Introduction

The latest routine international evaluation for **workability traits** took place as scheduled at the Interbull Centre. Data from fourteen (14) countries were included in this evaluation.

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

Changes in national procedures

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

FRA (ALL)	Base change
DEU (HOL,RDC,JER)	Base change
ITA (HOL)	Cut off one year of data, Base change
CHE (JER)	First time
AUS (ALL)	Changes to the rules for the official publication resulting in many bulls changing status to N
NZL (ALL)	Continuous DNA parentage testing.
CAM (RDC)	Base change
CAN (ALL)	Base change
ITA (BSW)	Base change
SVN (ALL)	Base change
USA (RDC)	Corrected an error in the system related to RDC pedigrees. Previously cow heterosis had been computed as if mating AY to Scandinavian does not cause heterosis, whereas bull heterosis assumed they were different breeds. Now the same math to both sexes is applied. The correction is a post-adjustment to the PTAs, not part of the genetic model.

INTERBULL CHANGES COMPARED TO THE DECEMBER ROUTINE RUN

Subsetting:

As decided by the ITC in Orlando, new subsetting was introduced in the september test run. Sub-setting is necessary for operational purposes and restrictions of time scales. To minimize the effect of subsetting, larger subsets with 10-12 countries and with 4 link providing countries have been applied.

Window:

According to the decision taken by ITC in Orlando, the following changes have been introduced in regards to the windows used for post processing:

The upper bounds have been set to 0.99 as these were judged to have very little effect on evaluations. The lower values have been set to about the 25% percentile value. The largest changes are for the lower values for conformation traits, with the lowest window being 40% for OFL otherwise it is about 50% for all other confirmation traits. It is anticipated that these low values may not have large impact on evaluations since there were very few countries combinations whose estimated correlations fell between the old limit of 0.30 and these new limits.

DATA AND METHOD OF ANALYSIS

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

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 (April Routine Evaluation 2018). Number of records for milking speed by breed

Country	BSW	GUE	HOL	JER	RDC	SIM
AUS			6181	1181	484	
BEL						
CAN	169		11604	628	780	
CHE	2553		2920	49		
CZE						
DEA	3959					
DEU			17893		244	
DFS			11320	1852	6365	
ESP						
EST						
FRA	325		16307			
FRM						
GBR			5294			
HUN						
IRL						
ISR						
ITA	1899		6612			
JPN						
KOR						
LTU						
LVA						
NLD	98		12889	25		
NOR					3739	
NZL			5653	3635	557	
POL						
PRT						
SVK						
SVN	268		425			
URY						
USA						
ZAF						
HRV						
MEX						
CAM					31	
No.Records	9271		97098	7370	12200	
Pub. Proofs	7890	0	84914	6839	11709	0

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

BSW msp

	CAN	CHE	DEA	ITA	NLD	SVN	FRA
CAN	7.57						
CHE	0.93	15.72					
DEA	0.89	0.96	11.71				
ITA	0.90	0.95	0.93	17.92			
NLD	0.93	0.95	0.93	0.92	6.22		
SVN	0.87	0.90	0.91	0.94	0.87	24.25	
FRA	0.94	0.93	0.86	0.90	0.95	0.86	0.87

HOL msp

	CAN	CHE	DEU	DFS	FRA	NLD	AUS	GBR	SVN	NZL	ITA
CAN	7.62										
CHE	0.88	12.20									
DEU	0.90	0.97	11.49								
DFS	0.94	0.94	0.97	14.49							
FRA	0.94	0.97	0.96	0.96	1.08						
NLD	0.95	0.97	0.96	0.97	0.98	5.57					
AUS	0.89	0.88	0.87	0.89	0.91	0.91	3.54				
GBR	0.85	0.85	0.85	0.85	0.85	0.85	0.86	0.14			
SVN	0.86	0.86	0.86	0.85	0.85	0.85	0.86	0.86	23.32		
NZL	0.91	0.90	0.87	0.87	0.93	0.92	0.94	0.85	0.86	0.37	
ITA	0.94	0.93	0.93	0.95	0.96	0.95	0.92	0.85	0.85	0.92	7.22

HOL tem

	CAN	CHE	DEU	DFS	FRA	NLD	AUS	GBR	NZL	ITA
CAN	6.92									
CHE	0.70	10.89								
DEU	0.85	0.77	12.06							
DFS	0.79	0.82	0.87	13.23						
FRA	0.71	0.90	0.81	0.92	0.99					
NLD	0.85	0.73	0.87	0.87	0.81	4.99				
AUS	0.70	0.70	0.70	0.73	0.72	0.74	3.07			
GBR	0.70	0.78	0.71	0.80	0.86	0.71	0.70	0.14		
NZL	0.70	0.70	0.71	0.70	0.70	0.70	0.74	0.70	0.34	
ITA	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	7.26

