INTRODUCTION

The latest genomic test international evaluation for dairy production traits took place as scheduled at the Interbull Centre. Data from 29 countries were included in this evaluation.

International genetic evaluations for milk, fat and protein yields of bulls were computed from:
AUS BEL CAN CHE CZE DEU DFS ESP EST FRA GBR HUN IRL ISR ITA JPN KOR LTU LVA NLD NZL POL PRT SVK SVN URY USA ZAF HRV

Holstein breed data were included in this evaluation.

BEL, CAN, DEU, ESP, FRA, AUS, DFS, GBR, ITA, NLD, POL, HUN, CZE submitted GEBVs.

fat: BEL, CAN, DEU, ESP, FRA, AUS, DFS, GBR, ITA, NLD, POL, HUN, CZE
mil: BEL, CAN, DEU, ESP, FRA, AUS, DFS, GBR, ITA, NLD, POL, HUN, CZE
pro: BEL, CAN, DEU, ESP, FRA, AUS, DFS, GBR, ITA, NLD, POL, HUN, CZE

CHANGES IN NATIONAL PROCEDURES

Changes in the national genomic evaluation of production traits are as follows:

ESP (HOL) Base change, in line with MACE
HUN (HOL) Provided new parameters. The software for the estimation of SNP solutions has been updated.
New estimation of starting values for estimation of SNPs solutions and
to calculate the ratio of residual to genetic variance.
The changes triggered an increase in SD of all submitted traits.

INTERBULL CHANGES COMPARED TO THE DECEMBER ROUTINE RUN

No changes in Interbull procedures

DATA AND METHOD OF ANALYSIS

Thirteen Holstein populations sent GEBV data for up to 38 traits, while classical EBVs for the same traits were used in the analyses. Young bull GEBVs from the GEBV providers have been converted to the scales of all countries participating in classical MACE. A bull will get a MACE EBV or a GMACE EBV but not both.
From those thirteen countries, National GEBVs of bulls less than seven years of age and with no classical MACE proofs were included for the breeding value prediction with a further requirement of either a MACE-PA or a GMACE-PA (for young genomic bulls with young genomic sires) being available.

The parameter-space approach is used for the GMACE genetic evaluations (Sullivan, 2016)

SCIENTIFIC LITERATURE

The international genetic evaluation procedure is based on international work described in the following scientific publications:

Sullivan, P.G. 2016. Defining a Parameter Space for GMACE. Interbull Bulletin 50, p 85-93.

VanRaden, P.M. and Sullivan, P.G. 2010. International genomic evaluation methods for dairy cattle. Gen. Sel. Evol. 42:7

Sullivan, P.G. and Jakobsen, J.H. 2012. Robust GMACE for young bulls methodology. Interbull Bulletin 45, Article 1.

Sullivan, P.G. 2012a. GMACE reliability approximation. Report to the GMACE working group of Interbull. GMACE_rels 2013

Sullivan, P.G. 2012b. GMACE variance estimation. Report to the GMACE working group of Interbull. GMACE_vce 2013

Sullivan, P.G. 2012c. GMACE Weighting Factors. Report to the GMACE working group of Interbull. GMACE_gedcs 2013

Jakobsen, J.H. and Sullivan, P.G. 2013. Trait specific computation of shared reference population. Reference sharing Nov 2013

NEXT ROUTINE INTERNATIONAL EVALUATION

Dates for next routine run can be found on http://www.interbull.org/ib/servicecalendar

NEXT TEST INTERNATIONAL EVALUATION

Dates for next routine run can be found on http://www.interbull.org/ib/servicecalendar

PUBLICATION OF INTERBULL ROUTINE RUN

Results were distributed by the Interbull Centre to designated representatives in each country. The international evaluation file comprised international proofs expressed on the base and unit of each country included in the analysis. Such records readily provide more information on bull performance in various countries, thereby minimising the need to resort to conversions.

At the same time, all recipients of Interbull results are expected to honour the agreed code of practice, decided by the Interbull Steering Committee, and only publish international evaluations on their own country scale. Evaluations expressed on another country scale are confidential and may only be used internally for research and review purposes.

