INTRODUCTION

The latest routine international evaluation for calving traits took place
as scheduled at the Interbull Centre. Data from sixteen (16) countries were
included in this evaluation.

International genetic evaluations for calving traits of bulls from
Australia, Austria-Germany, Belgium, Canada, Denmark-Finland-Sweden,
France, Germany, Hungary, Ireland, Israel, Italy, Netherlands, Norway,
Switzerland, the United Kingdom, and the United States of America were computed.
Brown Swiss, Holstein, and Red Dairy Cattle breed
data were included in this evaluation.

CHANGES IN NATIONAL PROCEDURES

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

AUS ALL   For a number of traits there were slight reductions in the reliability.

ITA HOL   Bulls loosing info in terms of herds/daugthers and rel. This is related to
           the type of editing we have to do, some records can be lost or eliminated
         between consecutive runs.

CAN ALL   Some bulls lost daughters/herds/EDCs which is related to pedigree changes
           in our database.

NLD ALL   The decrease in reliability/edc in calving and fertility traits is caused
           due to a finetuning in the rel/edc calculation.

BEL HOL   Decreases in the number of herds but also in the number of daughters could
           be explained by the existence of "breed" alias leading to decreases in EDC.
         Moreover, these decreases in EDC and in reliabilities could be also due to a
         "rounding effect". Years with low correlation between run or/and with large
change in SD may be the result of the increase of bulls for these years especially for
the recent years

NOR RDC   The rolling definition of hys is causing the daughters to distribute
           somewhat differently over hys-classes at each evaluation. This may have large
effects for
        the oldest bulls where the hys get what is left over and may not contain a full
year.
        Therefore some bulls occasionally may loose EDC although the number of daughters
stay
        the same.
        Reliability changes is a function of the EDC changes and have been .02 or lower.

INTERBULL CHANGES COMPARED TO THE DECEMBER ROUTINE RUN
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1)   Data submission for pedigree, EBV/PTA, and parameters is
        possible only through uploading of the data to the Interbull
        Data Exchange Area (IDEA);
2)   Interbull Centre has moved to a completely new MACE evaluation
        software called "Dairy System for International Evaluation
        (DAISIE)", partly because of the extended use of IDEA for EBV/PTA,
        and partly because of our continuous efforts to make the system
        more effective than before;
3)   All trait groups (including conformation traits) are now evaluated
        in-house.
4)   The file containing heritability values now contain more decimal
        places for heritability, and one extra field for the definition of

reference base population;
5)   The file containing genetic correlations has changed name from
          rG_columns_all to cor{RUNID}.csv, and also contains one extra field
          for the number of common bulls;
6)   The file containing sire genetic standard deviations has changed name
          from sire_std_columns_all to std{RUNID}.csv;
7)   Sire-MGS based pedigree files are not distributed anymore;
8)   Parent averages in the "ipa" format are not distributed anymore;
9)   An import AI bull (type of proof = 21) with official publication
          status 'Y' from a given country is included in the distribution
          file if the bull has a first country proof included from a different
          country OR a second country proof is included with minimum required
          number of daughters or EDC (20, 10, 150, 20, 20, and 80) and herds
          (20, 10, 150, 20, 20, and 80) for different breeds (BSW, GUE, HOL,
          JER, RDC and SIM), respectively;
10)   Bulls with some missing pedigree information (sires and/or dam and/or
          birthdate) are excluded from evaluations;
11)   Standardization factors are not used anymore;
12)   Post-processing of genetic correlation are now applied to all trait groups.

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
in the 01x-proof file.

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.

