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:

DFS HOL — HOL and RED HOL (RED) have merged. Cows with min 87 % HOL genes and bulls with min 93 % HOL genes have been converted to HOL. Animals with less % HOL genes will no longer be a part of the evaluation, and it is the reason, number of bulls and daughters drop more for HOL. But for most of the bulls the drop is less than 1%.

BEL HOL — mce - 101 bulls changing from official to unofficial for mce. This is due to a correction in a program, we have discovered a little mistake in the limits of reliability to be official or not for bulls with type of proof 21 (>.49 instead of >.59 to be official). This mistake has recently been detected and then corrected ==> 101 bulls are now not official!

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 loose EDC although the number of daughters stay the same. Reliability changes is a function of the EDC changes.

Bulls are modeled by sire of calf and sire of cow as correlated traits. Results are transformed to direct and maternal effect. The oldest bulls have only sire of cow data and the youngest have only sire of calf data. This create some instability among the oldest bulls and among the youngest bulls. New elite bulls also get a vast amount of 'sire of calf' data before the second batch daughters calves two years later. The magnitude and distribution of low correlation year classes and bulls with extreme changes was consistent with what we usually observes. Some of these bulls jumps back to the level they had two evaluations ago. Imported bulls are as usual frequent among bulls with large changes.

DEU HOL — Small decreases (< 10%) in number of daughters and/or herds are caused by data/pedigree corrections.

DEU RDC — Few bulls whose ownership has been corrected, they are now foreign AI bulls, therefore their Type of Proof changed and some of these are not publishable anymore.

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

ITA HOL — Changes in information due to data-flow and editing.

USA HOL — Calving data has herds that do not meet the criteria because of distribution of scoring changing between evaluations causing drops in information and missing bulls.

NZL HOL — More recent information included. Lots of changes to daughter and edc counts because of how early the trait is recorded.

NZL BSW/GUE HOL/JER RDC — Continuous DNA parentage testing affecting daughters, herds, EDCs and reliabilities.

ESP HOL First time some bulls do lose daughters/herds specially for dce due to some correction in number of daughters and herds

INTERBULL CHANGES COMPARED TO THE DECEMBER 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.

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 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 2017).
Number of records for direct calving ease by breed

Country	BSW	GUE	HOL	JER	RDC	SIM
AUS			2370			
BEL			771			
CAN	139		11875		459	
CHE	1787		2099			
CZE						
DEA	5124					
DEU			18055		243	
DFS			9805		6135	
ESP			1730			
EST						
FRA	310		11690			
FRM						
GBR			2388			
HUN			1647			
IRL			1860		56	
ISR			396			
ITA			9533			
JPN						
KOR						
LTU						
LVA						
NLD	78		13144		28	
NOR					3685	
NZL			6641		1030	
POL						
PRT						
SVK			624			
SVN						
URY						
USA	510		33949			
ZAF						
HRV						
MEX						

CAM

No.Records	7948		128577		11636	
Pub. Proofs	8401	0	119396	0	11970	0

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

BSW dce

	DEA	NLD	USA	CHE	CAN	FRA
DEA	9.79					
NLD	0.90	6.88				
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	7.69	
FRA	0.80	0.91	0.85	0.85	0.90	0.75

BSW mce

	DEA	NLD	USA	CHE	CAN	FRA
DEA	10.87					
NLD	0.85	5.92				
USA	0.77	0.78	0.15			
CHE	0.89	0.82	0.86	16.09		
CAN	0.61	0.80	0.84	0.75	6.16	
FRA	0.90	0.83	0.90	0.96	0.84	0.92

HOL dce

	AUS	CAN	CHE	DFS	FRA	ISR	ITA	NLD	USA	GBR	HUN
DEU	BEL	IRL	NZL	SVK	ESP						
AUS	2.98										
CAN	0.80	6.46									
CHE	0.76	0.94	10.41								
DFS	0.78	0.93	0.90	11.81							
FRA	0.80	0.95	0.95	0.92	0.93						
ISR	0.80	0.91	0.87	0.86	0.88	2.85					
ITA	0.67	0.77	0.77	0.76	0.75	0.78	7.24				
NLD	0.83	0.96	0.93	0.93	0.93	0.88	0.76	7.26			
USA	0.72	0.87	0.85	0.83	0.89	0.84	0.73	0.82	0.13		
GBR	0.81	0.79	0.78	0.77	0.78	0.81	0.74	0.84	0.73	0.07	
HUN	0.69	0.77	0.78	0.75	0.74	0.79	0.75	0.76	0.73	0.75	1.24
DEU	0.79	0.89	0.88	0.88	0.92	0.82	0.74	0.90	0.80	0.78	0.75
11.14											
BEL	0.66	0.77	0.77	0.74	0.73	0.80	0.73	0.75	0.73	0.74	0.75
0.74	10.18										
IRL	0.69	0.86	0.81	0.83	0.82	0.90	0.72	0.84	0.77	0.72	0.73
0.76	0.73	1.48									
NZL	0.69	0.78	0.79	0.80	0.77	0.79	0.75	0.81	0.76	0.75	0.75
0.77	0.73	0.82	3.08								
SVK	0.72	0.78	0.79	0.78	0.77	0.82	0.78	0.78	0.77	0.79	0.78
0.77	0.78	0.79	0.78	12.69							
ESP	0.71	0.77	0.77	0.77	0.77	0.80	0.77	0.77	0.77	0.77	0.77
0.77	0.77	0.77	0.77	0.78	11.33						

