

About Fertility Evaluations in April 2019

In April 2018 evaluations, larger-than-expected variation was observed in CDCB fertility traits (daughter pregnancy rate {DPR}, heifer conception rate {HCR} and cow conception rate {CCR}). Several recent AI bulls in all breeds showed a reduction in their traditional Predicted Transmitting Abilities (PTA). In earlier years, young bulls had unexplained increases or decreases averaging about 0.5/0.7% in April, but the changes were on average higher than 1.0% last April. Despite the drop in the mean for recent bulls, when comparing April to the previous run (December 2017), the individual bull rankings were still fairly stable having high correlations (0.98).

CDCB and AGIL staff investigated this undesirable pattern and discovered that the exceptionally larger fluctuation appeared to be due to the method of accounting for year-groups. For this reason, a revised yearly grouping strategy that incorporated age groups that were modified annually, instead of each 5 years was implemented in August 2018. The new model in August produced fertility evaluations for current bulls that compared more favorably with PTAs from December 2017 than before. In addition, the fertility traits did not show any trend fluctuation between August and December 2018.

Seasonal fluctuation remains unsolved

Although the revised model was expected to prevent the undesired exceptional variation in fertility traits that occurred in April 2018, the previously observed yearly April seasonal fluctuation remains unresolved. Despite the many efforts in finding the source of this seasonality, up to now, none of the investigated potential causes have been able to explain this effect. **Although the exceptionally large variation due to year-groups was resolved, the seasonal April downward trends on animals born recently is still visible (and will be present) in the upcoming evaluation released in April 2019.** Since the genomic evaluation for April 2019 is still in progress, the extent of the variation is still not measurable. Nevertheless, the traditional evaluation trends on the very last years of proven bulls indicate that a pattern similar to the previously observed seasonal variation on young animals and genomic PTAs (i.e. pre-April 2018) will be observed, with greater impact on Holstein than in other breeds.

CDCB and AGIL are undertaking additional investigations to reexamine the seasonality of this occurrence. Currently, none of the investigated potential causes have been able to fully explain this effect. As in previous years, there are indications that phenotypic trends in fertility traits are at least partially involved in the observed effects. However, the list of possible causes is large, and researchers are at work to investigate each one of them. A thorough revision on the way phenotypic data is received, handled and edited (fertility events, herd events and their frequency) is currently ongoing.

Although more likely to be one of the factors affecting these traits and not the cause of the observed variation, other model factors and the effects of inbreeding on fertility PTAs are also being considered. Expected future inbreeding, for example, uses a sample of mates a year younger every April. However the expected effect should account for less than 10% of the variation observed in the PTAs. The potential effect on reproductive events of miscoding of conventional vs. sexed semen is also an open area of investigation. It is likely that this variation is a combination of causes which, in combination to the seasonality of the events, makes the identification of the causes much more difficult.

CDCB and AGIL are committed to find a definitive answer to these undesired, and currently unexplained, seasonal trends on young animals in fertility traits. Further communication will follow, as for last year events, as research progresses.