

Fatty acid content of milk from Holstein-Friesian cows consuming different grass diets

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Short title: **Fatty acid content of milk from different diet**

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Summary

The aim of this study was to evaluate effects of three dairy cow groups consuming different diets (Diet A, Diet B and grazed grass) on cow milk fatty acid (FA) composition. The fatty acid methyl esters (FAMES) were prepared by the method of base catalyzed methylation of FAs with sodium methoxide in methanol. FAMES were determined by gas-liquid chromatography. The statistical analysis resulted in a two-principal-component model that explained 74.6% of the total variance. With our grass-based diets, the short-chain FAs (SCFAs) composed 7-11% of the cow milk FAs across all dietary groups. Conversely, if lipid dietary supplements are rich in medium-chain FAs (MCFAs), this could account for the different MCFA content of 45% in Diet B milk and 62% in Diet A milk. Long-chain FAs (LCFAs) composed 31-49% of cow milk FAs and, in contrast to MCFA, were the lowest in milk from Diet A, followed by milk from grazing, but were the highest in milk from Diet B. Very long-chain FAs (VLCFA) were very similar in the three milk groups and did not differ statistically.

In conclusion the most favorable FA composition was in milk from Diet B, comprising 50% grass. The least favorable FA composition was in milk from Diet A, comprising 20% grass and in milk from 100% grazed grass. The different feeding regimens resulted in dietary responses in the dairy cows that significantly affected the milk fat composition.