

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 (ALL) New database and procedures for data extraction. Mix99 software will be used for all traits. EBV expression is on the observable scale for a trait into consideration, (kg, days, log(scc), type scores, etc). Drop in reliabilities. The genetic parameters for all traits remain the same.

DEA (BSW) Base change

DEU (HOL,RDC) Base change, data and pedigree correction causing some decrease in information fro some bulls

ITA (HOL) Base change, editing and pedigree corrections

BEL (HOL) Up to 21 bulls missing in current data most of them are Montbeliard bulls erroneusly added before due to a bug in one of the programs preparing the file to be submitted. which has now been fixed.

NLD (HOL) Changes in type of proofs

CAN (ALL) Base change. An error was corrected due to which some calvings resulting from embryo transfers were incorrectly included in the calving trait evaluations before. This only affected about 1% of the records and there was no impact on proofs, however this does result in a drop in herds, daughters and EDCs for many of the bulls since these records have now been removed from the evaluation.

IRL (HOL,RDC) New model for this evaluation where we are splitting direct calving ease into 2 new traits, namely, DCE on dairy cow and DCE on dairy heifer. For the purposes of submitting to Interbull, only DCE DAIRY COW has been submitted. This will result in bulls having less observations compared to the old model that considered DCE for all parities of dam. There will be expected drops in reliability, number of daughters, number of herds and EDC. In addition, there are more stringent edits on variation in contemporary group calving score which was not imposed in the old model. The scale of the new model EBV is also different compared to the previous model. The previous values submitted were PTA which were transformed to a percentage difficult scale after the evaluation and then submitted to IDEA. Now the CURRENT values are the underlying EBV from the evaluation (instead of PTA) and without the transformation to the percentage difficult scale hence the change in mean and standard deviation of the EBV. There is a change in heritability from 0.1 (old) to 0.08 (new). There is a change in base years.

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. For dce, some bulls changed from official to unofficial. This is due to reverting the criterion of reliability>0.5 back to the old criterion of at least 70 daughters.

NZL (HOL) NZL has continuous DNA parentage testing so daughters, herds, EDC will always change. Small decrease in Reliability as consequence.

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 (April Routine Evaluation 2019).
 Number of records for direct calving ease by breed

Country	BSW	GUE	HOL	JER	RDC	SIM
AUS			5305			
BEL			1014			
CAN	156		12289		481	
CHE	1878		2219			
CZE						
DEA	5261					
DEU			18463		251	
DFS			10093		6301	
ESP			1914			
EST						
FRA	329		12102			
FRM						
GBR			2591			
HUN			1705			
IRL			1816		47	
ISR			438			
ITA			9596			
JPN						
KOR						
LTU						
LVA						
NLD	129		14369		63	
NOR					3820	
NZL			7258		1085	
POL						
PRT						
SVK			651			
SVN						
URY						
USA	542		35641			
ZAF						
HRV						
MEX						
CAM						
=====						
No. Records	8295		137464		12048	
Pub. Proofs	8647	0	124523	0	12611	0

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

BSW	dce						
		DEA	NLD	USA	CHE	CAN	FRA

DEA	9.80					
NLD	0.91	5.83				
USA	0.78	0.82	0.13			
CHE	0.93	0.96	0.79	12.21		
CAN	0.86	0.96	0.86	0.95	7.63	
FRA	0.80	0.91	0.85	0.86	0.90	0.75

