

INTRODUCTION

The latest routine international evaluation for calving traits took place as scheduled at the Interbull Centre. Data from eighteen (18) 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:

CHE (BSW)	Drops in information due to manual edits.
NOR (RDC)	The rolling definition of effects redistribute the daughters and some bulls loose EDC.
ISR (HOL)	Drops in information due to pedigree corrections and edits.
DFS (HOL, JER)	Correcting the way the Interbull EDC calculation methods was implemented, causing drops in EDC.
AUS (HOL)	Decreasing in information due to pedigree changes, changes in status of bull which leads to a good number of bulls no longer being qualified.
POL (HOL)	Drops in information due to data edits
ITA (HOL)	Drops in information due to data edits
USA (ALL)	Drops in information for most traits are due to pedigree corrections and herd-year edits.
ESP (HOL)	New EBVs for dce and mce and now calculated with an animal model with direct and maternal effects considering different trait between first vs later parities. Edits have been reviewed and Snell transformation are now applied to categorical data of calving ease. New genetic parameters are applied. Change from T+ to B+. Change in base definition.
FRA (HOL)	The reliability from the singlestep is now used as a factor of the publication.

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 (August Routine Evaluation 2022).
Number of records for direct calving ease by breed

Country	BSW	GUE	HOL	JER	RDC	SIM
AUS			6623			
BEL			1228			
CAN	166		13255		521	
CHE	1626		2160			
CZE						
DEA	3554					
DEU			20139		286	
DFS			10971		6661	
ESP			1896			
EST						
FRA	376		13156			
FRM						
GBR			3200			
HUN			1765			
IRL			2360		61	
ISR			558			
ITA			9318			
JPN						
KOR						
LTU						
LVA						
NLD	172		15408		82	
NOR					3886	
NZL			7542		1107	
POL			6751			
PRT						
SVK			699			
SVN						
URY						
USA	539		37046			
ZAF						
HRV						
CAM						
=====						
No. Records	6433		154075		12604	
Pub. Proofs	6828	0	131292	0	12918	0

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

BSW	dce					
	DEA	NLD	USA	CHE	CAN	FRA
DEA	9.28					
NLD	0.87	5.55				

USA	0.67	0.84	0.13			
CHE	0.86	0.93	0.82	10.54		
CAN	0.79	0.94	0.91	0.92	7.66	
FRA	0.75	0.87	0.82	0.83	0.86	0.76

BSW	mce					
	DEA	NLD	USA	CHE	CAN	FRA
DEA	9.77					
NLD	0.62	4.71				
USA	0.77	0.77	0.15			
CHE	0.75	0.71	0.87	13.03		
CAN	0.39	0.79	0.84	0.73	6.14	
FRA	0.83	0.77	0.92	0.92	0.79	1.02

HOL	dce																		
	AUS	CAN	CHE	DFS	FRA	ISR	ITA	NLD	USA	GBR	HUN	DEU	BEL	IRL	NZL	SVK	ESP	POL	
AUS	0.04																		
CAN	0.76	6.93																	
CHE	0.72	0.92	9.07																
DFS	0.74	0.92	0.84	11.21															
FRA	0.78	0.95	0.92	0.88	0.92														
ISR	0.70	0.83	0.67	0.84	0.79	2.73													
ITA	0.54	0.64	0.64	0.64	0.67	0.67	7.15												
NLD	0.84	0.97	0.90	0.93	0.93	0.85	0.68	7.03											
USA	0.73	0.91	0.88	0.86	0.91	0.79	0.62	0.87	0.13										
GBR	0.75	0.79	0.68	0.68	0.74	0.70	0.54	0.83	0.69	0.07									
HUN	0.51	0.59	0.47	0.48	0.61	0.60	0.36	0.58	0.57	0.55	1.26								
DEU	0.80	0.93	0.89	0.89	0.94	0.80	0.61	0.93	0.86	0.74	0.61	12.61							
BEL	0.58	0.63	0.66	0.66	0.67	0.49	0.51	0.66	0.66	0.46	0.60	0.62	9.37						
IRL	0.77	0.86	0.81	0.84	0.86	0.77	0.62	0.90	0.82	0.68	0.54	0.80	0.60	0.09					
NZL	0.77	0.77	0.74	0.77	0.75	0.68	0.52	0.80	0.74	0.60	0.36	0.77	0.49	0.80	2.99				
SVK	0.46	0.37	0.30	0.36	0.36	0.37	0.36	0.37	0.36	0.36	0.40	0.36	0.37	0.35	0.23	13.10			
ESP	0.63	0.83	0.78	0.73	0.82	0.67	0.59	0.79	0.80	0.59	0.59	0.81	0.61	0.74	0.65	0.33	11.76		
POL	0.47	0.53	0.45	0.56	0.54	0.46	0.38	0.50	0.51	0.49	0.36	0.49	0.41	0.52	0.24	0.38	0.37	14.23	

