's highest priority is the delivery of its current Services. In case of a lack of resources, the staff will focus on ensuring high-quality Service delivery, which may cause a delay or rescheduling of Strategic Goals' tasks. The '**MUST DO**' priorities for 2022 have been identified as follows:

SERVICE DELIVERY

- **High-quality delivery of Interbull Centre's Services**, as the operational unit for Interbull and Interbeef, and as the European Union Reference Centre for Zootechnics, according to processes and procedures defined in the Quality Management System (QMS).
- **Maintenance of Interbull Centre's Infrastructure**, software and programs to guarantee an updated and efficient IT environment towards high quality services delivery.
- **Interbull Centre Staff training**: in order to have uninterrupted services it is important to build the capability and capacity so that more than one person can provide each of the services.

STRATEGIC GOALS

STRATEGIC GOAL 1 - Meeting future data service needs

- **International Genotype Exchange Platform**: Improve the quality of the Platform's **Genomic Data Exchange (GenoEx-GDE)** by finalising database features regarding checks on users' data; streamline data accessibility by developing and implementing new database features; Improve platform's value by including complete SNP arrays' information.
- **Performance Recording, Evaluation and Publication Database ("PREP Db")**: Launch the PREP Db platform and finalise population activity with standardised and reviewed Dairy and Beef traits information.

STRATEGIC GOAL 2 - Defining a new traits pipeline

- The "**New Traits Pipeline**" WG appointed in 2021 will continue its activity towards a final implementation of procedures for introducing new traits: among the ones evaluated in current Interbull Centre's Services or towards the development of new Services.

STRATEGIC GOAL 3 - Providing international evaluations in the genomic era

- Define the Business Model and release the results of the Pilot Run for the "**SNPMace**" project, as next steps towards offering a service at the Interbull Centre that performs **meta-analyses to estimate SNP effects** by combining information from multiple countries without the exchange of genotypes.
- Implement "**Future MACE**" software in MACE services to **increase MACE robustness** to bias due to genomic pre-selection.
- Set up the **Interbeef Genomic Task Force** and **Working Group** which shall, respectively address business/political/operational and technical topics for the development and implementation at the Interbull Centre of an **international genomic beef evaluation**.

STRATEGIC GOAL 4 - Continuously improve core services

- Maintain an up-to-date **QMS**, incorporating changes in the operating and management system.
- Implement **genetic groups** in **Interbeef** evaluations.
- Finalise the Interbull Centre's activities for the EU-funded project "Genomic management tools to optimise resilience and efficiency ("**GenTORE**")", regarding the development of an international genetic evaluation of the trait "Age at Slaughter" in the context of Interbeef.
- Perform a **customer satisfaction survey**, and develop a follow up plan.

- **Identify potential emerging problems** in relation to genetic and genomic evaluations, and provide contingency plans.

STRATEGIC GOAL 5 - Strengthening governance

- Communicate the outcomes of the **Interbull Governance Review** that was undertaken in 2021, and plan follow up to the review to strengthen governance.
- Ensure appropriate **resources at the Interbull Centre** to support activities for Interbull, Interbeef, GenoEx and European Union Reference Centre (EUrc).

STRATEGIC GOAL 6 - Driving branding and marketing

- **Provide clear, customer-focused descriptions of all key services;** Interbull, Interbeef, GenoEx, and EUrc.
- Clearly define **value propositions** for each of Interbull's key Services.
- Publish the proceeding of the 2022 Interbull Meeting (Montreal – Canada) issuing the Interbull Bulletin n. 57.

4 INTERBULL CENTRE ANNUAL OPERATING PLAN FOR 2022

The 'Priority' assessment is based on the following 'traffic light' system, where green has the highest priority:

MUST DO	<ul style="list-style-type: none"> • Must have this requirement to meet the business needs. The must requirements are non-negotiable. • Critical to the current delivery timeframe in order for the project or organisation to be a success
Should do	<ul style="list-style-type: none"> • Should have this requirement if possible, but project or organisational success does not rely on it • Important but not necessary for delivery in the current delivery timeframe • They are often not as time-critical or there may be another way to satisfy the requirement so that it can be held back until a future delivery timeframe
could do	<ul style="list-style-type: none"> • Could have this requirement if it does not affect anything else in the project or organisation • Desirable but not necessary, e.g. could improve the user experience or customer satisfaction for little development cost • These will typically be included if time and resources permit

The 'Effort' assessment is based on a 'traffic light' system where green constitutes the least effort.

minor	<ul style="list-style-type: none"> • Under 4 weeks total time requirement
Moderate	<ul style="list-style-type: none"> • 4 to 8 weeks
SIGNIFICANT	<ul style="list-style-type: none"> • Greater than 8 weeks

Activities that depend on external activities have been included and have been identified in italics.

