Interbull Technical Workshop
Welcome

Interbull Technical Workshop

Matthew Shaffer
Interbull Chair
14-15 February 2023

THE GLOBAL STANDARD FOR LIVESTOCK DATA

Network. Guidelines. Certification.

Technical Workshop Organisers

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)

Technical Workshop Program

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)

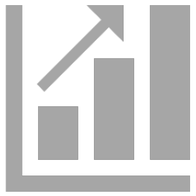
08:15	Bus leaving from Hotel
09:00 – 12:00	Future Mace
12:00	Lunch
13:30	Bus leaving to hotel

Technical Workshop Participants

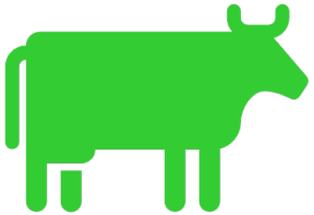
- 58 Registrations
- 20 Countries across three continents
- 29 Organisations

2020-2023 Strategic Plan - Goals

Meeting future data service needs



Continuously improve core services



Defining a new traits pipeline

Strengthening governance

Providing international evaluations in the genomic era

Driving branding and marketing

Thank You

New Traits Pipeline

14 February 2023

G. de Jong, E. Nicolazzi, V. Palucci, T. Roozen

ICAR THE GLOBAL STANDARD FOR LIVESTOCK DATA

SLU

Outline

- Why interest in new traits by Interbull
- How information on traits is gathered
- Sevices Interbull can provide
- Goal of this session of the workshop

New Pipeline for Additional Traits

- 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

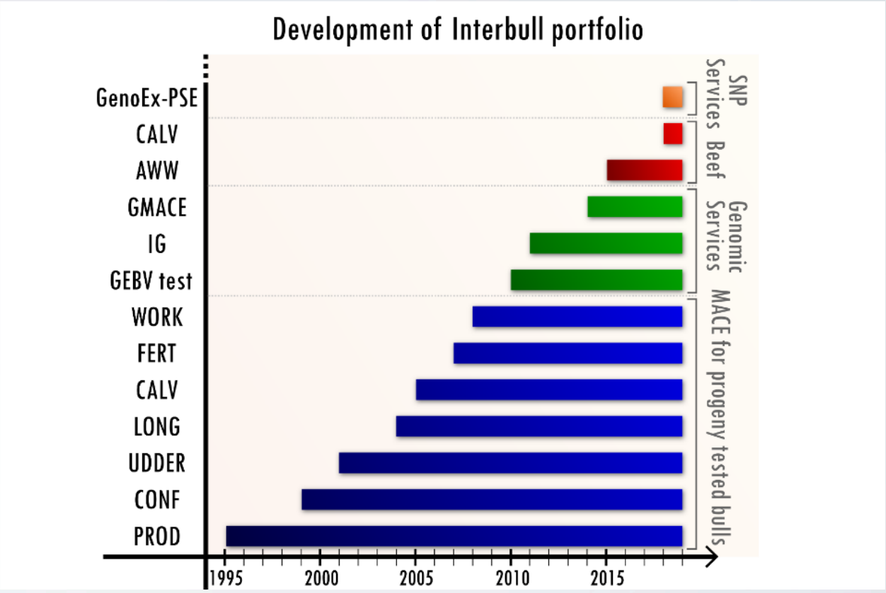
- ➢ Main tasks:
  - ✓ Identify key decision factors for implementing any traits
  - ✓ Define infrastructure needed and programs/methodology
  - ✓ Develop business model, business plan and appropriate fee structure

New Traits Pipeline: Why?

- 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...

New Traits Pipeline: Why?

- 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

Interbull Existing/Developing Services	Required Input	Required National Evaluation	Output
MACE	Nat EBV + ped	Conventional Evaluation	Int EBV
GMACE	Nat GEBV + int EBV + ped	Genomic Evaluation	Int GEBV
InterGenomics	Genotypes + int EBV + ped	Conventional Evaluation, Genomic evaluation (optional)	DGV, int GEBV, SNPs effects
SNP MACE	Nat SNP effects	Genomic evaluation	Int SNP effects
InterBeef	Phenotypes +	Conventional	Int EBV

