

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) If the oldest herdx4yr class (of a herd) is small, the data gets dropped. This cause a random loss of 1 to 2 daughters for old bulls, somewhat more if the daughter group was large. Base changed to a rolling cow base, based on cows born liability above 0.5.
IRL(HOL, JER, RDC) Survival records are all censored where the date of last calving is within 390 days of the date of extraction for the evaluation. Rewritten the code for assigning Proof Type/Status of Bull/Publishable as it was based on a ve
CHE (BSW) Based on manual data edits and the removal of data errors, the number of herds and the number of daughters for very few bulls decreased. The change of herd-year-season assignment of certain data records might explain the very small ch
CHE (HOL) Manual data editings causing drops in information especially for fertility because the changes in the data might affect the composition of the contemporary groups for this trait. The data used for HOL evaluations come from two differen
DEU (HOL, RDC, JER) Small changes in information due to data editings and pedigree corrections.
POL (HOL) Small decrease in information due to data edits.
SVN (HOL, BSW, SIM) Small drop in information due to changes in data base related to the pedigree completeness as well as phenotypic data improvement
ESP (HOL) Drops in information for some bulls higher than usual due to updating the database used for extracting the data.
USA (HOL) drops in information caused by data editings affecting mostly 20+ years old bulls which have now dropped below the threshold of number of daughters needed to be included in the evaluations.
ITA (HOL) Drops in information caused by data flow and data editings.

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.
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 (December Routine Evaluation 2019).
Number of records for direct longevity by breed

Country	BSW	GUE	HOL	JER	RDC	SIM
AUS		133	7775	1690	688	
BEL			1636			
CAN	221	102	12201	727	847	
CHE	2960		3402			
CZE			4213			3237
DEA	6458					
DEU			24327		314	
DFS			13524	2497	9207	
ESP			3753			
EST						
FRA	397		16879			
FRM						4557
GBR	114	307	7648	802	543	80
HUN			3370			
IRL			2836	182	65	
ISR			1478			
ITA	2130		9611			
JPN						
KOR						
LTU						
LVA						
NLD	179		15058	151	68	351
NOR					3809	
NZL	53	57	7812	4801	1269	
POL			10305			
PRT						
SVK						
SVN	392		572			606
URY						
USA	1105	785	38083	4606	710	53
ZAF			1245	687	133	
HRV						
MEX						
CAM					36	
=====						
No. Records	14009	1384	185728	16143	17689	8884
Pub. Proofs	11537	1105	145408	13245	15949	7908
=====						

^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	8.95										
CHE	0.73	11.03									
DEA	0.80	0.85	14.14								
NLD	0.65	0.78	0.79	335.29							
NZL	0.52	0.53	0.44	0.47	285.75						
USA	0.91	0.68	0.77	0.72	0.54	2.74					
ITA	0.79	0.67	0.79	0.62	0.45	0.68	16.10				
FRA	0.65	0.78	0.79	0.69	0.47	0.67	0.54	0.94			
GBR	0.85	0.60	0.49	0.60	0.57	0.84	0.64	0.53	0.32		
SVN	0.75	0.65	0.81	0.72	0.52	0.73	0.79	0.65	0.57	23.80	

GUE	dlo				
	AUS	CAN	NZL	USA	GBR
AUS	0.07				
CAN	0.73	7.77			
NZL	0.72	0.53	341.04		
USA	0.73	0.91	0.54	2.86	
GBR	0.75	0.91	0.60	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
AUS	0.05																			
BEL	0.72	0.38																		
CAN	0.74	0.86	5.99																	
CHE	0.81	0.78	0.84	12.32																
DEU	0.77	0.85	0.89	0.86	12.64															
DFS	0.79	0.86	0.86	0.82	0.92	12.35														
ESP	0.60	0.78	0.87	0.76	0.83	0.75	11.96													
FRA	0.68	0.61	0.59	0.76	0.64	0.71	0.56	0.99												
GBR	0.75	0.88	0.90	0.79	0.87	0.83	0.87	0.56	0.31											
IRL	0.61	0.82	0.79	0.65	0.74	0.69	0.76	0.44	0.80	2.06										
ISR	0.67	0.59	0.57	0.64	0.63	0.70	0.53	0.68	0.55	0.52	104.36									
ITA	0.54	0.63	0.75	0.71	0.74	0.66	0.87	0.61	0.74	0.62	0.52	6.00								
NLD	0.62	0.68	0.65	0.74	0.73	0.75	0.62	0.67	0.64	0.47	0.64	0.54	282.85							
NZL	0.68	0.69	0.55	0.61	0.66	0.65	0.49	0.48	0.60	0.61	0.45	0.44	0.48	207.69						
USA	0.72	0.86	0.90	0.79	0.88	0.88	0.87	0.64	0.85	0.74	0.68	0.74	0.74	0.57	2.26					
HUN	0.45	0.55	0.65	0.51	0.57	0.51	0.75	0.46	0.65	0.50	0.43	0.68	0.47	0.44	0.71	1.27				
CZE	0.45	0.51	0.63	0.58	0.61	0.50	0.71	0.44	0.59	0.57	0.42	0.68	0.45	0.44	0.62	0.52	12.76			
SVN	0.51	0.80	0.72	0.63	0.74	0.69	0.70	0.51	0.71	0.67	0.59	0.54	0.65	0.65	0.79	0.54	0.45	24.99		
ZAF	0.82	0.85	0.88	0.77	0.89	0.86	0.85	0.62	0.89	0.86	0.58	0.70	0.61	0.70	0.89	0.62	0.61	0.70	24.01	
POL	0.45	0.45	0.51	0.59	0.61	0.53	0.62	0.45	0.53	0.46	0.43	0.62	0.45	0.44	0.52	0.45	0.49	0.49	0.53	13.20

