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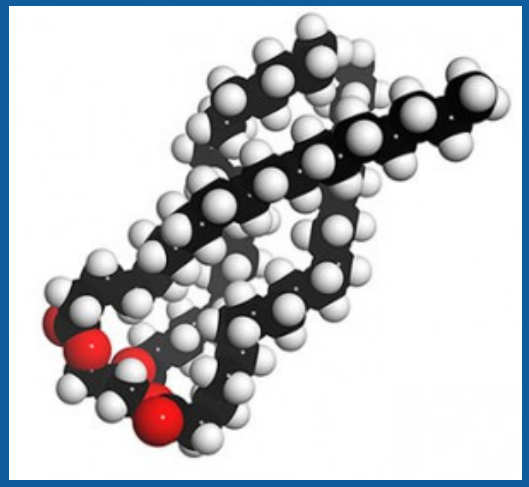

Reducing saturated fatty acids in dairy products: consequences for milk fat composition

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Milk and Dairy Products in Health and Disease, December 2011

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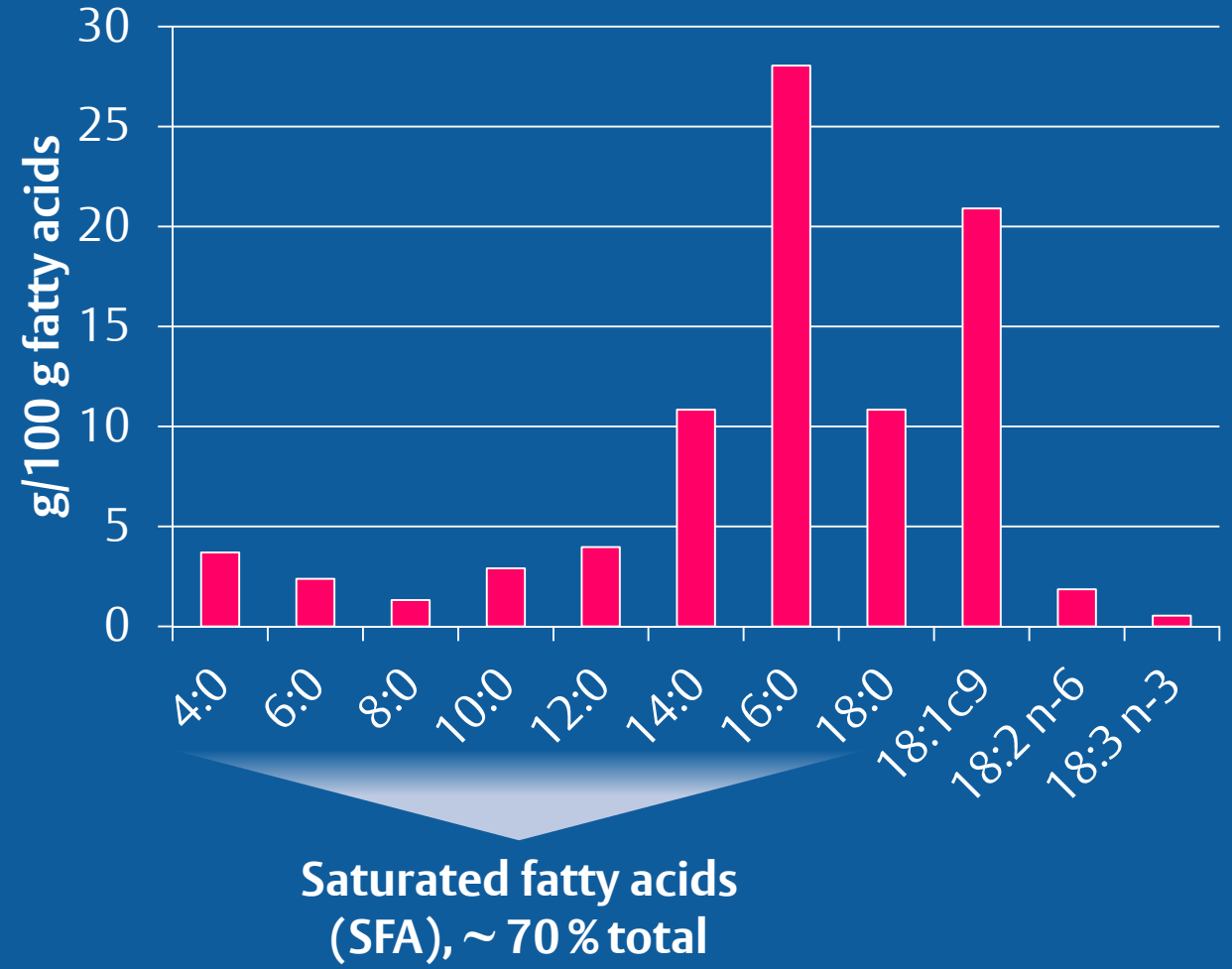
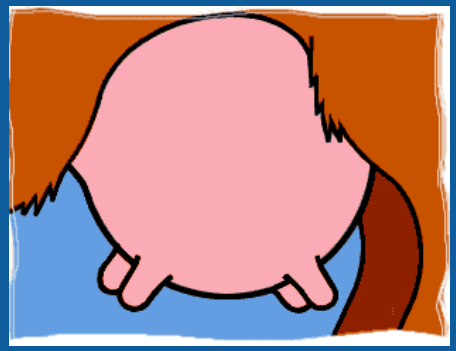
Fatty acid profile of milk fat



