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:

DFS (HOL) New standardization procedure and introduction of a polygenic effect of 10% in the genomic model.

POL (HOL) New method of estimating GEBV with polygenic effect included
New method of calculating PI and its accuracy and reliability of DGV
Whole EuroGenomic reference population has been used

DEU (HOL) Re-examined the assumed proportions of residual polygenic variance for all conformation traits and made modification of this parameter accordingly.

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.

SCIENTIFIC LITERATURE

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

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 December 2016

Country	Date
BEL	20161201
CAN	20161201
DEU	20161206
DFS	20161101
ESP	20161110
FRA	20161208
GBR	20161201
ITA	20161108
NLD	20161201
POL	20161015

Table 2.

Number of bulls in reference population for sta

BEL	2531.0									
CAN	1285.0	31440.0								
DEU	933.0	2192.0	33602.0							
DFS	845.0	1973.0	31451.0	32388.0						
ESP	888.0	2087.0	31704.0	31633.0	32719.0					
FRA	984.0	2389.0	30348.0	30140.0	30670.0	32451.0				
GBR	830.0	25431.0	2010.0	1824.0	1919.0	2190.0	25817.0			
ITA	727.0	24527.0	1592.0	1320.0	1403.0	1659.0	24448.0	24824.0		
NLD	949.0	2352.0	32045.0	31850.0	32283.0	30796.0	2159.0	1641.0	33877.0	
POL	1349.0	2380.0	27111.0	27043.0	27531.0	26309.0	1817.0	1312.0	27658.0	29188.0

Number of bulls in reference population for cwi

BEL	2531.0									
CAN	1285.0	31436.0								
DEU	932.0	2192.0	32386.0							
DFS	844.0	1973.0	30372.0	31302.0						
ESP	887.0	2087.0	30498.0	30555.0	31510.0					
FRA	983.0	2389.0	29160.0	29074.0	29489.0	31249.0				
GBR	830.0	25428.0	2010.0	1824.0	1919.0	2190.0	25814.0			
ITA	727.0	24524.0	1592.0	1320.0	1403.0	1659.0	24446.0	24821.0		
NLD	948.0	2352.0	30856.0	30787.0	31094.0	29633.0	2159.0	1641.0	32684.0	
POL	1348.0	2380.0	25962.0	26019.0	26380.0	25185.0	1817.0	1312.0	26513.0	28035.0

Number of bulls in reference population for bde

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BEL  2516.0
CAN  1285.0 31440.0
DEU   933.0  2192.0 33043.0
DFS   845.0  1973.0 31007.0 31941.0
ESP   888.0  2087.0 31148.0 31190.0 32161.0
FRA   984.0  2389.0 29817.0 29711.0 30140.0 31919.0
GBR   830.0 25431.0  2010.0  1824.0  1919.0  2190.0 25817.0
ITA   727.0 24527.0  1592.0  1320.0  1403.0  1659.0 24448.0 24824.0
NLD   949.0  2352.0 31486.0 31405.0 31725.0 30264.0  2159.0  1641.0 33315.0
POL  1349.0  2380.0 26599.0 26644.0 27018.0 25823.0  1817.0  1312.0 27143.0 28673.0

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Number of bulls in reference population for        ang
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BEL  2489.0
CAN  1283.0 31000.0
DEU   924.0  2187.0 29835.0
DFS   837.0  1969.0 27887.0 28815.0
ESP   879.0  2082.0 27961.0 28082.0 28968.0
FRA   975.0  2384.0 26678.0 26653.0 27007.0 28765.0
GBR   828.0 25419.0  2005.0  1820.0  1914.0  2185.0 25798.0
ITA   725.0 24517.0  1587.0  1316.0  1398.0  1654.0 24439.0 24812.0
NLD   930.0  2345.0 28310.0 28305.0 28557.0 27155.0  2150.0  1635.0 29800.0
POL  1338.0  2375.0 23415.0 23537.0 23842.0 22706.0  1812.0  1305.0 23965.0 25477.0

