

## INTRODUCTION

The latest genomic routine international evaluation for dairy production traits took place included in this evaluation. Data from 30 populations were included in this evaluation.

International genetic evaluations for milk, fat and protein yields of bulls from Australia, Belgium, Canada, Czech Republic, Denmark-Finland-Sweden, Estonia, France, Germany, Hungary, Ireland, Israel, Italy, Japan, Latvia, Lithuania, Netherlands, New Zealand, Poland, Republic of South Africa, Slovak Republic, Slovenia, Spain, Switzerland, the United Kingdom, the United States of America, Portugal, Korea, Uruguay, Croatia and Mexico were computed. 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 genetic evaluation of production traits are as follows:

no changeINTERBULL CHANGES COMPARED TO THE DECEMBER ROUTINE RUN

No changes in Interbull procedures

## DATA AND METHOD OF ANALYSIS

Eleven 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 eleven 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

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

## PUBLICATION OF INTERBULL ROUTINE RUN

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 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 December 2020

Country	Date
CAN	20201201
DEU	20201201
DFS	20201103
FRA	20201202
ITA	20201104
NLD	20201201
GBR	20201020
AUS	20201207
BEL	20190901
ESP	20201110
CZE	20201112
HUN	20201112
POL	20201031

Table 2.

Number of bulls in reference population for		mil
CAN	41254.0	
DEU	7326.0 42155.0	
DFS	4544.0 37076.0 38174.0	
FRA	4122.0 34815.0 34360.0 36708.0	
ITA	34235.0 6520.0 3681.0 3263.0 35245.0	
NLD	4168.0 36436.0 35974.0 34405.0 3334.0 38511.0	
GBR	34642.0 7474.0 4662.0 4126.0 33116.0 4329.0 36875.0	
AUS	1326.0 799.0 691.0 726.0 879.0 770.0 1490.0 4410.0	
BEL	1805.0 1356.0 1139.0 1291.0 1678.0 1238.0 1389.0 439.0 3259.0	
ESP	5110.0 37946.0 37372.0 34974.0 4188.0 36579.0 5277.0 741.0 1293.0 39070.0	
CZE	1501.0 1908.0 1604.0 1652.0 1306.0 1690.0 1417.0 374.0 1393.0 1809.0 3305.0	
HUN	1884.0 7564.0 7160.0 7054.0 1791.0 7330.0 1927.0 599.0 807.0 7442.0 1215.0 8141.0	
POL	4439.0 32362.0 32258.0 30450.0 3521.0 31792.0 4219.0 662.0 1740.0 32735.0 2373.0 7180.0 34368.0	

Number of bulls in reference population for		fat
CAN	41254.0	
DEU	7326.0 42155.0	
DFS	4544.0 37076.0 38174.0	
FRA	4122.0 34815.0 34360.0 36708.0	
ITA	34235.0 6520.0 3681.0 3263.0 35247.0	
NLD	4168.0 36436.0 35974.0 34405.0 3334.0 38511.0	

GBR	34642.0	7474.0	4662.0	4126.0	33116.0	4329.0	36875.0												
AUS	1326.0	799.0	691.0	726.0	879.0	770.0	1490.0	4410.0											
BEL	1805.0	1356.0	1139.0	1291.0	1678.0	1238.0	1389.0	439.0	3259.0										
ESP	5110.0	37946.0	37372.0	34974.0	4188.0	36579.0	5277.0	741.0	1293.0	39070.0									
CZE	1501.0	1908.0	1604.0	1652.0	1306.0	1690.0	1417.0	374.0	1393.0	1809.0	3305.0								
HUN	1884.0	7564.0	7160.0	7054.0	1791.0	7330.0	1927.0	599.0	807.0	7442.0	1215.0	8141.0							
POL	4439.0	32362.0	32258.0	30450.0	3521.0	31792.0	4219.0	662.0	1740.0	32735.0	2373.0	7180.0	34368.0						

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Number of bulls in reference population for                    pro  
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CAN	41254.0																		
DEU	7326.0	42155.0																	
DFS	4544.0	37076.0	38174.0																
FRA	4122.0	34815.0	34360.0	36708.0															
ITA	34235.0	6520.0	3681.0	3263.0	35245.0														
NLD	4168.0	36436.0	35974.0	34405.0	3334.0	38511.0													
GBR	34642.0	7474.0	4662.0	4126.0	33116.0	4329.0	36875.0												
AUS	1326.0	799.0	691.0	726.0	879.0	770.0	1490.0	4410.0											
BEL	1805.0	1356.0	1139.0	1291.0	1678.0	1238.0	1389.0	439.0	3259.0										
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HUN	1884.0	7564.0	7160.0	7054.0	1791.0	7330.0	1927.0	599.0	807.0	7442.0	1215.0	8141.0							
POL	4439.0	32362.0	32258.0	30450.0	3521.0	31792.0	4219.0	662.0	1740.0	32735.0	2373.0	7180.0	34368.0						