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, Slovack 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 pedigree updates and status changes of some bulls which then leads to no longer qualifying
CHE (ALL)	Decrease in information due to manual edits/data correction in data base and change of hys assignment
BEL (HOL)	Decrease in information due to the pedigree correction
POL (HOL)	Decrease in information due to data edits
USA (BSW,HOL)	Decrease in information due to pedigree correction and heard-year minimum edits.
ESP (HOL)	Base change

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 2023).
Number of records for direct calving ease by breed

Country	BSW	GUE	HOL	JER	RDC	SIM
AUS			6735			
BEL			1288			
CAN	169		13502		533	
CHE	1687		2236			
CZE						
DEA	3647					
DEU			20525		300	
DFS			11283		6707	
ESP			2000			
EST						
FRA	406		13366			
FRM						
GBR			3280			
HUN			1765			
IRL			2516		65	
ISR			598			
ITA			9128			
JPN						
KOR						
LTU						
LVA						
NLD	191		15700		85	
NOR					3973	
NZL			7542		1107	
POL			7173			
PRT						
SVK			715			
SVN						
URY						
USA	555		37485			
ZAF						
HRV						
CAM						
No.Records	6655		156837		12770	
Pub. Proofs	6984	0	132616	0	12986	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	0.85	5.88				
USA	0.65	0.84	0.13			
CHE	0.85	0.93	0.81	10.56		
CAN	0.78	0.94	0.90	0.92	7.84	
FRA	0.74	0.86	0.81	0.83	0.86	0.76

BSW mce

	DEA	NLD	USA	CHE	CAN	FRA
DEA	9.72					
NLD	0.61	4.27				
USA	0.74	0.72	0.15			
CHE	0.71	0.65	0.85	13.05		
CAN	0.36	0.75	0.84	0.71	6.03	
FRA	0.82	0.72	0.91	0.91	0.77	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	7.24																
CHE	0.74	0.93	8.96															
DFS	0.73	0.92	0.84	11.25														
FRA	0.78	0.95	0.92	0.87	0.92													
ISR	0.73	0.84	0.69	0.85	0.80	2.69												
ITA	0.37	0.44	0.50	0.45	0.48	0.51	4.17											
NLD	0.83	0.97	0.91	0.93	0.92	0.85	0.44	7.53										
USA	0.72	0.91	0.87	0.85	0.91	0.80	0.45	0.87	0.13									
GBR	0.74	0.80	0.70	0.70	0.75	0.71	0.34	0.83	0.68	0.07								
HUN	0.47	0.55	0.46	0.41	0.57	0.57	0.21	0.52	0.52	0.50	1.26							
DEU	0.80	0.94	0.89	0.89	0.94	0.81	0.40	0.93	0.86	0.75	0.58	12.51						
BEL	0.56	0.61	0.66	0.65	0.65	0.48	0.30	0.65	0.64	0.41	0.56	0.61	9.06					
IRL	0.77	0.86	0.82	0.83	0.85	0.79	0.36	0.89	0.82	0.66	0.49	0.80	0.57	0.09				
NZL	0.78	0.77	0.72	0.78	0.75	0.69	0.29	0.80	0.74	0.61	0.35	0.77	0.50	0.81	2.99			
SVK	0.41	0.29	0.27	0.27	0.27	0.30	0.20	0.25	0.27	0.29	0.31	0.26	0.28	0.27	0.22	13.05		
ESP	0.63	0.85	0.81	0.72	0.84	0.67	0.43	0.83	0.80	0.59	0.57	0.83	0.60	0.75	0.66	0.26	11.62	
POL	0.41	0.49	0.45	0.52	0.50	0.43	0.18	0.45	0.46	0.44	0.27	0.45	0.33	0.49	0.28	0.28	0.32	14.22

HOL mce

	CAN	CHE	DFS	FRA	ISR	ITA	NLD	USA	GBR	HUN	DEU	BEL	SVK	ESP	POL
CAN	7.05														
CHE	0.84	11.55													
DFS	0.83	0.67	11.62												
FRA	0.90	0.94	0.76	1.28											
ISR	0.85	0.68	0.80	0.78	2.63										
ITA	0.31	0.24	0.42	0.29	0.46	7.07									
NLD	0.78	0.68	0.79	0.76	0.71	0.42	4.50								
USA	0.92	0.90	0.77	0.95	0.86	0.29	0.75	0.15							
GBR	0.56	0.60	0.46	0.65	0.49	0.33	0.43	0.59	0.04						
HUN	0.39	0.33	0.38	0.37	0.46	0.22	0.37	0.38	0.34	1.28					
DEU	0.84	0.70	0.90	0.77	0.77	0.43	0.83	0.79	0.51	0.43	12.33				
BEL	0.64	0.67	0.66	0.70	0.53	0.34	0.75	0.66	0.47	0.41	0.70	10.00			
SVK	0.27	0.29	0.26	0.28	0.41	0.23	0.22	0.27	0.47	0.28	0.26	0.42	15.70		
ESP	0.75	0.62	0.82	0.69	0.73	0.34	0.80	0.70	0.46	0.50	0.82	0.59	0.28	12.21	
POL	0.49	0.44	0.51	0.47	0.46	0.31	0.46	0.50	0.34	0.26	0.53	0.48	0.26	0.44	15.53