Origins of milk fatty acids

Fatty acids	Fatty acid class	Source
Short chain SFA (4:0 – 10:0)	SFA	Mammary gland (de novo)
Medium chain SFA (12:0-16:0)	SFA	Mammary gland, diet
Long chain SFA (>=18:0)	SFA	Diet, rumen, adipose tissue
cis-MUFA	MUFA	Diet, mammary gland
trans-MUFA	MUFA	Rumen
PUFA	PUFA	Diet, rumen
CLA	PUFA	Rumen, mammary gland



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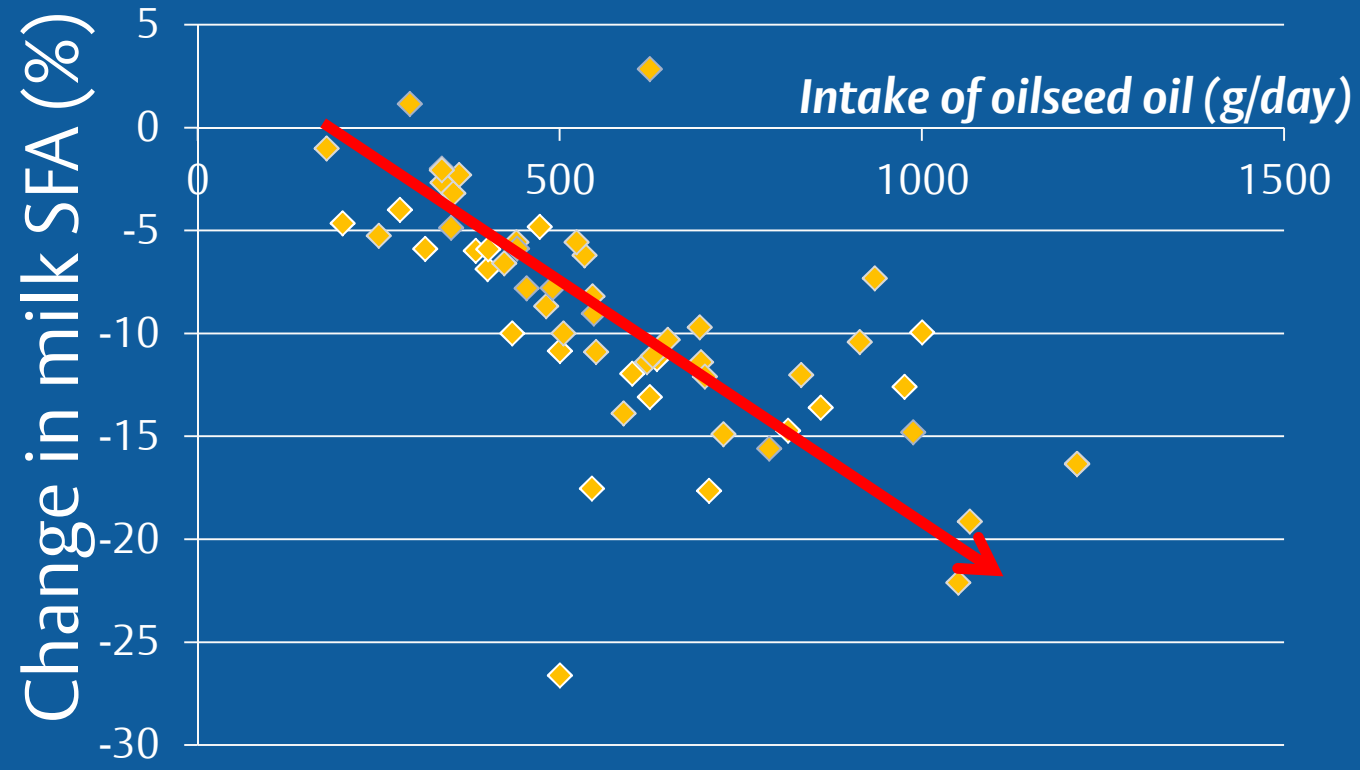
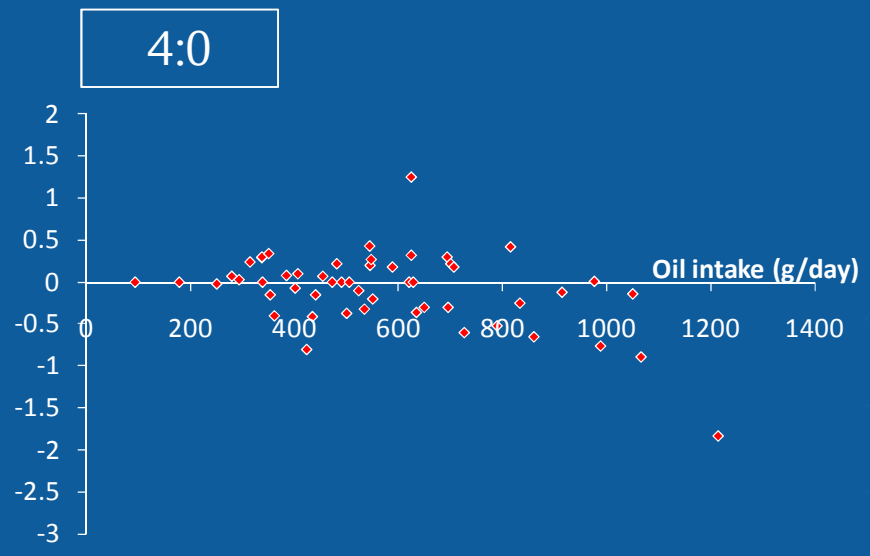
Dietary strategies to reduce milk SFA

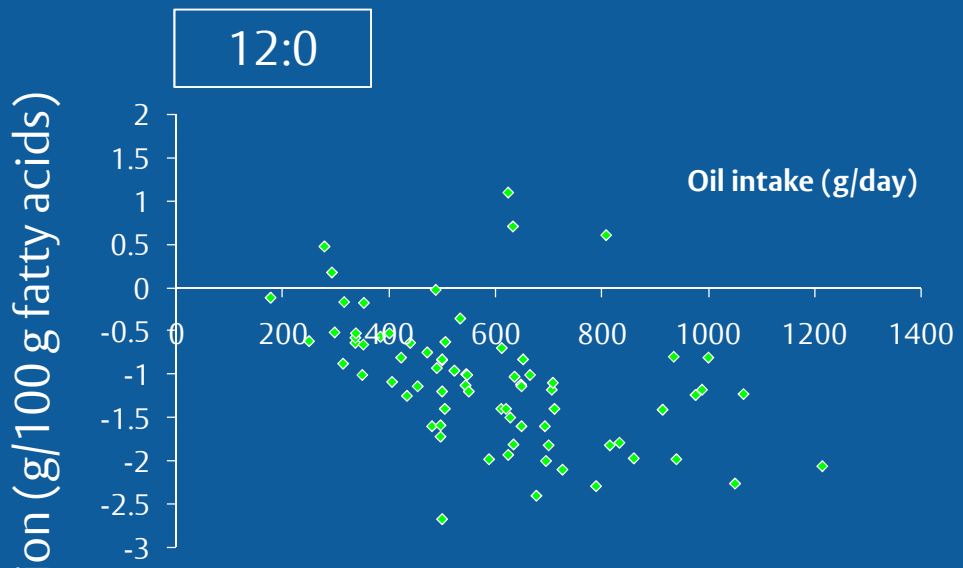
- Basal forage type
- Forage conservation
- Forage:concentrate ratio
- Inclusion of oilseeds