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Number of bulls in reference population for        ran
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BEL  2532.0
CAN  1285.0 31440.0
DEU   933.0  2192.0 33506.0
DFS   845.0  1973.0 31355.0 32292.0
ESP   888.0  2087.0 31613.0 31542.0 32628.0
FRA   984.0  2389.0 30253.0 30045.0 30580.0 32356.0
GBR   830.0 25431.0  2010.0  1824.0  1919.0  2190.0 25817.0
ITA   727.0 24527.0  1592.0  1320.0  1403.0  1659.0 24448.0 24824.0
NLD   949.0  2352.0 31950.0 31755.0 32193.0 30701.0  2159.0  1641.0 33782.0
POL  1349.0  2380.0 27108.0 27040.0 27528.0 26306.0  1817.0  1312.0 27655.0 29185.0

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Number of bulls in reference population for        rwi
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BEL  2516.0
CAN  1285.0 30620.0
DEU   933.0  2192.0 33547.0
DFS   845.0  1973.0 31399.0 32336.0
ESP   888.0  2087.0 31650.0 31582.0 32665.0
FRA   984.0  2389.0 30293.0 30088.0 30616.0 32396.0
GBR   830.0 25431.0  2010.0  1824.0  1919.0  2190.0 25817.0
ITA   727.0 24527.0  1592.0  1320.0  1403.0  1659.0 24448.0 24824.0
NLD   949.0  2352.0 31990.0 31798.0 32229.0 30741.0  2159.0  1641.0 33822.0
POL  1349.0  2380.0 27101.0 27036.0 27521.0 26299.0  1817.0  1312.0 27648.0 29178.0
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Number of bulls in reference population for        rls
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BEL  2532.0
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CAN  1285.0 31440.0
DEU   933.0  2192.0 33603.0
DFS   845.0  1973.0 31452.0 32389.0
ESP   888.0  2087.0 31705.0 31634.0 32720.0
FRA   984.0  2389.0 30349.0 30141.0 30671.0 32452.0
GBR   830.0 25431.0  2010.0  1824.0  1919.0  2190.0 25817.0
ITA   727.0 24527.0  1592.0  1320.0  1403.0  1659.0 24448.0 24824.0
NLD   949.0  2352.0 32046.0 31851.0 32284.0 30797.0  2159.0  1641.0 33878.0
POL  1349.0  2380.0 27111.0 27043.0 27531.0 26309.0  1817.0  1312.0 27658.0 29188.0

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Number of bulls in reference population for        rlr
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BEL  2506.0
CAN  1283.0 30510.0
DEU   927.0  2184.0 31503.0
DFS   839.0  1965.0 29542.0 30469.0
ESP   882.0  2079.0 29629.0 29723.0 30638.0
FRA   978.0  2381.0 28287.0 28252.0 28628.0 30322.0
GBR   827.0 24604.0  2001.0  1815.0  1910.0  2181.0 24982.0
ITA   726.0 23690.0  1584.0  1312.0  1395.0  1651.0 23625.0 23985.0
NLD   933.0  2342.0 30000.0 29965.0 30237.0 28786.0  2146.0  1632.0 31503.0
POL  1343.0  2372.0 25102.0 25193.0 25518.0 24333.0  1808.0  1304.0 25657.0 27125.0

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Number of bulls in reference population for        fan
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BEL  2517.0
CAN  1283.0 31435.0
DEU   932.0  2192.0 31411.0
DFS   845.0  1973.0 29674.0 30595.0
ESP   887.0  2087.0 29788.0 29867.0 30800.0
FRA   983.0  2389.0 28493.0 28421.0 28822.0 30590.0
GBR   828.0 25428.0  2010.0  1824.0  1919.0  2190.0 25810.0
ITA   726.0 24526.0  1592.0  1320.0  1403.0  1659.0 24447.0 24823.0
NLD   938.0  2350.0 30131.0 30086.0 30378.0 28951.0  2155.0  1640.0 31633.0
POL  1348.0  2380.0 25248.0 25329.0 25675.0 24515.0  1817.0  1312.0 25802.0 27320.0

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Number of bulls in reference population for        hde
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Number of bulls in reference population for        fua
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BEL  2532.0
CAN  1285.0 31439.0
DEU   933.0  2192.0 32784.0
DFS   845.0  1973.0 30763.0 31695.0
ESP   888.0  2087.0 30892.0 30945.0 31905.0
FRA   984.0  2389.0 29558.0 29466.0 29884.0 31656.0
GBR   830.0 25431.0  2010.0  1824.0  1919.0  2190.0 25817.0
ITA   727.0 24526.0  1592.0  1320.0  1403.0  1659.0 24448.0 24823.0
NLD   949.0  2352.0 31245.0 31173.0 31483.0 30023.0  2159.0  1641.0 33074.0
POL  1349.0  2380.0 26308.0 26362.0 26727.0 25532.0  1817.0  1312.0 26857.0 28382.0

