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INTRODUCTION
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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 NLD SVN NZL ITA JPN ESP CZE POL
Holstein data were included in this evaluation.

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

msp: CAN, DEU, FRA, DFS, GBR, NLD, ITA, ESP, POL
tem:    , DEU,    , DFS, GBR, NLD


CHANGES IN NATIONAL PROCEDURES
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Changes in the national genetic evaluation of workability traits are as follows:

GBR (HOL)    Loss of about 300 bulls in this run compared to previous run. Due to improved QA with such that all clones are removed, removal of animals failing
             parentage check, removal of some invalid genotypes, some identities have been updated from Herd book numbers to eartags between the runs
ITA (HOL)    Gebvs for a revised model for msp in line with changes in MACE

INTERBULL CHANGES COMPARED TO THE DECEMBER ROUTINE RUN
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No changes in Interbull procedures

DATA AND METHOD OF ANALYSIS
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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
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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
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Dates for next routine run can be found on http://www.interbull.org/ib/servicecalendar
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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 2021
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Country  Date
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CAN       20211201
DEU       20211207
DFS       20211102
FRA       20211208
NLD       20211201
GBR       20211105
ITA       20211104
ESP       20211115
POL       20211207
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Table 2.
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Number of bulls in reference population for        msp
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CAN 20480.0
DEU   5809.0 36466.0
DFS   4110.0 33190.0 34018.0
FRA   3595.0 30818.0 30410.0 32374.0
NLD   3540.0 32188.0 31755.0 30396.0 33490.0
GBR 16988.0  6067.0  4273.0  3705.0  3848.0 19017.0
ITA 16602.0  4589.0  3091.0  2869.0  2795.0 15689.0 17055.0
ESP  4840.0 34104.0 33491.0 30895.0 32256.0  5030.0  3640.0 35016.0
POL  3906.0 28561.0 28433.0 26468.0 27640.0  4021.0  2896.0 28891.0 29890.0

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Number of bulls in reference population for        tem
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DEU 34018.0
DFS 30768.0 31444.0
NLD 29907.0 29384.0 31059.0
GBR  5590.0  3837.0  3489.0 18218.0
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