4.1 SERVICES

High-quality delivery of Interbull Centre's services is critical to its success. All of Interbull Centre's current services are hence identified as 'MUST DO'. Delivery of the services accounts for approximately 60% of Interbull Centre resources. Most services require a significant amount of resources.

SERVICE	EFFORT	PRIORITY
International Evaluation Services:		
MACE	SIGNIFICANT	MUST DO
TMACE	Moderate	MUST DO
GMACE	SIGNIFICANT	MUST DO
InterGenomics	SIGNIFICANT	MUST DO
Interbeef	SIGNIFICANT	MUST DO
Validation Services:		
Validation Services (including EUrc validations)	SIGNIFICANT	MUST DO
ICAR DNA Interpretation Centre Accreditation	Moderate	MUST DO
Data Exchange:		
GenoEx-PSE	Moderate	MUST DO
AnimInfo: Exchange of Genetic Traits (WHFF), Coat Colour	minor	MUST DO
Communication:		
Communication includes Hosting and maintaining Interbull websites, Organisation of meetings and Publication of Interbull Bulletin	SIGNIFICANT	MUST DO
European Union Reference Centre (EUrc)		
Activities related to Interbull Centre's mandate as European Union Reference Centre	SIGNIFICANT	MUST DO

4.2 INFRASTRUCTURE

Infrastructure is required for Interbull Centre to be able to provide the services listed above. One of the cornerstones is to keep customer data safe and with correct access and integrity by using Free and Open Source software.

Interbull Infrastructure is built up with multiple systems:

- **Production systems:** where customers handle their data upload/download (IDEA, GenoEx and PREP);
- **Calculating system:** containing 20 calculating servers and 3 file storage clusters;
- **Web Services:** both for external and internal use (Gitlab repository, forum, chat, wiki, Interbull Bulletin, ftp-server, document share, survey, password share and instances of test servers);
- **Backups and replications.**

In order to guarantee an updated and efficient environment towards high quality services delivery, the maintenance and development activities of Interbull Centre's infrastructure will consider:

- production system;
- calculating system;
- web services;
- software and programs.

IT MAINTENANCE AND DEVELOPMENT ACTIVITIES	DELIVERABLES IN 2022	2022 TARGET / OUTCOMES	EFFORT	PRIORITY
(M) 1. Maintenance of Production systems	1.1 IDEA	1.1.1. Systems error free with full uptime	Moderate	MUST DO
	1.2 GenoEx	1.2.1 Systems error free with full uptime	Moderate	MUST DO
	1.3 PREP Db	1.3.1 Systems error free with full uptime	Moderate	MUST DO
(M) 2. Maintenance and development of Calculating System	2.1 Crunchers maintenance	2.1.1 Crunchers running	Moderate	MUST DO
	2.2 SLURM implementation	2.2.1 SLURM implementation	Moderate	Should do
		2.2.2 Adapt Services workflows to SLURM	SIGNIFICANT	Should do
(M) 3. Maintenance and development of web services	3.1 Maintenance of system and possible related issues	3.1.1 Websites available	Moderate	MUST DO
	3.2 Improvement of www.interbull.org website structure/ navigation/interface	3.2.1 Resources assessment; website restructuring for improved navigability	minor	could do
		3.2.2 Fix display of WIKI pages with Table of Content on current webpage	SIGNIFICANT	Should do
	3.3 Interbull Bulletin: assessment of alternative solutions.	3.3.1 Identify possible alternatives for hosting and handling Interbull Bulletin platform	Moderate	could do
(M) 4. Maintenance of software and programs	4.1 Transition from SAS to Python3	4.1.1 InterGenomics SAS programs converted in Python 3	minor	MUST DO
	4.2 Transition from Python2 to Python3	4.2.1 All available Python 2 programs converted in Python 3	SIGNIFICANT	MUST DO
	4.3 Clean up Wall warnings in Fortran code	4.3.1 No Wall warnings	Moderate	could do
	4.4 Transition from Fortran 90 to Fortran 2018 standard	4.4.1 All Fortran 90 code compiled in Fortran 2018 standard	Moderate	could do
	4.5 Transfer of R&D packages to production environment	4.5.1 All software in production environment is in line with ITBC IT policies	Moderate	MUST DO

