



IDF World Dairy Summit
United Dairy World 2009
BERLIN 20-24 SEPTEMBER

Conference 5 - Animal Feeding & Breeding

Environmental and Genetics Sources of the Variability of Stearoyl Coenzyme-A Desaturase 9 Activity During and Across Lactations.

Autor V.M.-R. Arnould¹, H. Soyeurt¹, N. Gengler^{1,2},

¹Gembloux Agricultural University, Animal Science Unit, Gembloux, Belgium,

²National Fund for Scientific Research, Brussels, Belgium.

Milk fatty acid (FA) profile is far from the optimal fat composition in regards to human health. Different natural sources of variation such as feeding or genetics could be used to modify the contents of unsaturated fatty acids. The impact of feeding is well described; however, the effect of genetics on the FA composition of milk was not well studied. Increasing the unsaturated fatty acids contents of bovine milk could have the potential to raise the nutritive and therapeutic values of dairy products. The stearyl 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 study the genetic variability on this enzyme activity across lactations using ratios of FA. A total of 199,977 test-day records were obtained from 29,603 Holstein cows in first lactation, 154,267 records from 23,453 Holstein cows in second lactation, and 173,244 records from 75,887 Holstein cows in third and later lactations. The used model was a multiple-trait random regressions test-day model. Fixed effects were: herd x date of test, and class of age. Random effects were: herd x year of calving, permanent environmental, additive genetic, and residual effects. The studied traits were milk yield, protein content, percentage of fat, monounsaturated fatty acids estimated by mid-infrared spectrometry, and the ratios reflecting the delta-9 activity. Obtained heritability estimates of delta-9 as well as the genetic and phenotypic correlations varied across lactations. These results suggest potential improvement milk FA composition based on delta-9 activity using animal selection and appropriate management practices.