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^LTable 1. National evaluation data considered in the Interbull
evaluation for calving (August Routine Evaluation 2015).
Number of records for direct calving ease by breed
```

Country	BSW	GUE	HOL	JER	RDC	SIM
ARG						
AUS			1698			
BEL			613			
CAN	118		10967		408	
CHE	2404		1786			
CZE						
DEA	5330					
DEU			16751		214	
DFS			11399		6403	
ESP						
EST						
FRA			10803			
FRM						
FRR						
GBR			2075			
HUN			1485			
IRL			1719		57	
ISR			314			
ITA			9351			
JPN						
KOR						
LTU						
LVA						
NLD	75		12705		32	
NOR					3478	
NZL			5982		940	
POL						
PRT						
SVK						
SVN						
URY						
USA	450		31441			
ZAF						
HRV						
No.Records	8377		119089		11532	
Pub. Proofs	9009	0	111946	0	11395	0

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

	DEA	NLD	USA	CHE	CAN
DEA	12.07				
NLD	0.89	6.17			
USA	0.64	0.79	0.13		
CHE	0.83	0.92	0.70	18.05	
CAN	0.73	0.87	0.81	0.81	7.20

BSW   mce

	DEA	NLD	USA	CHE	CAN
DEA	11.88				
NLD	0.64	5.32			
USA	0.68	0.83	0.15		
CHE	0.71	0.69	0.77	20.45	
CAN	0.63	0.80	0.85	0.74	6.76

HOL   dce

	AUS	CAN	CHE	DFS	FRA	ISR	ITA	NLD	USA	GBR	HUN	DEU	BEL	IRL	NZL
AUS	3.16														
CAN	0.74	6.30													
CHE	0.75	0.88	12.44												
DFS	0.79	0.90	0.89	12.71											
FRA	0.79	0.91	0.94	0.92	0.93										
ISR	0.68	0.83	0.81	0.85	0.85	3.17									
ITA	0.59	0.66	0.68	0.74	0.68	0.68	7.21								
NLD	0.81	0.89	0.92	0.92	0.92	0.78	0.70	6.43							
USA	0.72	0.80	0.82	0.83	0.89	0.80	0.60	0.80	0.13						
GBR	0.80	0.80	0.81	0.75	0.79	0.73	0.61	0.85	0.61	0.07					
HUN	0.62	0.60	0.61	0.60	0.60	0.65	0.60	0.61	0.60	0.61	1.12				
DEU	0.79	0.85	0.88	0.91	0.91	0.76	0.65	0.89	0.79	0.81	0.60	11.98			
BEL	0.52	0.61	0.66	0.64	0.62	0.69	0.61	0.61	0.61	0.61	0.61	0.61	11.25		
IRL	0.63	0.77	0.81	0.80	0.81	0.82	0.56	0.80	0.74	0.57	0.52	0.72	0.58	1.53	
NZL	0.64	0.74	0.74	0.82	0.76	0.72	0.62	0.77	0.68	0.61	0.51	0.73	0.51	0.80	3.31

```
HOL     mce
-------------------------------------------------------------------------------
          CAN      CHE      DFS      FRA      ISR      ITA      NLD      USA      GBR      HUN
DEU     BEL
CAN       6.56
CHE       0.84    14.34
DFS       0.84     0.82    12.50
FRA       0.93     0.91     0.78     1.31
ISR       0.60     0.70     0.73     0.61     3.09
ITA       0.78     0.78     0.57     0.82     0.59     9.25
NLD       0.81     0.80     0.81     0.83     0.58     0.61     5.35
USA       0.90     0.84     0.77     0.95     0.60     0.82     0.84     0.15
GBR       0.68     0.77     0.60     0.80     0.62     0.66     0.70     0.73     0.05
HUN       0.55     0.56     0.56     0.56     0.60     0.55     0.56     0.55     0.56     1.26
DEU       0.86     0.78     0.92     0.79     0.63     0.65     0.80     0.78     0.59     0.55
11.56
BEL       0.63     0.66     0.73     0.69     0.63     0.56     0.74     0.67     0.61     0.56
0.73    11.68


-------------------------------------------------------------------------------

HOL     dsb
-------------------------------------------------------------------------------
          AUS      CAN      CHE      DFS      FRA      ISR      ITA      NLD      USA      HUN
DEU
AUS       3.18
CAN       0.46     6.96
CHE       0.51     0.62    15.54
DFS       0.78     0.74     0.58    13.70
FRA       0.41     0.68     0.53     0.62     0.74
ISR       0.58     0.64     0.59     0.80     0.65     1.59
ITA       0.77     0.46     0.60     0.78     0.45     0.67     7.21
NLD       0.36     0.69     0.56     0.62     0.63     0.64     0.45     3.77
USA       0.36     0.64     0.59     0.61     0.65     0.64     0.45     0.60     0.08
HUN       0.70     0.46     0.61     0.51     0.46     0.51     0.60     0.46     0.46     1.10
DEU       0.66     0.69     0.59     0.87     0.60     0.85     0.56     0.61     0.60     0.46
11.75


