

## 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:

CHE (HOL) : The formerly separate genetic evaluations of HOL-CHR/SIM-CHE and HOL-CHE have been joined to one single evaluation. The main differences are:  
Use of pooled data, Various changes in data edits, New genetic parameters, Use of HOL-CHR data (formerly only HOL-CHE data), base change  
DEA (BSW) : Base change shifting 4 months ahead  
FRA (HOL) : Calculation of EDCs has been corrected for some traits and records before 1991 have been deleted for Holstein breed only. A high decrease in EDCs for some old bulls is expected and some old bulls may loose their proof for some traits for Holstein breed  
ITA (HOL) : Base change, deleting birthyear=1999  
ITA (BSW) : Base change  
NLD (ALL) : Base change, cow base is now 2010 and bull base is 2008.  
NZL (HOL,RDC,JER): Participating for the first time

## 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 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

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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

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

#### NEXT TEST INTERNATIONAL EVALUATION

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

PUBLICATION OF INTERBULL TEST RUN

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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 (April Routine Evaluation 2015).  
Number of records for milking speed by breed

Country	BSW	GUE	HOL	JER	RDC	SIM
ARG						
AUS			5775	1112	435	
BEL						
CAN	150		10296	516	715	
CHE	2375		2450			
CZE						
DEA	3652					
DEU			18237		341	
DFS			10762	1732	5803	
ESP						
EST						
FRA			15254			
FRM						
FRR						
GBR			4603			
HUN						
IRL						
ISR						
ITA	1679					
JPN						
KOR						
LTU						
LVA						
NLD	87		11874	24		
NOR					3389	
NZL			5006	3292	526	
POL						
PRT						
SVK						
SVN	230		299			
URY						
USA						
ZAF						
HRV						
No. Records	8173		84556	6676	11209	
Pub. Proofs	7127	0	75793	6246	10818	0

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

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BSW      msp

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	CAN	CHE	DEA	ITA	NLD	SVN
CAN	7.43					
CHE	0.96	15.87				
DEA	0.93	0.97	11.73			
ITA	0.93	0.95	0.92	14.79		
NLD	0.94	0.97	0.96	0.93	6.40	
SVN	0.90	0.91	0.89	0.97	0.88	25.58

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HOL      msp

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	AUS	CAN	CHE	DEU	DFS	FRA	GBR	NLD	NZL	SVN
AUS	3.57									
CAN	0.89	7.62								
CHE	0.88	0.88	12.04							
DEU	0.88	0.91	0.98	13.73						
DFS	0.90	0.95	0.95	0.97	14.80					
FRA	0.91	0.93	0.97	0.96	0.97	1.09				
GBR	0.86	0.85	0.85	0.85	0.85	0.85	0.15			
NLD	0.91	0.95	0.97	0.96	0.98	0.98	0.85	5.60		
NZL	0.94	0.91	0.89	0.88	0.88	0.93	0.85	0.92	0.37	
SVN	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.87	22.72

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HOL      tem

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	AUS	CAN	CHE	DEU	DFS	FRA	GBR	NLD	NZL
AUS	3.06								
CAN	0.70	6.93							
CHE	0.71	0.70	11.18						
DEU	0.70	0.86	0.82	8.78					
DFS	0.72	0.79	0.83	0.82	13.24				
FRA	0.71	0.73	0.90	0.80	0.91	1.00			
GBR	0.70	0.70	0.81	0.73	0.81	0.86	0.15		
NLD	0.74	0.85	0.73	0.84	0.88	0.82	0.71	4.92	
NZL	0.78	0.70	0.71	0.71	0.71	0.70	0.70	0.74	0.37

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JER      msp

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	AUS	CAN	DFS	NLD	NZL
AUS	3.36				
CAN	0.86	8.61			
DFS	0.87	0.90	14.04		
NLD	0.92	0.94	0.97	4.74	
NZL	0.90	0.87	0.87	0.91	0.33

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RDC      msp

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	AUS	CAN	DEU	DFS	NOR	NZL
AUS	4.40					
CAN	0.89	6.56				
DEU	0.88	0.91	9.95			
DFS	0.91	0.97	0.96	13.64		
NOR	0.88	0.92	0.92	0.95	13.13	
NZL	0.92	0.92	0.88	0.91	0.91	0.41

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RDC      tem
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      AUS      CAN      DEU      DFS      NOR      NZL
AUS      3.36
CAN      0.72      6.38
DEU      0.73      0.86      4.95
DFS      0.72      0.79      0.79      11.20
NOR      0.76      0.86      0.79      0.95      13.46
NZL      0.77      0.72      0.73      0.77      0.78      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   81   88   72   30   15
CHE      68   0  457  296   45   31
DEA      79  375   0  456   65   48
ITA      63  234  366   0   60   44
NLD      24   42   57   46   0   20
SVN      13   32   46   44   19   0
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HOL
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common bulls below diagonal
common three quarter sib group above diagonal
      AUS  CAN  CHE  DEU  DFS  FRA  GBR  NLD  NZL  SVN
-----
AUS      0  802  318  871  732  792  819  878  541  77
CAN     634   0  539 1574  890 1037 1103  935  320  91
CHE     240  401   0  672  391  368  432  526  180  59
DEU     415  657  476   0 1742 1627 1304 1896  374 142
DFS     344  527  300  653   0 1177 1028 1302  379 123
FRA     384  498  305  489  386   0 1126 1389  419  86
GBR     547 1056  404  690  593  538   0 1202  399 109
NLD     625  748  488 1027  818  594  881   0  505 128
NZL     402  278  145  215  211  185  292  436   0   39
SVN      52   76   49  124  106   64   89  111   30   0
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HOL
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common bulls below diagonal
common three quarter sib group above diagonal
      AUS  CAN  CHE  DEU  DFS  FRA  GBR  NLD  NZL
-----
AUS      0  770  262  762  693  739  817  872  540
CAN     612   0  441 1282  777  904 1069  889  308
CHE     199  304   0  444  293  309  371  390  150
DEU     319  463  273   0 1318 1317 1129 1602  329
DFS     292  418  226  431   0 1063  950 1112  365
FRA     382  489  253  399  349   0 1071 1284  384
GBR     545 1029  325  537  492  534   0 1193  397
NLD     617  709  337  785  609  568  881   0  500
NZL     401  270  119  176  193  183  292  430   0
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JER

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common bulls below diagonal  
common three quarter sib group above diagonal  
AUS CAN DFS NLD NZL

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AUS 0 132 68 13 168  
CAN 131 0 53 8 57  
DFS 42 38 0 10 69  
NLD 13 6 6 0 12  
NZL 158 60 48 11 0  
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RDC

-----  
common bulls below diagonal  
common three quarter sib group above diagonal  
AUS CAN DEU DFS NOR NZL

-----  
AUS 0 32 18 87 39 33  
CAN 29 0 7 78 4 29  
DEU 16 7 0 38 10 4  
DFS 65 73 27 0 77 49  
NOR 33 4 9 60 0 10  
NZL 30 26 4 47 9 0  
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RDC

-----  
common bulls below diagonal  
common three quarter sib group above diagonal  
AUS CAN DEU DFS NOR NZL

-----  
AUS 0 32 13 90 36 33  
CAN 29 0 4 74 4 28  
DEU 12 4 0 18 6 2  
DFS 67 68 12 0 78 48  
NOR 30 4 5 61 0 9  
NZL 30 26 2 46 8 0  
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