Effect of oilseeds on milk SFA



Change in fatty acid concentration (g/100 g fatty acids)




12:0
Change in fatty acid concentration (g/100 g fatty acids)
Oil intake (g/day)
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
0
200
400
600
800
1000
1200
1400

Oilseeds and milk fat

- Generally, supplemental oilseeds (< 1kg oil) do not decrease milk fat %
- Depends on comparative diet
- Also depends on oilseed form (oil vs milled)
- If SFA are decreased, what are they being replaced with?

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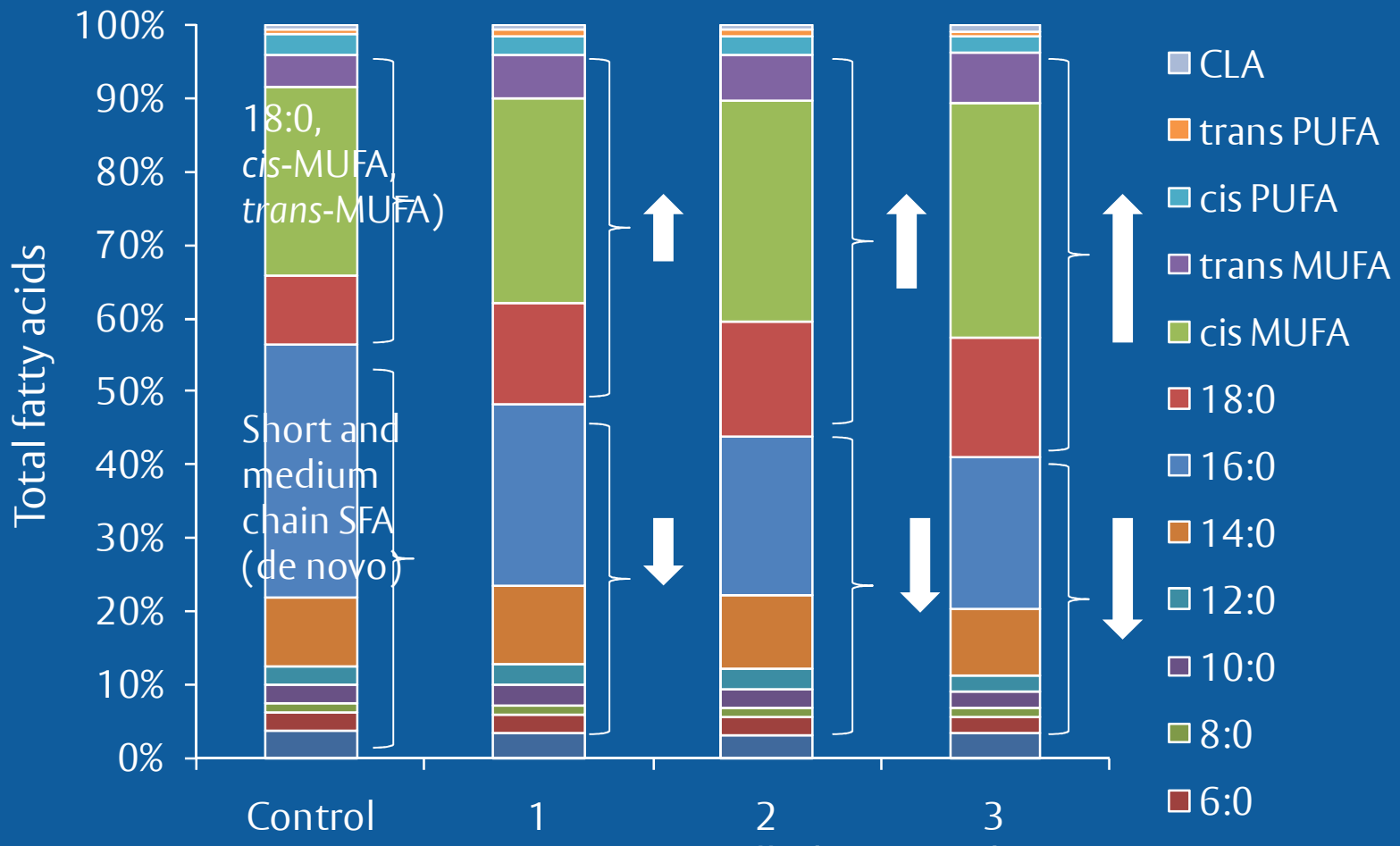
What are SFA replaced with?



