

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:

USA (ALL)	Separate groups for unknown foreign parents were removed because most such animals are now from countries with no domestic U.S. descendants. For HOL, BSW breeds, decrease in information due to the pedigree correction and herd-year minimum edits
AUS (ALL)	Some decrease in information due to pedigree, data updates and change in bulls' status which made bulls no longer qualifying for inclusion.
NLD (ALL)	Base change
ITA (JER)	First time participation. Index is calculated with a linear multiple trait animal model. There are the random effects of the animal and the herd*year of first calving. It is a combined index; breeding objective is survival to the 4th lactation, and it is calculated combining survival to 2nd, 3rd and 4th lactations. The index is expressed as mean 100 and SD of 5
CHE (ALL)	Drop of information due to changes in the groups of fixed effects regions and level (geographical) and edits in database. Base change.
POL (HOL)	Drop in information due to the data edits.
CAN (ALL)	Base change
ISR (HOL)	Drop in information due to the data edits and parentage correction
BEL (HOL)	Drop in information due to few pedigree correction
NZL (HOL, JER, RDC)	Drop in information due to the DNA parentage testing.
ITA (BSW)	Base change
ITA (HOL)	Base change. Drop in information due to the yearly data cut-off for phenotypes
DEU (ALL)	Base change
DEA (BSW)	Base change due to the rolling base definition
GBR (HOL, JER, BSW, RDC)	Drop in information due to the pedigree updates and clean up and data edits.
FRA (ALL)	Base change

INTERBULL CHANGES COMPARED TO THE PREVIOUS ROUTINE RUN

In 2020 new post-processing windows\200\231 correlations for all breeds and traits have been applied: 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. The previously lower value adopted (based on the 25th percentile) had been found too high causing estimated and post-processed correlations to differ significantly from each other. It is a recommendation from the Interbull Technical Committee to review such windows every 5 years. 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. More information can be read on https://interbull.org/ib/rg_procedure

Since 2021 a new trait group has been added to the MACE evaluation, called stcm (SNP Training for clinical mastitis) evaluating the trait cma (pure clinical mastitis). New trait group codes have been issued as follows: 041 for international ebv files (.itb), 071 for parent average (ipr).

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 2024).
Number of records for direct longevity by breed

Country	BSW	GUE	HOL	JER	RDC	SIM
AUS		144	8607	1830	779	
BEL			1903			
CAN	264	111	13585	858	914	
CHE	3230		3346			
CZE			5312			
DEA	5211					
DEU			24139		304	
DFS			14977	2715	9565	
ESP			4512			
EST						
FRA	497		18474			
FRM						5058
GBR	148	336	8593	911	644	107
HUN			3645			
IRL			3385	245	76	
ISR			1769			
ITA	2370		9100	68		
JPN			7134			
KOR						
LTU						
LVA						
NLD	227		16553	250	89	435
NOR					3991	
NZL			8102	4664	1049	
POL			12444			
PRT						
SVK						
SVN	305		674			514
URY						
USA	1222	824	42177	5359	810	106
ZAF			1262	723	134	
HRV						
CAM					45	
No. Records	13474	1415	209693	17623	18400	6220
Pub. Proofs	10695	1156	156560	14126	16443	5796

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

BSW	dlo								
	CAN	CHE	DEA	NLD	USA	ITA	FRA	GBR	SVN
CAN	9.09								
CHE	0.72	10.77							
DEA	0.89	0.84	12.25						
NLD	0.67	0.74	0.70	324.15					
USA	0.91	0.64	0.85	0.74	2.66				
ITA	0.79	0.71	0.86	0.62	0.71	15.86			
FRA	0.65	0.81	0.77	0.69	0.69	0.54	0.96		
GBR	0.85	0.59	0.64	0.61	0.84	0.65	0.62	0.32	
SVN	0.67	0.68	0.82	0.71	0.70	0.74	0.69	0.58	23.26

