

Effect of feeding high-oleic sunflower oil to dairy cows on the milk fatty acid profile – RESET study

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There is an urgent need to focus on modifiable risk factors for CVD, including a high intake of saturated fatty acids (SFA). Milk and dairy products (excluding butter) contribute 22–25% of mean daily intake of SFA in UK adults⁽¹⁾. One strategy for reducing SFA intake is removal or reduction of dairy intake. However, manipulation of the fatty acid (FA) profile of milk offers a sustainable means of reducing SFA intake at a population level, whilst still retaining the beneficial aspects of dairy foods^(2,3) and preventing SFA re-entering the food chain. As part of the RESET (REplacement of SaturatEd fat in dairy on Total cholesterol) study, the effect of feeding high-oleic sunflower oil (HOS; ~85% monounsaturated fatty acids (MUFA)) on the FA composition of ruminant winter milk was determined.

The habitual total mixed ration diet of 30 multiparous Holstein-Friesian cows in mid-lactation was supplemented with 1 kg/cow/d HOS (AAK, UK), for a 21 d period, with the aim of producing milk fat containing a lower proportion of SFA and a higher *cis*-MUFA content. Pooled milk from these cows was analysed in triplicate for FA composition by gas chromatography, and the results compared with commercially available control milk.

	Fatty acid profile of milk fat (g/100 g total FA)	
	Modified milk	Control milk
∑ SFA	54.0	71.8
∑ <i>cis</i> -MUFA	32.3	21.5
∑ <i>trans</i> -MUFA	10.2	3.4
∑ MUFA	42.4	24.9
∑ 18:1 <i>cis</i> total	29.9	19.0
∑ 18:1 <i>trans</i> total	9.6	3.0
∑ 18:1	39.5	21.9

HOS supplementation of the cows' diets for 21 d resulted in lower SFA and higher *cis*-MUFA and *trans*-FA concentrations than control milk. HOS supplementation was also associated with a lower total fat content (2.8 g/100 g) than that typically observed in commercially available whole milk. These data illustrate that supplementation of the dairy cow diet with 1 kg/cow/d HOS is an effective strategy for lowering the SFA content of milk and successfully reducing saturated fat in the food chain. Increases in *trans*-FA concentrations, were also observed, yet it is unclear whether there are effects of ruminant *trans*-FA on CVD risk⁽³⁾. In a randomised, crossover, double blind, controlled study (ClinicalTrials.gov NCT02089035), future work will determine whether modified, SFA-reduced dairy product consumption improves vascular function and other CVD risk markers.

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2. Givens *et al.* (2009) *Animal* 3: 1067–74.
3. Markey *et al.* (2014) *Nutr Bull* (In press).