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Number of bulls in reference population for        ruh
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BEL  2532.0
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CAN  1285.0 31439.0
DEU   933.0  2192.0 32472.0
DFS   845.0  1973.0 30444.0 31349.0
ESP   888.0  2087.0 30579.0 30599.0 31563.0
FRA   984.0  2389.0 29253.0 29154.0 29577.0 31352.0
GBR   830.0 25430.0  2010.0  1824.0  1919.0  2190.0 25816.0
ITA   727.0 24527.0  1592.0  1320.0  1403.0  1659.0 24448.0 24824.0
NLD   949.0  2352.0 30924.0 30849.0 31163.0 29708.0  2159.0  1641.0 32752.0
POL  1349.0  2380.0 26445.0 26493.0 26864.0 25669.0  1817.0  1312.0 26993.0 28519.0

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Number of bulls in reference population for        ruw
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Number of bulls in reference population for        usu
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BEL  2532.0
CAN  1285.0 31440.0
DEU   933.0  2192.0 33601.0
DFS   845.0  1973.0 31450.0 32387.0
ESP   888.0  2087.0 31703.0 31632.0 32718.0
FRA   984.0  2389.0 30347.0 30139.0 30669.0 32450.0
GBR   830.0 25431.0  2010.0  1824.0  1919.0  2190.0 25817.0
ITA   727.0 24527.0  1592.0  1320.0  1403.0  1659.0 24448.0 24824.0
NLD   949.0  2352.0 32044.0 31849.0 32282.0 30795.0  2159.0  1641.0 33876.0
POL  1349.0  2380.0 27109.0 27041.0 27529.0 26307.0  1817.0  1312.0 27656.0 29186.0

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Number of bulls in reference population for        ude
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BEL  2520.0
CAN  1283.0 31436.0
DEU   933.0  2192.0 33600.0
DFS   845.0  1973.0 31449.0 32386.0
ESP   888.0  2087.0 31702.0 31631.0 32717.0
FRA   984.0  2389.0 30347.0 30139.0 30669.0 32450.0
GBR   828.0 25428.0  2010.0  1824.0  1919.0  2190.0 25810.0
ITA   726.0 24526.0  1592.0  1320.0  1403.0  1659.0 24447.0 24823.0
NLD   939.0  2350.0 32043.0 31848.0 32281.0 30795.0  2155.0  1640.0 33553.0
POL  1349.0  2380.0 27109.0 27041.0 27529.0 26308.0  1817.0  1312.0 27656.0 29186.0

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Number of bulls in reference population for        ftp
-----------------------------------------------------
BEL  2532.0
CAN  1285.0 31441.0
DEU   933.0  2192.0 33555.0
DFS   845.0  1973.0 31404.0 32341.0
ESP   888.0  2087.0 31658.0 31587.0 32673.0
FRA   984.0  2389.0 30301.0 30093.0 30624.0 32404.0
GBR   830.0 25432.0  2010.0  1824.0  1919.0  2190.0 25818.0
ITA   727.0 24528.0  1592.0  1320.0  1403.0  1659.0 24449.0 24825.0
NLD   949.0  2352.0 31998.0 31803.0 32237.0 30749.0  2159.0  1641.0 33830.0
POL  1349.0  2380.0 27109.0 27041.0 27529.0 26307.0  1817.0  1312.0 27656.0 29186.0

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Number of bulls in reference population for        ftl
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BEL  2520.0
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CAN  1283.0 31425.0
DEU   933.0  2192.0 33600.0
DFS   845.0  1973.0 31449.0 32386.0
ESP   888.0  2087.0 31702.0 31631.0 32717.0
FRA   984.0  2389.0 30347.0 30139.0 30669.0 32450.0
GBR   828.0 25429.0  2010.0  1824.0  1919.0  2190.0 25811.0
ITA   726.0 24527.0  1592.0  1320.0  1403.0  1659.0 24448.0 24824.0
NLD   939.0  2350.0 32043.0 31848.0 32281.0 30795.0  2155.0  1640.0 33553.0
POL  1349.0  2380.0 27109.0 27041.0 27529.0 26308.0  1817.0  1312.0 27656.0 29186.0