HOL	mce														
	CAN	CHE	DFS	FRA	ISR	ITA	NLD	USA	GBR	HUN	DEU	BEL	SVK	ESP	POL
CAN	6.70														
CHE	0.85	11.64													
DFS	0.84	0.69	12.02												
FRA	0.90	0.95	0.77	1.28											
ISR	0.84	0.69	0.81	0.78	2.64										
ITA	0.79	0.83	0.63	0.84	0.77	9.02									
NLD	0.84	0.74	0.86	0.81	0.72	0.59	5.28								
USA	0.92	0.91	0.79	0.95	0.85	0.84	0.80	0.15							
GBR	0.61	0.68	0.51	0.71	0.53	0.59	0.54	0.65	0.04						
HUN	0.42	0.37	0.44	0.41	0.48	0.35	0.42	0.41	0.38	1.28					
DEU	0.84	0.71	0.91	0.77	0.76	0.66	0.85	0.79	0.55	0.45	12.44				
BEL	0.66	0.70	0.69	0.73	0.56	0.61	0.79	0.68	0.51	0.45	0.74	10.30			
SVK	0.32	0.34	0.33	0.34	0.45	0.33	0.32	0.32	0.52	0.33	0.32	0.43	15.67		
ESP	0.73	0.59	0.79	0.68	0.70	0.51	0.75	0.68	0.50	0.51	0.79	0.61	0.32	12.35	
POL	0.51	0.48	0.54	0.50	0.50	0.48	0.49	0.52	0.42	0.32	0.54	0.50	0.33	0.46	15.57

HOL	dsb												
	AUS	CAN	CHE	DFS	FRA	ISR	ITA	NLD	USA	HUN	DEU	POL	
AUS	0.04												
CAN	0.61	7.72											
CHE	0.26	0.65	17.55										
DFS	0.66	0.88	0.61	12.02									
FRA	0.46	0.75	0.62	0.65	0.77								
ISR	0.82	0.73	0.40	0.75	0.51	1.66							

ITA	0.62	0.53	0.30	0.54	0.37	0.71	7.15					
NLD	0.34	0.79	0.73	0.71	0.68	0.50	0.28	4.56				
USA	0.36	0.69	0.62	0.59	0.67	0.38	0.31	0.61	0.07			
HUN	0.59	0.45	0.23	0.46	0.27	0.64	0.38	0.23	0.29	1.10		
DEU	0.51	0.90	0.71	0.86	0.68	0.68	0.43	0.82	0.66	0.44	12.27	
POL	0.31	0.57	0.58	0.63	0.50	0.38	0.29	0.57	0.50	0.21	0.63	16.58