Kliem et al., 2010

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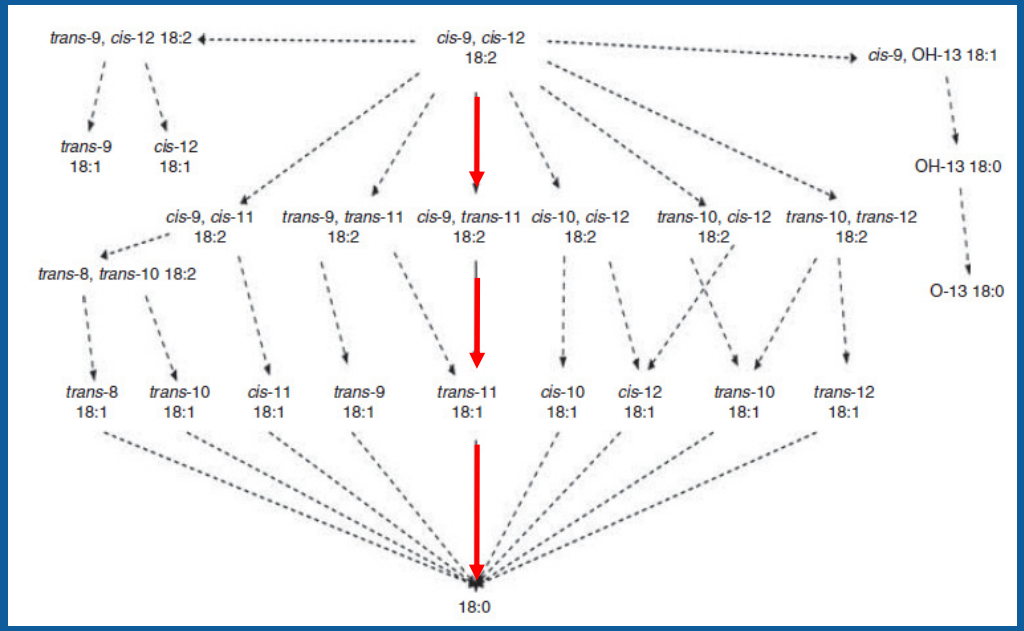
Why do 18:0, cis-MUFA and *trans* fatty acids increase?

- Rumen biohydrogenation
- Endpoint is 18:0
- Many *trans* intermediates
- Some will be incorporated into milk fat
- Some 18:0 converted to 18:1 *cis*-9 in mammary gland



