

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:

BEL HOL Minor pedigree corrections leading to a decrease of EDC and reliability for some bulls

NOR RDC Fixed an error in their procedure which caused more daughters to be added than usual. Some correlations within birth-year are therefore weaker than usual. In 2009 the daughter groups were small and incomplete at last evaluation

NZL BSW/JER Some decrease in information due to continuous parentage verification
HOL/RDC
GUE

DEU HOL Cows without culling date and with last calving date over 750 days ago are excluded resulting in decrease of information

CHE BSW/HOL The plausibility criterion applied to herd size changed causing some information decrease

IRL HOL Some changes in type of proof due to a program update

ESP HOL Introduced the changes tested in January:
-Changes in data edit for direct proofs
-Changes in fixed and random environmental effects and heritability

INTERBULL CHANGES COMPARED TO THE DECEMBER ROUTINE RUN

Sub-setting:

As decided by the ITC in Orlando, new sub-setting was introduced in the September test run. Sub-setting is necessary for operational purposes and restrictions of time scales. To minimize the effect of sub-setting, 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 calving 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 analyzed 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.

Table 1. National evaluation data considered in the Interbull evaluation for Longevity (August Routine Evaluation 2017). Number of records for direct longevity by breed

Country	BSW	GUE	HOL	JER	RDC	SIM
AUS		132	7311	1605	645	
BEL			999			
CAN	179	98	11269	633	791	
CHE	2781		3099			
CZE			4228			3236
DEA	6182					
DEU			24992		385	
DFS			12788	2371	8844	
ESP			3288			
EST						
FRA	360		16158			
FRM						4256
GBR	94	284	6936	741	498	77
HUN			3076			
IRL			2557	156	57	
ISR			1309			
ITA	2000		8945			
JPN						
KOR						
LTU						
LVA						
NLD	152		13624	111	50	267
NOR					3285	
NZL	44	56	6881	4356	1166	
POL			9312			
PRT						
SVK						
SVN	358		476			545
URY						
USA	1029	754	34831	4047	658	40
ZAF			1203	642	130	
HRV						
MEX						
<hr/>						
No. Records	13179	1324	173282	14662	16509	8421
Pub. Proofs	10970	1062	139822	12042	14957	7483

APPENDIX I. Sire standard deviations in diagonal and genetic correlations below diagonal

BSW dlo

	CAN	CHE	DEA	NLD	NZL	USA	ITA	FRA	GBR	SVN
CAN	8.71									
CHE	0.77	11.11								
DEA	0.82	0.85	13.78							
NLD	0.72	0.72	0.74	359.70						
NZL	0.52	0.54	0.43	0.48	294.12					
USA	0.92	0.70	0.77	0.82	0.55	2.78				
ITA	0.80	0.67	0.80	0.61	0.45	0.68	16.64			
FRA	0.65	0.78	0.78	0.69	0.46	0.66	0.56	0.94		
GBR	0.84	0.59	0.46	0.68	0.57	0.83	0.63	0.52	0.32	
SVN	0.76	0.61	0.77	0.74	0.52	0.71	0.81	0.62	0.59	25.14

GUE dlo

	AUS	CAN	NZL	USA	GBR
AUS	7.11				
CAN	0.72	7.69			
NZL	0.72	0.55	345.63		
USA	0.67	0.91	0.53	2.81	
GBR	0.73	0.91	0.59	0.88	0.38

