

## INTRODUCTION

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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, 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

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

BEL HOL Some corrections were made in our pedigree and therefore some bulls lost information (daughters, herds) leading sometimes to decreases in EDC and in reliabilities, improvement of our program that determines the type of proof for bulls

FRA BSW/HOL Some animals changed from official to unofficial as they do not pass the  
SIM publication rules anymore

NOR RDC The rolling definition of hys is causing the daughters to distribute somewhat differently over hys-classes at each evaluation. Therefore some bulls occasionally may lose EDC although the number of daughters stay the same. Reliability changes is a function of the EDC changes. They deliver RBV's for all traits. The scaling is according to a rolling base that change somewhat at each evaluation causing slight changes in sire standard deviation

DEU HOL In general small decreases in number of daughters and/or herds are caused by data/pedigree corrections.

ITA HOL Few changes are due to our data-flow and to pedigree correction

CHE BSW/HOL Many bulls with decreases in herds/daughters/EDC. In most of the cases the  
SIM decreases are very small. The reason for this can be found in the continuous work on the raw data by herd-book organizations.

NZL ALL Decrease in information due to continuous parentage verification

IRL HOL Updated calculation of type of proof

USA HOL A new set of edits is being applied to the incoming Calving Ease phenotypic data. Among these changes, CDCB now requires pedigree and lactation data to be included in the database before the calving event is processed.

## INTERBULL CHANGES COMPARED TO THE DECEMBER ROUTINE RUN

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Sub-setting:  
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As decided by the ITC in Orlando, new sub-setting was introduced in the September test run. Sub-setting is necessary for operational purposes and restrictions of time scales. To minimize the effect of sub-setting, larger subsets with 10-12 countries and with 4 link providing countries have been applied.

Window:

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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 conformation 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.

#### 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 calving 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 analyzed 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 TEST RUN

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 Test evaluation results are meant for review purposes only and should not be published.

Table 1. National evaluation data considered in the Interbull evaluation for calving (August Routine Evaluation 2017). Number of records for direct calving ease by breed

Country	BSW	GUE	HOL	JER	RDC	SIM
AUS			2369			
BEL			742			
CAN	134		11752		449	
CHE	1764		2059			
CZE						
DEA	5088					
DEU			17904		239	
DFS			9990		6135	
ESP						
EST						
FRA	304		11595			
FRM						
GBR			2344			
HUN			1624			
IRL			1851		58	
ISR			389			
ITA			9388			
JPN						
KOR						
LTU						
LVA						
NLD	76		13075		28	
NOR					3676	
NZL			6640		1029	
POL						
PRT						
SVK			626			
SVN						
URY						
USA	504		33633			
ZAF						
HRV						
MEX						
No. Records	7870		125981		11614	
Pub. Proofs	8343	0	117426	0	11929	0

APPENDIX I. Sire standard deviations in diagonal and genetic correlations below diagonal

BSW dce

	DEA	NLD	USA	CHE	CAN	FRA
DEA	9.82					
NLD	0.90	6.94				
USA	0.78	0.81	0.12			
CHE	0.93	0.94	0.79	12.19		
CAN	0.86	0.95	0.86	0.95	7.71	
FRA	0.80	0.90	0.85	0.85	0.89	0.75

BSW mce

	DEA	NLD	USA	CHE	CAN	FRA
DEA	10.86					
NLD	0.82	5.88				
USA	0.78	0.79	0.15			
CHE	0.89	0.83	0.88	16.12		
CAN	0.61	0.80	0.85	0.76	6.08	
FRA	0.90	0.83	0.90	0.96	0.85	0.90

HOL dce

	AUS	CAN	CHE	DFS	FRA	ISR	ITA	NLD	USA	GBR
HUN	DEU	BEL	IRL	NZL	SVK					
AUS	2.98									
CAN	0.81	6.48								
CHE	0.75	0.94	10.43							
DFS	0.79	0.93	0.89	11.91						
FRA	0.80	0.95	0.95	0.92	0.93					
ISR	0.80	0.91	0.87	0.86	0.88	2.86				
ITA	0.67	0.77	0.77	0.76	0.74	0.78	7.23			
NLD	0.83	0.96	0.92	0.92	0.93	0.87	0.76	7.29		
USA	0.73	0.87	0.84	0.83	0.89	0.84	0.72	0.82	0.13	
GBR	0.80	0.79	0.78	0.77	0.78	0.81	0.72	0.83	0.72	0.07
HUN	0.69	0.77	0.78	0.74	0.73	0.79	0.74	0.75	0.72	0.74
1.25										
DEU	0.79	0.88	0.87	0.88	0.91	0.82	0.74	0.90	0.80	0.78
0.74	11.22									
BEL	0.65	0.77	0.77	0.73	0.72	0.79	0.72	0.74	0.72	0.72
0.74	0.73	10.28								
IRL	0.68	0.85	0.80	0.82	0.82	0.89	0.70	0.83	0.77	0.71
0.72	0.76	0.71	1.48							
NZL	0.69	0.78	0.78	0.81	0.77	0.79	0.74	0.80	0.75	0.74
0.74	0.77	0.72	0.82	3.12						
SVK	0.72	0.78	0.79	0.78	0.77	0.83	0.78	0.78	0.77	0.79
0.78	0.77	0.78	0.79	0.78	12.64					

