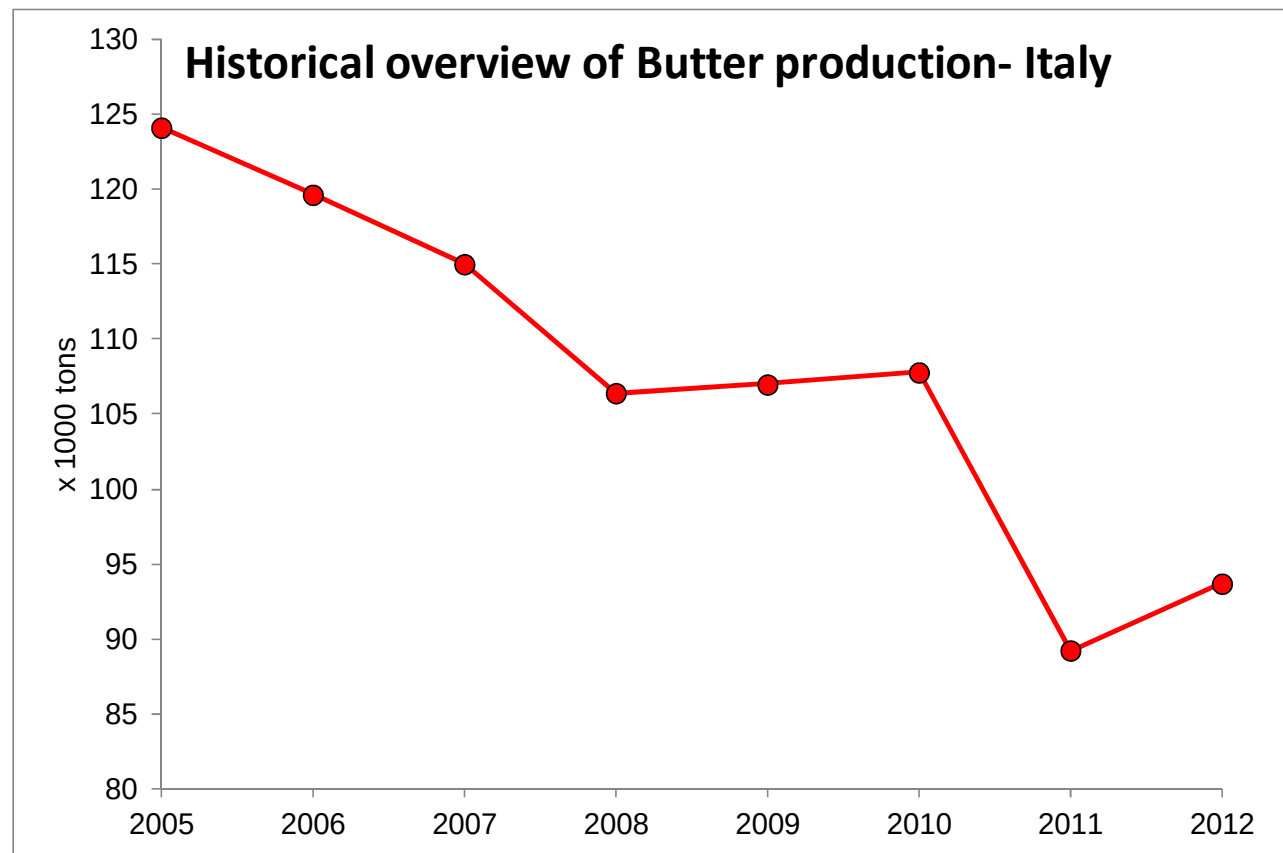


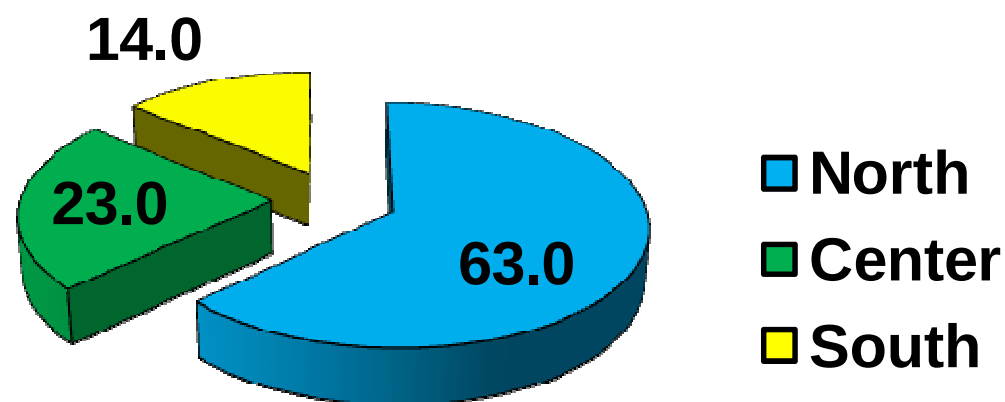


Butter
consumption
has been
going down
for several
years due to
its being
considered
unhealthy



tons*1000	2007	2012	
Italy	115	94	-18%
UE	1946	1935	-0.5%
USA	680	840	+23%

Butter consumption in Italy

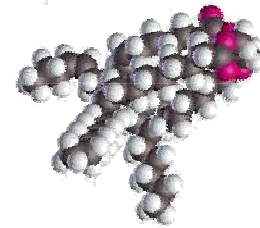


Prices

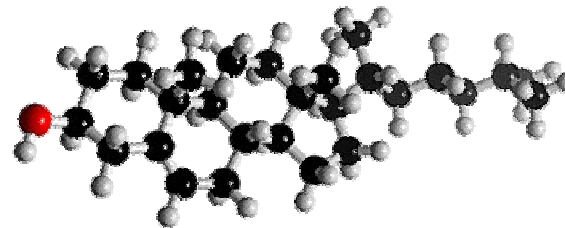
- ✓ Butter = (4) 9 -14 €/kg
- ✓ Margarine = 1.8 - 4 €/kg
- ✓ Seed Oil = 1.5 - 4 €/l
- ✓ Extra Virgin Olive Oil = 3 - 6 (26) €/l