-------------------------------------------------------------------------------
HOL     msb
-------------------------------------------------------------------------------
          CAN      CHE      DFS      FRA      ISR      ITA      NLD      USA      HUN      DEU
CAN       6.39
CHE       0.86    20.33
DFS       0.96     0.81    12.97
FRA       0.89     0.77     0.87     0.91
ISR       0.75     0.70     0.76     0.66     2.25
ITA       0.50     0.57     0.44     0.52     0.68     9.26
NLD       0.92     0.77     0.94     0.81     0.70     0.40     4.27
USA       0.76     0.80     0.73     0.76     0.63     0.46     0.72     0.13
HUN       0.41     0.55     0.41     0.41     0.45     0.55     0.41     0.40     1.22
DEU       0.95     0.78     0.96     0.84     0.78     0.51     0.90     0.74     0.40    12.04
-------------------------------------------------------------------------------
RDC     dce
-------------------------------------------------------------------------------
          CAN      DFS      NOR      NLD      DEU      IRL      NZL
CAN       6.45
DFS       0.88     9.19
NOR       0.82     0.95    12.74
NLD       0.88     0.92     0.89     4.74
DEU       0.85     0.91     0.89     0.89    11.80
IRL       0.78     0.82     0.81     0.81     0.74     0.91
NZL       0.76     0.81     0.76     0.78     0.76     0.80     2.81
```

```
--------------------------------------------------------------------------------
RDC      mce
--------------------------------------------------------------------------------
          CAN      DFS      NOR      DEU
CAN      5.84
DFS      0.79    10.77
NOR      0.74     0.80    13.56
DEU      0.84     0.84     0.76     9.59
```

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^LAPPENDIX II. Number of common bulls

BSW

```
 common bulls below diagonal
 common three quarter sib group above diagonal
      DEA   NLD   USA   CHE   CAN
  -----------------------------------------------------------------------------
  DEA     0    52   154   500    68
  NLD    40     0    19    36    13
  USA   106    16     0   176    80
  CHE   399    31   139     0    70
  CAN    51    10    67    52     0
  -----------------------------------------------------------------------------
```
BSW

```
 common bulls below diagonal
 common three quarter sib group above diagonal
      DEA   NLD   USA   CHE   CAN
  -----------------------------------------------------------------------------
  DEA     0    55    90   421    26
  NLD    44     0    22    33     8
  USA    77    18     0    85    21
  CHE   318    28    75     0    25
  CAN    22     5    19    20     0
  -----------------------------------------------------------------------------
```
HOL

```
 common bulls below diagonal
 common three quarter sib group above diagonal
      AUS   CAN   CHE   DFS   FRA   ISR   ITA   NLD   USA   GBR   HUN   DEU   BEL   IRL   NZL
  -----------------------------------------------------------------------------
  AUS     0   506   223   458   452    33   489   394   581   281   236   503   215   276   423
  CAN   456     0   465  1039  1025    46  1358   746  2478   489   552  1657   307   360   534
  CHE   180   345     0   336   354    18   405   330   515   204   194   625   232   219   211
  DFS   342   735   274     0  1186    63  1286  1245  1544   600   470  1787   333   447   630
  FRA   349   668   300   559     0    54  1448  1122  1725   667   535  1617   377   437   580
  ISR    22    32    10    48    27     0    58    64    64    30    32    59    19    40    57
  ITA   358   834   317   743   699    37     0  1119  2213   689   589  1905   344   444   630
  NLD   228   348   239   610   358    49   441     0  1479   591   405  1714   332   466   704
  USA   486  2375   409   943   824    47  1113   664     0   766   692  2403   335   481   801
  GBR   212   297   161   255   257    10   311   190   365     0   302   756   210   314   320
  HUN   172   448   143   311   319    23   406   199   544   168     0   694   191   221   269
  DEU   401  1041   508  1084   737    44   966   919  1393   321   467     0   434   547   658
  BEL   206   291   225   308   378    12   310   294   297   170   153   425     0   232   213
  IRL   263   339   211   388   377    27   378   344   443   267   191   507   232     0   481
  NZL   382   469   179   431   333    44   441   524   719   158   178   503   186   432     0
  -----------------------------------------------------------------------------
```

