

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:

NOR RDC Change from sire to an animal model for calving traits

This involves:

- New data extraction pipeline.
- Genetic groups in pedigree.
- Evaluation and EDC by Mix99.

Base change

DFS ALL Change in lactation weights for all traits and breeds

FRA ALL Evaluation now performed by a new genetic centre, GENEVAL

NLD BSW/RDC Changes due to the inclusion of new bulls in the population

NZL ALL Continues DNA parentage testing resulting in pedigree editing

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 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 2018). Number of records for direct calving ease by breed

Country	BSW	GUE	HOL	JER	RDC	SIM
AUS			2249			
BEL			993			
CAN	152		12216		477	
CHE	1855		2187			
CZE						
DEA	5230					
DEU			18282		248	
DFS			10056		6287	
ESP			1915			
EST						
FRA	323		11989			
FRM						
GBR			2541			
HUN			1694			
IRL			1953		60	
ISR			427			
ITA			9507			
JPN						
KOR						
LTU						
LVA						
NLD	128		14280		61	
NOR					3806	
NZL			7254		1083	
POL						
PRT						
SVK			643			
SVN						
URY						
USA	538		35346			
ZAF						
HRV						
MEX						
CAM						
No. Records	8226		133532		12022	
Pub. Proofs	8586	0	121622	0	12556	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	0.91	5.86				
USA	0.78	0.81	0.12			
CHE	0.93	0.96	0.79	12.20		
CAN	0.86	0.96	0.86	0.95	7.58	
FRA	0.80	0.91	0.85	0.86	0.90	0.75

BSW mce						
	DEA	NLD	USA	CHE	CAN	FRA
DEA						
NLD						
USA						
CHE						
CAN						
FRA						

DEA	10.85																
NLD	0.77	5.07															
USA	0.77	0.77	0.14														
CHE	0.88	0.79	0.86	16.03													
CAN	0.61	0.80	0.84	0.75	6.21												
FRA	0.90	0.80	0.90	0.96	0.84	0.96											

HOL dce

	AUS	CAN	CHE	DFS	FRA	ISR	ITA	NLD	USA	GBR	HUN	DEU	BEL	IRL	NZL	SVK	ESP
AUS	2.98																
CAN	0.82	6.56															
CHE	0.78	0.96	10.35														
DFS	0.79	0.92	0.90	11.76													
FRA	0.81	0.96	0.96	0.91	0.93												
ISR	0.81	0.90	0.86	0.87	0.87	2.86											
ITA	0.68	0.77	0.77	0.77	0.76	0.78	7.22										
NLD	0.84	0.97	0.94	0.93	0.93	0.89	0.77	6.96									
USA	0.72	0.87	0.86	0.82	0.89	0.83	0.74	0.82	0.13								
GBR	0.82	0.80	0.78	0.77	0.78	0.81	0.75	0.84	0.75	0.07							
HUN	0.70	0.77	0.77	0.76	0.76	0.78	0.76	0.76	0.75	0.76	1.23						
DEU	0.81	0.90	0.89	0.88	0.92	0.83	0.76	0.91	0.81	0.78	0.76	13.07					
BEL	0.68	0.77	0.77	0.75	0.75	0.79	0.75	0.76	0.75	0.75	0.76	0.75	10.01				
IRL	0.71	0.85	0.83	0.82	0.83	0.90	0.74	0.86	0.77	0.75	0.75	0.75	0.75	1.45			
NZL	0.70	0.79	0.79	0.80	0.77	0.78	0.76	0.81	0.76	0.76	0.76	0.77	0.75	0.82	3.02		
SVK	0.72	0.77	0.78	0.78	0.77	0.80	0.77	0.78	0.77	0.78	0.78	0.77	0.78	0.78	0.78	12.65	
ESP	0.71	0.77	0.77	0.77	0.77	0.79	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.78	11.25

