72°

CONGRESSO NAZIONALE FIMMG - METIS

MEDICINA DI FAMIGLIA: CAMBIARE PER MANTENERE I PROPRI VALORI

PERCORSI SIMPeSV PER UN AMBULATORIO DEGLI STILI DI VITA:

UN PO' DI CHIAREZZA SU EFFETTI SULLA SALUTE DI:
FRUTTA SECCA – OLII VEGETALI (PALMA - CANOLA)

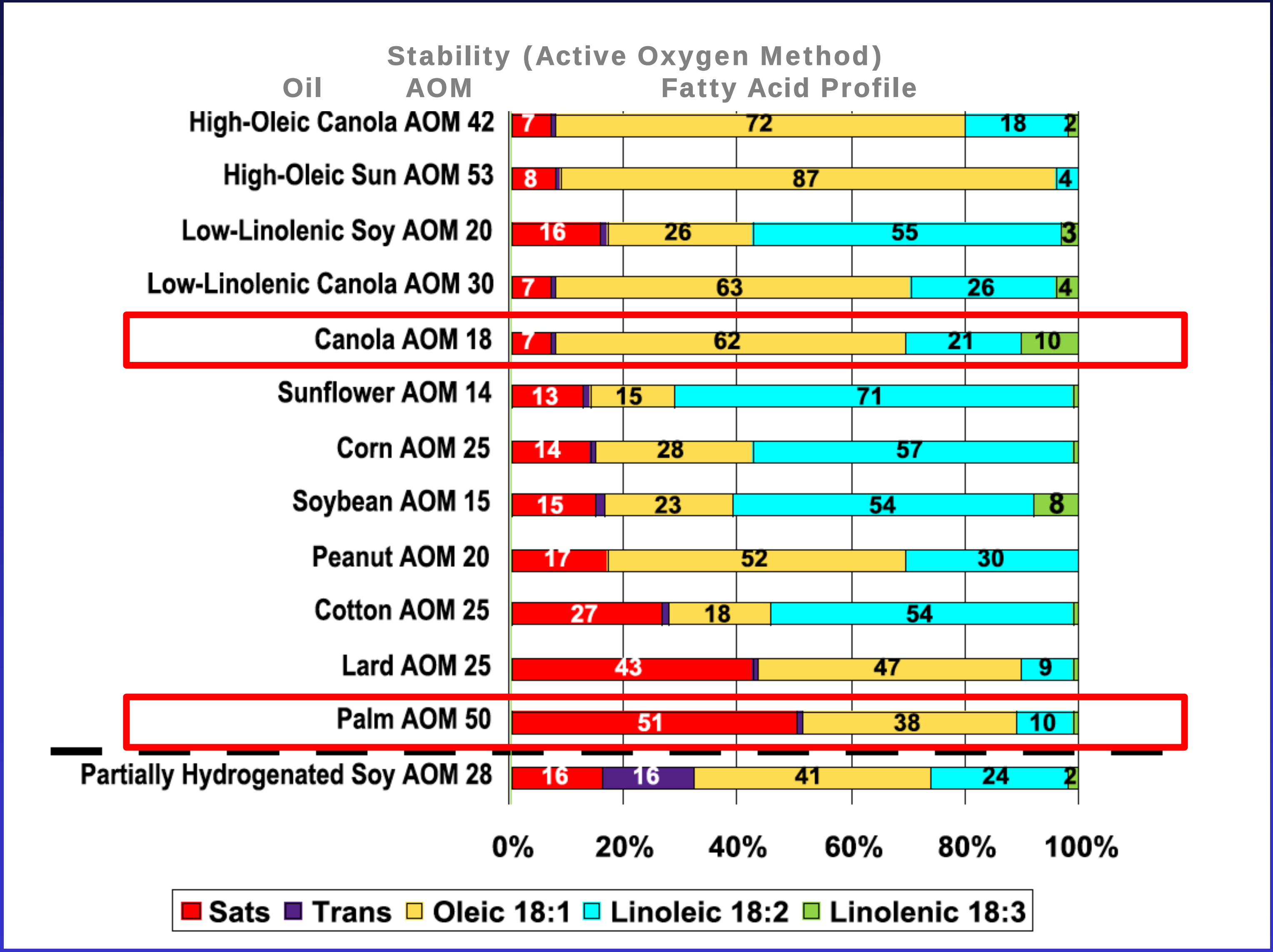
Olio di palma e olio Canola: proviamo a fare chiarezza

Andrea Poli

SIMPeSV Società Italiana di Medicina di Prevenzione e degli Stili di Vita

3/8 Ottobre 2016
Complesso Chia Laguna
Domus de Maria (CA)

Fatty acid composition and stability of different fats used in USA

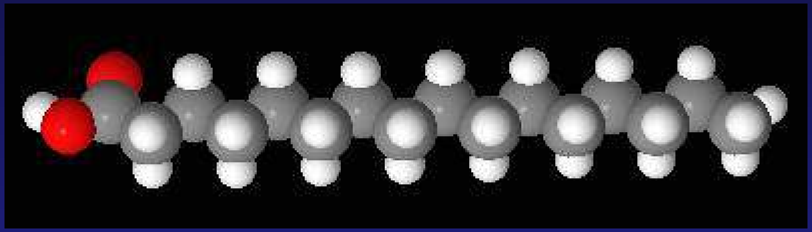


Palma vs Canola: l'origine e gli acidi grassi

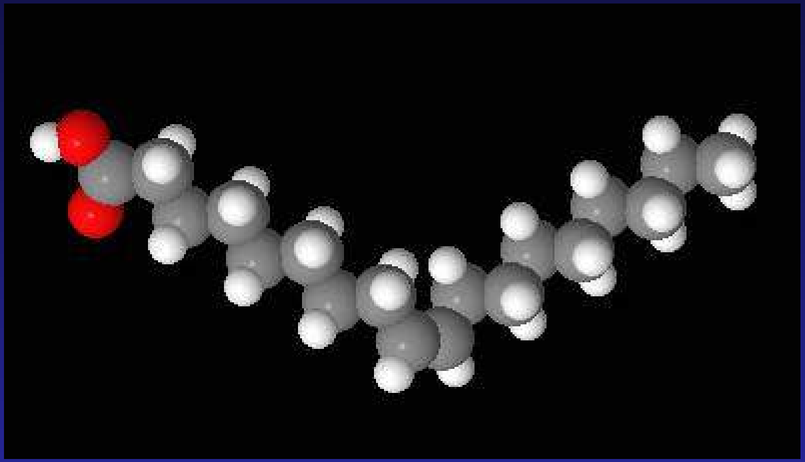
	Olio di Palma	Olio Canola
Saturi (Miristico, Palmitico, Stearico)	51%	7%
Monoinsaturi (Oleico)	38%	62%
Polinsaturi n-6 (Linoleico)	10%	21%
Polinsaturi n-3 (alfa-Linolenico)	1%	10%

***Olio di palma**: si ottiene dalla spremitura di frutti della palma*

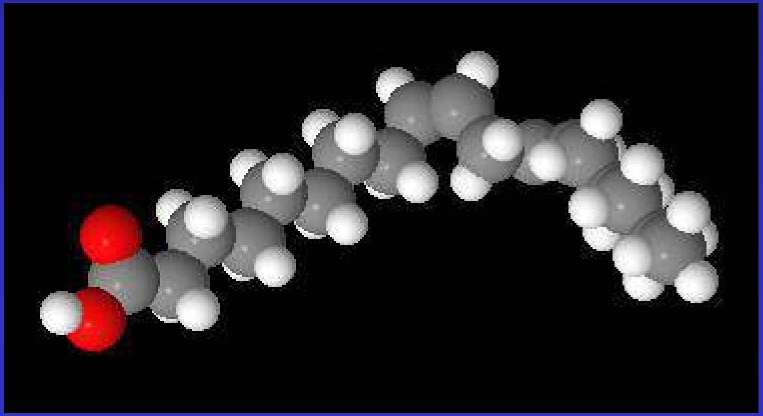
***Olio Canola**: si ottiene dal seme di una varietà di colza (o ravizzone) selezionata (non OGM) per essere priva di acido Erucico (22:1)*



Palmitic acid (18:0)



Oleic acid (18:1)



Linoleic acid (18:2, n-6)

Acidi grassi e rischio cardiovascolare: come sono mutate le evidenze tra il 2000 ed oggi

	Associazione con il rischio CV la visione del 2000	Associazione con il rischio CV la visione del 2016
Grassi totali	++	=
Grassi saturi	++	+
Grassi insaturi *trans*	++	+++
Monoinsaturi	–	=
Polinsaturi omega 6	–	– –
Polinsaturi omega 3	– –	– –
-: riduzione del rischio CV; +: aumento del rischio CV; =: nessun effetto significativo.		

NFI, unpublished, 2015

Acidi grassi e rischio cardiovascolare: come sono mutate le evidenze tra il 2000 ed oggi

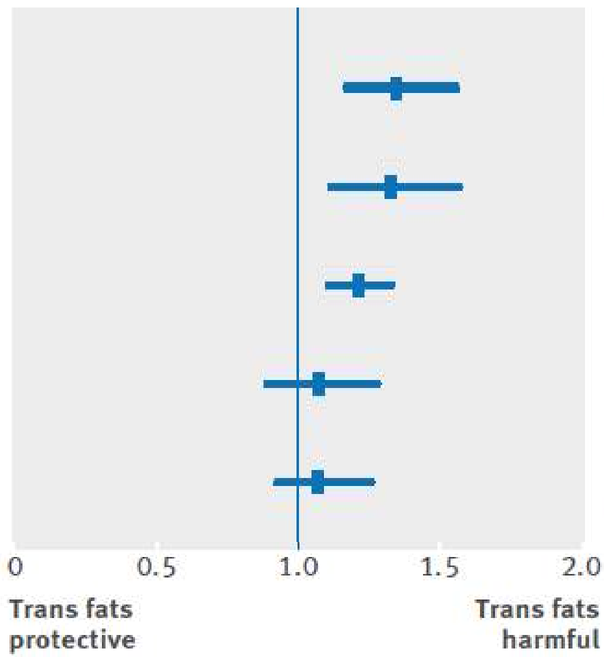
	Associazione con il rischio CV la visione del 2000	Associazione con il rischio CV la visione del 2016
Grassi totali	++	=
Grassi saturi	++	=
Grassi insaturi *trans*	++	++
Monoinsaturi	–	=
Polinsaturi omega 6	–	– –
Polinsaturi omega 3	– –	– –

-: riduzione del rischio CV; +: aumento del rischio CV; =: nessun effetto significativo.

NFI, unpublished, 2016

Intake of saturated and trans unsaturated fatty acids and risk of all cause mortality, cardiovascular disease, and type 2 diabetes: systematic review and meta-analysis of observational studies

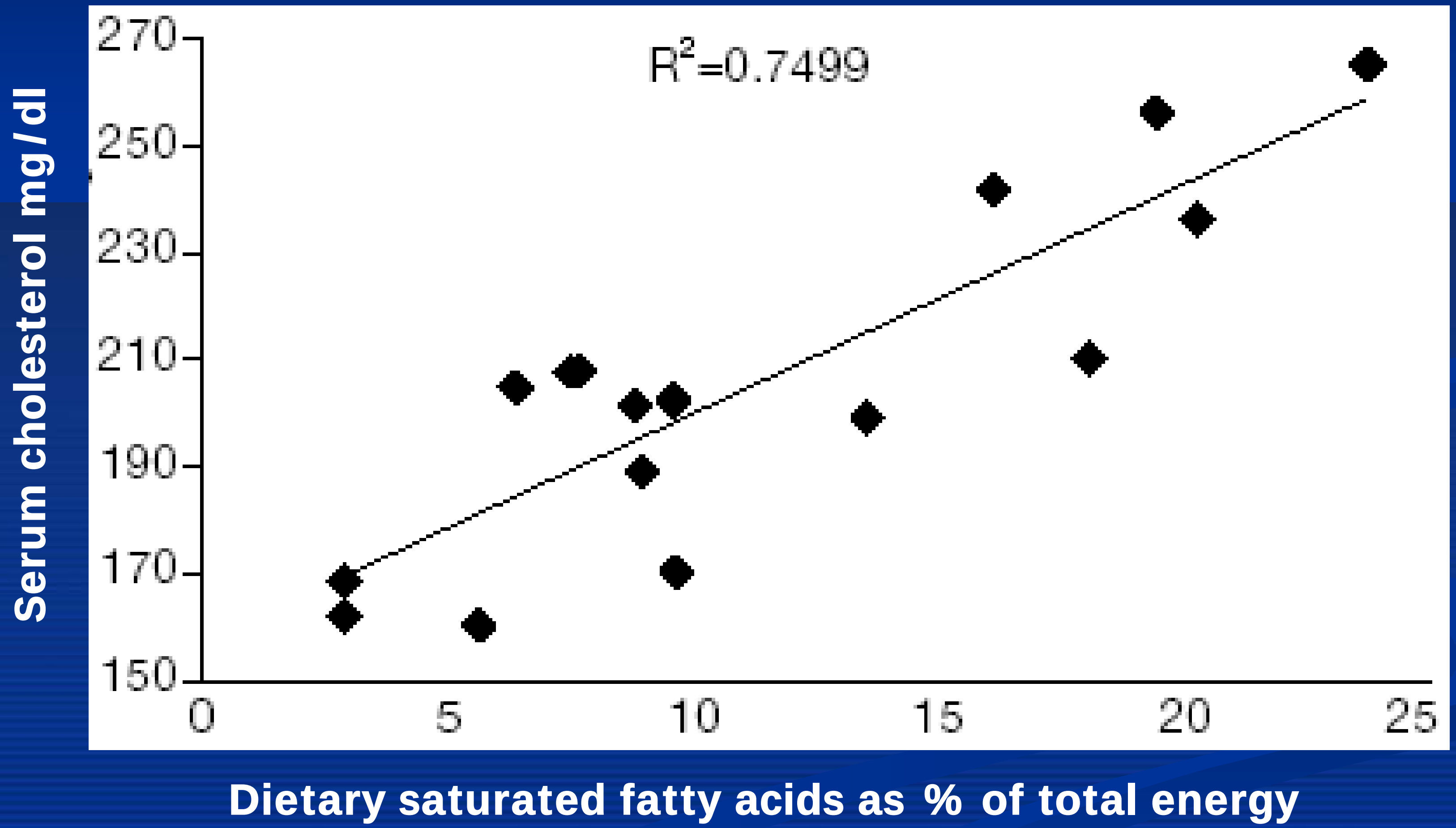
Outcome	No of studies /comparisons	No of events /participants	Risk ratio (95% CI)	Relative risk (95% CI)	P	P_{het}	I^2 (%)
Total trans fats							
All cause mortality	2/2	2141/20 346		1.34 (1.16 to 1.56)	‹0.001	0.07	70
CHD mortality	5/6	1234/70 864		1.28 (1.09 to 1.50)	0.003	0.66	0
CHD total	6/7	4579/145 922		1.21 (1.10 to 1.33)	‹0.001	0.43	0
Ischemic stroke	3/4	1905/190 284		1.07 (0.88 to 1.28)	0.50	0.03	67
Type 2 diabetes	6/6	8690/230 135		1.10 (0.95 to 1.27)	0.21	0.01	66



***trans* fats**

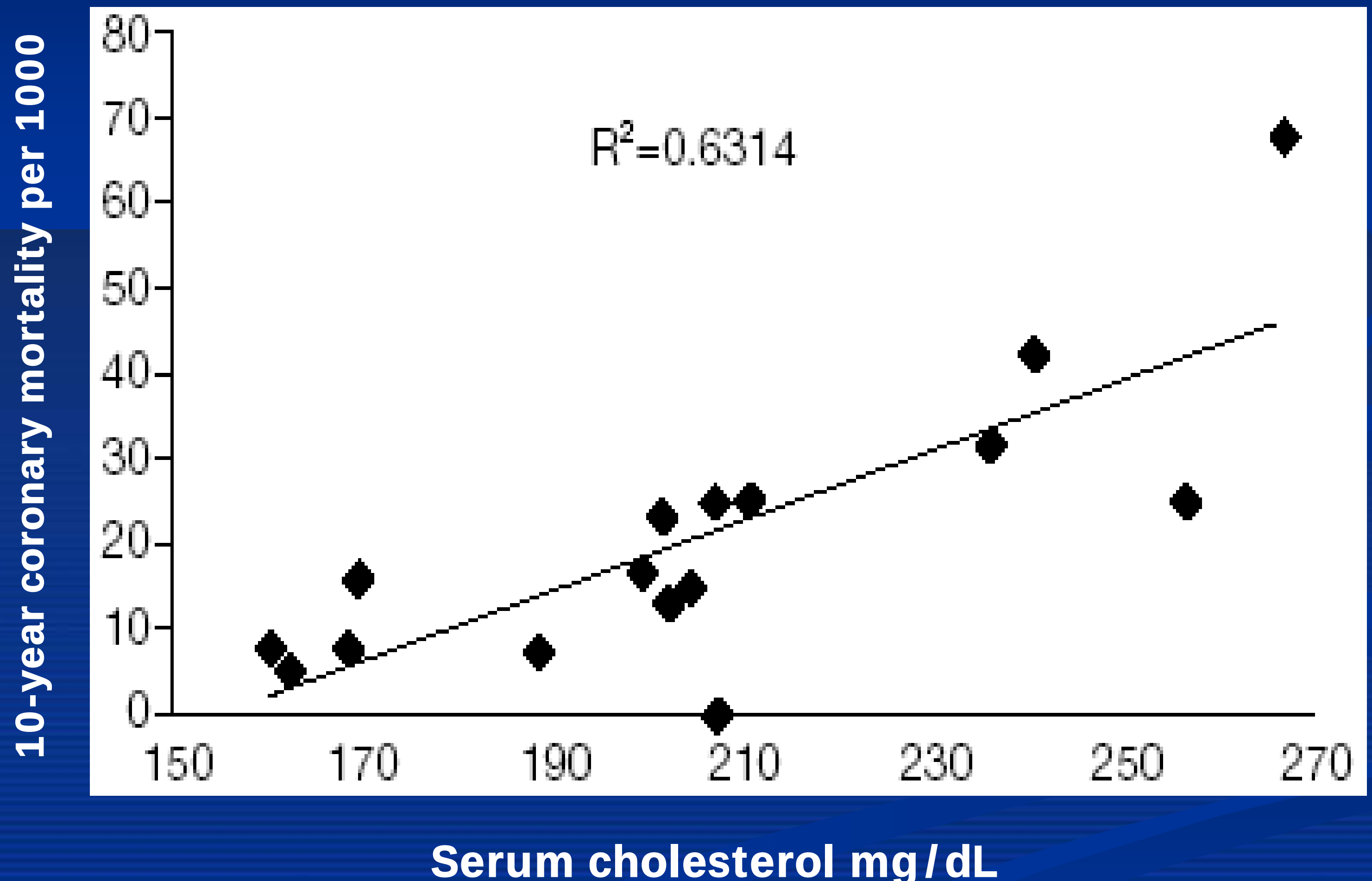
de Souza RJ et al, Brit Med J 2015

Seven Countries Study. Saturated fatty acids and serum cholesterol in 16 cohorts.