4.3 INTERBULL CENTRE PLANNER 2022

JANUARY			FEBRUARY			MARCH			APRIL			MAY			JUNE		
1			1	MACE test	IG test	GMACE test			1						1		
2			2						2						2		
3			3						3						3		
4			4						4						4		
5			5						5						5		
6			6						6						6		
7			7		IG test	GMACE test			7						7		
8			8						8						8		
9			9						9						9		
10			10						10						10		
11	MACE test	IG test							11						11		
12			12						12						12		
13			13						13						13		
14			14						14						14		
15			15						15						15		
16			16						16						16		
17	MACE test	IG test							17						17		
18			18						18						18		
19			19						19						19		
20			20						20						20		
21			21						21						21		
22			22						22						22		
23			23						23						23		
24	MACE test	IG test							24						24		
25			25						25						25		
26			26						26						26		
27			27						27						27		
28			28						28						28		
29			29						29						29		
30			30						30						30		
31			31						31						31		

JULY			AUGUST			SEPTEMBER			OCTOBER			NOVEMBER			DECEMBER		
1			1			1	MACE test	IG test	1			1			1		
2			2			2			2			2			2		
3			3			3			3			3			3		
4			4			4			4			4			4		
5			5			5	MACE test	IG test	5			5			5		
6			6			6			6			6			6		
7			7			7			7			7			7		
8			8			8			8			8			8		
9			9			9			9			9			9		
10			10			10			10			10			10		
11			11			11			11			11			11		
12			12			12	MACE test	IG test	12			12			12		
13			13			13			13			13			13		
14			14			14			14			14			14		
15			15			15			15			15			15		
16			16			16			16			16			16		
17			17			17			17			17			17		
18			18			18			18			18			18		
19	MACE rout.	IG rout.				19	MACE test	IG test	19			19			19		
20			20			20			20			20			20		
21			21			21			21			21			21		
22			22			22			22			22			22		
23			23			23			23			23			23		
24			24			24			24			24			24		
25	MACE rout.	IG rout.	GMACE rout.			25	MACE test	IG test	25			25			25		
26						26			26			26			26		
27						27			27			27			27		
28						28			28			28			28		
29						29			29			29			29		
30						30			30			30			30		
31						31			31			31			31		

4.4 MEETINGS and COMMUNICATIONS CALENDAR 2022

Interbull SC

Interbull Steering Committee Meetings are held by video conference unless otherwise indicated:

16 February 2022

28 April 2022

29 May 2022 in person, during the Interbull annual meeting/ICAR conference - Montreal (Canada)

31 May 2022 in person, during the Interbull annual meeting/ICAR conference - Montreal (Canada)

June 2022 (Date TBC)

September 2022 (Date TBC)

November 2022 (Date TBC)

December 2022 (Date TBC)

Interbull Technical Committee

8 March 2022 on-line.

28 May 2022 in person, during the Interbull annual meeting/ICAR conference - Montreal (Canada)

31 May 2022 in person, during the Interbull annual meeting/ICAR conference - Montreal (Canada)

November 2022 (Date TBC)

Interbeef-WG and Technical Committee

21 January 2022 on-line, 10.00-12.30 CET

11 March 2022 on-line, 10.00-12.30 CET

29 May 2022 in person, during the Interbull annual meeting/ICAR conference - Montreal (Canada)

12 July 2022 on-line, 10.00-12.30 CET

22 November 2022 on-line, 10.00-12.30 CET

ICAR-Interbull Meeting 2022 (Montreal, Canada; ICAR2022.CA)

ICAR Annual Meeting: 30 May – 3 June 2022, Montreal (Canada)

Interbull Annual Meeting: 28 – 31 May 2022, Montreal (Canada)

- 28 May 2022: ITC Meeting
- 29 May 2022: SC Meeting and Interbeef Meetings
- 30 May 2022: Open Meetings
- 31 May 2022: Open Meetings, Business Meeting, ITC and SC Meetings
- 1 June 2022: ICAR AGM, General Assembly and Joint ICAR-Interbull Session

Publications:**Interbull Centre Annual Report**

March 2022

Interbull Executive Summary

1 April 2022; 1 July 2022; 28 October 2022; 21 December 2022

Interbull Bulletin

Issue No. 57 (2022): Proceedings of the 2022 Interbull Meeting: September 2022.