HOL mce

	CAN	CHE	DFS	FRA	ISR	ITA	NLD	USA	GBR	HUN	DEU	BEL	SVK	ESP
CAN	6.50													
CHE	0.88	13.56												
DFS	0.82	0.70	12.21											
FRA	0.92	0.97	0.76	1.30										
ISR	0.81	0.71	0.80	0.75	2.62									
ITA	0.80	0.86	0.59	0.85	0.71	9.44								
NLD	0.82	0.77	0.85	0.81	0.67	0.58	5.25							
USA	0.89	0.90	0.76	0.95	0.79	0.82	0.79	0.15						
GBR	0.66	0.79	0.57	0.77	0.62	0.65	0.62	0.70	0.04					
HUN	0.55	0.56	0.55	0.55	0.59	0.55	0.56	0.55	0.56	1.25				
DEU	0.83	0.74	0.92	0.79	0.75	0.66	0.83	0.78	0.60	0.55	13.16			
BEL	0.68	0.69	0.73	0.75	0.62	0.61	0.77	0.69	0.59	0.56	0.75	10.87		
SVK	0.56	0.58	0.56	0.56	0.64	0.56	0.56	0.56	0.57	0.56	0.55	0.57	15.99	
ESP	0.75	0.71	0.66	0.75	0.73	0.66	0.70	0.77	0.59	0.56	0.69	0.63	0.57	12.56

HOL dsb

	AUS	CAN	CHE	DFS	FRA	ISR	ITA	NLD	USA	HUN	DEU
AUS	2.99										
CAN	0.64	7.73									
CHE	0.44	0.55	16.50								
DFS	0.72	0.87	0.52	12.67							
FRA	0.45	0.74	0.60	0.65	0.76						
ISR	0.76	0.75	0.45	0.74	0.53	1.76					
ITA	0.75	0.57	0.36	0.64	0.42	0.62	7.21				
NLD	0.44	0.77	0.72	0.70	0.66	0.57	0.35	4.25			
USA	0.42	0.75	0.61	0.63	0.70	0.46	0.37	0.63	0.07		
HUN	0.74	0.53	0.37	0.53	0.37	0.72	0.53	0.36	0.37	1.10	
DEU	0.58	0.80	0.59	0.80	0.63	0.72	0.45	0.74	0.61	0.41	12.71

HOL msb

	CAN	CHE	DFS	FRA	ISR	ITA	NLD	USA	HUN	DEU
CAN	6.27									
CHE	0.85	20.14								
DFS	0.95	0.82	11.63							
FRA	0.89	0.85	0.87	0.93						
ISR	0.90	0.83	0.87	0.80	1.75					
ITA	0.53	0.59	0.52	0.54	0.67	9.44				
NLD	0.93	0.78	0.94	0.81	0.82	0.52	4.27			
USA	0.88	0.82	0.84	0.88	0.81	0.52	0.78	0.13		
HUN	0.54	0.54	0.52	0.53	0.53	0.47	0.53	0.51	1.22	
DEU	0.95	0.85	0.96	0.85	0.89	0.53	0.93	0.81	0.52	13.32

RDC dce

	CAN	DFS	NOR	NLD	DEU	IRL	NZL
CAN	6.53						
DFS	0.93	11.29					
NOR	0.90	0.96	12.89				
NLD	0.96	0.93	0.93	4.63			
DEU	0.90	0.90	0.95	0.92	13.54		
IRL	0.86	0.83	0.88	0.85	0.79	0.99	
NZL	0.79	0.80	0.80	0.82	0.79	0.83	2.71

RDC mce

	CAN	DFS	NOR	DEU
CAN	7.02			
DFS	0.81	12.21		
NOR	0.70	0.91	15.86	
DEU	0.80	0.84	0.74	12.20

^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	94	180	465	89	181
NLD	84	0	34	58	18	47
USA	132	28	0	194	102	71
CHE	376	56	145	0	85	123
CAN	73	15	90	67	0	49
FRA	129	34	50	85	41	0