New Pipeline: Process Overview

PREP DB

- Extract information regarding additional traits' information

ITBC Report

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

SC

- Will assess if report will look promising

ITC

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

BFMTF

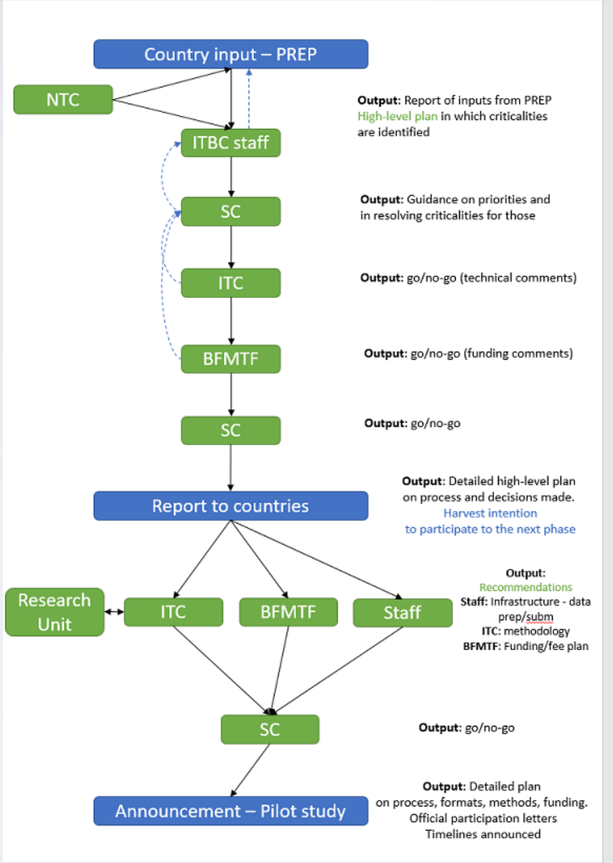
- Will look at right fee structure or business model

SC

- Final decision if proceeding or not

Report back to countries

- Inform countries on next actions



New Traits Pipeline: Overall Outcome

- 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

New Traits Pipeline: Collect information

- 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

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

PREP: A New Platform For Sharing Performance Recording And National Genetic Evaluations Information

Valentina Palucci

Interbull Technical Workshop 2023 – Maccarese, RM Italy

THE GLOBAL STANDARD FOR LIVESTOCK DATA

Network. Guidelines. Certification.

Outline

- 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

Why sharing of descriptive information?

- 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.

Why sharing of descriptive information?

- 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

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

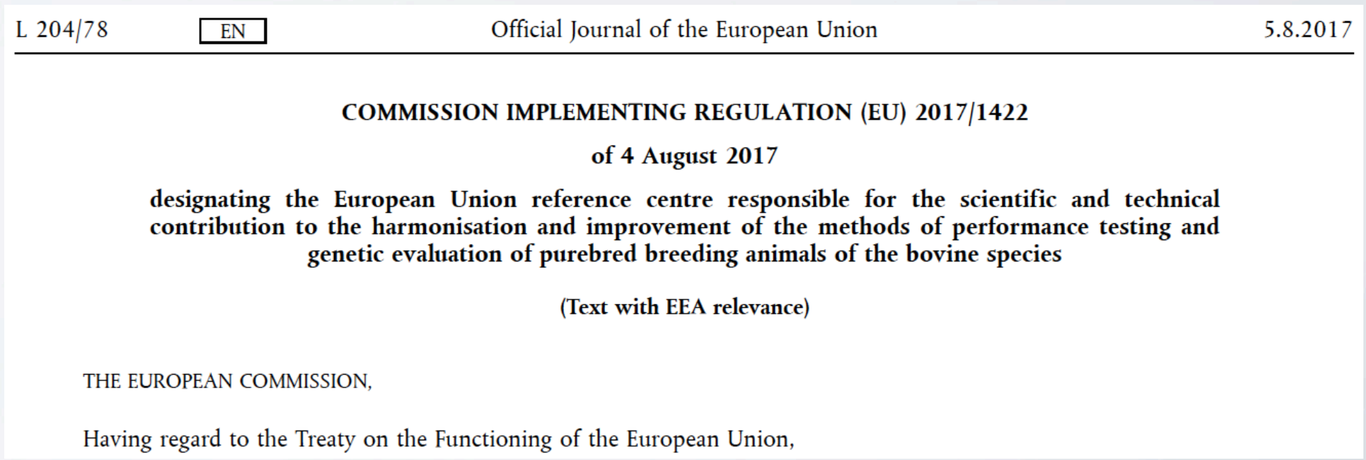
A look at the current Interbull GE Forms

- 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 & European Union

- 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: $EURL_{ab}$ -> $EURC_{entre}$



L 204/78 EN Official Journal of the European Union 5.8.2017

COMMISSION IMPLEMENTING REGULATION (EU) 2017/1422

of 4 August 2017

designating the European Union reference centre responsible for the scientific and technical contribution to the harmonisation and improvement of the methods of performance testing and genetic evaluation of purebred breeding animals of the bovine species

(Text with EEA relevance)

THE EUROPEAN COMMISSION,

Having regard to the Treaty on the Functioning of the European Union,

Interbull & European Union

“Rules for the recognition of breed societies and breeding operations and for the approval of their breeding programmes”

