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:

AUS (HOL,JER,RDC)	Some decrease in daughters and EDC due to data editing
NOR (RDC)	The rolling definition of hys (random) and herdX5yr (fixed) is causing the daughters to distribute somewhat differently over classes at each evaluation. Therefore some bulls occasionally may loose edc and reliability although number of daughters remain the same. Some cows disappear if they have been sold to a new herd since last evaluation. Usually there are less than five such cows per bull, but the number will be up to 20 for elite bulls with many recent daughters.
JPN (HOL)	First time
DEA (BSW)	Minor changes in number of daughters for some bulls
POL (HOL)	Decrease in number of herds/daughters/edc is caused by data edits.
NZL (ALL)	Drops in information due to continuous DNA parenting testing
SVN (ALL)	Base change, Holstein phenotype was cut off up to year 2002 (the cutoff year for Simmental and Brown Swiss is 2000)causing some decrease in reliabilities.
ESP (HOL)	Changes in data extraction and edits causing drop of information
CZE (HOL)	Made changes in herd book related to bulls category. No foreign information for BVs are used therefore all previous ToP "21" appear now as 11 or 12 as all information comes from domestic daughters.

INTERBULL CHANGES COMPARED TO THE PREVIOUS ROUTINE RUN

Subsetting:

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

The window so far applied for MAS evaluation have been found too high compared to the within-country genetic correlation between mastitis and SCS available from the literature. It has been an ITC recommendation to adjust the windows for MAS in this test run to make them more in line with the values available from the literature. The recommendation has been approved by the Steering committee.

Also, according to the decision taken by ITC in Orlando (2015) to review all windows every five (5) years, an overall review of the windows for all traits will take place during the first half of 2020 with the aim of implementation set for the September 2020 test run.

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 (August Routine Evaluation 2020).
Number of records for direct longevity by breed

Country	BSW	GUE	HOL	JER	RDC	SIM
AUS		137	7985	1737	725	
BEL			1684			
CAN	230	103	12434	754	859	
CHE	3008		3481			
CZE			4831			
DEA	6548					
DEU			22220		269	
DFS			13767	2536	9283	
ESP			3845			
EST						
FRA	405		17068			
FRM						4642
GBR	122	309	7816	819	555	81
HUN			3469			
IRL			2958	197	65	
ISR			1516			
ITA	2162		9454			
JPN			6369			
KOR						
LTU						
LVA						
NLD	183		15328	165	71	351
NOR					3829	
NZL	54	57	7800	4798	1265	
POL			10591			
PRT						
SVK						
SVN	407		599			617
URY						
USA	1121	792	38822	4747	724	64

ZAF		1246	692	135		
HRV						
MEX						
CAM				40		
No.Records	14240	1398	193283	16445	17820	5755
Pub. Proofs	11716	1116	150044	13428	16065	5067

^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	8.91									
CHE	0.73	10.99								
DEA	0.80	0.85	14.13							
NLD	0.65	0.80	0.80	317.55						
NZL	0.59	0.59	0.45	0.51	329.37					
USA	0.91	0.66	0.78	0.72	0.60	2.71				
ITA	0.78	0.67	0.79	0.62	0.45	0.68	16.07			
FRA	0.65	0.77	0.79	0.68	0.53	0.68	0.53	0.94		
GBR	0.85	0.60	0.50	0.60	0.63	0.84	0.64	0.53	0.31	
SVN	0.73	0.65	0.81	0.72	0.53	0.72	0.78	0.65	0.56	23.97

GUE dlo

	AUS	CAN	NZL	USA	GBR
AUS	0.05				
CAN	0.63	7.71			
NZL	0.72	0.68	282.35		
USA	0.66	0.90	0.66	2.85	
GBR	0.64	0.91	0.70	0.87	0.37

