

INTRODUCTION

The latest routine international evaluation for calving traits took place as scheduled at the Interbull Centre. Data from seventeen (17) countries were included in this evaluation.

International genetic evaluations for calving traits of bulls from Australia, Austria-Germany, Belgium, Canada, Denmark-Finland-Sweden, France, Germany, Hungary, Ireland, Israel, Italy, Netherlands, Norway Spain, Switzerland, the United Kingdom, Slovak Republic, Poland and the United States of America were computed. Brown Swiss, Holstein, and Red Dairy Cattle breed data were included in this evaluation.

CHANGES IN NATIONAL PROCEDURES

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

AUS (ALL)	Decrease in information due to the data clean-up, pedigree changes, bulls' statue changes and rounding effect
FRA (ALL)	All proofs sent to MACE are now "genomic-free" single-step proofs, issued from a BLUP evaluation running on single-step preadjusted performances, as suggested as one of the methods of choice to provide unbiased "genomic-free" proofs to Interbull by the Interbull working group on this topic. In addition to these changes, unknown parent groups have been modified for all traits.
ESP (HOL)	Change in requirement for officiality status: no longer required for foreign bulls to have 75 daughters in 50 herds causing much more bulls to be included in the evaluation; also drop in information due to the update of national database.
NZL (HOL,RDC)	No longer participating.
BEL(HOL)	Small decrease in information due to the pedigree(alias) correction and rounding effect
USA(HOL)	Drop in information due to the pedigree correction and herd-year minimum edits.
POL(HOL)	Decrease in information due to the data edits.
NLD (HOL)	Decrease in information due to pedigree changes /correction.
CHE(HOL)	Decrease in information due to the edits in database, and change in hys assignment.
ISR(HOL)	Drop in information due to the data edits, paternity correction.
ITA(HOL)	Drop in information (msb) due to pedigree editing.

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 calving (December Routine Evaluation 2023). Number of records for direct calving ease by breed

Country	BSW	GUE	HOL	JER	RDC	SIM
AUS			6728			
BEL			1303			
CAN	169		13594		536	
CHE	1703		2265			
CZE						
DEA	3678					
DEU			20670		304	
DFS			11332		6717	
ESP			2437			
EST						
FRA	408		13475			
FRM						
GBR			3315			
HUN			1765			
IRL			2479		64	
ISR			609			
ITA			9234			
JPN						
KOR						
LTU						
LVA						
NLD	191		15788		84	
NOR					4002	
NZL						
POL			7301			
PRT						
SVK			720			
SVN						
URY						
USA	560		37720			
ZAF						
HRV						
CAM						
=====						
No. Records	6709		150735		11707	
Pub. Proofs	7031	0	127990	0	12066	0
=====						

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

BSW	dce					
	DEA	NLD	USA	CHE	CAN	FRA
DEA	9.27					

NLD	0.84	5.84				
USA	0.64	0.84	0.13			
CHE	0.85	0.93	0.80	10.57		
CAN	0.78	0.94	0.90	0.92	7.84	
FRA	0.67	0.75	0.74	0.72	0.78	0.52

BSW mce

	DEA	NLD	USA	CHE	CAN	FRA
DEA	9.71					
NLD	0.62	4.46				
USA	0.73	0.72	0.15			
CHE	0.70	0.65	0.84	13.07		
CAN	0.35	0.74	0.83	0.70	6.07	
FRA	0.82	0.73	0.78	0.87	0.69	0.80

