INTRODUCTION
The latest genomic test international evaluation for workability traits took place as scheduled at the Interbull Centre. Data from 15 countries were included in this evaluation.

International genetic evaluations for workability traits of bulls were computed from:
AUS CAN CHE DEU DFS FRA GBR HLD NLD NZL ITA JPN ESP CZE POL
Holstein data were included in this evaluation.
CAN, DEU, FRA, DFS, GBR, HLD, ITA, ESP, POL submitted GEBVs.

CHANGES IN NATIONAL PROCEDURES
Changes in the national genetic evaluation of workability traits are as follows:
FRA (HOL)    Proofs and reliability calculated with the single step methodology (HSSGBLUP) developed by INRAE. A new software for the count of daughters and breed has also been developed by Geneval. Principles stayed the same than before but pedigree corrections have been made. Other information concerning publications can have been changed.

GBR (HOL)    Update of genotypes and data update

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 EBVs included for the breeding values 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. 2013a. GMACE reliability approximation. Report to the GMACE working group of Interbull. GMACE_rels 2013
Sullivan, P.G. 2013b. GMACE variance estimation. Report to the GMACE working group of Interbull. GMACE_vce 2013
Sullivan, P.G. 2013c. GMACE Weighting Factors. Report to the GMACE working group of Interbull. GMACE_gedcs 2013

NEXT ROUTINE INTERNATIONAL EVALUATION
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 minimizing 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. Evaluation expressed in 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 2022

<table>
<thead>
<tr>
<th>Country</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAN</td>
<td>20221201</td>
</tr>
<tr>
<td>DEU</td>
<td>20221206</td>
</tr>
<tr>
<td>DFS</td>
<td>20221101</td>
</tr>
<tr>
<td>FRA</td>
<td>20221206</td>
</tr>
<tr>
<td>NLD</td>
<td>20221201</td>
</tr>
<tr>
<td>GBR</td>
<td>20221109</td>
</tr>
<tr>
<td>ITA</td>
<td>20221111</td>
</tr>
<tr>
<td>ESP</td>
<td>20221115</td>
</tr>
<tr>
<td>POL</td>
<td>20221119</td>
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Table 2.

Number of bulls in reference population for msp

<table>
<thead>
<tr>
<th>Country</th>
<th>Number of bulls</th>
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</thead>
<tbody>
<tr>
<td>CAN</td>
<td>23985.0</td>
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<tr>
<td>DEU</td>
<td>6671.0 37684.0</td>
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<tr>
<td>DFS</td>
<td>4614.0 34042.0 34850.0</td>
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<tr>
<td>FRA</td>
<td>3646.0 30895.0 30460.0 32446.0</td>
</tr>
<tr>
<td>NLD</td>
<td>3589.0 32282.0 31802.0 30446.0 33552.0</td>
</tr>
<tr>
<td>GBR</td>
<td>20332.0  7194.0  5102.0  3748.0  3939.0 22221.0</td>
</tr>
<tr>
<td>ITA</td>
<td>21136.0  6217.0  4153.0  2998.0  3032.0 20278.0 22196.0</td>
</tr>
<tr>
<td>ESP</td>
<td>5546.0 35449.0 34333.0 30979.0 32323.0 6109.0 5290.0 34998.0</td>
</tr>
<tr>
<td>POL</td>
<td>4254.0 29444.0 29324.0 27669.0 4168.0 3787.0 24545.0 30565.0</td>
</tr>
</tbody>
</table>

Number of bulls in reference population for tem

<table>
<thead>
<tr>
<th>Country</th>
<th>Number of bulls</th>
</tr>
</thead>
<tbody>
<tr>
<td>DEU</td>
<td>35072.0</td>
</tr>
<tr>
<td>DFS</td>
<td>31499.0 32157.0</td>
</tr>
<tr>
<td>NLD</td>
<td>29999.0 29441.0 31146.0</td>
</tr>
<tr>
<td>GBR</td>
<td>6597.0 4556.0 3577.0 21277.0</td>
</tr>
</tbody>
</table>

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

NEXT TEST INTERNATIONAL EVALUATION

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