Introduction

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

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

NOR	RDC	Standard deviation changed from 10 to 12
FRA	BSW/SIM	Base change
	HOL	
ITA	HOL	Base change, One year cut off of data
NZL	BSW/JER	New organization providing data
	HOL/RDC	New Zealand has continuous DNA parentage testing so herds/daughters/edc will always
	GUE	change, herd count corrected for some bulls
CAN	BSW/JER	Base change
	HOL/RDC	
	GUE	
ISR	HOL	Base change
CHE	BSW	Changed the deduction of type of proofs for all traits Implemented new rules for the publication of proofs
ITA	BSW	Base change, changed procedure to estimate reliabilities and EDC, parentage correction. Changed formula to standardized the ebv
ZAF	HOL/JER	Data since 2012 on 18 ARC herds were added, which influenced the breeding values of certain birth years bulls

INTERBULL CHANGES COMPARED TO THE DECEMBER 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.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 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 2016).
Number of records for direct longevity by breed

Country	BSW	GUE	HOL	JER	RDC	SIM
AUS		127	7033	1542	611	
BEL			934			
CAN	195	97	10667	587	761	
CHE	2692		2923			
CZE			4116			3236
DEA	6033					
DEU			24061		370	
DFS			11581	2190	8212	
ESP			2943			
EST						
FRA	335		15485			
FRM						4103
FRR						
GBR	86	278	6606	709	444	71
HUN			2921			
IRL			2413	139	52	
ISR			1246			
ITA	1928		8718			
JPN						
KOR						
LTU						
LVA						
NLD	157		13069	117	55	248
NOR						
NZL	41	56	6604	4185	1124	
POL			8553			
PRT						
SVK						
SVN	333		422			508
URY						
USA	985	736	33176	3803	608	34
ZAF		28	1180	621	128	
HRV						
No.Records	12785	1322	164651	13893	12365	8200
Pub. Proofs	10621	1061	134457	11472	11235	7283

^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	8.22									
CHE	0.78	11.06								
DEA	0.82	0.85	14.11							
NLD	0.73	0.72	0.72	363.04						
NZL	0.50	0.53	0.42	0.46	290.25					
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	0.33	
SVN	0.73	0.64	0.81	0.77	0.51	0.71	0.79	0.66	0.56	25.31

GUE dlo

	AUS	CAN	NZL	USA	GBR	ZAF
AUS	6.98					
CAN	0.72	7.98				
NZL	0.71	0.56	344.37			
USA	0.67	0.90	0.52	2.79		
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

	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	12.35								
DEU	0.67	0.85	0.91	0.82	13.09							
DFS	0.77	0.86	0.87	0.82	0.87	12.45						
ESP	0.47	0.67	0.79	0.74	0.82	0.67	13.17					
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	0.40	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	102.10	
ITA	0.44	0.60	0.76	0.67	0.76	0.63	0.84	0.59	0.72	0.63	0.46	6.55
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
314.71												
NZL	0.67	0.68	0.55	0.59	0.55	0.63	0.46	0.42	0.58	0.56	0.40	0.39
0.46	210.45											
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	2.32										
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	1.14									
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	0.62	0.63	0.54
0.71	0.63	0.81	0.57	0.41	25.09							
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	24.93						
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	13.03					

JER dlo

	AUS	CAN	DFS	NLD	NZL	USA	GBR	ZAF	IRL
AUS	5.33								
CAN	0.47	6.76							
DFS	0.73	0.68	12.18						
NLD	0.59	0.70	0.73	337.93					
NZL	0.65	0.44	0.64	0.45	189.13				
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	0.28		
ZAF	0.49	0.60	0.75	0.56	0.47	0.62	0.77	29.03	
IRL	0.50	0.72	0.57	0.47	0.45	0.61	0.71	0.61	1.69

RDC dlo

	AUS	CAN	DEU	DFS	NZL	USA	GBR	NLD	ZAF	IRL
AUS	5.54									
CAN	0.64	6.78								
DEU	0.60	0.89	11.66							
DFS	0.78	0.73	0.81	13.00						
NZL	0.65	0.46	0.52	0.53	228.61					
USA	0.65	0.90	0.86	0.80	0.49	2.66				
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	349.11		
ZAF	0.57	0.84	0.85	0.59	0.52	0.87	0.74	0.57	29.62	
IRL	0.59	0.78	0.75	0.68	0.57	0.71	0.80	0.55	0.82	1.45

SIM dlo

	FRM	NLD	CZE	SVN	GBR	USA
FRM	1.00					
NLD	0.54	291.89				
CZE	0.38	0.41	20.23			
SVN	0.53	0.78	0.37	22.35		
GBR	0.46	0.60	0.52	0.66	0.23	
USA	0.83	0.79	0.58	0.81	0.83	2.49

