

# Effects of variation in fatty acids and triglyceride composition on melting behavior in milk fat

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## Abstract

The aim of this study was to determine the effects of fatty acids and triglycerides composition on melting behavior of milk fat. The melting profiles, fatty acids composition and triglycerides composition of milk fat from 27 cows fed palm oil, rapeseed oil and a low fat diet were analyzed. Correlations between individual fatty acids and triglycerides, and the melting off-set temperatures of milk fat fractions were obtained using multivariate data analysis. Low fat feeding increased the proportion of short and medium chain fatty acids and decreased the proportion of long chain fatty acids. The opposite effect was observed in milk fat of cows from lipid supplemented diets. Palmitic and myristic acids correlated positively to the melting off-set temperatures of high melting fraction of milk fat while oleic and linoleic acid had strong negative correlations. Furthermore, high molecular weight triglycerides contributed positively to the melting off-set temperatures of high melting fraction of milk fat. This is the first study to demonstrate that the melting off-set temperatures of high melting fraction of milk fat can be affected, to some extent, by dietary manipulations of cows. However, melting off-set temperatures of milk fat were still under physiological temperatures of cows indicating that the biological mechanism secure full milk fluidity under most dietary manipulations. Knowledge from this study could help to characterize melting fractions of milk fat resulting from different feeding regimes. This could aid in milk fat fractionation for use in specialty ingredients or modification of functionality of milk fat (e.g. softness or spreadability) in fat-based products.