HOL msb

	CAN	CHE	DFS	FRA	ISR	ITA	NLD	USA	HUN	DEU	POL
CAN	5.92										
CHE	0.78	16.76									
DFS	0.96	0.77	11.54								
FRA	0.86	0.80	0.85	0.93							
ISR	0.88	0.75	0.85	0.78	1.74						
ITA	0.47	0.62	0.41	0.53	0.62	9.02					
NLD	0.93	0.75	0.95	0.80	0.81	0.37	4.20				
USA	0.87	0.80	0.85	0.84	0.80	0.50	0.80	0.12			
HUN	0.25	0.31	0.29	0.30	0.50	0.43	0.25	0.32	1.22		
DEU	0.95	0.79	0.97	0.83	0.86	0.42	0.95	0.83	0.26	12.70	
POL	0.85	0.76	0.82	0.73	0.81	0.35	0.78	0.74	0.26	0.80	14.19

RDC dce

	CAN	DFS	NOR	NLD	DEU	IRL	NZL
CAN	6.77						
DFS	0.91	10.48					
NOR	0.80	0.92	13.67				
NLD	0.95	0.91	0.89	4.86			
DEU	0.92	0.88	0.86	0.92	13.55		
IRL	0.83	0.82	0.88	0.87	0.79	0.07	
NZL	0.73	0.72	0.68	0.78	0.73	0.74	2.78

RDC mce

	CAN	DFS	NOR	DEU
CAN	6.97			
DFS	0.79	12.18		
NOR	0.62	0.89	15.75	
DEU	0.82	0.86	0.72	12.10

^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	112	182	413	97	181
NLD	104	0	43	77	19	51
USA	138	38	0	153	104	66
CHE	344	71	118	0	86	110
CAN	84	17	95	73	0	53
FRA	132	38	50	77	45	0