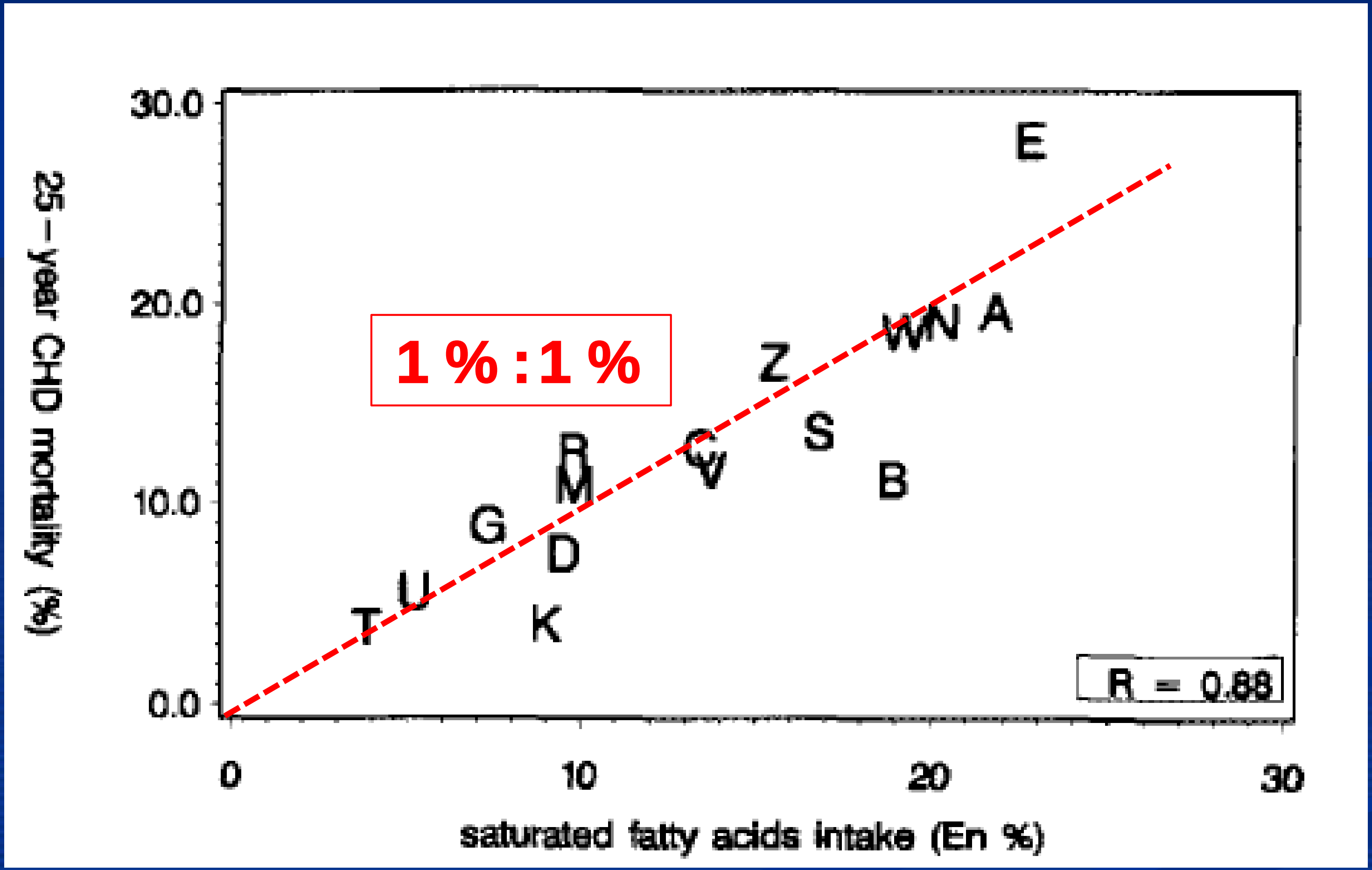
Keys A et al, Circulation, 1970

Seven Countries Study. Serum cholesterol and 10-year coronary mortality in 16 cohorts.



Keys A et al, Circulation, 1970

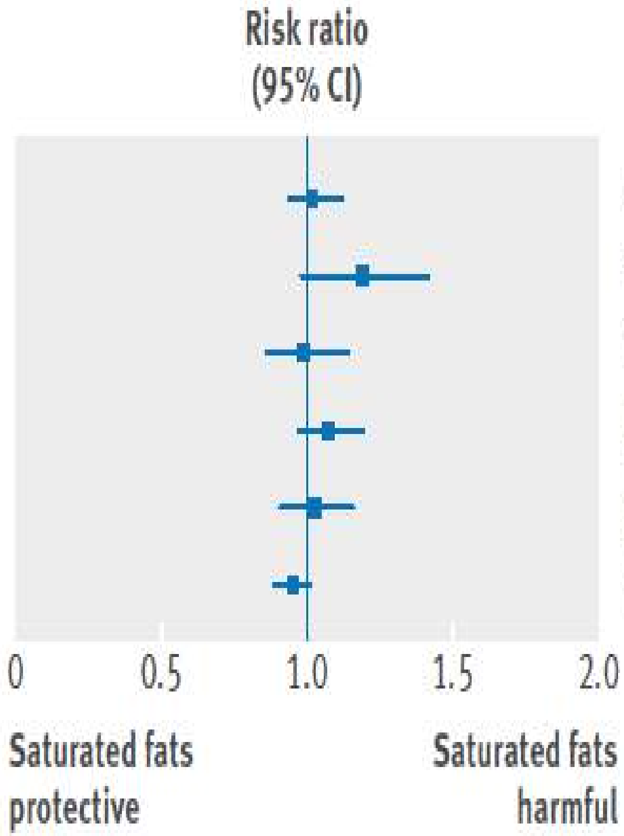
Seven Countries Study. Dietary saturated fatty acids and 25-year CHD mortality



Kromhout D et al, Prev Med, 1995

Intake of saturated and trans unsaturated fatty acids and risk of all cause mortality, cardiovascular disease, and type 2 diabetes: systematic review and meta-analysis of observational studies

Outcome	No of studies /comparisons	No of events /participants	Relative risk (95% CI)	P	P_{het}	I^2 (%)
All cause mortality	5/7	14 090/99 906	0.99 (0.91 to 1.09)	0.91	0.17	33
CHD mortality	11/15	2970/101 712	1.15 (0.97 to 1.36)	0.10	<0.001	70
CVD mortality	3/5	3792/90 501	0.97 (0.84 to 1.12)	0.69	0.29	19
CHD total	12/17	6383/267 416	1.06 (0.95 to 1.17)	0.29	0.02	47
Ischemic stroke	12/15	6226/339 090	1.02 (0.90 to 1.15)	0.79	0.002	59
Type 2 diabetes	8/8	8739/237 454	0.95 (0.88 to 1.03)	0.20	0.61	0



Saturated fats

de Souza RJ et al, Brit Med J 2015

Dietary Fatty Acid Intake and Risk of Fatal Coronary Heart Disease

The Kuopio Ischemic Heart Disease Risk Factor Study

Table 3. Dietary Fatty Acid Intake and Risk of Fatal Coronary Heart Disease

	Intake Quartile				
	1 (n=495)	2 (n=495)	3 (n=496)	4 (n=495)	*P* Trend
Total fat					
Median intake (E%)	31.9	36.9	40.7	45.6	...
No. of events	44	39	49	51	...
Model 1	1	0.88 (0.57–1.37)	1.11 (0.73–1.68)	1.12 (0.74–1.69)	0.42
Model 2	1	1.03 (0.66–1.60)	1.19 (0.77–1.84)	1.12 (0.71–1.75)	0.55
Saturated fatty acids					
Median intake (E%)	13.4	16.5	19.1	22.8	...
No. of events	42	40	43	58	...
Model 1	1	0.91 (0.59–1.41)	0.94 (0.61–1.47)	1.24 (0.81–1.89)	0.24
Model 2	1	1.10 (0.70–1.73)	1.16 (0.73–1.86)	1.29 (0.79–2.08)	0.30
Model 3	1	0.98 (0.61–1.56)	0.96 (0.58–1.58)	0.88 (0.48–1.62)	0.68

Virtanen JK et al, Arterioscl Thromb Vasc Biol 2014

Total fat and different types of fat intake in spanish high risk patients of the PREDIMED cohort: effects on all-cause mortality

Total fat						
Cases, *n* (%)	1408 (6.3)	1408 (6.9)	1407 (5.3)	1408 (6.0)	1407 (6.0)	
Median, % of energy	31.3	36.7	40.2	43.5	48.2	
Multivariable model 1	1 (Ref)	1.04 (0.77, 1.40)	0.73 (0.53, 1.01)	0.80 (0.58, 0.82)	0.57 (0.40, 0.82)	<0.01
Multivariable model 2	1 (Ref)	1.02 (0.75, 1.37)	0.71 (0.51, 0.98)	0.75 (0.54, 1.05)	0.53 (0.37, 0.76)	<0.01
MUFAs						
Cases, *n* (%)	1408 (6.3)	1408 (6.1)	1407 (5.9)	1408 (5.4)	1407 (5.4)	
Median, % of energy	14.7	17.9	20.5	22.8	26.0	
Multivariable model 1	1 (Ref)	0.85 (0.62, 1.16)	0.78 (0.56, 1.08)	0.70 (0.49, 1.00)	0.64 (0.43, 0.95)	0.02
Multivariable model 2	1 (Ref)	0.86 (0.63, 1.17)	0.78 (0.56, 1.09)	0.69 (0.48, 0.99)	0.64 (0.43, 0.94)	0.01
PUFAs						
Cases, *n* (%)	1408 (8.1)	1408 (5.9)	1407 (5.9)	1408 (4.9)	1407 (4.4)	
Median, % of energy	4.2	5.3	6.2	7.2	9.0	
Multivariable model 1	1 (Ref)	0.72 (0.53, 0.97)	0.71 (0.52, 0.97)	0.56 (0.40, 0.78)	0.50 (0.35, 0.71)	<0.01
Multivariable model 2	1 (Ref)	0.73 (0.54, 0.99)	0.72 (0.53, 0.99)	0.56 (0.39, 0.80)	0.50 (0.35, 0.73)	<0.01
SFAs						
Cases, *n* (%)	1408 (5.0)	1408 (5.8)	1407 (5.7)	1408 (6.2)	1407 (6.6)	
Median, % of energy	6.9	8.3	9.4	10.5	12.1	
Multivariable model 1	1 (Ref)	1.20 (0.86, 1.68)	1.17 (0.82, 1.67)	1.22 (0.84, 1.77)	1.21 (0.81, 1.80)	0.47
Multivariable model 2	1 (Ref)	1.16 (0.83, 1.62)	1.12 (0.78, 1.61)	1.12 (0.78, 1.60)	1.08 (0.74, 1.58)	0.90
trans Fat						
Cases, *n* (%)	1408 (4.8)	1408 (5.9)	1407 (4.7)	1408 (6.4)	1407 (7.5)	
Median, % of energy	0.05	0.10	0.16	0.23	0.36	
Multivariable model 1	1 (Ref)	1.15 (0.83, 1.60)	0.90 (0.64, 1.29)	1.22 (0.87, 1.72)	1.38 (1.00, 1.94)	0.03
Multivariable model 2	1 (Ref)	1.11 (0.80, 1.54)	0.86 (0.59, 1.24)	1.13 (0.78, 1.64)	1.29 (0.87, 1.90)	0.12

Guasch-Ferré M et al, Am J Clin Nutr 2015

Total fat and different types of fat intake in spanish high risk patients of the PREDIMED cohort: effects on all-cause mortality

Total fat						
Cases, *n* (%)	1408 (6.3)	1408 (6.9)	1407 (5.3)	1408 (6.0)	1407 (6.0)	
Median, % of energy	31.3	36.7	40.2	43.5	48.2	
Multivariable model 1	1 (Ref)	1.04 (0.77, 1.40)	0.73 (0.53, 1.01)	0.80 (0.58, 0.82)	0.57 (0.40, 0.82)	<0.01
Multivariable model 2	1 (Ref)	1.02 (0.75, 1.37)	0.71 (0.51, 0.98)	0.75 (0.54, 1.05)	0.53 (0.37, 0.76)	<0.01
MUFAs						
Cases, *n* (%)	1408 (6.3)	1408 (6.1)	1407 (5.9)	1408 (5.4)	1407 (5.4)	
Median, % of energy	14.7	17.9	20.5	22.8	26.0	
Multivariable model 1	1 (Ref)	0.85 (0.62, 1.16)	0.78 (0.56, 1.08)	0.70 (0.49, 1.00)	0.64 (0.43, 0.95)	0.02
Multivariable model 2	1 (Ref)	0.86 (0.63, 1.17)	0.78 (0.56, 1.09)	0.69 (0.48, 0.99)	0.64 (0.43, 0.94)	0.01
PUFAs						
Cases, *n* (%)	1408 (8.1)	1408 (5.9)	1407 (5.9)	1408 (4.9)	1407 (4.4)	
Median, % of energy	4.2	5.3	6.2	7.2	9.0	
Multivariable model 1	1 (Ref)	0.72 (0.53, 0.97)	0.71 (0.52, 0.97)	0.56 (0.40, 0.78)	0.50 (0.35, 0.71)	<0.01
Multivariable model 2	1 (Ref)	0.73 (0.54, 0.99)	0.72 (0.53, 0.99)	0.56 (0.39, 0.80)	0.50 (0.35, 0.73)	<0.01
SFAs						
Cases, *n* (%)	1408 (5.0)	1408 (5.8)	1407 (5.7)	1408 (6.2)	1407 (6.6)	
Median, % of energy	6.9	8.3	9.4	10.5	12.1	
Multivariable model 1	1 (Ref)	1.20 (0.86, 1.68)	1.17 (0.82, 1.67)	1.22 (0.84, 1.77)	1.21 (0.81, 1.80)	0.47
Multivariable model 2	1 (Ref)	1.16 (0.83, 1.62)	1.12 (0.78, 1.61)	1.12 (0.78, 1.60)	1.08 (0.74, 1.58)	0.90
trans Fat						
Cases, *n* (%)	1408 (4.8)	1408 (5.9)	1407 (4.7)	1408 (6.4)	1407 (7.5)	
Median, % of energy	0.05	0.10	0.16	0.23	0.36	
Multivariable model 1	1 (Ref)	1.15 (0.83, 1.60)	0.90 (0.64, 1.29)	1.22 (0.87, 1.72)	1.38 (1.00, 1.94)	0.03
Multivariable model 2	1 (Ref)	1.11 (0.80, 1.54)	0.86 (0.59, 1.24)	1.13 (0.78, 1.64)	1.29 (0.87, 1.90)	0.12

Guasch-Ferré M et al, Am J Clin Nutr 2015

Lipidi Alimentari e Lipidi Plasmatici

Δ colesterolo serico =

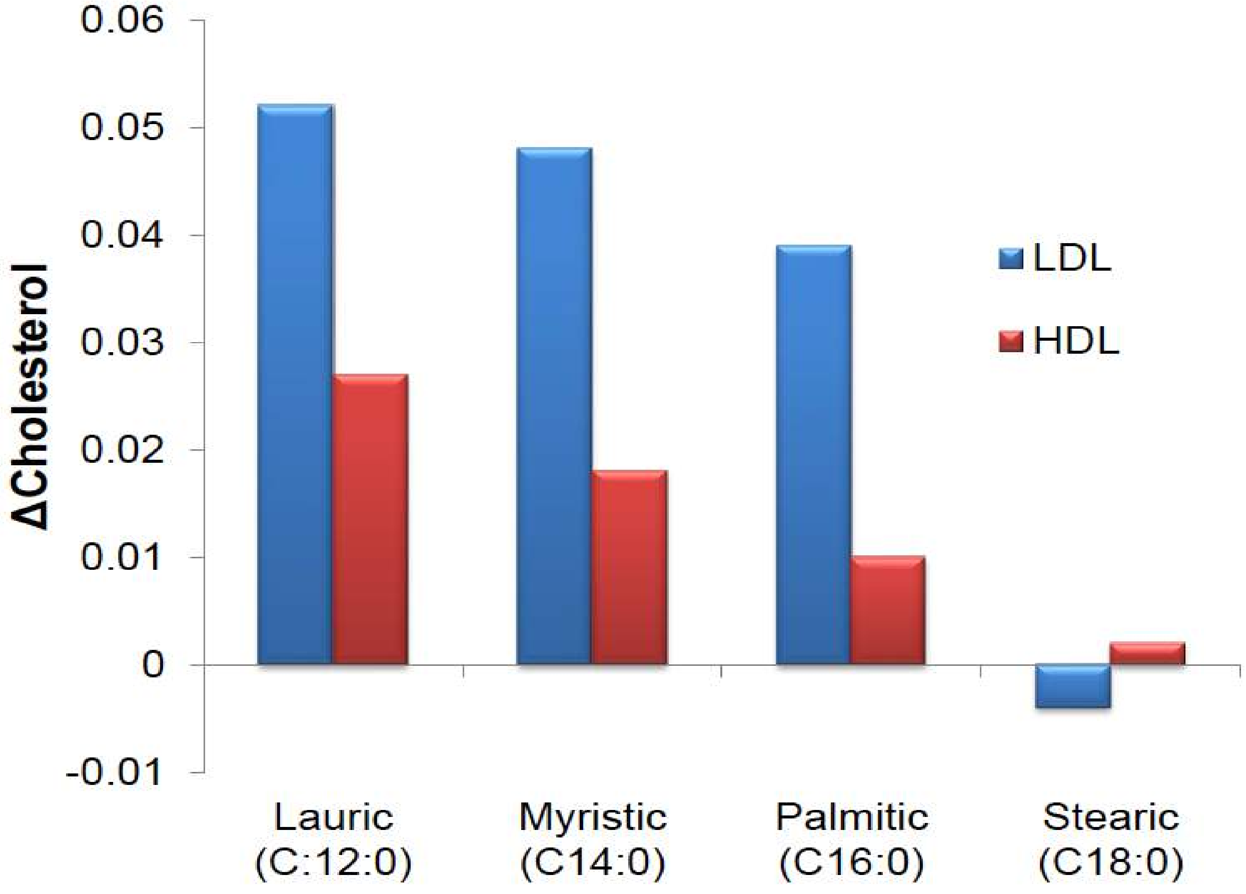
+ 0,0711 Δ saturi

- 0,0365 Δ polinsaturi

+ 0,0043 Δ colesterolo alimentare

Hegsted, 1993

But, Saturated fatty acids are not created equal…

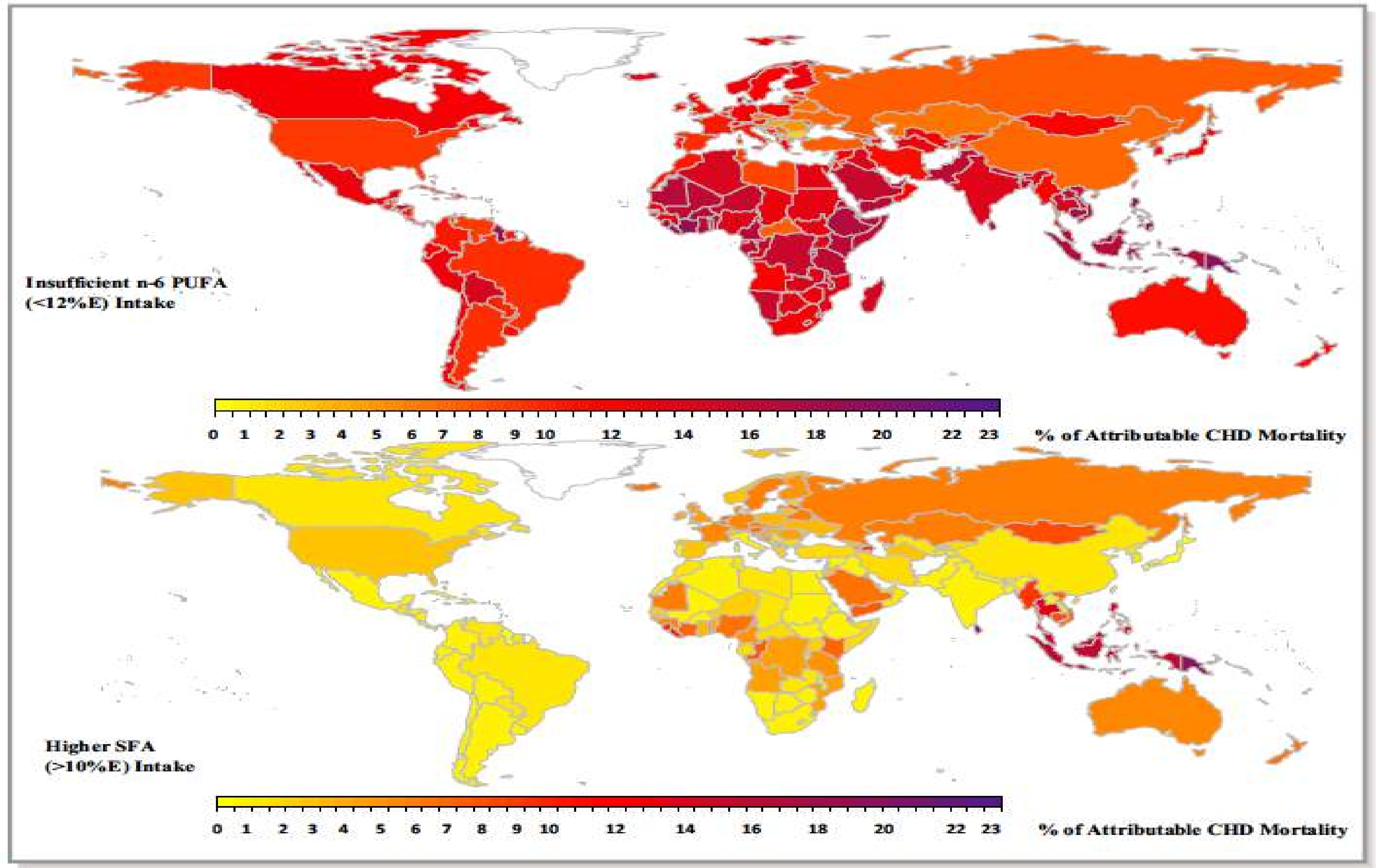


Effect of replacing 1% of energy as carbohydrate with different saturated fatty acids
-meta-analysis of 60 controlled trials