HOL mce

	CAN	CHE	DFS	FRA	ISR	ITA	NLD	USA	GBR	HUN	DEU
BEL	SVK	ESP									
CAN	6.50										
CHE	0.87	13.56									
DFS	0.82	0.70	12.29								
FRA	0.92	0.97	0.76	1.30							
ISR	0.79	0.71	0.78	0.75	2.64						
ITA	0.80	0.86	0.58	0.84	0.69	9.41					
NLD	0.82	0.78	0.85	0.82	0.67	0.59	5.32				
USA	0.89	0.89	0.76	0.95	0.79	0.82	0.81	0.15			
GBR	0.66	0.79	0.58	0.78	0.64	0.67	0.64	0.71	0.04		
HUN	0.55	0.56	0.55	0.55	0.59	0.55	0.56	0.55	0.56	1.25	
DEU	0.85	0.74	0.91	0.79	0.75	0.67	0.81	0.78	0.62	0.55	10.93
BEL	0.68	0.67	0.74	0.74	0.62	0.58	0.77	0.68	0.60	0.56	0.73
11.18											
SVK	0.56	0.58	0.56	0.56	0.64	0.56	0.56	0.56	0.57	0.56	0.56
0.57	15.86										
ESP	0.93	0.90	0.67	0.93	0.77	0.82	0.74	0.93	0.64	0.56	0.70
0.66	0.58	13.39									

HOL dsb

	AUS	CAN	CHE	DFS	FRA	ISR	ITA	NLD	USA	HUN	DEU
AUS	2.99										
CAN	0.62	7.88									
CHE	0.44	0.50	16.17								
DFS	0.71	0.87	0.46	12.71							
FRA	0.43	0.74	0.57	0.65	0.75						
ISR	0.75	0.74	0.46	0.73	0.54	1.76					
ITA	0.75	0.59	0.36	0.67	0.42	0.59	7.23				
NLD	0.44	0.77	0.72	0.69	0.66	0.56	0.35	4.26			
USA	0.42	0.75	0.59	0.63	0.70	0.49	0.38	0.63	0.07		
HUN	0.76	0.53	0.37	0.53	0.37	0.72	0.54	0.36	0.38	1.10	
DEU	0.57	0.75	0.55	0.80	0.61	0.77	0.48	0.70	0.60	0.44	10.90

HOL msb

	CAN	CHE	DFS	FRA	ISR	ITA	NLD	USA	HUN	DEU
CAN	6.41									
CHE	0.85	20.07								
DFS	0.95	0.83	11.62							
FRA	0.89	0.84	0.87	0.93						
ISR	0.89	0.83	0.87	0.81	1.76					
ITA	0.53	0.58	0.51	0.54	0.68	9.41				
NLD	0.92	0.78	0.94	0.81	0.82	0.51	4.24			
USA	0.88	0.82	0.82	0.87	0.81	0.52	0.77	0.13		
HUN	0.54	0.54	0.52	0.52	0.53	0.48	0.52	0.50	1.22	
DEU	0.95	0.84	0.96	0.85	0.89	0.53	0.92	0.80	0.52	11.46

RDC dce

	CAN	DFS	NOR	NLD	DEU	IRL	NZL
CAN	6.54						
DFS	0.93	11.26					
NOR	0.89	0.95	13.57				
NLD	0.96	0.93	0.92	5.09			
DEU	0.88	0.89	0.92	0.90	10.74		
IRL	0.86	0.83	0.84	0.84	0.78	0.91	
NZL	0.79	0.80	0.80	0.81	0.79	0.83	2.71

RDC mce

	CAN	DFS	NOR	DEU
CAN	7.02			
DFS	0.81	12.19		
NOR	0.72	0.77	17.25	
DEU	0.84	0.84	0.81	8.91

^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	54	168	447	78	174
NLD	41	0	22	31	13	33
USA	121	19	0	191	98	71
CHE	359	29	144	0	79	120
CAN	62	10	86	60	0	47
FRA	125	22	50	84	40	0

BSW

common bulls below diagonal
common three quarter sib group above diagonal

	DEA	NLD	USA	CHE	CAN	FRA
DEA	0	43	103	393	30	123
NLD	33	0	17	25	9	22
USA	86	14	0	94	26	45
CHE	293	23	80	0	26	80
CAN	25	6	23	22	0	21
FRA	89	18	39	60	19	0

