

Introduction

The latest routine international evaluation for longevity trait took place as scheduled at the Interbull Centre. Data from twenty two (22) 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, Czech Republic and Japan 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:

FRA (ALL)	Base change
DEA (BSW)	Base change
SVN (HOL, BSW)	Base change. Decrease in information due to changes in pedigree completeness as well as phenotypic data improvement.
JPN (HOL)	Some decrease in information due to pedigree changes
AUS (ALL)	Decrease in information due to pedigree updates, and status changes of some bulls which then leads to no longer being qualified for the >10 threshold.
ITA (HOL)	One year cut-off of data causing drops in information, base change
ITA (BSW)	Base change
USA (ALL)	Drops in information are due to pedigree corrections and herd-year minimum edits
ISR (HOL)	Drops in information due to edits and parentage corrections
CAN (ALL)	Base change
DEU (ALL)	Base change
POL (HOL)	Changes in the recording software by the national organisation of milk recording system. Most of the changes were caused by small revisions of herd registration numbers
NZL (ALL)	Changed pedigree extract so that Holstein and Friesian breed proportions re-balanced for all animals based on a more realistic assumption of Holstein and Friesian ancestry. Specifically, any HF animals from NZ, Australia or the UK in the pedigree which have one or both parents missing, instead of merely assuming the missing parent(s) to have no Holstein genetics, now assumes a mixture of Holstein and Friesian genetics equal to the average of their herd contemporaries. These changes are also carried down to all progeny in the pedigree. Updated days-in-milk to include all data collected up to 305 days of lactation. Excluded any records where a cow has not calved within 365 days of her last parturition.
CHE (ALL)	Improvements in recording of pedigree validity and handling of animals with uncertain parentage on the database as well as the recomputation of breed percentages for all animals born after 01.01.1990 led to (great) changes in all pedigrees and in consequences in all genetic evaluation results.
NLD (ALL)	Base change
GBR (ALL)	Data refreshed and some loss of information

INTERBULL CHANGES COMPARED TO THE PREVIOUS ROUTINE RUN

Post-processing Windows:

According to the decision taken by ITC in Orlando (2015) to review the post-processing windows every 5 years, during the 2020 the relative working group has been re-activated and new windows have been identified.

As before, the upper bounds have been set to 0.99 as these were judged to have very little effect on evaluations while the lower values have been reduced to the 10th percentile. This reduction would provide post-processed correlations to be closer to the real estimated ones. Over the past five years, in fact, the previous adopted lower value (25th percentile) had been found too high causing estimated and post-processed correlations to differ significantly from each other. The new lower values have been applied to all breeds and traits.

The weight assigned to the magnitude of the changes tested by each country has also been revised. The new weight will allow post-processed correlations to take more in consideration the value of the new estimated ones even when no changes are applied by the countries.

The new weights are as follows:

No changes :: 2
Small changes:: 1
Big changes :: 0

More information can be read on https://interbull.org/ib/rg_procedure

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 ROUTINE RUN

Results were distributed by the Interbull Centre to designated representatives in each country. The international evaluation file comprised international proofs expressed on the base and unit of each country included in the analysis. Such records readily provide more information on bull performance in various countries, thereby minimizing the need to resort to conversions.

At the same time, all recipients of Interbull results are expected to honor the agreed code of practice, decided by the Interbull Steering Committee, and only publish international evaluations on their own country scale. Evaluations expressed on another country scale are confidential and may only be used internally for research and review purposes.