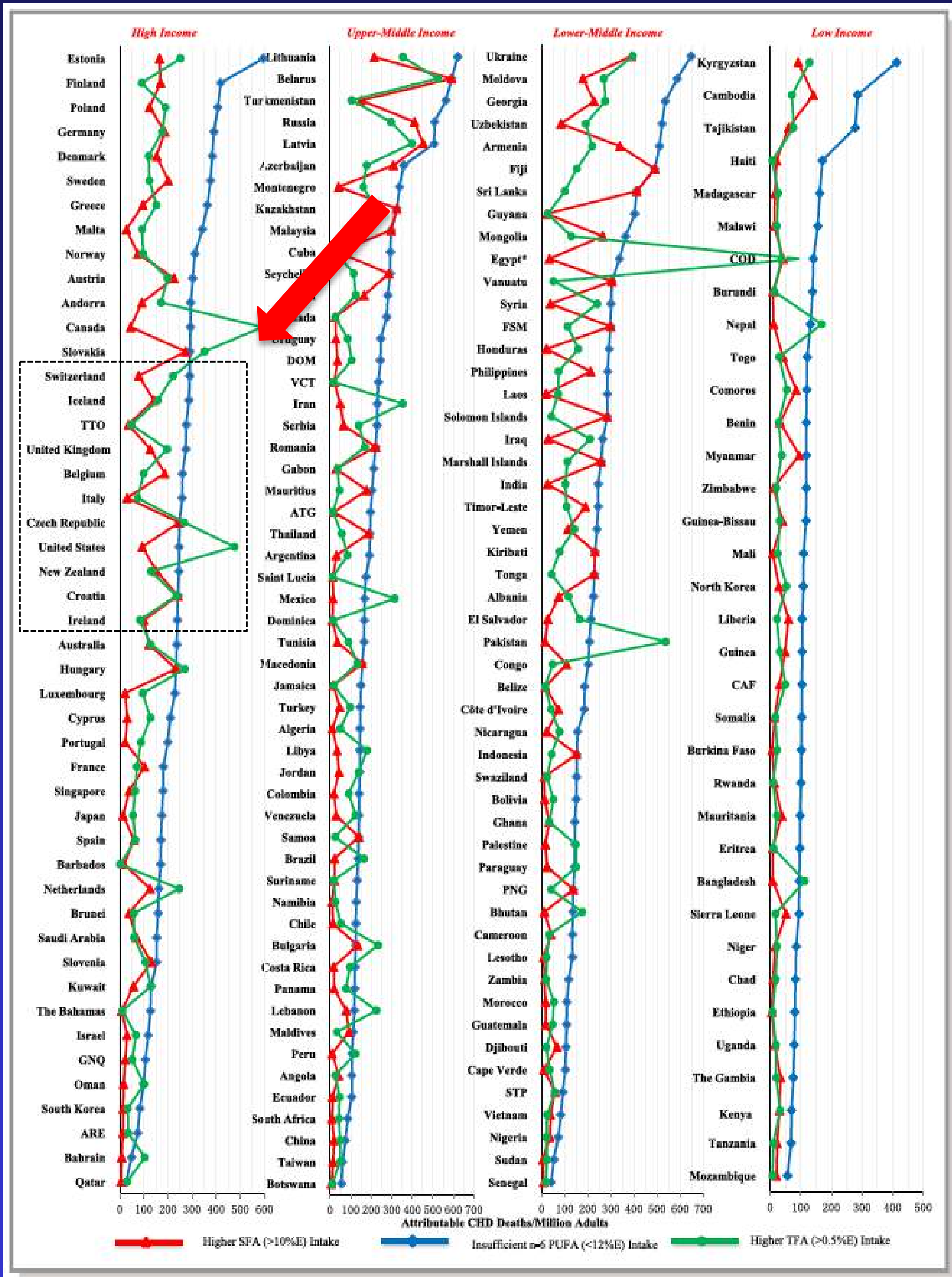
Mensink et al. (2003) Am. J. Clin. Nutr. 77, 1146-1155

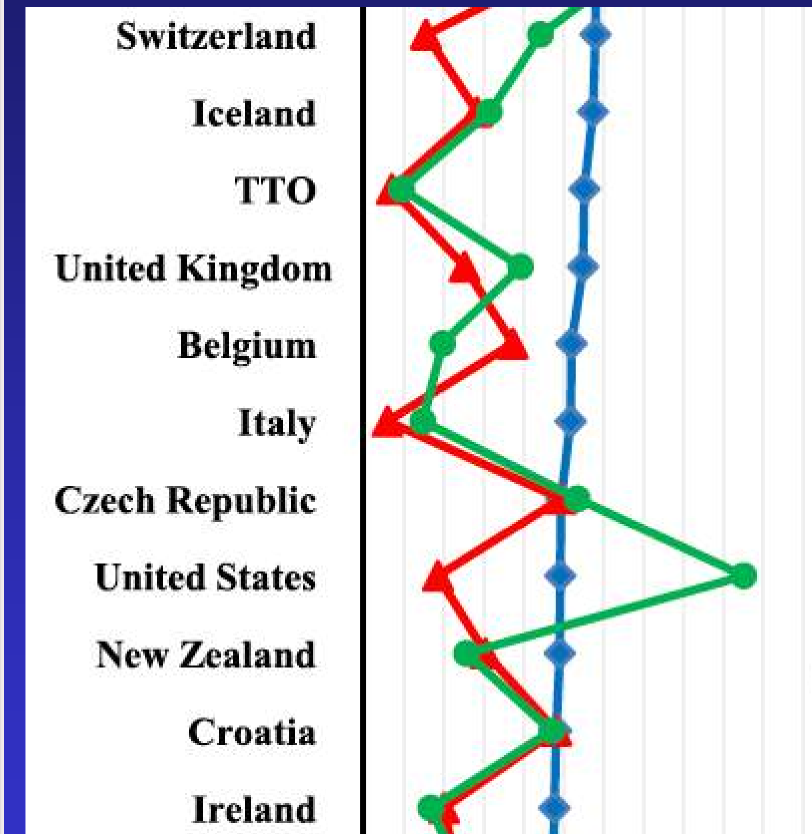
Impact of Nonoptimal Intakes of Saturated, Polyunsaturated, and Trans Fat on Global Burdens of Coronary Heart Disease

Qianyi Wang, ScD; Ashkan Afshin, ScD, MD; Mohammad Yawar Yakoob, ScD, MD; Gitanjali M. Singh, PhD; Colin D. Rehm, PhD, MPH; Shahab Khatibzadeh, MD; Renata Micha, PhD; Peilin Shi, PhD; Dariush Mozaffarian, MD, DrPH; on behalf of the Global Burden of Diseases Nutrition and Chronic Diseases Expert Group (NutriCoDE)*



CHD Deaths attributable to low PUFA n-6 high SFA or high TFA in various countries





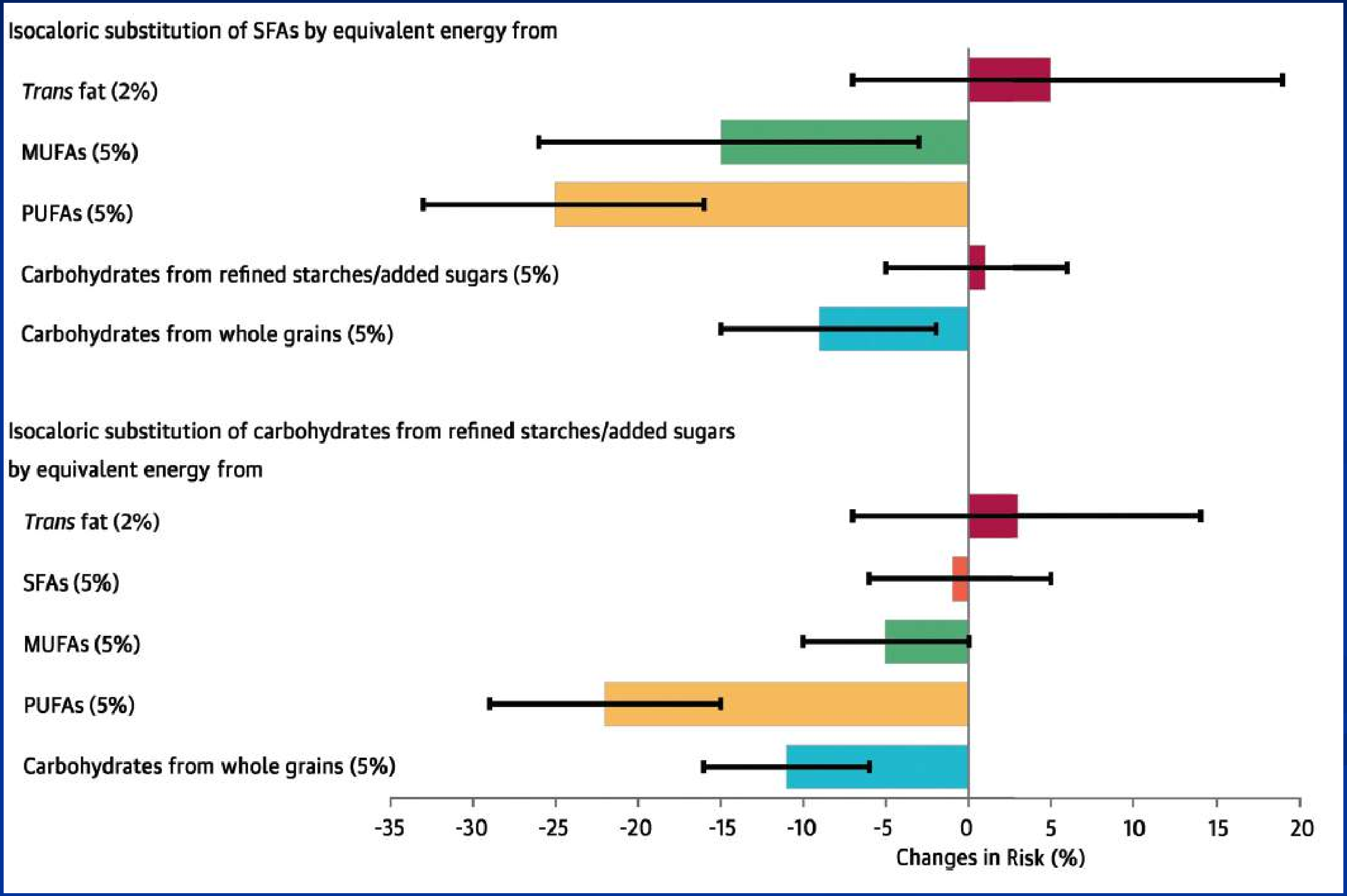
Wang Q et al, J Am Heart Assoc 2016

Impact of Nonoptimal Intakes of Saturated, Polyunsaturated, and Trans Fat on Global Burdens of Coronary Heart Disease

Qianyi Wang, ScD; Ashkan Afshin, ScD, MD; Mohammad Yawar Yakoob, ScD, MD; Gitanjali M. Singh, PhD; Colin D. Rehm, PhD, MPH; Shahab Khatibzadeh, MD; Renata Micha, PhD; Peilin Shi, PhD; Dariush Mozaffarian, MD, DrPH; on behalf of the Global Burden of Diseases Nutrition and Chronic Diseases Expert Group (NutriCoDE)*

		Proportion of CHD Deaths (%) due to (95%UI)		
	Population	Higher SFA (>10%E) Intake†	Insufficient N-6 PUFA (<12%E)intake‡	High TFA (>0.5%E) intake §
Italy				
Age 25-69	36342055	1.7 (1.3, 2.1)	13.9 (12.1, 15.6)	5.2 (4.7, 5.8)
Age 70+	9165930	1.1 (0.6, 1.5)	9.7 (7.6, 11.8)	3.1 (2.6, 3.7)
Female	23795067	1.1 (0.8, 1.5)	9.9 (8.3, 11.5)	3.4 (3, 3.8)
Male	21712918	1.3 (0.9, 1.7)	11.4 (9.6, 13.2)	3.8 (3.3, 4.3)
All	45507985	1.2 (1, 1.5)	10.7 (9.5, 11.8)	3.6 (3.3, 4)

Saturated fats compared with unsaturated fats and sources of carbohydrates in relation to risk of CHD



Li J et al, JACC 2015

Association of specific dietary fats with total and cause-specific mortality

Table 2. Associations Between Total and Specific Types of Fat Intake and Total Mortality (Comparison Is Isocaloric Substitution for Total Carbohydrates)

	Quintile of Dietary Fatty Acid Intake					*P* Value for Trend	HR (95% CI)[a]
	1	2	3	4	5		
Saturated fat intake							
NHS							
Median, % of energy	8.2	10.2	11.8	13.5	16.5	NA	NA
No. of deaths	5660	4729	4217	3376	2332	NA	NA
HPFS							
Median, % of energy	7.1	9.0	10.2	11.5	13.5	NA	NA
No. of deaths	2606	2662	2602	2548	2572	NA	NA
Pooled[b]							
Age-adjusted model	1 [Reference]	1.16 (1.12-1.19)	1.32 (1.27-1.36)	1.45 (1.40-1.50)	1.71 (1.65-1.78)	<.001	1.45 (1.42-1.48)
MV-adjusted model[c]	1 [Reference]	1.04 (1.00-1.08)	1.09 (1.05-1.14)	1.09 (1.04-1.14)	1.08 (1.03-1.14)	<.001	1.08 (1.04-1.11)

Wang DD et al, JAMA Int Med 2016

Association of specific dietary fats with total and cause-specific mortality

Table 2. Associations Between Total and Specific Types of Fat Intake and Total Mortality (Comparison Is Isocaloric Substitution for Total Carbohydrates)

	Quintile of Dietary Fatty Acid Intake					*P* Value for Trend	HR (95% CI)[a]
	1	2	3	4	5		
Saturated fat intake							
NHS							
Median, % of energy	8.2	10.2	11.8	13.5	16.5	NA	NA
No. of deaths	5660	4729	4217	3376	2332	NA	NA
HPFS							
Median, % of energy	7.1	9.0	10.2	11.5	13.5	NA	NA
No. of deaths	2606	2662	2602	2548	2572	NA	NA
Pooled[b]							
Age-adjusted model	1 [Reference]	1.16 (1.12-1.19)	1.32 (1.27-1.36)	1.45 (1.40-1.50)	1.71 (1.65-1.78)	<.001	1.45 (1.42-1.48)
MV-adjusted model[c]	1 [Reference]	1.04 (1.00-1.08)	1.09 (1.05-1.14)	1.09 (1.04-1.14)	1.08 (1.03-1.14)	<.001	1.08 (1.04-1.11)

Wang DD et al, JAMA Int Med 2016

PLOS | ONE

June, 29th, 2016

RESEARCH ARTICLE

Is Butter Back? A Systematic Review and Meta-Analysis of Butter Consumption and Risk of Cardiovascular Disease, Diabetes, and Total Mortality

Laura Pimpin[1], Jason H. Y. Wu[2], Hila Haskelberg[2], Liana Del Gobbo[1,3], Dariush Mozaffarian[1]*

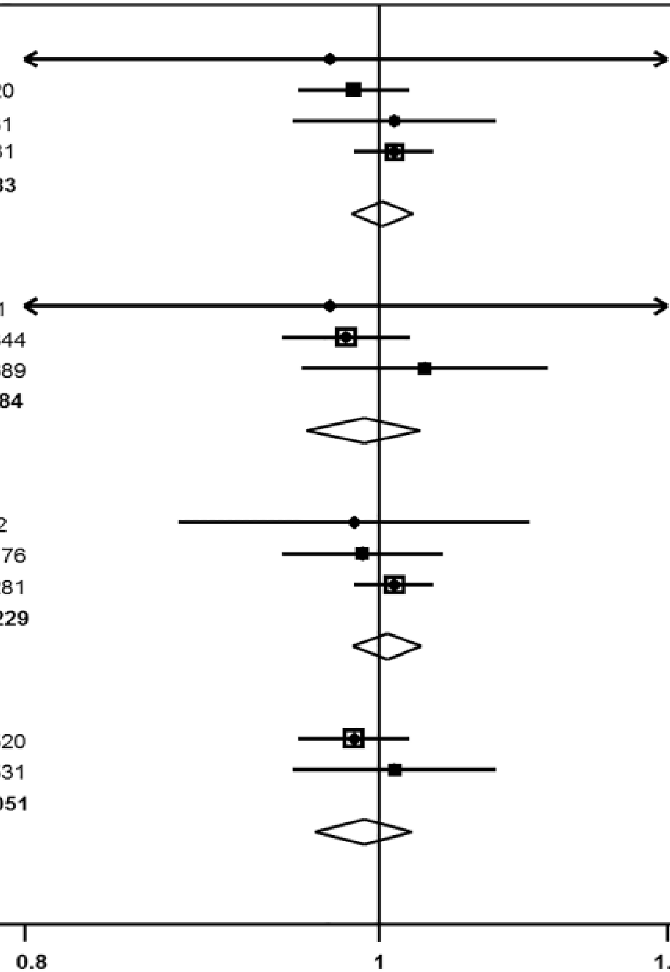
1 Friedman School of Nutrition Science & Policy, Tufts University, 150 Harrison Avenue, Boston, MA, United States of America, **2** The George Institute for Global Health, University of Sydney, Sydney, Australia, **3** Cardiovascular Medicine, Stanford School of Medicine, Palo Alto, CA, United States of America

* Dariush.Mozaffarian@tufts.edu

CrossMark
click for updates

Butter intake (one serving, 14 g/day) and cardiovascular disease risk: a meta-analysis

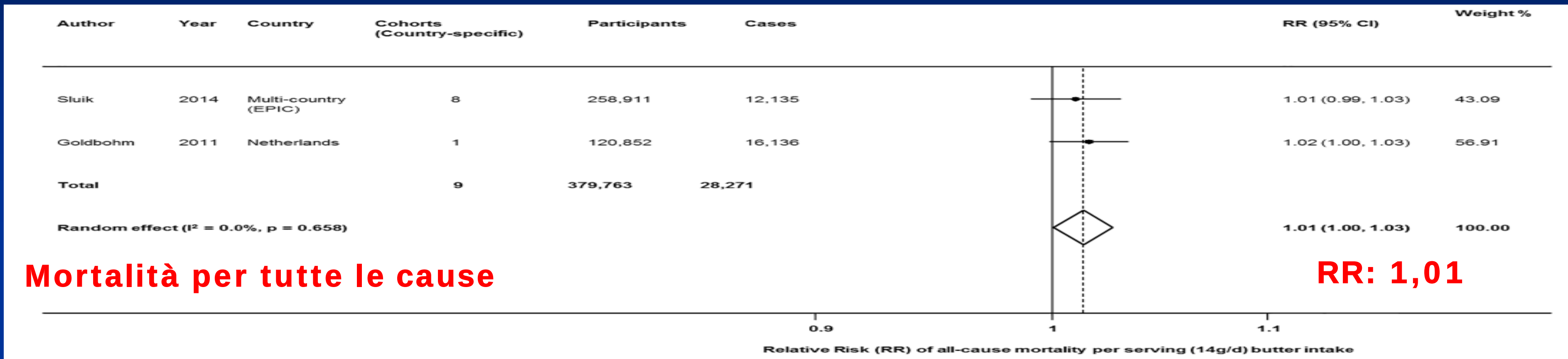
Author	Year	Country	Country- specific Cohorts	Outcome	Participants	Cases	RR (95% CI)	Weight %
Any CVD outcome								
Avalos	2012	USA	1	CHD	1,759	451	0.97 (0.59, 1.61)	0.15
Sonestedt	2011	Sweden	1	Total CVD	26,445	2,520	0.98 (0.95, 1.02)	30.46
Goldbohm	2011	Netherlands	1	Total CVD	120,852	3,531	1.01 (0.95, 1.08)	9.08
Larsson	2009	Finland	1	Total stroke	26,556	3,281	1.01 (0.99, 1.04)	60.31
Total			**4**		**175,612**	**9,783**		
Random effect (I² = 0.0%, p = 0.704							**1.00 (0.98, 1.02)**	**100.00**
Coronary Heart Disease only								
Avalos	2012	USA	1	CHD	1,759	451	0.97 (0.59, 1.61)	0.51
Sonestedt	2011	Sweden	1	CHD	26,445	1,344	0.98 (0.94, 1.02)	77.91
Goldbohm	2011	Netherlands	1	CHD	120,852	2,689	1.03 (0.95, 1.11)	21.58
Total			**3**		**149,056**	**4,484**		
Random effect (I² = 0.0%, p = 0.537)							**0.99 (0.96, 1.03)**	**100.00**
Stroke only								
Goldbohm	2011	Netherlands	1	Stroke	120,852	842	0.99 (0.88, 1.10)	3.91
Sonestedt	2011	Sweden	1	Stroke	26,445	1,176	0.99 (0.94, 1.04)	18.44
Larsson	2009	Finland	1	Total stroke	26,556	3,281	1.01 (0.99, 1.04)	77.66
Total			**3**		**173,853**	**5,229**	1.01 (0.98, 1.03)	
Random effect (I² = 0.0%, p = 0.737)							**1.01 (0.98, 1.03)**	**100.00**
Total CVD								
Sonestedt	2011	Sweden	1	Total CVD	26,445	2,520	0.98 (0.95, 1.02)	77.04
Goldbohm	2011	Netherlands	1	Total CVD	120,852	3,531	1.01 (0.95, 1.08)	22.96
Total			**2**		**147,297**	**6,051**		
Random effect (I² = 0.0%, p = 0.498)							**0.99 (0.96, 1.02)**	**100.00**

