

CDCB changes to evaluation system (August 2019)

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Updates on fertility traits

By Jana Hutchison and Paul VanRaden

Four updates to fertility evaluations will be applied in the upcoming August 2019 evaluation: i) Management group changes; ii) the discontinuation of an outdated edit on breeding records; iii) the exclusion of early abortions used in EFC calculations, and iv) the inclusion of old (pre-1990) herds in Daughter Pregnancy Rate (DPR) calculation. Introduction of these updates is expected to have a negative evaluation trend in most recent animals, but they should result in an increased stability over time.

- Management groups in the multi-trait fertility evaluation model were defined separately for heifers (Heifer Conception Rate, or HCR) than for the other two cow traits (DPR and Cow Conception Rate, CCR). The intention was to use the heifer group only when the cow group was missing in the model. However, it was recently discovered that during the 2014 implementation of the fertility traits, the HCR group always overwrote the first lactation DPR/CCR group information. In other words, first lactation cows were grouped based on when they were bred as heifers rather than when they were bred as cows. Incorrect management grouping is thought to be the main reason for the seasonal increases and decreases in recent evaluations.
- A separate investigation of CCR edits revealed that an edit for non-consecutive reproductive events causes large increases in conception rates in the last few months of data. Thus, this edit was discontinued.
- A new edit is introduced in Early First Calving. Early abortions were previously considered as first calving, and they are now excluded from the calculations. Since the incidence of these cases was extremely low, the impact of this new edit is negligible on a population framework but could slightly change EFC on single animals. The new EFC edit removed about 250,000 records – or <1% of total EFC records – where first lactation began with an abortion.
- Lastly, some older herds (prior to 1990) had been erroneously excluded from the calculation since 2014 and are now included. Restoring these records had a very small impact, as nearly all herds before 1990 did have their DPR included previously; less than 100,000 records were accidentally excluded from the many million DPR records.

The revised model, implemented in 2014, was shown to be more accurate than the previous model; however, the model may need revision again to account for recent changes in fertility management.

VanRaden, P.M., Tooker, M.E., Wright, J.R., Sun, C., and Hutchison, J.L. Comparison of single-trait to multi-trait national evaluations for yield, health, and fertility. J. Dairy Sci. 97(12):7952-7962. 2014.

Consistent breed base in traditional evaluations of crossbred animals

By Gary Fok, Jay Megonigal and Paul VanRaden

In its original implementation in April 2019, some parameters obtained during the traditional evaluation of crossbred animals (e.g. expected future inbreeding, breed base use for non-genomic evaluations, etc.) were based on the breed of the animal ID. To keep all the information of animals in line, the breed of evaluation based on BBR (using genomic information) from the previous monthly evaluation will be used to determine these parameters during the traditional evaluation. This solution should keep aligned the information used for the evaluations of 99.9% of crossbred animals. Only new animals (e.g. not present at the latest monthly evaluation) with contrasting breeds in the ID and in their BBR results – thus a very reduced number of animals – would not be affected by this enhancement.

Another important new introduction is using dam's breed code in determining progeny's breed of evaluation for progeny with breed code XX, XD or other non-evaluated breed. The agreed rule was to use the breed evaluation of the sire. If the sire is unknown use the breed of the dam, and if neither is available, default to Holstein as breed of evaluation. In reviewing the code used to determine breeds, it was noticed that the dam was being bypassed as criteria, thus all these animals with missing sire were defaulting to Holstein. We are now enforcing the correct rule including the dam breed.

Validation of a different procedure to obtain reliabilities on crossbred animals is at an advanced stage and is being validated but will not be introduced in the August 2019 evaluation.

Use of international data for Holstein mastitis resistance

By Kristen Gaddis, Jay Megonigal and Paul VanRaden

Foreign phenotypes for mastitis resistance (MAST) could be helpful to enhance the domestic reference population, which is not yet as large as other traits. Programs that receive multi-trait across country evaluations (MACE) from Interbull were revised to integrate mastitis resistance into routine processing. The edits for MACE bulls were 1) only Holsteins because mastitis is not yet evaluated for other breeds, 2) only bulls with IDs from countries that provide mastitis data (CAN, DFS, FRA, BEL, CHE, and NLD), and 3) exclude bulls if the country of most daughters sends only SCS (such as USA bulls with daughters only in JPN).

Those edits gave about 52,000 MACE bulls for mastitis with an average REL of 51% on USA scale compared to 220,000 bulls for SCS with REL of 74%. After merging the MACE and domestic PTAs for mastitis, genomic PTAs were computed. USA has genotypes for the CAN bulls but not for most bulls in the other countries, which limited the reliability gains to about 1% for genomic prediction of young animals. Some of the foreign bulls with many mastitis daughters do gain REL themselves, but unless the bulls had genotypes at CDCB or were the sires of U.S. calves, their extra MACE enhanced the genomic predictions very little.

UPDATE AUGUST 2019: *Mastitis reliability gains in the August evaluation were larger than originally communicated. In addition, PTA correlations with previous Mastitis evaluations (e.g. not including foreign information) were lower than the ones obtained in all our tests performed prior to the evaluation. The reason for this unexpected effect comes from France including many more historic bulls than in April. The additional French bulls plus a 9% gain in domestic MAST records from 2.40 to 2.62 million explains the US young bull REL boost of 3.5% since April and 2.5% since the internal tests used to provide the statistics announced above.*

Unknown parent group modifications for WW Breed Code

By Paul VanRaden

In 2018, the international community unanimously decided the discontinuation of the RED breed code to indicate Red Holstein. These animals are identified as HOL across international exchanges. CDCB, just as every country affected by this decision, has been gradually cross-referencing most of these IDs in order to comply to the international standard. In the U.S., RED breed codes, converted to "WW", are still in use for legacy purposes.

The sharp reduction of animals assigned to this breed makes Unknown Parent Group (UPGs) for WW animals not large enough to be maintained as a separate group. Therefore, effective the August 2019 evaluation, WW animals with incomplete pedigrees will be assigned a Holstein UPG.

Genomic evaluation file format and end of line policy change

By Ezequiel Nicolazzi

In February, CDCB released the first test run of the new genomic evaluation format. Among many other changes, the new genomic evaluation files contain the aforementioned genomic parent averages instead of Traditional PTA and reliabilities. The first official release of the new format was on March 2019. In April 2019, the new file formats were released publicly. Both old and new formats will be released in August 2019 for the last time. Effective with the September 2019 genomic monthly and weekly evaluation, all genomic evaluation files (public and private) will only be distributed in the new genomic format. More information about this format can be found at [https://redmine.uscdcb.com/projects/cdcb-customer-service/wiki/Genomic_evaluations_format_\(CSV\)](https://redmine.uscdcb.com/projects/cdcb-customer-service/wiki/Genomic_evaluations_format_(CSV))

Another important change to be implemented on August 20 (the weekly after the August triannual release) is the zipping of weekly evaluations (similar to the procedure for monthly evaluations) and the standardization of the “end of line” (EOL) control character throughout CDCB systems. For legacy purposes, CDCB has continued to change the EOL's for zipped files to DOS EOL (CR LF) whereas unzipped files have LINUX EOL (LF). Effective August 20, all files released by the CDCB, irrespective of being zipped or not, will have a LINUX EOL (LF) control character.

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