

## Introduction

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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

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

DEA BSW Base group is shifted by 4 months  
Minor loss of data for few bulls related to some corrections/updates in the data base

DEU HOL Some changes in number of herds/daughters due to the exclusion of daughters without culling date  
and with last calving date over 750 days ago.

ZAF RDC Data since Dec 2011 is now included for herds participating in Milk Recording at the ARC.

SVN HOL/BSW Minor changes in numbers of herds/daughters due to pedigree change and/or phenotypic data improvement  
SIM

NZL HOL/JER Base change  
RDC/BSW Some decrease in information due to parentage testing  
GUE

CHE HOL/BSW Some decrease in information due to continuous work on the raw data by herd-book organizations  
SIM

ESP HOL Some daughters previously mistakenly coded as culled are now corrected to censored which caused a  
slight decrease in reliability for some sires

## INTERBULL CHANGES COMPARED TO THE APRIL ROUTINE RUN

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None

## 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 TEST RUN

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

Country	BSW	GUE	HOL	JER	RDC	SIM
AUS		129	7085	1555	622	
BEL			954			
CAN	197	96	10829	599	771	
CHE	2716		2982			
CZE			4116			3236
DEA	6076					
DEU			24299		374	
DFS			11763	2211	8300	
ESP			3071			
EST						
FRA	344		15615			
FRM						4142
FRR						
GBR	88	279	6690	720	450	73
HUN			2953			
IRL			2424	138	53	
ISR			1257			
ITA	1944		8842			
JPN						
KOR						
LTU						
LVA						
NLD	145		13201	103	41	246
NOR						
NZL	41	56	6613	4188	1120	
POL			8759			
PRT						
SVK						
SVN	339		430			514
URY						
USA	997	743	33596	3869	621	34
ZAF		28	1185	627	131	
HRV						
No. Records	12887	1331	166664	14010	12483	8245
Pub. Proofs	10717	1070	135783	11572	11341	7331

^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	8.31									
CHE	0.78	11.11								
DEA	0.82	0.85	14.22							
NLD	0.73	0.72	0.72	363.87						
NZL	0.50	0.53	0.42	0.46	291.15					
USA	0.92	0.70	0.77	0.82	0.53	2.80				
ITA	0.81	0.67	0.80	0.60	0.45	0.68	16.84			
FRA	0.67	0.77	0.78	0.68	0.42	0.65	0.57	0.94		
GBR	0.83	0.59	0.45	0.68	0.55	0.82	0.63	0.51	0.32	
SVN	0.73	0.64	0.81	0.77	0.51	0.71	0.79	0.66	0.56	25.46

GUE dlo

	AUS	CAN	NZL	USA	GBR	ZAF
AUS	7.07					
CAN	0.72	7.97				
NZL	0.71	0.56	348.28			
USA	0.67	0.90	0.52	2.82		
GBR	0.72	0.91	0.59	0.88	0.37	
ZAF	0.70	0.83	0.64	0.86	0.82	18.53

