Introduction

The latest routine international evaluation for workability traits took place as scheduled at the Interbull Centre. Data from eighteen (18) 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, Poland, Czech Republic 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:

JPN (HOL)	Decrease in information due to pedigree corrections.
AUS (ALL)	Decrease in information due to pedigree updates and status changes of some bulls which then leads to no longer qualifying
CHE (ALL)	Decrease in information due to the manual edits/data correction in data base and change of hys assignment
POL (HOL)	Decrease in information due to data edits
NZL (ALL)	Decrease in information due to continuous parentage tverification and phenotype records updates.
ESP (HOL)	Base change
NLD (HOL)	Drop in information due to change in reliability calculation
ITA (HOL)	Drop in information due to one year cutt-off data

INTERBULL CHANGES COMPARED TO THE PREVIOUS ROUTINE RUN

Post-processing Windows:

According to the decision taken by ITC in Orlando (2015) to review the post-processing windows every 5 years, during the 2020 the relative working group has been re-activated and new windows have been identified.

As before, the upper bounds have been set to 0.99 as these were judged to have very little effect on evaluations while the lower values have been reduced to the 10th percentile. This reduction would provide post-processed correlations to be closer to the real estimated ones. Over the past five years, in fact, the previous adopted lower value (25th percentile) had been found too high causing estimated and post-processed correlations to differ significantly from each other.
The new lower values have been applied to all breeds and traits.

The weight assigned to the magnitude of the changes tested by each country has also been revised. The new weight will allow post-processed correlations to take more in consideration the value of the new estimated ones even when no changes are applied by the countries.
The new weights are as follows:
No changes   :: 2
Small changes:: 1
Big changes :: 0

More information can be read on https://interbull.org/ib/rg_procedure

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 2023).
Number of records for milking speed by breed

Country	BSW	GUE	HOL	JER	RDC	SIM
AUS			6587	1311	557	
BEL						
CAN	215		13297	783	868	
CHE	2919		3001	59		
CZE			2023			
DEA	4486					
DEU			13411		213	
DFS			12421	2056	6849	
ESP			3536			
EST						
FRA	433		17985			
FRM						
GBR			6282			
HUN						
IRL						
ISR						
ITA	2131		7676			
JPN			2233			
KOR						
LTU						
LVA						
NLD	125		14371	45		
NOR					4019	
NZL			6618	4071	518	
POL			9471			
PRT						
SVK						
SVN	246		579			
URY						
USA						
ZAF						
HRV						
CAM					37	
No.Records	10555		119491	8325	13061	
Pub. Proofs	8832	0	100106	7738	12601	0

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

BSW	msp						
	CAN	CHE	DEA	ITA	NLD	SVN	FRA

CAN	9.14						
CHE	0.94	15.63					
DEA	0.91	0.96	11.72				
ITA	0.86	0.93	0.91	17.45			
NLD	0.93	0.95	0.92	0.85	5.78		
SVN	0.83	0.88	0.87	0.90	0.82	30.13	
FRA	0.93	0.93	0.86	0.87	0.95	0.83	0.81

HOL msp

	CAN	CHE	DEU	DFS	FRA	NLD	AUS	GBR	SVN	NZL	ITA	JPN	ESP	CZE	POL
CAN	7.59														
CHE	0.93	12.44													
DEU	0.89	0.96	12.65												
DFS	0.94	0.95	0.95	14.33											
FRA	0.95	0.97	0.94	0.96	1.07										
NLD	0.95	0.98	0.95	0.97	0.98	4.95									
AUS	0.83	0.83	0.78	0.80	0.84	0.83	0.25								
GBR	0.74	0.74	0.74	0.76	0.79	0.77	0.74	0.20							
SVN	0.77	0.86	0.91	0.88	0.85	0.87	0.70	0.68	27.11						
NZL	0.87	0.88	0.80	0.82	0.88	0.86	0.89	0.73	0.73	0.33					
ITA	0.75	0.81	0.79	0.81	0.82	0.82	0.69	0.60	0.76	0.71	6.19				
JPN	0.96	0.93	0.88	0.93	0.97	0.95	0.85	0.79	0.79	0.85	0.81	2.15			
ESP	0.93	0.93	0.90	0.93	0.95	0.95	0.81	0.73	0.81	0.84	0.79	0.94	13.36		
CZE	0.88	0.92	0.93	0.91	0.90	0.91	0.76	0.63	0.81	0.76	0.75	0.85	0.89	18.24	
POL	0.52	0.53	0.51	0.52	0.52	0.51	0.53	0.51	0.52	0.53	0.48	0.53	0.53	0.53	14.81

HOL tem

	CAN	CHE	DEU	DFS	FRA	NLD	AUS	GBR	NZL	ITA	JPN	POL
CAN	7.67											
CHE	0.68	10.30										
DEU	0.84	0.75	11.75									
DFS	0.77	0.84	0.86	13.08								
FRA	0.71	0.91	0.79	0.92	0.96							
NLD	0.86	0.77	0.90	0.86	0.81	5.42						
AUS	0.58	0.65	0.63	0.68	0.68	0.70	0.23					
GBR	0.60	0.80	0.67	0.77	0.84	0.69	0.61	0.16				
NZL	0.59	0.51	0.72	0.59	0.57	0.69	0.72	0.49	0.36			
ITA	0.11	0.09	0.10	0.09	0.08	0.14	0.09	0.09	0.10	6.19		
JPN	0.92	0.80	0.91	0.87	0.85	0.93	0.64	0.74	0.62	0.10	2.64	
POL	0.25	0.16	0.27	0.16	0.15	0.21	0.21	0.14	0.20	0.09	0.27	19.60

