Interbull Routine Genetic Evaluation for Calving Traits

August 2014

INTRODUCTION

The latest routine international evaluation for calving traits took place as scheduled at the Interbull Centre. Data from sixteen (16) 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, 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:

GBR Base change

NOR Base change

INTERBULL CHANGES COMPARED TO THE DECEMBER ROUTINE RUN

No changes.

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 in the 01x-proof file.

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

The next routine evaluation of Interbull for production, conformation, udder health, longevity, calving, female fertility and workability traits is scheduled for November 2014. Deadline for sending data to the Interbull Centre is Tuesday November 11, 2014, 17:00 CET; confidential distribution of results is targeted for Thursday 20 Nov, 2014, with earliest possible official release of results on November 2, 2014. Please remark the three week turn around time.

NEXT TEST INTERNATIONAL EVALUATION

The next test run for production, conformation, udder health, longevity, calving, female fertility and workability traits will take place in September 2014.

Countries planning to introduce changes in their national evaluation procedures and wishing to have them included in the routine Interbull evaluation, should have their data examined in this test run. New data and validation results should be sent to the Interbull Centre no later than September 2, 2014, 17:00 CET.

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 2014).
Number of records for direct calving ease by breed

Country	BSW	GUE	HOL	JER	RDC	SIM
ARG						
AUS			1478			
BEL			557			
CAN	110		10454		388	
CHE	2329		921			
CHR			1107			
CZE						
DEA	5175					
DEU			16276		209	
DFS			11098		6234	
ESP						
EST						
FRA			10428			
FRM						
FRR						
GBR			1980			
HUN			1400			
IRL			1600		50	
ISR			309			
ITA			9237			
JPN						
KOR						
LTU						
LVA						
NLD	72		12406		29	
NOR					3359	
NZL			5680		896	
POL						
PRT						
SVK						
SVN						
URY						
USA	426		30268			
ZAF						
No.Records	8112		115199		11165	
Pub. Proofs	8769	0	108801	0	11082	0

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

BSW dce

	DEA	NLD	USA	CHE	CAN
DEA	12.28				
NLD	0.90	5.47			
USA	0.65	0.79	0.13		
CHE	0.83	0.92	0.72	18.02	
CAN	0.73	0.86	0.81	0.82	7.18

BSW mce

	DEA	NLD	USA	CHE	CAN
DEA	12.22				
NLD	0.64	4.75			
USA	0.68	0.84	0.14		
CHE	0.67	0.69	0.78	19.95	
CAN	0.64	0.80	0.85	0.75	6.24

HOL dce

	AUS	CAN	CHE	DFS	FRA	ISR	ITA	NLD	USA	GBR	HUN	CHR	DEU	BEL	IRL	NZL
AUS	3.20															
CAN	0.74	6.28														
CHE	0.72	0.88	9.28													
DFS	0.79	0.90	0.88	12.78												
FRA	0.78	0.90	0.94	0.92	0.93											
ISR	0.68	0.82	0.82	0.85	0.85	3.20										
ITA	0.60	0.65	0.68	0.74	0.67	0.69	7.23									
NLD	0.79	0.87	0.92	0.92	0.92	0.80	0.70	5.64								
USA	0.72	0.80	0.83	0.83	0.89	0.80	0.60	0.81	0.13							
GBR	0.77	0.81	0.83	0.75	0.80	0.74	0.63	0.84	0.62	0.07						
HUN	0.56	0.60	0.60	0.60	0.60	0.64	0.60	0.60	0.60	0.61	1.11					
CHR	0.72	0.89	0.93	0.90	0.92	0.79	0.75	0.91	0.80	0.78	0.61	12.03				
DEU	0.76	0.85	0.88	0.89	0.91	0.77	0.65	0.88	0.80	0.82	0.60	0.88	12.50			
BEL	0.52	0.61	0.60	0.65	0.62	0.69	0.61	0.60	0.61	0.61	0.61	0.71	0.62	11.53		
IRL	0.65	0.76	0.84	0.82	0.83	0.84	0.60	0.82	0.78	0.60	0.51	0.80	0.73	0.57	1.58	
NZL	0.62	0.74	0.74	0.83	0.76	0.73	0.64	0.78	0.70	0.61	0.51	0.77	0.73	0.51	0.84	3.39

