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"Development on the margin"

Variation of Phytanic Acid in Transition from Conventional to Organic Milk Production

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Abstract

Nowadays, many consumers switch from conventional to organic milk, and the demand in organic milk and dairies is high, despite the higher price. Thus, falsely labeled organic products may be found on the market. Therefore, consumers raise the question "Can we trust organic milk?" The availability of reliable analytical methods is fundamental for the authentication of organic milk and dairies. The main difference between organic and conventional milk is the feed supplied to dairy cows. Thus, most approaches are based on identification of markers' characteristic for feed items. One suitable method is gas chromatography coupled with mass spectrometry based on determination of milk fatty acid. The difference in milk fatty acid pattern is due to different feed intake of cows as grass based or pasture versus concentrate.

Our previous studies have indicated that phytanic acid might be a valuable marker to distinguish difference between organic and conventional milk. Phytanic acid cannot be *de novo* synthesized by mammals. It is completely derived from the cows' diet because its initial source is chlorophyll. Therefore, phytanic acid is supposed to be higher concentrated in organic (mainly grass-based diet and pasture) than conventional milk (higher proportions of concentrate). Furthermore, a target value of 200 mg phytanic acid per 100 g milk fat was proposed for the authentication of organic milk. In this study we analysed milk samples from a farm in transition to organic farming. The mean concentration of phytanic acid of 287 mg per 100 g milk fat was above the suggested target value of previous studies. Hence, phytanic acid can be recommended for authentication of organic milk and it may serve as a reliable marker for the differentiation of organic and conventional milk. Research is ongoing to further verify this claim.

Keywords: Farm in transition, gas chromatography/mass spectrometry, organic milk, phytanic acid

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