1) High content of
saturated fatty acids
(high ratio sat/unsat)



2) High content
of cholesterol



Buttermaking

Raw milk

Separation: creaming or centrifugation

Cream

Pasteurization (95°C)

+ starter cultures

Ripening (14-21°C)

Crystallization (5-10°C)

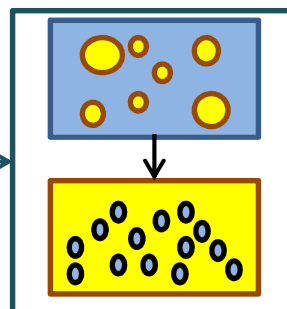
Churning

Buttermilk

Butter

Working (salting)

Packaging



Butter: commodity-related categories

L. 13.5.83 n. 202 and Reg. CE n. 2991/94

Butter: product consisting of emulsion, principally of the water-in-oil type, obtained from cream of cow milk, from cheese making whey and also from the mixture of both raw materials (fat ≥ 82 and < 90 (80 for salted); water ≤ 16 ; NFDM ≤ 2).

COUNCIL REGULATION (EC) No 1234/2007

Three-quarter-fat light butter: (fat 60-62 %)

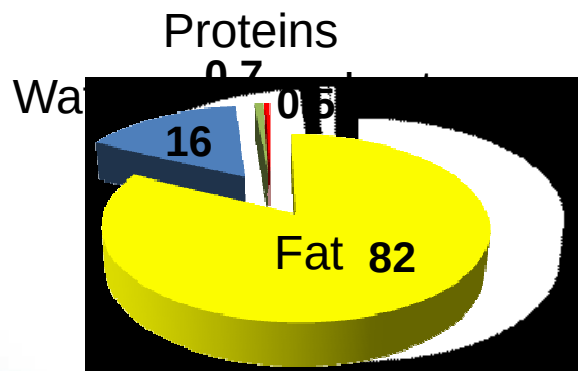
Half-fat light butter (fat: 39-41)

Dairy spread X % (fat < 39 ; $> 41 < 60$; $> 62 < 80$)

Concentrated butter (fat > 90)

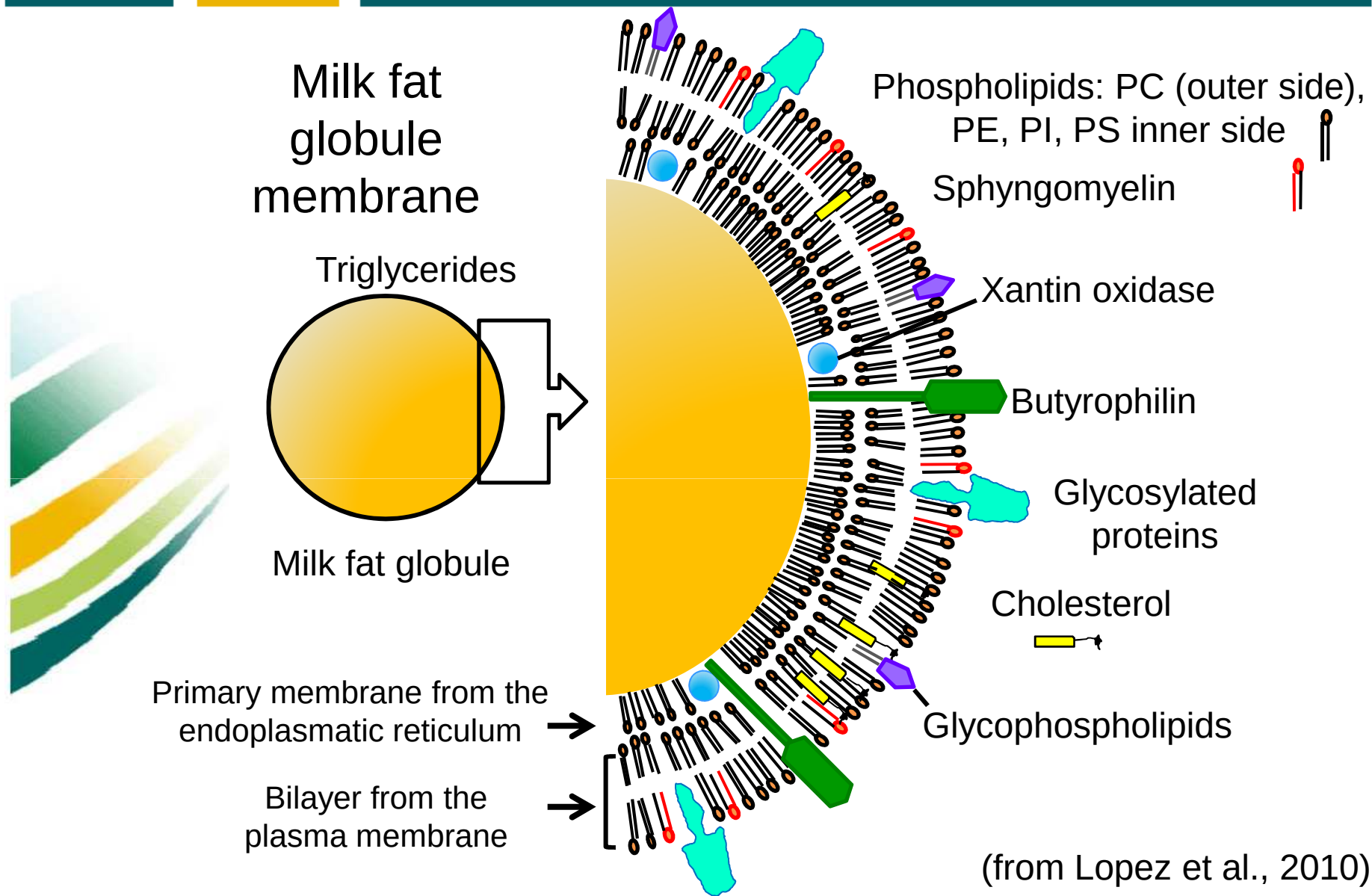
Traditional Butter : obtained only from milk and cream