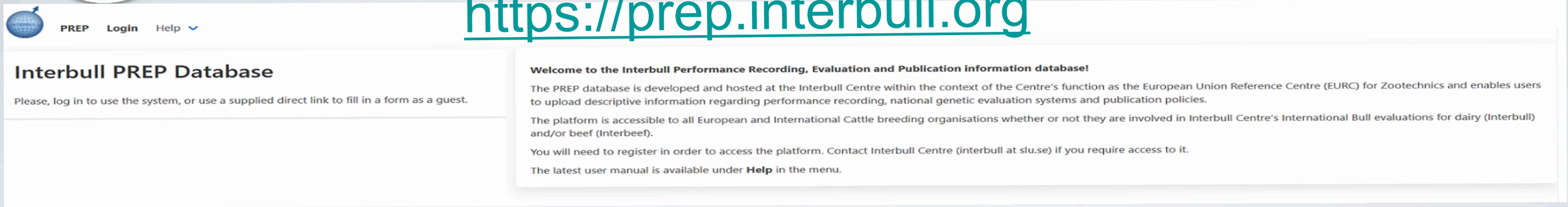
What does it exactly mean for Interbull and Interbull Centre?

- Closer interaction between EURC and national Competent Authorities (political bodies)
- Providing necessary platform for <u>any</u> 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!

PREP: The New Interbull Database

https://prep.interbull.org



- 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

Why PREP? What are its Benefits?

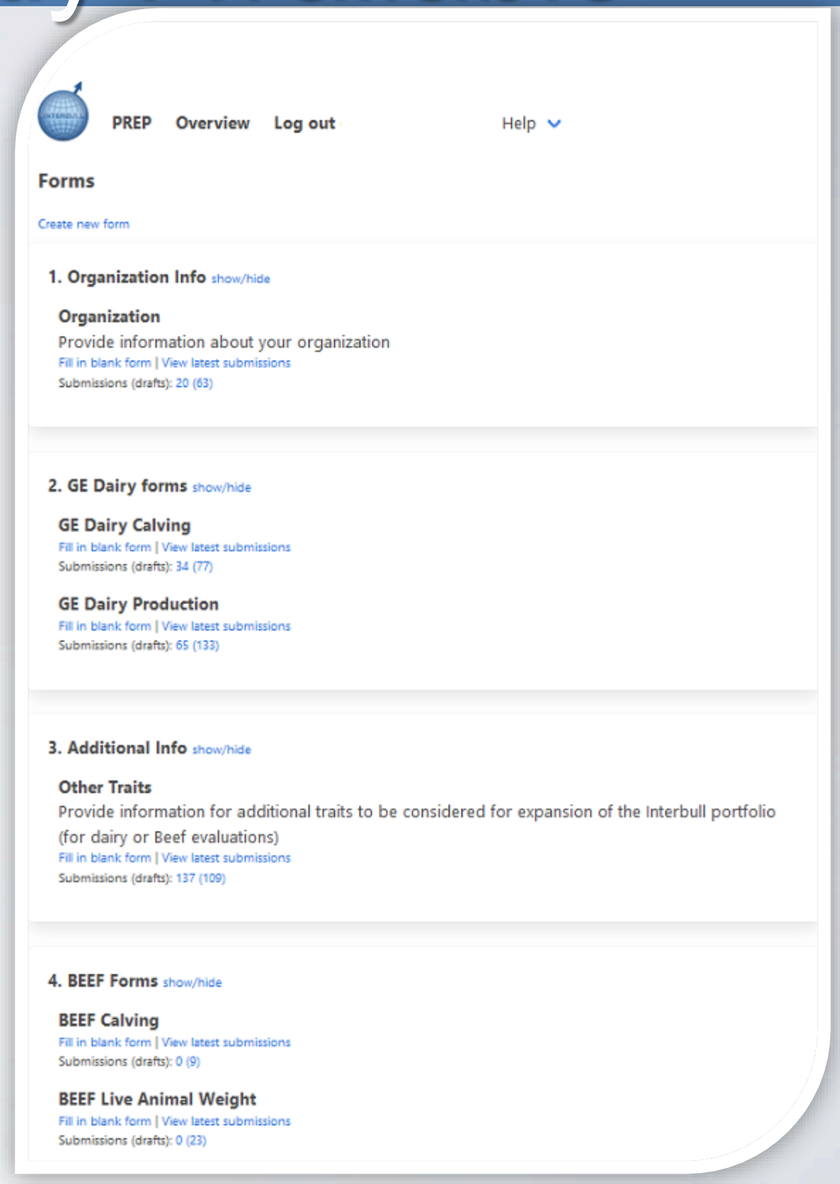
PREP prepares us all for new opportunities

- **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*** → Improving the content, details and quality of information reported
  - Reviewed and Improved/Expanded questions
  - Electronic Forms rather than flat files → Facilitating submission and frequency of updated information
  - List of pre-defined answers rather than free text → Improving harmonization and standardization
  - Easy comparison of different information available
  - Providing information on traits beyond what is included in the current international evaluations → Central part of the newly proposed pipeline for Identifying next suitable traits to be included in the international evaluations

