

Introduction

The latest routine international evaluation for udder traits took place as scheduled at the Interbull Centre. Data from thirty-three (33) countries were included in this evaluation.

International genetic evaluations for udder health traits of bulls from Australia, Austria-Germany, Belgium, Canada, Croatia, Czech Republic, Denmark-Finland-Sweden, Estonia, France, Hungary, Ireland, Israel, Italy, Japan, Netherlands, New Zealand, Norway, South Africa, Slovak Republic, Spain, Switzerland, the United Kingdom, the United States of America, Poland, Lithuania, Latvia, Croatia, Slovenia, Portugal and Uruguay were computed. Brown Swiss, Holstein, Red Dairy Cattle, Guernsey, Jersey and Simmental breed data were included in this evaluation.

Countries sending real MAS data (other countries participate to the MAS evaluation using SCS data as predictor):

HOL : DFS, NLD, FRA, CAN, ITA, CHE, USA, DEU, GBR, AUS
RDC : DFS, NLD, CAN, GBR, AUS
BSW : NLD, FRA, CHE, GBR, USA
JER : DFS, NLD, CAN, GBR, AUS, USA
SIM : NLD, CHE, GBR
GUE : No evaluation for MAS yet

Changes in national procedures

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

EST (ALL)	Decrease in information due to the pedigree correction and updated herd information
NOR (RDC)	Decrease in information due to the rolling definition of hys.
DEA (BSW,SIM)	Cow base group has been shifted by 4 month (rolling base), decrease in information due to herd changes regarding the movement of cows herds in the valleys back to alpine pasturing.
JPN (HOL)	Decrease in information due to the poedigree changes.
AUS (ALL)	Decrease in information due to pedigree updates and status changes of some bulls which then leads to no longer qualifying
CHE (ALL)	Decrease in information due to the manual edits/ data correction in data base, change of hys assignment
SVN (All)	Decrease in information due to the changes in database regarding pedigree completeness and pheontype improvement.
BEL (HOL)	Decrease in information due to the pedigree correction
NZL(ALL)	Decrease in information due to the continious parentage verification and some phenotypic records updates.
ESP (HOL)	Base change.
GBR(ALL)	Decrease in information due to the data updates and pedigree correction.

INTERBULL CHANGES COMPARED TO THE PREVIOUS ROUTINE RUN

Post-processing Windows:

According to the decision taken by ITC in Orlando (2015) to review the post-processing windows every 5 years, during the 2020 the relative working group has been re-activated and new windows have been identified.

As before, 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. Over the past five years, in fact, the previous adopted lower value (25th percentile) had been found too high causing estimated and post-processed correlations to differ significantly from each other. The new lower values have been applied to all breeds and traits.

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.

The new weights are as follows:

No changes :: 2

Small changes:: 1
Big changes :: 0

More information can be read on https://interbull.org/ib/rg_procedure

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 udder health (August Routine Evaluation 2023).
 Number of records for milk somatic cells by breed

Country	BSW	GUE	HOL	JER	RDC	SIM
AUS		148	8825	1753	821	
BEL			2306			
CAN	274	109	13894	881	877	
CHE	3209		3377	100		3633
CZE			4803			
DEA	6045					24858
DEU			24223		302	
DFS			14481	2347	8162	
ESP			4616			
EST			1380		485	
FRA	494		18543			481
FRM						4786
GBR	151	312	7576	773	596	109
HUN			3164			190
IRL			3064			
ISR			1718			
ITA	2175		9673	66		1814
JPN			7016			
KOR			1689			
LTU			898		362	
LVA			1373		674	
NLD	232		17108	267	105	519
NOR					4336	
NZL	75	57	8887	5091	1447	
POL			12671			
PRT			2965			
SVK			1186			
SVN	334		680			672
URY			2097			
USA	1187	744	42111	5243	766	107
ZAF			1205	616	125	

ITA	0.90	0.82	12.46																				
NLD	0.87	0.86	0.78	4.14																			
CHE	0.82	0.88	0.86	0.83	9.85																		
DEA	0.92	0.91	0.85	0.88	0.74	12.24																	
HUN	0.86	0.82	0.88	0.86	0.84	0.87	16.37																
SVN	0.82	0.80	0.82	0.77	0.80	0.80	0.82	9.22															
GBR	0.74	0.88	0.75	0.81	0.89	0.76	0.82	0.76	2.55														
HRV	0.83	0.77	0.79	0.71	0.77	0.78	0.83	0.78	0.75	9.67													
USA	0.81	0.87	0.71	0.84	0.81	0.80	0.75	0.69	0.80	0.72	0.20												