Note: The milk-fat component of these products may be modified only by physical processes.



Composition:

	100 g butter	100g milk fat
• Triglycerides (g)	80.6	• 98.3
• Phospholipids (g)	0.5	• 0.8
• Cholesterols (g)	0.21	• 0.32
• Mono-diglycerides (g)	0.2	• 0.3
• Free fatty acids (g-oleic)	0.1	• 0.1
• Vitamin E (mg)	1.2	• 1.5
• Vitamin A (μg)	700	• 850



(from Lopez et al., 2010)



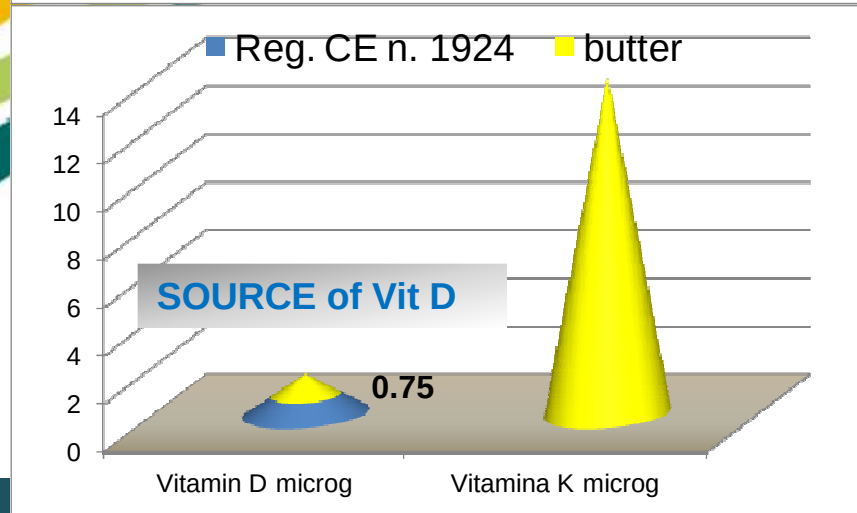
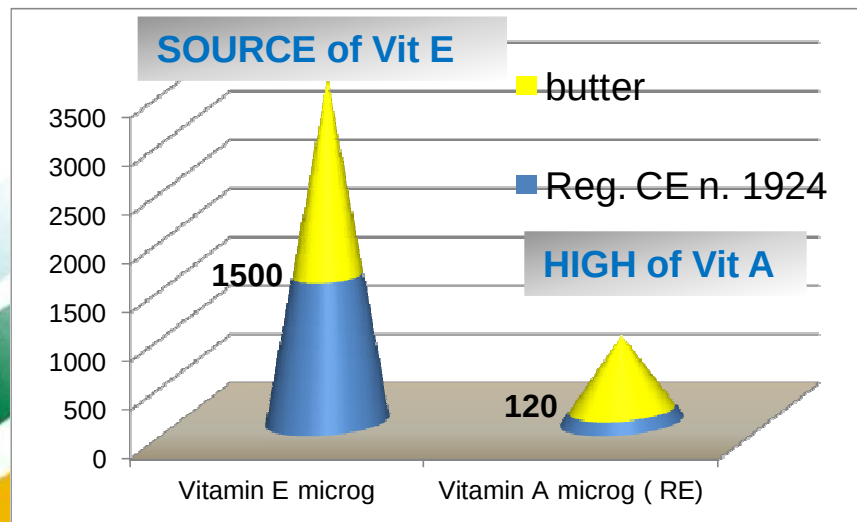
NGD Ib 009-10

Fatty acid composition %

Saturated		Branched		Unsaturated	
C4	3.0-5.3	C15I	0.2-0.4	C10:1	0.2-0.4
C6	1.6-3.0	C15AI	0.3-0.7	C14:1	0.2-1.2
C8	1.1-1.8	C16I	0.1-0.4	C16:1	1.0-2.0
C10	1.8-3.7	C17I	0.2-0.4	C17:1	0.1-0.3
C12	2.3-3.9	C17AI	0.2-0.6	C18:1	19.0-29.0
C14	8.0-12.0	SFA Tot59-76		C18:2	1.0-3.5
C15	0.2-1.3			C18:3	0.2-1.3
C16	25.0-33.0			CLA	0.3-1.5
C17	0.3-0.7			C20:1	0.1-0.3
C18	9.0-13.0				
C20	0.1-0.3	UFA Tot 23-40			