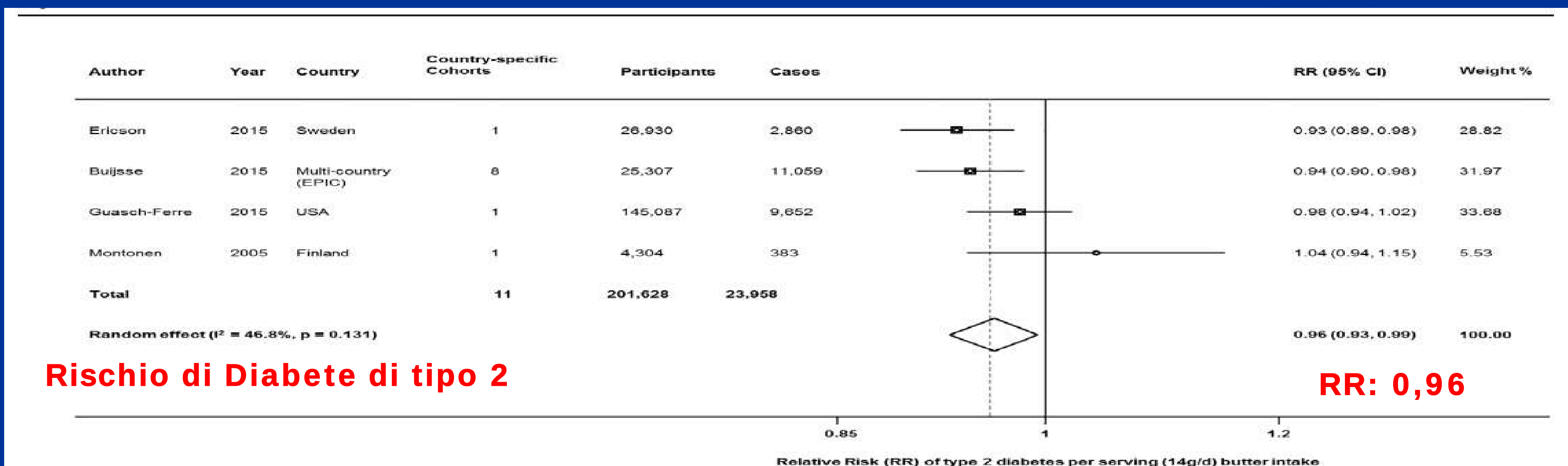


Relative Risk (RR) of CVD and stroke per serving (14g/d) butter intake

Pimpin L et al, PlosOne 2016

Butter intake (one serving, 14 g/day) and all-cause mortality and T2D risk: a meta-analysis





Pimpin L et al, PlosOne 2016


TIME
June 12th, 2014
Eat Butter.
Scientists labeled fat the enemy. Why they were wrong
BY BRYAN WALSH

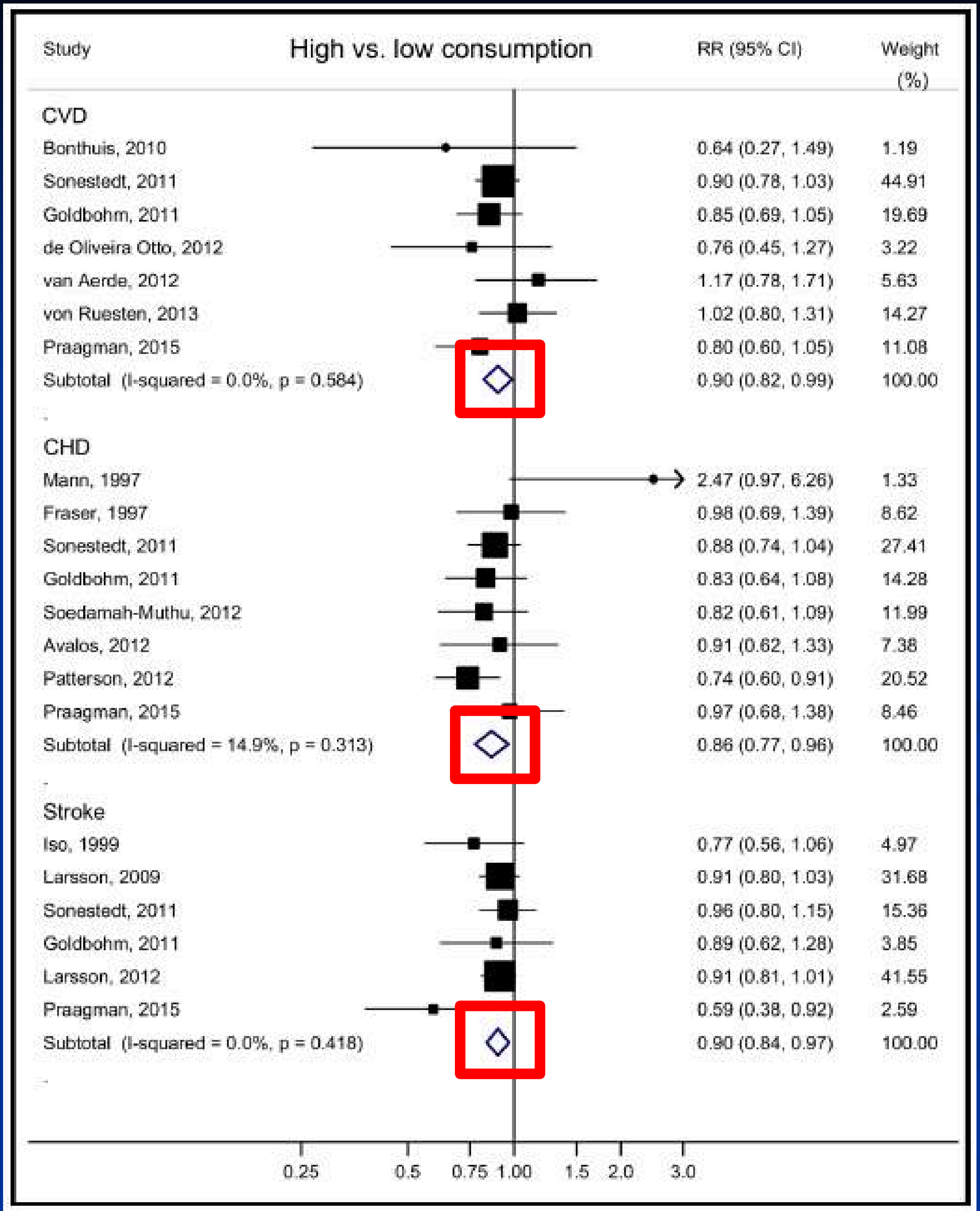
A changing view on SFAs and dairy: from enemy to friend

CONCLUSIONS

The totality of evidence does not support that dairy SFAs increase the risk of coronary artery disease or stroke or CVD mortality. In contrast, lean dairy is clearly associated with decreased risk of type 2 diabetes, and this effect is partly independent of any effect of body fat loss. In addition, lean dairy does not increase body fatness but tends to preserve lean body tissue. There is no evidence left to support the existing public health advice to limit consumption of dairy to prevent CVD and type 2 diabetes. Cheese and other dairy products are, in fact, nutrient-dense foods that give many people pleasure in their daily meals.

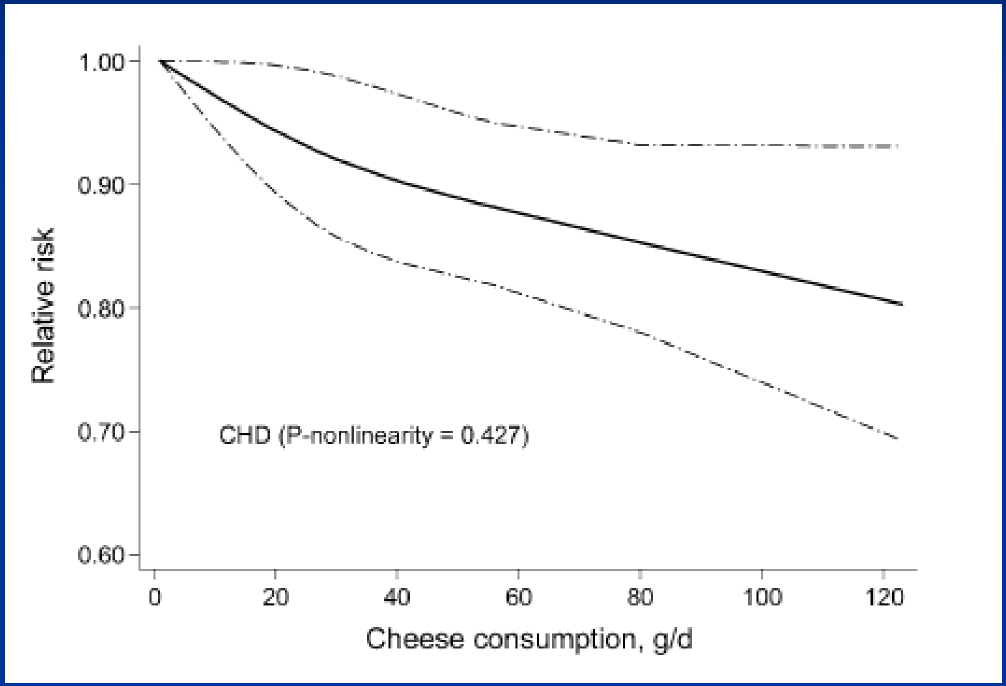
Astrup A, Am J Clin Nutr 2014

Cheese, CVD, CHD and stroke: a meta-analysis



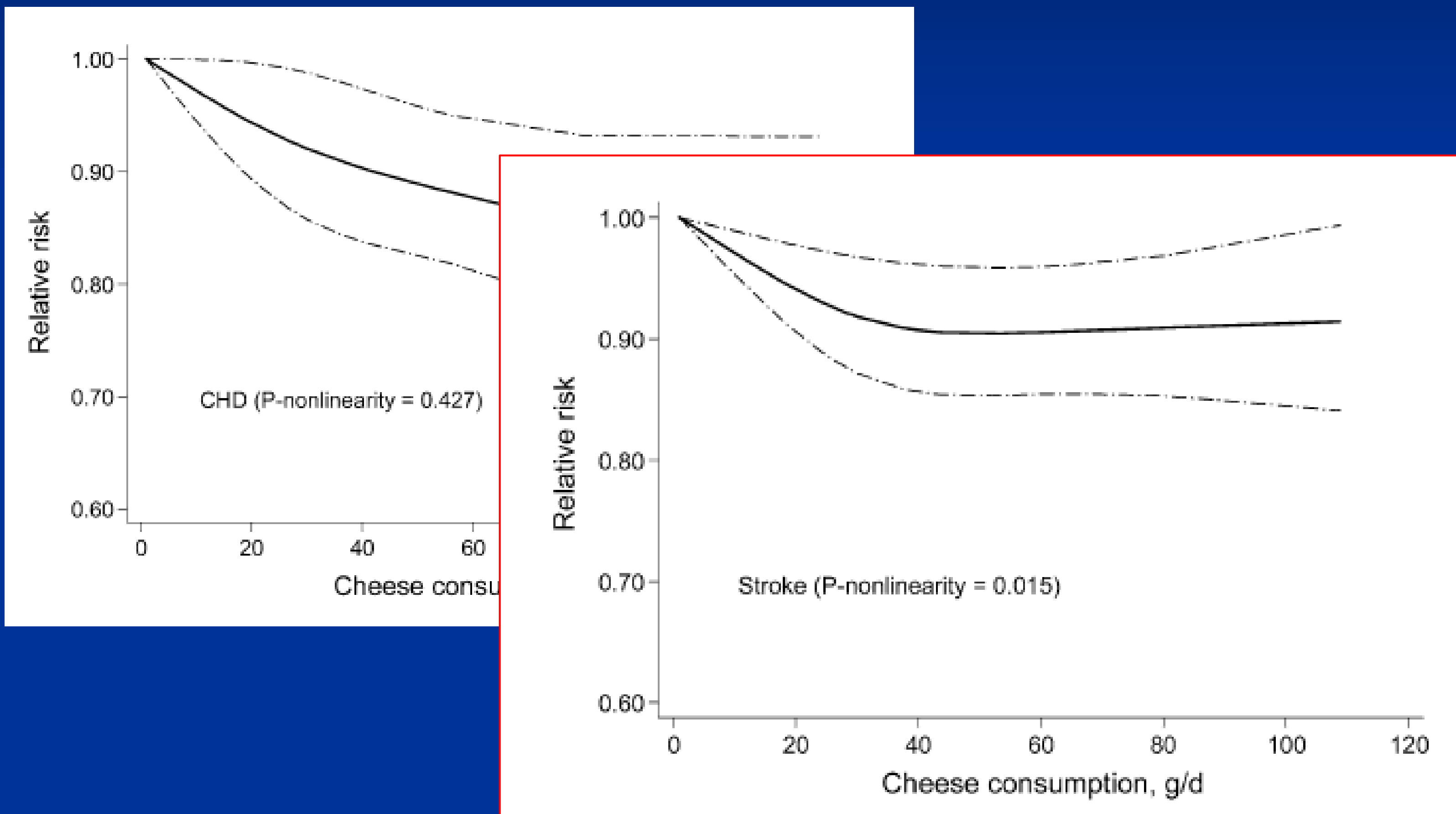
Chen GC et al, Eur J Nutr, 2016

Cheese and CV diseases: a metanalysis



Chen GC et al, Eur J Nutr 2016

Cheese and CV diseases: a metanalysis



Chen GC et al, Eur J Nutr 2016

Full fat or reduced fat cheese (80 g/day): effect on lipid and anthropometric parameters in patients with MetS: a 12 weeks RCT

Fasting blood values at week 12 and changes from baseline[1]

	REG (n = 50)		RED (n = 51)	
	Week 12	Change from baseline	Week 12	Change from baseline
LDL-C, mmol/L	3.51 ± 0.11	0.17 ± 0.07	3.45 ± 0.13	0.09 ± 0.08
HDL-C, mmol/L	1.45 ± 0.06	0.06 ± 0.02	1.46 ± 0.04	0.05 ± 0.02
TC, mmol/L	5.40 ± 0.14	0.18 ± 0.07	5.28 ± 0.15	0.03 ± 0.09
Triacylglycerols, mmol/L	1.42 ± 0.11	0.11 ± 0.09	1.23 ± 0.07	−0.03 ± 0.07
FFAs, μmol/L	510 ± 31	28 ± 25	494 ± 24	−42 ± 34
LDL-C:HDL-C	2.54 ± 0.12	0.02 ± 0.05	2.49 ± 0.13	−0.04 ± 0.05
TC:HDL-C	3.92 ± 0.18	0.01 ± 0.10	3.76 ± 0.15	−0.14 ± 0.06
Insulin, pmol/L	90.0 ± 8.3	11.7 ± 4.2	81.2 ± 8.2	7.5 ± 4.5
Glucose, mmol/L	5.78 ± 0.08	0.01 ± 0.06	5.81 ± 0.10	0.04 ± 0.06
HOMA-IR	3.43 ± 0.35	0.51 ± 0.20	3.13 ± 0.36	0.33 ± 0.20
CRP, mg/L	2.39 ± 0.30	0.54 ± 0.28	2.17 ± 0.30	0.44 ± 0.17

Raziani F et al, Am J Clin Nutr, 2016

AJCN. First published ahead of print April 9, 2014 as doi: 10.3945/ajcn.113.081190.

Palm oil and blood lipid–related markers of cardiovascular disease: a systematic review and meta-analysis of dietary intervention trials[1–3]

Elena Fattore, Cristina Bosetti, Furio Brighenti, Carlo Agostoni, and Giovanni Fattore

TABLE 4

WMDs, and corresponding 95% CIs, in selected blood lipid–related markers of cardiovascular disease after palm oil substitution for MUFAs[1]

Blood marker	No. of studies	No. of treated/ control subjects	WMD (95% CI)[2]	*P*-heterogeneity[3]	I^2
					%
TC (mg/dL)	21	546/580	13.77 (8.85, 18.69)*	0.043	37.6
LDL-C (mg/dL)	20	532/566	10.75 (6.60, 14.89)*	0.096	30.6
VLDL-C (mg/dL)	9	160/160	0.01 (−1.36, 1.37)	0.743	0.00
apo B (mg/L)	8	221/221	60.97 (24.01, 97.93)*	0.6	0.00
HDL-C (mg/dL)	21	546/580	1.54 (0.38, 2.71)*	0.936	0.00
apo A-I (mg/L)	9	235/235	22.72 (−15.54, 60.98)	0.787	0.00
TGs (mg/dL)	20	523/557	1.57 (−3.11, 6.25)	1.00	0.00
TC/HDL-C	5	119/119	0.02 (−0.1, 0.14)	0.918	0.00
LDL-C/HDL-C	8	206/206	0.07 (−0.1, 0.25)	0.933	0.00
Lp(a) (mg/L)	3	77/77	−1 (−44.84, 42.84)	0.934	0.00

Fattore E et al, Am J Clin Nutr 2014

AJCN. First published ahead of print April 9, 2014 as doi: 10.3945/ajcn.113.081190.

Palm oil and blood lipid–related markers of cardiovascular disease: a systematic review and meta-analysis of dietary intervention trials[1–3]

Elena Fattore, Cristina Bosetti, Furio Brighenti, Carlo Agostoni, and Giovanni Fattore

TABLE 3

WMDs, and corresponding 95% CIs, in selected blood lipid–related markers of cardiovascular disease after palm oil substitution for myristic and lauric acids[1]

Blood marker	No. of studies	No. of treated/ control subjects	WMD (95% CI)[2]	P-heterogeneity[3]	I^2
					%
TC (mg/dL)	11	257/258	−8.77 (−15, −2.53)*	0.117	35.26
LDL-C (mg/dL)	11	257/258	−4.7 (−10.28, 0.87)	0.102	37.13
VLDL-C (mg/dL)	6	100/100	−0.31 (−1.71, 1.09)	0.866	0.00
apo B (mg/L)	9	216/217	−25.15 (−58.77, 8.48)	0.231	23.84
HDL-C (mg/dL)	11	257/258	−3.7 (−6.26, −1.15)*	0.063	42.95
apo A-I (mg/L)	9	216/217	−52.21 (−95.46, −8.96)*	0.366	8.32
TGs (mg/dL)	11	257/250	0.18 (−5.71, 6.06)	0.99	0.00
TC/HDL-C	—	—	—	—	—
LDL-C/HDL-C	5	98/98	−0.06 (−0.38, 0.26)	0.104	47.88
Lp(a) (mg/L)	2	42/42	−8.49 (−54.29, 37.3)	0.72	0.00

[1] apo, apolipoprotein; HDL-C, HDL cholesterol; LDL-C, LDL cholesterol; Lp(a), lipoprotein(a); TC, total cholesterol; TG, triacylglycerol; VLDL-C, VLDL cholesterol; WMD, weighted mean difference.