JER	dlo									
	AUS	CAN	DFS	NLD	NZL	USA	GBR	ZAF	IRL	
AUS	0.05									
CAN	0.53	7.00								
DFS	0.73	0.67	12.13							
NLD	0.65	0.61	0.79	342.14						
NZL	0.64	0.47	0.68	0.51	191.56					
USA	0.69	0.81	0.79	0.75	0.56	2.40				
GBR	0.60	0.85	0.75	0.65	0.48	0.80	0.29			
ZAF	0.56	0.59	0.68	0.56	0.47	0.70	0.74	27.93		
IRL	0.61	0.69	0.57	0.46	0.52	0.65	0.69	0.58	1.55	

RDC	dlo												
	AUS	CAN	DEU	DFS	NZL	USA	GBR	NLD	ZAF	IRL	NOR	CAM	
AUS	0.06												
CAN	0.68	6.74											
DEU	0.69	0.86	12.92										
DFS	0.74	0.73	0.89	12.95									
NZL	0.67	0.49	0.60	0.50	233.64								
USA	0.66	0.86	0.87	0.83	0.50	2.54							
GBR	0.72	0.90	0.83	0.73	0.51	0.80	0.31						
NLD	0.60	0.66	0.75	0.77	0.47	0.78	0.62	328.21					
ZAF	0.61	0.85	0.83	0.61	0.53	0.84	0.79	0.61	30.66				
IRL	0.57	0.75	0.72	0.62	0.58	0.67	0.72	0.47	0.79	1.48			
NOR	0.62	0.78	0.71	0.83	0.45	0.84	0.67	0.74	0.62	0.64	40.50		
CAM	0.46	0.50	0.63	0.65	0.44	0.61	0.49	0.67	0.45	0.44	0.50	9.13	

SIM	dlo	FRM	NLD	CZE	SVN	GBR	USA
FRM		0.98					
NLD		0.59	295.39				
CZE		0.45	0.45	20.20			
SVN		0.69	0.71	0.45	22.54		
GBR		0.55	0.62	0.54	0.71	0.25	
USA		0.75	0.77	0.59	0.79	0.81	2.34

^LAPPENDIX II. Number of common bulls

BSW

common bulls below diagonal

	CAN	CHE	DEA	NLD	NZL	USA	ITA	FRA	GBR	SVN
CAN	0	117	131	40	24	161	115	81	57	32
CHE	94	0	569	90	24	311	447	166	67	79
DEA	106	465	0	136	32	327	702	218	68	105
NLD	35	85	126	0	21	68	114	72	33	45
NZL	22	19	25	13	0	29	26	22	17	12
USA	150	290	288	57	24	0	236	121	80	41
ITA	98	386	590	93	22	168	0	194	70	99
FRA	72	125	165	57	19	83	155	0	52	56
GBR	53	51	46	25	14	73	49	44	0	23
SVN	28	75	97	45	10	33	98	56	18	0

