



Interbull New Services: Current & Future

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THE GLOBAL STANDARD
FOR LIVESTOCK DATA





Interbull New Services

EVALUATIONS

MACE

Interbeef

VALIDATION

GEBV-test

EURC
validation

EXCHANGE

GenoEx-GDE

GenoEx-PSE

Genetic traits

COLLABORATION

PREPdb



Interbull New Services

EVALUATIONS



Genomic Pre-Selection & Future MACE

- *Genomic pre-selection (GPS) has altered the distributions of breeding values for AI bulls, because genomics made it possible to identify above average bulls within a family prior to progeny testing.*
- *Before genomics, it was reasonable to assume within-family pre-selection was random in EBV models, but this assumption is no longer valid.*

Sullivan et al. Interbull Bulletin no. 58. February 14 - 15 2023, Rome, Italy

- ✓ A working group was established in 2018, several reports have been produced during the past years with the latest developments towards a “*Future MACE*” implementation presented at the Interbull Technical Workshop in Rome



Genomic Pre-Selection and Future MACE

The international MACE model was thus modified to account for non-random within-family GPS of AI bulls. The effects of GPS are estimated and included in the international EBV of sires in the new model: GPS-MACE. ”

Sullivan et al. Interbull Bulletin no. 58. February 14 - 15 2023, Rome, Italy

- ✓ Further testing of the new model is planned during 2023/2024
- ✓ Aim for pilot run late 2024
 - **More information during the Business Meeting -> DO NOT MISS!**



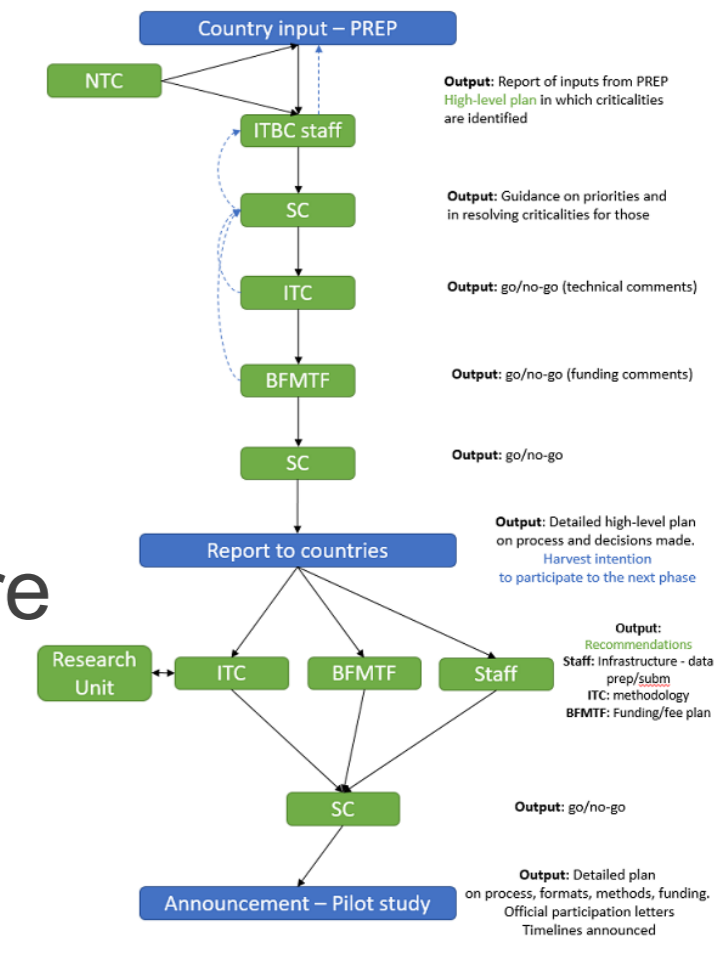
Expanding MACE Portfolio

✓ 2021: New Trait Pipeline WG established:

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

✓ WG's Take home message:

- 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





Most Promising Next Traits

Feed efficiency

Claw-health related traits

| | Retained placenta | Hypocalcaemia/Milk fever | Gestation length | Feed efficiency | Residual feed intake | Methane emission | Sub-clinical ketosis | Clinical Ketosis | Calf Survival | Lactation Persistency | Anestrus | Metritis | Endo-metritis | Cystic ovaries | Digital dermatitis | Interdigital dermatitis | Interdigital hyperplasia | Sole hemorrhage | Sole ulcer | White line disease | Body weight | |
|----------|-------------------|--------------------------|------------------|-----------------|----------------------|------------------|----------------------|------------------|---------------|-----------------------|----------|----------|---------------|----------------|--------------------|-------------------------|--------------------------|-----------------|------------|--------------------|-------------|---|
| ANABLE | | | | | | | | | | | | | | | | | | | | | | |
| ANAFI | | | / | / | | | | | | | | | | | | | | | | | | / |
| ANAPRI | | | | | | | | | | | | | | | | | | | | | | |
| CDCB | / | / | / | / | / | | | / | | | | / | | | | | | | | | | |
| CONAFE | D | | | | | | | | | | | D | | | | | | | | | | |
| CRV | / | / | / | | | | / | / | | | / | D | / | / | / | / | / | / | / | / | / | / |
| DATAGENE | | | | | | | | | | | | | | | | | | | | | | |
| GENO | / | / | / | | | | | / | | | / | / | / | / | / | | | | | / | / | / |
| ICBF | | | / | | | | | | | | | | | | | | | | | | | |
| LACTANET | | | | | | | | | | | | | | | / | / | / | / | / | / | / | / |
| NAV | | | | | | | | | | | | | | | | | | | | | | |
| NIAP | | | | | | / | | | | | | | | | / | | | | | | | |
| NLBC | | | | | | | | | | | | | | | | | | | | | | |
| PLEMDAT | | | | | | | | | | | | | | | | | | | | | | |
| QUALITAS | | | / | | | | | | / | / | / | | | | | | | | | | | |
| VIT | / | / | | / | / | | | / | / | / | / | | / | | / | | / | / | | / | / | / |

- Legend:
- = High interest
 - = Medium Interest
 - = No information provided
 - = Low Interest
 - / = Evaluation implemented
 - D = Evaluation under development
 - { = New potential traits identified

- Next steps:**
- Fill in PREP in relation to new traits identified
 - Review of information
 - Decision on how to proceed



Interbeef



BREED GROUPS

For technical details see Fernando's talk in Session 6!



Aberdeen-Angus

Limousin

Charolais

Simmental

Hereford

TRAIT GROUPS

Adjusted Weaning Weight (AWW)

Calving Traits:

Calving Ease (CAE) - direct and maternal
Birth Weight (BWT)

Carcass Traits:

Carcass Conformation

Carcass Fat

Carcass Weight



Interbull New Services

VALIDATIONS



GEBV-test

SERVICE

- Validation of national genomic breeding values that evaluates:
 - Unbiasedness - assessment of consistency of genetic trend captured by GEBV
 - Consistency of variation of GEBVs and EBVs
 - Improvement in accuracy from the use of GEBV instead of EBV
- Developed in the early genomic era, needed improvements to account for GPS

IMPROVEMENTS

- Option to make a *base adjustment*
- Options to allow use of different *validation targets*
- Option on using either weighted (WLS) or unweighted (OLS) least-squares regression tests.
- Adjustments for small populations
- Information regarding the power of the test
- Additional information to allow further analysis at national level (i.e R^2 of base adjustment regression, validation test regression, mean difference ...)