[2] Calculated from a random-effects model. *Significant result, $P < 0.05$.

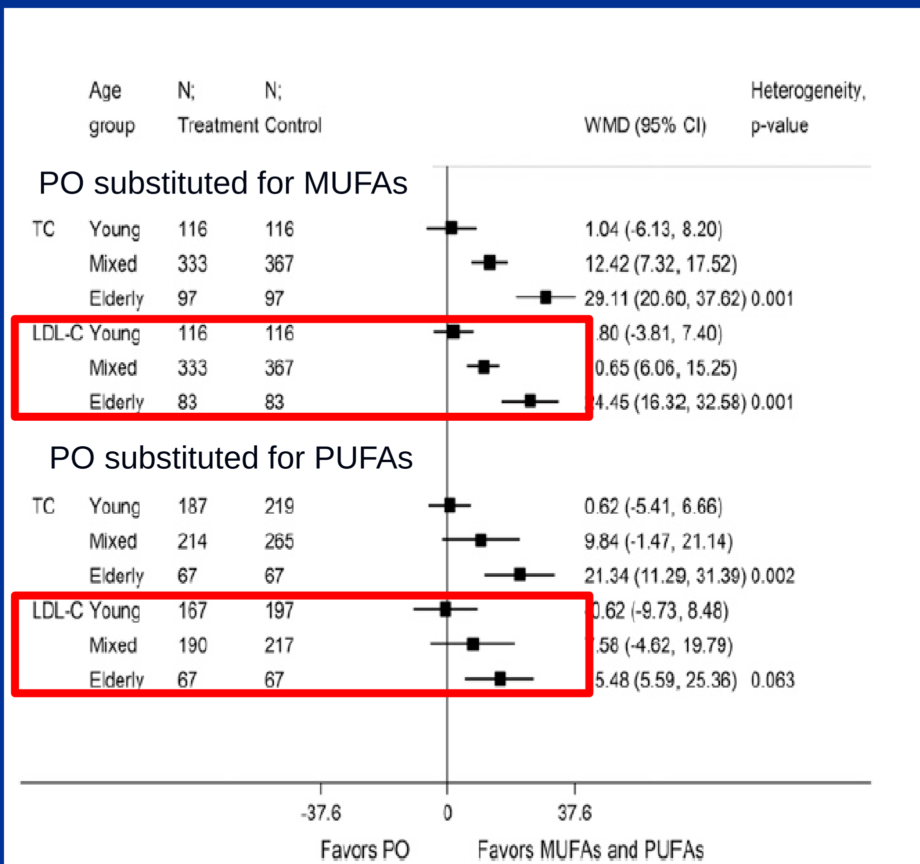
[3] Calculated by using chi-square statistic.

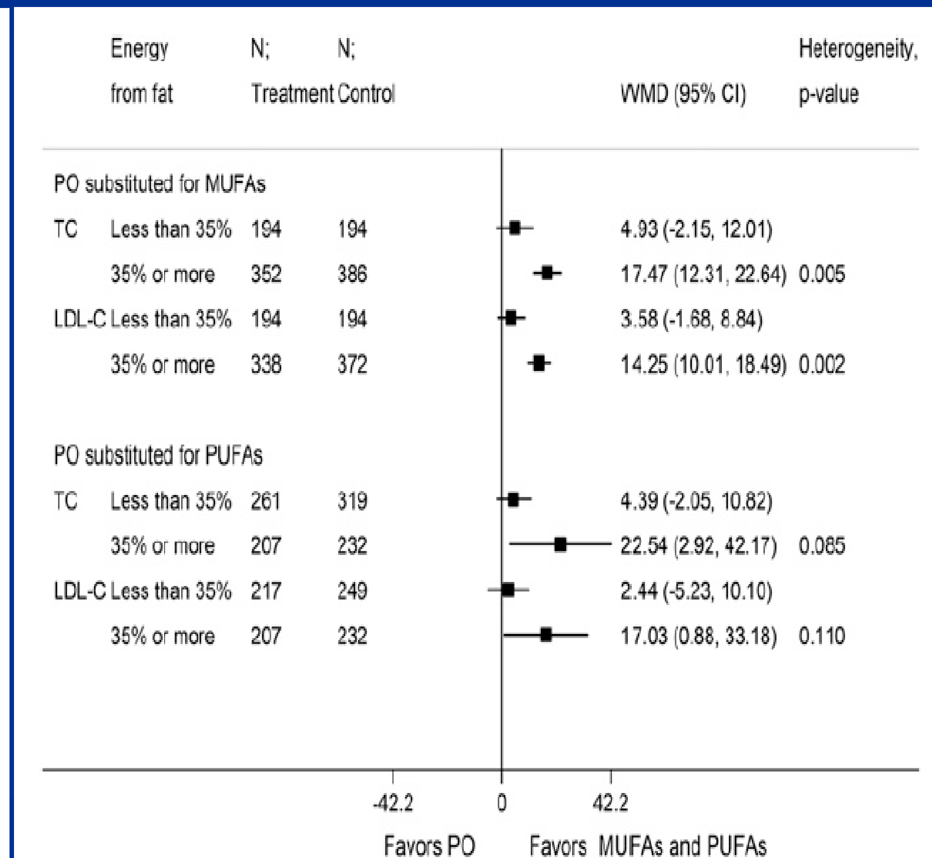
Fattore E et al, Am J Clin Nutr 2014

AJCN. First published ahead of print April 9, 2014 as doi: 10.3945/ajcn.113.081190.

Palm oil and blood lipid–related markers of cardiovascular disease: a systematic review and meta-analysis of dietary intervention trials[1–3]

Elena Fattore, Cristina Bosetti, Furio Brighenti, Carlo Agostoni, and Giovanni Fattore





Fattore E et al, Am J Clin Nutr 2014

Effect ol palm oil, in substitution for different MUFA / PUFA rich oils, on LDL and HDL cholesterol levels

TABLE 3 Pooled estimates of effects on LDL cholesterol and observed minus Katan expected effects within various subgroups for the comparison between palm oil and vegetable oils low in saturated fat in humans[1]

	Observed values			Observed − expected values			
Subgroup	Net change (95% CI), mmol/L	I^2, %	*P*-difference	Net change (95% CI), mmol/L	I^2, %	*P*-difference	Studies, *n*
Overall	0.24 (0.13, 0.35)	83.2		−0.25 (−0.35, −0.16)	76.8		26
Type of control oil							
Oleic safflower oil	0.57 (0.30, 0.83)	0.0	0.91	−0.15 (−0.42, 0.11)	0.0	0.92	2
Oleic sunflower oil	0.54 (0.38, 0.70)	42.4	Ref	−0.13 (−0.27, 0.02)	29.6	Ref	6
Linoleic sunflower oil	0.33 (−0.01, 0.68)	63.5	0.26	−0.37 (−0.77, 0.03)	73.4	0.57	2
Soybean oil	0.33 (−0.18, 0.83)	78.1	0.06	−0.16 (−0.79, 0.47)	86.0	0.66	3
Canola oil	0.20 (0.06, 0.33)	4.9	0.05	−0.29 (−0.49, −0.08)	53.2	0.44	4
Olive oil	0.11 (−0.02, 0.25)	50.7	0.004	−0.16 (−0.26, −0.06)	23.4	0.75	4
Peanut oil	−0.15 (−0.38, 0.08)	73.6	<0.001	−0.31 (−0.50, −0.12)	61.1	0.77	3
Others (rice bran, corn, safflower, mixtures)	0.21 (−0.07, 0.48)	67.8	0.02	−0.17 (−0.52, 0.17)	80.2	0.82	5

Sun Y et al, J Nutr 2015

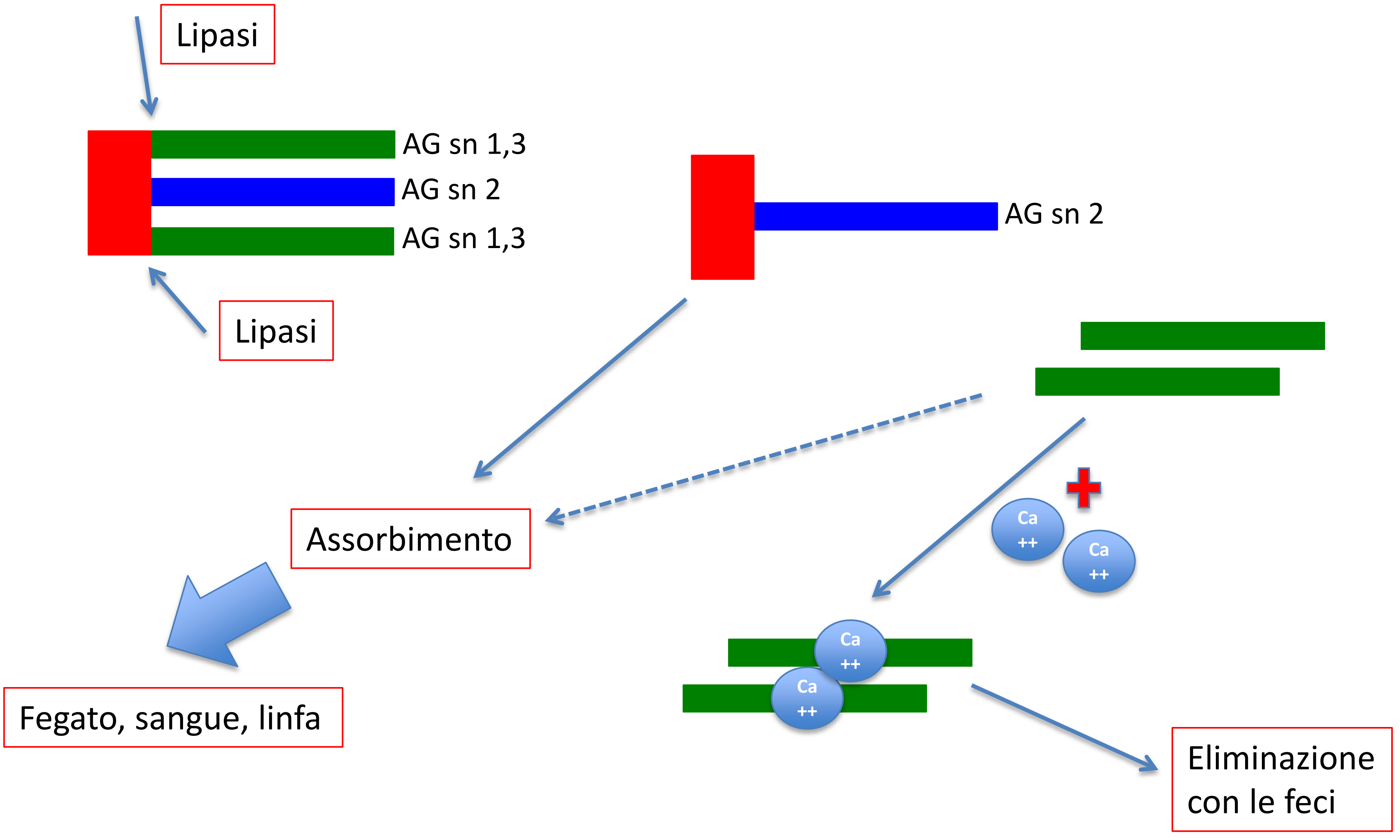
Effect ol palm oil, in substitution for different MUFA / PUFA rich oils, on LDL and HDL cholesterol levels

TABLE 3 Pooled estimates of effects on LDL cholesterol and observed minus Katan expected effects within various subgroups for the comparison between palm oil and vegetable oils low in saturated fat in humans[1]

	Observed values			Observed − expected values			
Subgroup	Net change (95% CI), mmol/L	I^2, %	*P*-difference	Net change (95% CI), mmol/L	I^2, %	*P*-difference	Studies, *n*
Overall	0.24 (0.13, 0.35)	83.2		−0.25 (−0.35, −0.16)	76.8		26
Type of control oil							
Oleic safflower oil	0.57 (0.30, 0.83)	0.0	[illegible]	−0.15 (−0.42, 0.11)	0.0	0.92	2
Oleic sunflower oil	0.54 (0.38, 0.70)	42.4	Ref	−0.13 (−0.27, 0.02)	29.6	Ref	6
Linoleic sunflower oil	0.33 (−0.01, 0.68)	63.5	0.26	−0.37 (−0.77, 0.03)	73.4	0.57	2
Soybean oil	0.33 (−0.18, 0.83)	78.1	0.06	−0.16 (−0.79, 0.47)	86.0	0.66	3
Canola oil	0.20 (0.06, 0.33)	4.9	0.05	−0.29 (−0.49, −0.08)	53.2	0.44	4
Olive oil	0.11 (−0.02, 0.25)	50.7	0.004	−0.16 (−0.26, −0.06)	23.4	0.75	4
Peanut oil	−0.15 (−0.38, 0.08)	73.6	<0.001	−0.31 (−0.50, −0.12)	61.1	0.77	3
Others (rice bran, corn, safflower, mixtures)	0.21 (−0.07, 0.48)	67.8	0.02	−0.17 (−0.52, 0.17)	80.2	0.82	5

Sun Y et al, J Nutr 2015

Destino metabolico degli acidi grassi in posizione sn-1,3 o sn-2 nel trigliceride

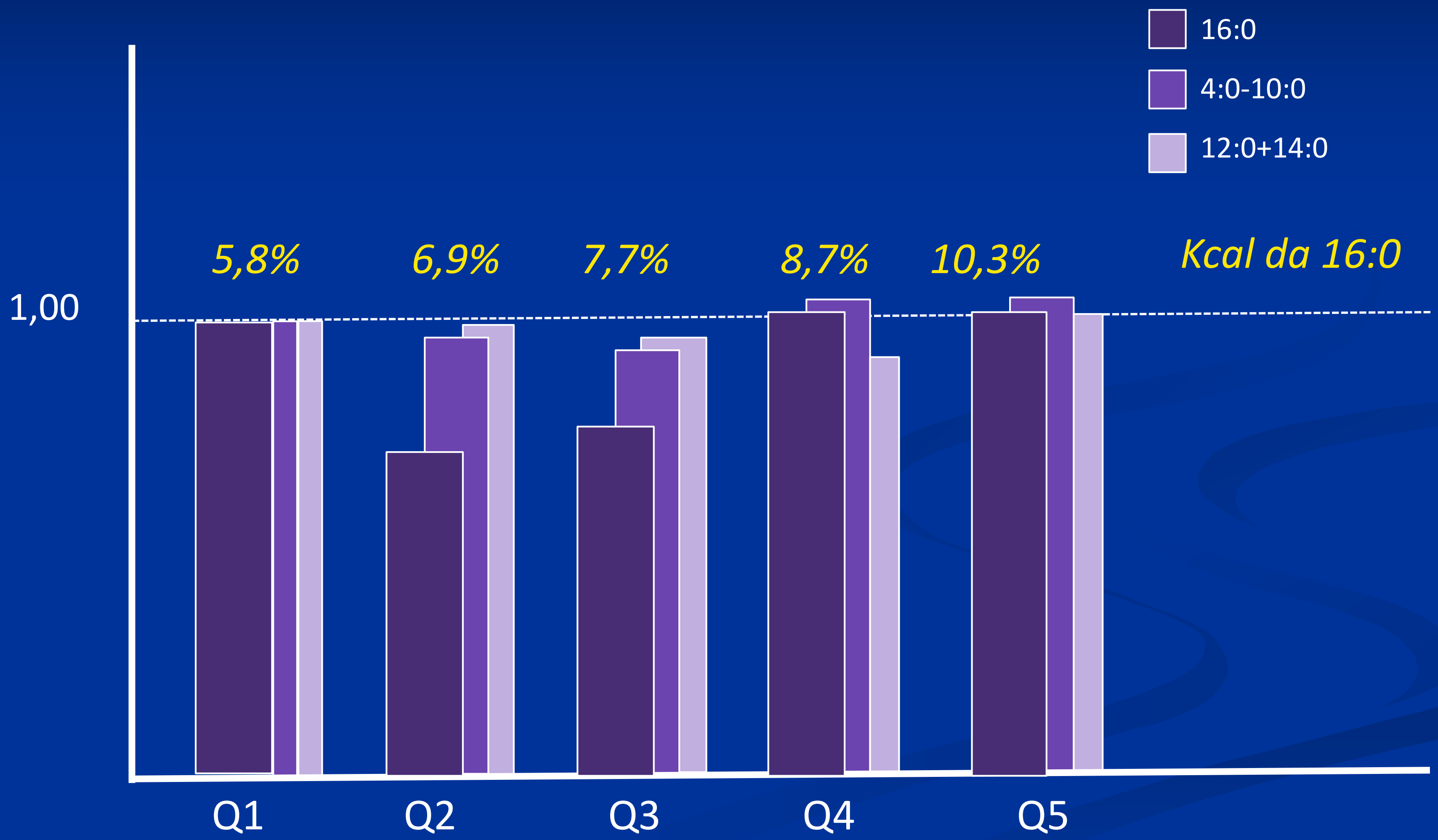


Distribuzione dei differenti acidi grassi nelle posizioni sn-2 ed sn 1,3 dei trigliceridi dell'olio di Palma

Acidi grassi	Posizione sn-2	Posizioni sn-1,3
C 14:0	0,96	1,42
C 16:0	16,03	**62,77**
C 18:0	1,37	5,73
C 18:1	**62,68**	24,52
C 18:2	18,95	5,52

Tan BK, Doctoral Thesis, UK,1979

Rischio Relativo di eventi coronarici, in relazione ai quintili di consumo dei vari acidi grassi saturi, nel Nurses' Health Study



Hu FB et al, Am J Clin Nutr 1999

Palma vs Canola: l’origine e gli acidi grassi

	Olio di Palma	Olio Canola
Saturi (Miristico, Palmitico, Stearico)	51%	7%
Monoinsaturi (Oleico)	38%	62%
Polinsaturi n-6 (Linoleico)	10%	21%
Polinsaturi n-3 (alfa-Linolenico)	1%	10%

Olio di palma*: si ottiene dalla spremitura di frutti della palma*

Olio Canola*: si ottiene dal seme di una varietà di colza (o ravizzone) selezionata (non OGM) per essere priva di acido Erucico (22:1)*

Olio di oliva V/EV o "normale"

Risk of cardiovascular events and mortality according to baseline extra-virgin olive oil intake

	Energy-adjusted tertiles of extra-virgin olive oil, g/day				
	1 (low) (n = 2,405)	**2 (n = 2,406)**	**3 (high) (n = 2,405)**	***P for trend***	**Energy-adjusted extra virgin olive oil intake (10 g/d)**
Mean extra-virgin olive oil intake	**9.1 ± 11.23**	**19.5 ± 20.0**	**34.6 ± 27.4**		
Major CVD events					
Cardiovascular event, % (n)	4.6 (111)	4.2 (101)	2.7 (65)		3.8 (277)
Multivariable model 1	1 (Ref.)	1.01 (0.77, 1.33)	0.60 (0.43, 0.82)	< 0.01	0.89 (0.84, 0.95)
Multivariable model 2	1 (Ref.)	1.00 (0.76, 1.32)	0.60 (0.44, 0.84)	< 0.01	0.90 (0.85, 0.95)
Multivariable model 3	1 (Ref.)	0.99 (0.75, 1.31)	0.61 (0.44, 0.85)	< 0.01	0.90 (0.85, 0.95)
All-cause mortality	**1 (low) (n = 2,405)**	**2 (n = 2,406)**	**3 (high) (n = 2,405)**	***P for trend***	
All causes of mortality, % (n)	5.2 (125)	4.2 (100)	4.1 (98)		4.5 (323)
Multivariable model 1	1 (Ref.)	0.88 (0.67, 1.15)	0.81 (0.61, 1.07)	0.19	0.95 (0.91, 1.00)
Multivariable model 2	1 (Ref.)	0.84 (0.64, 1.10)	0.80 (0.60, 1.07)	0.20	0.95 (0.90, 1.00)
Multivariable model 3	1 (Ref.)	0.84 (0.64, 1.10)	0.82 (0.61, 1.09)	0.25	0.96 (0.91, 1.01)