HOL dlo

	AUS	BEL	CAN	CHE	DEU	DFS	ESP	FRA	GBR	IRL
ISR	ITA	NLD	NZL	USA	HUN	CZE	SVN	ZAF	POL	
ISR	4.46									
AUS	0.76	0.36								
BEL	0.73	0.84	6.16							
CAN	0.80	0.79	0.85	12.30						
CHE	0.70	0.84	0.90	0.84	13.00					
DEU	0.78	0.86	0.87	0.82	0.90	12.40				
DFS	0.54	0.72	0.83	0.74	0.83	0.72	12.29			
ESP	0.68	0.64	0.60	0.76	0.62	0.70	0.53	1.00		
FRA	0.73	0.87	0.90	0.78	0.86	0.82	0.82	0.54	0.31	
GBR	0.55	0.76	0.78	0.63	0.72	0.67	0.73	0.42	0.80	2.02
IRL	0.61	0.63	0.57	0.63	0.60	0.70	0.54	0.72	0.55	0.44
ISR	102.11									
ITA	0.46	0.60	0.76	0.68	0.75	0.64	0.84	0.59	0.72	0.62
NLD	0.48	6.28								
NZL	0.71	0.75	0.69	0.72	0.71	0.81	0.61	0.67	0.67	0.50
USA	0.68	0.49	319.65							
HUN	0.67	0.68	0.55	0.60	0.59	0.63	0.47	0.44	0.58	0.58
CZE	0.42	0.42	0.47	211.10						
SVN	0.71	0.84	0.91	0.77	0.87	0.88	0.83	0.63	0.86	0.75
ZAF	0.66	0.73	0.80	0.56	2.30					
POL	0.42	0.49	0.62	0.47	0.55	0.49	0.70	0.44	0.64	0.50
IRL	0.42	0.68	0.51	0.43	0.71	1.19				
GBR	0.42	0.47	0.62	0.58	0.63	0.47	0.68	0.41	0.58	0.58
DEU	0.38	0.68	0.42	0.42	0.60	0.55	12.76			
ESP	0.57	0.80	0.79	0.72	0.74	0.73	0.71	0.53	0.75	0.69
ITA	0.70	0.58	0.71	0.64	0.82	0.55	0.45	26.40		
NZL	0.76	0.76	0.84	0.90	0.76	0.87	0.83	0.82	0.58	0.86
USA	0.56	0.71	0.58	0.66	0.88	0.61	0.58	0.70	23.81	
HUN	0.50	0.50	0.45	0.58	0.65	0.64	0.56	0.59	0.44	0.48
CZE	0.39	0.60	0.46	0.43	0.53	0.43	0.54	0.46	0.54	13.19

JER dlo

	AUS	CAN	DFS	NLD	NZL	USA	GBR	ZAF	IRL
AUS	5.31								
CAN	0.49	6.75							
DFS	0.73	0.68	12.20						
NLD	0.60	0.68	0.77	383.75					
NZL	0.65	0.45	0.64	0.50	191.95				
USA	0.71	0.82	0.80	0.80	0.55	2.45			
GBR	0.52	0.82	0.73	0.67	0.46	0.77	0.28		
ZAF	0.49	0.61	0.73	0.60	0.47	0.63	0.78	28.23	
IRL	0.50	0.70	0.57	0.48	0.48	0.60	0.70	0.60	1.51

RDC dlo

	AUS	CAN	DEU	DFS	NZL	USA	GBR	NLD	ZAF	IRL
NOR										
AUS	5.52									
CAN	0.65	6.74								
DEU	0.61	0.88	11.74							
DFS	0.77	0.73	0.82	12.99						
NZL	0.65	0.48	0.54	0.51	230.59					
USA	0.66	0.89	0.85	0.81	0.49	2.62				
GBR	0.64	0.88	0.85	0.77	0.50	0.81	0.29			
NLD	0.70	0.68	0.70	0.81	0.48	0.79	0.67	342.23		
ZAF	0.58	0.85	0.82	0.60	0.52	0.86	0.76	0.58	29.75	
IRL	0.55	0.76	0.73	0.63	0.56	0.68	0.78	0.50	0.81	1.45
NOR	0.80	0.61	0.51	0.70	0.55	0.81	0.53	0.81	0.64	0.45
40.97										

SIM dlo

	FRM	NLD	CZE	SVN	GBR	USA
FRM	0.99					
NLD	0.55	295.84				
CZE	0.41	0.43	20.23			
SVN	0.63	0.84	0.42	23.23		
GBR	0.50	0.62	0.52	0.71	0.25	
USA	0.81	0.80	0.58	0.81	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	92	105	33	17	125	90	66	50	26
CHE	63	0	517	80	18	295	399	150	57	68
DEA	73	411	0	117	25	307	642	196	59	93
NLD	26	73	105	0	15	62	104	68	27	39
NZL	11	14	19	8	0	24	20	16	14	7
USA	100	279	269	49	20	0	222	118	71	37
ITA	65	342	540	83	17	155	0	172	60	87
FRA	49	114	148	53	13	80	139	0	46	50
GBR	39	45	41	19	12	68	45	38	0	18
SVN	21	64	86	39	5	29	86	50	13	0

