Institut National de la Recherche Agronomique

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N4.6
Kinetics of trans fatty acids and CLA in cow milk fat after lipid feeding

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Dairy fatty acids:

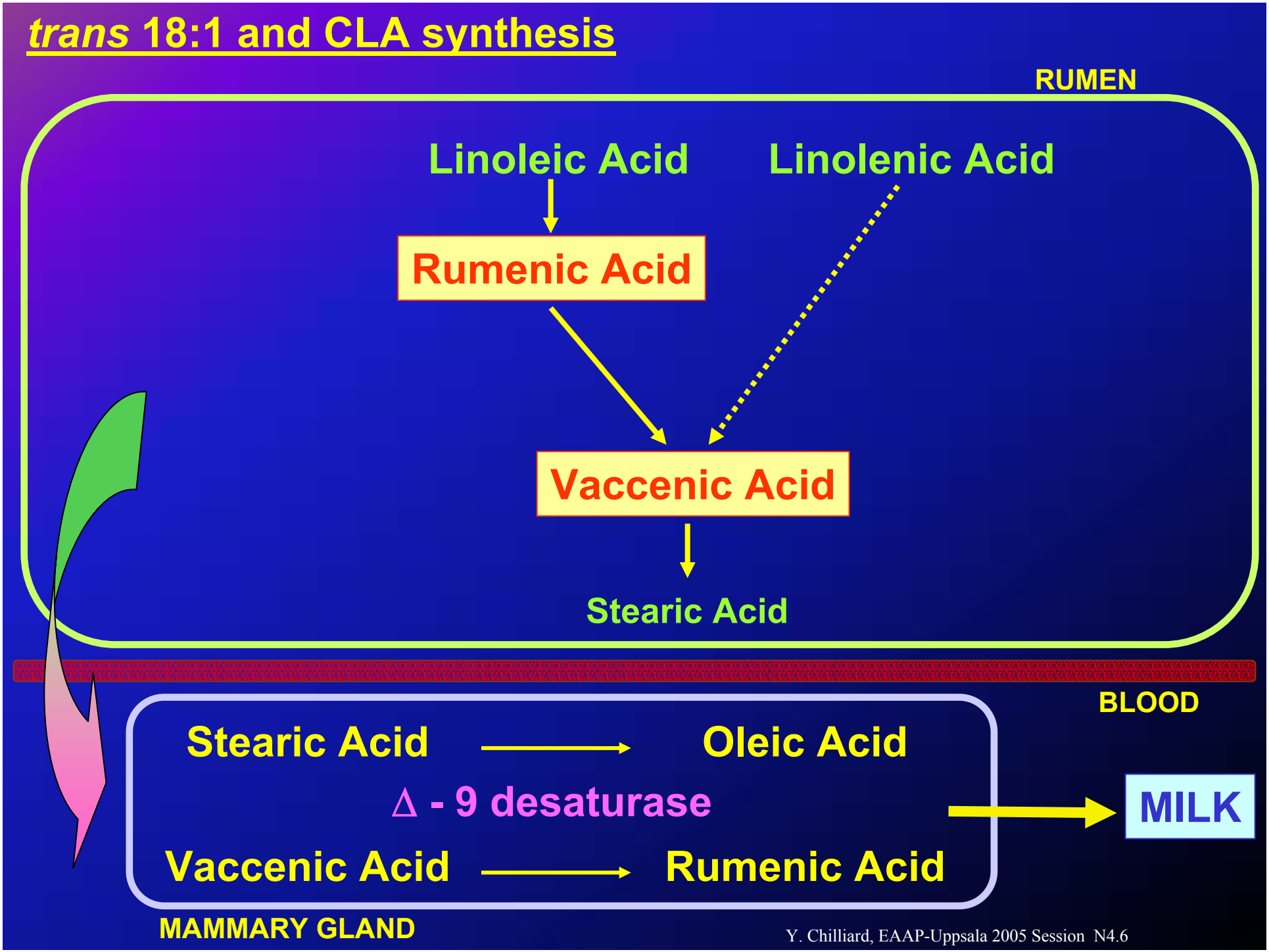
	% total FAs
Saturated (4:0 - 24:0)	71 – 76
Monounsaturated	21 – 25
incl. *cis*-18:1	15.5 – 18.5
incl. *trans*-18:1	2.0 – 3.2
incl. *trans-11*	1.2 – 2.8
CLA	0.6 – 1.0
incl. *cis*9, *trans*-11	0.5 – 0.95
Linoleic Acid	~1.3
Linolenic Acid	0.3 – 0.6