HOL dce

	AUS	CAN	CHE	DFS	FRA	ISR	ITA	NLD	USA	GBR	HUN	DEU	BEL	IRL	SVK	ESP	POL
AUS	0.04																
CAN	0.75	7.23															
CHE	0.73	0.93	8.93														
DFS	0.72	0.92	0.84	11.23													
FRA	0.71	0.86	0.84	0.79	0.73												
ISR	0.71	0.83	0.83	0.67	0.85	2.68											
ITA	0.37	0.45	0.51	0.46	0.41	0.50	4.17										
NLD	0.82	0.97	0.91	0.93	0.83	0.84	0.44	7.51									
USA	0.72	0.91	0.87	0.85	0.84	0.80	0.46	0.87	0.13								
GBR	0.74	0.81	0.70	0.70	0.67	0.70	0.32	0.83	0.68	0.06							
HUN	0.45	0.54	0.46	0.40	0.49	0.56	0.21	0.52	0.52	0.48	1.26						
DEU	0.79	0.94	0.89	0.89	0.86	0.80	0.40	0.93	0.86	0.75	0.57	12.49					
BEL	0.55	0.60	0.67	0.64	0.63	0.47	0.31	0.65	0.64	0.40	0.53	0.59	9.01				
IRL	0.76	0.85	0.82	0.82	0.78	0.79	0.36	0.89	0.81	0.65	0.47	0.79	0.56	0.09			
SVK	0.39	0.25	0.25	0.23	0.20	0.26	0.20	0.23	0.23	0.25	0.27	0.23	0.25	0.24	13.09		
ESP	0.59	0.85	0.83	0.71	0.80	0.65	0.42	0.82	0.81	0.56	0.55	0.83	0.57	0.74	0.20	11.70	
POL	0.40	0.48	0.45	0.51	0.41	0.43	0.18	0.44	0.45	0.42	0.24	0.44	0.32	0.49	0.24	0.26	14.20

HOL mce

	CAN	CHE	DFS	FRA	ISR	ITA	NLD	USA	GBR	HUN	DEU	BEL	SVK	ESP	POL
CAN	7.05														
CHE	0.83	11.56													
DFS	0.83	0.67	11.60												
FRA	0.76	0.78	0.81	0.99											
ISR	0.85	0.67	0.80	0.70	2.62										
ITA	0.30	0.24	0.41	0.39	0.46	7.10									
NLD	0.78	0.68	0.79	0.78	0.72	0.42	4.55								
USA	0.92	0.89	0.77	0.76	0.86	0.28	0.75	0.15							
GBR	0.57	0.61	0.46	0.62	0.50	0.28	0.46	0.60	0.04						
HUN	0.37	0.32	0.37	0.33	0.46	0.22	0.37	0.37	0.32	1.28					
DEU	0.84	0.70	0.90	0.81	0.78	0.42	0.83	0.80	0.51	0.42	12.31				
BEL	0.63	0.66	0.65	0.68	0.53	0.32	0.75	0.65	0.48	0.41	0.70	9.94			
SVK	0.25	0.28	0.25	0.23	0.38	0.23	0.22	0.25	0.42	0.26	0.24	0.44	15.73		
ESP	0.78	0.62	0.85	0.76	0.77	0.34	0.80	0.71	0.44	0.49	0.87	0.65	0.25	12.25	
POL	0.49	0.42	0.51	0.45	0.45	0.32	0.46	0.49	0.31	0.26	0.54	0.47	0.25	0.42	15.52

HOL dsb

	AUS	CAN	CHE	DFS	FRA	ISR	ITA	NLD	USA	HUN	DEU	POL
AUS	0.04											
CAN	0.61	7.78										
CHE	0.21	0.66	17.36									
DFS	0.64	0.88	0.65	11.18								
FRA	0.27	0.61	0.55	0.55	0.61							
ISR	0.81	0.71	0.34	0.70	0.34	1.62						

ITA	0.42	0.55	0.49	0.50	0.38	0.52	6.87					
NLD	0.32	0.79	0.75	0.72	0.58	0.45	0.47	4.51				
USA	0.35	0.73	0.64	0.63	0.59	0.38	0.41	0.62	0.07			
HUN	0.59	0.43	0.19	0.43	0.17	0.65	0.33	0.19	0.27	1.10		
DEU	0.51	0.91	0.75	0.86	0.56	0.64	0.55	0.83	0.68	0.44	12.20	
POL	0.33	0.58	0.58	0.62	0.39	0.37	0.35	0.57	0.48	0.18	0.62	16.46

HOL msb

	CAN	CHE	DFS	FRA	ISR	ITA	NLD	USA	HUN	DEU	POL
CAN	6.15										
CHE	0.79	16.53									
DFS	0.95	0.76	10.55								
FRA	0.81	0.75	0.85	0.79							
ISR	0.88	0.73	0.86	0.69	1.72						
ITA	0.67	0.50	0.70	0.62	0.65	6.63					
NLD	0.93	0.75	0.95	0.79	0.84	0.72	4.36				
USA	0.88	0.81	0.85	0.77	0.81	0.55	0.78	0.12			
HUN	0.17	0.26	0.19	0.13	0.46	0.42	0.16	0.25	1.22		
DEU	0.95	0.79	0.97	0.82	0.86	0.73	0.95	0.83	0.17	12.59	
POL	0.84	0.75	0.81	0.75	0.81	0.62	0.77	0.75	0.18	0.79	13.95

