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Introduction
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The latest routine international evaluation for workability traits took place as
scheduled at the Interbull Centre. Data from six (6) countries were included
in this evaluation.

International genetic evaluations for workability traits of bulls from
Austria-Germany, Canada, Denmark-Finland-Sweden, France, Italy, Netherlands, Norway
and Switzerland were computed. Brown Swiss, Holstein, Jersey and Red Dairy Cattle breed
data were included in this evaluation.



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

CAN (ALL)       Decrease in information due to pedigree changes.
AUS (HOL, JER)  Decrease in information due to pedigree changes.



INTERBULL CHANGES COMPARED TO THE DECEMBER ROUTINE RUN
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1)    Data submission for pedigree, EBV/PTA, and parameters is
         possible only through uploading of the data to the Interbull
         Data Exchange Area (IDEA);
2)    Interbull Centre has moved to a completely new MACE evaluation
         software called "Dairy System for International Evaluation
         (DAISIE)", partly because of the extended use of IDEA for EBV/PTA,
         and partly because of our continuous efforts to make the system
         more effective than before;
3)    All trait groups (including conformation traits) are now evaluated
         in-house.
4)    The file containing heritability values now contain more decimal
         places for heritability, and one extra field for the definition of
         reference base population;
5)    The file containing genetic correlations has changed name from
         rG_columns_all to cor{RUNID}.csv, and also contains one extra field
         for the number of common bulls;
6)    The file containing sire genetic standard deviations has changed name
         from sire_std_columns_all to std{RUNID}.csv;
7)    Sire-MGS based pedigree files are not distributed anymore;
8)    Parent averages in the "ipa" format are not distributed anymore;
9)    An import AI bull (type of proof = 21) with official publication
         status 'Y' from a given country is included in the distribution
         file if the bull has a first country proof included from a different
         country OR a second country proof is included with minimum required
         number of daughters or EDC (20, 10, 150, 20, 20, and 80) and herds
         (20, 10, 150, 20, 20, and 80) for different breeds (BSW, GUE, HOL,
         JER, RDC and SIM), respectively;
10)   Bulls with some missing pedigree information (sires and/or dam and/or
         birthdate) are excluded from evaluations;
11)   Standardization factors are not used anymore;
12)   Post-processing of genetic correlation are now applied to all trait groups.

DATA AND METHOD OF ANALYSIS
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Data were national genetic evaluations of AI sampled bulls with at least
10 daughters or 10 EDC (for clinical mastitis and maternal calving traits at least
50 daughters or 50 EDC, and for direct calving traits at least 50 calvings or 50 EDC) in at
least 10 herds. Table 1 presents the amount of data included
in this Interbull evaluation for all breeds.

National proofs were first de-regressed within country and then analysed
jointly with a linear model including the effects of evaluation country,
genetic group of bull and bull merit. Heritability estimates used in both
the de-regression and international evaluation were as in each country's
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national evaluation.

Table 2 presents the date of evaluation as supplied by each country
in the 01x-proof file.

Estimated genetic parameters and sire standard deviations are shown in APPENDIX I
and the corresponding number of common bulls are listed in APPENDIX II.

SCIENTIFIC LITERATURE

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

International genetic evaluation computation:
     Schaeffer. 1994. J. Dairy Sci. 77:2671-2678
     Klei, 1998. Interbull Bulletin 17:3-7

Verification and Genetic trend validation:
     Klei et al., 2002. Interbull Bulletin 29:178-182.
     Boichard et al., 1995. J. Dairy Sci. 78:431-437

Weighting factors:
     Fikse and Banos, 2001. J. Dairy Sci. 84:1759-1767

De-regression:
     Sigurdsson and G. Banos. 1995. Acta Agric. Scand. 45:207-219
     Jairath et al. 1998. J. Dairy Sci. Vol. 81:550-562

Genetic parameter estimation:
     Klei and Weigel, 1998, Interbull Bulletin 17:8-14
     Sullivan, 1999. Interbull Bulletin 22:146-148