BSW

common bulls below diagonal
common three quarter sib group above diagonal

	DEA	NLD	USA	CHE	CAN	FRA
DEA	0	99	102	472	35	139
NLD	92	0	32	63	15	46
USA	92	29	0	99	31	45

CHE	380	62	85	0	33	93
CAN	31	12	29	28	0	24
FRA	102	40	39	68	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	NZL	SVK	ESP	POL
AUS	0	1347	409	1017	1082	85	1091	1163	1686	735	446	1323	495	468	940	191	473	756
CAN	1293	0	654	1319	1463	104	1871	1445	3685	912	697	2354	601	433	691	294	760	1326
CHE	352	568	0	392	478	30	517	551	799	342	197	801	352	216	244	108	279	464
DFS	670	1029	329	0	1402	104	1352	1557	1808	805	525	2056	562	453	711	243	519	1053
FRA	775	1098	417	810	0	87	1681	1689	2209	898	669	2237	676	475	733	298	663	1371
ISR	54	72	16	71	52	0	104	122	146	74	53	114	47	62	84	33	51	97
ITA	807	1601	452	990	1050	70	0	1593	2673	1055	715	2478	629	482	697	314	778	1447
NLD	879	1245	513	1022	996	86	1162	0	2296	1026	560	2821	739	597	963	329	573	1460
USA	1588	3990	716	1228	1289	133	2061	1689	0	1281	843	3293	646	568	980	367	852	1877
GBR	545	744	294	462	487	39	708	662	919	0	380	1202	421	441	447	174	415	789
HUN	272	554	131	334	410	34	511	313	656	213	0	832	277	234	328	174	341	493
DEU	1007	1858	724	1386	1340	88	1700	2337	2437	752	543	0	841	606	844	497	840	2074
BEL	457	577	346	492	699	24	630	757	596	372	207	873	0	308	344	154	352	538
IRL	413	389	200	368	426	40	406	511	534	394	183	530	294	0	544	113	218	360
NZL	833	620	209	476	495	62	543	797	924	282	198	667	293	487	0	168	304	447
SVK	91	205	46	125	190	15	206	210	254	75	110	391	84	46	101	0	151	259
ESP	320	504	205	376	504	24	537	428	539	279	218	479	318	178	211	60	0	578
POL	616	1251	369	847	1029	74	1209	1345	1954	642	370	1862	497	303	370	175	388	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	614	1219	1207	91	1435	1162	2420	803	650	2007	538	262	625	1129
CHE	518	0	513	522	41	515	609	777	378	238	834	370	118	285	451
DFS	1059	461	0	1566	114	1365	1892	1815	814	635	2553	616	248	507	1248
FRA	895	461	904	0	95	1457	1698	1911	740	690	2330	688	263	585	1368
ISR	57	21	77	54	0	99	122	140	83	62	127	46	29	51	96
ITA	1164	435	1072	871	64	0	1405	2138	808	694	2144	578	257	607	1232
NLD	1098	577	1578	1120	91	1120	0	1894	855	645	2822	766	302	512	1411
USA	2426	699	1444	1087	124	1639	1538	0	1025	853	2964	599	312	677	1719
GBR	883	364	827	746	59	885	936	1209	0	401	981	429	167	377	649
HUN	545	177	437	426	40	527	436	719	365	0	900	299	175	326	502
DEU	1468	742	1758	1269	94	1395	2368	2084	1052	600	0	809	375	692	2043
BEL	534	368	583	712	25	559	827	550	485	238	835	0	147	326	502
SVK	180	46	132	146	11	177	194	218	103	117	270	78	0	134	212
ESP	444	224	396	465	21	466	431	484	350	242	438	300	63	0	468
POL	982	339	1025	929	69	968	1256	1721	692	367	1717	445	151	320	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
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AUS	0	1302	399	1019	955	85	1087	1308	1565	318	1322	745
CAN	1283	0	630	1275	1318	100	1858	1685	3367	488	2342	1313
CHE	345	546	0	385	471	29	503	590	744	129	779	452
DFS	674	1031	324	0	1267	106	1355	1684	1671	410	2068	1048
FRA	724	1036	411	773	0	76	1604	1692	1777	486	2150	1354
ISR	54	71	16	71	49	0	104	126	142	35	117	94
ITA	806	1600	438	993	1011	70	0	1793	2533	524	2476	1435
NLD	1122	1648	566	1265	1266	96	1491	0	2362	468	3134	1534
USA	1501	3761	658	1175	1068	130	1977	2038	0	575	3067	1811
HUN	199	382	89	256	304	26	369	320	428	0	634	303
DEU	1010	1867	698	1391	1322	88	1701	2818	2312	419	0	2066
POL	614	1256	361	851	1032	74	1211	1461	1925	224	1879	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	608	1208	1138	90	1425	1217	2219	469	1958	1078
CHE	514	0	518	517	41	511	629	738	179	813	423
DFS	1078	469	0	1475	114	1373	2001	1610	510	2553	1208
FRA	872	458	899	0	90	1417	1686	1546	522	2196	1306
ISR	57	21	77	52	0	99	125	135	45	125	94
ITA	1162	432	1089	853	64	0	1463	1942	528	2112	1180
NLD	1190	602	1706	1143	91	1188	0	1790	519	2892	1362
USA	2313	665	1432	984	123	1593	1565	0	579	2572	1566
HUN	387	134	347	320	27	392	370	507	0	708	307
DEU	1413	715	1759	1195	92	1356	2426	1910	464	0	1891
POL	946	317	997	872	68	920	1210	1585	209	1542	0

JER

JER

JER

JER

RDC

common bulls below diagonal
common three quarter sib group above diagonal
CAN DFS NOR NLD DEU IRL NZL

CAN	0	166	5	4	11	4	60
DFS	170	0	135	57	82	19	127
NOR	4	110	0	45	25	53	39
NLD	4	55	44	0	26	12	21
DEU	11	75	24	25	0	6	21
IRL	4	16	52	12	6	0	13
NZL	61	110	38	21	21	13	0

RDC

common bulls below diagonal
common three quarter sib group above diagonal
CAN DFS NOR DEU

CAN	0	108	4	9
DFS	108	0	135	50
NOR	4	108	0	15
DEU	9	42	14	0

RDC

RDC

SIM

SIM

SIM

SIM