^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	103	111	45	19	137	101	72	50	23
CHE	84	0	499	82	17	289	382	141	53	55
DEA	93	392	0	124	23	298	612	182	54	79
NLD	39	73	113	0	17	71	109	74	28	35
NZL	19	13	17	10	0	23	19	15	13	6
USA	132	273	260	61	19	0	214	115	65	31
ITA	90	328	507	88	16	149	0	162	55	75
FRA	65	105	137	59	12	77	129	0	41	43
GBR	52	44	39	24	11	66	43	37	0	14
SVN	21	56	74	35	4	25	76	43	12	0

GUE

common bulls below diagonal
common three quarter sib group above diagonal

	AUS	CAN	NZL	USA	GBR	ZAF
AUS	0	43	26	56	34	3
CAN	43	0	13	61	27	2
NZL	26	11	0	28	14	2
USA	51	51	26	0	75	7
GBR	29	22	12	78	0	3
ZAF	2	0	0	4	2	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
AUS	0	411	990	451	1296	973	659	1001	1163	604	81	970	1114	960	1431	569	725	134	423	745
BEL	305	0	373	313	571	425	349	483	496	307	44	437	606	284	477	288	370	94	210	374
CAN	852	322	0	636	1825	939	969	1078	1315	437	79	1265	977	559	2421	758	875	140	431	921
CHE	371	277	465	0	884	499	423	463	587	322	47	561	661	306	755	359	454	107	228	491
DEU	764	457	841	680	0	2167	1206	1998	1883	741	119	2141	2383	768	2858	1024	1667	224	519	1681
DFS	563	325	558	402	1019	0	757	1286	1334	630	115	1276	1500	659	1555	712	1048	179	452	1119
ESP	443	306	496	318	692	510	0	866	901	423	83	998	819	426	1197	605	735	142	402	764
FRA	568	416	553	381	777	482	563	0	1346	631	102	1514	1488	642	2084	763	1093	146	419	1160
GBR	967	436	1450	553	1299	953	753	769	0	871	114	1419	1535	824	1899	776	1048	186	492	1122
IRL	496	274	372	318	594	475	393	457	903	0	77	591	758	606	666	389	488	101	298	491
ISR	54	24	47	31	93	90	52	49	89	63	0	113	117	85	129	88	102	36	54	106
ITA	598	329	748	474	1132	792	664	637	1076	487	86	0	1373	639	2182	848	1123	184	463	1196
NLD	857	600	712	599	1552	1065	648	711	1331	668	97	914	0	814	1865	768	1253	188	445	1238
NZL	916	210	556	249	520	404	307	320	731	513	70	446	708	0	882	416	556	103	325	504
USA	1242	365	2236	648	1453	906	704	907	1672	571	108	1177	1271	809	0	1069	1438	177	581	1474
HUN	407	212	614	285	736	521	476	461	721	344	70	699	585	328	984	0	814	132	358	753
CZE	431	260	542	329	1196	620	527	623	821	380	78	751	1030	388	1055	742	0	171	387	1071
SVN	88	72	100	76	197	141	104	89	150	76	29	152	152	72	138	103	129	0	85	182
ZAF	351	162	354	184	367	319	343	265	433	255	40	338	350	259	541	285	264	61	0	364
POL	471	293	605	377	1217	765	502	572	939	384	82	832	981	348	1187	631	819	156	257	0

JER

common bulls below diagonal
common three quarter sib group above diagonal

	AUS	CAN	DFS	NLD	NZL	USA	GBR	ZAF	IRL
AUS	0	183	114	52	353	384	178	185	38
CAN	189	0	74	28	138	304	134	124	5
DFS	82	63	0	65	123	160	143	118	26
NLD	47	22	62	0	56	65	67	58	18
NZL	392	151	100	48	0	293	175	169	81
USA	413	308	139	71	361	0	205	251	33
GBR	189	141	142	68	190	245	0	148	42
ZAF	178	122	99	55	177	262	160	0	26
IRL	36	4	22	17	89	35	45	27	0

RDC

common bulls below diagonal
common three quarter sib group above diagonal

	AUS	CAN	DEU	DFS	NZL	USA	GBR	NLD	ZAF	IRL
AUS	0	80	24	159	107	93	54	16	32	10
CAN	80	0	9	95	67	177	75	5	68	3
DEU	22	8	0	46	7	11	4	12	1	4
DFS	139	91	36	0	129	125	57	34	47	12
NZL	108	66	7	125	0	85	52	7	34	6
USA	94	158	10	124	85	0	79	25	60	17
GBR	53	74	4	56	49	74	0	11	45	10
NLD	14	5	11	34	7	24	11	0	2	9
ZAF	32	69	1	45	30	53	38	2	0	2
IRL	9	3	4	9	6	17	10	8	2	0

SIM

common bulls below diagonal
common three quarter sib group above diagonal

	FRM	NLD	CZE	SVN	GBR	USA
FRM	0	101	163	0	56	22
NLD	123	0	130	28	45	14
CZE	192	126	0	55	43	14
SVN	0	29	54	0	0	0
GBR	71	43	39	0	0	16
USA	34	16	13	0	20	0