HOL mce

	CAN	CHE	DFS	FRA	ISR	ITA	NLD	USA	GBR	HUN	CHR	DEU	BEL
CAN	6.56												
CHE	0.83	16.13											
DFS	0.84	0.86	12.55										
FRA	0.93	0.90	0.78	1.31									
ISR	0.60	0.71	0.73	0.61	3.08								
ITA	0.77	0.74	0.56	0.80	0.59	9.26							
NLD	0.81	0.81	0.81	0.83	0.58	0.61	4.82						
USA	0.89	0.82	0.77	0.95	0.59	0.80	0.85	0.15					
GBR	0.69	0.78	0.61	0.81	0.61	0.66	0.69	0.74	0.05				
HUN	0.55	0.56	0.56	0.55	0.60	0.55	0.56	0.55	0.56	1.24			
CHR	0.90	0.93	0.80	0.95	0.72	0.79	0.82	0.88	0.78	0.58	13.62		
DEU	0.82	0.84	0.90	0.78	0.62	0.61	0.80	0.77	0.58	0.55	0.79	11.95	
BEL	0.61	0.71	0.72	0.67	0.63	0.56	0.72	0.67	0.56	0.56	0.62	0.76	12.30

HOL dsb

	AUS	CAN	CHE	DFS	FRA	ISR	ITA	NLD	USA	HUN	CHR	DEU
AUS	3.23											
CAN	0.47	7.01										
CHE	0.82	0.54	9.27									
DFS	0.79	0.73	0.79	13.79								
FRA	0.43	0.68	0.55	0.62	0.73							
ISR	0.58	0.65	0.67	0.80	0.66	1.60						
ITA	0.77	0.46	0.85	0.78	0.46	0.70	7.23					
NLD	0.36	0.68	0.46	0.63	0.63	0.66	0.45	3.45				
USA	0.36	0.65	0.52	0.61	0.68	0.63	0.45	0.60	0.08			
HUN	0.58	0.46	0.61	0.48	0.46	0.51	0.60	0.46	0.45	1.10		
CHR	0.58	0.71	0.69	0.81	0.61	0.75	0.65	0.61	0.61	0.47	12.83	
DEU	0.58	0.69	0.60	0.84	0.60	0.83	0.53	0.62	0.60	0.45	0.79	12.45

HOL msb

	CAN	CHE	DFS	FRA	ISR	ITA	NLD	USA	HUN	CHR	DEU
CAN	6.42										
CHE	0.59	16.13									
DFS	0.96	0.62	12.99								
FRA	0.90	0.56	0.87	0.90							
ISR	0.74	0.73	0.75	0.66	2.23						
ITA	0.49	0.82	0.42	0.46	0.69	9.27					
NLD	0.93	0.47	0.94	0.81	0.70	0.40	4.30				
USA	0.88	0.58	0.84	0.89	0.66	0.48	0.77	0.13			
HUN	0.41	0.57	0.41	0.41	0.46	0.55	0.41	0.40	1.22		
CHR	0.91	0.69	0.90	0.82	0.76	0.51	0.83	0.86	0.43	14.19	
DEU	0.95	0.62	0.96	0.84	0.75	0.46	0.92	0.80	0.40	0.88	12.47

RDC dce

	CAN	DFS	NOR	NLD	DEU	IRL	NZL
CAN	6.52						
DFS	0.88	9.19					
NOR	0.82	0.95	13.02				
NLD	0.87	0.91	0.88	4.14			
DEU	0.86	0.90	0.86	0.88	11.94		
IRL	0.76	0.85	0.82	0.84	0.76	0.85	
NZL	0.75	0.81	0.75	0.79	0.76	0.84	2.68