GEBV-test

IMPROVEMENTS

- Software presented at the Interbull Technical Workshop in Rome
- Fine-tuned after feedback received
- Under final testing from selected countries
- Implementation aimed 2024

IMPROVEMENTS

- Option to make a *base adjustment*
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EU Reference Centre (EURC) Validation

SERVICE

- Independent validation of genetic evaluation models using EURC Validation software
- Available to all European breeding organisations and NGECs **even if not participating in an Interbull genetic evaluation**

BENEFITS

- Covers **all dairy breeds**
- Inclusive to countries, organisations, populations and breeds **that do not participate in international evaluations**
- Assists with the harmonisation in methods and models between European countries
- Provides a “quality stamp” on conventional evaluation services as required by the EU for bulls advertised in the European market



Interbull Services

DATA EXCHANGE



Genetic Traits Data Exchange

SERVICE

- Collection, exchange and conflict resolution of information on genetic traits
- Sharing of updated information regarding recessive traits
- Automated data exchange via AnimInfo module within the Interbull Data Exchange Area (“IDEA”)
- Distributed 3 times per year with official evaluations

BENEFITS

- Identify animals which are carriers of important recessive traits
- Allows an easier, safer and more efficient exchange of information on genetic recessive traits
- Consistency of unique international animal ID is maintained across countries
- Reduction in conflicting information
- Responsive to new recessive traits



Genetic Traits Data Exchange

BREED GROUPS



Holstein-Friesian
(Black & White /
Red & White)



Brown Swiss



- *For expansion of this service to other breeds, please contact Interbull Centre*

PREREQUISITES

- A genetic coding standard needs to be in place
- Information to be uploaded by NGEC
- For each animal with recessive genetic trait information to be submitted, pedigree records also need to be submitted
- MACE participation
- Service User Agreement with Interbull Centre



Genetic Traits Data Exchange

Holstein genetic traits

- BLAD (Indirect Test)
- Mule foot
- DUMPS
- CVM
- Factor X1
- CIT
- Brachyspina
- Polled (Current –
- Cholesterol Deficiency
- Red
- Black / red
- Black

Brown Swiss genetic traits

- Arachnomelia
- Beta-Casein
- Kappa-Casein
- Polledness
- Renal Dysplasia
- Spinal Dysmyelination (SDM)
- Spinal Muscular Atrophy (SMA)
- Bovine Progressive Degenerative Myeloencephalopathy (Weaver)



SERVICE

- Parentage SNP Exchange (PSE) - a SNP exchange only for parentage analysis
- Facilitates and streamlines parentage analysis activities carried out by authorised users of the service
- A defined set of SNPs can be exchanged:
 - Parentage Verification – 200 SNPs (recommended by ISAG)
 - **Parentage Discovery – 354 SNPs**

BENEFITS

- Access to parentage analysis genotypes for essentially all dams and AI sires and potentially missing genotypes for some sires
- Bull owners have more accurate identity of progeny in countries importing semen
- Eliminate costs of genotyping duplication
- Assists with transition from microsatellites to the use of SNPs for parentage verification



SERVICE

- Enables full genotype exchanges (whole SNP arrays) covering a variety of available genotyping chips
- Users have full access to their own genotypes plus genotypes obtained by exchange in the system
- Each user of the service has full control over which of their own genotypes it shares with other service users, and which of those service users

BENEFITS

- An easy and safe exchange of genotype data (performing quality and pedigree availability checks)
- Easy and standard for exchanging large genotype datasets
- Facilitates building reference populations
- Decreases costs by avoiding re-genotyping the same individuals
- Encourages development of genomic evaluations



GENEX
Genomic Data Exchange

EXCHANGE

BREED GROUPS

- GenoEx-GDE covers all beef and dairy cattle breeds
- *GenoEx-GDE is in use by InterGenomics*
 - *Extended to IG-HOL*
 - *Ready for other breeds*

PREREQUISITES

- Existing participation in Interbull international genetic evaluations
- Service User Agreement with Interbull Centre



A big thank you to all WGs and WG members!



Interbull Centre will have a stand during the EAAP, come and visit us for more information!!!

Thank
YOU!