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 (April Routine Evaluation 2023).
 Number of records for direct longevity by breed

Country	BSW	GUE	HOL	JER	RDC	SIM
AUS		142	8460	1805	764	
BEL			1849			
CAN	257	108	13281	835	901	
CHE	3170		3270			
CZE			5176			
DEA	5141					
DEU			23655		295	
DFS			14608	2593	9495	
ESP			4323			
EST						
FRA	487		18262			
FRM						4944
GBR	137	327	8413	887	605	82
HUN			3646			
IRL			3243	232	73	
ISR			1702			
ITA	2310		9138			
JPN			6917			
KOR						
LTU						
LVA						
NLD	210		16250	228	84	412
NOR					3946	
NZL			7839	4538	1022	
POL			11958			
PRT						
SVK						
SVN	296		628			484
URY						

USA	1201	821	41418	5233	796	94
ZAF			1258	719	134	
HRV						
CAM					42	

No. Records	13209	1398	205294	17070	18157	6016
Pub. Proofs	10521	1148	154727	13818	16288	5615

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

BSW dlo

	CAN	CHE	DEA	NLD	USA	ITA	FRA	GBR	SVN
CAN	8.75								
CHE	0.71	10.85							
DEA	0.90	0.84	12.27						
NLD	0.67	0.77	0.73	329.09					
USA	0.91	0.64	0.85	0.73	2.68				
ITA	0.79	0.70	0.86	0.63	0.70	15.84			
FRA	0.63	0.77	0.73	0.66	0.66	0.51	0.94		
GBR	0.85	0.59	0.65	0.60	0.84	0.64	0.58	0.32	
SVN	0.66	0.64	0.79	0.70	0.67	0.74	0.55	0.56	23.43

GUE dlo

	AUS	CAN	USA	GBR
AUS	0.05			
CAN	0.59	8.25		
USA	0.63	0.89	2.91	
GBR	0.63	0.91	0.86	0.38

HOL dlo

	AUS	BEL	CAN	CHE	DEU	DFS	ESP	FRA	GBR	IRL	ISR	ITA	NLD	NZL	USA	HUN	CZE	SVN	ZAF	POL	JPN
AUS	0.04																				
BEL	0.64	0.38																			
CAN	0.61	0.88	6.69																		
CHE	0.72	0.77	0.82	12.21																	
DEU	0.67	0.85	0.86	0.88	12.48																
DFS	0.69	0.85	0.86	0.81	0.92	12.23															
ESP	0.55	0.80	0.87	0.78	0.83	0.76	11.48														
FRA	0.57	0.61	0.62	0.75	0.64	0.70	0.59	0.98													
GBR	0.68	0.90	0.90	0.78	0.86	0.83	0.88	0.57	0.31												
IRL	0.57	0.85	0.79	0.66	0.75	0.70	0.76	0.44	0.80	2.10											
ISR	0.60	0.57	0.53	0.69	0.70	0.71	0.59	0.63	0.59	0.59	106.41										
ITA	0.52	0.68	0.76	0.73	0.74	0.68	0.88	0.64	0.77	0.63	0.56	6.04									
NLD	0.54	0.66	0.66	0.72	0.70	0.75	0.62	0.66	0.63	0.48	0.69	0.53	263.06								
NZL	0.64	0.68	0.68	0.74	0.74	0.69	0.53	0.51	0.66	0.65	0.49	0.48	0.50	2.23							
USA	0.63	0.85	0.89	0.80	0.88	0.88	0.88	0.66	0.84	0.72	0.73	0.76	0.74	0.60	2.21						
HUN	0.44	0.59	0.70	0.58	0.60	0.54	0.77	0.53	0.65	0.49	0.44	0.71	0.47	0.45	0.73	1.20					
CZE	0.44	0.50	0.57	0.57	0.56	0.47	0.68	0.44	0.56	0.56	0.45	0.62	0.44	0.44	0.57	0.52	18.05				
SVN	0.44	0.75	0.67	0.66	0.73	0.66	0.65	0.56	0.69	0.65	0.59	0.59	0.65	0.57	0.72	0.45	0.44	22.63			
ZAF	0.60	0.82	0.89	0.69	0.82	0.75	0.86	0.51	0.86	0.86	0.55	0.69	0.48	0.64	0.85	0.68	0.58	0.61	29.80		
POL	0.44	0.44	0.44	0.54	0.56	0.48	0.60	0.44	0.47	0.44	0.44	0.60	0.44	0.44	0.49	0.44	0.51	0.44	0.44	12.19	
JPN	0.61	0.90	0.94	0.74	0.86	0.86	0.86	0.53	0.90	0.83	0.50	0.70	0.63	0.69	0.87	0.68	0.55	0.73	0.90	0.44	1.59

