INTRODUCTION

The latest genomic routine international evaluation for **conformation traits** took place as scheduled at the Interbull Centre. Data from twenty (22) countries were included in this evaluation.

International genetic evaluations for calving traits of bulls from Australia, Belgium, Canada, Switzerland, Czech Republic, Germany, Denmark-Finland-Sweden, Spain, France, United Kingdom, Hungary, Ireland, Italy, Japan, Korea, The Netherlands, Norway, New Zealand, Poland, South Africa, Estonia, Slovenia, Portugal and the United States of America were computed. Holstein data were included in this evaluation.

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

ang: BEL, CAN, DEU, ESP, FRA, , DFS, GBR, ITA, NLD, POL
bcs: BEL, CAN, DEU, , FRA, , , GBR, ITA, NLD,
bde: BEL, CAN, DEU, ESP, FRA, , DFS, GBR, ITA, NLD, POL
cwi: BEL, CAN, DEU, ESP, FRA, , DFS, GBR, ITA, NLD, POL
fan: BEL, CAN, DEU, ESP, FRA, , DFS, GBR, ITA, NLD, POL
ftl: BEL, CAN, DEU, ESP, FRA, , DFS, GBR, ITA, NLD, POL
ftp: BEL, CAN, DEU, ESP, FRA, , DFS, GBR, ITA, NLD, POL
fua: BEL, CAN, DEU, ESP, FRA, , DFS, GBR, ITA, NLD, POL
loc: BEL, CAN, DEU, ESP, FRA, , DFS, GBR, ITA, NLD,
ocs: BEL, CAN, DEU, ESP, FRA, AUS, , GBR, ITA, NLD, POL
ofl: BEL, CAN, DEU, ESP, FRA, , DFS, GBR, ITA, NLD, POL
ous: BEL, CAN, DEU, ESP, FRA, , DFS, GBR, ITA, NLD, POL
ran: BEL, CAN, DEU, ESP, FRA, , DFS, GBR, ITA, NLD, POL
rlr: BEL, CAN, DEU, ESP, FRA, , DFS, GBR, ITA, NLD, POL
rls: BEL, CAN, DEU, ESP, FRA, , DFS, GBR, ITA, NLD, POL
rtp: BEL, CAN, DEU, ESP, FRA, , DFS, GBR, ITA, NLD, POL
ruh: BEL, CAN, DEU, ESP, FRA, , DFS, GBR, ITA, NLD, POL
rwi: BEL, CAN, DEU, ESP, FRA, , DFS, GBR, ITA, NLD, POL
sta: BEL, CAN, DEU, ESP, FRA, , DFS, GBR, ITA, NLD, POL
ude: BEL, CAN, DEU, ESP, FRA, , DFS, GBR, ITA, NLD, POL
usu: BEL, CAN, DEU, ESP, FRA, , DFS, GBR, ITA, NLD, POL

CHANGES IN NATIONAL PROCEDURES

Changes in the national genetic evaluation of conformation traits are as follows:

CAN HOL Corrected some coding of proof types to better reflect the information included in the GEBV calculations for each bull

INTERBULL 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

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 2017

Country	Date
BEL	20170801
CAN	20170801
DEU	20170808
DFS	20170306
ESP	20170710
FRA	20170809
GBR	20170605
ITA	20170712
NLD	20170801
POL	20170701

Table 2.

Number of bulls in reference population for sta									
BEL	2573.0								
CAN	1315.0	32473.0							
DEU	982.0	2710.0	34802.0						
DFS	867.0	2344.0	32423.0	33457.0					
ESP	940.0	2403.0	32850.0	32746.0	33775.0				
FRA	1017.0	2723.0	31296.0	31019.0	31578.0	33380.0			
GBR	878.0	26333.0	2509.0	2192.0	2236.0	2510.0	26808.0		
ITA	1145.0	26154.0	1898.0	1511.0	1562.0	1810.0	24919.0	26420.0	
NLD	987.0	2669.0	32921.0	32601.0	33129.0	31541.0	2464.0	1790.0	34784.0
POL	1443.0	2743.0	28225.0	28131.0	28587.0	27284.0	2165.0	1844.0	28569.0	30259.0