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							
AUS	4.43												
BEL	0.76	0.36											
CAN	0.73	0.84	6.28										
CHE	0.80	0.79	0.85	12.31									
DEU	0.67	0.85	0.91	0.82	13.07								
DFS	0.77	0.86	0.87	0.82	0.87	12.48							
ESP	0.47	0.67	0.79	0.74	0.82	0.67	13.11						
FRA	0.68	0.63	0.62	0.76	0.61	0.70	0.53	1.00					
GBR	0.71	0.87	0.89	0.77	0.85	0.82	0.77	0.54	0.31				
IRL	0.53	0.75	0.78	0.62	0.72	0.67	0.70	0.41	0.81	2.05			
ISR	0.60	0.60	0.56	0.61	0.54	0.68	0.48	0.75	0.54	0.44	102.32		
ITA	0.44	0.60	0.76	0.67	0.76	0.63	0.84	0.59	0.72	0.63	0.46	6.58	
NLD	0.72	0.74	0.69	0.70	0.68	0.81	0.52	0.66	0.65	0.50	0.67	0.48	315.06
NZL	0.67	0.68	0.55	0.59	0.55	0.63	0.46	0.42	0.58	0.57	0.40	0.39	0.46
211.14													
USA	0.71	0.84	0.91	0.77	0.87	0.88	0.79	0.63	0.86	0.76	0.66	0.73	0.80
0.56	2.31												
HUN	0.40	0.48	0.62	0.46	0.54	0.48	0.66	0.43	0.64	0.51	0.40	0.69	0.49
0.41	0.71	1.15											
CZE	0.40	0.47	0.62	0.59	0.65	0.47	0.65	0.38	0.57	0.59	0.35	0.66	0.39
0.39	0.60	0.55	19.68										
SVN	0.54	0.74	0.73	0.65	0.74	0.75	0.71	0.51	0.70	0.63	0.63	0.54	0.71
0.63	0.81	0.57	0.41	24.95									
ZAF	0.75	0.83	0.90	0.75	0.86	0.82	0.76	0.58	0.90	0.87	0.53	0.71	0.58
0.66	0.88	0.61	0.57	0.67	25.21								
POL	0.52	0.44	0.61	0.65	0.65	0.56	0.56	0.43	0.54	0.49	0.35	0.59	0.45
0.42	0.52	0.42	0.52	0.53	0.52	13.35							

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JER dlo

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	AUS	CAN	DFS	NLD	NZL	USA	GBR	ZAF	IRL
AUS	5.33								
CAN	0.47	6.72							
DFS	0.73	0.68	12.19						
NLD	0.59	0.70	0.73	360.25					
NZL	0.65	0.44	0.64	0.45	189.57				
USA	0.71	0.83	0.79	0.80	0.56	2.46			
GBR	0.51	0.82	0.74	0.66	0.44	0.76	0.29		
ZAF	0.49	0.60	0.75	0.56	0.47	0.62	0.77	28.55	
IRL	0.50	0.72	0.57	0.47	0.45	0.61	0.72	0.61	1.61

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RDC dlo

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	AUS	CAN	DEU	DFS	NZL	USA	GBR	NLD	ZAF	IRL
AUS	5.56									
CAN	0.64	6.82								
DEU	0.60	0.89	11.51							
DFS	0.78	0.73	0.81	13.01						
NZL	0.65	0.46	0.52	0.53	228.20					
USA	0.65	0.90	0.86	0.80	0.49	2.67				
GBR	0.61	0.88	0.86	0.78	0.47	0.82	0.30			
NLD	0.70	0.69	0.69	0.80	0.47	0.78	0.67	366.60		
ZAF	0.57	0.84	0.85	0.59	0.52	0.87	0.74	0.57	29.43	
IRL	0.58	0.78	0.75	0.68	0.57	0.71	0.80	0.54	0.82	1.37

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SIM dlo

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	FRM	NLD	CZE	SVN	GBR	USA
FRM	1.00					
NLD	0.54	297.94				
CZE	0.38	0.41	20.23			
SVN	0.53	0.78	0.37	21.98		
GBR	0.46	0.60	0.52	0.66	0.24	
USA	0.83	0.79	0.58	0.81	0.83	2.33

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^LAPPENDIX II. Number of common bulls

BSW

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common bulls below diagonal  
common three quarter sib group above diagonal

	CAN	CHE	DEA	NLD	NZL	USA	ITA	FRA	GBR	SVN
CAN	0	103	111	35	19	138	101	73	50	23
CHE	83	0	506	78	17	291	387	143	53	57
DEA	93	398	0	115	23	299	617	188	54	82
NLD	28	71	102	0	14	60	100	64	22	36
NZL	19	13	17	7	0	23	19	15	13	6
USA	134	274	262	48	19	0	217	115	66	31
ITA	89	331	514	80	16	150	0	165	55	76
FRA	66	107	141	50	12	77	132	0	41	45
GBR	52	44	39	18	11	66	43	37	0	14
SVN	21	58	77	36	4	25	77	45	12	0

