

## 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:

DEA (BSW)	Base change
JPN (HOL)	Changed from RBV to SBV
IRL (HOL,JER,RDC)	Slight decrease in information due to database clean ups
BEL (HOL)	Some bulls with type of proof showing an unexpected change are due to the program used to determine the type of proof for bulls
AUS (ALL)	Drops of information due to data clean up such as pedigree changes or status changes leading to a good number of bulls no longer being qualified. Decreases in EDC are also due to rounding.
ITA (HOL)	Base change plus 1 year cutoff data.
DEU (ALL)	Base change
CHE (ALL)	Base change. Decrease in information due to manual edits in the database
ITA (BSW)	Base change
POL (HOL)	Decrease in information due to data editings
NZL (BSW,GUE)	No longer participating
NZL (ALL)	Daughter counts: New Zealand has continuous DNA parentage testing so daughters will always change. Herd Count: Affected by continuous DNA parentage testing. EDCs: Affected by continuous DNA parentage testing. Reliability changes.
CAN (ALL)	Base change
GBR (ALL)	Drop in information due to data clean up
USA (ALL)	Pedigree corrections and herd-year minimum edits causing drops in information
FRA (ALL)	Base change

## 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](https://interbull.org/ib/rg_procedure)

#### DATA AND METHOD OF ANALYSIS

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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

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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

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Dates for the next routine evaluation can be found on <http://www.interbull.org/ib/servicecalendar>.

#### NEXT TEST INTERNATIONAL EVALUATION

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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 2022).  
Number of records for direct longevity by breed

Country	BSW	GUE	HOL	JER	RDC	SIM
AUS		137	8259	1767	743	
BEL			1788			
CAN	255	105	12953	806	884	
CHE	3110		3180			
CZE			5041			
DEA	5046					
DEU			23145		284	
DFS			14274	2554	9413	
ESP			4122			
EST						
FRA	436		17471			
FRM						4842
GBR	135	322	8213	860	585	83
HUN			3644			
IRL			3107	212	69	
ISR			1636			
ITA	2246		9136			
JPN			6711			
KOR						
LTU						
LVA						
NLD	202		15926	198	78	384
NOR					3892	
NZL			7465	4358	996	
POL			11422			
PRT						
SVK						
SVN	429		679			663
URY						
USA	1168	802	40472	5041	769	78
ZAF			1257	708	134	
HRV						
CAM					41	
No. Records	13027	1366	199901	16504	17888	6050
Pub. Proofs	10428	1125	152680	13421	16102	5327

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

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 BSW dlo  
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	CAN	CHE	DEA	NLD	USA	ITA	FRA	GBR	SVN
CAN	9.09								
CHE	0.72	10.82							
DEA	0.90	0.84	12.24						
NLD	0.66	0.78	0.73	328.68					
USA	0.90	0.64	0.84	0.72	2.69				
ITA	0.79	0.71	0.87	0.63	0.70	15.89			
FRA	0.64	0.77	0.72	0.66	0.67	0.51	0.94		
GBR	0.85	0.58	0.63	0.60	0.84	0.64	0.56	0.31	
SVN	0.72	0.67	0.83	0.74	0.72	0.76	0.62	0.55	23.61

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 GUE dlo  
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	AUS	CAN	USA	GBR
AUS	0.05			
CAN	0.60	7.93		
USA	0.63	0.90	2.88	
GBR	0.62	0.91	0.87	0.38