RDC dce

	CAN	DFS	NOR	NLD	DEU	IRL
CAN	6.80					
DFS	0.89	10.79				
NOR	0.74	0.90	11.64			
NLD	0.95	0.90	0.88	5.05		
DEU	0.92	0.88	0.84	0.92	13.59	
IRL	0.81	0.80	0.85	0.85	0.78	0.07

RDC mce

	CAN	DFS	NOR	DEU
CAN	7.07			
DFS	0.73	11.54		
NOR	0.58	0.78	13.36	
DEU	0.82	0.87	0.63	11.80

^LAPPENDIX II. Number of common bulls

BSW

common bulls below diagonal

common three quarter sib group above diagonal

	DEA	NLD	USA	CHE	CAN	FRA
DEA	0	123	187	436	98	196
NLD	113	0	47	85	21	56
USA	144	42	0	156	107	72
CHE	367	77	123	0	88	119
CAN	85	19	98	74	0	59
FRA	156	45	58	92	51	0

BSW

common bulls below diagonal

common three quarter sib group above diagonal

	DEA	NLD	USA	CHE	CAN	FRA
DEA	0	110	109	495	36	160
NLD	102	0	35	74	16	51
USA	99	32	0	102	32	50
CHE	401	71	88	0	33	110

CAN	32	13	30	28	0	24
FRA	128	45	44	85	21	0

BSW

BSW

GUE

GUE

GUE

GUE

HOL

common bulls below diagonal
common three quarter sib group above diagonal

	AUS	CAN	CHE	DFS	FRA	ISR	ITA	NLD	USA	GBR	HUN	DEU	BEL	IRL	SVK	ESP	POL
AUS	0	1414	432	1055	1109	89	1085	1209	1760	770	446	1380	516	492	196	595	811
CAN	1359	0	695	1380	1516	119	1918	1542	3853	957	698	2457	635	454	300	972	1437
CHE	374	606	0	416	500	32	541	587	727	358	196	857	369	228	110	336	486
DFS	711	1087	353	0	1455	113	1366	1627	1880	831	526	2148	595	469	250	681	1127
FRA	806	1160	443	861	0	92	1683	1750	2248	935	671	2318	710	487	305	852	1478
ISR	56	78	17	77	56	0	115	134	171	87	54	125	53	68	33	71	116
ITA	828	1652	472	1027	1087	76	0	1613	2730	1097	704	2546	650	488	321	975	1558
NLD	930	1346	550	1098	1060	93	1221	0	2384	1061	561	2985	794	632	336	770	1575
USA	1666	4183	635	1305	1338	158	2165	1791	0	1355	843	3362	677	589	376	1091	2060
GBR	578	790	310	485	521	50	766	695	998	0	380	1258	443	465	179	513	867
HUN	273	554	131	333	411	34	508	312	656	214	0	833	280	235	174	400	494
DEU	1068	1971	783	1486	1424	94	1782	2515	2533	803	543	0	896	639	505	1080	2251
BEL	480	608	362	523	732	28	653	809	629	392	208	927	0	325	158	442	580
IRL	434	406	210	377	437	45	414	537	549	416	184	554	302	0	114	270	382
SVK	95	210	48	133	193	16	216	216	264	79	110	400	88	47	0	175	269
ESP	469	780	282	565	746	39	794	656	871	381	283	763	441	239	88	0	771
POL	675	1367	393	929	1138	88	1337	1467	2195	727	370	2057	538	321	186	599	0