JER dlo

	AUS	CAN	DFS	NLD	NZL	USA	GBR	ZAF	IRL
AUS	0.04								
CAN	0.49	7.30							
DFS	0.68	0.70	12.05						
NLD	0.58	0.64	0.80	332.36					

NZL	0.48	0.50	0.61	0.47	1.96								
USA	0.58	0.82	0.80	0.73	0.54	2.35							
GBR	0.53	0.88	0.74	0.63	0.52	0.79	0.29						
ZAF	0.46	0.64	0.51	0.46	0.46	0.65	0.68	26.59					
IRL	0.51	0.69	0.58	0.46	0.48	0.66	0.69	0.69	1.59				

RDC dlo

	AUS	CAN	DEU	DFS	NZL	USA	GBR	NLD	ZAF	IRL	NOR	CAM
AUS	0.05											
CAN	0.54	7.38										
DEU	0.66	0.84	12.42									
DFS	0.64	0.75	0.92	13.00								
NZL	0.63	0.57	0.71	0.60	2.51							
USA	0.56	0.86	0.88	0.86	0.68	2.45						
GBR	0.62	0.90	0.84	0.74	0.58	0.80	0.31					
NLD	0.57	0.65	0.71	0.77	0.54	0.76	0.62	315.11				
ZAF	0.50	0.87	0.77	0.57	0.56	0.79	0.82	0.49	33.03			
IRL	0.53	0.75	0.73	0.65	0.60	0.64	0.71	0.49	0.79	1.51		
NOR	0.53	0.78	0.72	0.80	0.46	0.81	0.69	0.81	0.62	0.58	40.95	
CAM	0.44	0.62	0.72	0.72	0.61	0.81	0.61	0.62	0.53	0.43	0.55	8.91

SIM dlo

	FRM	NLD	SVN	GBR	USA
FRM	0.98				
NLD	0.56	292.78			
SVN	0.44	0.55	22.93		
GBR	0.67	0.63	0.70	0.26	
USA	0.73	0.75	0.71	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	USA	ITA	FRA	GBR	SVN
CAN	0	136	150	46	179	139	96	65	28
CHE	117	0	617	106	328	508	197	78	71
DEA	132	516	0	153	335	734	257	80	92
NLD	39	99	140	0	80	132	81	35	42
USA	174	304	297	69	0	255	135	94	33
ITA	125	448	644	105	181	0	230	83	86
FRA	87	154	204	68	98	191	0	65	45
GBR	65	62	57	31	92	63	59	0	16
SVN	26	64	86	41	27	82	45	14	0