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Number of bulls in reference population for        rtp
-----------------------------------------------------
BEL  2509.0
CAN  1285.0 28299.0
DEU   931.0  2183.0 31225.0
DFS   843.0  1968.0 29331.0 30174.0
ESP   886.0  2079.0 29377.0 29434.0 30303.0
FRA   982.0  2382.0 28104.0 28037.0 28371.0 30095.0
GBR   830.0 23569.0  2003.0  1819.0  1912.0  2184.0 23950.0
ITA   727.0 22761.0  1586.0  1315.0  1397.0  1654.0 22688.0 23055.0
NLD   947.0  2328.0 29714.0 29678.0 29900.0 28499.0  2135.0  1618.0 31335.0
POL  1346.0  2373.0 25597.0 25677.0 25964.0 24786.0  1811.0  1307.0 26089.0 27530.0

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Number of bulls in reference population for        ocs
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AUS  2145.0
BEL   224.0  2515.0
CAN   441.0  1285.0 31423.0
DEU   382.0   932.0  2192.0 32972.0
ESP   371.0   887.0  2087.0 31081.0 32095.0
FRA   381.0   983.0  2389.0 29718.0 30046.0 31808.0
GBR   459.0   830.0 25414.0  2010.0  1919.0  2190.0 25800.0
ITA   309.0   727.0 24511.0  1592.0  1403.0  1659.0 24432.0 24808.0
NLD   471.0   948.0  2352.0 31442.0 31680.0 30193.0  2159.0  1641.0 33270.0
POL   348.0  1348.0  2380.0 26502.0 26921.0 25699.0  1817.0  1312.0 27057.0 28578.0

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Number of bulls in reference population for        ous
-----------------------------------------------------
BEL  2510.0
CAN  1285.0 31439.0
DEU   933.0  2192.0 33603.0
DFS   845.0  1973.0 31452.0 32389.0
ESP   888.0  2087.0 31705.0 31634.0 32719.0
FRA   984.0  2389.0 30349.0 30141.0 30670.0 32450.0
GBR   830.0 25430.0  2010.0  1824.0  1919.0  2190.0 25816.0
ITA   727.0 24527.0  1592.0  1320.0  1403.0  1659.0 24448.0 24824.0
NLD   949.0  2352.0 32046.0 31851.0 32284.0 30797.0  2159.0  1641.0 33877.0
POL  1349.0  2380.0 27111.0 27043.0 27530.0 26308.0  1817.0  1312.0 27658.0 29187.0
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Number of bulls in reference population for        ofl
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BEL  2497.0
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CAN  1283.0 31290.0
DEU   932.0  2192.0 32962.0
DFS   844.0  1973.0 30827.0 31761.0
ESP   887.0  2087.0 31071.0 31009.0 32084.0
FRA   983.0  2389.0 29709.0 29515.0 30036.0 31786.0
GBR   828.0 25302.0  2010.0  1824.0  1919.0  2190.0 25684.0
ITA   726.0 24422.0  1592.0  1320.0  1403.0  1659.0 24343.0 24719.0
NLD   938.0  2350.0 31432.0 31243.0 31669.0 30183.0  2155.0  1640.0 32916.0
POL  1348.0  2380.0 26492.0 26430.0 26910.0 25689.0  1817.0  1312.0 27046.0 28567.0

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Number of bulls in reference population for        loc
-----------------------------------------------------
BEL  2476.0
CAN  1277.0 25127.0
DEU   927.0  2156.0 27252.0
DFS   840.0  1935.0 25671.0 26398.0
ESP   882.0  2041.0 25808.0 25885.0 26535.0
FRA   978.0  2343.0 24417.0 24334.0 24701.0 26118.0
GBR   826.0 22674.0  1976.0  1786.0  1874.0  2145.0 23044.0
ITA   722.0 21993.0  1571.0  1300.0  1382.0  1639.0 21934.0 22233.0
NLD   932.0  2309.0 26003.0 25952.0 26253.0 24746.0  2115.0  1618.0 27291.0

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Number of bulls in reference population for        bcs
-----------------------------------------------------
BEL  2286.0
DEU   920.0 24095.0
FRA   971.0 21375.0 22902.0
GBR   823.0  1963.0  2133.0 21557.0
ITA   721.0  1559.0  1628.0 20441.0 20737.0
NLD   923.0 22890.0 21716.0  2097.0  1601.0 24161.0
CAN  1277.0  2142.0  2330.0 21206.0 20510.0  2290.0 25469.0
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