→ **Vaccenic Acid VA**

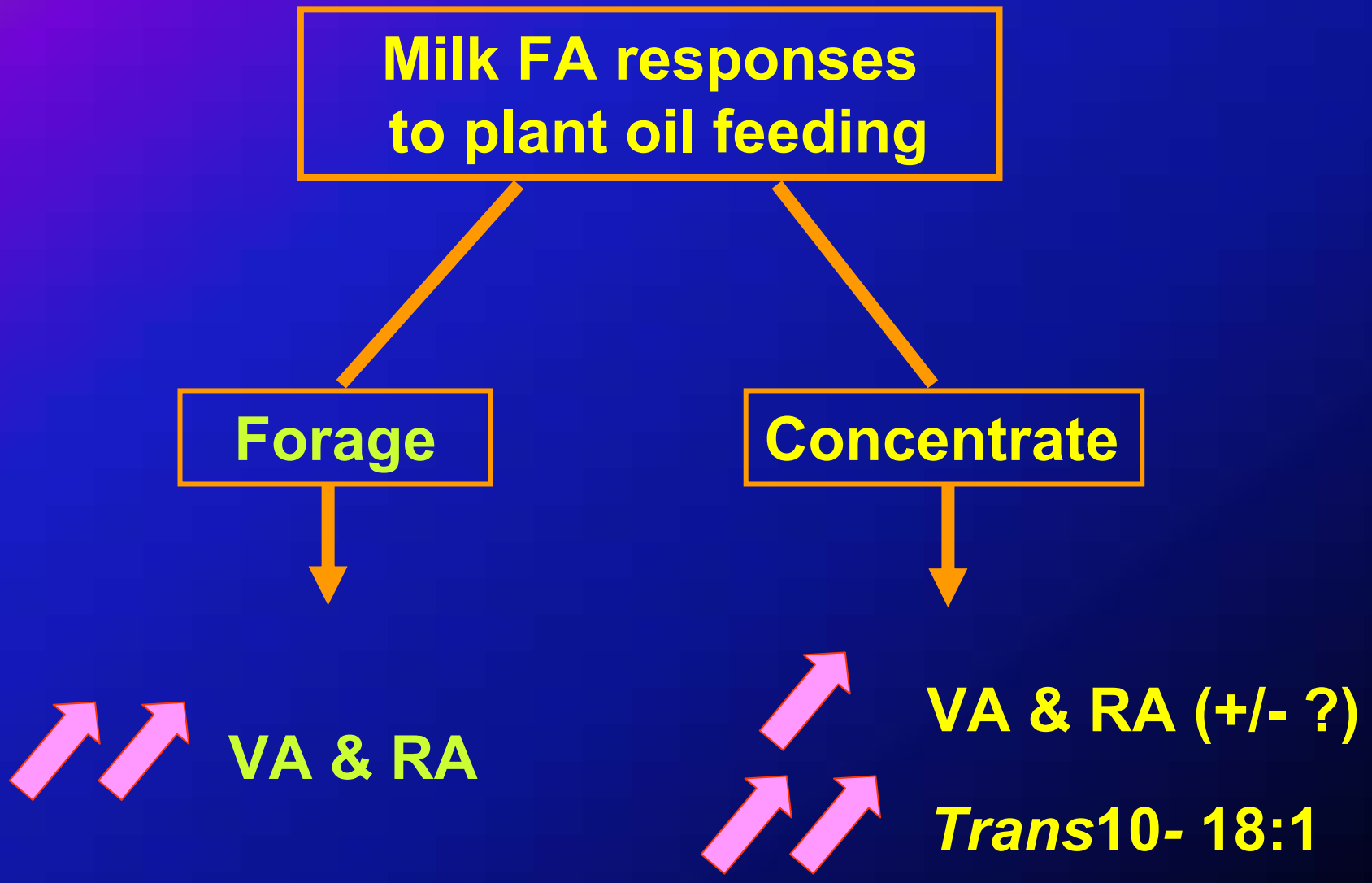
→ **Rumenic Acid RA**

(From Ledoux et al., 2005 : winter and summer butters in French market)

trans 18:1 and CLA synthesis



Feeding and Milk FAs



(Reviews : Bauman et al., 2003; Chilliard & Ferlay, 2004)

Experimental aims:

