16. New Milk Recording Methods and Services

Title presentation

Analysis of the accuracy of lactation qualification methods and use of weighting factors for genetic evaluation

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Abstract

In France, the Dairy Cattle Milk Recording Guidelines allow 8 protocols, each with 6 levels of recording intervals (between 4 to 9 weeks) approved by ICAR. The percentage of cows recorded with A protocol has decreased by 42 points during the last twenty years (from 92% in 2000 to 50% in 2020). Milk Recording Organizations have indeed wished to adapt and simplify protocols in keeping with the changes in measuring equipment, new services, etc.

The aim of this study was to determine the effect of all qualification methods on prediction accuracy of 305-day production traits (milk yields, fat yields, protein yields, fat%, protein%), a lactation model being use for the French genetic evaluation, and to calculate and/or update the different weighting factors applied to each method in the genetic evaluation. Two datasets have been created: one with 19047 lactations reference-305 days A4 method, another with 8250 lactations reference-305 days R4 method.

The methodology used for this study has consisted in simulating T4, Z4, T*4, Z*4 methods from reference A4 method and R*4 method from reference R4 method. A8, T8, Z8, T*8, Z*8, R8, R*8 methods have been obtained by taking into account only one of two test-day per lactation.

The 305-day production traits estimated for each simulated method were compared to those of the reference method. The accuracies of the other methods (5, 6, 7 and 9) have been extrapolated by means of a linear regression model. The calculation of the weighting factors for all methods took into account the determination coefficient (R^2) and the repetability level of each trait.

The results of accuracy (R^2, $1-R^2$, bias and standard deviation) underlined the fact that R2 is lower for all traits for 8 methods compared to 4 methods. For example, R2 is equal to 0.945 and 0.861 for fat yields and percent for T8 method compared to 0.989 and 0.962 for T4 method. Moreover the loss of accuracy is lower for R8 method compared to A8 method.

The comparison between the old and the new weighting factors for each lactation qualification method brought out an overall underestimation for milk yields, fat yields and protein yields and an overestimation for fat%, protein% with the old factors. For example, the new milk yield weighting factor for A8 method is equal to 0.95 compared with 0.93 previously. The weighting factors obtained

for new C protocol are low, mainly for fat% for which it, is equal to 0.44 for C9 method. The weighting factors will have an impact on the accuracy of the cows' index, low weighting factors leading to reduced accuracy.