

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:

AUS (ALL)	Base change
SVN (ALL)	Small decrease in information due to changes in data base related to the pedigree completeness as well as phenotypic data improvement.
DFS (ALL)	Updated our pedigree program used for genetic evaluation. The effect is minor.
POL (HOL)	Decrease of information due to data edits. First time for work.
JPN (HOL)	Base change, now the cows born in 2015 are the base. Some changes in information due to pedigree verification
BEL (HOL)	Base change now set to cows born in 2015
GBR (ALL)	Changes in information due to changes from data recording agents
NZL (ALL)	Changes in information due to continuous pedigree verification
CZE (HOL)	First time with msp

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 the 2001t 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. Implementation of the reviewed windows is aimed for January 2021 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 (December Routine Evaluation 2020). Number of records for milking speed by breed

Country	BSW	GUE	HOL	JER	RDC	SIM
AUS			6367	1266	523	
BEL						
CAN	198		12519	716	834	
CHE	2750		3208	53		
CZE			1723			
DEA	4238					
DEU			17431		248	
DFS			11925	1990	6645	
ESP			3107			
EST						
FRA	364		16952			
FRM						
GBR			5868			
HUN						
IRL						
ISR						
ITA	2021		6744			
JPN			1802			
KOR						
LTU						
LVA						
NLD	112		13643	33		
NOR					3907	
NZL			6391	3976	591	
POL			7695			
PRT						
SVK						
SVN	312		545			
URY						
USA						
ZAF						
HRV						
MEX						
CAM					34	
No. Records	9995		115920	8034	12782	
Pub. Proofs	8435	0	97546	7484	12250	0

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

BSW	msp						
	CAN	CHE	DEA	ITA	NLD	SVN	FRA
CAN	8.57						
CHE	0.95	15.64					
DEA	0.91	0.96	11.70				
ITA	0.92	0.95	0.93	17.62			
NLD	0.94	0.96	0.94	0.93	5.85		
SVN	0.88	0.91	0.91	0.94	0.88	25.11	
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	CZE	POL
CAN	7.64														
CHE	0.92	12.59													
DEU	0.90	0.97	11.83												
DFS	0.94	0.95	0.96	14.44											
FRA	0.94	0.98	0.95	0.96	1.07										
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	0.19							
SVN	0.85	0.86	0.87	0.85	0.85	0.86	0.86	0.85	23.80						
NZL	0.90	0.91	0.87	0.86	0.91	0.91	0.92	0.85	0.86	0.36					
ITA	0.94	0.94	0.92	0.94	0.96	0.95	0.85	0.85	0.85	0.88	6.90				
JPN	0.97	0.94	0.91	0.94	0.97	0.97	0.89	0.85	0.86	0.91	0.95	2.17			
ESP	0.95	0.94	0.91	0.94	0.96	0.96	0.86	0.85	0.85	0.88	0.94	0.96	13.68		
CZE	0.88	0.92	0.93	0.90	0.91	0.91	0.86	0.85	0.86	0.86	0.85	0.86	0.90	18.89	
POL	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.86	0.85	0.85	0.85	0.85	15.27

HOL	tem											
	CAN	CHE	DEU	DFS	FRA	NLD	AUS	GBR	NZL	ITA	JPN	POL
CAN	7.11											
CHE	0.70	10.73										
DEU	0.84	0.77	11.88									
DFS	0.77	0.84	0.87	13.14								
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	0.36			
ITA	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	6.90		
JPN	0.91	0.80	0.91	0.87	0.85	0.94	0.70	0.70	0.70	0.70	2.66	
POL	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	20.32

JER	msp					
	CAN	DFS	NLD	AUS	NZL	CHE
CAN	8.06					
DFS	0.92	13.67				
NLD	0.95	0.96	4.68			
AUS	0.85	0.86	0.89	0.24		
NZL	0.87	0.86	0.89	0.86	0.32	
CHE	0.93	0.95	0.97	0.87	0.88	11.70

