

More unsaturated fatty acids in dairy: opportunities and threats

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Dairy products in the diet

Changing societal drivers (e.g., landscape values, animal welfare) and consumer demands (e.g., tasty/healthy products) require systems that provide desired human foods produced through sustainable production processes. High-fat human diets, especially those rich in saturated fats, are often claimed to have detrimental effects on cardiovascular disease risk factors such as blood low density lipoprotein cholesterol. Dairy products contribute 15-20% of human intake of total fat, 25-33% of saturated fat and about 15% of dietary cholesterol.

Composition of milk fatty acids

During the last few decades, the fatty acid (FA) composition of milk has in many countries become less favourable, as unsaturated FA concentrations have declined. E.g., in the 1960's, during summer the Dutch farm milk contained, on average, 15 g/kg CLA, but in 2001-2002 the average was 7 g/kg between June and August, and 5 g/kg in spring and autumn. This is due to an increased demand for energy in cows, and changed feeding and management practices, notably higher proportions of concentrates and silages in diets with less grazing.

Cow diets

There is a trend for cows to be kept indoors year round. In the Netherlands, this an issue for the political agenda; effects on milk production, landscape values, animal welfare and public opinion all play a role in the debate. Some economic analyses show benefits of grazing, as conserved feed is more expensive than fresh herbage. However, cows with very high milk yield potential cannot meet their energy requirements from grass alone, partly due to insufficient intake.

Strategies for improving milk composition

Milk from cows fed fresh green forage, especially in grazing systems, have a much higher unsaturated FA proportion than milk from silage-fed cows. Grasslands thus offer considerable scope to help create product differentiation in increasingly competitive markets. Farmers from Dutch dairy cooperatives who produce milk from grazed grass now receive a premium payment in addition to the base milk price, so that primary producers can benefit from the higher market value at the end of the production chain. Dairy industries are eager to encourage their milk suppliers to produce milk with higher concentrations of unsaturated fatty acids, but when done in a natural way (through green herbage) this is correlated with an increase in CLA (C18:2 cis9,trans11) and vaccenic acid (C18:1 trans11).

Trans fatty acids, threats and opportunities

Dairy industries hesitate which way to go, as for marketing they fear penalties for elevated contents of trans fatty acids. Industries are therefore in search of alternatives such as protected omega-3 fatty acids in concentrate feed, that can escape rumen biohydrogenation. It can be questioned if this is a desirable development in view of farm incomes, sustainable land use, grassland management and animal welfare. Due to the penalty on trans fatty acids (in general) the current situation hampers rapid, large-scale improvement of the fatty acid composition of dairy products which is undesirable for consumers. Therefore a proposal for more specified terminology regarding trans fatty acids is urgently needed and could really help to provide a solution. This is of great societal and economic importance.