Table 1. National evaluation dates in GMACE run August 2022

Country	Date
CAN	20220801
DEU	20220809
DFS	20220809
FRA	20220810
ITA	20220712
NLD	20220801
GBR	20220704
AUS	20201207
BEL	20201201
ESP	20220711
CZE	20220725
HUN	20211122
POL	20220630

Table 2.

Number of bulls in reference population for mil

CAN	43175.0												
DEU	9759.0	45411.0											
DFS	5532.0	38702.0	39782.0										
FRA	4176.0	35010.0	34465.0	36798.0									
ITA	33853.0	6979.0	3928.0	3278.0	34776.0								
NLD	4270.0	36902.0	36213.0	34497.0	3341.0	38844.0							
GBR	36687.0	10284.0	5926.0	4237.0	32933.0	4605.0	39793.0						
AUS	1327.0	803.0	703.0	731.0	879.0	770.0	1498.0	4408.0					
BEL	727.0	728.0	636.0	710.0	706.0	743.0	687.0	287.0	1729.0				
ESP	6485.0	39914.0	38816.0	35111.0	4476.0	36871.0	6982.0	763.0	703.0	41128.0			
CZE	1760.0	2216.0	1801.0	1672.0	1323.0	1738.0	1710.0	375.0	843.0	2081.0	3624.0		
HUN	2284.0	8204.0	7684.0	7295.0	1935.0	7832.0	2525.0	703.0	549.0	8066.0	1399.0	9111.0	
POL	4813.0	33512.0	33218.0	30529.0	3328.0	32054.0	5110.0	660.0	994.0	33860.0	2491.0	7639.0	35260.0

Number of bulls in reference population for fat

CAN	43174.0		
DEU	9759.0	45409.0	

```
DFS  5532.0 38701.0 39781.0
FRA  4176.0 35010.0 34465.0 36798.0
ITA 33853.0  6979.0  3928.0  3278.0 34778.0
NLD  4270.0 36902.0 36213.0 34497.0  3341.0 38844.0
GBR 36687.0 10283.0  5925.0  4237.0 32934.0  4605.0 39793.0
AUS  1327.0   803.0   703.0   731.0   879.0   770.0  1498.0  4408.0
BEL   727.0   728.0   636.0   710.0   706.0   743.0   687.0   287.0  1729.0
ESP  6485.0 39913.0 38815.0 35111.0  4476.0 36871.0  6981.0   763.0   703.0 41127.0
CZE  1760.0  2216.0  1801.0  1672.0  1323.0  1738.0  1710.0   375.0   843.0  2081.0  3624.0
HUN  2284.0  8204.0  7684.0  7295.0  1935.0  7832.0  2525.0   703.0   549.0  8066.0  1399.0  9111.0
POL  4813.0 33512.0 33218.0 30529.0  3328.0 32054.0  5110.0   660.0   994.0 33860.0  2491.0  7639.0 35260.0

-----------------------------------------------------
Number of bulls in reference population for        pro
-----------------------------------------------------
CAN 43174.0
DEU  9759.0 45409.0
DFS  5532.0 38701.0 39781.0
FRA  4176.0 35010.0 34465.0 36798.0
ITA 33853.0  6979.0  3928.0  3278.0 34776.0
NLD  4270.0 36902.0 36213.0 34497.0  3341.0 38844.0
GBR 36687.0 10283.0  5925.0  4237.0 32933.0  4605.0 39792.0
AUS  1327.0   803.0   703.0   731.0   879.0   770.0  1498.0  4408.0
BEL   727.0   728.0   636.0   710.0   706.0   743.0   687.0   287.0  1729.0
ESP  6485.0 39913.0 38815.0 35111.0  4476.0 36871.0  6981.0   763.0   703.0 41127.0
CZE  1760.0  2216.0  1801.0  1672.0  1323.0  1738.0  1710.0   375.0   843.0  2081.0  3624.0
HUN  2284.0  8204.0  7684.0  7295.0  1935.0  7832.0  2525.0   703.0   549.0  8066.0  1399.0  9111.0
POL  4813.0 33512.0 33218.0 30529.0  3328.0 32054.0  5110.0   660.0   994.0 33860.0  2491.0  7639.0 35260.0
```