HOL mce

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	CAN	CHE	DFS	FRA	ISR	ITA	NLD	USA	GBR	HUN
DEU	BEL	SVK								
CAN	6.52									
CHE	0.87	13.50								
DFS	0.82	0.71	12.31							
FRA	0.92	0.97	0.77	1.30						
ISR	0.78	0.71	0.78	0.75	2.63					
ITA	0.81	0.86	0.58	0.84	0.69	9.39				
NLD	0.83	0.79	0.84	0.83	0.67	0.60	5.33			
USA	0.89	0.89	0.76	0.95	0.80	0.82	0.82	0.15		
GBR	0.65	0.79	0.58	0.79	0.65	0.67	0.65	0.72	0.04	
HUN	0.55	0.56	0.55	0.55	0.59	0.55	0.56	0.55	0.56	1.25
DEU	0.86	0.75	0.91	0.79	0.75	0.68	0.80	0.78	0.63	0.55
11.00										
BEL	0.69	0.66	0.75	0.74	0.63	0.57	0.77	0.68	0.61	0.56
0.73	11.27									
SVK	0.56	0.58	0.56	0.56	0.65	0.56	0.56	0.56	0.57	0.56
0.56	0.58	15.78								

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HOL dsb

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	AUS	CAN	CHE	DFS	FRA	ISR	ITA	NLD	USA	HUN
DEU										
AUS	2.99									
CAN	0.62	7.91								
CHE	0.44	0.48	16.09							
DFS	0.73	0.87	0.45	12.81						
FRA	0.43	0.74	0.55	0.65	0.75					
ISR	0.76	0.74	0.47	0.74	0.55	1.76				
ITA	0.77	0.60	0.36	0.69	0.43	0.59	7.23			
NLD	0.44	0.77	0.72	0.69	0.66	0.56	0.35	4.25		
USA	0.41	0.74	0.59	0.63	0.69	0.51	0.38	0.63	0.07	
HUN	0.76	0.53	0.37	0.53	0.38	0.73	0.54	0.36	0.39	1.10
DEU	0.58	0.74	0.54	0.80	0.60	0.80	0.49	0.69	0.59	0.45
10.99										

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HOL msb

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	CAN	CHE	DFS	FRA	ISR	ITA	NLD	USA	HUN	DEU
CAN	6.42									
CHE	0.85	19.92								
DFS	0.95	0.83	11.63							
FRA	0.89	0.83	0.87	0.92						
ISR	0.89	0.83	0.87	0.81	1.76					
ITA	0.53	0.58	0.50	0.55	0.68	9.39				
NLD	0.92	0.79	0.94	0.81	0.81	0.51	4.24			
USA	0.88	0.82	0.82	0.87	0.81	0.51	0.77	0.13		
HUN	0.54	0.54	0.51	0.52	0.53	0.48	0.52	0.49	1.22	
DEU	0.95	0.83	0.96	0.84	0.89	0.53	0.92	0.80	0.51	11.53

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RDC dce

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	CAN	DFS	NOR	NLD	DEU	IRL	NZL
CAN	6.55						
DFS	0.93	11.26					
NOR	0.89	0.96	14.15				
NLD	0.96	0.93	0.92	5.12			
DEU	0.88	0.89	0.92	0.90	11.01		
IRL	0.86	0.83	0.84	0.84	0.77	0.94	
NZL	0.79	0.81	0.80	0.81	0.79	0.83	2.75

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RDC mce

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	CAN	DFS	NOR	DEU
CAN	7.00			
DFS	0.80	12.19		
NOR	0.73	0.79	16.91	
DEU	0.84	0.84	0.81	9.08

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^LAPPENDIX II. Number of common bulls

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BSW

common bulls below diagonal  
common three quarter sib group above diagonal

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	DEA	NLD	USA	CHE	CAN	FRA
DEA	0	52	166	443	74	170
NLD	39	0	20	31	13	33
USA	120	17	0	188	92	71
CHE	357	29	141	0	74	116
CAN	51	7	71	49	0	44
FRA	120	22	49	80	33	0

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BSW

common bulls below diagonal  
common three quarter sib group above diagonal

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	DEA	NLD	USA	CHE	CAN	FRA
DEA	0	43	98	388	27	117
NLD	33	0	17	25	7	22
USA	82	14	0	90	21	44
CHE	289	23	76	0	22	76
CAN	19	4	17	16	0	18
FRA	86	18	39	57	15	0