```
HOL
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
        CAN   CHE   DFS   FRA   ISR   ITA   NLD   USA   GBR   HUN   DEU   BEL
      ----------------------------------------------------------------------
  CAN     0   422   816   792    47  1024   620  1646   421   529  1436   199
  CHE   303     0   357   329    20   391   386   464   238   213   628   158
  DFS   583   295     0  1180    71  1151  1307  1344   492   543  1980   229
  FRA   472   283   471     0    65  1270  1187  1523   435   557  1717   252
  ISR    30    12    49    30     0    65    74    77    45    46    82    13
  ITA   664   305   671   536    40     0  1028  1705   485   600  1751   224
  NLD   415   316   777   440    57   536     0  1310   453   496  1929   264
  USA  1418   374   831   645    53   949   732     0   546   721  2194   224
  GBR   436   229   460   391    30   498   444   585     0   294   550   140
  HUN   440   164   367   320    28   434   316   595   279     0   778   131
  DEU   806   506  1033   655    56   887  1154  1179   562   523     0   300
  BEL   177   140   192   231     8   171   227   183   137   103   244     0
      ----------------------------------------------------------------------
HOL
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
        AUS   CAN   CHE   DFS   FRA   ISR   ITA   NLD   USA   HUN   DEU
      ----------------------------------------------------------------------
  AUS     0   353   152   327   270    19   340   341   393   134   346
  CAN   272     0   462  1008   881    43  1316  1010  2200   485  1643
  CHE   109   345     0   344   343    18   404   458   478   181   627
  DFS   191   767   283     0  1037    65  1310  1502  1447   447  1826
  FRA   174   608   293   520     0    43  1256  1148  1326   470  1518
  ISR     9    31    10    49    25     0    58    68    60    32    59
  ITA   176   831   317   768   605    37     0  1367  2040   535  1902
  NLD   226   856   406  1079   672    56   868     0  1609   460  2120
  USA   266  2169   376   937   620    45  1030  1127     0   582  2216
  HUN    71   383   131   292   281    23   367   309   435     0   636
  DEU   213  1044   510  1135   703    44   967  1561  1284   425     0
      ----------------------------------------------------------------------
HOL
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
        CAN   CHE   DFS   FRA   ISR   ITA   NLD   USA   HUN   DEU
      ----------------------------------------------------------------------
  CAN     0   419   802   720    46  1006   721  1458   468  1397
  CHE   302     0   364   323    20   390   443   426   199   622
  DFS   602   299     0  1082    73  1160  1424  1136   510  1996
  FRA   447   275   460     0    59  1161  1151  1140   499  1595
  ISR    30    12    49    27     0    65    78    69    45    82
  ITA   661   304   687   489    40     0  1142  1426   556  1736
  NLD   583   388   970   536    60   690     0  1195   501  2078
  USA  1332   349   831   530    51   906   836     0   588  1832
  HUN   387   151   345   292    27   402   346   513     0   717
  DEU   773   496  1048   598    56   866  1386  1060   476     0
      ----------------------------------------------------------------------
```

```
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RDC
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
       CAN   DFS   NOR   NLD   DEU   IRL   NZL
     ----------------------------------------------------------------------
   CAN     0   110     3     3     8     3    42
   DFS   110     0    98    25    51    18    97
   NOR     3    71     0    15    20    50    32
   NLD     3    25    14     0    12     8     9
   DEU     8    45    20    12     0     7    17
   IRL     3    14    48     7     7     0     9
   NZL    42    80    30     8    16     9     0
     ----------------------------------------------------------------------
RDC
--------
 common bulls below diagonal
 common three quarter sib group above diagonal
       CAN   DFS   NOR   DEU
     ----------------------------------------------------------------------
   CAN     0    73     3     6
   DFS    69     0   100    36
   NOR     3    79     0    12
   DEU     6    29    12     0
     ----------------------------------------------------------------------
```