From Shingfield et al., 2010

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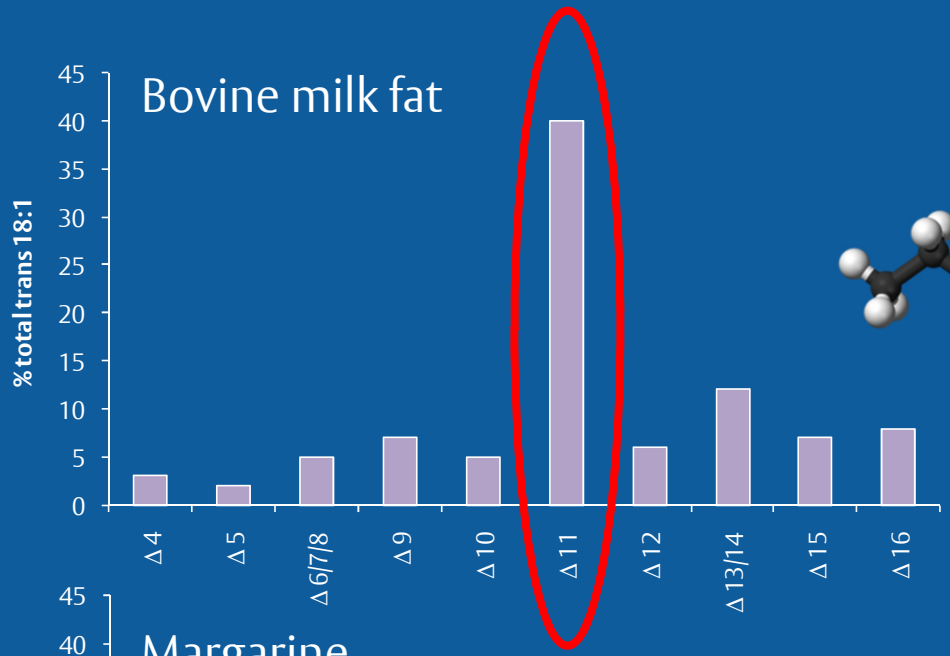
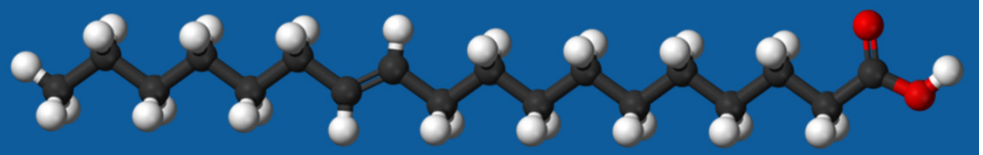
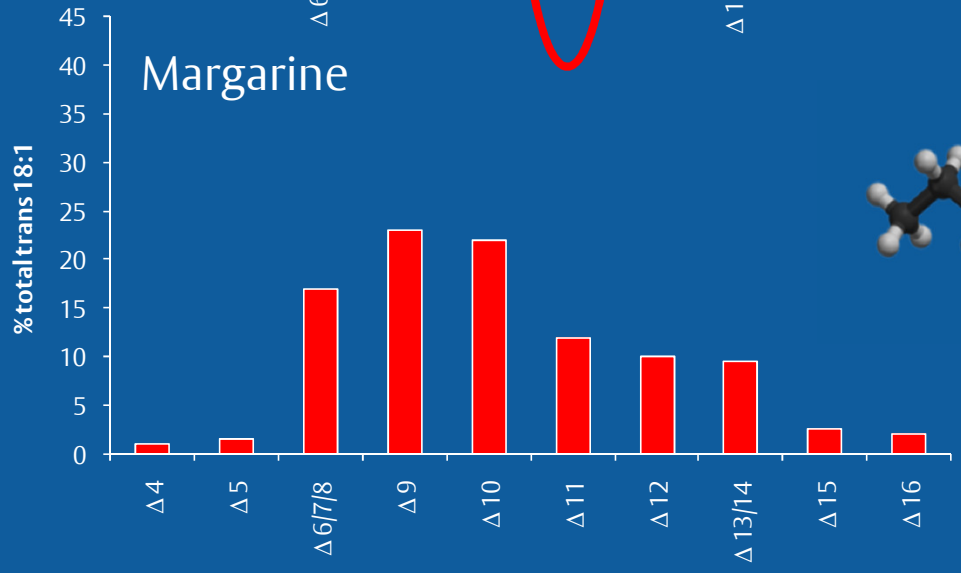
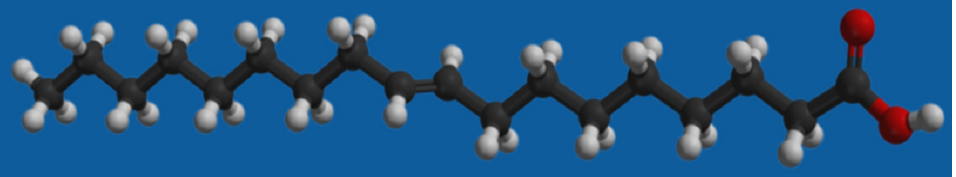
Ruminant derived *trans* fatty acids