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	0.66	0.38																			
CAN	0.65	0.86	6.20																		
CHE	0.75	0.78	0.84	12.32																	
DEU	0.70	0.85	0.89	0.86	12.65																
DFS	0.72	0.86	0.86	0.82	0.93	12.33															
ESP	0.56	0.78	0.87	0.77	0.84	0.75	11.79														
FRA	0.61	0.61	0.59	0.76	0.64	0.71	0.57	0.98													
GBR	0.70	0.89	0.91	0.80	0.87	0.83	0.88	0.56	0.31												
IRL	0.58	0.83	0.79	0.65	0.74	0.69	0.76	0.45	0.80	2.07											
ISR	0.61	0.58	0.56	0.64	0.64	0.70	0.53	0.67	0.55	0.53	104.00										
ITA	0.52	0.64	0.75	0.72	0.74	0.67	0.87	0.61	0.75	0.62	0.51	5.87									
NLD	0.57	0.64	0.64	0.74	0.72	0.75	0.61	0.67	0.63	0.47	0.65	0.52	265.99								
NZL	0.70	0.75	0.65	0.75	0.76	0.73	0.54	0.58	0.67	0.68	0.53	0.46	0.53	248.43							
USA	0.66	0.86	0.90	0.80	0.88	0.89	0.88	0.65	0.85	0.74	0.68	0.75	0.73	0.66	2.25						
HUN	0.45	0.56	0.65	0.53	0.57	0.52	0.75	0.46	0.65	0.51	0.43	0.68	0.46	0.45	0.71	1.28					
CZE	0.45	0.51	0.60	0.57	0.59	0.49	0.70	0.44	0.59	0.57	0.43	0.68	0.45	0.45	0.60	0.53	13.02				
SVN	0.46	0.80	0.72	0.62	0.74	0.70	0.70	0.51	0.71	0.67	0.58	0.54	0.65	0.66	0.80	0.52	0.45	25.40			
ZAF	0.75	0.86	0.88	0.77	0.89	0.86	0.85	0.63	0.89	0.86	0.58	0.70	0.60	0.78	0.90	0.62	0.57	0.71	23.86		
POL	0.45	0.45	0.48	0.58	0.60	0.52	0.61	0.45	0.51	0.45	0.44	0.62	0.45	0.45	0.52	0.45	0.52	0.47	0.49	12.65	
JPN	0.62	0.89	0.94	0.72	0.86	0.85	0.85	0.50	0.89	0.83	0.47	0.67	0.59	0.70	0.87	0.68	0.55	0.76	0.90	0.45	1.81

JER dlo

	AUS	CAN	DFS	NLD	NZL	USA	GBR	ZAF	IRL
AUS	0.04								
CAN	0.51	7.18							
DFS	0.67	0.67	12.16						
NLD	0.59	0.61	0.79	336.89					
NZL	0.67	0.51	0.70	0.52	226.49				
USA	0.62	0.82	0.79	0.75	0.60	2.38			
GBR	0.58	0.85	0.75	0.65	0.51	0.81	0.29		
ZAF	0.50	0.60	0.67	0.55	0.48	0.71	0.74	27.69	
IRL	0.57	0.70	0.58	0.46	0.54	0.66	0.70	0.59	1.57

RDC dlo

	AUS	CAN	DEU	DFS	NZL	USA	GBR	NLD	ZAF	IRL	NOR	CAM
AUS	0.05											
CAN	0.57	6.86										
DEU	0.64	0.86	12.50									
DFS	0.66	0.74	0.90	12.94								
NZL	0.70	0.51	0.64	0.52	278.45							
USA	0.60	0.86	0.88	0.85	0.51	2.53						
GBR	0.65	0.90	0.83	0.74	0.52	0.81	0.31					
NLD	0.54	0.65	0.74	0.75	0.51	0.76	0.61	327.18				
ZAF	0.56	0.85	0.84	0.62	0.55	0.85	0.80	0.61	29.77			
IRL	0.55	0.75	0.72	0.63	0.60	0.66	0.72	0.48	0.79	1.53		
NOR	0.56	0.77	0.72	0.83	0.45	0.82	0.65	0.77	0.62	0.65	40.95	
CAM	0.45	0.53	0.66	0.62	0.44	0.62	0.50	0.64	0.45	0.44	0.47	9.34

SIM dlo

	FRM	NLD	SVN	GBR	USA
FRM	0.98				
NLD	0.59	279.48			
SVN	0.63	0.71	22.39		
GBR	0.60	0.61	0.71	0.26	
USA	0.74	0.76	0.80	0.82	2.22

^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	122	137	41	24	164	120	84	57	35
CHE	101	0	582	92	24	314	458	168	68	86
DEA	114	475	0	138	33	330	714	222	69	115
NLD	36	87	128	0	22	71	118	74	34	49
NZL	22	19	26	14	0	29	27	22	17	13
USA	153	292	292	60	24	0	240	122	82	43
ITA	105	396	603	97	23	171	0	198	71	107
FRA	73	125	166	59	19	83	156	0	52	62
GBR	53	51	46	25	14	73	49	44	0	23
SVN	31	79	107	49	11	35	106	61	18	0