BSW mce

	DEA	NLD	USA	CHE	CAN	FRA
DEA	10.86					
NLD	0.73	4.99				
USA	0.77	0.76	0.15			
CHE	0.88	0.78	0.86	15.94		
CAN	0.60	0.80	0.84	0.75	6.51	
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	0.05																
CAN	0.77	6.58															
CHE	0.79	0.96	10.36														
DFS	0.77	0.92	0.90	11.75													
FRA	0.80	0.96	0.96	0.91	0.93												
ISR	0.78	0.91	0.86	0.88	0.87	2.85											
ITA	0.70	0.77	0.77	0.77	0.76	0.78	7.20										
NLD	0.83	0.97	0.94	0.93	0.93	0.90	0.77	6.94									
USA	0.72	0.87	0.87	0.82	0.90	0.82	0.75	0.82	0.13								
GBR	0.72	0.80	0.78	0.77	0.78	0.82	0.76	0.84	0.75	0.07							
HUN	0.70	0.77	0.77	0.76	0.76	0.79	0.76	0.77	0.75	0.76	1.23						
DEU	0.81	0.91	0.89	0.88	0.93	0.84	0.76	0.91	0.81	0.78	0.76	13.03					
BEL	0.70	0.77	0.77	0.76	0.76	0.79	0.76	0.76	0.75	0.76	0.76	0.76	9.95				
IRL	0.76	0.92	0.93	0.89	0.93	0.91	0.77	0.94	0.84	0.77	0.77	0.86	0.77	0.11			
NZL	0.81	0.79	0.80	0.80	0.77	0.78	0.76	0.82	0.76	0.76	0.76	0.77	0.75	0.81	3.02		
SVK	0.71	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	12.67	
ESP	0.70	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	6.47													
CHE	0.88	13.61												
DFS	0.82	0.70	12.20											
FRA	0.92	0.97	0.76	1.30										
ISR	0.81	0.72	0.80	0.76	2.63									
ITA	0.80	0.86	0.60	0.85	0.72	9.39								
NLD	0.82	0.77	0.85	0.80	0.67	0.57	5.24							
USA	0.88	0.90	0.76	0.95	0.79	0.82	0.78	0.15						
GBR	0.65	0.78	0.57	0.76	0.62	0.64	0.61	0.69	0.04					
HUN	0.55	0.56	0.55	0.55	0.59	0.55	0.56	0.55	0.56	1.25				
DEU	0.82	0.73	0.92	0.78	0.74	0.65	0.84	0.78	0.59	0.55	13.21			
BEL	0.68	0.71	0.73	0.75	0.63	0.62	0.77	0.69	0.58	0.56	0.76	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	15.91	
ESP	0.72	0.69	0.66	0.73	0.70	0.63	0.68	0.74	0.58	0.56	0.69	0.65	0.57	12.56

HOL dsb

	AUS	CAN	CHE	DFS	FRA	ISR	ITA	NLD	USA	HUN	DEU
AUS	0.05										
CAN	0.62	7.46									
CHE	0.44	0.57	16.51								

DFS	0.70	0.87	0.53	12.66							
FRA	0.48	0.74	0.61	0.66	0.76						
ISR	0.82	0.75	0.45	0.75	0.53	1.76					
ITA	0.64	0.56	0.36	0.62	0.41	0.65	7.19				
NLD	0.43	0.77	0.72	0.70	0.67	0.56	0.35	4.28			
USA	0.43	0.75	0.63	0.63	0.70	0.45	0.36	0.63	0.07		
HUN	0.62	0.53	0.37	0.53	0.36	0.72	0.53	0.36	0.37	1.10	
DEU	0.46	0.82	0.60	0.81	0.63	0.70	0.43	0.76	0.62	0.40	12.67

HOL msb

	CAN	CHE	DFS	FRA	ISR	ITA	NLD	USA	HUN	DEU
CAN	6.18									
CHE	0.85	20.12								
DFS	0.95	0.82	11.62							
FRA	0.89	0.85	0.87	0.93						
ISR	0.90	0.82	0.86	0.80	1.76					
ITA	0.53	0.60	0.52	0.54	0.66	9.40				
NLD	0.93	0.77	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	0.53	0.53	0.53	0.47	0.53	0.52	1.22	
DEU	0.95	0.85	0.96	0.84	0.89	0.53	0.94	0.82	0.53	13.28

RDC dce

	CAN	DFS	NOR	NLD	DEU	IRL	NZL
CAN	6.49						
DFS	0.93	11.29					
NOR	0.90	0.96	13.04				
NLD	0.96	0.93	0.93	4.58			
DEU	0.91	0.90	0.95	0.92	13.20		
IRL	0.88	0.85	0.90	0.87	0.81	0.08	
NZL	0.79	0.79	0.79	0.83	0.79	0.82	2.72

RDC mce

	CAN	DFS	NOR	DEU
CAN	7.07			
DFS	0.81	12.20		
NOR	0.71	0.92	15.74	
DEU	0.79	0.85	0.74	12.17

^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	184	469	92	185
NLD	84	0	34	59	18	47
USA	134	28	0	195	104	73
CHE	380	57	146	0	87	126
CAN	77	15	92	70	0	51
FRA	132	34	51	87	43	0

