

Introduction

The latest routine international evaluation for **longevity** trait took place as scheduled at the Interbull Centre. Data from twenty one (21) populations were included in this evaluation.

International genetic evaluations for direct longevity trait of bulls from Australia, Belgium, Canada, Switzerland, Germany, Denmark-Finland-Sweden Spain, France, The United Kingdom, Ireland, Israel, Italy, New Zealand, The Netherlands, The United States of America Hungary, Norway, Slovenia and Czech Republic were computed. Brown Swiss, Guernsey, Holstein, Jersey, Red Dairy Cattle and Simmental breed data were included in this evaluation.

Changes in national procedures

Changes in the national genetic evaluation of longevity traits are as follows:

- CHE HOL/BSW Slightly changed the deduction of type of proofs (This affects the type of proofs of domestic AI bulls not tested through the official progeny testing scheme and of domestic natural-service bulls. For such bulls the type of proof changed from 21 to 12)
- CHE BSW Change in pedigree. Animals with unverified pedigree get a missing dam, sire or both. This is the reason why there are many bulls dropping information.
- CZE HOL Base change

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 Longevity (December Routine Evaluation 2016).
Number of records for direct longevity by breed

Country	BSW	GUE	HOL	JER	RDC	SIM
AUS		129	7085	1555	622	
BEL			968			
CAN	199	97	10955	610	777	
CHE	2728		3021			
CZE			4228			3236
DEA	6104					
DEU			24505		376	
DFS			11868	2225	8356	
ESP			3166			
EST						
FRA	347		15752			
FRM						4188
GBR	89	281	6772	725	455	77
HUN			3000			
IRL			2421	139	53	
ISR			1284			
ITA	1959		9064			
JPN						
KOR						
LTU						
LVA						
NLD	147		13354	106	44	256
NOR						
NZL	43	56	6833	4336	1142	
POL			8940			
PRT						
SVK						
SVN	339		454			525
URY						
USA	1012	749	33994	3928	631	35
ZAF		28	1193	634	131	
HRV						
FRR						
No. Records	12967	1340	168857	14258	12587	8317
Pub. Proofs	10786	1078	137241	11789	11423	7391

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

BSW	dlo									
	CAN	CHE	DEA	NLD	NZL	USA	ITA	FRA	GBR	SVN
CAN	8.25									
CHE	0.78	11.08								
DEA	0.82	0.85	14.11							
NLD	0.73	0.72	0.74	367.22						
NZL	0.50	0.53	0.42	0.46	285.08					
USA	0.92	0.70	0.77	0.82	0.53	2.78				
ITA	0.80	0.66	0.81	0.61	0.45	0.68	16.82			
FRA	0.66	0.77	0.78	0.68	0.42	0.65	0.56	0.94		
GBR	0.83	0.59	0.46	0.67	0.55	0.82	0.63	0.51	0.32	
SVN	0.73	0.63	0.80	0.75	0.51	0.71	0.80	0.65	0.56	25.47

GUE dlo

	AUS	CAN	NZL	USA	GBR	ZAF
AUS	7.07					
CAN	0.72	7.55				
NZL	0.71	0.56	345.20			
USA	0.67	0.90	0.52	2.81		
GBR	0.72	0.91	0.59	0.88	0.37	
ZAF	0.71	0.84	0.64	0.85	0.84	18.53