Nutritional characteristics

100 g of butter = 740 kcal



ATHEROGENIC INDEX = 2.2 ± 0.4
TROMBOGENIC INDEX = 1.6 ± 0.3
OMEGA-6/OMEGA 3 = 10.4 ± 3

Saturated /unsaturated = 2.3 ± 0.3

**Saturated (excluding C4-C10)/
unsaturated = 1.9 ± 0.3**
**Short chain FAs exhibited higher
rate and extent of lipid digestion**

***trans* fatty acids = 2.8 ± 0.6**

***trans* (-VA) fatty acids = 1.9 ± 0.5**

Extra-nutritional characteristics

In a large number of in vitro and in vivo studies, some butter constituents showed to exert the following activities:

Immunomodulatory : liposoluble vitamins, CLA

Anti-inflammatory : PLs (protective against gastric acid - PC)

Bactericidal: against gastrointestinal infections (SM)

Anti-carcinogenic: C4, CLA PLs

Anti-adipogenic: CLA (*t10,c12*)

Lowering plasma cholesterol: C4-C10, CLA, PLs

Hormonal production: Vit.D, cholesterol

Fat is the constituent mostly affected by the factors determining the natural variability of milk



Feeding !!

Origin of milk fatty acids

Acetate
 β -OH Butyrate