PREP: What is Currently Available

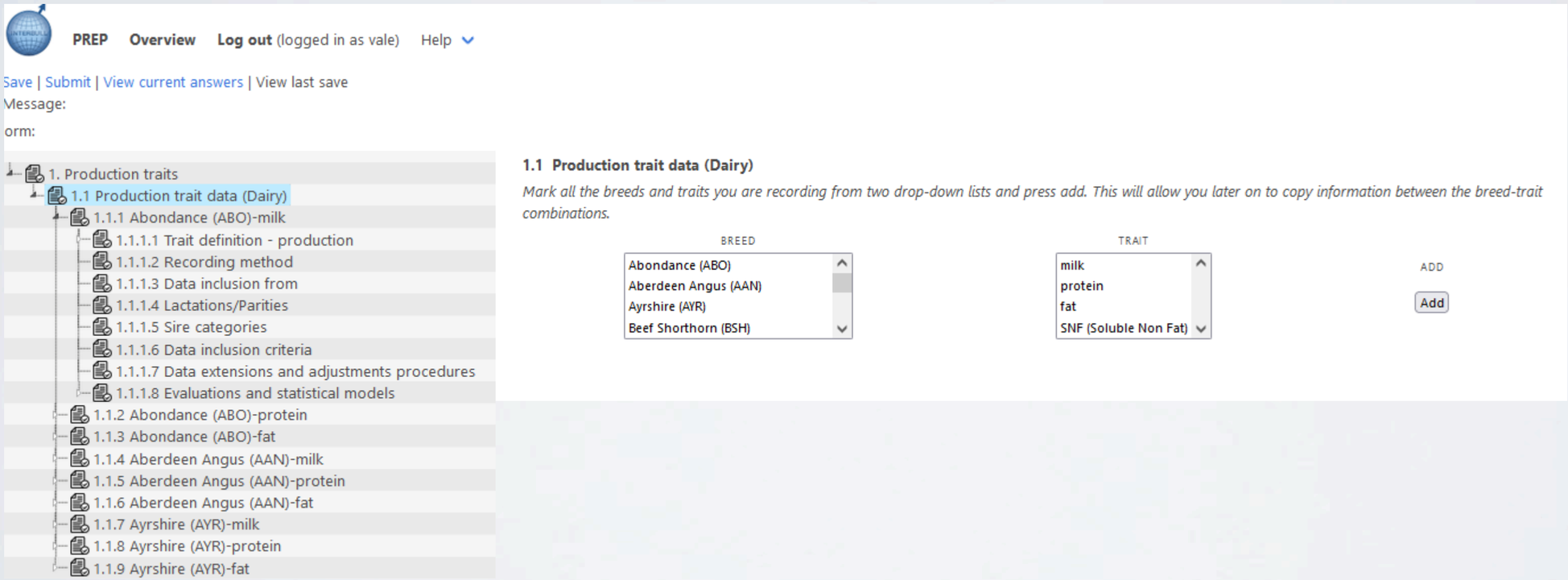
New electronic forms for:

- 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



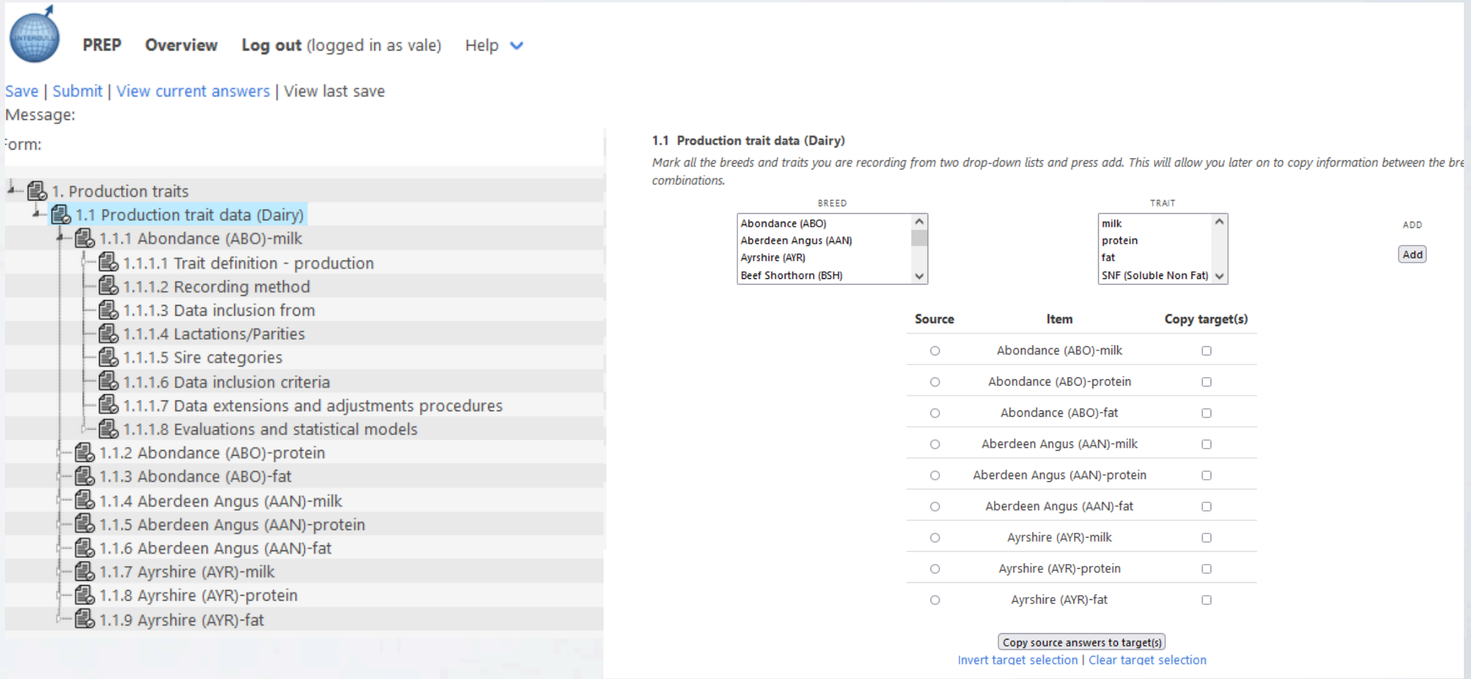
A Quick Look at How It Works

- 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



A Quick Look at How It Works

- 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



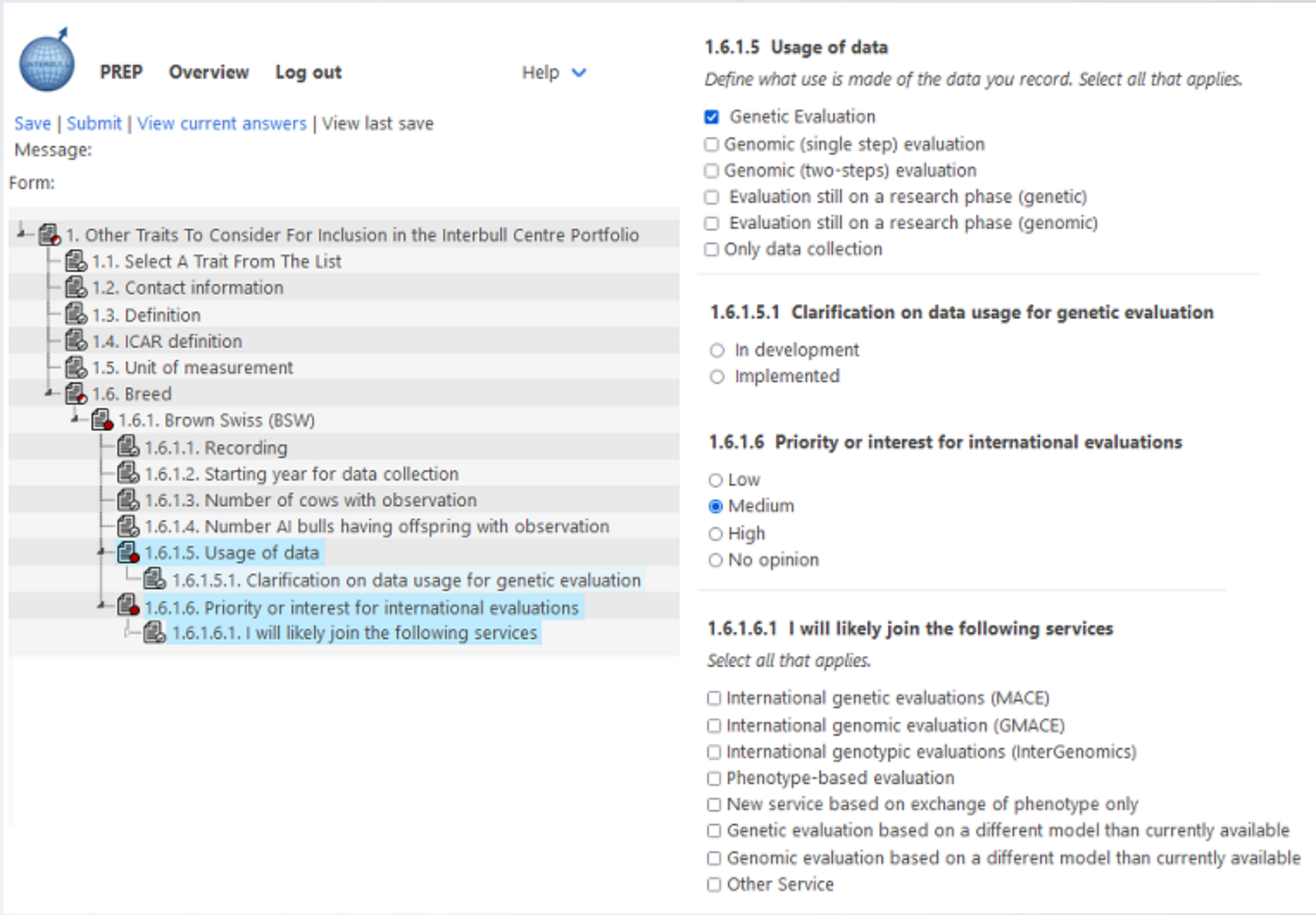
A Detailed Look at the Other Traits Form

