The latest routine international evaluation for workability traits took place as scheduled at the Interbull Centre. Data from fourteen (14) countries were included in this evaluation.

International genetic evaluations for workability traits of bulls from Austria-Germany, Canada, Denmark-Finland-Sweden, France, Great Britain, Italy, Netherlands, Norway, New Zealand, Slovenia and Switzerland were computed. Brown Swiss, Holstein, Jersey and Red Dairy Cattle breed data were included in this evaluation.

Changes in national procedures

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

DFS (ALL)  Change in lactation weights for all traits and breeds
FRA (ALL)  Evaluation now performed by a new genetic centre, GENAL
NOR (RDC)  Testing an animal model for MSP. New data extraction pipeline, genetic groups, evaluation and EDC by Mix99, change of genetic base, change of genetic merit from T+ to B+.
CHE (BUL)  Correction in the software used for preparing the data, milking speed observations have been assigned to cows that actually did not have it. This error has now been corrected. Only observations made from 2005 or earlier were affected by this.
CHE (ALL)  Decrease of information due to continuous work on the raw data by herd-book organizations and joined data from two databases (for HOL-CHE and SIM-CHE).
NZL (ALL)  Continues DNA parentage testing resulting in pedigree editing.
SVN (ALL)  Pedigree updates and phenotypic data improvements

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 conformation 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**

- **Boichard et al., 1995. J. Dairy Sci. 78:431-437**

- **Weighting factors:** Fikse and Banos. 2001. J. Dairy Sci. 84:1759-1767

- **Genetic parameter estimation:** Klei and Weigel, 1998, Interbull Bulletin 17:8-14

- **Post-processing of estimated genetic correlations:** Mark et al., 2005, Interbull Bulletin 30:126-135

- **Time edits:** Weigel and Banos. 1997. J. Dairy Sci. 80:2425-2430
- **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](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](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.

*^Table 1. National evaluation data considered in the Interbull*
### Evaluation for Workability (December Routine Evaluation 2018)

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### Appendix I. Sire standard deviations in diagonal and genetic correlations below diagonal

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*Values are approximate and may vary.*
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|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| CAN | 0   | 96  | 104 | 97  | 34  | 17  | 63  |     |     |     |     |     |     |     |     |     |     |     |     |
| CHE | 78  | 0   | 512 | 399 | 56  | 42  | 144 |     |     |     |     |     |     |     |     |     |     |     |     |
| DEU | 88  | 429 | 0   | 550 | 81  | 64  | 175 |     |     |     |     |     |     |     |     |     |     |     |     |
| DFS | 81  | 341 | 454 | 0   | 72  | 58  | 154 |     |     |     |     |     |     |     |     |     |     |     |     |
| NLD | 28  | 53  | 72  | 56  | 0   | 25  | 51  |     |     |     |     |     |     |     |     |     |     |     |     |
| SVN | 14  | 41  | 59  | 57  | 22  | 0   | 33  |     |     |     |     |     |     |     |     |     |     |     |     |
| FRA | 55  | 108 | 129 | 123 | 41  | 31  |     |     |     |     |     |     |     |     |     |     |     |     |     |
|     | BSW |     | GUE |     |     | GUE |     |     |     |     |     |     |     |     |     |     |     |     |     |
| CAN | 0   | 736 | 1761| 1070| 1247| 1157| 918 | 1358| 149 | 356 | 1355|     |     |     |     |     |     |     |     |
| CHE | 612 | 0   | 855 | 518 | 508 | 685 | 420 | 592 | 100 | 225 | 553 |     |     |     |     |     |     |     |     |
| DEU | 948 | 657 | 0   | 1779| 1789| 2120| 934 | 1498| 227 | 386 | 1683|     |     |     |     |     |     |     |     |
| DFS | 738 | 437 | 889 | 0   | 1295| 1467| 820 | 1188| 174 | 414 | 1039|     |     |     |     |     |     |     |     |
| FRA | 462 | 620 | 678 | 508 | 0   | 1581| 889 | 1277| 130 | 457 | 1170|     |     |     |     |     |     |     |     |
| NLD | 1009| 648 | 1348| 1033| 766 | 0   | 966 | 1592| 184 | 541 | 1163|     |     |     |     |     |     |     |     |
| AUS | 777 | 340 | 520 | 437 | 479 | 732 | 0   | 911 | 104 | 574 | 656 |     |     |     |     |     |     |     |     |
| GBR | 1171| 372 | 1136| 95  | 163 | 75  | 126 | 0   | 52  | 173 | 222 |     |     |     |     |     |     |     |     |
| NZL | 1592| 137 | 196 | 211 | 123 | 214 | 0   | 914 | 574 | 688 | 0   |     |     |     |     |     |     |     |     |
| ITA | 1056| 892 | 717 | 582 | 868 | 463 | 935 | 144 | 235 | 0   |     |     |     |     |     |     |     |     |     |
|     | BSW |     | GUE |     |     | GUE |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| CAN | 0   | 647 | 1514| 890 | 1117| 1106| 888 | 1327| 346 | 1246|     |     |     |     |     |     |     |     |     |
| CHE | 528 | 0   | 638 | 413 | 455 | 353 | 367 | 545 | 200 | 493 |     |     |     |     |     |     |     |     |     |
| DEU | 760 | 464 | 0   | 1362| 1336| 1833| 824 | 1532| 338 | 1438|     |     |     |     |     |     |     |     |     |
| DFS | 542 | 327 | 582 | 0   | 1153| 1225| 759 | 1061| 397 | 924 |     |     |     |     |     |     |     |     |     |
| FRA | 654 | 377 | 590 | 441 | 0   | 1476| 835 | 1226| 415 | 1209|     |     |     |     |     |     |     |     |     |
| NLD | 861 | 517 | 1587| 728 | 737 | 0   | 957 | 1389| 534 | 1237|     |     |     |     |     |     |     |     |     |
| AUS | 758 | 306 | 433 | 362 | 477 | 723 | 0   | 914 | 573 | 688 |     |     |     |     |     |     |     |     |     |
| GBR | 1268| 500 | 768 | 601 | 569 | 1097| 664 | 0   | 434 | 1149|     |     |     |     |     |     |     |     |     |
| NZL | 324 | 190 | 259 | 253 | 219 | 485 | 449 | 339 | 0   | 315 |     |     |     |     |     |     |     |     |     |
| ITA | 892 | 419 | 718 | 575 | 553 | 799 | 457 | 867 | 253 | 0   |     |     |     |     |     |     |     |     |     |
|     | BSW |     | GUE |     |     | GUE |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| CAN | 0   | 59  | 9152| 64  | 22  |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| DFS | 44  | 0   | 11  | 75  | 75  | 39  |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| NLD | 56  | 0   | 14  | 132 | 13  | 77  |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| SVN | 135 | 404 | 0   | 114 | 24  |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| FRA | 66  | 52  | 12  | 170 | 0   | 22  |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| CHE | 20  | 38  | 4   | 23  | 20  | 0   |     |     |     |     |     |     |     |     |     |     |     |     |     |     |

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**JER**
### Common Bulls Below Diagonal

### Common Three Quarter Sib Group Above Diagonal

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