Mammary gland

C4 to C14

C16

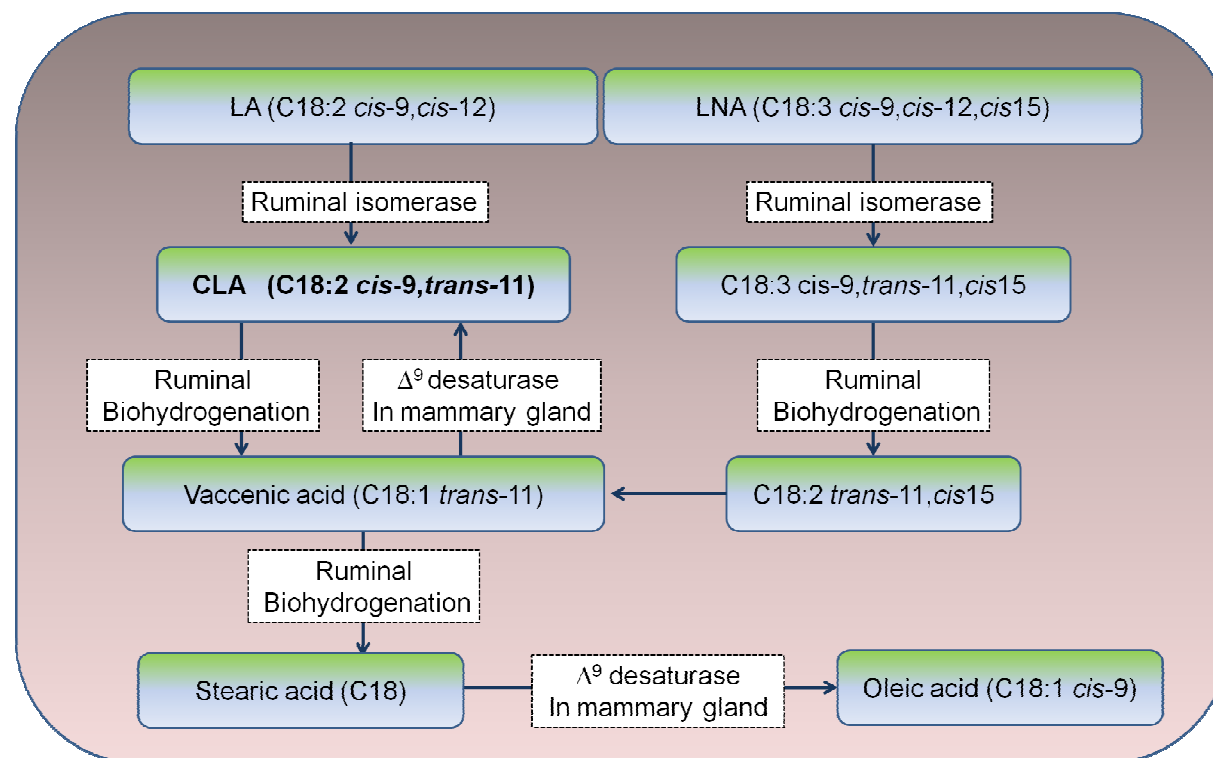
C18 C18:1

C18:2

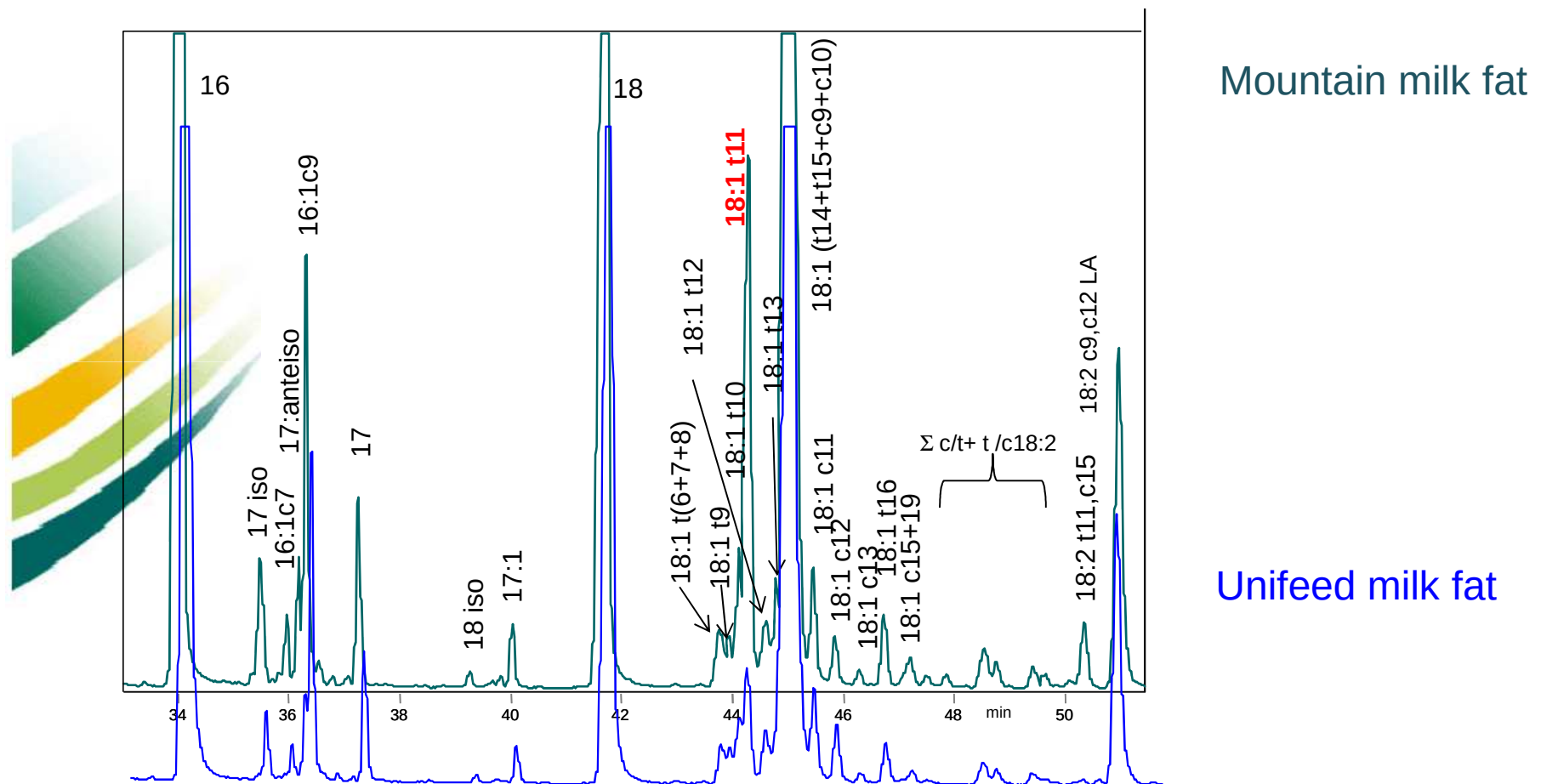
C18:3

Diet
 TGs of blood plasma
 Adipose Tissue

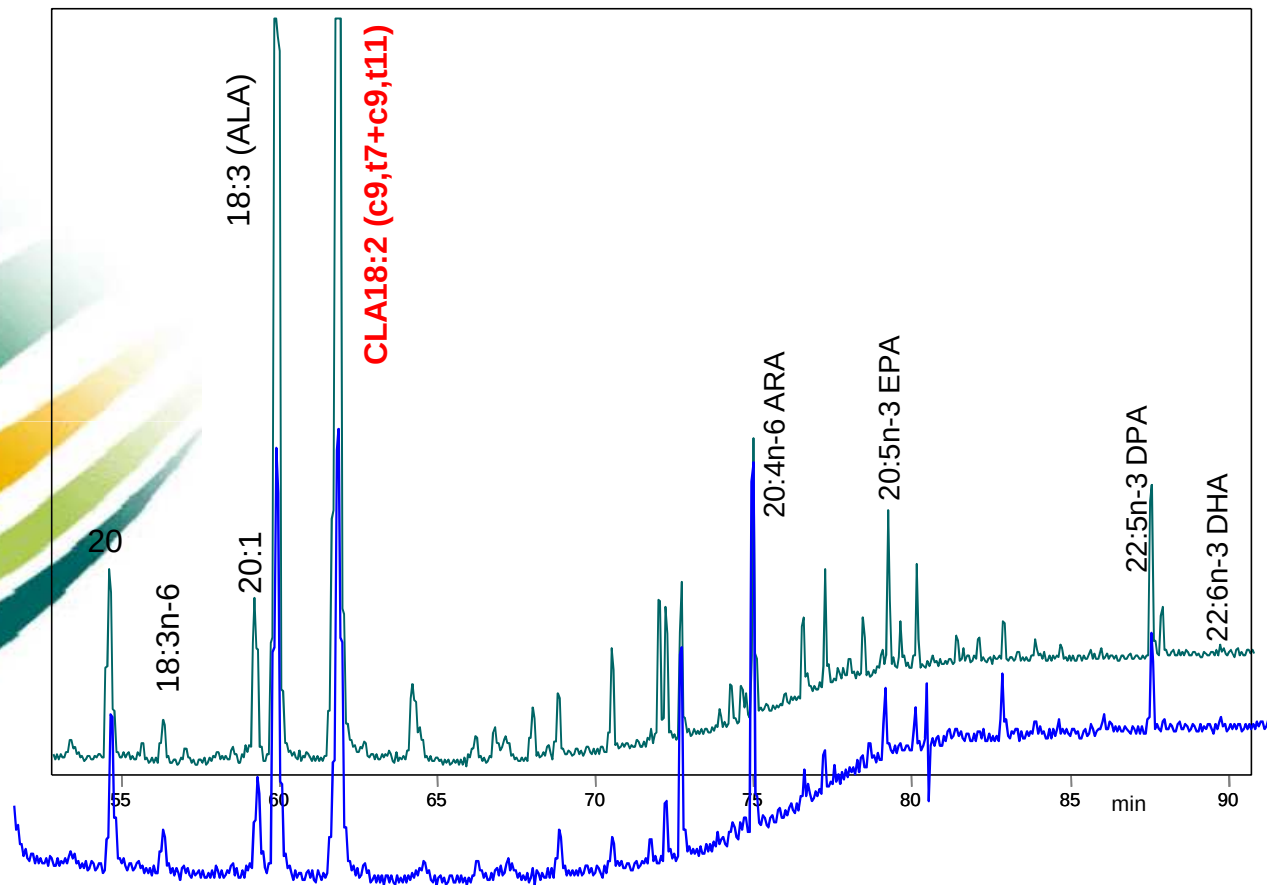
CLAs
 Oleic
 Vaccenic



Analysis of milk fatty acids

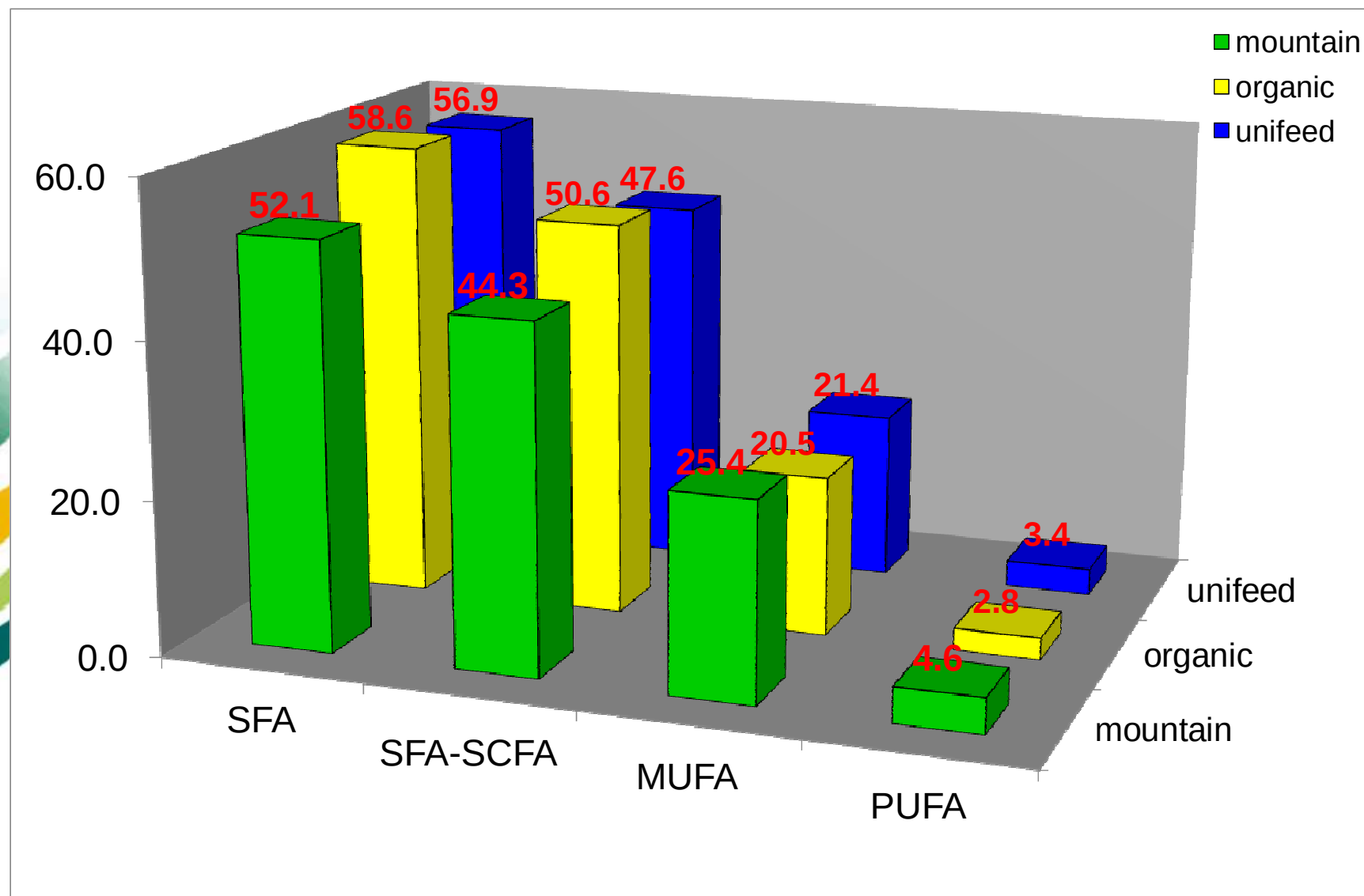


