

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, 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:

- DEA BSW The base group is shifted by 4 month for all traits in every evaluation. No changes in the evaluation. As usual there is some minor loss of data for a few bulls most of these changes are related to some corrections/updates for "original Braunvieh" in our data base.
- NOR RDC 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.
- DFS HOL/RDC Some bulls have lost EDC' s or herds or daughters. But it is only very few animals and less than 1% even if number of animals is big.
- ITA HOL Decrease in herd, daughters and edc, even if the number of bulls is quite hight the difference are small
- DEU HOL/RDC In general small decreases in number of daughters and/or herds are caused by data corrections. Decrease in information due to pedigree corrections.
- ZAF RDC Data since Dec 2011 has now been included for herds participating in Milk Recording at the ARC.
- AUS HOL Decrease in number of information is due to the fact that the bulls lost daughters/herds. The changes are tiny and in many cases are due to the round off errors.
- NZL HOL/JER Base change, decrease in information due to parentage testing
RDC/BSW
GUE
- FRA BSW Change in publication status from official to unofficial because of a change in the publication rules for this trait group.
- CHE HOL Decrease in information due to continuous work on the raw data by herd-book organizations. Some bulls are missing in the current proof files. This is because the information changed based on which we define the publication criterion. Some bulls changed from TOP 12 to 11. This is related to changes in the database by the herdbook organizations resulting in a lower number of daughters of these bulls.
- CHE BSW/SIM Decrease in information due to continuous work on the raw data by herd-book organizations.
- SVK HOL Merit for DCE and MCE changed, it was wrongly set to B- in previous evaluation, now it has been corrected to B+

INTERBULL CHANGES COMPARED TO THE APRIL ROUTINE RUN

None

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 (August Routine Evaluation 2016).
Number of records for direct calving ease by breed

Country	BSW	GUE	HOL	JER	RDC	SIM
AUS			1900			
BEL			676			
CAN	131		11366		430	
CHE	1687		1932			
CZE						
DEA	4974					
DEU			17350		227	
DFS			11655		6514	
ESP						
EST						
FRA	291		11139			
FRM						
FRR						
GBR			2177			
HUN			1552			
IRL			1720		58	
ISR			360			
ITA			9354			
JPN						
KOR						
LTU						
LVA						
NLD	79		12683		31	
NOR					3594	
NZL			6188		903	
POL						
PRT						
SVK			607			
SVN						
URY						
USA	485		32661			
ZAF						
HRV						
No. Records	7647		123320		11757	
Pub. Proofs	8128	0	114772	0	11647	0

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

BSW		dce				
	DEA	NLD	USA	CHE	CAN	FRA
DEA	9.81					
NLD	0.90	6.10				
USA	0.78	0.79	0.12			
CHE	0.93	0.92	0.78	13.23		
CAN	0.79	0.87	0.81	0.82	7.31	
FRA	0.81	0.91	0.85	0.85	0.87	0.75

BSW		mce				
	DEA	NLD	USA	CHE	CAN	FRA
DEA	10.83					
NLD	0.68	5.22				
USA	0.79	0.84	0.15			
CHE	0.91	0.79	0.88	17.18		
CAN	0.61	0.80	0.85	0.73	6.36	
FRA	0.91	0.80	0.88	0.95	0.84	0.91

HOL dce

	AUS	CAN	CHE	DFS	FRA	ISR	ITA	NLD	USA	GBR	HUN	DEU	BEL
IRL	NZL	SVK											
AUS	3.13												
CAN	0.74	6.31											
CHE	0.75	0.89	12.28										
DFS	0.81	0.91	0.90	12.62									
FRA	0.80	0.91	0.94	0.92	0.93								
ISR	0.81	0.90	0.87	0.88	0.89	2.85							
ITA	0.64	0.71	0.77	0.75	0.72	0.79	7.22						
NLD	0.83	0.89	0.89	0.93	0.92	0.87	0.73	6.38					
USA	0.72	0.80	0.82	0.83	0.89	0.83	0.68	0.80	0.13				
GBR	0.80	0.81	0.78	0.76	0.78	0.82	0.68	0.83	0.68	0.07			
HUN	0.67	0.71	0.78	0.71	0.71	0.80	0.71	0.71	0.68	0.71	1.26		
DEU	0.80	0.85	0.89	0.91	0.91	0.83	0.70	0.89	0.78	0.80	0.71	11.61	
BEL	0.60	0.68	0.77	0.70	0.69	0.81	0.68	0.68	0.68	0.68	0.71	0.68	10.83
IRL	0.67	0.78	0.79	0.82	0.81	0.89	0.65	0.81	0.75	0.66	0.68	0.74	0.66
1.53													
NZL	0.68	0.76	0.78	0.82	0.77	0.79	0.72	0.77	0.74	0.71	0.71	0.76	0.68
0.81	3.16												
SVK	0.72	0.78	0.79	0.78	0.78	0.83	0.78	0.78	0.78	0.79	0.78	0.77	0.78
0.79	0.78	12.60											

