Introduction

The latest routine international evaluation for **workability traits** took place as scheduled at the Interbull Centre. Data from ten (10) 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, 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:

NOR (RDC)	The rolling definition of hys is causing the daughters to distribute somewhat differently over hys-classes at each evaluation. Therefore some bulls occasionally may lose EDC although the number of daughters stay the same. Reliability changes is a function of the EDC changes
SVN (BSW,HOL)	changed the definition of genetic reference base. As genetic reference base we use population average. Genetic parameters were recalculated
GBR (HOL)	Data now provided by SRUC
CHE (HOL)	Base change
CHE (BSW)	Base change, the effect of stage of lactation is partitioned into more levels than in the old models. Application of a new plausibility criteria with respect to days in milk and age at calving. This causes a decrease in number of daughters for many bulls.
FRA(HOL)	Base change, inclusion of HOLFRR in HOLFRA population
FRA(BSW)	Base change
DEU (HOL,RDC)	Base change
NZL (ALL)	Continuous DNA parentage testing therefore daughter counts, herd counts, edc and reliability are subjected to changes
DEA (BSW)	Base change
CAN (ALL)	Base change
AUS (ALL)	Base change

INTERBULL CHANGES COMPARED TO THE DECEMBER ROUTINE RUN

Sub-setting:

As decided by the ITC in Orlando, new sub-setting was introduced in the September test run. Sub-setting is necessary for operational purposes and restrictions of time scales. To minimize the effect of sub-setting, 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 2017).

Number of records for milking speed by breed

Country	BSW	GUE	HOL	JER	RDC	SIM
AUS			6075	1166	469	
BEL						
CAN	148		11189	583	759	
CHE	2481		2806			
CZE						
DEA	3850					
DEU			17408		233	
DFS			11347	1830	6207	
ESP						
EST						
FRA	308		16031			
FRM						
GBR			5080			
HUN						
IRL						
ISR						
ITA	1855		6591			
JPN						
KOR						
LTU						
LVA						
NLD	95		12579	25		
NOR					3626	
NZL			5408	3527	547	
POL						
PRT						
SVK						
SVN	257		392			
URY						
USA						
ZAF						
HRV						
MEX						
No.Records	8994		94906	7131	11841	
Pub. Proofs	7686	0	83396	6689	11372	0

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

BSW msp

	CAN	CHE	DEA	ITA	NLD	SVN	FRA
CAN	7.18						
CHE	0.92	15.79					
DEA	0.89	0.97	11.70				
ITA	0.89	0.95	0.93	17.98			
NLD	0.93	0.94	0.94	0.91	6.09		
SVN	0.87	0.89	0.90	0.94	0.87	24.66	
FRA	0.93	0.92	0.86	0.89	0.95	0.86	0.89

HOL msp

	CAN	CHE	DEU	DFS	FRA	NLD	AUS	GBR	SVN	NZL	ITA
CAN	7.64										
CHE	0.88	12.11									
DEU	0.90	0.97	11.47								
DFS	0.94	0.94	0.97	14.55							
FRA	0.93	0.97	0.96	0.96	1.08						
NLD	0.95	0.97	0.96	0.98	0.98	5.58					
AUS	0.89	0.88	0.87	0.89	0.91	0.91	3.55				
GBR	0.85	0.85	0.85	0.85	0.85	0.85	0.86	0.15			
SVN	0.86	0.86	0.85	0.85	0.86	0.85	0.86	0.86	22.65		
NZL	0.91	0.89	0.87	0.87	0.92	0.92	0.94	0.85	0.86	0.37	
ITA	0.94	0.93	0.92	0.95	0.96	0.95	0.92	0.85	0.85	0.91	7.29

HOL tem

	CAN	CHE	DEU	DFS	FRA	NLD	AUS	GBR	NZL	ITA
CAN	6.95									
CHE	0.70	11.07								
DEU	0.85	0.78	12.14							
DFS	0.79	0.82	0.87	13.21						
FRA	0.71	0.90	0.82	0.92	0.99					
NLD	0.85	0.72	0.87	0.87	0.81	4.97				
AUS	0.70	0.70	0.70	0.72	0.71	0.74	3.07			
GBR	0.70	0.79	0.72	0.81	0.86	0.71	0.70	0.14		
NZL	0.70	0.70	0.71	0.70	0.70	0.71	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	7.30

