

613 Genetic parameters of stearoyl coenzyme-A desaturase 9 activity estimated by test-day model.

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Dairy and beef products account for a large part of fat intake in human nutrition and therefore can be linked to dietary diseases. The stearoyl Coenzyme-A desaturase 9 (delta-9) gene was identified as a potential functional candidate gene affecting milk fat composition in dairy cattle. The objective of this research was to estimate the genetic parameters of delta-9 activity indicator traits and to study the relationship between delta-9 activity as described by these indicator traits and common milk production traits. A total of 126,331 test-day records were obtained from 14,259 Holstein (> 84% Holstein gene) heifers belonging to 105 herds. The studied traits were milk yield, percentages of fat and protein, content of monounsaturated fatty acids, and 3 ratios reflecting the delta-9 activity (C14:1/ C14:0; C16:1/C16:0 and C18:1/C18). The used model was a multiple-trait random regressions test-day model and included as fixed effects: herd x date of test, class of age, and month x year. Random effects were herd x year of calving, permanent environmental, additive genetic, and residual effects. The fatty acid contents were estimated by mid-infrared spectrometry. Delta-9 activity varied within year and lactation. The obtained heritability estimates of delta-9 as well as the genetic and phenotypic correlation varied also through lactation. This study suggests potential improvements of delta-9 activity and subsequently milk fat composition can be achieved by animal management but also by breeding and animal selection.

Key Words: Delta-9 Desaturase, Genetic Parameters, Dairy Cattle