GUE

common bulls below diagonal
common three quarter sib group above diagonal

	AUS	CAN	USA	GBR
AUS	0	51	66	38
CAN	50	0	72	31
USA	63	63	0	90
GBR	33	26	92	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	JPN
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AUS	0	714	1432	622	1669	1399	921	1366	1557	770	131	1144	1498	1075	1985	773	947	153	469	1129	965
BEL	617	0	765	570	1133	893	677	966	923	518	90	771	1145	432	926	541	677	151	303	809	551
CAN	1418	730	0	867	2486	1619	1341	1590	1853	591	157	1813	1648	629	3713	1061	1221	201	473	1611	1430
CHE	547	570	761	0	1149	750	578	738	794	423	76	741	940	344	1029	442	555	128	250	722	491
DEU	1258	1151	1886	1080	0	2936	1611	2640	2430	938	198	2631	3545	845	3723	1317	2066	337	541	2866	1517
DFS	1040	845	1405	702	2290	0	1143	1895	1951	837	189	1708	2478	769	2422	1023	1495	255	510	1951	1105
ESP	667	661	848	481	1073	893	0	1336	1226	544	124	1320	1210	493	1656	833	970	177	443	1192	971
FRA	963	966	1083	678	1599	1177	1112	0	1833	817	152	1731	2192	750	2699	1042	1473	212	502	1953	1326
GBR	1422	939	2095	790	2082	1673	1053	1364	0	1143	185	1743	2179	942	2633	1024	1372	219	538	1747	1217
IRL	663	506	532	432	824	707	522	683	1219	0	119	654	966	714	870	491	617	109	332	694	494
ISR	80	51	96	42	148	137	70	92	143	86	0	170	195	112	252	136	156	50	71	186	131
ITA	899	771	1534	682	1900	1464	1000	1126	1535	593	117	0	1815	577	2697	1075	1357	246	439	1878	1222
NLD	1295	1271	1530	925	3325	2268	1069	1521	2099	911	144	1575	0	919	2725	1059	1735	266	499	2168	1160
NZL	1035	332	572	283	612	530	359	455	841	611	84	445	810	0	982	470	614	93	334	602	525
USA	1992	815	4061	964	2808	1995	1111	1563	2580	792	240	2147	2326	905	0	1448	1917	241	630	2487	2131
HUN	591	457	938	371	1062	846	678	756	955	430	92	972	894	352	1426	0	1040	153	395	1082	795
CZE	645	542	876	430	1661	1067	726	1017	1124	487	118	1060	1567	445	1576	966	0	215	429	1564	968
SVN	101	115	152	93	332	208	127	159	176	81	35	208	232	61	194	112	153	0	64	277	159
ZAF	408	259	397	210	422	387	386	385	491	292	44	354	408	263	607	315	300	45	0	416	434
POL	872	739	1385	611	2644	1684	884	1409	1664	584	141	1578	2067	450	2478	992	1343	248	311	0	1122
JPN	588	370	776	360	744	665	507	560	732	340	55	672	681	291	1083	484	492	90	312	660	0

JER

common bulls below diagonal
common three quarter sib group above diagonal

	AUS	CAN	DFS	NLD	NZL	USA	GBR	ZAF	IRL
AUS	0	262	170	75	391	504	251	244	63
CAN	269	0	123	41	151	474	191	165	15
DFS	144	118	0	123	144	232	215	165	56
NLD	67	35	125	0	68	98	103	75	40
NZL	426	160	125	61	0	322	234	186	137
USA	545	487	219	105	382	0	286	321	54
GBR	264	197	222	102	250	336	0	196	96
ZAF	237	161	152	71	196	336	206	0	44
IRL	61	14	52	38	152	55	104	44	0

RDC

common bulls below diagonal
common three quarter sib group above diagonal

	AUS	CAN	DEU	DFS	NZL	USA	GBR	NLD	ZAF	IRL	NOR	CAM
AUS	0	97	39	214	109	135	95	34	36	21	74	10
CAN	100	0	13	185	52	232	106	6	70	5	7	0
DEU	38	12	0	62	12	24	14	15	2	6	14	0
DFS	193	192	53	0	129	222	135	52	49	20	147	0
NZL	109	51	12	124	0	75	63	14	30	10	29	8
USA	136	214	22	219	76	0	137	48	61	31	82	23
GBR	94	106	14	133	62	131	0	37	50	27	63	0
NLD	33	6	14	50	14	47	36	0	2	16	47	0
ZAF	37	72	2	48	26	55	43	2	0	2	0	0
IRL	20	5	6	16	10	31	26	16	2	0	61	0
NOR	63	6	13	120	27	83	66	46	0	59	0	0
CAM	10	0	0	0	8	23	0	0	0	0	0	0

SIM

common bulls below diagonal
common three quarter sib group above diagonal

	FRM	NLD	SVN	GBR	USA
FRM	0	119	0	64	73
NLD	140	0	65	43	29
SVN	0	65	0	0	1
GBR	81	41	0	0	20
USA	88	30	1	27	0