GUE dlo				
	AUS	CAN	USA	GBR
AUS	0.06			
CAN	0.58	7.88		
USA	0.63	0.89	2.89	
GBR	0.63	0.91	0.87	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	6.99																		
CHE	0.72	0.78	0.82	12.25																	
DEU	0.66	0.86	0.87	0.87	12.42																
DFS	0.68	0.85	0.86	0.81	0.92	12.19															
ESP	0.56	0.81	0.87	0.79	0.83	0.76	11.39														
FRA	0.56	0.65	0.66	0.78	0.66	0.69	0.64	0.94													
GBR	0.68	0.90	0.90	0.79	0.86	0.82	0.88	0.62	0.31												
IRL	0.58	0.85	0.78	0.67	0.75	0.70	0.76	0.45	0.80	2.11											
ISR	0.61	0.58	0.51	0.71	0.71	0.71	0.58	0.57	0.59	0.58	107.18										
ITA	0.54	0.69	0.76	0.74	0.75	0.69	0.89	0.70	0.78	0.64	0.57	6.07									
NLD	0.53	0.66	0.65	0.72	0.69	0.75	0.61	0.66	0.63	0.47	0.68	0.53	261.53								
NZL	0.65	0.68	0.68	0.75	0.75	0.70	0.54	0.49	0.67	0.66	0.51	0.50	0.50	2.22							
USA	0.64	0.85	0.89	0.80	0.89	0.88	0.87	0.69	0.84	0.72	0.72	0.77	0.74	0.62	2.20						
HUN	0.44	0.59	0.70	0.60	0.60	0.54	0.78	0.58	0.65	0.49	0.43	0.72	0.48	0.46	0.73	1.20					
CZE	0.44	0.51	0.57	0.57	0.56	0.46	0.69	0.44	0.57	0.57	0.45	0.61	0.44	0.44	0.57	0.53	18.84				
SVN	0.44	0.76	0.70	0.68	0.75	0.68	0.69	0.62	0.71	0.65	0.56	0.62	0.67	0.57	0.74	0.50	0.44	22.08			
ZAF	0.61	0.81	0.89	0.72	0.83	0.75	0.86	0.58	0.86	0.86	0.53	0.71	0.47	0.66	0.86	0.69	0.61	0.64	30.27		
POL	0.44	0.44	0.44	0.51	0.56	0.47	0.61	0.44	0.48	0.44	0.44	0.60	0.44	0.44	0.49	0.44	0.52	0.44	0.46	12.21	
JPN	0.62	0.90	0.94	0.75	0.87	0.86	0.87	0.58	0.90	0.83	0.50	0.71	0.63	0.70	0.87	0.68	0.56	0.75	0.90	0.44	1.56

JER dlo										
	AUS	CAN	DFS	NLD	NZL	USA	GBR	ZAF	IRL	ITA
AUS	0.04									
CAN	0.49	7.51								
DFS	0.67	0.68	11.98							
NLD	0.58	0.63	0.81	315.72						
NZL	0.48	0.52	0.60	0.47	1.96					
USA	0.59	0.82	0.79	0.75	0.55	2.35				
GBR	0.52	0.88	0.71	0.62	0.53	0.79	0.30			
ZAF	0.46	0.63	0.50	0.48	0.46	0.66	0.65	26.41		
IRL	0.50	0.67	0.56	0.46	0.49	0.65	0.67	0.68	1.60	
ITA	0.51	0.69	0.68	0.54	0.47	0.70	0.71	0.54	0.60	7.27

RDC dlo												
	AUS	CAN	DEU	DFS	NZL	USA	GBR	NLD	ZAF	IRL	NOR	CAM
AUS	0.05											
CAN	0.53	7.33										
DEU	0.65	0.84	12.53									
DFS	0.63	0.75	0.91	13.01								
NZL	0.63	0.57	0.70	0.56	2.54							
USA	0.56	0.86	0.88	0.86	0.66	2.48						
GBR	0.63	0.89	0.85	0.75	0.59	0.81	0.30					
NLD	0.56	0.65	0.71	0.77	0.54	0.77	0.63	322.41				
ZAF	0.50	0.89	0.78	0.59	0.57	0.81	0.82	0.48	35.48			
IRL	0.53	0.74	0.72	0.66	0.60	0.63	0.71	0.47	0.79	1.55		
NOR	0.52	0.76	0.70	0.80	0.45	0.81	0.72	0.80	0.63	0.53	40.78	
CAM	0.43	0.69	0.75	0.75	0.55	0.86	0.68	0.71	0.62	0.43	0.62	9.29

SIM	dlo	FRM	NLD	SVN	GBR	USA
FRM	0.94					
NLD	0.59	286.56				
SVN	0.50	0.60	22.55			
GBR	0.75	0.64	0.73	0.26		
USA	0.71	0.75	0.75	0.83	2.12	

^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	141	156	49	185	143	97	67	28
CHE	121	0	636	115	333	526	197	80	72
DEA	136	534	0	164	340	764	256	81	96
NLD	42	108	151	0	87	142	87	37	43
USA	179	310	304	76	0	261	135	97	33
ITA	128	465	671	116	188	0	233	84	89
FRA	88	156	207	72	100	196	0	66	47
GBR	65	62	56	30	93	63	57	0	16
SVN	26	67	89	43	27	84	47	13	0