HOL dlo

	AUS	BEL	CAN	CHE	DEU	DFS	ESP	FRA	GBR	IRL	ISR	ITA
NLD	NZL	USA	HUN	CZE	SVN	ZAF	POL					
AUS	4.43											
BEL	0.76	0.36										
CAN	0.73	0.84	6.22									
CHE	0.80	0.79	0.84	12.28								
DEU	0.71	0.84	0.90	0.84	13.06							
DFS	0.77	0.86	0.87	0.82	0.90	12.47						
ESP	0.53	0.70	0.82	0.74	0.82	0.71	13.01					
FRA	0.68	0.63	0.61	0.75	0.61	0.70	0.53	1.00				
GBR	0.72	0.87	0.89	0.77	0.86	0.82	0.80	0.54	0.31			
IRL	0.54	0.75	0.78	0.62	0.72	0.67	0.71	0.41	0.80	2.02		
ISR	0.60	0.61	0.57	0.62	0.60	0.69	0.54	0.74	0.55	0.43	102.64	
ITA	0.45	0.60	0.76	0.67	0.74	0.63	0.83	0.59	0.72	0.62	0.47	6.54
NLD	0.72	0.74	0.69	0.71	0.71	0.81	0.59	0.66	0.66	0.49	0.68	0.48
317.55												
NZL	0.67	0.68	0.54	0.59	0.59	0.63	0.46	0.43	0.58	0.57	0.41	0.41
0.46	209.49											
USA	0.71	0.84	0.91	0.77	0.87	0.88	0.81	0.63	0.86	0.75	0.66	0.73
0.80	0.55	2.30										
HUN	0.41	0.49	0.62	0.46	0.55	0.48	0.68	0.43	0.64	0.51	0.41	0.69
0.50	0.42	0.71	1.15									
CZE	0.41	0.47	0.62	0.59	0.62	0.48	0.67	0.39	0.58	0.59	0.37	0.67
0.40	0.41	0.60	0.56	12.77								
SVN	0.54	0.75	0.73	0.64	0.74	0.74	0.67	0.51	0.69	0.62	0.64	0.53
0.70	0.62	0.80	0.57	0.42	25.23							
ZAF	0.75	0.84	0.90	0.76	0.87	0.83	0.81	0.58	0.90	0.87	0.56	0.71
0.59	0.66	0.88	0.61	0.59	0.66	25.14						
POL	0.51	0.44	0.59	0.64	0.65	0.56	0.58	0.44	0.54	0.48	0.37	0.59
0.45	0.42	0.53	0.43	0.54	0.53	0.53	13.07					

JER dlo

	AUS	CAN	DFS	NLD	NZL	USA	GBR	ZAF	IRL
AUS	5.33								
CAN	0.48	6.73							
DFS	0.73	0.68	12.24						
NLD	0.60	0.69	0.76	359.29					
NZL	0.65	0.45	0.64	0.48	188.09				
USA	0.71	0.82	0.79	0.80	0.56	2.45			
GBR	0.51	0.82	0.74	0.67	0.45	0.77	0.28		
ZAF	0.49	0.61	0.74	0.58	0.47	0.63	0.78	29.01	
IRL	0.50	0.70	0.57	0.47	0.47	0.60	0.71	0.60	1.49

RDC dlo

	AUS	CAN	DEU	DFS	NZL	USA	GBR	NLD	ZAF	IRL
AUS	5.56									
CAN	0.65	6.83								
DEU	0.62	0.88	11.53							
DFS	0.77	0.73	0.83	13.01						
NZL	0.65	0.46	0.54	0.53	229.36					
USA	0.66	0.90	0.86	0.80	0.49	2.65				
GBR	0.62	0.88	0.85	0.77	0.48	0.81	0.30			
NLD	0.70	0.68	0.70	0.80	0.48	0.78	0.67	357.60		
ZAF	0.57	0.85	0.84	0.60	0.52	0.87	0.75	0.58	29.43	
IRL	0.55	0.76	0.73	0.64	0.55	0.68	0.78	0.51	0.81	1.38

SIM dlo

	FRM	NLD	CZE	SVN	GBR	USA
FRM	1.00					
NLD	0.55	289.63				
CZE	0.40	0.42	20.23			
SVN	0.57	0.79	0.39	21.77		
GBR	0.47	0.61	0.52	0.67	0.24	
USA	0.81	0.79	0.58	0.80	0.83	2.21

^LAPPENDIX II. Number of common bulls

BSW

common bulls below diagonal
common three quarter sib group above diagonal

	CAN	CHE	DEA	NLD	NZL	USA	ITA	FRA	GBR	SVN
CAN	0	102	111	35	20	140	101	73	51	23
CHE	83	0	509	78	18	294	390	146	54	57
DEA	93	399	0	115	24	302	621	191	55	82
NLD	28	71	102	0	15	61	101	65	23	36
NZL	20	14	18	8	0	24	20	16	14	7
USA	136	277	265	49	20	0	220	116	67	32
ITA	89	335	519	81	17	153	0	168	56	76
FRA	66	110	144	51	13	78	135	0	41	46
GBR	52	44	39	18	12	66	43	37	0	14
SVN	21	58	77	36	5	26	77	46	12	0

GUE

common bulls below diagonal
common three quarter sib group above diagonal

	AUS	CAN	NZL	USA	GBR	ZAF
AUS	0	43	26	56	33	3
CAN	43	0	13	61	26	2
NZL	25	10	0	28	14	2
USA	51	51	25	0	77	7
GBR	29	21	12	79	0	3
ZAF	2	0	0	4	2	0