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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	GBR	HUN	DEU	BEL	IRL	NZL	SVK
AUS	0	730	307	536	545	45	625	458	825	354	276	705	274	326	514	115
CAN	727	0	572	1010	1148	66	1502	795	2834	583	622	1877	364	400	596	252
CHE	254	456	0	358	422	27	479	365	626	256	225	744	278	251	251	112
DFS	393	694	275	0	1172	78	1234	1121	1466	612	473	1707	357	451	625	220
FRA	432	778	366	556	0	74	1534	1214	1857	733	598	1821	429	476	636	257
ISR	26	48	16	57	41	0	77	80	88	44	43	83	28	51	66	24
ITA	474	1065	391	726	790	53	0	1125	2326	786	651	2064	405	487	684	264
NLD	267	388	261	465	416	56	465	0	1517	642	430	1816	372	497	769	253
USA	778	2899	524	847	936	74	1380	693	0	878	762	2663	398	521	864	310
GBR	287	393	201	275	321	19	401	213	476	0	334	861	251	371	365	141
HUN	197	506	162	301	353	29	451	203	597	188	0	766	210	238	296	159
DEU	590	1317	631	991	897	66	1157	1018	1697	416	498	0	510	598	736	452
BEL	272	361	279	310	445	18	379	324	369	214	168	517	0	261	246	105
IRL	310	388	241	373	420	35	424	364	491	328	201	550	265	0	534	109
NZL	487	533	214	405	383	50	496	578	795	202	189	574	217	477	0	153
SVK	65	173	50	107	158	10	166	121	210	52	101	350	57	51	92	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	GBR	HUN	DEU	BEL	SVK
CAN	0	479	894	905	59	1119	616	1886	519	592	1606	264	203
CHE	356	0	405	389	26	431	388	524	289	243	697	228	99
DFS	673	335	0	1257	87	1202	1278	1435	584	591	2108	308	200
FRA	572	336	551	0	75	1339	1162	1650	519	621	1914	341	197
ISR	40	15	62	38	0	77	79	91	56	55	98	23	20
ITA	784	350	752	625	46	0	969	1818	583	655	1859	313	213
NLD	396	314	773	465	60	516	0	1223	479	503	1880	318	198
USA	1738	427	958	755	70	1107	654	0	656	799	2458	302	249
GBR	555	281	559	485	36	609	446	730	0	347	674	218	122
HUN	501	182	399	358	34	487	302	671	320	0	846	188	150
DEU	1010	576	1198	799	72	1011	1164	1474	714	572	0	398	311
BEL	251	202	271	340	11	254	275	256	217	145	352	0	71
SVK	140	44	97	99	8	137	107	172	68	108	219	33	0

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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	708	305	536	477	45	623	629	777	205	701
CAN	721	0	569	967	1004	62	1469	1185	2560	488	1865
CHE	252	456	0	359	409	27	478	541	588	189	747
DFS	394	695	275	0	1032	80	1240	1363	1354	408	1721
FRA	397	719	358	511	0	63	1359	1285	1459	472	1719
ISR	26	47	16	57	39	0	77	88	84	35	83
ITA	474	1062	391	731	703	53	0	1463	2186	536	2061
NLD	546	1064	494	895	796	73	1016	0	1788	462	2372
USA	745	2684	491	804	734	72	1301	1350	0	582	2480
HUN	150	384	135	256	282	26	368	311	436	0	635
DEU	591	1324	634	995	859	66	1159	1892	1589	424	0

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	476	879	833	58	1105	836	1701	468	1564
CHE	355	0	414	382	26	430	504	488	208	689
DFS	688	344	0	1158	89	1210	1544	1229	513	2121
FRA	549	327	545	0	70	1248	1280	1269	505	1790
ISR	40	15	64	36	0	77	90	83	44	98
ITA	782	349	770	582	46	0	1209	1568	556	1845
NLD	717	450	1111	664	68	789	0	1347	509	2293
USA	1647	403	949	637	68	1065	1001	0	588	2100
HUN	387	154	347	295	27	402	355	513	0	718
DEU	974	561	1212	741	72	988	1649	1346	475	0

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	118	4	3	10	3	53
DFS	117	0	111	21	56	18	112
NOR	4	86	0	13	22	50	34
NLD	3	21	12	0	11	7	10
DEU	10	49	21	11	0	8	20
IRL	3	15	49	6	8	0	11
NZL	52	94	32	10	19	11	0

RDC

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 common bulls below diagonal  
 common three quarter sib group above diagonal

	CAN	DFS	NOR	DEU
CAN	0	77	3	7
DFS	73	0	107	39
NOR	3	80	0	13
DEU	7	31	13	0