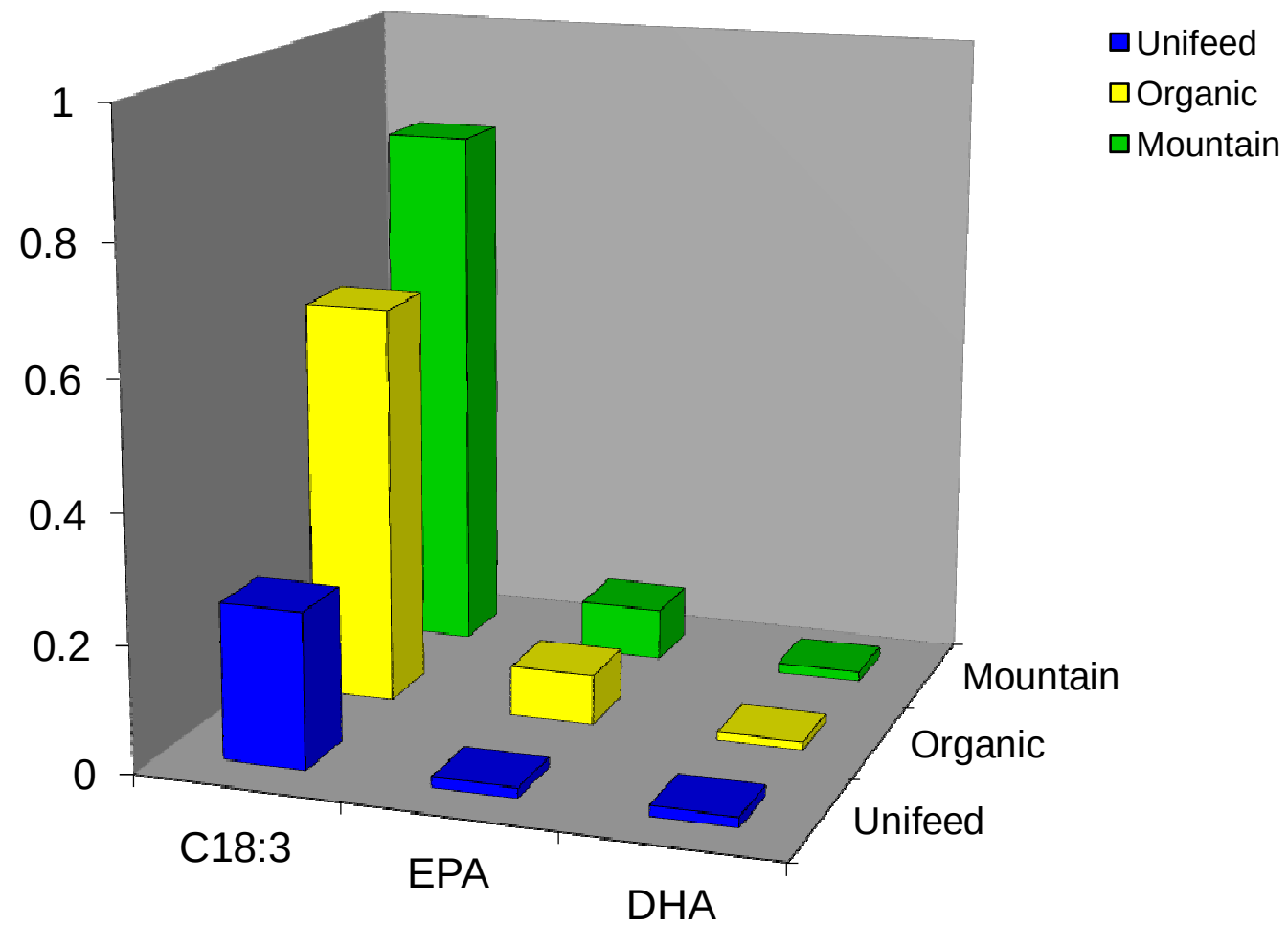
Analysis of milk fatty acids

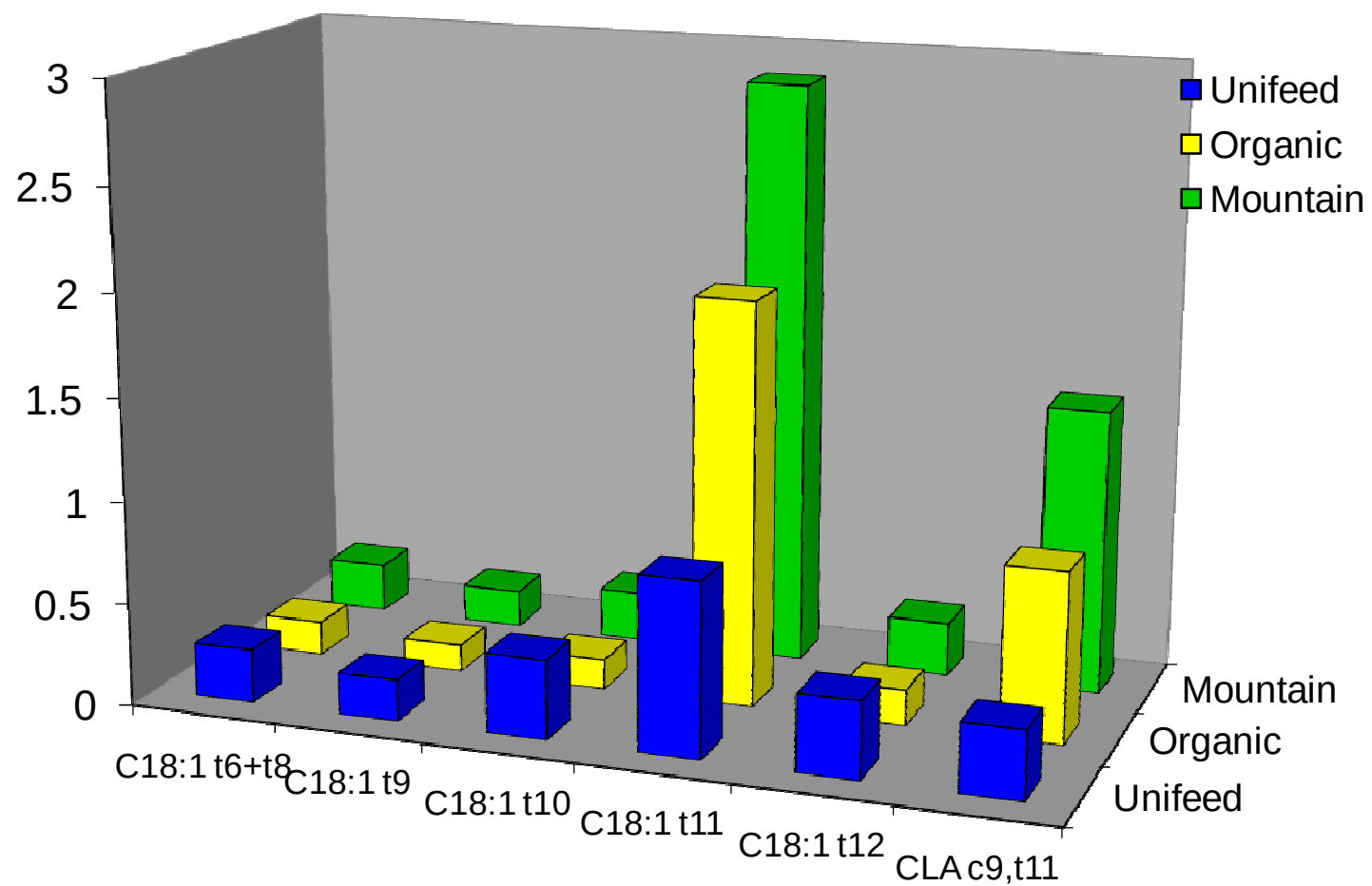


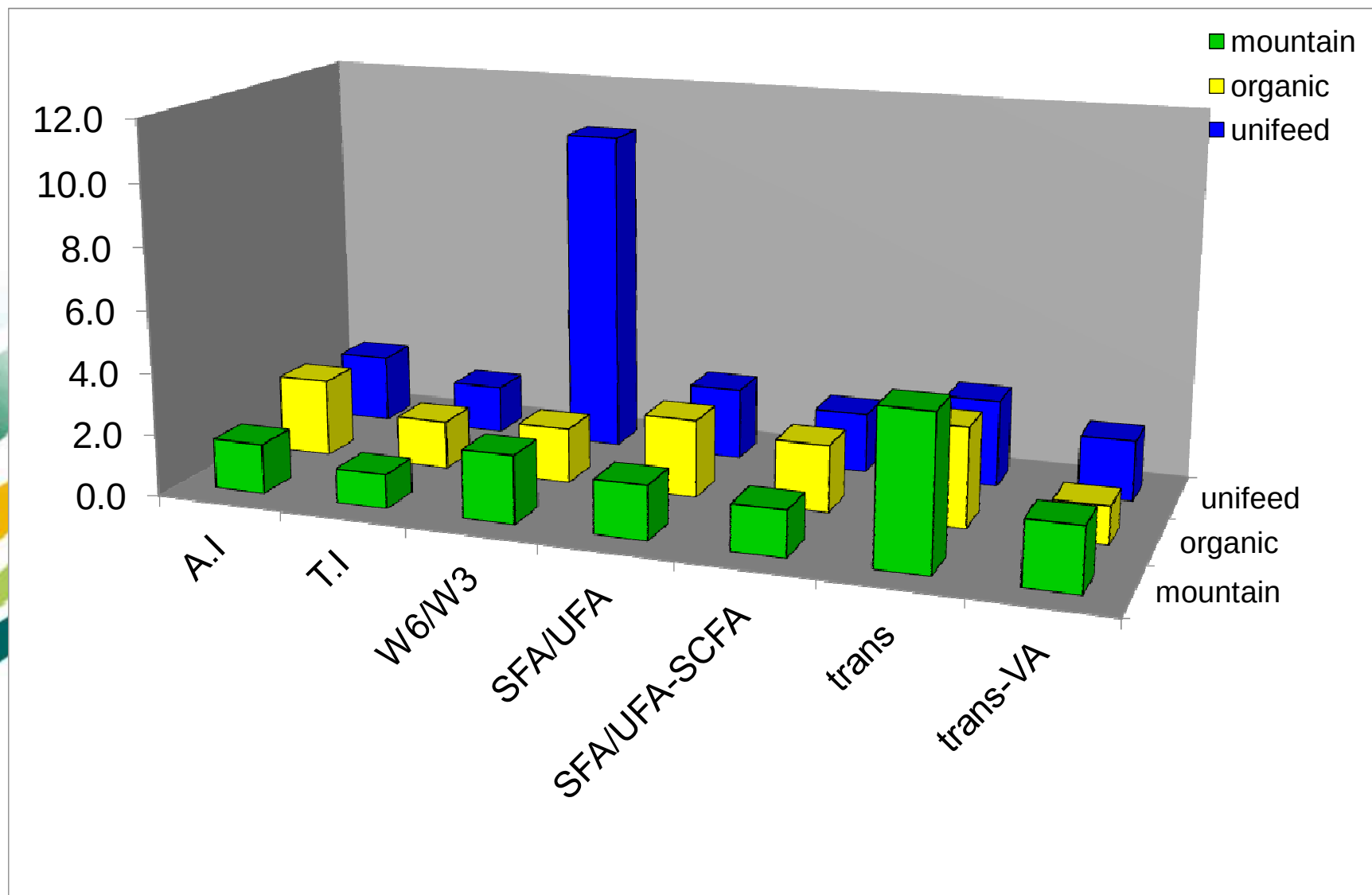
Mountain milk fat

Unifeed milk fat











Butter is a safe and natural product. Its *moderate*, like all the other foods, consumption should not be avoided because it contains several healthy factors