Post-processing of estimated genetic correlations:
     Mark et al., 2003, Interbull Bulletin 30:126-135
     Jorjani et al., 2003. J. Dairy Sci. 86:677-679
     https://wiki.interbull.org/public/rG%20procedure?action=print

Time edits
     Weigel and Banos. 1997. J. Dairy Sci. 80:3425-3430

International reliability estimation
     Harris and Johnson. 1998. Interbull Bulletin 17:31-36

NEXT ROUTINE INTERNATIONAL EVALUATION

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

NEXT TEST INTERNATIONAL EVALUATION

Dates for the next test run can be found on
http://www.interbull.org/ib/servicecalendar.
PUBLICATION OF INTERBULL TEST RUN

Test evaluation results are meant for review purposes only and should not be
published.

^LTable 1. National evaluation data considered in the Interbull
evaluation for Workability (August Routine Evaluation 2015).
Number of records for milking speed by breed

Country	BSW	GUE	HOL	JER	RDC	SIM
ARG						
AUS			5796	1115	438	
BEL						
CAN	156		10424	531	723	
CHE	2403		2489			
CZE						
DEA	3691					
DEU			18465		344	
DFS			10837	1732	5928	
ESP						
EST						
FRA			15340			
FRM						
FRR						
GBR			4675			
HUN						
IRL						
ISR						
ITA	1700					
JPN						
KOR						
LTU						
LVA						
NLD	91		11993	24		
NOR					3424	
NZL			5006	3294	527	
POL						
PRT						
SVK						
SVN	233		312			
URY						
USA						
ZAF						
HRV						
No.Records	8274		85337	6696	11384	
Pub. Proofs	7209	0	76456	6260	10987	0

^LAPPENDIX I. Sire standard deviations in diagonal and genetic correlations below diagonal
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BSW   msp

	CAN	CHE	DEA	ITA	NLD	SVN
CAN	7.55					
CHE	0.96	15.87				
DEA	0.93	0.97	11.77			
ITA	0.93	0.95	0.92	14.78		
NLD	0.94	0.97	0.96	0.93	6.38	
SVN	0.90	0.91	0.89	0.97	0.88	25.32

HOL   msp

	CAN	CHE	DEU	DFS	FRA	NLD	AUS	GBR	SVN	NZL
CAN	7.61									
CHE	0.88	12.10								
DEU	0.91	0.98	13.72							
DFS	0.95	0.95	0.97	14.86						
FRA	0.93	0.97	0.96	0.97	1.09					
NLD	0.95	0.97	0.96	0.98	0.98	5.60				
AUS	0.89	0.88	0.88	0.90	0.91	0.91	3.56			
GBR	0.85	0.85	0.85	0.85	0.85	0.85	0.86	0.15		
SVN	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	22.86	
NZL	0.91	0.89	0.88	0.88	0.93	0.92	0.94	0.85	0.87	0.37

HOL   tem

	CAN	CHE	DEU	DFS	FRA	NLD	AUS	GBR	NZL
CAN	6.94								
CHE	0.70	11.10							
DEU	0.86	0.82	8.72						
DFS	0.79	0.83	0.82	13.22					
FRA	0.73	0.90	0.80	0.91	1.00				
NLD	0.85	0.73	0.84	0.88	0.82	4.92			
AUS	0.70	0.71	0.70	0.72	0.71	0.74	3.06		
GBR	0.70	0.81	0.73	0.81	0.86	0.71	0.70	0.15	
NZL	0.70	0.71	0.71	0.71	0.70	0.74	0.78	0.70	0.37

JER   msp

	CAN	DFS	NLD	AUS	NZL
CAN	8.73				
DFS	0.90	14.51			
NLD	0.94	0.97	4.63		
AUS	0.86	0.87	0.92	3.36	
NZL	0.87	0.87	0.91	0.90	0.33

