

# CLA Isomers in Milk Fat from Cows Fed Diets with High Levels of Unsaturated Fatty Acids

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**Aim of study:** What sort of CLA isomers were preferentially found in milk fat from cows fed a fodder rich in either oleic, linoleic or  $\alpha$ -linolenic acid ?

## Diet

- Control diet (CD): Hay ad libitum and 15 kg fodder beet
- CD + 1kg rapeseed (RAP1)
- CD + 1 kg sunflowerseed (SUN1)
- CD + 1.4 kg sunflowerseed (SUN 1.4)
- CD + 1 kg linseed (LIN1)
- CD + 1.4 kg linseed (LIN1.4)

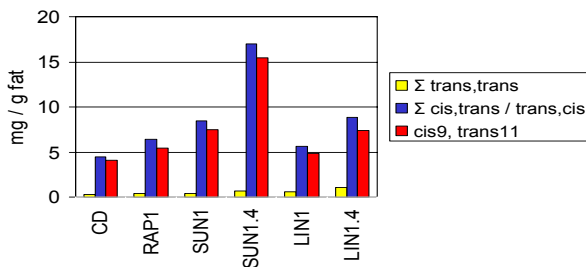
## Daily intake of unsaturated acids (UFA), (g day<sup>-1</sup> cow<sup>-1</sup>)

	Oleic	Linoleic	$\alpha$ -Linolenic
RAP1	258	85	42
SUN1	80	281	1
SUN1.4	106	375	1
LIN1	59	48	157
LIN1.4	84	68	224

**Sample choice & analysis:** Ten individual milks per variant (total of 60 milks) were analysed after 2 weeks feeding using GC – Ag<sup>+</sup> HPLC

## Results

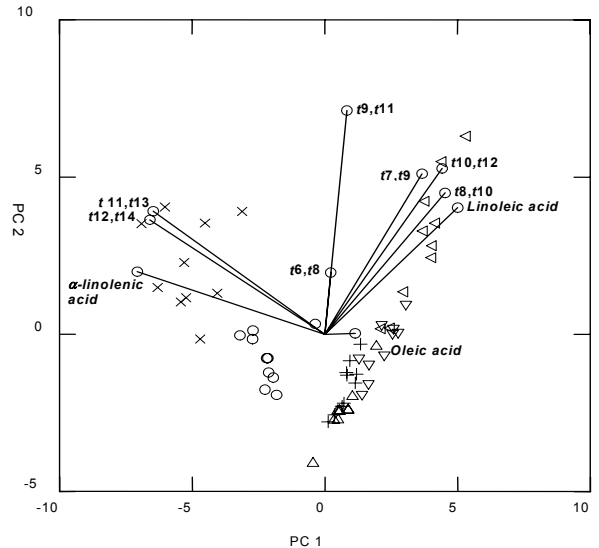
### CLA in milk fat (n = 10 per variant)



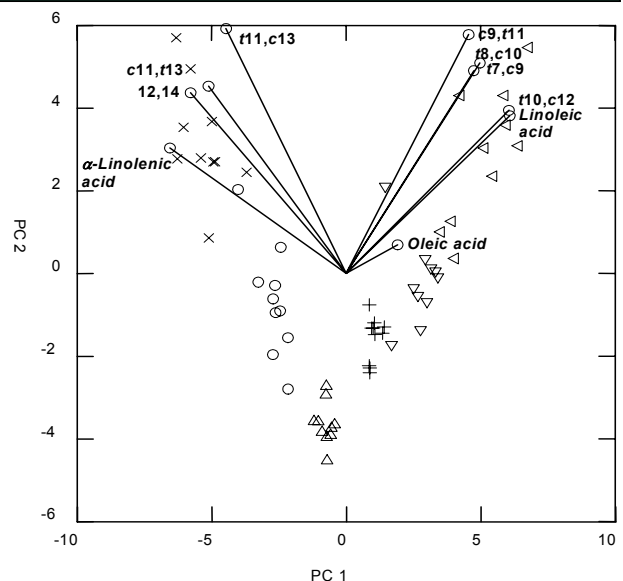
**Positive correlation coefficients between the daily intake of UFA and the concentration of CLA in milk (P<0.001)**

Oleic acid	Linoleic acid	$\alpha$ -Linolenic acid
t7c9: 0.57	t10t12: 0.78	t12t14: 0.88
	t9t11: 0.58	t11t13: 0.89
	t8t10: 0.60	ct/tc12,14: 0.88
	t7t9: 0.47	t11c13: 0.76
	t10c12: 0.89	c11t13: 0.74
	c9t11: 0.81	
	t8c10: 0.85	
	t7c9: 0.74	

**Principal component (PC) analysis of the daily intake of UFA and the CLA trans,trans in milk. PC1 explains 39 % and PC2 28 % of the total variance.**



**Principal component (PC) analysis of the daily intake of UFA and the CLA cis,trans/trans,cis in milk. PC1 explains 46 % and PC2 35 % of the total variance.**



Δ: CD, +: RAP1, ∇: SUN1, ◁: SUN1.4, O: LIN1, X: LIN1.4

**Conclusion:** CLA t7c9 was found in highest concentrations in milk fat from cows fed a oleic acid-rich diet, CLA t10t12, t9t11, t8t10, t7t9, t10c12, c9t11, t8c10 and t7c9 in milk fat from cows fed a linoleic acid-rich diet and CLA t12t14, t11t13, ct/tc 12,14, t11c13 and c11t13 in milk fat from cows fed a  $\alpha$ -linolenic acid-rich diet. These results indicate the principal probable precursors of the CLA isomers.