+ 16:1 *trans*, 18:2 *trans*





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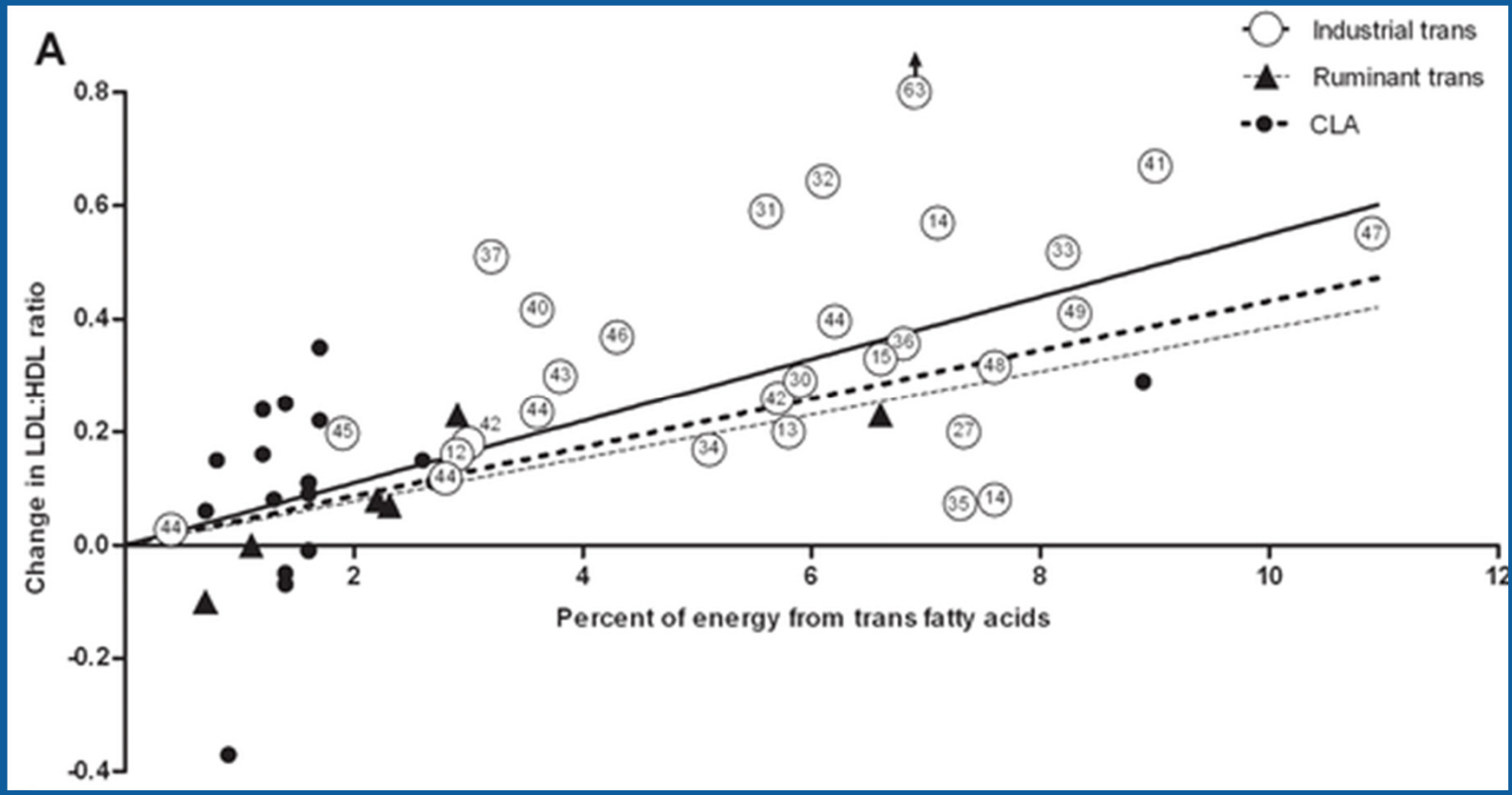
Results of randomised studies of the effects of diets high in industrial *trans* fatty acids, ruminant *trans* fatty acids or CLA compared with *cis*-unsaturated fatty acids on ratio of LDL:HDL cholesterol.