Guasch-Ferrè M et al, BMC Medicine 2014

Olio di oliva V/EV o "normale"

Risk of cardiovascular events and mortality according to baseline common olive oil intake

	Energy-adjusted tertiles of common olive oil, g/day				
	1 (low) (n = 2,405)	2 (n = 2,406)	3 (high) (n = 2,405)	*P for trend*	Energy-adjusted common olive oil intake (10 g/d)
Mean common olive oil intake	**12.1 ± 11.7**	**18.6 ± 18.5**	**21.7 ± 25.9**		
Major CVD events					
Cardiovascular event, % (n)	3.5 (85)	3.6 (86)	4.4 (106)		3.8 (277)
Multivariable model 1	1 (Ref.)	1.06 (0.78, 1.45)	1.20 (0.88, 1.62)	0.23	1.04 (0.99, 1.10)
Multivariable model 2	1 (Ref.)	1.01 (0.74, 1.38)	1.13 (0.83, 1.54)	0.35	1.04 (0.98, 1.10)
Multivariable model 3	1 (Ref.)	0.99 (0.73, 1.36)	1.11 (0.82, 1.51)	0.40	1.03 (0.98, 1.09)
All-cause mortality	**1 (low) (n = 2,405)**	**2 (n = 2,406)**	**3 (high) (n = 2,405)**	***P for trend***	
All causes of mortality, % (n)	4.2 (101)	4.4 (106)	4.8 (116)		4.5 (323)
Multivariable model 1	1 (Ref.)	1.14 (0.86, 1.51)	1.17 (0.88, 1.51)	0.34	1.01 (0.96, 1.07)
Multivariable model 2	1 (Ref.)	1.10 (0.83, 1.47)	1.16 (0.87, 1.54)	0.37	1.01 (0.96, 1.07)
Multivariable model 3	1 (Ref.)	1.09 (0.82, 1.45)	1.14 (0.85, 1.51)	0.44	1.01 (0.96, 1.07)

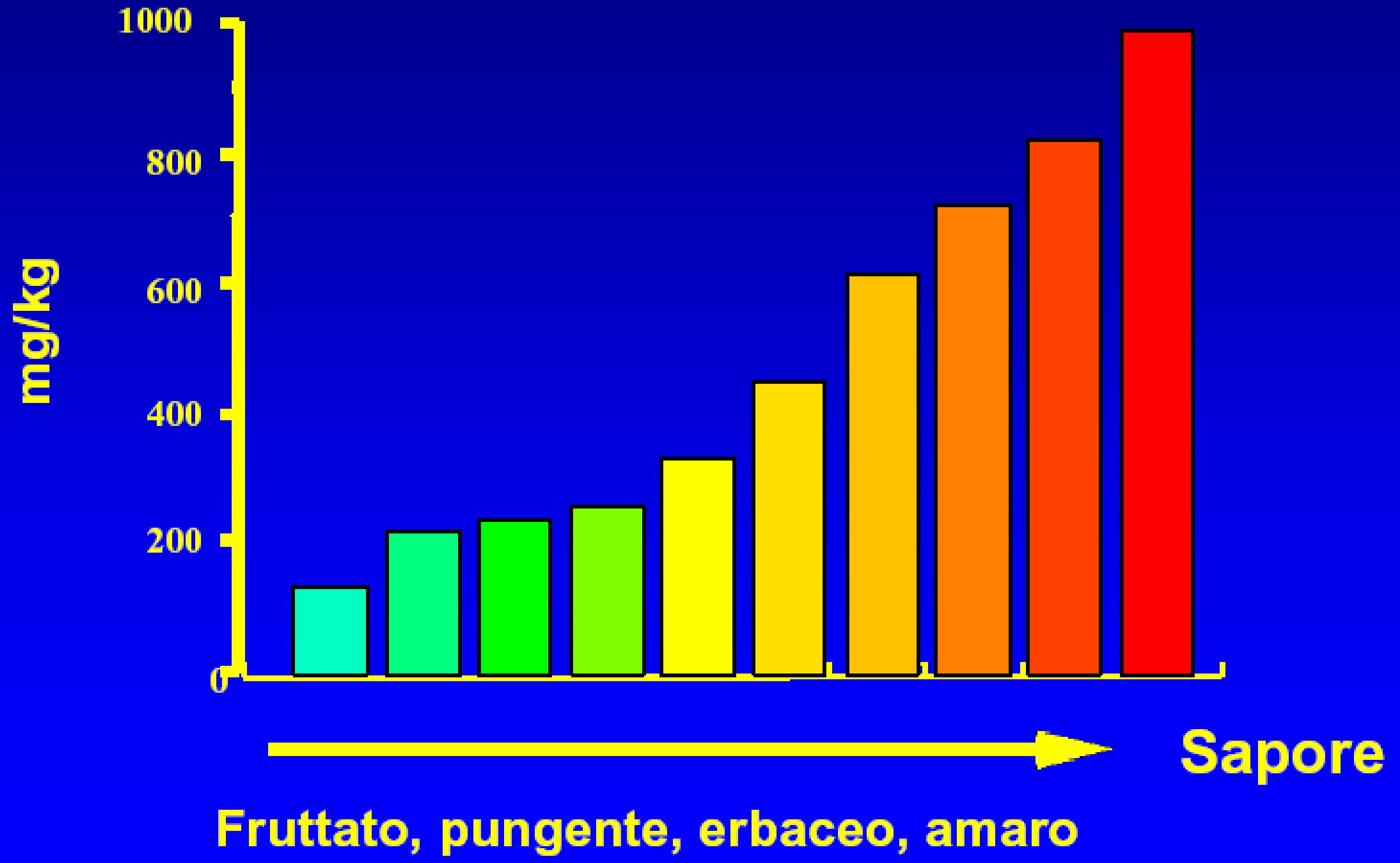
Guasch-Ferrè M et al, BMC Medicine 2014

Costituenti dell'olio d'oliva

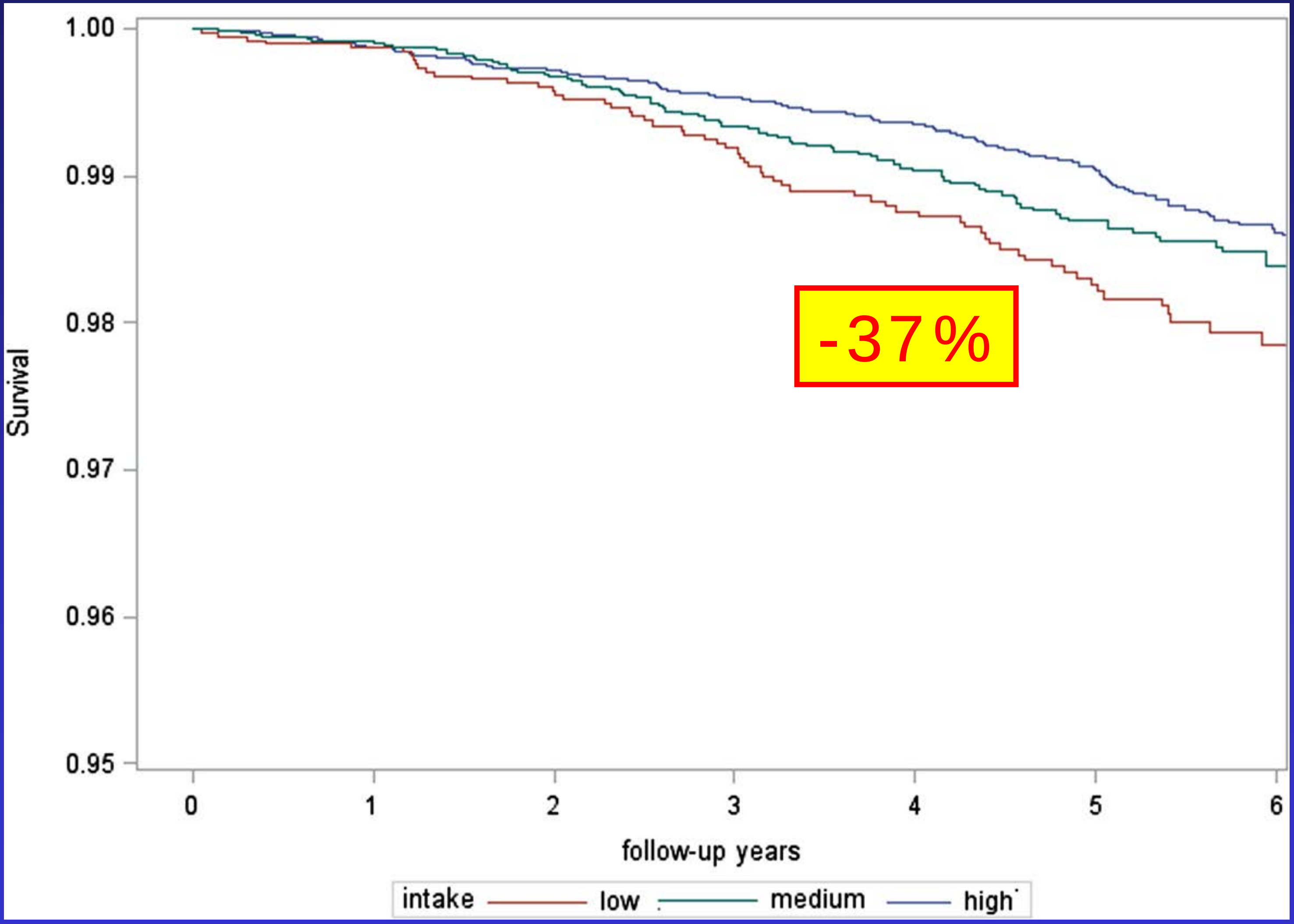
- Trigliceridi
- Idrocarburi
- Esteri non-gliceridi
- Tocoferoli
- *Poli*fenoli
- Steroli
- Acidi e alcoli terpenici
- Pigmenti
- Clorofille
- Carotenoidi

- *Poli*fenoli (50-800 mg/Kg)
- Idrossitirosolo
- Oleuropeina
- Tirosolo
- Acido caffeico
- Ligstroside
- Acido vanillico
- Esteri di idrossitirosolo
- Acido sinapico
- Acido siringico

Contenuto in polifenoli e gusto dell'olio

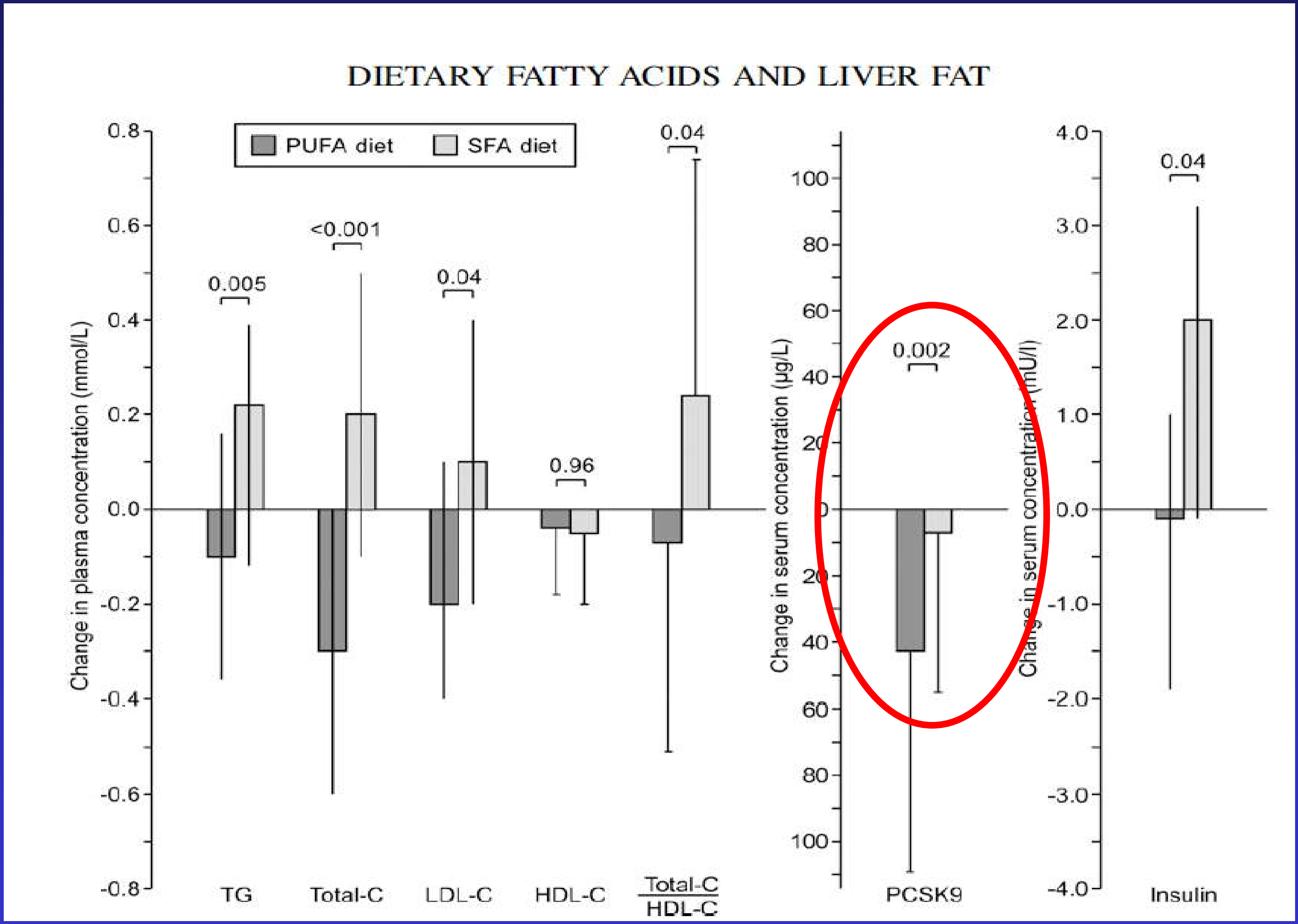


Polyphenol intake and all-cause mortality risk: a re-analysis of the PREDIMED trial



Tresserra-Rimbau A et al, BMC Medicine 2014

HEPFAT: changes in blood biochemical parameters

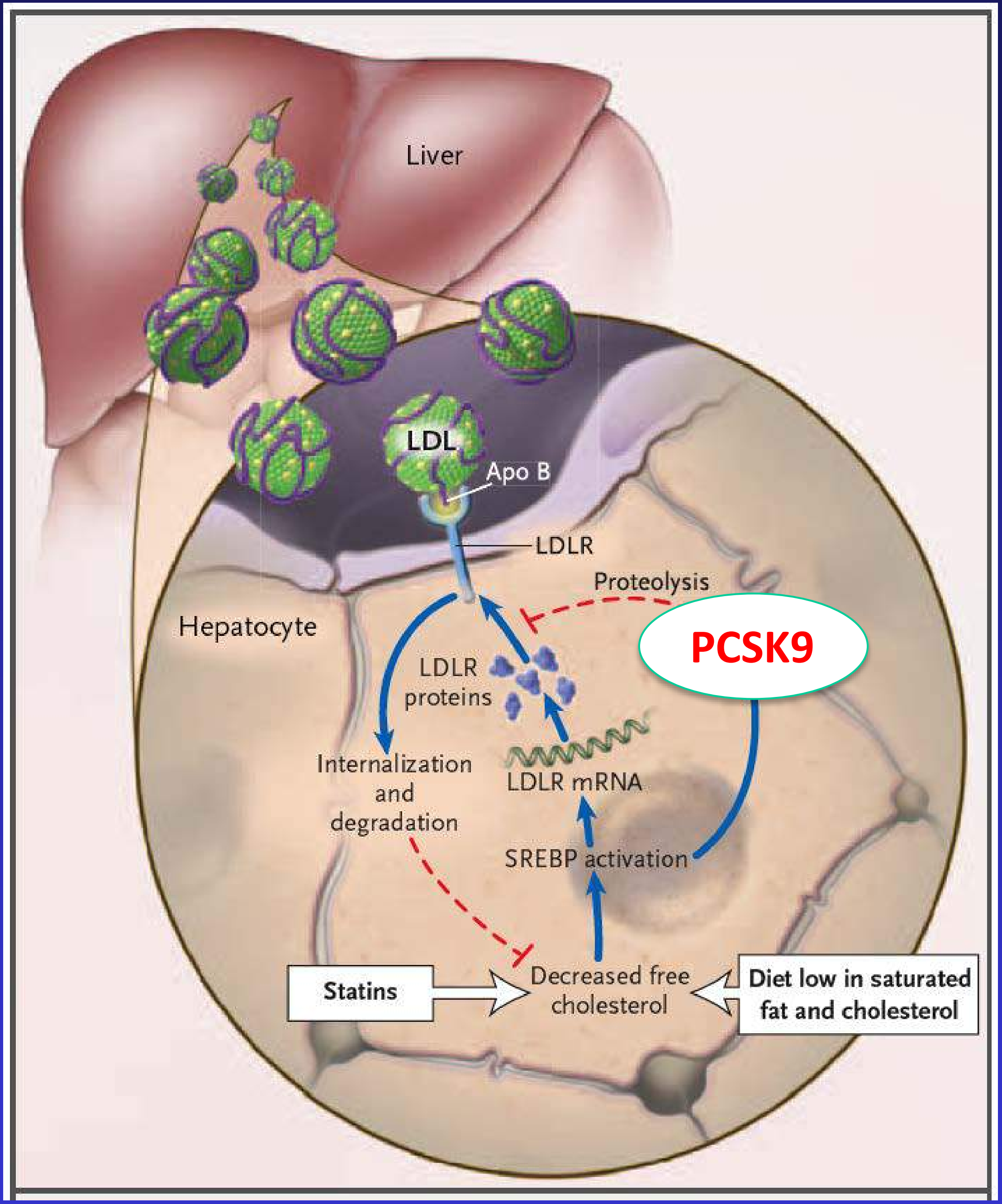


Bjermo H et al, Am J Clin Nutr 2012

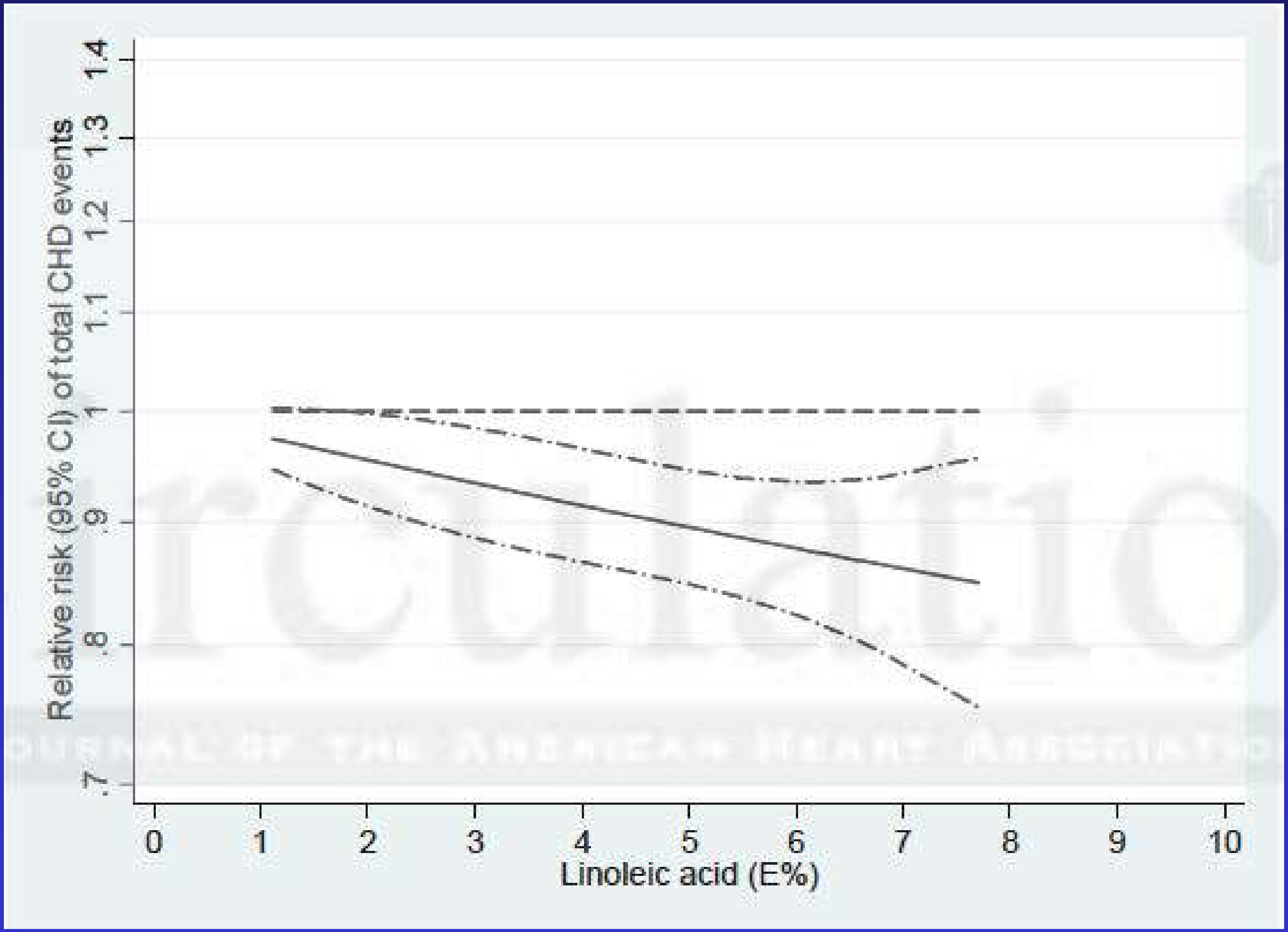
La PCSK9 cos'è e cosa fa.