GUE

common bulls below diagonal
common three quarter sib group above diagonal

	AUS	CAN	NZL	USA	GBR
AUS	0	46	26	61	36
CAN	46	0	13	68	29

NZL	26	11	0	28	15
USA	56	58	26	0	88
GBR	32	24	13	90	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	656	1268	568	1489	1242	837	1184	1393	702	104	1124	1358	1109	1751	697	863	179	461	969	867
BEL	563	0	681	520	1016	791	596	804	843	474	79	742	1035	454	840	498	615	167	297	696	508
CAN	1217	647	0	829	2196	1367	1228	1357	1639	527	120	1591	1406	668	3199	995	1102	204	469	1299	1312
CHE	488	518	657	0	1089	699	537	617	747	390	62	695	860	371	977	429	545	143	258	638	465
DEU	1078	1032	1547	953	0	2551	1448	2224	2172	851	166	2463	3094	887	3343	1240	1887	321	535	2330	1390
DFS	880	738	1124	609	1868	0	1007	1593	1746	758	157	1616	2134	806	2092	927	1354	264	504	1616	994
ESP	587	566	717	423	909	743	0	1090	1103	493	107	1230	1054	510	1502	756	881	193	434	1013	894
FRA	745	755	803	520	1071	770	739	0	1580	721	126	1646	1852	746	2408	935	1293	207	459	1565	1192
GBR	1240	863	1856	708	1818	1443	932	993	0	1029	152	1672	1935	978	2353	949	1264	244	530	1485	1122
IRL	606	468	473	392	745	628	475	553	1100	0	102	664	885	711	782	451	570	128	328	611	453
ISR	64	47	75	37	130	118	60	59	119	77	0	149	161	108	193	119	129	50	67	149	106
ITA	823	701	1213	618	1628	1250	888	845	1408	582	111	0	1680	713	2528	1039	1307	244	482	1585	1196
NLD	1141	1141	1253	814	2785	1884	903	1061	1834	826	122	1358	0	973	2403	983	1566	272	493	1772	1044
NZL	1079	366	654	310	660	562	377	411	892	612	86	535	869	0	1017	490	637	132	349	621	545
USA	1690	729	3354	856	2313	1596	957	1187	2245	700	178	1747	1953	958	0	1349	1743	248	622	2012	1978
HUN	524	418	867	345	970	740	597	599	890	404	83	904	813	378	1306	0	968	168	390	964	740
CZE	571	492	761	399	1478	916	642	794	1020	452	97	969	1405	464	1380	899	0	233	424	1363	887
SVN	123	136	147	103	310	215	147	136	193	100	38	209	232	91	191	128	174	0	102	264	173
ZAF	397	254	394	210	417	380	374	303	483	289	44	379	401	281	596	310	296	72	0	408	427
POL	705	629	1029	513	2039	1310	688	940	1371	511	113	1216	1615	467	1880	852	1131	234	304	0	990
JPN	498	329	658	314	627	557	436	419	646	307	48	581	575	301	930	437	424	102	303	543	0

JER

common bulls below diagonal
common three quarter sib group above diagonal

	AUS	CAN	DFS	NLD	NZL	USA	GBR	ZAF	IRL
AUS	0	239	140	64	414	458	219	225	54
CAN	243	0	98	33	165	416	168	152	10
DFS	107	87	0	101	139	193	177	143	45
NLD	57	28	97	0	66	78	84	66	32
NZL	448	174	114	59	0	337	228	196	118
USA	492	422	167	84	404	0	252	298	45
GBR	228	170	173	81	240	294	0	178	80
ZAF	217	147	122	62	203	312	186	0	38
IRL	52	9	38	31	131	46	86	38	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	94	35	192	123	119	87	24	38	17	63	10
CAN	96	0	12	159	80	208	94	6	72	5	6	0
DEU	35	11	0	48	14	20	14	14	3	6	13	0
DFS	171	162	39	0	157	182	117	45	51	19	135	0
NZL	124	79	14	151	0	107	80	19	37	12	35	9
USA	120	190	20	178	106	0	117	38	63	27	69	21
GBR	85	93	14	114	75	110	0	29	51	23	53	0
NLD	23	6	14	44	18	37	28	0	3	13	39	0
ZAF	39	74	3	50	33	57	44	3	0	3	0	0
IRL	16	5	6	15	12	27	22	13	3	0	54	0
NOR	53	6	12	107	33	71	56	39	0	52	0	0
CAM	10	0	0	0	9	21	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
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  FRM    0  107    0   63   46
  NLD  128    0   53   42   20
  SVN    0   52    0    0    0
  GBR   80   40    0    0   19
  USA   61   22    0   26    0
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