

## 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 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 (HOL,JER,RDC)	Some decrease in daughters and EDC due to data editing
NOR (RDC)	Delivered RBV's for all traits. The scaling is according to a rolling base that change somewhat at each evaluation. Therefore percentage changes in sire standard deviations between evaluations may solely be due to changes in the standard deviation in the rolling base.
DEA (BSW)	Minor changes in number of daughters for some bulls
DFS (ALL)	Changes in number of information mainly caused by the fact that each single observation is checked with informations coming from calvings. If there is a conflict the observation is dropped.
SVN (ALL)	Base change
USA (ALL)	Drops in herds/daus/EDCs are because for the latest partial year, the previous year's statistics are used. Then, as the full year data arrives some herds that did not pass previously pass this year and others that previously qualified are dropped.
ESP (HOL)	Changes in data extraction and edits causing drop of information

## 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 this 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 with the aim of implementation set for the September 2020 test run.

#### DATA AND METHOD OF ANALYSIS

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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

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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

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Dates for the next routine evaluation can be found on  
<http://www.interbull.org/ib/servicecalendar>.

NEXT TEST INTERNATIONAL EVALUATION

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 Dates for the next test run can be found on  
<http://www.interbull.org/ib/servicecalendar>.

PUBLICATION OF INTERBULL ROUTINE RUN

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 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

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 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 2020).  
 Number of records for direct calving ease by breed

Country	BSW	GUE	HOL	JER	RDC	SIM
AUS			6336			
BEL			1108			
CAN	159		12726		501	
CHE	1940		2333			
CZE						
DEA	5388					
DEU			19197		265	
DFS			10377		6406	
ESP			2109			
EST						
FRA	348		12461			
FRM						
GBR			2967			
HUN			1752			
IRL			2085		55	
ISR			487			
ITA			9621			
JPN						
KOR						
LTU						
LVA						
NLD	142		14761		67	
NOR					3786	
NZL			7542		1107	
POL						
PRT						
SVK			672			
SVN						
URY						
USA	492		35556			

ZAF  
 HRV  
 MEX  
 CAM

No. Records	8469		142090		12187	
Pub. Proofs	8809	0	126352	0	12685	0

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

BSW dce

	DEA	NLD	USA	CHE	CAN	FRA
DEA	9.82					
NLD	0.91	5.95				
USA	0.78	0.87	0.13			
CHE	0.92	0.96	0.88	12.18		
CAN	0.85	0.96	0.92	0.96	7.40	
FRA	0.80	0.90	0.87	0.86	0.89	0.76

BSW mce

	DEA	NLD	USA	CHE	CAN	FRA
DEA	10.91					
NLD	0.65	5.12				
USA	0.85	0.76	0.15			
CHE	0.88	0.76	0.92	16.10		
CAN	0.60	0.81	0.87	0.75	6.30	
FRA	0.89	0.78	0.93	0.96	0.84	0.99

HOL dce

	AUS	CAN	CHE	DFS	FRA	ISR	ITA	NLD	USA	GBR	HUN	DEU	BEL	IRL	NZL	SVK	ESP
AUS	0.04																
CAN	0.78	6.64															
CHE	0.81	0.96	10.28														
DFS	0.77	0.92	0.89	11.69													
FRA	0.81	0.96	0.96	0.90	0.92												
ISR	0.79	0.90	0.86	0.89	0.88	2.80											
ITA	0.70	0.77	0.77	0.77	0.76	0.78	7.26										
NLD	0.86	0.97	0.95	0.93	0.93	0.92	0.77	7.17									
USA	0.76	0.91	0.92	0.87	0.92	0.83	0.77	0.87	0.13								
GBR	0.75	0.80	0.78	0.77	0.77	0.82	0.76	0.85	0.77	0.07							
HUN	0.70	0.77	0.77	0.77	0.76	0.78	0.77	0.77	0.77	0.77	1.23						
DEU	0.82	0.92	0.90	0.89	0.93	0.84	0.76	0.92	0.87	0.78	0.76	12.83					
BEL	0.70	0.77	0.77	0.76	0.76	0.78	0.76	0.77	0.77	0.76	0.77	0.76	9.71				
IRL	0.77	0.89	0.91	0.86	0.90	0.90	0.77	0.92	0.82	0.77	0.77	0.83	0.77	0.09			
NZL	0.80	0.79	0.80	0.79	0.77	0.78	0.76	0.81	0.77	0.77	0.77	0.77	0.76	0.81	2.99		
SVK	0.71	0.77	0.78	0.77	0.77	0.78	0.77	0.77	0.77	0.78	0.77	0.77	0.78	0.77	0.78	12.80	
ESP	0.70	0.77	0.77	0.77	0.77	0.78	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.78	0.78	11.29