HOL dsb

	AUS	CAN	CHE	DFS	FRA	ISR	ITA	NLD	USA	HUN	DEU	POL
AUS	0.04											
CAN	0.60	7.80										
CHE	0.21	0.66	17.43									

DFS	0.64	0.88	0.64	11.19							
FRA	0.44	0.75	0.63	0.67	0.77						
ISR	0.83	0.71	0.35	0.72	0.51	1.62					
ITA	0.42	0.55	0.48	0.50	0.47	0.53	6.92				
NLD	0.31	0.79	0.75	0.72	0.67	0.46	0.47	4.52			
USA	0.35	0.72	0.64	0.62	0.68	0.37	0.42	0.62	0.07		
HUN	0.59	0.43	0.19	0.44	0.25	0.65	0.33	0.19	0.27	1.10	
DEU	0.51	0.91	0.74	0.86	0.68	0.65	0.55	0.82	0.68	0.43	12.20
POL	0.32	0.58	0.58	0.63	0.48	0.39	0.35	0.56	0.49	0.18	0.63	16.52

HOL msb

	CAN	CHE	DFS	FRA	ISR	ITA	NLD	USA	HUN	DEU	POL
CAN	6.16										
CHE	0.78	16.63									
DFS	0.95	0.76	10.56								
FRA	0.86	0.79	0.84	0.93							
ISR	0.88	0.73	0.86	0.77	1.72						
ITA	0.67	0.51	0.70	0.52	0.65	6.65					
NLD	0.93	0.75	0.95	0.79	0.83	0.73	4.37				
USA	0.88	0.80	0.85	0.84	0.81	0.56	0.78	0.12			
HUN	0.18	0.27	0.20	0.22	0.48	0.42	0.17	0.27	1.22		
DEU	0.95	0.79	0.97	0.82	0.86	0.73	0.95	0.83	0.19	12.61	
POL	0.84	0.75	0.81	0.74	0.82	0.61	0.77	0.75	0.19	0.80	14.00

RDC dce

	CAN	DFS	NOR	NLD	DEU	IRL	NZL
CAN	6.84						
DFS	0.89	10.80					
NOR	0.75	0.90	11.60				
NLD	0.95	0.90	0.88	5.07			
DEU	0.92	0.88	0.84	0.92	13.57		
IRL	0.82	0.81	0.86	0.86	0.79	0.07	
NZL	0.72	0.66	0.63	0.76	0.72	0.73	2.78

RDC mce

	CAN	DFS	NOR	DEU
CAN	7.06			
DFS	0.73	11.54		
NOR	0.57	0.77	13.36	
DEU	0.82	0.86	0.62	11.94

^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	185	427	98	197
NLD	113	0	47	85	21	55
USA	142	42	0	156	107	73
CHE	358	77	123	0	88	122
CAN	85	19	98	74	0	58
FRA	155	44	57	91	50	0