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GUE

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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	60	26	2
NZL	25	10	0	28	14	2
USA	51	50	25	0	76	7
GBR	29	21	12	79	0	3
ZAF	2	0	0	4	2	0

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HOL

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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	415	1002	462	1314	986	674	1014	1178	612	82	988	1124	964	1441	573	730	135	427	761
BEL	315	0	381	318	583	430	358	491	501	311	45	449	616	288	483	291	372	96	212	381
CAN	873	329	0	652	1855	957	996	1102	1327	441	81	1288	994	562	2466	772	877	143	435	959
CHE	378	283	480	0	904	515	439	478	603	330	47	585	678	313	773	362	464	110	232	509
DEU	787	474	886	705	0	2205	1242	2027	1917	749	122	2180	2443	781	2900	1034	1676	228	527	1746
DFS	583	336	586	421	1057	0	773	1302	1358	637	117	1304	1529	665	1581	720	1060	181	455	1164
ESP	452	322	524	332	714	527	0	892	922	432	86	1026	841	431	1229	616	746	145	408	790
FRA	586	428	577	394	799	503	587	0	1360	638	104	1538	1506	649	2108	774	1104	150	422	1191
GBR	989	445	1468	570	1348	983	776	788	0	882	115	1444	1559	828	1916	783	1053	189	496	1152
IRL	505	278	376	325	604	487	400	465	918	0	77	601	764	611	671	390	492	103	300	500
ISR	54	25	48	31	95	92	53	49	91	63	0	116	118	87	130	88	102	36	56	108
ITA	616	342	769	500	1168	824	683	658	1101	497	87	0	1401	651	2211	861	1137	192	469	1245
NLD	872	615	730	615	1617	1105	670	730	1361	675	97	935	0	818	1887	778	1256	190	448	1277
NZL	924	213	558	256	536	414	315	331	737	516	71	459	715	0	885	418	557	103	327	520
USA	1267	372	2317	667	1501	941	734	930	1703	576	109	1206	1295	814	0	1084	1437	178	586	1531
HUN	413	216	631	288	745	534	485	469	729	345	70	711	589	331	998	0	816	133	360	763
CZE	435	261	545	332	1206	627	536	631	826	383	78	761	1033	389	1054	745	0	171	389	1087
SVN	91	73	102	79	203	143	108	93	152	78	29	159	156	72	139	105	131	0	86	185
ZAF	355	163	358	184	374	326	346	266	437	257	40	343	353	261	546	285	265	61	0	371
POL	491	302	635	389	1286	813	518	598	972	394	84	861	1018	361	1246	644	826	161	263	0

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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	186	114	48	354	390	183	186	39
CAN	191	0	75	24	138	311	138	126	5
DFS	82	64	0	54	123	162	143	119	25
NLD	42	18	52	0	52	59	60	53	18
NZL	394	151	100	44	0	295	179	169	81
USA	418	312	140	66	363	0	211	254	34
GBR	193	145	142	60	195	251	0	152	45
ZAF	179	123	100	50	178	265	165	0	26
IRL	37	4	21	17	89	35	48	27	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
AUS	0	83	26	163	110	98	55	14	34	10
CAN	83	0	9	100	67	179	76	5	69	3
DEU	24	8	0	46	7	11	4	9	1	4
DFS	143	96	36	0	132	133	59	25	48	13
NZL	111	66	7	128	0	85	52	7	35	6
USA	99	160	10	131	85	0	82	25	61	17
GBR	54	75	4	58	49	77	0	12	46	11
NLD	13	5	8	25	7	24	12	0	2	9
ZAF	34	71	1	47	31	55	39	2	0	2
IRL	9	3	4	10	6	17	11	8	2	0

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SIM

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common bulls below diagonal  
 common three quarter sib group above diagonal

	FRM	NLD	CZE	SVN	GBR	USA
FRM	0	93	163	0	57	22
NLD	114	0	125	30	41	14
CZE	192	121	0	57	43	14
SVN	0	31	56	0	0	0
GBR	73	40	39	0	0	17
USA	34	16	13	0	22	0

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