HOL mce

	CAN	CHE	DFS	FRA	ISR	ITA	NLD	USA	GBR	HUN	DEU	BEL	SVK	ESP
CAN	6.64													
CHE	0.88	13.48												
DFS	0.83	0.70	12.12											
FRA	0.92	0.97	0.77	1.29										
ISR	0.82	0.72	0.81	0.77	2.65									
ITA	0.80	0.86	0.62	0.85	0.75	9.34								

NLD	0.83	0.77	0.85	0.80	0.70	0.58	5.44								
USA	0.92	0.93	0.78	0.95	0.87	0.86	0.78	0.15							
GBR	0.64	0.77	0.56	0.75	0.60	0.63	0.57	0.68	0.04						
HUN	0.55	0.56	0.55	0.55	0.59	0.55	0.55	0.55	0.56	1.25					
DEU	0.83	0.74	0.91	0.78	0.76	0.67	0.84	0.79	0.58	0.55	12.59				
BEL	0.68	0.70	0.71	0.75	0.62	0.62	0.78	0.68	0.57	0.56	0.75	10.60			
SVK	0.56	0.57	0.56	0.56	0.63	0.56	0.56	0.56	0.57	0.56	0.55	0.57	15.98		
ESP	0.69	0.66	0.66	0.69	0.69	0.61	0.67	0.67	0.57	0.56	0.68	0.64	0.57	12.17	

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HOL dsb  
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	AUS	CAN	CHE	DFS	FRA	ISR	ITA	NLD	USA	HUN	DEU				
AUS	0.04														
CAN	0.64	7.35													
CHE	0.44	0.60	16.98												
DFS	0.71	0.87	0.56	12.62											
FRA	0.49	0.75	0.63	0.66	0.76										
ISR	0.83	0.73	0.44	0.76	0.51	1.72									
ITA	0.64	0.56	0.36	0.59	0.41	0.69	7.25								
NLD	0.43	0.79	0.72	0.71	0.68	0.52	0.35	4.45							
USA	0.43	0.47	0.61	0.39	0.54	0.37	0.35	0.55	0.07						
HUN	0.62	0.52	0.37	0.53	0.36	0.68	0.53	0.36	0.36	1.10					
DEU	0.51	0.85	0.63	0.83	0.66	0.69	0.45	0.79	0.54	0.43	12.45				

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HOL msb  
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	CAN	CHE	DFS	FRA	ISR	ITA	NLD	USA	HUN	DEU					
CAN	6.19														
CHE	0.84	20.00													
DFS	0.95	0.82	11.60												
FRA	0.88	0.84	0.86	0.93											
ISR	0.90	0.81	0.86	0.79	1.74										
ITA	0.53	0.60	0.53	0.55	0.64	9.34									
NLD	0.93	0.75	0.95	0.81	0.82	0.53	4.20								
USA	0.82	0.80	0.81	0.78	0.73	0.53	0.78	0.13							
HUN	0.54	0.54	0.53	0.53	0.53	0.47	0.53	0.53	1.22						
DEU	0.95	0.85	0.97	0.84	0.88	0.53	0.95	0.81	0.53	12.86					

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RDC dce  
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	CAN	DFS	NOR	NLD	DEU	IRL	NZL								
CAN	6.50														
DFS	0.93	11.35													
NOR	0.90	0.95	13.73												
NLD	0.96	0.92	0.93	4.78											
DEU	0.92	0.90	0.94	0.92	13.82										
IRL	0.87	0.85	0.93	0.90	0.82	0.07									
NZL	0.79	0.79	0.79	0.83	0.79	0.81	2.78								

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RDC mce  
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	CAN	DFS	NOR	DEU											
CAN	6.99														
DFS	0.81	12.17													
NOR	0.71	0.91	15.41												
DEU	0.80	0.85	0.76	12.13											

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^LAPPENDIX II. Number of common bulls  
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BSW  
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common bulls below diagonal  
 common three quarter sib group above diagonal

	DEA	NLD	USA	CHE	CAN	FRA
DEA	0	99	175	486	95	192
NLD	88	0	35	66	19	49
USA	130	30	0	175	99	65
CHE	396	64	133	0	88	129
CAN	80	16	90	71	0	53
FRA	134	36	47	87	43	0

