Interbull Technical Workshop

Welcome
Local Organisers

- ANAPRI – Dr Daniele Vicario
- AIA – Dr Mauro Donda
- Maccarese – Dr Claudio Destro
- Interbull Centre

Program Committee

- Pete Sullivan (Chair GPS and FutureMace WG)
- Esa Mäntysaari (Chair Validation WG)
- Gerben de Jong (Chair ITC and NTP WG)
- Valentina Palucci (Interbull Centre)
- Toine Roozen (Interbull Centre)
Today (14 February 2023)
09:00 – 12:00    New Traits
13:00 – 16:00    Validation
16:00 – 18:30    Visit to Maccarese’s Farm (Bus leaving at 16:10)
20:00 – 23:00    Dinner & return to Hotel (Bus leaving the Hotel at 19:30)

Tomorrow (15 February)
08:15            Bus leaving from Hotel
09:00 – 12:00    Future Mace
12:00            Lunch
13:30            Bus leaving to hotel
• 58 Registrations
• 20 Countries across three continents
• 29 Organisations
2020-2023 Strategic Plan - Goals

- Meeting future data service needs
- Defining a new traits pipeline
- Providing international evaluations in the genomic era
- Continuously improve core services
- Strengthening governance
- Driving branding and marketing
Thank You
Why interest in new traits by Interbull

How information on traits is gathered

Sevices Interbull can provide

Goal of this session of the workshop
From the 2020-2023 Interbull Strategic Plan:

- Strategic Goal #2: **Defining a new traits pipeline**

  - 2021 Steering Committee set up a dedicated working group
    - G. de Jong (chair), E. Nicolazzi, V. Palucci, T. Roozen

- Main tasks:
  - Identify key decision factors for implementing any traits
  - Define infrastructure needed and programs/methodology
  - Develop business model, business plan and appropriate fee structure
Over the years, countries have developed EBVs for many more traits than currently evaluated internationally (e.g. claw health, feed intake, metabolic disorders..)

Interbull would like to get a better overview of the needs from its members, given that:

- Different countries are on different stages of:
  - Collecting data
  - Research phase
  - Developing genomic evaluations
  - Different scenarios per breeds

=> Hence the need to collect your specific feedback on a more routinary basis...
Interbull would like to get a better overview of the needs from its members: trait x type service

- Which traits are considered important to have an international evaluation for?
  - Which traits have enough data available?
  - Which traits have a national evaluation (conventional/genomic) in place?
  - Is there a need to combine information (data/EBV) across countries?
  - What service is requested?
    - One of the current available
    - New service
    - Service within a specified group of countries

<table>
<thead>
<tr>
<th>Interbull Existing/Developing Services</th>
<th>Required Input</th>
<th>Required National Evaluation</th>
<th>Output</th>
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<tbody>
<tr>
<td>MACE</td>
<td>Nat EBV + ped</td>
<td>Conventional Evaluation</td>
<td>Int EBV</td>
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<tr>
<td>GMACE</td>
<td>Nat GEBV + int EBV + ped</td>
<td>Genomic Evaluation</td>
<td>Int GEBV</td>
</tr>
<tr>
<td>InterGenomics</td>
<td>Genotypes + int EBV + ped</td>
<td>Conventional Evaluation, Genomic evaluation (optional)</td>
<td>DGV, int GEBV, SNPs effects</td>
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<tr>
<td>SNP MACE</td>
<td>Nat SNP effects</td>
<td>Genomic evaluation</td>
<td>Int SNP effects</td>
</tr>
<tr>
<td>InterBeef</td>
<td>Phenotypes + data</td>
<td>Conventional Evaluation</td>
<td>Int EBV</td>
</tr>
</tbody>
</table>
• Extract information regarding additional traits’ information

• Prepare a report for which breed*traits could be suitable for an international evaluation

• Will assess if report will look promising

• Will collect more detailed information on the type of data/service needed

• Will look at right fee structure or business model

• Final decision if proceeding or not

• Inform countries on next actions

Report back to countries
Main objectives that the new traits pipeline’s strategy would like to achieve:

- Make Interbull Centre closer to members’ needs
- Increase dynamics for expansion of Interbull portfolio
- Provide the right service(s) to members

- Service should be financially viable
- Take full advantage of tools already available at Interbull Centre
Help Interbull to find the needs for its members by:

- Make use of the PREP database
- Submit information on traits - not currently in Interbull’s portfolio - but of importance for your breed(s), using the dedicated PREP’s other traits online form
- Submit information on All traits
  - Focus on gestation length, retained placenta, milk fever
- Information collected reviewed and presented, together with the new pipeline’s strategy, at this workshop
• Share information on traits from survey
  • 3 most mentioned traits -> presentation Valentina

• Discuss with panel value of these 3 traits

• Discuss in groups which service is needed from Interbull
  - combination of trait * breed * service
  - ‘open’ or ‘closed’ evaluation

• Input for SC how to proceed
• Why sharing of descriptive information?
• A look at the current Interbull GE Form
• Interbull and EURC
• A look at the PREP database
  • Benefits and Scope
  • Other traits information collected
• What’s Next
Before first international evaluations….

