Introduction

The latest routine international evaluation for workability traits took place as scheduled at the Interbull Centre. Data from sixteen (16) 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, Japan, Switzerland and Spain 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:

AUS (HOL,JER,RDC)	Some decrease in daughters and EDC due to data editing
NOR (RDC)	Delivered RBV's for all traits. The scaling is according to a rolling base that change somewhat at each evaluation. Therefore percentage changes in sire standard deviations between evaluations may solely be due to changes in the standard deviation in the rolling base.
JPN (HOL)	Some changes in proofs caused by additional records and in EDCs caused by modification of pedigree.
ITA (HOL)	Drop of information due to a one-year cut off
NZL (ALL)	Drops in information due to continuous DNA parenting testing
ESP (HOL)	First time

INTERBULL CHANGES COMPARED TO THE PREVIOUS 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.

The window so far applied for MAS evaluation have been found too high compared to the within-country genetic correlation between mastitis and SCS available from the literature. It has been an ITC recommendation to adjust the windows for MAS in this test run to make them more in line with the values available from the literature. The recommendation has been approved by the Steering committee. Also, according to the decision taken by ITC in Orlando (2015) to review all windows every five (5) years, an overall review of the windows for all traits will take place during the first half of 2020 with the aim of implementation set for the September 2020 test run.

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 ROUTINE RUN

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 minimizing the need to resort to conversions.

At the same time, all recipients of Interbull results are expected to honor 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.

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 2020).
Number of records for milking speed by breed

Country	BSW	GUE	HOL	JER	RDC	SIM
AUS			6336	1255	518	
BEL						
CAN	193		12383	707	828	
CHE	2737		3177	52		
CZE						
DEA	4205					
DEU			17263		244	
DFS			11906	1979	6620	
ESP			3017			
EST						
FRA	356		16873			
FRM						
GBR			5777			
HUN						
IRL						
ISR						
ITA	2009		6596			
JPN			1729			
KOR						
LTU						
LVA						
NLD	111		13580	29		
NOR					3889	
NZL			6176	3884	588	
POL						
PRT						
SVK						
SVN	310		526			
URY						
USA						
ZAF						
HRV						
MEX						
CAM					34	
No.Records	9921		105339	7906	12721	

Pub. Proofs 8380 0 90359 7360 12201 0

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

BSW msp

	CAN	CHE	DEA	ITA	NLD	SVN	FRA
CAN	8.53						
CHE	0.94	15.63					
DEA	0.91	0.96	11.71				
ITA	0.92	0.95	0.93	17.65			
NLD	0.94	0.96	0.94	0.93	5.84		
SVN	0.87	0.91	0.91	0.94	0.88	24.93	
FRA	0.94	0.93	0.86	0.90	0.96	0.86	0.84

HOL msp

	CAN	CHE	DEU	DFS	FRA	NLD	AUS	GBR	SVN	NZL	ITA	JPN	ESP
CAN	7.64												
CHE	0.92	12.61											
DEU	0.91	0.98	11.82										
DFS	0.94	0.95	0.97	14.44									
FRA	0.94	0.98	0.96	0.96	1.08								
NLD	0.96	0.98	0.97	0.97	0.98	5.10							
AUS	0.86	0.87	0.85	0.85	0.88	0.87	0.26						
GBR	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.20					
SVN	0.85	0.86	0.87	0.85	0.85	0.86	0.86	0.85	23.76				
NZL	0.90	0.91	0.87	0.86	0.92	0.91	0.93	0.85	0.86	0.36			
ITA	0.94	0.94	0.93	0.94	0.96	0.95	0.85	0.85	0.85	0.88	7.03		
JPN	0.97	0.94	0.92	0.95	0.97	0.97	0.89	0.85	0.86	0.91	0.95	2.12	
ESP	0.95	0.94	0.92	0.94	0.96	0.96	0.86	0.85	0.85	0.89	0.94	0.96	13.76

HOL tem

	CAN	CHE	DEU	DFS	FRA	NLD	AUS	GBR	NZL	ITA	JPN
CAN	7.11										
CHE	0.70	10.76									
DEU	0.84	0.77	11.90								
DFS	0.78	0.83	0.87	13.13							
FRA	0.71	0.91	0.80	0.92	0.97						
NLD	0.86	0.76	0.89	0.86	0.81	5.49					
AUS	0.70	0.70	0.70	0.70	0.70	0.72	0.23				
GBR	0.70	0.80	0.70	0.78	0.85	0.70	0.70	0.16			
NZL	0.70	0.70	0.74	0.70	0.70	0.71	0.75	0.70	0.37		
ITA	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	7.03	
JPN	0.92	0.81	0.90	0.87	0.85	0.94	0.70	0.71	0.70	0.70	2.31

JER msp

	CAN	DFS	NLD	AUS	NZL	CHE
CAN	8.02					
DFS	0.91	13.66				
NLD	0.95	0.96	4.22			
AUS	0.85	0.86	0.89	0.24		
NZL	0.87	0.86	0.90	0.86	0.32	
CHE	0.93	0.95	0.97	0.87	0.88	11.85