JER msp

	CAN	DFS	NLD	AUS	NZL	CHE
CAN	8.31					
DFS	0.91	14.28				
NLD	0.94	0.97	4.64			
AUS	0.86	0.87	0.92	3.31		
NZL	0.87	0.86	0.91	0.88	0.33	
CHE	0.91	0.95	0.96	0.88	0.88	12.69

RDC msp

	CAN	DEU	DFS	NOR	AUS	NZL	CAM
CAN	6.70						
DEU	0.90	9.24					
DFS	0.95	0.93	13.51				
NOR	0.91	0.88	0.96	14.80			
AUS	0.88	0.87	0.87	0.86	4.36		
NZL	0.90	0.88	0.89	0.91	0.90	0.40	
CAM	0.90	0.90	0.90	0.90	0.88	0.90	7.84

RDC tem

	CAN	DEU	DFS	NOR	AUS	NZL	CAM
CAN	6.45						
DEU	0.83	9.88					
DFS	0.76	0.81	11.13				
NOR	0.78	0.72	0.92	17.12			
AUS	0.71	0.71	0.71	0.71	3.44		
NZL	0.71	0.72	0.73	0.72	0.79	0.40	
CAM	0.74	0.74	0.74	0.74	0.72	0.74	7.05

^LAPPENDIX II. Number of common bulls

BSW

common bulls below diagonal
common three quarter sib group above diagonal

	CAN	CHE	DEA	ITA	NLD	SVN	FRA
CAN	0	92	99	92	33	15	62
CHE	75	0	500	388	53	39	141
DEA	84	418	0	534	75	59	173
ITA	76	330	439	0	71	53	152
NLD	27	50	66	56	0	22	50
SVN	13	38	55	52	21	0	31
FRA	54	107	127	121	41	30	0

BSW

GUE

GUE

HOL

common bulls below diagonal
common three quarter sib group above diagonal

	CAN	CHE	DEU	DFS	FRA	NLD	AUS	GBR	SVN	NZL	ITA
CAN	0	711	1698	1018	1208	1115	912	1312	139	353	1289
CHE	579	0	839	505	504	673	419	578	94	225	549
DEU	888	638	0	1712	1758	2069	926	1452	207	380	1653
DFS	682	418	823	0	1276	1418	809	1148	158	409	1028
FRA	638	412	654	485	0	1556	880	1249	130	448	1223
NLD	953	634	1291	970	746	0	957	1363	174	534	1164
AUS	771	336	512	427	474	722	0	908	101	571	692
GBR	1329	554	865	727	658	1059	660	0	156	433	1167
SVN	109	73	192	126	91	154	72	120	0	52	168
NZL	322	191	254	249	219	480	447	338	39	0	317
ITA	954	475	853	686	553	838	462	894	138	252	0

HOL

common bulls below diagonal
common three quarter sib group above diagonal

	CAN	CHE	DEU	DFS	FRA	NLD	AUS	GBR	NZL	ITA
CAN	0	612	1390	868	1077	1063	881	1279	342	1238
CHE	490	0	589	403	439	532	362	517	197	488
DEU	589	403	0	1308	1472	1713	795	1231	327	1406
DFS	520	319	513	0	1144	1204	755	1041	395	925
FRA	630	363	537	431	0	1451	827	1194	414	1206
NLD	902	495	929	699	715	0	948	1350	528	1132
AUS	749	300	386	358	472	712	0	910	570	685
GBR	1303	480	642	583	654	1054	659	0	430	1138
NZL	314	170	211	224	217	472	446	336	0	314
ITA	887	416	659	574	546	795	455	864	252	0

JER

common bulls below diagonal
common three quarter sib group above diagonal

	CAN	DFS	NLD	AUS	NZL	CHE
CAN	0	58	9	152	64	22
DFS	43	0	11	74	74	38
NLD	7	7	0	14	13	7
AUS	152	47	15	0	180	23
NZL	66	51	12	168	0	22
CHE	20	37	4	22	20	0

JER

RDC

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common bulls below diagonal
common three quarter sib group above diagonal

	CAN	DEU	DFS	NOR	AUS	NZL	CAM
CAN	0	8	110	5	34	32	0
DEU	8	0	36	10	21	3	0
DFS	110	27	0	100	106	53	0
NOR	5	10	75	0	48	10	0
AUS	31	21	80	40	0	35	8
NZL	29	3	51	9	32	0	1
CAM	0	0	0	0	8	1	0

RDC

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common bulls below diagonal
common three quarter sib group above diagonal

	CAN	DEU	DFS	NOR	AUS	NZL	CAM
CAN	0	5	97	5	34	31	0
DEU	5	0	24	8	18	2	0
DFS	96	19	0	94	106	53	0
NOR	5	8	69	0	45	9	0
AUS	31	18	80	37	0	35	8
NZL	29	2	51	8	32	0	1
CAM	0	0	0	0	8	1	0

SIM

SIM