BSW

common bulls below diagonal
 common three quarter sib group above diagonal

	DEA	NLD	USA	CHE	CAN	FRA
DEA	0	87	108	409	31	129
NLD	81	0	29	55	13	40
USA	90	24	0	96	26	45
CHE	308	54	83	0	27	83
CAN	26	10	23	23	0	21
FRA	90	35	39	61	19	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	678	296	532	578	48	625	547	771	371	290	653	312	333	530	118	363
CAN	678	0	625	1085	1234	73	1590	1145	3095	644	658	1978	492	417	658	262	779
CHE	252	510	0	381	460	30	507	509	685	285	238	777	332	262	281	120	318
DFS	404	795	307	0	1213	84	1276	1283	1562	652	495	1740	458	468	670	214	525
FRA	459	852	400	606	0	77	1570	1406	1947	773	619	1892	537	501	668	266	650
ISR	27	51	16	59	42	0	83	93	99	49	48	89	35	56	72	26	53
ITA	503	1206	420	812	838	55	0	1364	2439	848	683	2145	510	508	722	280	791
NLD	435	913	449	748	673	67	832	0	1949	774	515	2263	579	581	908	288	564
USA	731	3270	568	960	1011	83	1562	1306	0	968	802	2815	534	542	949	325	874
GBR	304	473	226	321	348	24	476	407	580	0	352	921	316	395	397	150	392
HUN	202	532	167	316	366	32	473	280	631	200	0	792	257	248	314	166	377
DEU	556	1415	663	1068	962	72	1261	1681	1825	485	509	0	675	606	781	461	852
BEL	302	478	334	397	535	19	486	587	493	277	196	695	0	311	316	138	354
IRL	319	409	254	389	440	36	448	511	516	354	204	559	314	0	562	115	265
NZL	504	591	238	443	410	53	534	747	891	234	196	606	275	504	0	164	326
SVK	68	183	55	109	167	12	181	174	223	63	106	364	75	54	100	0	149
ESP	294	570	259	408	511	31	595	445	617	280	276	555	347	254	257	73	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	520	982	971	65	1214	909	2057	590	618	1695	422	222	692
CHE	401	0	432	421	30	454	523	574	321	253	731	332	110	286
DFS	793	372	0	1313	93	1260	1526	1543	642	609	2177	488	211	547
FRA	635	365	609	0	80	1360	1382	1721	575	647	1965	525	219	622
ISR	43	15	63	40	0	81	96	101	62	59	104	39	22	54
ITA	900	374	830	666	50	0	1221	1936	645	682	1922	484	227	702
NLD	810	466	1157	740	76	843	0	1586	644	602	2257	612	253	556
USA	1960	473	1086	822	81	1251	1149	0	748	830	2603	485	272	803
GBR	634	309	624	531	42	663	686	835	0	375	743	343	136	387
HUN	522	188	418	378	37	511	398	697	345	0	869	277	160	390
DEU	1114	611	1324	850	80	1084	1704	1601	777	583	0	647	332	846
BEL	419	325	456	532	21	445	644	439	388	225	665	0	117	318
SVK	149	47	103	113	8	146	154	185	77	110	240	60	0	130
ESP	418	222	387	422	27	470	427	474	353	278	459	297	54	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	502	215	392	374	30	459	449	560	137	479
CAN	456	0	622	1044	1092	69	1562	1285	2814	488	1967
CHE	163	510	0	383	448	30	506	577	649	189	781
DFS	246	798	308	0	1075	86	1281	1399	1448	408	1755
FRA	254	792	392	561	0	66	1417	1358	1551	472	1800
ISR	13	50	16	59	40	0	83	95	95	35	89

ITA	296	1203	420	817	756	55	0	1524	2307	533	2140
NLD	332	1177	537	971	866	75	1115	0	1932	462	2487
USA	471	3052	536	915	810	81	1486	1506	0	585	2637
HUN	73	384	136	256	282	26	368	311	437	0	632
DEU	343	1420	667	1074	930	72	1260	2012	1722	414	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	517	962	903	64	1199	915	1866	468	1654
CHE	400	0	436	412	30	453	536	537	210	722
DFS	804	378	0	1214	93	1262	1605	1329	510	2176
FRA	615	354	601	0	75	1284	1347	1345	505	1850
ISR	43	15	63	38	0	81	97	93	45	103
ITA	898	373	848	626	50	0	1263	1693	551	1896
NLD	817	482	1229	727	74	870	0	1456	510	2316
USA	1867	447	1077	709	79	1213	1134	0	588	2246
HUN	387	154	346	295	27	401	357	514	0	710
DEU	1076	595	1326	796	79	1053	1696	1471	469	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	145	5	4	10	3	58
DFS	147	0	113	43	58	18	121
NOR	4	87	0	34	20	51	37
NLD	4	41	33	0	20	10	19
DEU	10	51	19	19	0	6	17
IRL	3	15	50	10	6	0	11
NZL	59	104	36	19	17	11	0

RDC

common bulls below diagonal

common three quarter sib group above diagonal

	CAN	DFS	NOR	DEU
CAN	0	89	4	9
DFS	88	0	107	40
NOR	4	79	0	13
DEU	9	32	13	0

RDC

RDC

SIM

SIM

SIM

SIM