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	729	307	538	556	45	642	459	824	366	283	705	281	330	514	116	361
CAN	730	0	584	1021	1167	66	1540	806	2898	598	634	1907	379	404	596	253	721
CHE	256	466	0	354	430	27	486	367	636	264	229	755	284	254	254	113	290
DFS	395	713	281	0	1170	78	1243	1086	1473	622	477	1654	359	454	625	208	481
FRA	437	792	373	557	0	74	1552	1221	1875	742	606	1843	438	481	641	258	607
ISR	26	48	16	57	41	0	78	82	89	44	44	84	28	51	66	25	47
ITA	492	1108	396	745	795	54	0	1134	2380	802	664	2103	422	494	688	268	739
NLD	267	394	261	458	417	56	470	0	1536	651	435	1835	379	500	769	250	418
USA	780	2998	534	859	949	75	1437	702	0	897	773	2695	411	527	865	311	802
GBR	295	415	207	286	325	20	418	216	501	0	338	879	261	377	367	145	354
HUN	200	512	164	303	356	31	459	205	608	193	0	775	214	240	302	160	356
DEU	592	1348	646	973	908	67	1195	1038	1728	435	502	0	528	602	737	452	795
BEL	276	374	285	314	449	18	395	328	383	224	171	539	0	268	252	106	281
IRL	314	394	244	375	422	35	431	366	499	334	202	554	270	0	537	109	244
NZL	488	533	217	405	386	50	501	578	797	205	191	575	221	480	0	154	298
SVK	65	174	52	101	159	11	167	121	210	55	102	351	57	51	92	0	142
ESP	273	491	230	352	475	28	527	250	526	240	265	498	266	237	234	69	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
CAN	0	490	905	922	60	1142	628	1928	536	596	1634	232	210	649
CHE	370	0	400	399	27	440	393	537	300	245	713	198	102	272
DFS	686	341	0	1262	87	1206	1253	1450	594	593	2086	264	199	511
FRA	588	345	557	0	76	1353	1169	1669	531	628	1933	308	205	582
ISR	42	15	63	39	0	77	80	93	58	56	101	20	20	48
ITA	807	358	760	635	47	0	981	1852	600	663	1884	273	221	659
NLD	400	318	771	468	60	521	0	1235	492	508	1908	294	202	425
USA	1792	441	974	775	74	1142	659	0	676	805	2498	267	256	755
GBR	570	292	571	500	38	623	450	753	0	356	693	194	128	351
HUN	504	182	400	363	36	492	303	674	328	0	853	163	154	364
DEU	1038	594	1208	816	76	1033	1188	1512	733	573	0	353	319	797
BEL	211	171	217	297	8	201	242	216	182	114	295	0	63	188
SVK	143	45	96	102	8	141	108	179	70	109	225	27	0	123
ESP	382	210	362	391	23	424	279	431	329	257	436	156	51	0

HOL

common bulls below diagonal
common three quarter sib group above diagonal

	AUS	CAN	CHE	DFS	FRA	ISR	ITA	NLD	USA	HUN	DEU
AUS	0	707	305	538	488	45	640	629	776	205	701
CAN	724	0	581	978	1023	62	1504	1206	2623	488	1895
CHE	254	466	0	355	418	27	485	551	599	189	758
DFS	396	714	281	0	1032	80	1248	1328	1361	408	1667
FRA	402	733	365	513	0	63	1378	1301	1477	472	1742
ISR	26	47	16	57	39	0	78	90	85	35	84
ITA	492	1105	396	750	708	54	0	1484	2237	536	2096
NLD	548	1090	505	891	809	73	1045	0	1819	462	2410
USA	745	2782	502	817	747	73	1358	1379	0	582	2515
HUN	150	384	135	256	282	26	368	311	436	0	635
DEU	593	1353	649	977	871	67	1196	1941	1622	424	0

HOL

common bulls below diagonal
common three quarter sib group above diagonal

	CAN	CHE	DFS	FRA	ISR	ITA	NLD	USA	HUN	DEU
CAN	0	487	887	851	59	1126	856	1745	468	1591
CHE	369	0	409	392	27	439	510	500	208	703
DFS	700	351	0	1165	88	1212	1525	1238	510	2102
FRA	563	336	549	0	71	1262	1298	1289	505	1810
ISR	42	15	63	37	0	77	91	85	44	101
ITA	805	357	776	591	47	0	1229	1598	556	1866
NLD	741	459	1116	674	70	813	0	1371	510	2329
USA	1704	417	966	654	72	1100	1031	0	588	2144
HUN	387	154	346	295	27	402	356	513	0	718
DEU	995	578	1225	756	76	1008	1691	1379	475	0

RDC

common bulls below diagonal
common three quarter sib group above diagonal

	CAN	DFS	NOR	NLD	DEU	IRL	NZL
CAN	0	119	5	3	10	2	55
DFS	118	0	112	21	58	16	112
NOR	5	87	0	13	22	48	34
NLD	3	21	12	0	11	6	10
DEU	10	51	21	11	0	7	20
IRL	2	13	48	5	7	0	10
NZL	54	94	32	10	19	10	0

RDC

common bulls below diagonal
common three quarter sib group above diagonal

	CAN	DFS	NOR	DEU
CAN	0	77	3	8
DFS	73	0	107	40
NOR	3	80	0	13
DEU	8	32	13	0