HOL

common bulls below diagonal
common three quarter sib group above diagonal

	CAN	CHE	DFS	FRA	ISR	ITA	NLD	USA	GBR	HUN	DEU	BEL	SVK	ESP	POL
CAN	0	652	1285	1253	104	1535	1276	2545	875	650	2106	569	273	760	1221
CHE	553	0	545	556	46	574	668	710	415	243	895	400	123	335	488
DFS	1130	497	0	1619	120	1427	2039	1898	869	632	2673	649	254	643	1361
FRA	949	496	958	0	101	1458	1834	1942	775	690	2408	721	268	705	1448
ISR	64	23	83	57	0	110	135	165	96	62	136	52	30	62	111
ITA	1295	498	1181	934	73	0	1491	2268	882	674	2219	604	272	748	1384
NLD	1211	636	1710	1207	101	1261	0	2060	951	660	3092	809	312	662	1552
USA	2569	620	1545	1128	150	1864	1695	0	1123	853	3055	634	325	840	1900
GBR	953	393	882	780	71	964	1032	1308	0	402	1072	458	173	476	738
HUN	545	178	433	426	40	519	447	720	367	0	901	302	175	365	502
DEU	1583	804	1880	1344	101	1567	2635	2221	1139	602	0	854	385	863	2228
BEL	563	397	612	743	28	599	874	579	511	240	882	0	154	399	537
SVK	187	50	138	148	13	191	205	233	108	118	281	82	0	159	224
ESP	597	282	556	598	31	644	597	683	462	287	619	386	83	0	590
POL	1086	382	1151	1017	82	1164	1401	1946	785	368	1931	476	165	459	0

HOL

common bulls below diagonal
common three quarter sib group above diagonal

	AUS	CAN	CHE	DFS	FRA	ISR	ITA	NLD	USA	HUN	DEU	POL
AUS	0	1369	420	1059	982	89	1093	1366	1636	318	1379	801
CAN	1349	0	673	1335	1370	115	1954	1788	3533	488	2442	1424

CHE	366	588	0	409	493	31	537	632	674	128	838	475
DFS	716	1091	348	0	1316	115	1389	1772	1742	411	2161	1122
FRA	755	1098	437	824	0	81	1631	1751	1817	485	2229	1458
ISR	56	77	17	77	53	0	118	137	167	35	127	113
ITA	850	1724	478	1064	1095	83	0	1848	2665	512	2578	1607
NLD	1179	1757	610	1356	1334	104	1603	0	2442	467	3316	1666
USA	1579	3953	580	1249	1118	155	2193	2136	0	575	3133	1994
HUN	199	382	89	256	304	26	363	318	428	0	634	303
DEU	1072	1976	761	1491	1406	94	1867	3004	2402	419	0	2246
POL	673	1374	389	933	1140	88	1431	1604	2164	224	2078	0

HOL

common bulls below diagonal
common three quarter sib group above diagonal

	CAN	CHE	DFS	FRA	ISR	ITA	NLD	USA	HUN	DEU	POL
CAN	0	648	1293	1184	103	1664	1321	2347	469	2061	1168
CHE	550	0	555	551	46	621	681	667	179	879	461
DFS	1164	504	0	1527	122	1602	2103	1713	510	2689	1331
FRA	926	493	952	0	96	1580	1746	1580	522	2276	1385
ISR	64	23	84	55	0	116	136	160	45	133	108
ITA	1405	549	1323	991	82	0	1716	2345	533	2533	1499
NLD	1291	653	1809	1209	101	1470	0	1881	517	3071	1501
USA	2454	584	1544	1024	149	2007	1664	0	580	2667	1740
HUN	387	134	348	320	27	396	367	508	0	708	307
DEU	1532	781	1901	1268	97	1746	2629	2040	464	0	2062
POL	1045	356	1120	957	81	1237	1352	1800	209	1737	0

JER

JER

JER

JER

RDC

common bulls below diagonal
common three quarter sib group above diagonal

	CAN	DFS	NOR	NLD	DEU	IRL
CAN	0	173	6	5	11	4
DFS	178	0	154	58	90	21
NOR	5	130	0	47	31	55
NLD	5	56	46	0	26	13
DEU	11	82	29	25	0	7
IRL	4	17	54	13	6	0

RDC

common bulls below diagonal
common three quarter sib group above diagonal

	CAN	DFS	NOR	DEU
CAN	0	113	4	9
DFS	112	0	142	59
NOR	4	116	0	17
DEU	9	51	16	0

RDC

RDC

SIM

SIM

SIM

SIM