RDC msp

	CAN	DEU	DFS	NOR	AUS	NZL	CAM
CAN	6.98						
DEU	0.91	9.48					
DFS	0.93	0.93	13.39				
NOR	0.90	0.88	0.98	14.90			
AUS	0.86	0.86	0.85	0.86	0.27		
NZL	0.90	0.88	0.88	0.91	0.89	0.40	
CAM	0.90	0.90	0.90	0.90	0.88	0.90	7.85

RDC tem

	CAN	DEU	DFS	NOR	AUS	NZL	CAM
CAN	6.42						
DEU	0.82	9.82					
DFS	0.73	0.80	11.09				
NOR	0.76	0.72	0.92	16.94			
AUS	0.70	0.71	0.70	0.71	0.25		
NZL	0.71	0.73	0.72	0.72	0.80	0.44	
CAM	0.74	0.74	0.74	0.74	0.72	0.73	7.02

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^LAPPENDIX II. Number of common bulls

BSW

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common bulls below diagonal
common three quarter sib group above diagonal

	CAN	CHE	DEA	ITA	NLD	SVN	FRA
CAN	0	104	113	106	36	27	69
CHE	88	0	544	426	58	58	151
DEA	98	459	0	584	84	79	187
ITA	91	367	485	0	76	73	165
NLD	30	55	76	61	0	28	51
SVN	24	55	74	72	27	0	43
FRA	59	111	135	126	42	40	0

BSW

GUE

GUE

HOL

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common bulls below diagonal
common three quarter sib group above diagonal

	CAN	CHE	DEU	DFS	FRA	NLD	AUS	GBR	SVN	NZL	ITA	JPN	ESP
CAN	0	812	1790	1147	1325	1267	971	1475	174	378	1436	341	1007
CHE	678	0	895	565	553	737	445	649	114	236	588	125	437
DEU	1051	704	0	1798	1790	2129	928	1546	263	383	1678	340	1052
DFS	829	474	981	0	1356	1568	855	1240	198	433	1022	199	670
FRA	741	458	715	555	0	1651	929	1335	158	465	1169	289	818
NLD	1139	703	1447	1145	841	0	1008	1475	214	562	1179	236	748
AUS	833	358	555	472	507	771	0	960	119	593	642	154	496
GBR	1535	617	983	826	733	1197	716	0	189	456	1200	246	772
SVN	135	83	246	152	108	186	80	144	0	58	193	71	149
NZL	343	198	268	269	231	504	466	356	44	0	274	76	226
ITA	1200	514	945	762	611	946	480	1014	165	231	0	338	918
JPN	128	69	109	94	92	104	98	104	31	51	111	0	276
ESP	571	308	517	439	518	563	317	531	107	164	576	90	0

HOL

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common bulls below diagonal
common three quarter sib group above diagonal

	CAN	CHE	DEU	DFS	FRA	NLD	AUS	GBR	NZL	ITA	JPN
CAN	0	724	1514	928	1192	1205	939	1441	366	1429	341
CHE	595	0	691	435	501	605	392	597	211	550	124
DEU	832	522	0	1328	1526	1822	810	1334	325	1490	303
DFS	586	340	625	0	1197	1278	791	1088	408	861	155
FRA	733	415	624	475	0	1544	874	1280	431	1166	289
NLD	1082	573	1160	778	809	0	1000	1456	556	1161	236
AUS	811	324	454	390	504	763	0	962	592	641	154
GBR	1504	551	803	632	729	1190	715	0	453	1198	246
NZL	335	179	225	234	229	497	465	355	0	273	76
ITA	1190	479	811	594	610	928	480	1014	231	0	337
JPN	128	69	101	71	92	104	98	104	51	111	0

JER

common bulls below diagonal
common three quarter sib group above diagonal

	CAN	DFS	NLD	AUS	NZL	CHE
CAN	0	59	9	165	69	22
DFS	45	0	13	77	77	40
NLD	7	9	0	15	13	7
AUS	166	50	16	0	192	25
NZL	70	55	12	177	0	24
CHE	20	39	4	24	22	0

JER

RDC

common bulls below diagonal
common three quarter sib group above diagonal

	CAN	DEU	DFS	NOR	AUS	NZL	CAM
CAN	0	9	134	6	36	33	0
DEU	9	0	39	10	23	5	0
DFS	134	31	0	109	114	56	0
NOR	6	10	85	0	51	11	0
AUS	33	23	87	42	0	38	8
NZL	30	5	53	10	35	0	2
CAM	0	0	0	0	8	2	0

RDC

common bulls below diagonal
common three quarter sib group above diagonal

	CAN	DEU	DFS	NOR	AUS	NZL	CAM
CAN	0	8	116	6	36	32	0
DEU	8	0	35	10	22	5	0
DFS	116	29	0	104	114	56	0
NOR	6	10	80	0	48	10	0
AUS	33	22	87	39	0	38	8
NZL	30	5	53	9	35	0	2
CAM	0	0	0	0	8	2	0

SIM

SIM