RDC   msp

	CAN	DEU	DFS	NOR	AUS	NZL
CAN	6.53					
DEU	0.91	10.03				
DFS	0.97	0.96	13.66			
NOR	0.92	0.92	0.95	13.02		
AUS	0.89	0.88	0.91	0.88	4.39	
NZL	0.92	0.88	0.91	0.91	0.92	0.41

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RDC     tem
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          CAN     DEU     DFS     NOR     AUS     NZL
CAN      6.35
DEU      0.86    4.95
DFS      0.79    0.79   11.19
NOR      0.86    0.79    0.95   13.77
AUS      0.72    0.73    0.72    0.76    3.35
NZL      0.72    0.73    0.77    0.78    0.77    0.44


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^LAPPENDIX II. Number of common bulls
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BSW
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 common bulls below diagonal
 common three quarter sib group above diagonal
       CAN   CHE   DEA   ITA   NLD   SVN
 ----------------------------------------------------------------------------
   CAN    0    86    91    75    30    15
   CHE   72     0   463   298    48    32
   DEA   81   381     0   460    70    49
   ITA   65   234   368     0    64    45
   NLD   24    45    60    49     0    21
   SVN   13    33    47    44    20     0
 ----------------------------------------------------------------------------
HOL
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
       CAN   CHE   DEU   DFS   FRA   NLD   AUS   GBR   SVN   NZL
 ----------------------------------------------------------------------------
   CAN    0   550  1599   895  1050   949   811  1126    98   320
   CHE  412     0   681   396   375   534   326   441    63   182
   DEU  690   485     0  1756  1639  1925   881  1327   152   376
   DFS  534   307   676     0  1179  1295   739  1035   129   380
   FRA  515   312   506   397     0  1399   798  1137    93   419
   NLD  768   496  1057   805   614     0   884  1220   135   505
   AUS  641   246   421   348   388   627     0   826    81   543
   GBR 1086   416   715   600   557   899   552     0   117   400
   SVN   77    50   133   106    65   112    52    91     0    39
   NZL  278   148   218   212   186   436   404   294    30     0
 ----------------------------------------------------------------------------
HOL
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
       CAN   CHE   DEU   DFS   FRA   NLD   AUS   GBR   NZL
 ----------------------------------------------------------------------------
   CAN    0   452  1306   795   918   902   779  1092   308
   CHE  315     0   455   304   316   399   271   381   152
   DEU  486   286     0  1337  1329  1627   772  1151   330
   DFS  443   235   454     0  1073  1127   703   974   369
   FRA  507   259   415   366     0  1294   745  1082   384
   NLD  729   348   810   628   585     0   879  1213   501
   AUS  620   206   326   301   386   620     0   826   542
   GBR 1059   338   555   511   553   900   551     0   397
   NZL  270   122   180   197   184   431   403   293     0
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JER
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
       CAN   DFS   NLD   AUS   NZL
 ------------------------------------------------------------------------------
   CAN    0    53     8   132    57
   DFS   38     0    10    68    69
   NLD    6     6     0    13    12
   AUS  131    42    13     0   168
   NZL   61    49    11   159     0
 ------------------------------------------------------------------------------
RDC
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
       CAN   DEU   DFS   NOR   AUS   NZL
 ------------------------------------------------------------------------------
   CAN    0     7    85     4    32    29
   DEU    7     0    38    10    18     4
   DFS   81    28     0    78    87    50
   NOR    4    10    60     0    39    10
   AUS   29    17    65    33     0    33
   NZL   26     4    48     9    30     0
 ------------------------------------------------------------------------------
RDC
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
       CAN   DEU   DFS   NOR   AUS   NZL
 ------------------------------------------------------------------------------
   CAN    0     4    78     4    32    28
   DEU    4     0    18     6    13     2
   DFS   73    12     0    79    90    49
   NOR    4     5    61     0    36     9
   AUS   29    12    67    30     0    33
   NZL   26     2    47     8    30     0
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