Just when we thought we understood everything about low-density lipoprotein (LDL) cholesterol and its relationship to cardiovascular risk, along comes a discovery that reveals a new control mechanism and suggests a strategy for the prevention of atherosclerotic cardiovascular disease.

A fourth variant of familial hypercholesterolemia with dominant inheritance and an identical phenotype to the other forms was recently found to be associated with missense mutations in PCSK9, which encodes the protease proprotein convertase subtilisin/kexin type 9 (PCSK9)

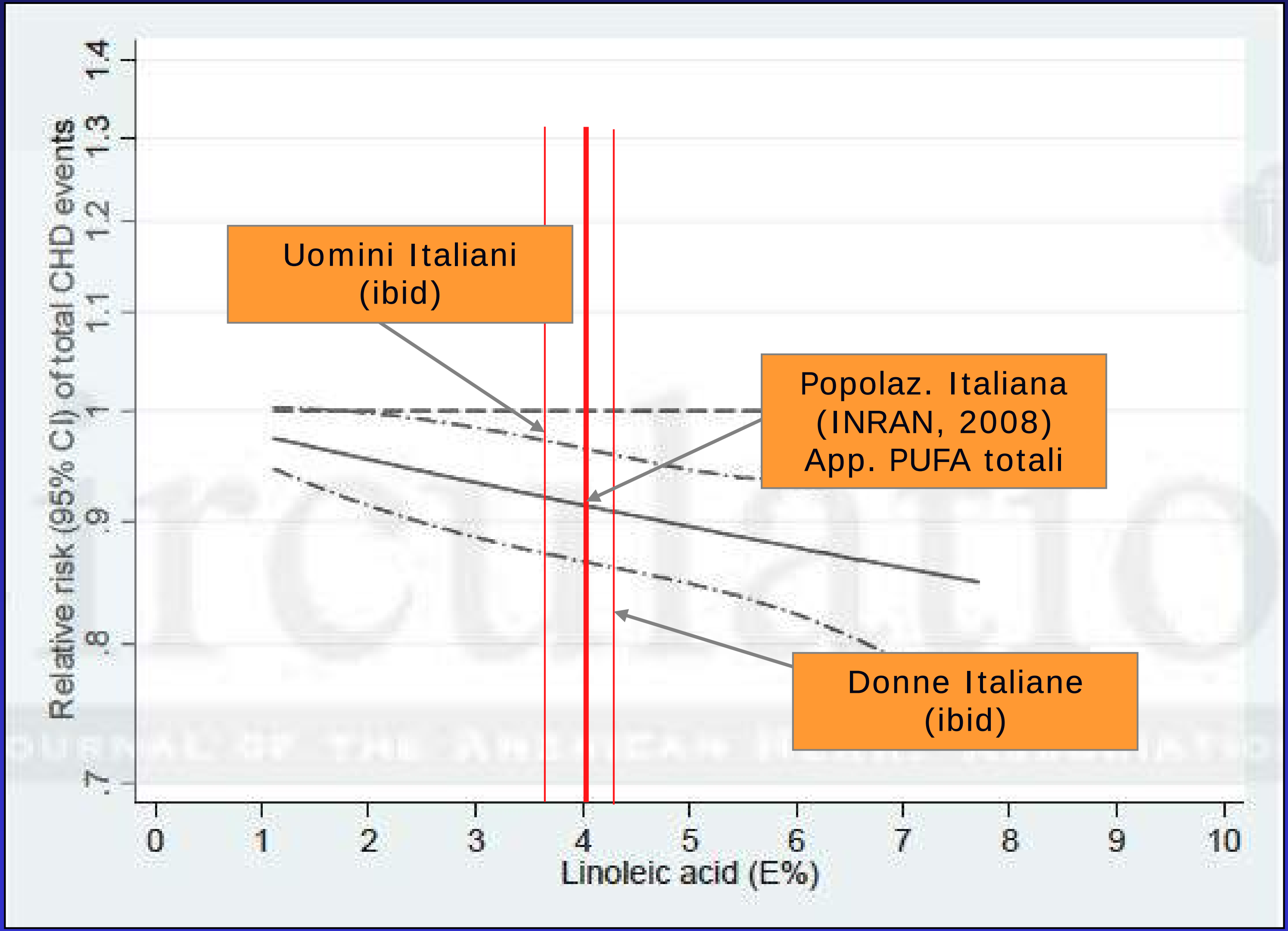


Dietary omega-6 and CHD: a meta-analysis



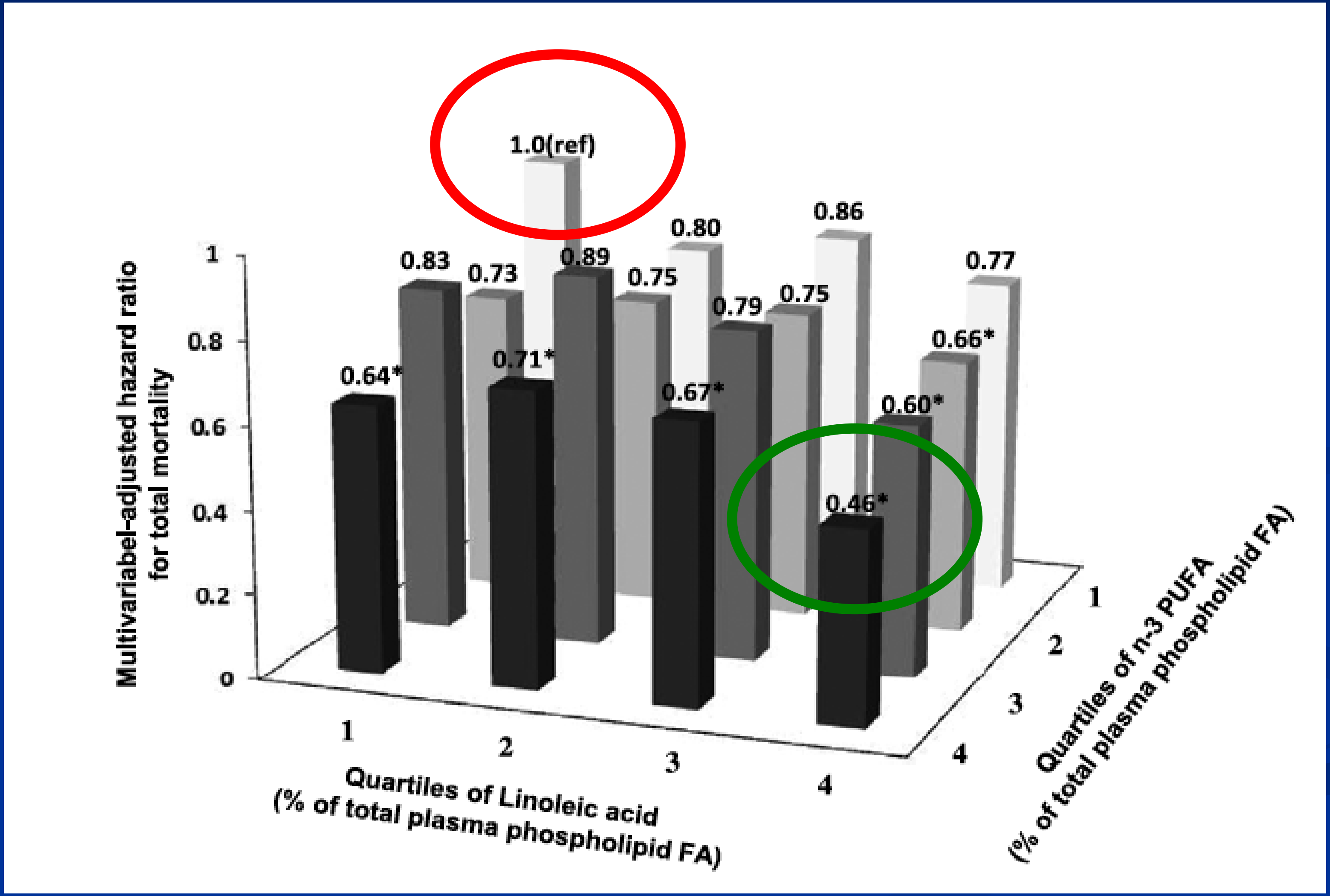
Farvid MS et al, Circulation 2014

Dietary omega-6 and CHD: a meta-analysis



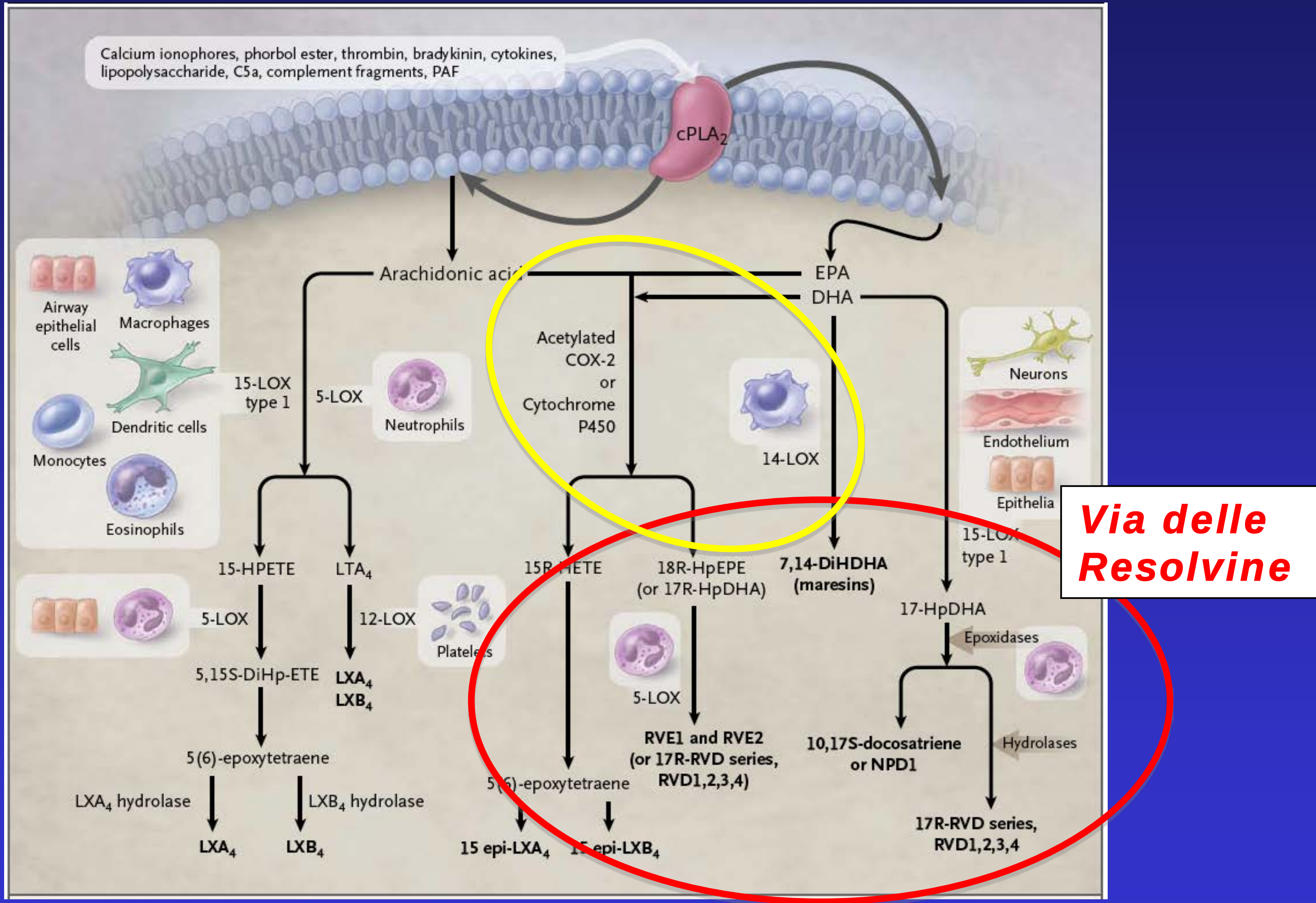
Farvid MS et al, Circulation 2014

Omega-3, omega-6 in plasma PL and all-cause mortality



Wu JHY et al, Circulation 2014

Vie metaboliche alternative responsabili degli effetti antinfiammatori degli omega 3

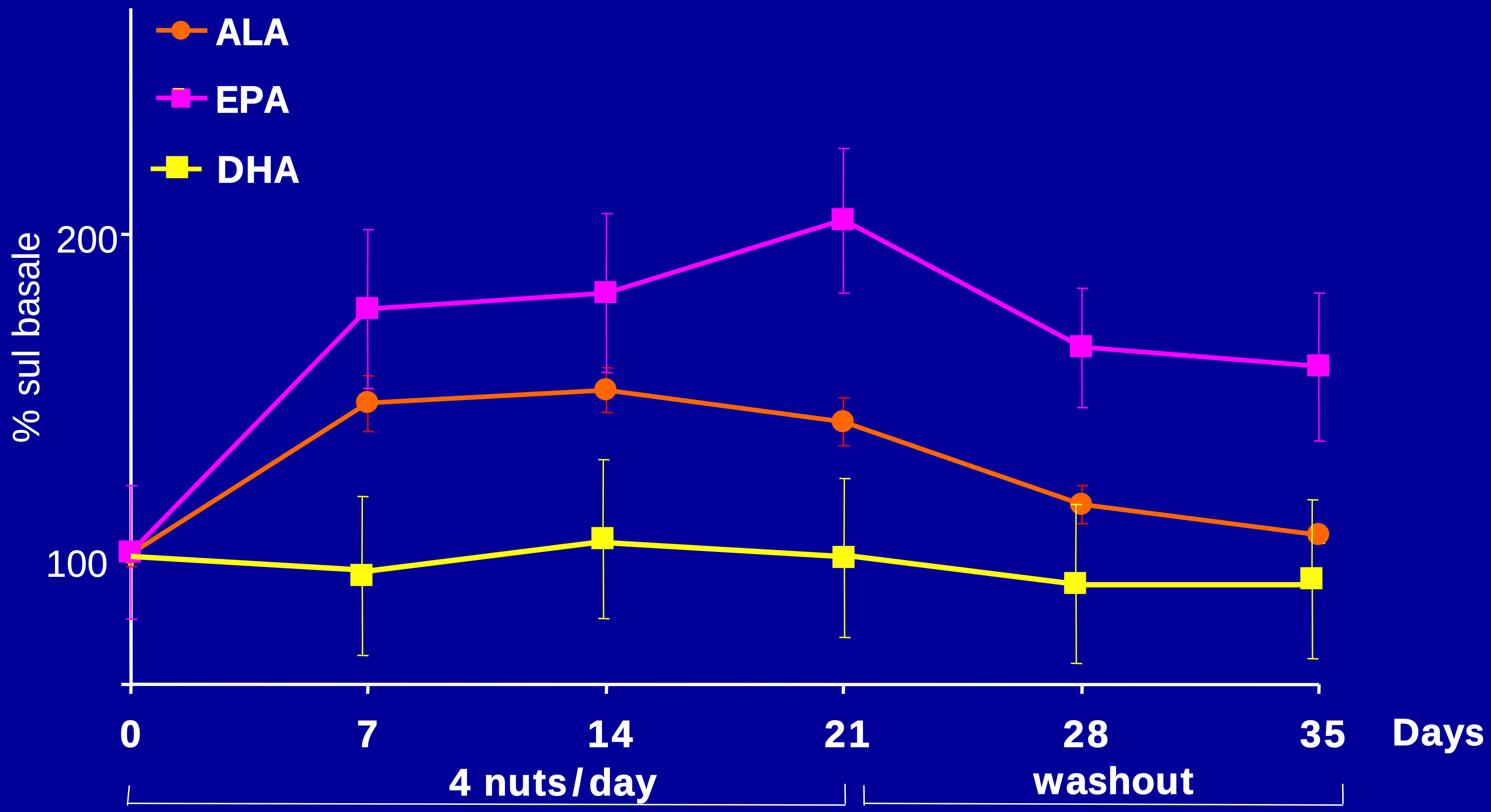


De Caterina R, N Engl J Med, 2011

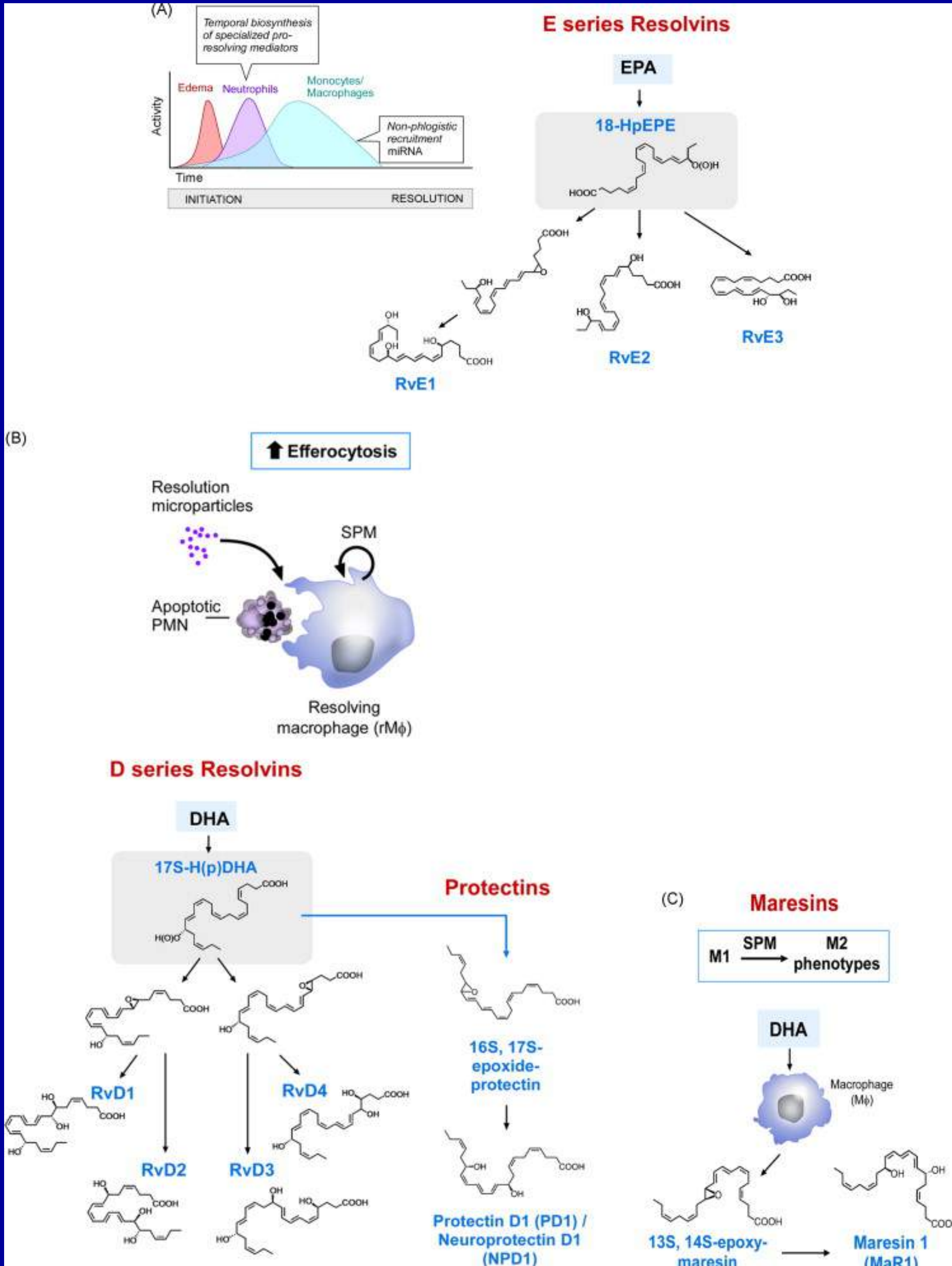
Plasma fatty acids in vegans and omnivorous

