Content of Fatty Acids, Vitamin E and Carotenoids in Milk and Herbage as Affected by Sward Composition and Period of Grazing

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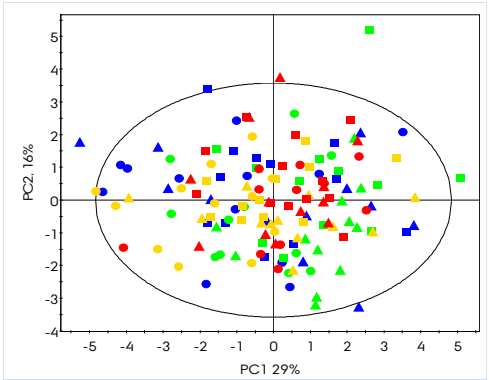
Introduction

The quality of organic milk is affected by feed composition and especially the high use of legumes has been identified as the reason for high levels of polyunsaturated fatty acids, carotenoids and tocopherols in organic milk. The aim of the present study was to investigate how milk composition was affected by grazing different species during the grazing period.

Experimental

Four different pastures composed of mainly white clover, red clover, lucerne or chicory, respectively were grazed by groups of 12 Holstein cows. Milk as well as swards was sampled three times during the grazing period.

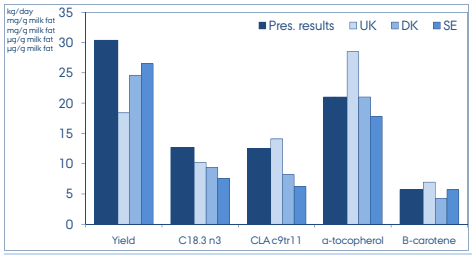
Feed quality of sward samples was analysed and content of tocopherols, carotenoids and fatty acid composition of sward as well as milk samples was analysed.



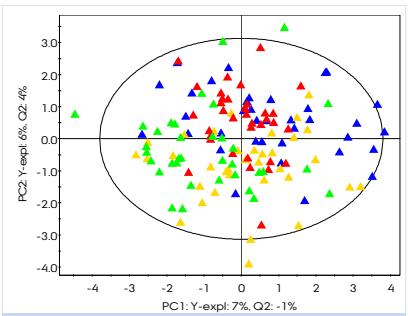
PCA of milk content of α-tocopherol, carotenoids, and fatty acid composition . Samples could neither be grouped according to herbage nor to period. Symbols: May: squares, June: triangles, August: circles, colours: **Chicory**, **Red clover**, **White clover**, **Lucerne**.

Conclusion

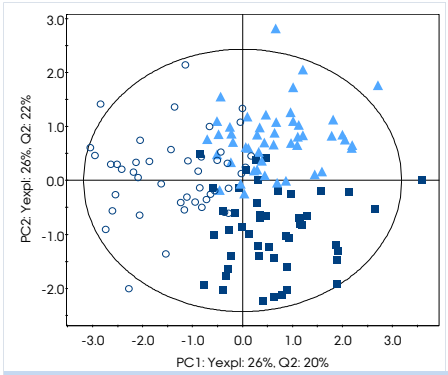
Differences in milk composition were minor when cows grazed the four different herbage species at different occasions during the grazing period. Thus it was concluded that grazing either of the four species was suitable for production of a high yield of milk with high concentrations of polyunsaturated fatty acids, carotenoids and tocopherols.

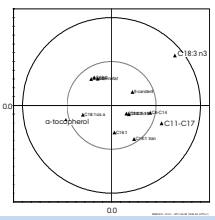


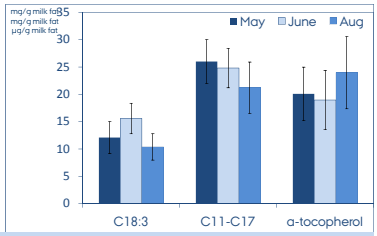
Milk yield and composition in comparison with results obtained in the **Q**uality **L**ow **I**nput **F**ood project. UK, DK, and SE data obtained from Butler et al (2008), Slots et al (2009), and Larsen et al (2010), respectively.



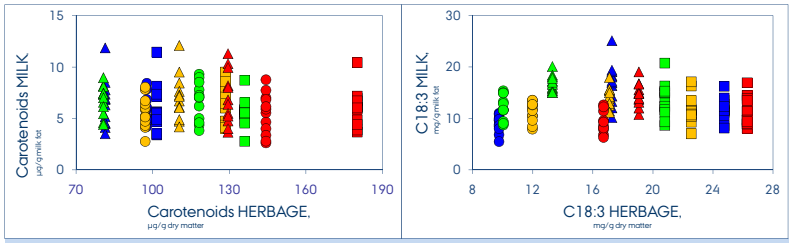
OPLS-DA could not separate milk samples according to herbage. Colours: **Chicory**, **Red clover**, **White clover**, **Lucerne**.







OPLS-DA showed grouping according to period. Symbols: May: squares, June: triangles, August: circles. The most important parameters were C18:3, C11-C17 and α-tocopherol. However, differences between samples were minor



Differences in the content of carotenoids and C18:3 in herbage were not reflected in milk composition. Carotenoids as well as C18:3 content was highest of red clover, C18:3 content decreased during the grazing period. Symbols: May: squares, June: triangles, August: circles, colours: **Chicory**, **Red clover**, **White clover**, **Lucerne**.

References

Butler, G., J. H. Nielsen, T. Slots, C. Seal, M. D. Eyre, R. Sanderson, C. Leifert. 2008. Journal of the Science of Food and Agriculture 88(8):1431-1441.

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