BSW

common bulls below diagonal  
 common three quarter sib group above diagonal

	DEA	NLD	USA	CHE	CAN	FRA
DEA	0	96	95	433	34	139
NLD	90	0	29	59	14	42
USA	82	26	0	87	28	44
CHE	332	56	73	0	28	91
CAN	29	11	26	24	0	22
FRA	98	37	39	66	20	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
AUS	0	1239	431	937	1000	75	1071	1068	1543	666	438	1228	460	449	929	187	490
CAN	1180	0	671	1193	1330	88	1725	1264	3391	789	687	2176	547	404	688	280	806
CHE	372	557	0	419	511	36	551	556	725	338	250	845	367	249	297	128	326
DFS	602	904	342	0	1277	97	1330	1390	1658	722	516	1877	510	425	702	231	533
FRA	679	935	440	660	0	80	1645	1501	2039	836	643	2021	590	446	696	276	669
ISR	44	59	19	63	43	0	97	105	118	63	52	101	45	56	83	32	57
ITA	762	1401	468	899	918	61	0	1457	2559	951	712	2306	569	462	735	296	822
NLD	795	1044	496	854	770	72	973	0	2078	897	540	2505	645	539	955	310	588
USA	1428	3637	615	1081	1086	103	1805	1447	0	1142	832	3062	585	526	980	345	898
GBR	476	616	276	383	406	29	587	523	754	0	372	1076	366	399	434	169	411
HUN	269	549	173	332	383	33	502	298	651	210	0	825	271	230	324	173	374
DEU	916	1646	727	1207	1078	78	1467	1978	2150	630	537	0	756	565	836	481	881
BEL	426	528	365	440	597	21	560	656	540	327	206	780	0	291	334	150	363
IRL	391	367	234	339	385	34	384	453	488	351	184	494	281	0	531	106	229
NZL	817	617	250	468	440	60	558	787	923	266	198	655	285	476	0	167	332
SVK	88	194	57	117	174	13	192	191	234	70	110	377	79	45	100	0	156
ESP	366	571	260	413	508	28	606	462	605	295	266	549	352	204	249	71	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
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CAN	0	564	1073	1067	79	1316	1011	2179	683	648	1834	479	240	803
CHE	440	0	470	461	35	482	564	610	355	259	791	359	115	318
DFS	900	409	0	1394	102	1319	1657	1624	705	630	2311	552	230	622
FRA	722	401	689	0	83	1410	1484	1764	631	669	2081	593	233	713
ISR	47	17	67	42	0	96	111	121	72	61	118	44	24	60
ITA	1027	399	940	732	56	0	1302	2000	727	708	2029	538	243	794
NLD	930	507	1307	837	81	962	0	1679	726	630	2471	691	276	638
USA	2149	510	1221	892	104	1434	1293	0	863	850	2717	541	286	933
GBR	754	345	704	602	50	778	797	1006	0	397	842	389	151	437
HUN	541	192	431	393	38	535	416	715	361	0	896	294	168	427
DEU	1276	667	1493	960	86	1217	1961	1789	899	598	0	734	355	958
BEL	473	349	514	596	24	502	725	493	445	233	757	0	135	367
SVK	164	50	118	123	9	165	170	200	93	114	257	71	0	147
ESP	499	252	449	482	27	536	490	560	406	297	523	337	63	0

HOL

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common bulls below diagonal  
common three quarter sib group above diagonal

	AUS	CAN	CHE	DFS	FRA	ISR	ITA	NLD	USA	HUN	DEU
AUS	0	1194	428	942	865	75	1068	1192	1421	316	1223
CAN	1170	0	668	1152	1188	84	1702	1406	3076	487	2168
CHE	369	557	0	420	500	36	550	626	685	189	849
DFS	606	906	342	0	1140	99	1335	1499	1524	408	1892
FRA	618	876	432	615	0	69	1510	1447	1621	472	1931
ISR	44	58	19	63	41	0	97	108	114	35	101
ITA	761	1398	468	904	844	61	0	1617	2386	532	2302
NLD	995	1309	585	1067	952	81	1252	0	2042	462	2730
USA	1343	3403	576	1026	880	100	1717	1640	0	575	2838
HUN	197	382	136	256	282	26	368	311	428	0	634
DEU	919	1654	731	1212	1049	78	1467	2312	2027	419	0

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HOL

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common bulls below diagonal  
common three quarter sib group above diagonal

	CAN	CHE	DFS	FRA	ISR	ITA	NLD	USA	HUN	DEU
CAN	0	561	1065	992	78	1300	1017	1987	469	1785
CHE	439	0	477	451	35	480	576	567	211	772
DFS	919	417	0	1296	103	1323	1742	1429	510	2309
FRA	696	389	679	0	78	1341	1428	1393	505	1944
ISR	47	17	68	40	0	96	111	116	45	115
ITA	1025	398	956	697	56	0	1340	1767	547	1995
NLD	941	525	1394	808	80	987	0	1535	511	2497
USA	2041	473	1214	780	102	1377	1254	0	582	2339
HUN	387	155	346	296	27	402	357	507	0	707
DEU	1227	647	1495	887	84	1183	1933	1633	464	0

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JER

JER

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RDC

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common bulls below diagonal  
common three quarter sib group above diagonal

	CAN	DFS	NOR	NLD	DEU	IRL	NZL
CAN	0	158	5	4	11	3	60
DFS	161	0	122	45	73	15	128

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NOR	4	97	0	40	23	49	39
NLD	4	43	39	0	21	12	20
DEU	11	66	22	20	0	6	21
IRL	3	12	48	12	6	0	12
NZL	61	111	38	20	21	12	0

RDC

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

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CAN 0 98 4 9  
DFS 98 0 124 44  
NOR 4 97 0 14  
DEU 9 36 13 0  
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RDC

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RDC

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