JER msp

	CAN	DFS	NLD	AUS	NZL	CHE
CAN	7.69					
DFS	0.89	13.62				
NLD	0.93	0.94	4.51			
AUS	0.74	0.75	0.83	0.24		
NZL	0.67	0.72	0.83	0.77	0.30	
CHE	0.92	0.93	0.95	0.79	0.74	11.41

RDC msp

	CAN	DEU	DFS	NOR	AUS	NZL	CAM
CAN	6.78						
DEU	0.87	11.49					
DFS	0.92	0.90	13.22				
NOR	0.79	0.75	0.95	14.65			
AUS	0.77	0.72	0.75	0.73	0.27		
NZL	0.86	0.77	0.85	0.80	0.84	0.38	
CAM	0.68	0.68	0.70	0.68	0.61	0.68	7.66

RDC tem

	CAN	DEU	DFS	NOR	AUS	NZL	CAM
CAN	6.28						
DEU	0.79	9.98					
DFS	0.67	0.75	11.07				
NOR	0.65	0.55	0.89	16.74			
AUS	0.60	0.46	0.63	0.56	0.25		
NZL	0.48	0.66	0.65	0.51	0.76	0.43	
CAM	0.55	0.50	0.50	0.51	0.42	0.49	7.59

^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	117	129	117	36	24	81
CHE	102	0	595	467	66	55	178
DEA	118	506	0	638	92	71	224
ITA	104	407	537	0	87	67	198
NLD	29	64	83	70	0	28	57
SVN	22	52	67	63	28	0	39
FRA	73	141	183	166	49	39	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	JPN	ESP	CZE	POL
CAN	0	847	1780	1307	1558	1460	1077	1702	191	326	1696	424	1152	579	1360
CHE	774	0	887	604	679	798	478	711	113	198	660	160	487	234	524
DEU	1208	776	0	1802	1906	2181	913	1595	292	312	1773	379	1097	750	1846
DFS	1011	551	1148	0	1578	1740	932	1369	193	393	1167	248	764	600	1176
FRA	1074	628	1072	854	0	1937	1044	1546	187	442	1404	341	1010	625	1489
NLD	1345	783	1689	1331	1252	0	1078	1673	216	533	1382	296	895	773	1493
AUS	937	403	588	545	652	836	0	1049	109	545	728	196	553	360	579
GBR	1770	706	1118	965	1044	1398	808	0	186	411	1388	301	883	564	1137
SVN	149	85	280	142	147	189	72	143	0	42	218	86	161	109	253
NZL	292	171	217	238	246	479	428	314	32	0	221	65	192	149	154
ITA	1473	588	1110	910	893	1132	544	1177	187	185	0	417	1086	589	1460
JPN	173	92	139	123	128	144	120	134	39	47	154	0	325	177	384
ESP	731	368	616	546	741	705	371	636	115	137	732	122	0	413	892
CZE	312	119	384	256	284	553	139	249	70	59	341	72	212	0	589
POL	1292	425	1620	919	1068	1344	406	940	226	110	1200	168	615	402	0

HOL

common bulls below diagonal
common three quarter sib group above diagonal

	CAN	CHE	DEU	DFS	FRA	NLD	AUS	GBR	NZL	ITA	JPN	POL
CAN	0	765	1656	975	1426	1370	1044	1666	314	1686	424	1335
CHE	695	0	742	427	615	667	422	657	173	624	159	501
DEU	960	614	0	1414	1831	2037	887	1482	284	1668	353	1649
DFS	632	365	698	0	1335	1342	825	1137	373	919	182	874
FRA	1059	565	992	660	0	1816	993	1493	413	1397	339	1463
NLD	1258	657	1388	839	1201	0	1069	1623	529	1331	288	1421
AUS	915	369	514	418	651	828	0	1050	544	727	196	573

GBR	1736	641	934	673	1033	1355	807	0	408	1386	301	1124
NZL	284	152	192	212	244	474	427	313	0	220	65	153
ITA	1463	560	976	633	892	1084	543	1177	185	0	416	1430
JPN	173	92	132	90	128	141	120	134	47	154	0	380
POL	1286	407	1258	583	1063	1284	406	940	110	1195	168	0

JER

common bulls below diagonal
common three quarter sib group above diagonal

	CAN	DFS	NLD	AUS	NZL	CHE
CAN	0	66	11	186	67	29
DFS	51	0	21	86	79	42
NLD	8	17	0	18	16	9
AUS	187	58	18	0	188	30
NZL	67	58	14	173	0	25
CHE	28	42	6	29	24	0

JER

RDC

common bulls below diagonal
common three quarter sib group above diagonal

	CAN	DEU	DFS	NOR	AUS	NZL	CAM
CAN	0	6	160	6	37	28	0
DEU	6	0	24	8	20	2	0
DFS	163	16	0	113	134	47	0
NOR	6	7	91	0	59	10	0
AUS	34	19	106	50	0	38	9
NZL	25	2	46	10	35	0	1
CAM	0	0	0	0	9	1	0

RDC

common bulls below diagonal
common three quarter sib group above diagonal

	CAN	DEU	DFS	NOR	AUS	NZL	CAM
CAN	0	8	136	6	37	27	0
DEU	8	0	47	11	27	4	0
DFS	138	41	0	108	134	47	0
NOR	6	11	86	0	56	9	0
AUS	34	26	106	47	0	38	9
NZL	25	4	46	9	35	0	1
CAM	0	0	0	0	9	1	0

SIM

SIM