GUE

common bulls below diagonal
common three quarter sib group above diagonal

	AUS	CAN	USA	GBR
AUS	0	53	68	41
CAN	52	0	75	35
USA	65	66	0	95
GBR	36	30	96	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	729	1487	644	1715	1445	946	1392	1599	794	134	1152	1533	1112	2055	785	965	160	472	1185	988
BEL	636	0	789	582	1172	933	700	992	958	532	95	788	1184	448	960	549	699	156	307	841	568
CAN	1479	755	0	900	2587	1736	1399	1623	1918	617	169	1888	1739	661	3879	1062	1281	215	476	1727	1484
CHE	569	582	797	0	1187	785	597	755	816	442	77	761	968	364	1059	445	568	135	252	755	511
DEU	1315	1197	2009	1114	0	3115	1676	2697	2514	971	209	2715	3694	887	3846	1318	2132	366	544	3033	1569
DFS	1088	883	1534	745	2486	0	1214	1956	2023	870	197	1795	2613	811	2570	1029	1563	276	513	2099	1149
ESP	690	683	911	498	1130	961	0	1372	1270	557	128	1360	1268	516	1726	843	1007	195	446	1277	994
FRA	986	986	1119	697	1659	1235	1152	0	1861	834	155	1718	2245	766	2728	1047	1500	223	504	2034	1346
GBR	1473	975	2171	815	2176	1750	1095	1393	0	1176	194	1766	2252	985	2728	1027	1416	233	541	1842	1254
IRL	690	520	560	451	858	736	535	702	1259	0	130	650	1007	752	911	496	632	116	334	728	512
ISR	82	54	102	43	158	143	73	94	153	96	0	179	203	122	283	136	169	52	71	201	143
ITA	926	792	1648	699	2047	1570	1037	1146	1576	583	121	0	1882	580	2780	1056	1397	274	418	2024	1243
NLD	1326	1316	1630	951	3496	2407	1124	1573	2191	951	155	1678	0	969	2824	1062	1792	286	502	2303	1206
NZL	1075	347	602	301	645	564	376	470	889	647	91	449	855	0	1029	484	633	102	336	635	546
USA	2087	846	4284	988	2962	2176	1183	1589	2696	832	272	2310	2434	957	0	1448	1992	256	634	2685	2203
HUN	598	464	941	373	1067	858	686	760	962	435	93	951	899	364	1426	0	1045	156	398	1093	805
CZE	656	556	927	439	1725	1123	758	1040	1161	498	129	1095	1620	458	1656	973	0	226	432	1647	1000
SVN	107	121	165	97	359	223	141	167	185	88	35	236	247	69	207	115	161	0	67	298	170
ZAF	410	263	400	212	425	390	388	386	494	294	44	340	411	265	610	317	303	48	0	419	437
POL	920	769	1517	647	2841	1842	962	1491	1773	616	155	1773	2209	482	2720	1002	1421	263	313	0	1170
JPN	606	386	824	372	788	698	529	575	759	357	63	696	721	308	1147	489	520	95	314	697	0

JER

```

common bulls below diagonal
common three quarter sib group above diagonal
  AUS  CAN  DFS  NLD  NZL  USA  GBR  ZAF  IRL  ITA
-----
AUS    0  267  190   79  398  515  259  249   64  43
CAN  274    0  149   47  159  489  203  166   14  37
DFS  165  146    0  163  159  276  243  176   62  39
NLD   70   40  166    0   76  112  113   77   44  23
NZL  436  169  140   69    0  336  248  191  145  35
USA  557  503  265  117  397    0  299  325   57  48
GBR  269  206  249  112  260  347    0  200  100  45
ZAF  241  162  162   73  200  340  210    0   43  42
IRL   61   13   58   42  160   58  108   43    0  13
ITA   41   35   39   20   35   50   46   41   12    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   99   42  222  116  140  102   36   36   22   75  11
CAN  102    0   13  196   54  235  116    6   70    5    7   0
DEU   41   12    0   66   15   25   15   18    2    6   15   0
DFS  201  203   57    0  137  228  150   55   49   21  151   0
NZL  117   53   15  132    0   80   69   19   30   11   31   9
USA  142  218   23  226   81    0  151   49   61   33   87  27
GBR  101  116   15  148   67  145    0   42   50   30   76   0
NLD   35    6   17   53   19   48   41    0    2   17   50   0
ZAF   37   72    2   48   26   55   43    2    0    2    0   0
IRL   21    5    6   17   11   33   29   17    2    0   63   0
NOR   64    6   14  125   29   88   80   49    0   61    0   0
CAM   11    0    0    0    9   27    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  123    0   65   84
NLD  144    0   74   44   31
SVN    0   72    0    0    1
GBR   82   42    0    0   20
USA   99   32    1   27    0
-----

```