GUE

common bulls below diagonal

common three quarter sib group above diagonal

	AUS	CAN	NZL	USA	GBR
AUS	0	45	26	58	35
CAN	45	0	13	62	27
NZL	25	10	0	28	14
USA	53	52	25	0	79
GBR	31	22	12	81	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															
AUS	0	435	1058	487	1370	1080	700	1056	1225	630	88	1008	1161	999	1507	590	752
148	434	799															
BEL	342	0	409	339	616	486	380	526	528	322	49	472	643	298	511	310	394
115	219	409															
CAN	953	360	0	694	1930	1120	1055	1174	1388	451	89	1342	1069	587	2630	822	907
164	444	1027															
CHE	416	304	524	0	945	595	462	523	636	340	49	612	708	322	816	381	478
121	237	543															
DEU	859	517	987	760	0	2428	1301	2190	1989	772	132	2221	2553	805	3014	1081	1724
253	537	1877															
DFS	693	403	790	510	1320	0	879	1443	1512	680	129	1429	1766	721	1785	807	1177
216	478	1340															
ESP	496	354	582	371	773	627	0	946	971	446	92	1079	891	450	1300	657	771
164	417	847															
FRA	633	465	629	434	922	614	643	0	1423	656	110	1569	1617	675	2191	820	1151
169	434	1324															
GBR	1053	476	1552	602	1430	1167	831	841	0	912	122	1479	1628	855	2006	817	1078
206	503	1218															
IRL	533	296	387	338	633	550	429	490	959	0	83	609	788	639	684	399	508
109	308	524															
ISR	57	27	54	33	104	100	55	54	96	67	0	121	130	93	143	95	107
41	57	114															
ITA	665	376	856	533	1244	982	757	703	1160	518	90	0	1426	667	2249	897	1158
210	471	1315															
NLD	924	648	821	652	1764	1386	725	814	1435	707	107	989	0	848	1975	816	1294
211	457	1365															
NZL	967	222	577	266	558	477	334	347	765	544	76	483	743	0	919	433	571
109	336	548															
USA	1355	401	2544	713	1647	1198	802	993	1818	593	124	1309	1395	845	0	1140	1478
201	594	1630															
HUN	431	236	692	301	780	603	516	496	761	352	72	756	615	341	1066	0	840
144	368	805															
CZE	458	281	577	344	1261	723	565	668	847	398	82	792	1079	397	1105	768	0
186	397	1127															
SVN	104	87	114	89	228	179	124	111	166	85	32	174	173	76	154	109	140
0	92	205															
ZAF	364	172	365	192	384	351	356	277	449	268	40	351	364	269	556	289	270
63	0	382															
POL	535	334	722	423	1433	995	576	727	1054	425	91	942	1122	393	1401	690	872
183	275	0															

JER

common bulls below diagonal
common three quarter sib group above diagonal

	AUS	CAN	DFS	NLD	NZL	USA	GBR	ZAF	IRL
AUS	0	207	126	51	369	415	191	199	44
CAN	211	0	86	25	149	331	146	134	9
DFS	94	75	0	62	129	175	152	127	33
NLD	45	19	60	0	52	59	62	54	23
NZL	411	161	107	44	0	304	187	177	92
USA	444	334	152	66	373	0	220	263	40
GBR	200	152	151	62	203	258	0	157	55
ZAF	193	132	109	51	187	275	171	0	32
IRL	41	7	28	22	100	41	58	32	0

RDC

common bulls below diagonal
common three quarter sib group above diagonal

	AUS	CAN	DEU	DFS	NZL	USA	GBR	NLD	ZAF	IRL	NOR
AUS	0	86	30	172	117	104	78	17	35	13	49
CAN	87	0	10	121	70	188	85	5	69	4	4
DEU	29	9	0	49	11	13	12	8	2	5	14
DFS	151	121	39	0	141	152	99	29	48	16	98
NZL	118	69	11	137	0	93	69	12	35	8	33
USA	106	170	13	150	93	0	99	28	60	21	55
GBR	77	84	11	97	65	94	0	22	47	19	35
NLD	16	5	8	29	12	26	20	0	2	9	26
ZAF	36	71	2	47	31	54	40	2	0	2	0
IRL	12	4	5	13	8	21	18	8	2	0	46
NOR	40	4	14	77	31	56	36	25	0	45	0

SIM

common bulls below diagonal
common three quarter sib group above diagonal

	FRM	NLD	CZE	SVN	GBR	USA
FRM	0	97	163	0	61	25
NLD	119	0	133	36	42	14
CZE	192	127	0	58	43	14
SVN	0	36	57	0	0	0
GBR	77	40	39	0	0	17
USA	40	17	14	0	23	0