BSW

common bulls below diagonal
common three quarter sib group above diagonal

	DEA	NLD	USA	CHE	CAN	FRA

DEA	0	110	108	493	36	160
NLD	101	0	34	73	16	49
USA	98	31	0	101	31	50
CHE	399	71	87	0	33	114
CAN	32	13	29	28	0	24
FRA	126	44	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	NZL	SVK	ESP	POL
AUS	0	1396	423	1048	1102	87	1077	1198	1741	763	446	1363	511	494	947	195	493	793
CAN	1346	0	681	1363	1498	116	1890	1521	3809	946	698	2427	626	454	691	297	798	1403
CHE	366	593	0	412	492	32	531	581	714	351	196	838	364	228	245	109	290	477
DFS	701	1072	348	0	1439	110	1348	1615	1868	825	526	2129	588	469	710	248	550	1107
FRA	797	1139	434	843	0	91	1664	1735	2229	922	671	2292	704	486	738	301	691	1439
ISR	56	77	17	77	56	0	111	131	167	84	54	122	52	68	84	33	57	111
ITA	819	1623	462	1010	1064	74	0	1592	2682	1081	704	2509	643	485	651	318	804	1527
NLD	917	1326	546	1089	1044	92	1199	0	2356	1053	561	2942	784	630	965	334	611	1549
USA	1648	4126	623	1294	1319	155	2110	1768	0	1331	843	3335	670	590	980	372	889	2014
GBR	569	778	304	481	512	47	745	687	972	0	380	1238	443	463	447	179	436	843
HUN	273	554	131	333	411	34	508	312	656	214	0	833	280	235	328	174	342	494
DEU	1049	1936	765	1467	1398	93	1744	2473	2501	788	543	0	883	638	845	503	889	2198
BEL	474	601	358	519	723	27	644	800	620	393	208	913	0	325	344	157	368	569
IRL	435	406	210	377	437	45	408	535	551	414	184	552	302	0	552	114	226	376
NZL	838	620	210	477	500	62	521	798	923	282	198	668	293	495	0	168	307	455
SVK	94	208	47	132	193	16	213	215	261	79	110	398	87	47	101	0	153	266
ESP	340	542	216	410	528	28	563	465	580	295	218	520	333	179	215	61	0	638
POL	659	1337	381	909	1101	84	1299	1443	2143	705	369	2004	527	315	377	183	440	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	643	1270	1239	103	1519	1252	2512	855	650	2086	562	269	666	1202
CHE	545	0	536	546	46	568	660	701	408	243	883	397	120	308	482
DFS	1116	488	0	1602	120	1412	2017	1879	852	631	2644	641	251	536	1336
FRA	933	484	941	0	100	1444	1817	1931	762	690	2386	713	264	611	1429
ISR	64	23	83	57	0	109	133	163	96	62	133	51	30	56	109
ITA	1280	491	1165	919	73	0	1468	2239	871	674	2190	595	268	642	1364
NLD	1187	628	1684	1189	98	1238	0	2034	929	660	3055	793	308	555	1533
USA	2534	612	1525	1117	148	1836	1667	0	1098	853	3034	625	321	719	1874
GBR	935	390	864	771	69	951	1011	1286	0	402	1044	449	169	407	716
HUN	545	178	432	426	40	519	448	720	367	0	901	301	175	327	502
DEU	1561	792	1848	1324	99	1542	2597	2194	1114	602	0	839	381	741	2190
BEL	558	395	606	732	28	591	860	572	503	239	868	0	149	351	529
SVK	185	49	135	147	12	187	202	228	106	118	277	80	0	140	220
ESP	485	246	430	492	25	511	469	533	376	245	483	323	66	0	507
POL	1064	373	1118	994	81	1139	1378	1906	758	367	1886	467	161	363	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	1351	411	1051	975	87	1085	1345	1616	318	1363	785
CAN	1336	0	658	1318	1352	112	1922	1756	3488	488	2414	1393
CHE	358	573	0	404	484	31	526	619	659	128	817	465
DFS	706	1076	343	0	1302	112	1370	1747	1729	411	2142	1102
FRA	746	1077	427	806	0	80	1610	1733	1798	485	2201	1420
ISR	56	76	17	77	53	0	113	134	163	35	124	108
ITA	840	1692	466	1048	1071	80	0	1818	2610	510	2531	1570
NLD	1160	1724	598	1335	1313	103	1570	0	2408	468	3265	1635
USA	1558	3897	566	1238	1099	152	2132	2099	0	575	3106	1952
HUN	199	382	89	256	304	26	363	319	428	0	634	303
DEU	1055	1942	738	1472	1379	93	1824	2956	2372	419	0	2194
POL	657	1345	374	913	1105	84	1387	1570	2115	224	2025	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	640	1272	1170	102	1644	1295	2306	469	2039	1146
CHE	544	0	544	540	46	613	671	657	179	864	455
DFS	1145	496	0	1509	122	1576	2077	1686	510	2652	1305
FRA	908	481	934	0	95	1561	1732	1567	522	2255	1369
ISR	64	23	84	55	0	113	135	157	45	131	107
ITA	1384	540	1299	971	80	0	1685	2310	533	2503	1467
NLD	1267	642	1777	1189	99	1438	0	1840	518	3025	1464
USA	2417	575	1517	1013	146	1971	1625	0	579	2640	1708
HUN	387	134	348	320	27	396	368	508	0	708	307
DEU	1504	765	1857	1246	96	1718	2582	2007	464	0	2030
POL	1022	348	1089	943	81	1201	1311	1757	209	1700	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	171	6	5	11	4	60
DFS	176	0	152	58	87	21	126
NOR	5	128	0	47	29	55	39
NLD	5	56	46	0	26	13	21
DEU	11	80	28	25	0	7	21
IRL	4	17	54	13	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	112	4	9
DFS	111	0	138	59
NOR	4	112	0	16
DEU	9	51	15	0

RDC

RDC

SIM

SIM

SIM

SIM