Aim:

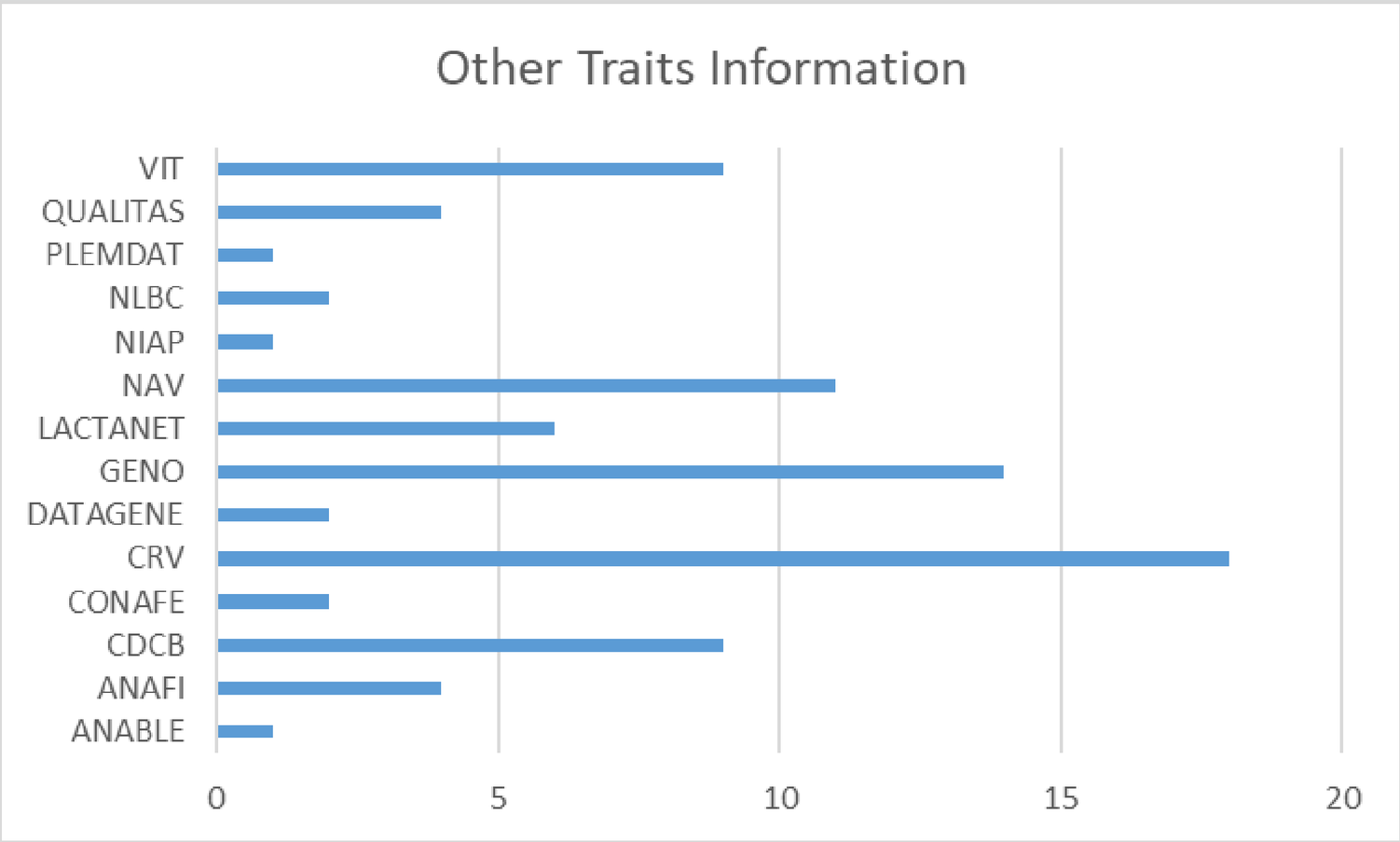
- *Collect* general, basic information

So to:

- *Assess* data availability, status & level of interest
- *Identify* potential new traits