BSW

common bulls below diagonal
common three quarter sib group above diagonal

	DEA	NLD	USA	CHE	CAN	FRA
--	-----	-----	-----	-----	-----	-----

DEA	0	88	109	419	33	132
NLD	82	0	29	55	13	40
USA	91	24	0	99	28	45
CHE	316	54	85	0	28	85
CAN	27	10	25	24	0	21
FRA	93	35	39	63	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	957	340	791	881	61	904	875	1211	526	389	957	371	362	797	158	419
CAN	859	0	630	1099	1261	76	1616	1158	3153	659	660	1994	502	341	658	267	779
CHE	304	514	0	384	469	31	516	516	695	289	239	794	336	215	283	122	318
DFS	491	805	310	0	1233	87	1292	1296	1572	659	498	1755	467	375	674	221	528
FRA	607	868	404	616	0	80	1610	1432	1980	790	626	1930	552	385	672	270	669
ISR	34	52	16	61	43	0	86	96	103	53	50	92	38	45	75	28	56
ITA	612	1240	427	826	864	57	0	1385	2474	864	685	2176	517	399	727	286	797
NLD	602	929	455	759	696	69	859	0	1973	791	519	2300	594	467	909	297	564
USA	996	3345	582	971	1030	87	1611	1336	0	988	807	2838	542	454	952	331	873
GBR	360	489	232	331	359	25	499	430	607	0	353	939	325	316	403	154	394
HUN	256	531	167	316	371	32	478	282	632	202	0	795	258	210	315	166	379
DEU	670	1443	679	1084	994	74	1300	1736	1868	509	511	0	688	481	786	469	853
BEL	349	488	336	402	546	22	496	603	502	288	197	710	0	251	317	142	357
IRL	324	310	201	298	330	28	332	391	419	279	170	423	247	0	482	94	211
NZL	676	591	239	445	413	56	540	748	896	242	196	612	275	429	0	165	327
SVK	74	187	56	112	170	13	186	180	226	66	106	369	77	41	101	0	152
ESP	335	570	259	409	525	31	602	447	616	285	276	557	348	186	258	75	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	532	994	1002	66	1232	924	2091	614	626	1726	429	229	691
CHE	410	0	439	432	31	464	533	588	334	254	748	334	113	288
DFS	812	376	0	1340	94	1279	1550	1555	660	615	2198	498	217	549
FRA	664	371	632	0	81	1389	1416	1758	592	651	2013	541	226	627
ISR	43	15	63	41	0	82	97	105	64	59	105	40	23	54
ITA	925	381	856	692	51	0	1242	1964	667	691	1950	496	233	706
NLD	827	475	1184	770	76	870	0	1615	669	609	2310	629	259	557
USA	2000	481	1105	853	86	1288	1182	0	776	839	2640	495	278	803
GBR	663	317	645	547	45	685	717	876	0	384	772	355	143	392
HUN	527	188	421	384	37	516	402	703	349	0	877	279	162	391
DEU	1157	625	1353	892	80	1119	1770	1645	815	588	0	663	340	846
BEL	424	326	463	546	21	455	663	448	399	225	681	0	121	321
SVK	157	50	108	118	8	154	160	191	85	111	247	63	0	133
ESP	419	222	390	427	27	473	428	474	356	278	460	300	56	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  911  340  798  745   61  899  988 1102  312  955
CAN  847    0  627 1058 1118   72 1589 1309 2872  487 1985
CHE  304  514    0  385  457   31  515  585  657  189  798
DFS  495  807  310    0 1095   89 1297 1413 1457  408 1770
FRA  545  808  396  570    0   69 1456 1386 1582  472 1837
ISR   34   51   16   61   41    0   86   97   99   35   92
ITA  611 1237  427  831  782   57    0 1551 2343  533 2173
NLD  810 1204  543  982  886   77 1146    0 1966  462 2530
USA  918 3127  549  926  827   84 1534 1546    0  585 2663
HUN  204  382  136  256  282   26  368  311  437    0  632
DEU  672 1450  683 1090  961   74 1300 2077 1767  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  529  975  928   65 1216  939 1901  468 1684
CHE  409    0  443  424   31  462  549  552  210  737
DFS  824  382    0 1235   94 1282 1633 1343  510 2200
FRA  636  360  617    0   76 1308 1373 1376  505 1889
ISR   43   15   63   39    0   82   98   97   45  104
ITA  923  380  875  648   51    0 1289 1718  551 1924
NLD  842  491 1257  746   74  903    0 1497  511 2368
USA 1910  457 1097  730   84 1248 1177    0  588 2287
HUN  387  154  346  296   27  401  357  514    0  710
DEU 1116  607 1359  826   79 1089 1762 1522  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  146    5    4   11    3   58
DFS  148    0  116   44   60   14  122
NOR    4   90    0   35   21   43   37
NLD    4   42   34    0   20   11   20
DEU   11   53   20   19    0    5   17
IRL    3   11   42   11    5    0    9
NZL   59  104   36   20   17    9    0
-----

```

```

RDC
-----
common bulls below diagonal
common three quarter sib group above diagonal
  CAN  DFS  NOR  DEU
-----
CAN    0   89    4    9
DFS   89    0  124   40
NOR    4   97    0   13
DEU    9   32   13    0
-----

```

RDC

RDC

SIM

SIM

SIM

SIM