Number of bulls in reference population for cwi									
BEL	2573.0								
CAN	1315.0	32469.0							
DEU	981.0	2710.0	33588.0						
DFS	866.0	2344.0	31343.0	32370.0					
ESP	939.0	2403.0	31640.0	31664.0	32551.0				
FRA	1016.0	2723.0	30109.0	29952.0	30388.0	32180.0			
GBR	878.0	26330.0	2509.0	2192.0	2236.0	2510.0	26805.0		
ITA	1145.0	26152.0	1898.0	1511.0	1562.0	1810.0	24918.0	26418.0	
NLD	986.0	2669.0	31734.0	31537.0	31941.0	30380.0	2464.0	1790.0	33594.0
POL	1442.0	2743.0	27077.0	27106.0	27437.0	26162.0	2165.0	1844.0	27426.0	29108.0

Number of bulls in reference population for bde									
BEL	2558.0								
CAN	1315.0	32473.0							
DEU	982.0	2710.0	34244.0						
DFS	867.0	2344.0	31979.0	33010.0					
ESP	940.0	2403.0	32293.0	32302.0	33216.0				
FRA	1017.0	2723.0	30765.0	30590.0	31047.0	32848.0			
GBR	878.0	26333.0	2509.0	2192.0	2236.0	2510.0	26808.0		
ITA	1145.0	26154.0	1898.0	1511.0	1562.0	1810.0	24919.0	26420.0	
NLD	987.0	2669.0	32363.0	32156.0	32570.0	31009.0	2464.0	1790.0	34223.0
POL	1443.0	2743.0	27713.0	27732.0	28073.0	26798.0	2165.0	1844.0	28054.0	29744.0

Number of bulls in reference population for ang									
BEL	2530.0								
CAN	1313.0	32033.0							
DEU	972.0	2705.0	31030.0						
DFS	859.0	2340.0	28856.0	29881.0					
ESP	930.0	2398.0	29097.0	29188.0	30001.0				
FRA	1007.0	2718.0	27621.0	27529.0	27899.0	29688.0			
GBR	875.0	26321.0	2503.0	2187.0	2230.0	2504.0	26786.0		
ITA	1143.0	25978.0	1893.0	1507.0	1557.0	1805.0	24910.0	26242.0	
NLD	967.0	2662.0	29179.0	29051.0	29395.0	27893.0	2454.0	1784.0	30669.0
POL	1431.0	2738.0	24522.0	24620.0	24890.0	23674.0	2158.0	1837.0	24867.0	26541.0

Number of bulls in reference population for ran

BEL	2574.0									
CAN	1315.0	32473.0								
DEU	982.0	2710.0	34706.0							
DFS	867.0	2344.0	32327.0	33361.0						
ESP	940.0	2403.0	32759.0	32655.0	33684.0					
FRA	1017.0	2723.0	31201.0	30924.0	31488.0	33285.0				
GBR	878.0	26333.0	2509.0	2192.0	2236.0	2510.0	26808.0			
ITA	1145.0	26154.0	1898.0	1511.0	1562.0	1810.0	24919.0	26420.0		
NLD	987.0	2669.0	32826.0	32506.0	33039.0	31446.0	2464.0	1790.0	34689.0	
POL	1443.0	2743.0	28222.0	28128.0	28584.0	27281.0	2165.0	1844.0	28566.0	30256.0

Number of bulls in reference population for rwi

BEL	2558.0									
CAN	1315.0	31653.0								
DEU	982.0	2710.0	34747.0							
DFS	867.0	2344.0	32371.0	33405.0						
ESP	940.0	2403.0	32796.0	32695.0	33721.0					
FRA	1017.0	2723.0	31241.0	30967.0	31524.0	33325.0				
GBR	878.0	26333.0	2509.0	2192.0	2236.0	2510.0	26808.0			
ITA	1145.0	26154.0	1898.0	1511.0	1562.0	1810.0	24919.0	26420.0		
NLD	987.0	2669.0	32866.0	32549.0	33075.0	31486.0	2464.0	1790.0	34729.0	
POL	1443.0	2743.0	28215.0	28124.0	28577.0	27274.0	2165.0	1844.0	28559.0	30249.0