Brouwer et al., 2010

Human intervention studies

- ..."moderate intakes of rTFA (well above upper limit of current consumption) have neutral effects on CVD risk factors"

Motard-Bélanger et al., 2008

- ..."difficult in the present study to draw a conclusion about the effect of TFA from either source on CVD risk in these normolipidemic subjects"

Chardigny et al., 2008

Animal studies

- ..." results suggest a rather neutral effect of *trans*-11 18:1/CLA butter towards the risk of atherogenesis, whereas *trans*-10 18:1 butter would tend to be detrimental.""

Bauchart et al., 2007

- ..."the ratio of potentially atherogenic to antiatherogenice lipoproteins was significantly lower in hamsters fed VA/RA enriched butter than in those fed a control diet or one containing partially hydrogenated vegetable oil"

Lock et al., 2005

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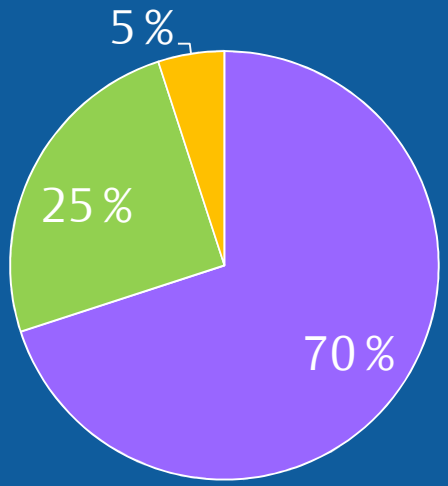
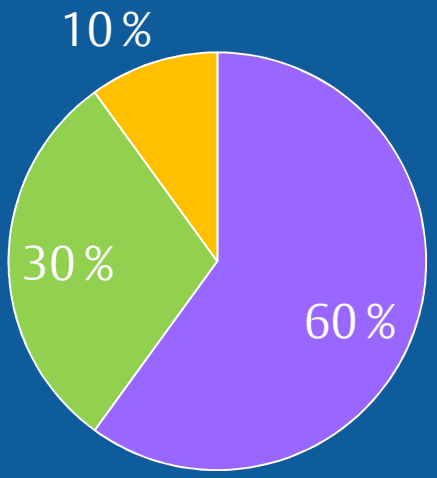
Trans fatty acids in milk - the bigger picture



SFA

Total cis MUFA/PUFA

Total trans MUFA/PUFA



0.8 % EI

Total *trans* as a % of total energy intake

1.0 % EI

Department of Health maximum recommended intake level = 2 % EI

(Using mean adult men NDNS figures for 2010)

But, need to cautious....”SFA + *trans*”

The European Commission

Health and Consumer Protection

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LOW SATURATED FAT
A claim that a food is low in saturated fat, and any claim likely to have the same meaning for the consumer, may only be made if the sum of saturated fatty acids and trans-fatty acids in the product does not exceed 1,5 g per 100 g for solids or 0,75 g/100 ml for liquids and in either case the sum of saturated fatty acids and trans-fatty acids must not provide more than 10 % of energy.

SATURATED FAT-FREE
A claim that a food does not contain saturated fat, and any claim likely to have the same meaning for the consumer, may only be made where the sum of saturated fat and trans-fatty acids does not exceed 0,1 g of saturated fat per 100 g or 100 ml.

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22 June 2010 Last updated at 00:02

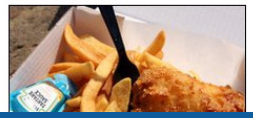
NHS watchdog NICE calls for trans-fats ban in foods

By Jane Dreaper
Health correspondent, BBC News

Trans-fats should be eliminated from food in England, NHS watchdog NICE has said.

The artificial fats are often found in biscuits, cakes and fast food - but they can damage health.

NICE is also pressing for further reductions in salt and saturated fats, to help prevent deaths from cardiovascular disease



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Nutrition Facts

Serving Size 1 cup (200g)

Amount Per Serving	
Calories 260	
	% Daily Value
Fat 13g	20%
Saturated Fat 3g + Trans Fat 2g	**25%**
Cholesterol 30mg	10%
Sodium 660 mg	28%
Carbohydrate 31g	10%
Fiber 0g	0%
Sugars 5g	
Protein 5g	

Vitamin A 4% · Vitamin C 2%

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Thank you for listening



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