GUE

common bulls below diagonal

	AUS	CAN	NZL	USA	GBR
AUS	0	46	26	60	36
CAN	46	0	13	67	29
NZL	26	11	0	28	15
USA	55	57	26	0	87
GBR	32	24	13	89	0

HOL

common bulls below diagonal

	AUS	BEL	CAN	CHE	DEU	DFS	ESP	FRA	GBR	IRL	ISR	ITA	NLD	NZL	USA	HUN	CZE	SVN	ZAF	POL
AUS	0	632	1197	543	1508	1197	799	1155	1342	683	102	1113	1304	1082	1676	673	774	171	459	923
BEL	541	0	653	504	1017	763	582	784	823	461	79	738	1002	447	814	481	562	164	296	672
CAN	1118	615	0	801	2231	1305	1200	1322	1588	506	115	1557	1339	664	3073	957	906	193	469	1224
CHE	467	502	632	0	1091	673	519	599	721	375	62	681	830	368	948	418	486	138	256	617
DEU	1060	1032	1513	948	0	2618	1461	2312	2231	862	162	2491	3187	922	3445	1234	1726	309	556	2261
DFS	823	704	1053	581	1827	0	977	1560	1697	735	152	1596	2052	793	2010	898	1188	256	504	1539
ESP	565	556	698	415	917	714	0	1059	1082	483	108	1218	1026	504	1469	742	778	187	436	982
FRA	717	725	768	501	1109	740	715	0	1554	708	125	1663	1815	739	2372	911	1160	196	459	1513
GBR	1177	836	1800	683	1853	1382	919	959	0	994	146	1666	1883	959	2269	915	1113	232	531	1422
IRL	583	455	450	375	756	605	465	537	1066	0	97	659	861	692	755	440	527	122	327	585
ISR	61	47	73	37	132	116	60	59	113	75	0	144	156	107	184	115	111	48	67	140
ITA	775	688	1150	601	1617	1198	877	822	1381	571	106	0	1655	730	2525	1019	1153	239	490	1521
NLD	1074	1101	1180	786	2824	1784	880	1011	1776	804	122	1312	0	967	2322	948	1333	255	492	1671
NZL	1051	361	648	308	696	551	374	399	869	597	86	538	863	0	1011	484	590	129	350	611
USA	1577	701	3171	828	2315	1498	935	1150	2154	673	169	1677	1854	947	0	1293	1485	236	623	1913
HUN	496	397	827	335	966	714	583	574	862	391	83	884	773	371	1233	0	856	162	390	924
CZE	478	440	580	352	1312	734	571	676	872	407	83	801	1126	409	1111	784	0	194	408	1159
SVN	122	133	138	102	301	215	144	130	188	96	37	205	218	90	179	126	145	0	102	244

ZAF	389	252	393	208	434	379	374	300	481	287	44	381	400	281	596	308	278	71	0	409
POL	654	604	942	496	1948	1229	666	891	1300	485	109	1147	1502	455	1756	813	899	219	304	0

JER

common bulls below diagonal

common three quarter sib group above diagonal

	AUS	CAN	DFS	NLD	NZL	USA	GBR	ZAF	IRL
AUS	0	224	134	60	404	439	208	215	50
CAN	229	0	94	30	162	393	159	151	9
DFS	102	85	0	87	138	186	167	138	42
NLD	50	24	85	0	64	74	73	63	30
NZL	437	172	114	56	0	332	217	196	108
USA	472	401	162	79	399	0	242	295	44
GBR	218	163	164	70	230	283	0	173	76
ZAF	209	146	118	58	203	308	182	0	38
IRL	48	8	36	29	120	45	80	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	91	40	183	121	112	85	21	36	15	57	10
CAN	93	0	14	149	77	203	91	6	70	5	6	0
DEU	39	13	0	63	18	28	20	17	3	7	19	0
DFS	163	151	53	0	153	175	114	43	49	19	131	0
NZL	122	76	17	147	0	104	79	18	36	11	35	9
USA	113	187	28	172	104	0	115	35	61	27	67	18
GBR	83	90	19	110	74	108	0	28	49	23	48	0
NLD	20	6	17	42	17	34	27	0	3	13	37	0
ZAF	37	72	3	48	32	55	42	3	0	3	0	0
IRL	14	5	7	15	11	27	22	13	3	0	54	0
NOR	47	6	18	103	33	69	50	37	0	52	0	0
CAM	10	0	0	0	9	18	0	0	0	0	0	0

SIM

common bulls below diagonal

common three quarter sib group above diagonal

	FRM	NLD	CZE	SVN	GBR	USA
FRM	0	104	161	0	63	35
NLD	126	0	139	46	42	17
CZE	192	133	0	60	43	17
SVN	0	45	58	0	0	0
GBR	80	40	39	0	0	19
USA	50	20	17	0	26	0