HOL

common bulls below diagonal
 common three quarter sib group above diagonal

	AUS	BEL	CAN	CHE	DEU	DFS	ESP	FRA	GBR	IRL	ISR	ITA	NLD	NZL	USA	HUN	CZE	SVN	ZAF	
POL																				
767	AUS	0	419	1003	464	1316	998	675	1019	1184	612	84	989	1125	976	1444	574	737	142	428
390	BEL	320	0	389	327	592	442	365	498	509	315	47	459	624	294	490	297	383	107	216
983	CAN	873	336	0	668	1874	974	1020	1126	1346	438	86	1314	1018	579	2512	786	904	154	440
521	CHE	383	291	498	0	919	531	449	490	617	331	48	600	693	318	785	368	477	120	235
1799	DEU	792	486	913	727	0	2234	1263	2055	1949	747	127	2206	2483	795	2937	1051	1712	245	532
1194	DFS	595	347	604	436	1090	0	787	1319	1380	647	120	1325	1562	678	1604	735	1085	188	462
819	ESP	462	336	547	353	743	547	0	906	941	433	90	1049	860	443	1260	631	761	154	411
1213	FRA	593	437	594	410	815	516	613	0	1377	638	107	1556	1526	662	2137	786	1128	161	426
1180	GBR	994	454	1491	584	1378	1009	804	805	0	882	120	1463	1583	844	1948	794	1071	201	500
500	IRL	507	284	375	328	608	500	411	468	921	0	79	601	764	614	669	391	495	105	303
112	ISR	55	25	52	32	99	93	54	52	95	64	0	120	123	92	138	92	105	40	56
1280	ITA	622	357	804	520	1198	844	721	676	1131	503	90	0	1419	664	2252	879	1164	204	473
1302	NLD	874	626	762	631	1665	1139	695	748	1382	679	102	961	0	837	1911	790	1289	203	452
536	NZL	927	216	572	261	544	423	326	338	750	520	76	470	733	0	906	430	569	106	331
1570	USA	1269	379	2388	682	1541	969	763	950	1738	575	118	1249	1329	834	0	1099	1477	187	590
785	HUN	416	222	649	293	754	549	501	480	744	346	73	730	599	338	1019	0	834	140	365
1118	CZE	439	273	575	341	1238	646	555	648	844	386	81	788	1074	396	1100	766	0	180	394
196	SVN	93	80	109	86	218	148	116	105	161	80	32	166	166	74	145	108	139	0	89
377	ZAF	357	167	362	188	378	331	351	271	442	261	40	347	359	264	550	286	267	62	0
0	POL	499	315	663	407	1337	841	549	616	1003	399	88	901	1056	377	1297	667	859	173	267

JER

common bulls below diagonal
 common three quarter sib group above diagonal

	AUS	CAN	DFS	NLD	NZL	USA	GBR	ZAF	IRL
AUS	0	187	115	48	359	390	184	187	38
CAN	192	0	77	25	147	318	142	131	6
DFS	83	66	0	57	124	163	144	119	26
NLD	42	19	55	0	52	59	61	53	20
NZL	397	159	102	44	0	302	184	174	82
USA	418	319	141	66	371	0	215	259	34
GBR	193	148	143	61	200	254	0	153	47
ZAF	180	127	100	50	183	270	166	0	27
IRL	36	5	22	19	90	35	50	28	0

RDC

common bulls below diagonal

common three quarter sib group above diagonal

	AUS	CAN	DEU	DFS	NZL	USA	GBR	NLD	ZAF	IRL
AUS	0	83	26	164	111	99	55	15	34	10
CAN	83	0	9	103	69	182	78	5	69	3
DEU	24	8	0	46	8	11	4	9	1	4
DFS	143	99	36	0	134	133	59	27	48	13
NZL	112	68	8	129	0	88	54	10	35	7
USA	100	163	10	132	88	0	84	26	61	18
GBR	54	77	4	58	51	79	0	12	46	12
NLD	14	5	8	27	10	25	12	0	2	9
ZAF	34	71	1	47	31	55	39	2	0	2
IRL	9	3	4	10	7	18	12	8	2	0

SIM

common bulls below diagonal

common three quarter sib group above diagonal

	FRM	NLD	CZE	SVN	GBR	USA
FRM	0	94	163	0	61	23
NLD	116	0	129	32	42	14
CZE	192	124	0	58	43	14
SVN	0	33	57	0	0	0
GBR	77	40	39	0	0	17
USA	35	16	13	0	22	0