

Genetics of the mid-infrared predicted lactoferrin content in milk of dairy cows

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Lactoferrin is an iron-binding glycoprotein found in bovine milk that presents therapeutic properties. It can be interesting for humans, as a biologically active food component. Also lactoferrin concentration was shown to be higher in milk from (sub)clinical mastitic cows and it could be considered as an indicator of udder health. The objectives of this study were to estimate genetic parameters of the mid-infrared prediction of lactoferrin content in milk (MIRLf; mg/l) and to estimate its genetic correlations with milk, fat, and protein yields, somatic cell count (SCS), and contents in milk (g/dl) of 7 groups of fatty acids (FA) predicted by mid-infrared spectrometry (saturated, monounsaturated, polyunsaturated, unsaturated, short chain, medium chain, and long chain). Variance components were estimated using a series of 11 two-trait random regression models. Dataset included records from 4928 first-parity Walloon Holstein cows and contained 88,270 milk, fat, and protein records; 85,664 SCS records; 62,628 MIRLf records; and from 61,834 to 61,974 FA records according to the trait. Heritability estimates for MIRLf ranged from 0.20 at 5 days in milk (DIM) to 0.40 at 250 DIM. Genetic correlation of MIRLf with yields decreased along the lactation; from 0.50 to -0.50 for milk, from 0.40 to -0.10 for fat, and from 0.55 to -0.25 for protein. Genetic correlation between MIRLf and SCS increased along the lactation from 0.10 at 5 DIM to 0.30 at 305 DIM. This positive correlation substantiated the potential interest of MIRLf as an indicator of udder health. Average daily genetic correlations between MIRLf and FA ranged from 0.25 to 0.35 and were higher for unsaturated FA. Concomitant selection of MIRLf and unsaturated FA is therefore feasible and this would be beneficial for the genetic improvement of nutraceutical properties of milk.