- Back in the days, the increasing international trade in frozen semen and embryos notably remarked the need for a standardized documentation of methods, as applied in various countries, for genetic evaluation of dairy cattle:

- In 1985, Interbull Centre performed a very first “survey” among participating countries (25) focusing on production evaluations

- The results contained detailed information on which traits were included, how they were evaluated and expressed, and the definition of the genetic base with which comparisons were made (*Interbull Bulletin* #2)

- The purpose of publishing such information was that it should have been used in the international bull catalogues, by AI studs or breeders, and for educational purposes, wherever international information on sire evaluation procedures or breeding programs was needed.
After commencing of international evaluations…
Specific “National Genetic Forms” have been derived from an initial survey done in 1985
- One form per trait group
- Later on adjusted also to collect *Genomic* national information

Descriptive national genetic evaluation information for each and every traits evaluated internationally has been collected and shared on the Interbull webpage with the aim of:
- Facilitating access of information
  - Transparency of methodologies applied
  - Infer on most common methodologies used
  - Provide feedback for countries starting to evaluate, or improving, a given trait
- Provide support on interpreting international results
- Provide opportunity for trait harmonization

Why sharing of descriptive information?
A look at the current Interbull GE Forms

- Description of national genetic/genomic evaluations are provided via specific forms (GE/GENO)
- Information are made publicly available via Interbull website
- Updated at least twice/year every time major changes to the model, data editing or trait definition are applied
Limitations of GE/GENO Forms:

- One form per *trait group*
  - Difficult at times to provide same level of detailed information for each individual traits included in the group
  - Set of questions not reviewed in a long time

- Format of questionnaire dealing only with description of national evaluation for *international* evaluation
  - Not suitable for including description of phenotype recording
  - Not easy to infer if differences do occur between the model meant for *national* or *international* evaluation

- Free text
  - Sometimes difficult to identify clear similarities across trait definitions, recording proceedings, methodology applied etc.

- Limited to traits currently evaluated at international level
- Interbull Centre since 1996 Official European Reference Laboratory for Zootechnics
- In 2016 new EU Animal Breeding Regulation (Regulation EU 2016/1012)
- Animal Breeding Regulation addresses, among other things:
  - Rules for the recognition of breed societies and breeding operations and for the approval of their breeding programmes;
- From 2018: Interbull Centre: EURL_{ab} -> EURC_{entre}
“Rules for the recognition of breed societies and breeding operations and for the approval of their breeding programmes”

What does it exactly mean for Interbull and Interbull Centre?

- Closer interaction between EURC and national Competent Authorities (political bodies)

- Providing necessary platform for any breeding organisations or breed societies in EU to:
  - Share publicly their performance recording and genetic evaluation procedures
  - Assess soundness of the models applied and refer back to C.A.

GE Forms and its current platform NOT UP for the job!
Database platform entirely developed and hosted at the Interbull Centre

- Database language: PostgreSQL
- Server side: powered by Python and Web2py
- Client side: developed in JavaScript, jQuery and JSTree

Enables users to upload descriptive information regarding **Performance Recording, National Genetic Evaluation systems and Publication Policies.**

Accessible worldwide to all Cattle Breeding Organisations regardless of their involvement with Interbull activities

β-version released in March 2022
PREP prepares us all for new opportunities

- PREP is widening the scope: sharing information for additional breeds, populations and traits
- PREP will, with time, replace the way National Genetic Information (GE) forms will be displayed:

  - Descriptive information per trait rather than trait-group
  - Reviewed and Improved/Expanded questions
  - Electronic Forms rather than flat files
  - List of pre-defined answers rather than free text
  - Easy comparison of different information available
  - Providing information on traits beyond what is included in the current international evaluations

  - Improving the content, details and quality of information reported
  - Facilitating submission and frequency of updated information
  - Improving harmonization and standardization
  - Central part of the newly proposed pipeline for identifying next suitable traits to be included in the international evaluations
New electronic forms for:

- Organisation’s information
- Revised Electronic GE forms for:
  - Production Traits (milk, fat, protein)
  - Calving Traits (calving ease, stillbirth – direct & maternal)
  - Beef Adjusted Weaning Weight
  - Beef Calving
    - All forms populated with the latest GE’s information available
  - Other traits to be considered for international evaluation
Each electronic form is made up of a series of questions in a tree-structure.

The tree-structure gets created ad-hoc depending on the number of breeds/traits defined by the user.
Special built-in functionalities allows copying of answers between multiple sections

- Possibility to further edit copied answers to adjust them to any specific breed/trait situation
- Possibility to either save partially filled form (for resuming work later on) or submit completed ones
Aim:

- **Collect** general, basic information

So to:

- **Assess** data availability, status & level of interest

- **Identify** potential new traits
“Other Traits” - Information Collected

Other Traits Information

- VIT
- QUALITAS
- PLEMDAT
- NLBC
- NIAP
- NAV
- LACTANET
- GENO
- DATAGENE
- CRV
- CONAFE
- CDCB
- ANAFI
- ANABLE

0  5  10  15  20
### “Other Traits” - Information Collected

#### Total New Traits Reported
- **22**

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<th>Organisation Count</th>
<th>Notes</th>
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<th># Org</th>
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<tr>
<td>Metritis</td>
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<tr>
<td>Sub-clinical Ketosis</td>
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<tr>
<td>Clinical ketosis</td>
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<tr>
<td>Body Weight</td>
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<tr>
<td>Digital dermatitis</td>
<td>4</td>
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<tr>
<td>Hypocalcaemia/milk fever</td>
<td>5</td>
</tr>
<tr>
<td>Retained placenta</td>
<td>5</td>
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<tr>
<td>Gestation length</td>
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## Gestation length

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<th>COU3 (nld)</th>
<th>COU4 (nor)</th>
<th>COU5 (che)</th>
<th>COU6 (cze)</th>
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<td>RDC</td>
<td>HOL, BSW</td>
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<td>SIM, DFR, MRY, MON</td>
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## Retained Placenta

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<th>COU2 (nld)</th>
<th>COU3 (nor)</th>
<th>COU4 (dfs)</th>
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</table>
## Hypocalcaemia/Milk fever

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<th>COU3 (nor)</th>
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<td>HOL BSW JER</td>
<td>HOL BSW JER RDC</td>
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<td>HOL JER RDC</td>
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</table>
• All forms always “ON” for editing of existing or new information
• PREP is a new platform still developing in its features
  • New features coming soon to improve user’s experience
• Almost 1 year from its launch, we hope to see an higher participation rate
Inclusion of electronic forms for the remaining currently evaluated traits (udder health, fertility, longevity, workability, conformation, interbeef traits)

- Improving the way information are displayed
- Developing “ready to use” query for getting quick and easy overview of the information
  - At countries level
  - At breed level
  - At methodology level
  - ...

PREP: What is Next
Welcome to the Interbull Performance Recording, Evaluation and Publication Information database!

The PREP database is developed and hosted at the Interbull Centre within the context of the Centre’s function as the European Union Reference Centre (EURC) for Zootechnics and enables users to upload descriptive information regarding performance recording, national genetic evaluation systems and publication policies.

The platform is accessible to all European and International Cattle breeding organisations whether or not they are involved in Interbull Centre’s International Bull evaluations for dairy (Interbull) and/or beef (Interbeef).

You will need to register in order to access the platform. Contact Interbull Centre (interbull at sluse.se) if you require access to it.

The latest user manual is available under Help in the menu.
Session I – Part II

- Panel session (6 countries discussing 3 traits)
  - Questions from audience welcomed (time allowing)
- Break-out session (6 groups)
- Groups report
- Wrap up
Panel session

*Countries experience on selected new traits*
Panelists

- ITALY (ANAFIBJ): Raffaella Finocchiaro
- GERMANY (VIT): Stefan Rensing
- DNK-FIN-SWE (NAV): Gert Pedersen Aamand
- SWITZERLAND (QUALITAS): Urs Schnyder
- USA (CDCB): Ezequiel Nicolazzi
- NORWAY (GENO): Morten Svendsen
Questions

- Why it is important to have an evaluation for such traits?
- What is the return value for the farmers/industry on evaluating such traits?
- Do you include them in your selection index?
Your turn!

• For Break-out groups:
  ➢ What is the return value for the farmers/industry on evaluating such traits?
  ➢ What is your expectation for such traits on an international level?
    ➢ What are the pros/cons of an international evaluation?
    ➢ What is the role you envision for Interbull?
    ➢ What kind of service is expected? (MACE, GMACE, conventional phenotypic evaluation, SNPs based)
## Grouping For WS Session I

### GROUP I:
- Simone Savoia
- Jan-Thijs van Kaam
- Juan Pena
- Gerben de Jong
- Sigbjørn Eikje
- Katrine Haugaard
- Brian Van Doormaal
- Gert Pedersen Aamand
- Adrien Butty

### GROUP II
- Kristine Adama
- Lorenzo Degano
- Javier Lopez
- Ibrahim Jibrila
- Roberta Rostellato
- Thomas Lawlor
- Toine Roozen
- Esa Mäntysaari
- Jiri Bauer
- Madeleine Berweger
## Grouping For WS Session I

<table>
<thead>
<tr>
<th>GROUP III</th>
<th>GROUP IV</th>
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<tbody>
<tr>
<td>Marco</td>
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<tr>
<td>Daniele</td>
<td>Attilio</td>
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<td>Noureddine</td>
<td>Joao</td>
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Grouping For WS Session I

- **GROUP V**
  - Martino
  - Reiner
  - Ezequiel
  - Gert
  - Morten
  - Fernando
  - Dr. Stefan
  - Barbara
  - Marcin
  - Marija

- **GROUP VI**
  - Raffaella
  - Christian
  - Andres
  - Suzanne
  - Janez
  - Joanna
  - Peter
  - Monika
  - Magdalena
  - Judith

• Groups I to IV: stay in this room

• Groups V & VI: go to the “sofa” room
Group reports
Wrap up

- Thank you panel!
- Thank you all for participating
- Next steps
- Lunch time!
- Next session, GEBV validation test
- Back at 1pm!
- Enjoy!