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 HOL dlo  
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	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	0.62	0.88	6.39																		
CHE	0.73	0.77	0.83	12.23																	
DEU	0.67	0.86	0.87	0.87	12.57																
DFS	0.69	0.85	0.86	0.82	0.92	12.27															
ESP	0.55	0.80	0.88	0.77	0.83	0.76	11.58														
FRA	0.58	0.60	0.61	0.75	0.63	0.70	0.58	0.98													
GBR	0.68	0.90	0.90	0.78	0.86	0.83	0.88	0.56	0.31												
IRL	0.57	0.85	0.79	0.65	0.75	0.70	0.76	0.44	0.80	2.09											
ISR	0.60	0.57	0.55	0.66	0.68	0.71	0.57	0.62	0.57	0.57	105.37										
ITA	0.51	0.67	0.75	0.73	0.74	0.68	0.88	0.63	0.76	0.62	0.54	5.82									
NLD	0.54	0.64	0.65	0.72	0.71	0.75	0.61	0.66	0.63	0.47	0.68	0.53	268.94								
NZL	0.63	0.66	0.67	0.72	0.72	0.67	0.51	0.49	0.65	0.62	0.44	0.46	0.49	2.22							
USA	0.63	0.86	0.89	0.79	0.88	0.88	0.88	0.65	0.84	0.72	0.71	0.76	0.73	0.58	2.23						
HUN	0.44	0.59	0.69	0.57	0.59	0.54	0.77	0.52	0.65	0.49	0.44	0.71	0.46	0.45	0.72	1.20					
CZE	0.44	0.51	0.57	0.57	0.56	0.48	0.69	0.44	0.58	0.55	0.44	0.65	0.44	0.44	0.57	0.52	16.48				
SVN	0.44	0.77	0.71	0.60	0.73	0.67	0.68	0.50	0.69	0.64	0.58	0.53	0.65	0.55	0.77	0.45	0.44	24.49			
ZAF	0.60	0.82	0.88	0.66	0.80	0.74	0.85	0.49	0.85	0.86	0.49	0.67	0.46	0.62	0.85	0.68	0.56	0.67	29.73		
POL	0.44	0.44	0.45	0.55	0.56	0.48	0.59	0.44	0.47	0.44	0.44	0.61	0.44	0.44	0.49	0.44	0.51	0.45	0.44	12.54	
JPN	0.60	0.90	0.94	0.73	0.86	0.86	0.86	0.52	0.90	0.83	0.49	0.68	0.61	0.68	0.87	0.68	0.54	0.76	0.90	0.44	1.65

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 JER dlo  
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	AUS	CAN	DFS	NLD	NZL	USA	GBR	ZAF	IRL
AUS	0.04								
CAN	0.49	7.39							
DFS	0.68	0.70	12.06						
NLD	0.58	0.63	0.79	342.94					
NZL	0.47	0.50	0.62	0.47	1.95				
USA	0.60	0.83	0.81	0.74	0.55	2.36			
GBR	0.53	0.88	0.74	0.64	0.54	0.80	0.30		
ZAF	0.46	0.65	0.54	0.46	0.46	0.67	0.66	26.85	
IRL	0.52	0.70	0.60	0.46	0.48	0.68	0.71	0.72	1.59

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 RDC dlo  
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	AUS	CAN	DEU	DFS	NZL	USA	GBR	NLD	ZAF	IRL	NOR	CAM
AUS	0.05											
CAN	0.54	7.13										
DEU	0.66	0.85	12.32									
DFS	0.65	0.75	0.92	12.99								
NZL	0.62	0.56	0.71	0.64	2.45							
USA	0.56	0.86	0.88	0.86	0.68	2.45						
GBR	0.62	0.90	0.84	0.75	0.56	0.81	0.31					
NLD	0.55	0.65	0.72	0.76	0.55	0.77	0.62	329.94				
ZAF	0.51	0.86	0.78	0.56	0.51	0.79	0.81	0.49	32.29			
IRL	0.53	0.76	0.72	0.64	0.58	0.65	0.72	0.49	0.80	1.49		
NOR	0.54	0.79	0.73	0.80	0.45	0.80	0.66	0.79	0.61	0.65	40.97	
CAM	0.47	0.61	0.77	0.74	0.77	0.80	0.62	0.73	0.51	0.44	0.54	8.90

SIM dlo

	FRM	NLD	SVN	GBR	USA
FRM	0.98				
NLD	0.55	286.32			
SVN	0.46	0.70	22.11		
GBR	0.66	0.60	0.69	0.26	
USA	0.74	0.75	0.74	0.82	2.03

^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	134	145	45	177	136	88	64	37
CHE	115	0	592	103	322	488	175	77	93
DEA	127	494	0	148	326	703	225	79	121
NLD	39	96	137	0	77	128	76	34	54
USA	173	298	289	66	0	251	122	93	46
ITA	122	426	614	103	179	0	204	82	113
FRA	79	131	167	61	84	163	0	59	66
GBR	64	61	56	30	91	62	52	0	24
SVN	34	87	114	53	38	112	65	21	0