^LAPPENDIX II. Number of common bulls

BSW

common bulls below diagonal

	common	three	quarter	sib	group	above	diagonal					
	CAN	FRA	NLD	USA	CHE	DEA	NZL	ITA	GBR	SVN		
CAN	0	97	58	187	150	159	32	144	68	32		
FRA	89	0	93	135	196	258	29	229	64	52		
NLD	53	80	0	91	112	167	30	144	41	46		
USA	183	99	82	0	332	343	37	241	95	40		
CHE	128	155	102	310	0	646	36	510	78	76		
DEA	143	214	156	310	540	0	50	730	80	103		
NZL	32	23	23	33	29	45	0	42	23	11		
ITA	128	195	117	170	454	630	35	0	82	95		
GBR	69	57	36	94	62	57	21	62	0	20		
SVN	29	51	45	32	72	94	10	91	16	0		

BSW

common bulls below diagonal

	common	three	quarter	sib	group	above	diagonal					
	CAN	FRA	NLD	USA	CHE	DEA	NZL	ITA	GBR	SVN		
CAN	0	86	55	58	74	157	32	142	32	32		
FRA	79	0	69	26	79	220	23	198	31	51		
NLD	48	60	0	20	54	149	30	132	21	45		
USA	59	25	18	0	30	51	15	44	19	12		
CHE	68	64	51	26	0	255	17	219	20	60		
DEA	143	176	138	45	222	0	50	729	39	102		
NZL	32	20	23	14	15	45	0	42	11	11		
ITA	127	166	106	35	192	630	35	0	43	95		
GBR	31	28	18	18	17	29	9	34	0	14		
SVN	29	49	44	11	57	94	10	91	12	0		

GUE

common bulls below diagonal

	common	three	quarter	sib	group	above	diagonal					
	CAN	GBR	USA	AUS	NZL							
CAN	0	35	78	54	14							
GBR	30	0	92	43	13							
USA	70	94	0	72	29							
AUS	52	36	70	0	26							
NZL	11	11	29	26	0							

GUE

HOL

common bulls below diagonal

	common	three	quarter	sib	group	above	diagonal																						
	CAN	CHE	DEU	DFS	EST	FRA	GBR	NLD	USA	ISR	ITA	AUS	HUN	BEL	JPN	ESP	ZAF	NZL	IRL	CZE	SVK	POL	LTU	LVA	PRT	KOR	SVN	HRV	URY
CAN	0	944	2659	1761	325	1703	1839	1838	4024	166	2005	1627	1122	928	1519	1477	505	843	579	1307	468	1795	300	566	1260	802	231	348	884
CHE	871	0	1218	795	194	784	749	996	1074	71	785	688	455	663	514	618	257	454	405	561	249	775	145	272	566	299	144	221	343

CAN	0	140	182	50	502	285	161	201	42	33
DFS	135	0	196	175	233	178	163	179	61	36
GBR	186	191	0	104	262	245	175	243	74	41
NLD	45	179	97	0	116	86	81	98	42	27
USA	531	216	288	122	0	532	300	407	74	42
AUS	293	149	250	77	580	0	243	469	60	41
ZAF	157	146	178	77	316	233	0	210	57	38
NZL	210	156	248	93	480	522	219	0	56	34
CHE	36	60	72	36	75	50	50	48	0	28
ITA	28	35	41	22	41	35	33	32	28	0

JER

common bulls below diagonal										
common three quarter sib group above diagonal										
	CAN	DFS	GBR	NLD	USA	AUS	ZAF	NZL	CHE	ITA
CAN	0	53	89	22	98	138	75	97	26	22
DFS	48	0	127	146	73	143	141	151	59	33
GBR	87	121	0	77	94	181	138	176	66	38
NLD	15	142	73	0	44	81	78	89	39	27
USA	89	62	95	43	0	177	127	135	41	26
AUS	126	109	185	74	187	0	238	464	57	40
ZAF	68	120	140	75	138	232	0	205	54	38
NZL	90	125	179	84	135	515	216	0	52	34
CHE	24	56	64	34	35	50	49	47	0	27
ITA	18	31	36	22	25	34	33	32	28	0