→ New knowledge on kinetics of PUFA and *trans*-FA metabolism in dairy cows

→ Yield of butters rich in :

either *trans*11-18:1,
or *trans*10-18:1

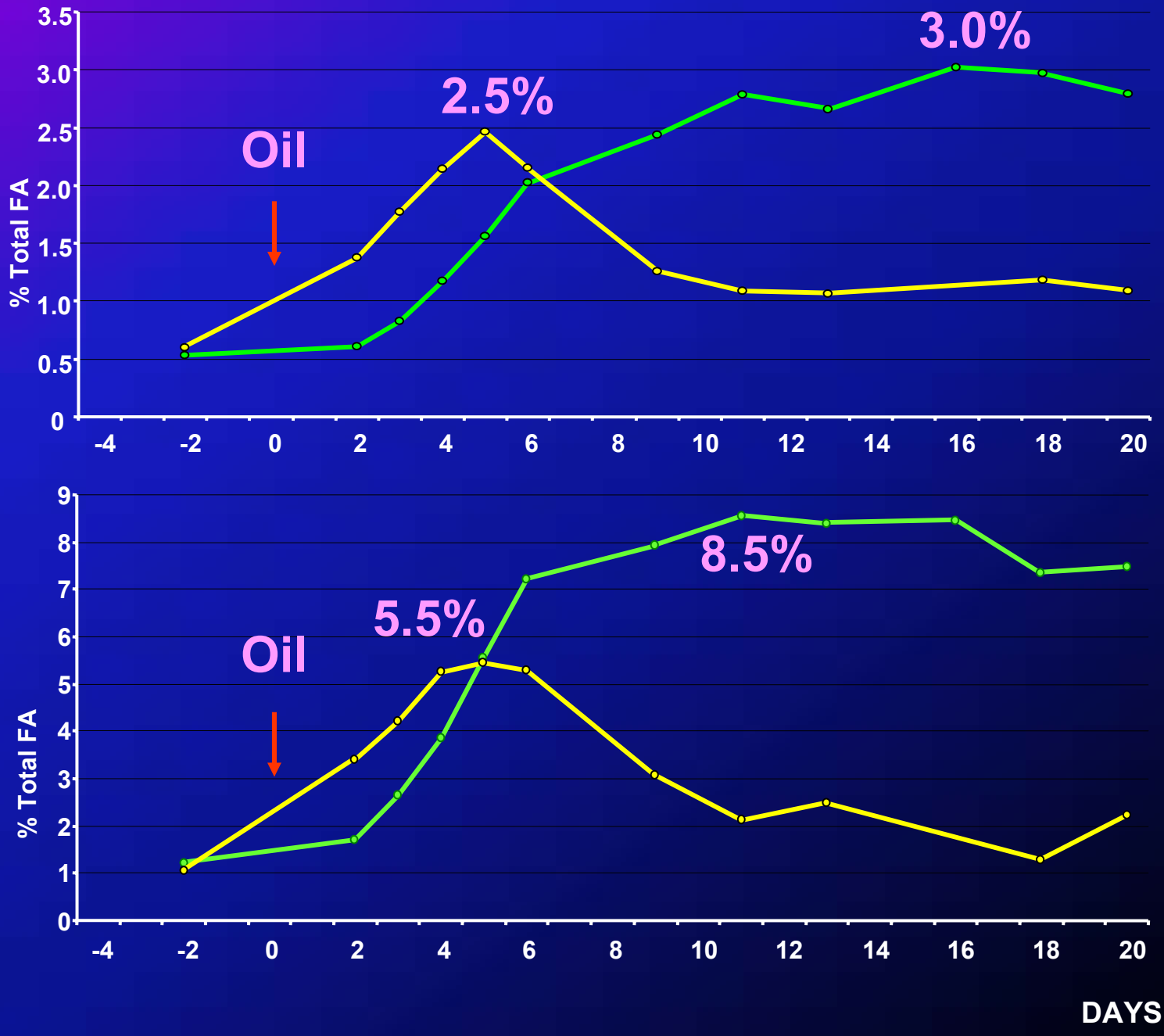
→ Methods :

Dietary conditions & Milk FA kinetics

6 cows/diet	Diet H-L	Diet C-S
F / C	65 / 35	25 / 75
Forage	Nat. Grasl. Hay	Corn Silage
Oil	Linseed, 5%	Sunflower, 5%