Number of bulls in reference population for rls

BEL	2574.0									
CAN	1315.0	32473.0								
DEU	982.0	2710.0	34803.0							
DFS	867.0	2344.0	32424.0	33458.0						
ESP	940.0	2403.0	32851.0	32747.0	33776.0					
FRA	1017.0	2723.0	31297.0	31020.0	31579.0	33381.0				
GBR	878.0	26333.0	2509.0	2192.0	2236.0	2510.0	26808.0			
ITA	1145.0	26154.0	1898.0	1511.0	1562.0	1810.0	24919.0	26420.0		
NLD	987.0	2669.0	32922.0	32602.0	33130.0	31542.0	2464.0	1790.0	34785.0	
POL	1443.0	2743.0	28225.0	28131.0	28587.0	27284.0	2165.0	1844.0	28569.0	30259.0

Number of bulls in reference population for rlr

BEL	2548.0									
CAN	1313.0	31542.0								
DEU	976.0	2702.0	32701.0							
DFS	861.0	2336.0	30511.0	31535.0						
ESP	934.0	2395.0	30762.0	30829.0	31668.0					
FRA	1011.0	2715.0	29232.0	29128.0	29516.0	31248.0				
GBR	874.0	25504.0	2500.0	2183.0	2227.0	2501.0	25968.0			
ITA	1144.0	25317.0	1890.0	1503.0	1554.0	1802.0	24095.0	25581.0		
NLD	971.0	2659.0	30874.0	30713.0	31078.0	29528.0	2451.0	1781.0	32377.0	
POL	1437.0	2735.0	26213.0	26278.0	26569.0	25305.0	2156.0	1836.0	26565.0	28193.0

Number of bulls in reference population for fan

BEL	2559.0									
CAN	1313.0	32468.0								
DEU	981.0	2710.0	32611.0							
DFS	867.0	2344.0	30648.0	31666.0						
ESP	939.0	2403.0	30925.0	30975.0	31844.0					
FRA	1016.0	2723.0	29440.0	29301.0	29721.0	31518.0				
GBR	876.0	26330.0	2509.0	2192.0	2236.0	2510.0	26801.0			
ITA	1144.0	26152.0	1898.0	1511.0	1562.0	1810.0	24918.0	26418.0		
NLD	976.0	2667.0	31006.0	30837.0	31216.0	29695.0	2460.0	1789.0	32508.0	
POL	1442.0	2743.0	26362.0	26418.0	26723.0	25489.0	2165.0	1844.0	26711.0	28391.0

Number of bulls in reference population for hde

Number of bulls in reference population for fua

BEL	2574.0									
CAN	1315.0	32472.0								
DEU	982.0	2710.0	33985.0							
DFS	867.0	2344.0	31735.0	32764.0						
ESP	940.0	2403.0	32035.0	32056.0	32952.0					
FRA	1017.0	2723.0	30506.0	30345.0	30786.0	32585.0				
GBR	878.0	26333.0	2509.0	2192.0	2236.0	2510.0	26808.0			
ITA	1145.0	26153.0	1898.0	1511.0	1562.0	1810.0	24919.0	26419.0		
NLD	987.0	2669.0	32122.0	31924.0	32328.0	30768.0	2464.0	1790.0	33982.0	
POL	1443.0	2743.0	27422.0	27450.0	27782.0	26507.0	2165.0	1844.0	27768.0	29453.0

Number of bulls in reference population for ruh

BEL	2574.0									
CAN	1315.0	32472.0								
DEU	982.0	2710.0	33673.0							
DFS	867.0	2344.0	31416.0	32418.0						
ESP	940.0	2403.0	31723.0	31711.0	32614.0					
FRA	1017.0	2723.0	30201.0	30033.0	30482.0	32281.0				
GBR	878.0	26332.0	2509.0	2192.0	2236.0	2510.0	26807.0			
ITA	1145.0	26154.0	1898.0	1511.0	1562.0	1810.0	24919.0	26420.0		
NLD	987.0	2669.0	31801.0	31600.0	32008.0	30453.0	2464.0	1790.0	33660.0	
POL	1443.0	2743.0	27559.0	27581.0	27919.0	26644.0	2165.0	1844.0	27904.0	29590.0