RDC

common bulls below diagonal														
common three quarter sib group above diagonal														
	CAN	DFS	GBR	NOR	USA	DEU	AUS	EST	ZAF	NZL	LTU	LVA	NLD	CAM
CAN	0	192	91	7	221	14	106	3	70	94	22	10	7	0
DFS	198	0	126	138	218	66	212	135	51	190	103	132	64	0
GBR	92	121	0	70	131	16	98	14	40	96	26	16	45	0
NOR	6	113	74	0	85	16	77	28	0	51	19	19	52	0
USA	208	216	126	86	0	25	150	26	59	136	37	25	49	31
DEU	13	57	16	15	23	0	44	32	1	22	28	36	18	0
AUS	107	186	93	66	153	43	0	42	34	166	43	40	43	13
EST	2	124	12	28	25	32	39	0	0	19	22	53	22	0
ZAF	72	48	35	0	53	1	34	0	0	35	5	2	3	0
NZL	92	187	91	51	137	22	167	18	30	0	22	19	27	13
LTU	21	89	24	18	33	27	40	22	5	22	0	44	15	0
LVA	10	91	16	17	22	30	36	46	2	16	40	0	17	0
NLD	7	62	44	51	48	17	41	21	3	27	14	16	0	0
CAM	0	0	0	0	31	0	13	0	0	13	0	0	0	0

RDC

common bulls below diagonal													
common three quarter sib group above diagonal													
	CAN	DFS	GBR	NOR	USA	AUS	EST	ZAF	NZL	LTU	LVA	NLD	CAM
CAN	0	88	33	3	83	34	0	35	37	18	7	3	0
DFS	87	0	87	140	209	227	135	46	188	102	126	63	0
GBR	31	82	0	60	92	61	7	27	65	20	14	34	0
NOR	3	114	63	0	85	77	28	0	51	19	19	45	0
USA	82	207	90	86	0	139	26	54	133	37	25	47	31
AUS	34	204	59	66	143	0	42	31	157	40	38	41	12
EST	0	124	7	28	25	39	0	0	19	22	49	21	0
ZAF	36	46	26	0	52	33	0	0	33	5	2	2	0
NZL	37	183	63	51	137	159	18	30	0	22	18	24	13
LTU	17	88	18	18	33	38	22	5	22	0	44	14	0
LVA	7	84	14	17	22	35	42	2	15	40	0	14	0
NLD	3	61	34	44	47	39	20	2	24	13	13	0	0
CAM	0	0	0	0	31	12	0	0	13	0	0	0	0

SIM

common bulls below diagonal
common three quarter sib group above diagonal
FRM FRA ITA NLD CHE DEA HUN SVN GBR HRV USA

FRM 0 2 186 132 240 275 2 11 66 2 86
FRA 1 0 142 80 14 259 4 50 0 102 3
ITA 211 125 0 258 101 1009 18 151 45 334 34
NLD 157 76 252 0 94 396 8 85 48 167 31
CHE 292 11 103 98 0 367 2 2 53 2 34
DEA 314 216 920 417 333 0 37 261 48 726 39
HUN 0 3 15 8 1 24 0 10 0 19 0
SVN 10 48 143 79 2 246 9 0 0 131 1
GBR 83 0 49 48 60 51 0 0 0 0 20
HRV 1 92 317 163 2 760 17 120 0 0 4
USA 101 3 41 32 33 42 0 1 27 4 0

SIM

common bulls below diagonal
common three quarter sib group above diagonal
FRM FRA ITA NLD CHE DEA HUN SVN GBR HRV USA

FRM 0 2 157 104 5 227 2 11 25 2 37
FRA 1 0 84 31 2 161 3 25 0 58 1
ITA 182 71 0 247 9 1008 18 151 18 334 34
NLD 127 30 241 0 8 362 8 78 18 158 31
CHE 5 2 9 8 0 97 0 0 1 0 5
DEA 275 124 920 381 90 0 37 261 20 726 39
HUN 0 2 15 8 0 24 0 10 0 19 0
SVN 10 22 143 73 0 246 9 0 0 131 1
GBR 34 0 23 20 1 25 0 0 0 0 17
HRV 1 51 317 155 0 760 17 120 0 0 4
USA 52 1 41 32 5 42 0 1 23 4 0
