

# Effect of pasture botanical composition on milk quality in organic production

Steffen Adler<sup>1,2</sup>, Annette Veberg Dahl<sup>3</sup>, Håvard Steinshamn<sup>1</sup>, Anne Holter Vae<sup>2</sup>, Erling Thuen<sup>2</sup>, Torstein Garmo<sup>2</sup>, Søren Krogh-Jensen<sup>4</sup>

<sup>1</sup>Bioforsk Organic Food and Farming Division; <sup>2</sup>Department of Animal and Aquacultural Sciences, Norwegian University of Life Sciences; <sup>3</sup>Nofima Food; <sup>4</sup>Faculty of Agricultural Sciences, University of Aarhus

## A continuous grazing experiment

with 3 measurement periods, 3 weeks each, was conducted with 16 Norwegian Red dairy cows in mid-lactation to compare milk quality when grazing **red clover-grass pasture** or **botanical diverse pasture** in Ås, Norway. Milk yields were measured and milk samples were collected during the last week in each period (end of June, end of July and beginning of September 2008). Milk oxidative stability was measured in a light exposure experiment by determining lipid hydroperoxides and by front face fluorescence spectroscopy.



**Red clover-grass pasture**

**Red clover-grass** herbage (30% red clover) had higher concentrations of fat and higher fatty acid proportion of C18:3n-3 than botanical diverse herbage.



**Botanical diverse pasture**

**Botanical diverse** herbage had higher concentrations of non fibrous carbohydrates, and higher fatty acid proportions of C16:0 and C18:2n-6 than red clover-grass herbage.

## Results

The herbage had the same feed energy concentration. There was no effect on feed intake, milk yield, milk fat concentration or milk protein concentration.

**Milk** from red clover-grass pasture had higher proportions of C18:0 ( $p = 0.02$ ) and C18:1t11 ( $p = 0.02$ ) and higher concentration of  $\alpha$ -tocopherol ( $p = 0.01$ ) than milk from botanical diverse pasture. The proportion of C16:0 was highest ( $p = 0.02$ ) in milk from botanical diverse pasture.

**Milk oxidative stability** was not affected by botanical composition.

## Conclusion

Pasture with a proportion of 30% red clover did not affect fatty acid composition in milk to an extent susceptible to a higher risk of milk fat oxidation compared to pasture with a botanical diverse composition.