RDC mce

	CAN	DFS	NOR	DEU
CAN	5.81			
DFS	0.78	10.76		
NOR	0.74	0.79	15.22	
DEU	0.81	0.82	0.69	10.01

^LAPPENDIX II. Number of common bulls

BSW

common bulls below diagonal
common three quarter sib group above diagonal

	DEA	NLD	USA	CHE	CAN
DEA	0	51	148	479	61
NLD	39	0	19	35	12
USA	103	16	0	174	72
CHE	380	30	140	0	67
CAN	48	9	62	51	0

BSW

common bulls below diagonal
common three quarter sib group above diagonal

	DEA	NLD	USA	CHE	CAN
DEA	0	51	87	401	23
NLD	41	0	20	30	8
USA	75	17	0	80	21
CHE	300	24	72	0	22
CAN	20	5	19	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	CHR	DEU	BEL	IRL	NZL
AUS	0	449	196	415	406	31	447	357	522	244	206	107	447	185	254	384
CAN	392	0	379	974	961	42	1300	708	2295	452	503	196	1572	276	338	498
CHE	163	268	0	310	327	15	345	242	394	177	177	194	449	191	211	207
DFS	305	664	268	0	1147	61	1263	1205	1484	575	446	154	1700	309	434	597
FRA	305	606	283	517	0	53	1397	1085	1668	643	498	158	1541	348	417	553
ISR	20	28	10	46	26	0	57	63	63	28	31	6	57	18	38	55
ITA	318	749	265	698	650	36	0	1104	2165	649	553	188	1844	322	431	602
NLD	208	325	165	580	330	49	428	0	1442	572	375	172	1651	306	445	679
USA	416	2073	292	867	766	46	1032	647	0	722	639	240	2297	310	459	763
GBR	182	267	141	236	238	10	273	187	327	0	280	95	720	193	298	300
HUN	155	400	132	292	299	23	382	192	495	154	0	82	652	171	209	246
CHR	84	164	199	128	148	4	154	138	209	82	66	0	311	116	112	97
DEU	351	939	358	992	671	42	903	876	1270	295	439	261	0	398	523	620
BEL	176	262	184	278	341	12	277	275	268	153	141	114	381	0	220	191
IRL	234	316	206	375	356	26	355	331	421	245	180	108	481	216	0	455
NZL	348	434	185	405	306	42	408	501	673	144	167	83	459	167	404	0

```
 ------------------------------------------------------------------------
HOL
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
       CAN  CHE  DFS  FRA  ISR  ITA  NLD  USA  GBR  HUN  CHR  DEU  BEL
 ------------------------------------------------------------------------
  CAN    0  274  768  737   45  951  591 1543  380  495  190 1381  183
  CHE  183    0  252  235   13  246  230  281  185  147  170  346  110
  DFS  528  201    0 1136   69 1098 1265 1281  451  513  165 1896  206
  FRA  424  201  433    0   63 1203 1151 1459  400  527  141 1641  225
  ISR   29    7   47   28    0   63   72   76   41   44    6   79   11
  ITA  596  193  616  492   39    0 1002 1614  441  568  178 1653  203
  NLD  403  197  747  419   57  525    0 1278  428  478  213 1856  241
  USA 1294  216  767  590   52  872  723    0  494  677  222 2119  209
  GBR  391  185  424  363   28  459  427  532    0  276   99  502  120
  HUN  411  106  348  304   27  412  309  552  263    0   91  743  122
  CHR  153  174  128  126    3  140  174  184   88   69    0  323   89
  DEU  743  264  949  603   54  812 1110 1096  512  497  266    0  272
  BEL  161   97  167  203    6  148  211  162  119   97   82  211    0
 ------------------------------------------------------------------------
HOL
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
       AUS  CAN  CHE  DFS  FRA  ISR  ITA  NLD  USA  HUN  CHR  DEU
 ------------------------------------------------------------------------
  AUS    0  310  139  295  238   17  312  309  351  130   73  309
  CAN  221    0  377  940  822   38 1248  930 2018  480  196 1557
  CHE   99  268    0  314  311   15  345  336  367  172  194  449
  DFS  165  692  273    0 1002   63 1289 1437 1389  446  156 1743
  FRA  144  550  269  481    0   42 1198 1095 1269  468  156 1447
  ISR    8   27   10   47   24    0   57   66   59   31    6   57
  ITA  151  746  265  719  553   36    0 1324 1986  537  188 1841
  NLD  194  760  309 1005  605   55  817    0 1526  458  245 2020
  USA  213 1875  270  861  567   44  950 1028    0  581  209 2114
  HUN   70  376  125  292  280   23  366  306  434    0   79  633
  CHR   53  164  199  130  146    4  154  220  181   60    0  311
  DEU  182  941  358 1043  641   42  902 1442 1161  420  261    0
 ------------------------------------------------------------------------
HOL
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
       CAN  CHE  DFS  FRA  ISR  ITA  NLD  USA  HUN  CHR  DEU
 ------------------------------------------------------------------------
  CAN    0  271  755  664   44  931  676 1358  467  190 1349
  CHE  183    0  255  222   13  246  253  254  144  170  346
  DFS  541  203    0 1038   71 1106 1353 1069  505  166 1906
  FRA  400  185  421    0   58 1086 1095 1072  496  136 1521
  ISR   29    7   47   26    0   63   74   68   44    6   79
  ITA  593  193  628  445   39    0 1092 1330  552  178 1638
  NLD  529  220  889  476   58  642    0 1140  496  244 1984
  USA 1210  202  758  474   50  828  771    0  588  198 1752
  HUN  387  104  343  289   27  399  340  513    0   88  716
  CHR  153  174  129  123    3  140  206  168   66    0  322
  DEU  716  263  956  549   54  798 1294  974  475  264    0
 ------------------------------------------------------------------------
```

RDC
----
 common bulls below diagonal
 common three quarter sib group above diagonal

	CAN	DFS	NOR	NLD	DEU	IRL	NZL
CAN	0	99	3	3	7	3	39
DFS	99	0	95	23	50	14	89
NOR	3	67	0	13	20	43	30
NLD	3	23	12	0	11	8	8
DEU	7	44	20	11	0	6	14
IRL	3	12	43	7	6	0	6
NZL	39	74	28	8	13	6	0

RDC
----
 common bulls below diagonal
 common three quarter sib group above diagonal

	CAN	DFS	NOR	DEU
CAN	0	68	3	6
DFS	65	0	95	34
NOR	3	76	0	11
DEU	6	26	10	0