JER msp

	CAN	DFS	NLD	AUS	NZL
CAN	8.49				
DFS	0.90	14.26			
NLD	0.94	0.97	4.63		
AUS	0.86	0.87	0.92	3.32	
NZL	0.87	0.86	0.91	0.88	0.33

RDC msp

	CAN	DEU	DFS	NOR	AUS	NZL
CAN	6.59					
DEU	0.90	9.46				
DFS	0.96	0.94	13.54			
NOR	0.91	0.88	0.96	14.79		
AUS	0.88	0.87	0.88	0.86	4.34	
NZL	0.92	0.87	0.90	0.91	0.91	0.41

RDC tem

	CAN	DEU	DFS	NOR	AUS	NZL
CAN	6.52					
DEU	0.83	9.86				
DFS	0.78	0.82	11.16			
NOR	0.78	0.72	0.92	16.59		
AUS	0.71	0.71	0.71	0.71	3.46	
NZL	0.71	0.72	0.73	0.72	0.76	0.39

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^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	78	85	79	28	13	55
CHE	55	0	474	378	50	38	135
DEA	61	393	0	518	73	58	162
ITA	55	323	429	0	68	52	144
NLD	20	47	64	53	0	22	49
SVN	10	38	54	52	21	0	31
FRA	41	102	121	115	40	30	0

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	677	1622	1000	1157	1052	883	1240	131	342	1236
CHE	537	0	803	498	479	641	397	548	90	217	535
DEU	808	598	0	1724	1711	1984	902	1393	193	371	1645
DFS	654	402	810	0	1273	1425	795	1133	157	402	1057
FRA	594	394	614	470	0	1513	857	1217	121	436	1239
NLD	878	605	1195	952	707	0	935	1315	161	523	1138
AUS	729	315	483	404	446	694	0	885	95	562	698
GBR	1242	527	812	709	625	1010	625	0	147	422	1137
SVN	102	69	177	126	88	140	68	113	0	47	159
NZL	310	182	242	238	208	466	436	325	35	0	325
ITA	867	466	806	668	533	792	444	846	130	253	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	577	1332	848	1026	1003	850	1206	331	1227
CHE	447	0	562	381	413	501	341	488	189	471
DEU	545	378	0	1276	1437	1651	776	1187	318	1419
DFS	492	303	491	0	1124	1180	742	1027	387	948
FRA	586	344	508	412	0	1410	803	1162	402	1227
NLD	835	466	868	677	678	0	928	1305	517	1136
AUS	706	280	368	340	443	687	0	885	561	698
GBR	1215	453	612	564	621	1009	624	0	419	1138
NZL	302	161	198	215	206	459	435	323	0	324
ITA	859	399	644	567	532	786	444	848	253	0

JER

common bulls below diagonal
common three quarter sib group above diagonal

	CAN	DFS	NLD	AUS	NZL
CAN	0	57	9	151	64
DFS	42	0	11	72	74
NLD	7	7	0	14	13
AUS	150	45	15	0	178
NZL	66	51	12	166	0

RDC

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common bulls below diagonal
common three quarter sib group above diagonal

	CAN	DEU	DFS	NOR	AUS	NZL
CAN	0	6	97	4	33	31
DEU	6	0	33	9	20	3
DFS	95	24	0	98	101	52
NOR	4	9	73	0	45	10
AUS	30	20	75	37	0	35
NZL	28	3	50	9	32	0

RDC

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common bulls below diagonal
common three quarter sib group above diagonal

	CAN	DEU	DFS	NOR	AUS	NZL
CAN	0	4	90	4	33	30
DEU	4	0	21	8	17	2
DFS	88	16	0	92	101	52
NOR	4	8	67	0	42	9
AUS	30	17	75	34	0	35
NZL	28	2	50	8	32	0