Interbull Centre Annual Operational Plan 2023

January 2023.

4.5 RESEARCH AND DEVELOPMENT

STRATEGIC GOAL 1 Meeting future data service needs		OBJECTIVES 1A. Maintain existing data exchange services 1B. Expand data sharing 1C. Understand and meet future data needs		
FOCUS ACTIVITIES	DELIVERABLES IN 2022	2022 TARGET / OUTCOMES	EFFORT	PRIORITY
1.1 Deliver and improve data exchange services.	1.1.1 GenoEx-GDE 2.0	1.1.1 b) Improved Quality of the Service by developing and implementing additional database features (i.e. cross-reference ICAR DNA WG recommendations on genotypes quality control; connect GenoEx-GDE to IDEA)	SIGNIFICANT	MUST DO
		1.1.1 d) Streamlined data exchange and accessibility (develop server and client-side web API)	Moderate	MUST DO
		1.1.1. e) Improve platform's value by including complete information of SNP arrays.	SIGNIFICANT	MUST DO
	1.1.3 Performance Recording, Evaluation and Publication Database (PREP Db) - EUrc	1.1.3 a) PREP Db populated with standardised and reviewed Dairy and Beef traits information.	SIGNIFICANT	MUST DO
		1.1.3 b) Standardise and review set of questions (finalising the XML forms needed for populating the database with data) for: - Dairy traits - Beef traits	SIGNIFICANT	MUST DO
		1.1.3 c) User interface available for uploading and looking up of information	SIGNIFICANT	MUST DO
		1.1.3 d) Provide information and guidance on the use of the PREP Db	SIGNIFICANT	MUST DO
		1.1.3 e) Incorporate structure to collect information for New Traits Pipeline	Moderate	MUST DO
		1.1.3. f) Launch of PREP Db	SIGNIFICANT	MUST DO

	1.1.4 Standardisation and data exchange of Beef Genetic Traits	1.1.4 a) Expand Genetic Traits Exchange to beef breeds and associations.	minor	could do
1.2 Expand services where a compelling business case exists.	1.2.1 GenoEx-GDE opened for wider use.	1.2.1 a) Use of GenoEx-GDE extended to additional Users (InterGenomics-Holstein, Interbeef)	minor	Should do
		1.2.1 b) GenoEx-GDE Business Model	Moderate	Should do
	1.2.2 Extend the use of GenoEx-PSE to additional Users	1.2.2 a) Increased number of users for GenoEx-PSE.	minor	Should do
		1.2.2 b) Release Parentage Discovery features in GenoEx-PSE	minor	Should do
1.3 Conduct a needs analysis to understand future data exchange requirements.	1.3.1 Analysis of Interbull Centre Infrastructure against needs	1.3.1 a) Asses the needs against current infrastructure as a result of information gathered (through PREP, NTP, surveys)	Moderate	could do
		1.3.1 b) Assess development needs of databases and infrastructure	Moderate	could do
	1.3.2 Proposal presented to the Interbeef-WG for improving and expanding information exchange services related to Interbeef	1.3.2 a) Investigate new types of information that could be exchanged at Interbeef community level and provide recommendations to Interbeef-WG	Moderate	could do
1.4 Collaborate with big data users.	1.4.1 Identify possible valuable collaboration with big data users	1.4.1 a) Identify possible valuable collaboration with big data users by attending international meetings, conferences and events	Minor	could do