“Other Traits”- Information Collected



“Other Traits”- Information Collected

Total New Traits Reported	22	Notes
…..By 1 organisation	1	
…. By 2 organisations	12	Level of information varies
…. By 3 organisations	3	Level of information varies
…. By 4 organisations	3	Level of information varies
…. By 5 organisations	2	Level of information varies
…. By 6 organisations	1	Level of information varies

Trait	# Org
Feed intake	3
Metritis	3
Sub-clinical Ketosis	3
Clinical ketosis	4
Body Weight	4
Digital dermatitis	4
Hypocalcaemia/milk fever	5
Retained placenta	5
Gestation length	6

Gestation length

	Cou1 (ita)	COU2 (usa)	COU3 (nld)	COU4 (nor)	COU5 (che)	COU6 (cze)
Breeds	HOL	HOL BSW RDC JER GUE	HOL BSW RDC JER SIM, DFR, MRY, MON	RDC	HOL, BSW	HOL
Evaluation	Genetic, Genomic (2-step)	Genetic, Genomic (2-step)	Genetic, Single Step	Genetic, Single Step	Genetic, Genomic (2-step)	-
Status evaluation	Implemented	Implemented	Implemented	Implemented	-	-
Priority of Interest	Medium	Medium	Low/Medium	-	Medium	-

Retained placenta

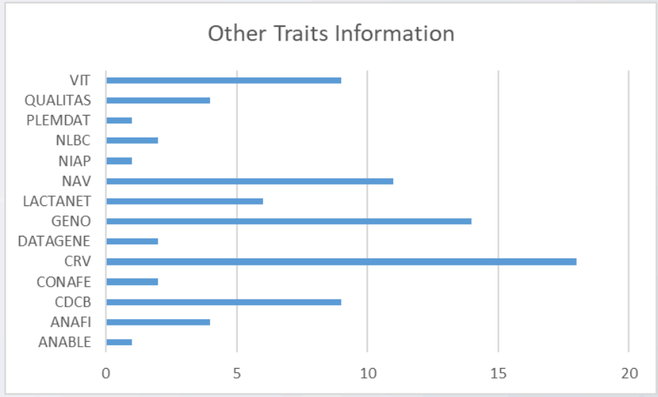
	Cou1 (usa)	COU2 (nld)	COU3 (nor)	COU4 (dfs)	COU5 (deu)
Breeds	HOL BSW JER	HOL BSW JER RDC SIM, DFR, MRY, MON	RDC	HOL JER RDC	HOL
Evaluation	Genetic, Genomic (2- step)	Genetic, Single Step	Genetic, Single Step	Genetic, Genomic (2- step)	-
Status evaluation	Implemented (HOL,JER), In development (BSW)	Implemented	Implemented	Implemented	-
Priority of Interest	High	Low	Low	-	-

Hypocalcaemia/Milk fever

	Cou1 (usa)	COU2 (nld)	COU3 (nor)	COU4 (dfs)	COU5 (deu)
Breeds	HOL BSW JER	HOL BSW JER RDC SIM, DFR, MRY, MON	RDC	HOL JER RDC	HOL
Evaluation	Genetic, Genomic (2 step)	Genetic, Single Step	Genetic, Single Step	Genetic, Genomic (2 step)	-
Status evaluation	Implemented (BSW, JER) In development (HOL)	Implemented	Implemented	Implemented	-
Priority of interest	High	Low	Low	-	-