Number of bulls in reference population for ruw

Number of bulls in reference population for usu

BEL	2574.0									
CAN	1315.0	32473.0								
DEU	982.0	2710.0	34801.0							
DFS	867.0	2344.0	32422.0	33456.0						
ESP	940.0	2403.0	32849.0	32745.0	33774.0					
FRA	1017.0	2723.0	31295.0	31018.0	31577.0	33379.0				
GBR	878.0	26333.0	2509.0	2192.0	2236.0	2510.0	26808.0			
ITA	1145.0	26154.0	1898.0	1511.0	1562.0	1810.0	24919.0	26420.0		
NLD	987.0	2669.0	32920.0	32600.0	33128.0	31540.0	2464.0	1790.0	34783.0	
POL	1443.0	2743.0	28223.0	28129.0	28585.0	27282.0	2165.0	1844.0	28567.0	30257.0

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Number of bulls in reference population for        ude
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BEL  2562.0
CAN  1313.0 32469.0
DEU   982.0  2710.0 34800.0
DFS   867.0  2344.0 32421.0 33455.0
ESP   940.0  2403.0 32848.0 32744.0 33773.0
FRA  1017.0  2723.0 31295.0 31018.0 31577.0 33379.0
GBR   876.0 26330.0  2509.0  2192.0  2236.0  2510.0 26801.0
ITA  1144.0 26153.0  1898.0  1511.0  1562.0  1810.0 24918.0 26419.0
NLD   977.0  2667.0 32919.0 32599.0 33127.0 31540.0  2460.0  1789.0 34429.0
POL  1443.0  2743.0 28223.0 28129.0 28585.0 27283.0  2165.0  1844.0 28567.0 30257.0

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Number of bulls in reference population for        ftp
-----------------------------------------------------
BEL  2574.0
CAN  1315.0 32473.0
DEU   982.0  2710.0 34755.0
DFS   867.0  2344.0 32376.0 33410.0
ESP   940.0  2403.0 32804.0 32700.0 33729.0
FRA  1017.0  2723.0 31249.0 30972.0 31532.0 33333.0
GBR   878.0 26333.0  2509.0  2192.0  2236.0  2510.0 26808.0
ITA  1145.0 26154.0  1898.0  1511.0  1562.0  1810.0 24919.0 26420.0
NLD   987.0  2669.0 32874.0 32554.0 33083.0 31494.0  2464.0  1790.0 34737.0
POL  1443.0  2743.0 28223.0 28129.0 28585.0 27282.0  2165.0  1844.0 28567.0 30257.0

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Number of bulls in reference population for        ftl
-----------------------------------------------------
BEL  2562.0
CAN  1313.0 32457.0
DEU   982.0  2710.0 34800.0
DFS   867.0  2344.0 32421.0 33455.0
ESP   940.0  2403.0 32848.0 32744.0 33773.0
FRA  1017.0  2723.0 31295.0 31018.0 31577.0 33379.0
GBR   876.0 26330.0  2509.0  2192.0  2236.0  2510.0 26801.0
ITA  1144.0 26153.0  1898.0  1511.0  1562.0  1810.0 24918.0 26419.0
NLD   977.0  2667.0 32919.0 32599.0 33127.0 31540.0  2460.0  1789.0 34429.0
POL  1443.0  2743.0 28223.0 28129.0 28585.0 27283.0  2165.0  1844.0 28567.0 30257.0