STRATEGIC GOAL 2 Defining a new traits pipeline		OBJECTIVES 2A. Identify the key decision factors 2B. Define the service need 2C. Define and maintain business models and fee structures		
FOCUS ACTIVITIES	DELIVERABLES IN 2022	2022 TARGET / OUTCOMES	EFFORT	PRIORITY
2.1 Identifying key decision factors for implementing any trait	2.1.1 Release of “New Traits Pipeline” principles.	2.1.1 a) Present the principles of a required pipeline for a new trait implementation.	Moderate	MUST DO
2.2 Define infrastructure needed and programs/methodology	2.2.1 Testing of “New Traits Pipeline” procedures.	2.2.1 a) Carry out survey to analyse stakeholders’ interests in international evaluation of additional traits	minor	could do
		2.2.1 b) Identify which trait(s) (if any) to be prioritised/ proposed into the New Traits pipeline.	Moderate	MUST DO
2.3 Develop business model, Business Plan and appropriate infrastructure. “Business Funding Models Task Force” (BFMTF)	2.3.1 Business Model principles for new traits to be introduced and/or Services to be released.	2.3.1 a) Present (verify existing or develop a new) business model and appropriate fee structure for each new trait and service to be introduced.	Moderate	Should do

STRATEGIC GOAL 3 Providing international evaluations in the genomic era		OBJECTIVES 3A. Provide international genomic information 3B. Develop a system where all data can be used in one single step model 3C. Develop new methodologies		
FOCUS ACTIVITIES	DELIVERABLES IN 2022	2022 TARGET / OUTCOMES	EFFORT	PRIORITY
3.1 Provide input into genomic evaluation and SNPmace implementation.	3.1.1 SNPmace implementation	3.1.1 c) Validation analyses finalised	Moderate	Should do
		3.1.1 d) Issue a data call	Moderate	MUST DO
		3.1.1 e) Pilot run performed	SIGNIFICANT	MUST DO
		3.1.1 f) SNPmace Business Model developed	SIGNIFICANT	MUST DO
3.2 Develop system for optimal use of genomic and conventional information	3.2.1 Future MACE software	3.2.1 b) Implementation of Future MACE software in MACE Service	SIGNIFICANT	MUST DO
	3.2.2 Principles of the Interbeef Genomic Evaluation	3.2.2 a) "Interbeef Genomic Task Force" and "Genomic Technical WG" appointed; Task Force's and WG's ToR finalised	Moderate	MUST DO
		3.2.2 b) Defined the Business Model for Future Interbeef Genomic Services	Moderate	Should do
		3.2.2 c) Technical development and implementation of Interbeef Genomic Evaluation.	SIGNIFICANT	could do
3.3 Develop new methodologies and validations	3.3.1 Methods and guidelines for validation of beef evaluations.	3.3.1 a) Continue the development of methods and guidelines for validation of models used at national level for beef breeds evaluations.	Moderate	Should do
	3.3.2 Methods and guidelines for validation of dairy evaluations.	3.3.2 a) Continue the development of methodologies for validation of models used at national level for dairy breeds evaluations.	Moderate	Should do
	3.3.3 Technical-strategy for next 5 years	3.3.3 a) Technical-strategic (ITC/SAC) meeting convened	minor	Should do

STRATEGIC GOAL 4 Continuously improve core services		OBJECTIVES 4A. Maintain high level of service user satisfaction 4B. Maintain relevant and accurate methods and tools.		
FOCUS ACTIVITIES	DELIVERABLES IN 2022	2022 TARGET / OUTCOMES	EFFORT	PRIORITY
4.1 Assess customer satisfaction, needs, and demands	4.1.1 Fulfilment of customers' needs (mainly based on customers satisfaction survey 2020)	4.1.1 f) Maintain converting programs from flat files to XML for handling new Interbeef traits	minor	could do
		4.1.1 g) IDEA modified to upload traits with multiple observations per animal	Moderate	could do
	4.1.2 Update of QMS according to changes in operating and management system during 2022	4.1.2 a) QMS updated	Moderate	MUST DO
	4.1.3 2022 customers' satisfaction survey.	4.1.3 a) Issue the 2022 customers' satisfaction survey	minor	MUST DO
		4.1.3 b) Review of 2022 customers' satisfaction survey results	Moderate	MUST DO
	4.2 Regularly review and adjust methods and tools	4.2.3 IG2.0	4.2.3 a) Finalise IG2.0 new agreement.	Moderate
4.2.3 c) Implement Interbull Method for Genomic Reliability in InterGenomics-Brown Swiss			Moderate	Should do
4.2.3 d) Develop procedures and pipelines			SIGNIFICANT	could do
4.2.4 InterGenomics-Brown Swiss; InterGenomics-Holstein		4.2.4 a) Cross-referencing Service's quality checks with ICAR DNA WG recommendations	minor	MUST DO
4.2.5 GenTORE – international evaluation for “Age at Slaughter” results released to Interbeef members.		4.2.5 d) Finalisation of activities.	Moderate	MUST DO
4.2.6 Interbeef Genetic Evaluation of Carcass Traits		4.2.6 a) Performing the research runs towards a Service Pilot run	Moderate	Should do
4.2.9 ICAR guidelines (EUrc)		4.2.9 b) Expand existing ICAR/Interbull guidelines with inclusion of specific genomic related information	Moderate	Should do
		4.2.9 c) To establish a sheared set of guidelines between ICAR/Interbeef/BIF	Moderate	Should do
4.2.10 Interbeef Genetic Evaluation of Female Fertility traits.		4.2.10 a) Results on Female Fertility traits investigations.	Minor	could do
4.2.11 GMACE implementation of mix99 software		4.2.11 a) implement mix99 in GMACE evaluation workflow	Moderate	could do
4.2.12 Implementation of Genetic Groups in Interbeef Genetic Evaluations		4.2.12 a) Genetic groups implemented in Interbeef evaluations.	Moderate	MUST DO