HOL mce

	CAN	CHE	DFS	FRA	ISR	ITA	NLD	USA	GBR	HUN	DEU	BEL	SVK
CAN	6.58												
CHE	0.88	13.99											
DFS	0.84	0.73	12.44										
FRA	0.92	0.96	0.78	1.30									
ISR	0.75	0.72	0.80	0.75	2.63								
ITA	0.78	0.85	0.58	0.83	0.66	9.31							
NLD	0.82	0.82	0.81	0.84	0.70	0.63	5.35						
USA	0.90	0.88	0.77	0.95	0.80	0.82	0.84	0.15					
GBR	0.67	0.79	0.60	0.80	0.68	0.68	0.69	0.73	0.05				
HUN	0.55	0.56	0.55	0.55	0.60	0.55	0.56	0.55	0.56	1.25			
DEU	0.87	0.75	0.92	0.79	0.75	0.66	0.81	0.78	0.59	0.55	11.28		
BEL	0.64	0.63	0.74	0.71	0.64	0.56	0.75	0.68	0.61	0.56	0.71	11.02	
SVK	0.56	0.58	0.56	0.56	0.66	0.56	0.56	0.56	0.57	0.56	0.56	0.58	15.71

HOL dsb

	AUS	CAN	CHE	DFS	FRA	ISR	ITA	NLD	USA	HUN	DEU
AUS	3.14										
CAN	0.53	6.84									
CHE	0.44	0.57	16.55								
DFS	0.80	0.74	0.48	13.60							
FRA	0.42	0.68	0.55	0.62	0.74						
ISR	0.80	0.70	0.46	0.81	0.56	1.76					
ITA	0.77	0.49	0.36	0.76	0.44	0.61	7.22				
NLD	0.39	0.70	0.62	0.63	0.63	0.52	0.41	3.80			
USA	0.39	0.65	0.59	0.61	0.67	0.52	0.41	0.60	0.07		
HUN	0.74	0.50	0.37	0.52	0.39	0.73	0.56	0.39	0.41	1.10	
DEU	0.71	0.69	0.54	0.89	0.59	0.84	0.58	0.61	0.60	0.50	11.37

HOL msb

	CAN	CHE	DFS	FRA	ISR	ITA	NLD	USA	HUN	DEU
CAN	6.37									
CHE	0.87	20.63								
DFS	0.96	0.87	12.95							
FRA	0.89	0.80	0.87	0.92						
ISR	0.89	0.82	0.88	0.80	1.77					
ITA	0.52	0.54	0.48	0.53	0.67	9.31				
NLD	0.93	0.80	0.94	0.81	0.81	0.46	4.28			
USA	0.81	0.81	0.79	0.82	0.81	0.49	0.75	0.13		
HUN	0.49	0.54	0.49	0.49	0.53	0.50	0.49	0.46	1.22	
DEU	0.94	0.78	0.95	0.84	0.89	0.52	0.90	0.76	0.49	11.78

RDC dce

	CAN	DFS	NOR	NLD	DEU	IRL	NZL
CAN	6.43						
DFS	0.89	9.19					
NOR	0.89	0.96	15.46				
NLD	0.89	0.93	0.92	4.70			
DEU	0.85	0.92	0.93	0.89	11.33		
IRL	0.79	0.83	0.86	0.82	0.76	0.90	
NZL	0.78	0.85	0.80	0.79	0.79	0.82	2.74

RDC mce

	CAN	DFS	NOR	DEU
CAN	6.30			
DFS	0.77	10.73		
NOR	0.72	0.74	15.97	
DEU	0.85	0.83	0.77	9.52

^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	55	160	424	76	166
NLD	42	0	21	32	14	33
USA	110	18	0	182	90	71
CHE	338	30	137	0	75	113
CAN	59	11	79	58	0	47
FRA	119	22	49	78	41	0