RDC	msp						
	CAN	DEU	DFS	NOR	AUS	NZL	CAM
CAN	7.01						
DEU	0.90	9.50					
DFS	0.93	0.93	13.38				
NOR	0.90	0.89	0.98	14.90			
AUS	0.86	0.86	0.85	0.86	0.27		
NZL	0.89	0.88	0.88	0.91	0.89	0.40	

CAM 0.90 0.90 0.90 0.90 0.88 0.90 7.91

RDC tem

	CAN	DEU	DFS	NOR	AUS	NZL	CAM
CAN	6.44						
DEU	0.82	10.04					
DFS	0.73	0.80	11.09				
NOR	0.77	0.72	0.92	17.03			
AUS	0.70	0.71	0.71	0.70	0.25		
NZL	0.71	0.73	0.71	0.72	0.81	0.44	
CAM	0.74	0.74	0.74	0.74	0.72	0.74	7.48

^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	107	117	107	36	27	70
CHE	91	0	551	429	59	59	153
DEA	102	465	0	589	84	80	190
ITA	92	370	489	0	77	76	169
NLD	30	56	76	62	0	28	51
SVN	24	56	75	75	27	0	45
FRA	60	113	138	130	42	43	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	824	1808	1158	1338	1280	989	1504	182	383	1479	359	1031	455	997
CHE	691	0	910	569	557	748	457	657	118	239	602	130	449	205	392
DEU	1075	717	0	1811	1811	2153	940	1564	271	388	1705	349	1073	701	1439
DFS	844	479	1001	0	1362	1578	867	1251	202	434	1039	206	685	520	915
FRA	753	461	735	569	0	1660	937	1348	162	468	1187	294	831	540	1081
NLD	1154	712	1473	1160	850	0	1021	1489	221	566	1197	248	769	645	1044
AUS	846	367	561	481	511	781	0	974	124	601	655	158	506	322	461
GBR	1570	628	1000	840	748	1220	723	0	196	461	1225	256	792	471	847
SVN	141	87	254	155	111	194	81	150	0	58	203	74	157	95	191
NZL	348	201	271	271	234	507	473	359	44	0	279	77	229	160	169
ITA	1249	528	977	781	629	972	488	1042	173	235	0	358	954	462	1057
JPN	133	70	112	98	93	108	98	108	33	52	117	0	292	132	309
ESP	594	320	534	456	526	586	326	550	112	166	606	94	0	342	674
CZE	199	94	340	185	194	430	104	168	58	62	219	49	153	0	396
POL	891	288	1030	640	596	830	299	638	160	120	796	125	396	195	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	737	1538	931	1205	1221	957	1470	371	1471	359	979
CHE	609	0	704	437	506	617	405	606	214	565	130	369
DEU	851	533	0	1335	1545	1847	823	1349	329	1518	313	1220
DFS	590	342	630	0	1202	1279	796	1091	409	867	159	742

FRA	745	419	640	480	0	1552	882	1293	434	1184	294	1066
NLD	1098	584	1185	780	817	0	1012	1471	560	1180	248	1016
AUS	824	334	460	394	508	772	0	976	600	654	158	457
GBR	1538	563	815	636	744	1209	722	0	458	1222	256	835
NZL	340	182	228	234	232	500	472	358	0	278	77	168
ITA	1239	494	840	602	628	953	488	1041	235	0	357	1037
JPN	133	71	104	73	93	107	98	108	52	117	0	304
POL	885	272	778	462	596	817	299	638	120	790	125	0

JER

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

CAN	0	61	10	169	70	23
DFS	47	0	14	79	78	41
NLD	7	10	0	16	14	8
AUS	168	52	16	0	192	26
NZL	71	56	12	177	0	25
CHE	21	40	5	24	23	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	40	10	23	5	0
DFS	135	32	0	109	115	56	0
NOR	6	10	86	0	52	11	0
AUS	33	23	88	43	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	118	6	36	32	0
DEU	8	0	36	10	22	5	0
DFS	118	30	0	105	115	56	0
NOR	6	10	81	0	49	10	0
AUS	33	22	88	40	0	38	8
NZL	30	5	53	9	35	0	2
CAM	0	0	0	0	8	2	0

SIM

SIM