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Number of bulls in reference population for        rtp
-----------------------------------------------------
BEL  2551.0
CAN  1315.0 29326.0
DEU   980.0  2698.0 32413.0
DFS   865.0  2336.0 30289.0 31230.0
ESP   938.0  2393.0 30508.0 30531.0 31345.0
FRA  1015.0  2711.0 29038.0 28902.0 29264.0 31008.0
GBR   875.0 24465.0  2500.0  2184.0  2227.0  2499.0 24929.0
ITA  1145.0 24220.0  1892.0  1506.0  1556.0  1803.0 23153.0 24484.0
NLD   985.0  2642.0 30577.0 30414.0 30732.0 29230.0  2437.0  1766.0 32229.0
POL  1440.0  2734.0 26699.0 26753.0 27007.0 25750.0  2157.0  1838.0 26988.0 28590.0

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Number of bulls in reference population for ocs

AUS	2705.0									
BEL	325.0	2556.0								
CAN	884.0	1314.0	32454.0							
DEU	606.0	980.0	2709.0	34168.0						
ESP	583.0	938.0	2402.0	32219.0	33132.0					
FRA	616.0	1015.0	2722.0	30662.0	30941.0	32732.0				
GBR	907.0	877.0	26314.0	2508.0	2235.0	2509.0	26789.0			
ITA	642.0	1145.0	26138.0	1898.0	1562.0	1810.0	24903.0	26404.0		
NLD	687.0	985.0	2668.0	32316.0	32524.0	30936.0	2463.0	1790.0	34175.0	
POL	546.0	1441.0	2742.0	27612.0	27974.0	26671.0	2164.0	1844.0	27966.0	29646.0

Number of bulls in reference population for ous

BEL	2552.0									
CAN	1315.0	32472.0								
DEU	982.0	2710.0	34801.0							
DFS	867.0	2344.0	32422.0	33456.0						
ESP	940.0	2403.0	32849.0	32745.0	33774.0					
FRA	1017.0	2723.0	31295.0	31018.0	31577.0	33377.0				
GBR	877.0	26332.0	2509.0	2192.0	2236.0	2510.0	26804.0			
ITA	1145.0	26154.0	1898.0	1511.0	1562.0	1810.0	24919.0	26420.0		
NLD	987.0	2669.0	32922.0	32602.0	33130.0	31542.0	2464.0	1790.0	34784.0	
POL	1443.0	2743.0	28223.0	28129.0	28585.0	27282.0	2165.0	1844.0	28569.0	30257.0

Number of bulls in reference population for ofl

BEL	2539.0									
CAN	1313.0	32323.0								
DEU	981.0	2710.0	34165.0							
DFS	866.0	2344.0	31799.0	32830.0						
ESP	939.0	2403.0	32216.0	32120.0	33129.0					
FRA	1016.0	2723.0	30660.0	30394.0	30939.0	32730.0				
GBR	875.0	26204.0	2509.0	2192.0	2236.0	2510.0	26672.0			
ITA	1144.0	26048.0	1898.0	1511.0	1562.0	1810.0	24813.0	26314.0		
NLD	976.0	2667.0	32313.0	31996.0	32521.0	30934.0	2460.0	1789.0	33798.0	
POL	1442.0	2743.0	27609.0	27518.0	27971.0	26669.0	2165.0	1844.0	27963.0	29643.0

Number of bulls in reference population for loc

BEL	2518.0									
CAN	1307.0	26249.0								
DEU	976.0	2657.0	28318.0							
DFS	862.0	2299.0	26501.0	27281.0						
ESP	934.0	2355.0	26816.0	26809.0	27508.0					
FRA	1011.0	2673.0	25296.0	25109.0	25573.0	26984.0				
GBR	872.0	23667.0	2459.0	2146.0	2189.0	2460.0	24112.0			
ITA	1136.0	23424.0	1874.0	1490.0	1541.0	1788.0	22508.0	23622.0		
NLD	970.0	2625.0	26874.0	26678.0	27099.0	25493.0	2419.0	1767.0	28171.0	

Number of bulls in reference population for bcs

BEL	2407.0						
DEU	969.0	25023.0					
FRA	1004.0	22124.0	23631.0				
GBR	865.0	2448.0	2449.0	22624.0			
ITA	1137.0	1863.0	1777.0	21018.0	22369.0		
NLD	961.0	23630.0	22351.0	2402.0	1750.0	24927.0	
CAN	1307.0	2641.0	2657.0	22200.0	22182.0	2603.0	26590.0