GUE

common bulls below diagonal  
common three quarter sib group above diagonal

	AUS	CAN	USA	GBR
AUS	0	48	62	37
CAN	46	0	69	30
USA	58	60	0	89
GBR	32	25	91	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
AUS	0	687	1361	590	1593	1336	886	1247	1491	743	119	1124	1440	1030	1882	745	917	195	468	1059	929
BEL	594	0	732	546	1087	856	637	853	890	499	88	752	1105	413	891	529	659	183	303	774	538
CAN	1336	700	0	833	2376	1517	1302	1435	1772	563	142	1696	1559	591	3491	1059	1173	232	473	1490	1386
CHE	523	548	723	0	1109	720	555	642	765	402	73	709	909	321	992	437	548	157	251	688	475
DEU	1185	1102	1766	1040	0	2781	1530	2335	2329	896	185	2534	3378	791	3569	1314	1998	365	541	2657	1475
DFS	978	807	1284	674	2125	0	1087	1680	1871	797	176	1634	2339	729	2286	1003	1446	295	510	1808	1072
ESP	633	621	803	458	988	828	0	1146	1174	518	119	1272	1142	459	1595	817	937	216	440	1120	947
FRA	804	807	878	561	1176	866	798	0	1653	750	133	1583	1942	679	2501	976	1338	219	465	1701	1238
GBR	1355	908	2009	761	1983	1587	995	1071	0	1101	176	1695	2083	904	2527	1010	1336	265	538	1642	1182

IRL	640	489	507	413	786	669	493	574	1173	0	109	655	926	688	832	474	597	139	331	656	475
ISR	73	49	88	40	142	124	66	62	136	84	0	164	183	104	225	135	151	55	71	171	124
ITA	865	744	1379	650	1761	1347	939	870	1474	577	112	0	1743	579	2589	1084	1327	267	460	1750	1215
NLD	1232	1229	1426	892	3123	2115	998	1160	1995	869	134	1465	0	864	2598	1052	1676	304	500	2018	1121
NZL	993	321	542	269	568	497	335	361	807	589	83	431	759	0	921	446	584	121	331	558	499
USA	1865	785	3792	926	2632	1835	1053	1275	2464	752	213	1949	2181	845	0	1445	1845	276	630	2294	2078
HUN	571	448	936	368	1053	824	660	637	944	418	91	973	885	339	1423	0	1025	190	395	1066	787
CZE	620	530	830	423	1590	1016	691	834	1091	477	109	1004	1505	421	1496	951	0	253	429	1487	944
SVN	135	145	165	116	356	239	162	145	214	108	38	231	260	82	214	142	193	0	102	297	193
ZAF	407	258	397	210	422	387	381	311	491	291	44	367	408	262	606	315	299	73	0	416	434
POL	809	704	1249	579	2407	1531	798	1078	1550	547	129	1420	1891	414	2238	975	1259	266	311	0	1082
JPN	554	356	731	346	704	629	479	453	701	326	53	637	641	271	1027	473	468	112	312	622	0

JER

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common bulls below diagonal  
common three quarter sib group above diagonal

	AUS	CAN	DFS	NLD	NZL	USA	GBR	ZAF	IRL
AUS	0	252	159	71	370	486	238	235	56
CAN	257	0	113	38	140	451	182	161	12
DFS	130	106	0	111	134	214	200	155	52
NLD	64	33	111	0	61	90	94	72	34
NZL	402	150	114	54	0	304	220	175	125
USA	523	463	198	96	364	0	269	310	49
GBR	250	186	205	93	235	318	0	190	87
ZAF	229	157	139	68	186	325	200	0	40
IRL	54	11	48	33	139	50	93	40	0

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RDC

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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	96	36	206	106	128	91	29	36	18	70	10
CAN	99	0	13	177	52	222	102	6	70	5	7	0
DEU	36	12	0	57	12	23	14	15	2	6	14	0
DFS	185	182	48	0	127	209	126	50	49	20	143	0
NZL	107	51	12	122	0	75	60	13	30	10	29	8
USA	129	205	22	207	76	0	129	44	61	28	79	22
GBR	90	102	14	124	59	124	0	34	50	24	59	0
NLD	28	6	14	48	13	43	33	0	2	14	42	0
ZAF	37	72	2	48	26	55	43	2	0	2	0	0
IRL	17	5	6	16	10	28	23	14	2	0	58	0
NOR	60	6	13	116	27	80	62	41	0	56	0	0
CAM	10	0	0	0	8	22	0	0	0	0	0	0

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SIM

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common bulls below diagonal  
common three quarter sib group above diagonal

	FRM	NLD	SVN	GBR	USA
FRM	0	116	0	65	58
NLD	137	0	62	43	27
SVN	0	61	0	0	1
GBR	82	41	0	0	19
USA	73	29	1	26	0

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