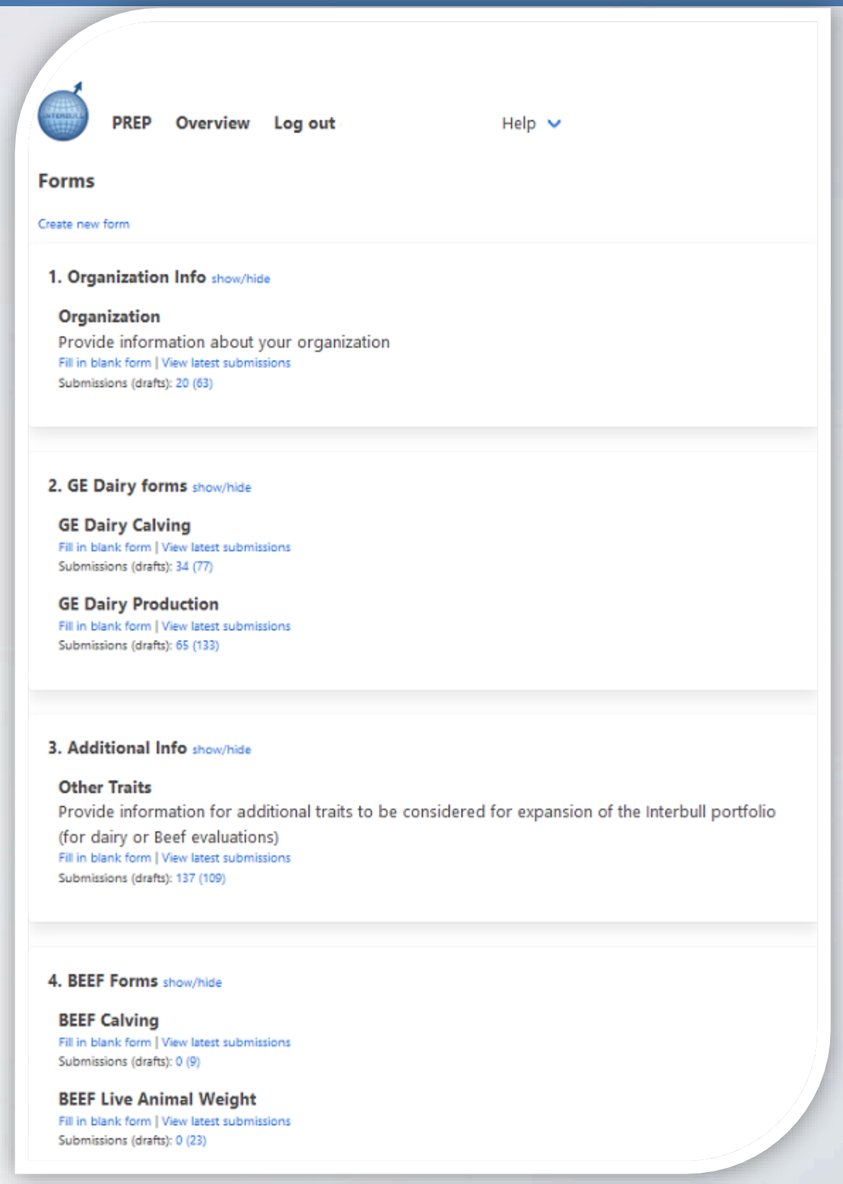
Good To Remember…

- 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



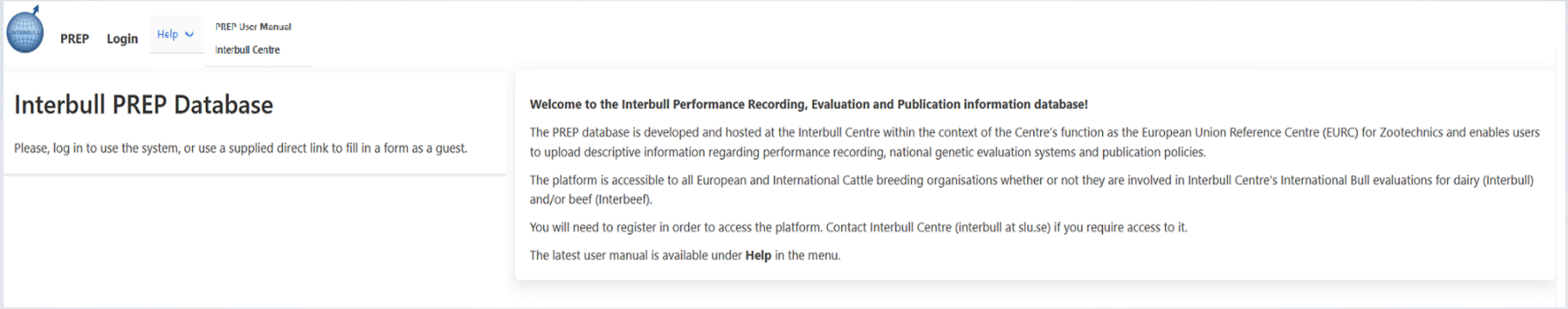
PREP: What is Next

- 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
  - …



WELCOME TO PREP!!!!

https://prep.interbull.org



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!

- <u>For Break-out groups:</u>

- 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

- GROUP III

Marco	Winters
Daniele	Vicario
Noureddine	Charfeddine
Herwin	Eding
Iola	Croue
Ross	Evans
Valentina	Palucci
ismo	Stranden
Jiri	Splichal
Urs	Schnyder

- GROUP IV

Daniel	Pitt
Attilio	Rossoni
Joao	Durr
Matthew	Shaffer
Arne	Gjuvsland
Thierry	Pabiou
Zengting	Liu
Dawid	Słomian
Sebastian	Mucha
Ulrik	Nielsen

Grouping For WS Session I

- GROUP V

Martino	Cassandro
Reiner	Emmerling
Ezequiel	Nicolazzi
Gert	Nieuwhof
Morten	Svendsen
Fernando	Macedo
Dr. Stefan	Rensing
Barbara	Kulesza-Zydzik
Marcin	Pszczola
Marija	Klopcic

- GROUP VI

Raffaella	Finocchiaro
Christian	Edel
Andres	Legarra Albizu
Suzanne	deroo
Janez	Jenko
Joanna	Sendecka
Peter	Sullivan
Monika	Skarwecka
Magdalena	Graczyk-Bogdanowicz
Judith	Himmelbauer

- 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!