Milk was sampled every 1-3 d for 3wk

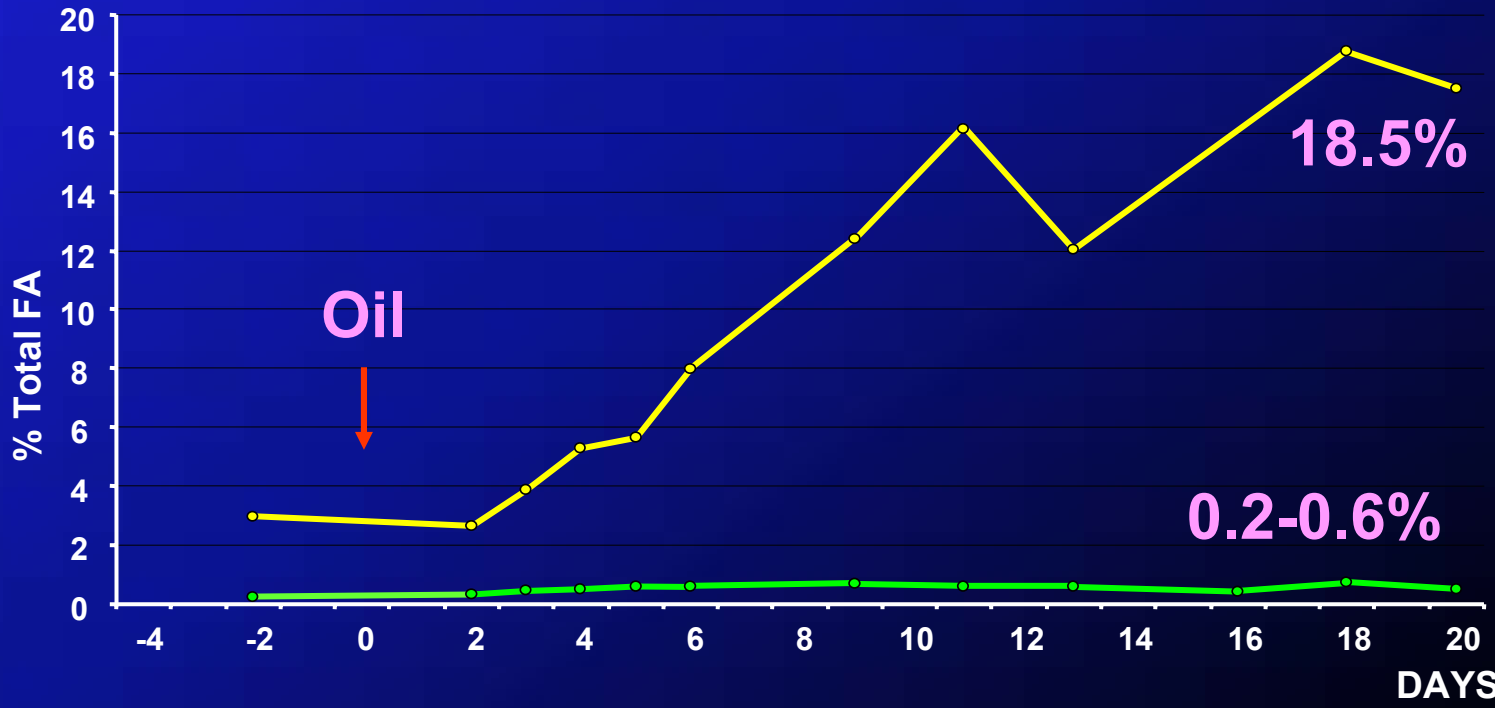
Results


RA
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0
% Total FA
Oil
2.5%
3.0%
-4
-2
0
2
4
6
8
10
12
14
16
18
20
VA
9
8
7
6
5
4
3
2
1
0
% Total FA
Oil
5.5%
8.5%
H-L
C-S
DAYS

Results

VA (*trans*11)

***trans*10-18:1**



— H-L
— C-S

Conclusions

- Very large changes in RA, VA and trans10-18:1 according to :
  - dietary conditions
  - duration of lipid supplementation

- With C-S diet, successive waves of *trans*11 and then *trans*10-18:1

Perspectives

BUTTER	RA	VA	*trans*10-18:1	Saturated FAs
« Standard »	0.4	1.2	0.3	73.2
« trans11 »	3.1	7.4	2.3	49.3
« *trans*10 »	0.9	1.6	14.2	47.8

35%

% total FA

animal model (rabbit) for cardio-vascular diseases

Lipid metabolites linked to atherogenesis