BSW

common bulls below diagonal
common three quarter sib group above diagonal

	DEA	NLD	USA	CHE	CAN	FRA
DEA	0	56	94	373	29	115
NLD	44	0	22	30	9	30
USA	79	18	0	88	24	43
CHE	280	27	75	0	25	73
CAN	24	6	22	21	0	20
FRA	84	23	38	55	18	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
AUS	0	559	252	495	486	41	531	414	640	305	252	558	234	284	444	102
CAN	524	0	526	1100	1075	60	1427	760	2644	515	586	1764	337	361	548	238
CHE	211	407	0	374	385	24	444	350	575	227	213	688	255	228	224	104
DFS	374	799	305	0	1219	79	1329	1260	1612	624	499	1870	360	450	635	229
FRA	388	722	331	588	0	69	1490	1142	1784	689	563	1696	397	444	584	235
ISR	24	42	14	61	38	0	71	79	81	41	40	76	26	49	62	24
ITA	405	940	357	796	746	47	0	1124	2269	723	619	1984	374	448	637	256
NLD	246	363	251	639	378	55	454	0	1487	611	420	1762	357	466	708	239
USA	551	2633	466	1011	879	66	1236	636	0	799	725	2549	366	480	806	299
GBR	234	326	177	278	279	15	346	202	396	0	318	792	225	322	328	133
HUN	187	478	157	326	341	28	434	203	568	176	0	730	202	224	278	151
DEU	449	1177	565	1169	792	60	1052	968	1563	355	484	0	478	551	673	435
BEL	233	324	248	332	408	16	339	315	331	183	164	472	0	239	226	96
IRL	275	341	222	390	390	33	390	345	443	280	196	510	240	0	476	98
NZL	407	481	192	435	340	48	453	519	727	170	181	512	193	430	0	141
SVK	53	164	46	115	141	10	157	112	204	45	98	337	54	44	82	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
CAN	0	446	873	852	53	1067	644	1759	454	553	1518	224	187
CHE	327	0	382	350	23	409	398	490	257	227	658	182	86
DFS	649	315	0	1220	82	1183	1352	1408	527	569	2063	257	189
FRA	529	305	517	0	72	1304	1212	1582	462	586	1792	275	176
ISR	36	13	58	36	0	72	80	84	50	49	91	19	18
ITA	722	326	721	585	45	0	1038	1760	521	626	1806	249	201
NLD	426	325	818	464	59	539	0	1345	469	514	1987	282	201
USA	1570	397	913	698	63	1018	742	0	580	751	2332	254	229
GBR	475	245	499	423	33	537	457	626	0	317	596	163	103
HUN	457	172	383	333	30	458	320	619	298	0	808	154	140
DEU	916	535	1136	713	68	958	1192	1336	614	545	0	338	289
BEL	210	167	227	269	10	208	246	214	165	122	293	0	54
SVK	129	41	91	89	7	127	106	159	57	103	204	28	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	396	175	357	297	25	375	372	444	136	393
CAN	324	0	524	1070	931	56	1389	1087	2368	487	1752
CHE	131	407	0	382	373	24	443	502	539	187	690
DFS	215	839	317	0	1072	81	1351	1562	1517	448	1917
FRA	200	660	322	555	0	58	1308	1194	1389	471	1599
ISR	10	41	14	62	36	0	71	82	77	35	76
ITA	211	937	357	829	654	47	0	1414	2110	536	1982
NLD	257	950	449	1160	717	68	939	0	1711	462	2237
USA	318	2421	434	1009	673	64	1154	1247	0	581	2366
HUN	72	384	133	292	281	26	368	311	435	0	635
DEU	251	1182	567	1236	756	60	1053	1713	1454	423	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	443	859	781	52	1049	775	1574	468	1481
CHE	326	0	390	344	23	408	470	452	203	651
DFS	666	319	0	1120	84	1190	1494	1199	513	2079
FRA	503	297	502	0	66	1204	1202	1203	502	1671
ISR	36	13	59	32	0	72	85	76	44	91
ITA	719	325	736	537	45	0	1173	1492	558	1791
NLD	646	416	1053	587	65	736	0	1265	504	2180
USA	1479	373	908	580	61	976	907	0	588	1964
HUN	387	151	346	292	27	402	348	512	0	718
DEU	883	523	1154	652	68	933	1501	1208	475	0

RDC

common bulls below diagonal
common three quarter sib group above diagonal

	CAN	DFS	NOR	NLD	DEU	IRL	NZL
CAN	0	113	4	3	10	3	43
DFS	115	0	107	24	54	18	92
NOR	4	80	0	14	20	51	31
NLD	3	24	13	0	11	8	8
DEU	10	48	20	11	0	7	16
IRL	3	14	49	7	7	0	9
NZL	43	78	29	8	15	9	0

RDC

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

CAN 0 77 3 6
DFS 74 0 109 37
NOR 3 82 0 13
DEU 6 30 13 0