	4.2.13 ICAR DNA Data Interpretation Centre, Accreditation for Parentage Discovery	4.2.13 a) Interbull Centre to provide technical part of the accreditation.	minor	Should do
4.3 Regularly review results and update programming if necessary.	4.3.1 Identify potential emerging problems in relation to genetic and genomic evaluations, and provide contingency plans	4.3.1 a) Identify any potential emerging problems in relation to genetic and genomic evaluations.	minor	MUST DO
		4.3.1 b) Provide contingency plans if needed	minor	Should do
		4.3.1 c) Extend checks of CheckProofPara.py program: add check for average number of herds/daughters per trait.	minor	Should do
		4.3.1 d) GMACE: add check on scale. Re-assess requirements and implement check in IDEA	minor	Should do

STRATEGIC GOAL 5 Strengthening governance		OBJECTIVES 5A. Develop responsive and transparent decision-making 5B. Maintain a fit-for-purpose governance structure		
FOCUS ACTIVITIES	DELIVERABLES IN 2022	2022 TARGET / OUTCOMES	EFFORT	PRIORITY
5.1 Document and review the existing Interbull governance model	5.1.1 Evaluate decision-making processes and Interbull resourcing to support such process	5.1.1 a) Plan on the basis of Recommendations and Response Table	minor	MUST DO
		5.1.1 b) Report on the Governance Review to the wider community	minor	MUST DO
	5.1.3 Implementation of new Governance	5.1.3 a) Implementation of new Governance	Moderate	Should do
5.2 Better define the relationship between ICAR (C'tees and WGs), SLU, Steering Committee, ITB Centre, Interbeef and IB Business Meeting delegates	5.2.1 Review of the Terms of Reference	5.2.1 a) SC agreement on necessary changes to the Terms of Reference	Moderate	Should do
		5.2.1 b) Review of various WG ToRs (and membership)	Moderate	Should do
5.3 Ensure Interbull Centre is appropriately resourced	5.3.1 Evaluate Interbull Centre resourcing to support activities for Interbull, Interbeef and EUrc	5.3.1 a) Budget	Moderate	MUST DO
		5.3.1 b) AOP	Moderate	MUST DO
5.4 Ensure best-practice systems, processes and reporting are in place	5.4.1 Annual evaluation of governance and Steering Committee performance	5.4.1 a) Annual report on governance and SC performance	minor	could do
	5.4.2 Electronic Governance Handbook	5.4.2 a) Robust documented policies and procedures are in place and accessible to Interbull Centre staff and relevant committee, WG and TF members.	Moderate	Should do

STRATEGIC GOAL 6 Driving branding and marketing		OBJECTIVES 6A. Clearly define Interbull's value proposition 6B. Improve communication and marketing		
FOCUS ACTIVITIES	DELIVERABLES IN 2022	2022 TARGET / OUTCOMES	EFFORT	PRIORITY
6.1 Better define offered services	6.1.1 Customer focused description of services.	6.1.1 a) All key Interbull, Interbeef, EUrc, and GenoEx services description completed.	Moderate	MUST DO
6.2 Clearly define the value proposition of Interbull's core services	6.2.1 Value proposition for each of Interbull's core services described	6.2.1 a) Finalised value propositions for core services	Moderate	MUST DO
		6.2.1 b) Increase Interbull Centre's visibility as European Union Reference Centre for Zootechnics	Moderate	Should do
6.3 Specify target markets or audiences through identifying who uses which methodologies	6.3.1 Description of potential target markets/audiences	6.3.1 a) Potential target markets/audiences identified and described	Moderate	could do
		6.3.1 b) Increase awareness and participation to the existing WHFF genetic traits.	minor	could do
6.4 Develop a communication and marketing plan	6.4.1 Communication with stakeholders	6.4.1 a) Targeted Communication: Communicate and engage with stakeholders through Executive Summary, meetings, workshops, etc.	Moderate	Should do
		6.4.1 b) Broad Communication: distribute newsletters and assure website's content up-to-date and relevant	Moderate	Should do
		6.4.1 c) Issue Interbull Bulletin	Moderate	MUST DO
		6.4.1 d) Alternative Communication: Develop and deliver alternatives for communication (Open Meeting – Business Meeting)	Moderate	Should do
	6.4.2 Draft communication and marketing plan written	6.4.2 a) Endorsement by SC of a draft communications and marketing plan	minor	Should do
	6.4.3 Restructuring of Interbull Centre webpage	6.4.3 a) Restructuring of Interbull Centre webpage.	SIGNIFICANT	Should do
6.5 Stakeholder surveys or interviews, where appropriate	6.5.1 Conduct surveys and interviews as necessary to support work on 6.1-6.4	6.5.1 a) Necessary surveys and interviews conducted to inform and support the other key focus activities	Moderate	Should do

5 ACRONYMS

AWW	Adjusted Weaning Weight
BSW	Brown Swiss
EBV	Estimated Breeding Values
EUrc	European Union reference centre
GenoEx	International Genotype Exchange Platform: a database situated in the Interbull Centre for the storage and exchange of genomic data.
GenoEx-GDE	Genomic Data Exchange on the GenoEx Platform: A service provided by the Interbull Centre through the GenoEx Platform that allows users to exchange genomic data
GenoEx-PSE	Parentage SNP Exchange on the GenoEx Platform: A service provided by the Interbull Centre through the GenoEx Platform for exchanging standardised sets of SNPs for genotyped animals to facilitate parentage analysis activities.
GenTORE	Genomic management Tools to Optimise Resilience and Efficiency - a European Union funded project within the Research and Innovation Program H2020.
GDE	Genomic Data Exchange
GMACE	Genomic MACE: International Genomic Evaluation Methodology used at Interbull Centre
GREL	Genomic Reliability Calculation
HOL	Holstein
ICAR	International Committee for Animal Recording www.icar.org
ICBF	Irish Cattle Breeding Federation
IDEA	Interbull Data Exchange Area
IG2.0	InterGenomics 2.0: Second stage of InterGenomics with additional focus on Quality Assurance.
Interbeef	ICAR's Interbeef WG, for the international evaluation of beef cattle. Interbeef evaluations are performed at the Interbull Centre
INTERBULL	International Bull Evaluation Services www.interbull.org
InterGenomics	International Genomic Evaluation Service performed at the Interbull Centre for the Brown Swiss and Holstein breeds
ITB	Interbull
ITBC	Interbull Centre
ITC	Interbull Technical Committee
MACE	Multiple Across Country Evaluation: International Genetic Evaluation Methodology used at Interbull Centre
NGEC	National Genetic Evaluation Centre
PDF	Portable Document Format
PREP Db	Database with information on Performance Recording, Evaluation and Publication of national cattle populations.
PSE	Parentage SNP Exchange
QMS	Quality Management System
SAC	Interbull Scientific Advisory Committee
SC	Interbull Steering Committee
SLU	Sveriges lantbruksuniversitet: Swedish University of Agricultural Sciences
SLURM	Simple Linux Utility for Resource Management, Job queueing and computer resource management system. https://slurm.schedmd.com/
SNP	Single Nucleotide Polymorphisms
snpMACE	A meta-analysis to estimate SNP effects across countries
TF	Task Force
TMACE	Truncated MACE: Service provided by the Interbull Centre to assist countries with improving the national genomic prediction and validation.
ToR	Terms of Reference
VCE	Variance Component Estimation
WG	Working Group
XML	Extensible Markup Language