Sarter B et al, Clin Nutr 2014

Omega 3 PUFA levels and walnut intake (4/day or 1.2g ALA)



Marangoni F. et al., NMCD, 2007

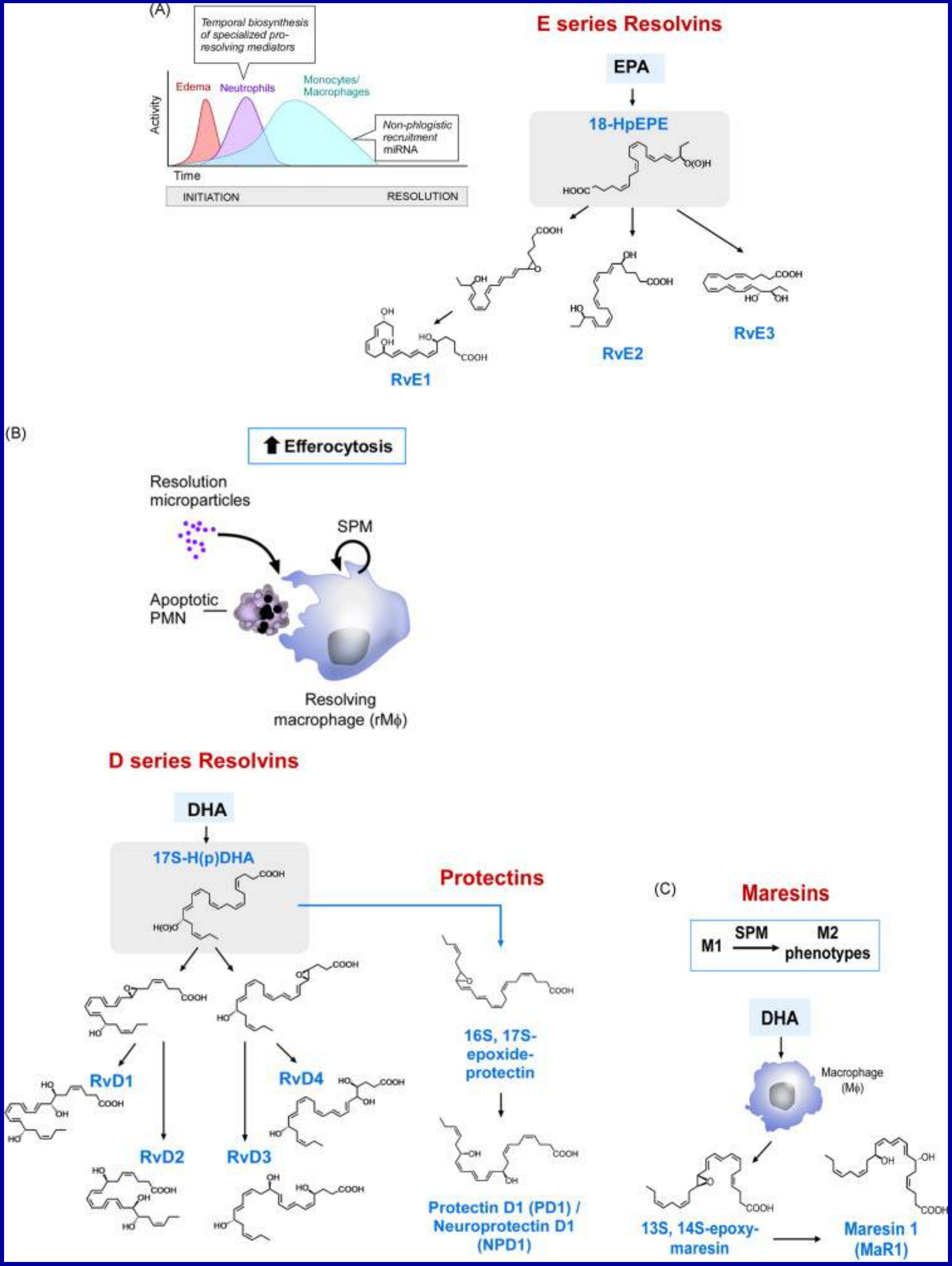


ALA

EPA

DHA

Serhan , 2015

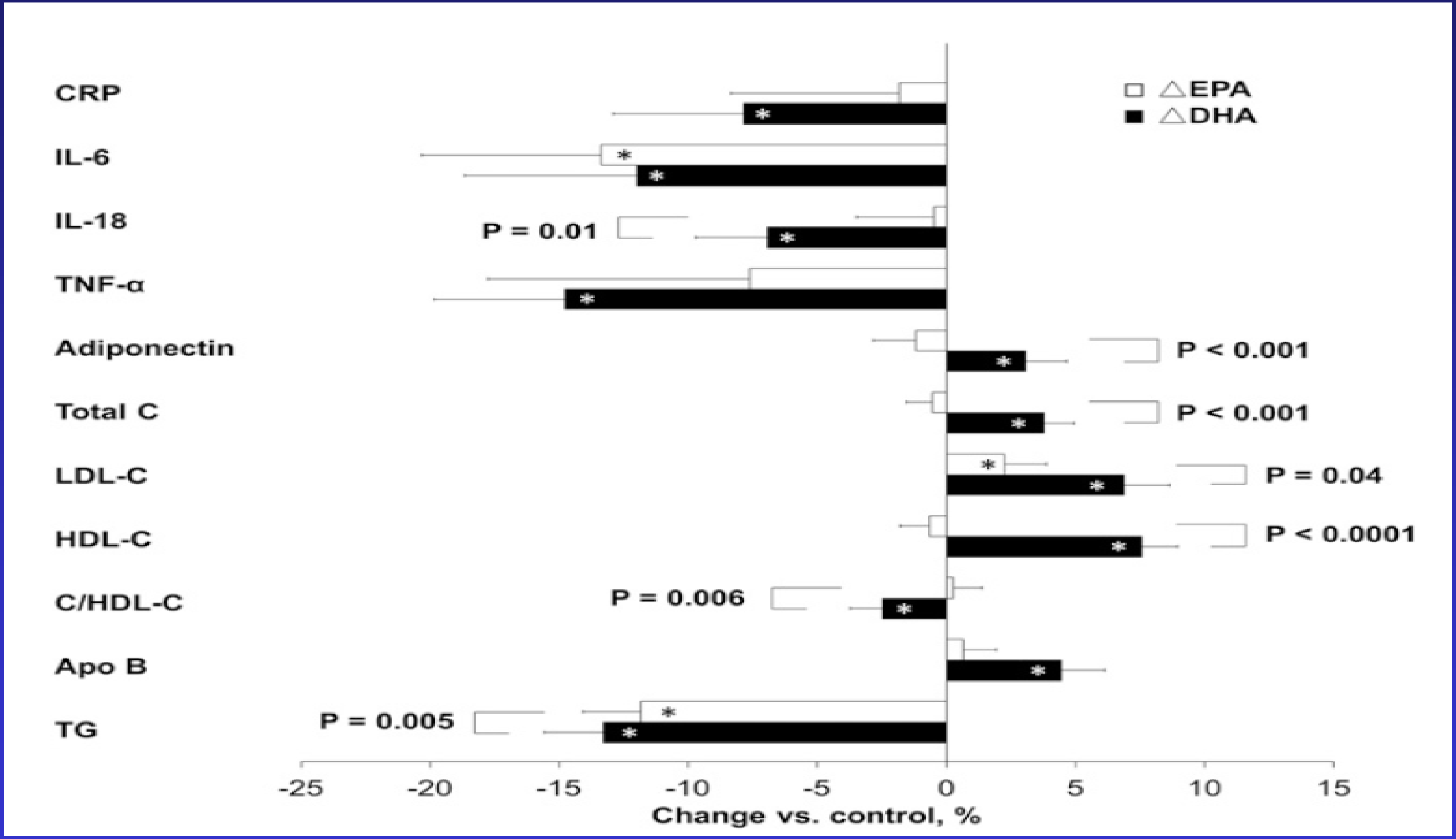


(A)
Temporal biosynthesis of specialized pro-resolving mediators
Edema
Neutrophils
Monocytes/ Macrophages
Activity
Time
Non-phlogistic recruitment miRNA
INITIATION
RESOLUTION
E series Resolvins
EPA
18-HpEPE
RvE1
RvE2
RvE3
(B)
Efferocytosis
Resolution microparticles
SPM
Apoptotic PMN
Resolving macrophage (rMϕ)
D series Resolvins
DHA
17S-H(p)DHA
Protectins
RvD1
RvD2
RvD3
RvD4
16S, 17S-epoxide-protectin
Protectin D1 (PD1) / Neuroprotectin D1 (NPD1)
(C)
Maresins
M1
SPM
M2 phenotypes
DHA
Macrophage (Mϕ)
13S, 14S-epoxy-maresin
Maresin 1 (MaR1)

ALA
EPA
DHA

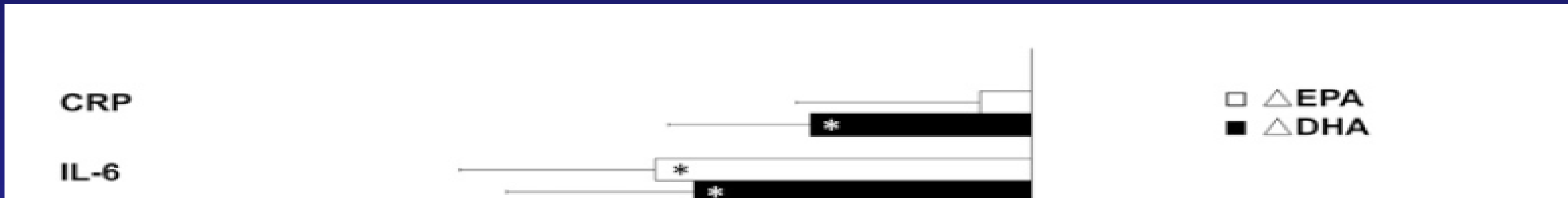
Serhan , 2015

Omega-3: sono tutti uguali?
Lo studio ComparED

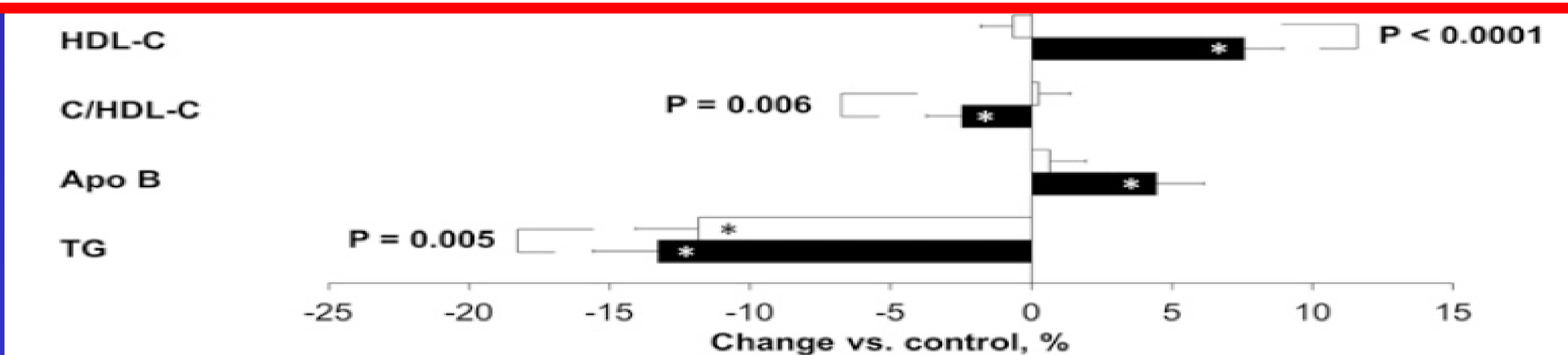


Allaire J et al, Am J Clin Nutr 2016

Omega-3: sono tutti uguali?
Lo studio ComparED

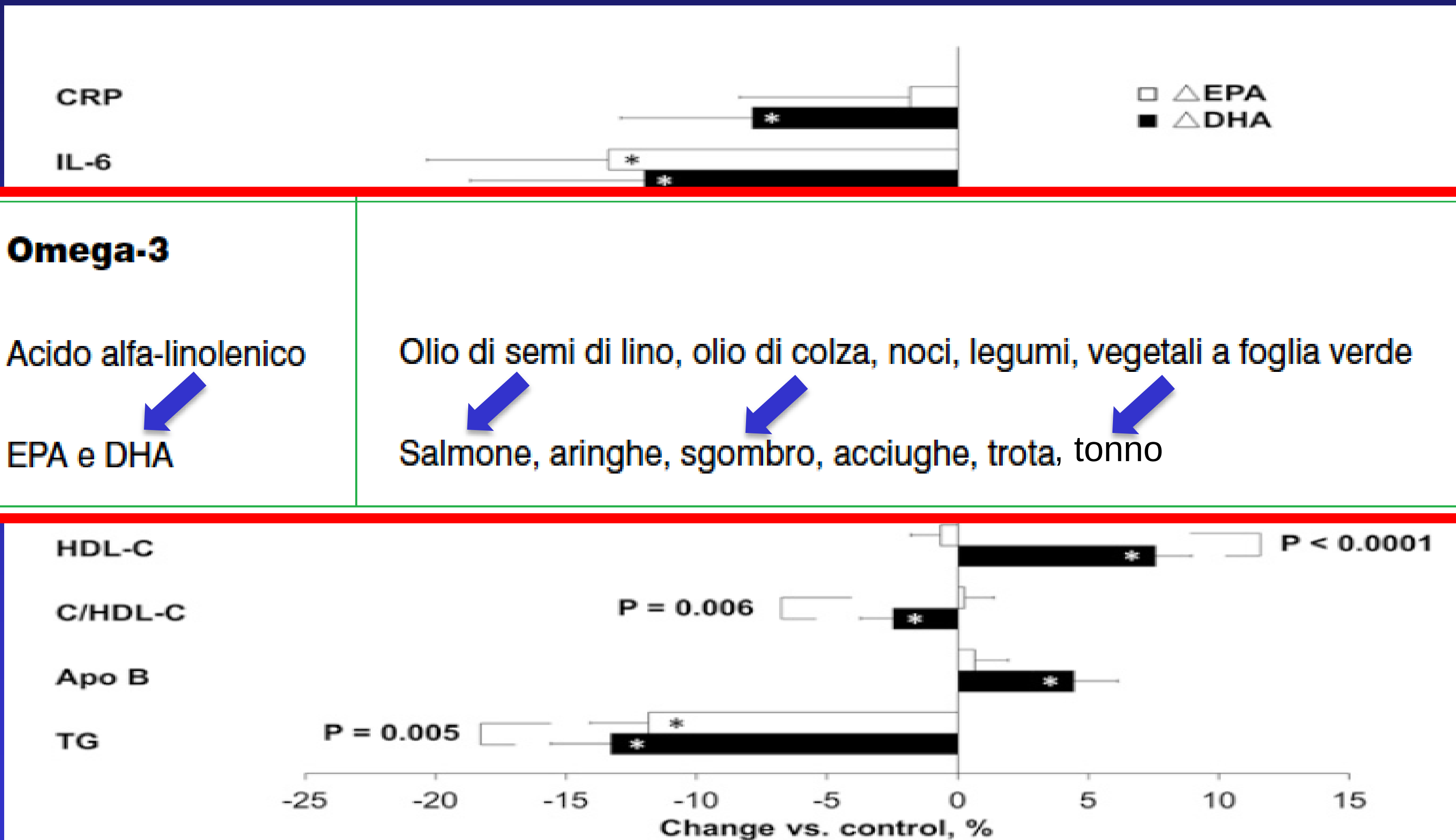


Omega-3	
Acido alfa-linolenico	Olio di semi di lino, olio di colza, noci, legumi, vegetali a foglia verde
EPA e DHA	Salmone, aringhe, sgombro, acciughe, trota, tonno



Allaire J et al, Am J Clin Nutr 2016

Omega-3: sono tutti uguali?
Lo studio ComparED



Omega-3	
Acido alfa-linolenico	Olio di semi di lino, olio di colza, noci, legumi, vegetali a foglia verde
EPA e DHA	Salmone, aringhe, sgombro, acciughe, trota, tonno

Allaire J et al, Am J Clin Nutr 2016

Healthy eating and mortality in a cohort of CHD patients whit state-of-the-art drug treatment

The Dutch Healthy Nutrient and Food Score (DHNaFS) included 11 nutrient-dense food groups:
vegetables, fruit, whole grains, protein-rich plant foods (mostly legumes), potatoes, lean meat, fish, eggs, low-fat milk and yogurt, oils and soft margarines, and noncaloric drinks.

The Dutch Undesirable Nutrient and Food Score (DUNaFS) included 13 food groups high in solid fats, sodium, and/or added sugar:
processed fruit, high-fat meat, processed meat, full-fat milk, cheese; refined grains, butter and hard margarines, soups, spreads, ready-to-eat meals, savory snacks, sweet snacks, and sugar-sweetened beverages.

4,307 CHD pts from the Alpha-Omega Trial, 60-80 yrs at baseline, 10 yrs follow-up

Sijstma FPC et al, Am J Clin Nutr, 2015

Healthy eating and mortality in a cohort of CHD patients whit state-of-the-art drug treatment

Multivariable adjusted HRs for all-cause and CVD mortality across quintiles of the DHNaFS and the DUNaFS[1]

	Q1	Q2	Q3	Q4	Q5	*P*-trend
All cause mortality						
DHNaFS						
Model 1	1	0.89 (0.72, 1.10)	0.74 (0.61, 0.90)	0.67 (0.54, 0.84)	0.57 (0.45, 0.71)	<0.0001
Model 2	1	0.97 (0.78, 1.20)	0.81 (0.66, 0.99)	0.78 (0.62, 0.99)	0.72 (0.56, 0.93)	0.0015
Model 3	1	0.95 (0.76, 1.18)	0.77 (0.63, 0.95)	0.76 (0.60, 0.97)	0.70 (0.55, 0.91)	0.0006
DUNaFS						
Model 1	1	1.12 (0.90, 1.39)	1.03 (0.83, 1.27)	1.09 (0.87, 1.36)	0.95 (0.75, 1.20)	0.552
Model 2	1	1.19 (0.94, 1.49)	1.10 (0.87, 1.39)	1.24 (0.95, 1.62)	1.08 (0.79, 1.48)	0.857
Model 3	1	1.22 (0.97, 1.54)	1.14 (0.89, 1.45)	1.28 (0.98, 1.68)	1.15 (0.84, 1.58)	0.702
Cardiovascular mortality						
DHNaFS						
Model 1	1	0.84 (0.60, 1.16)	0.62 (0.46, 0.84)	0.59 (0.41, 0.83)	0.61 (0.44, 0.85)	<0.0001
Model 2	1	0.88 (0.63, 1.23)	0.63 (0.46, 0.87)	0.65 (0.45, 0.94)	0.72 (0.50, 1.03)	0.008
Model 3	1	0.88 (0.63, 1.23)	0.59 (0.43, 0.82)	0.59 (0.41, 0.87)	0.68 (0.47, 0.99)	0.0002
DUNaFS						
Model 1	1	1.17 (0.83, 1.63)	0.90 (0.64, 1.26)	1.14 (0.81, 1.61)	1.05 (0.74, 1.48)	0.99
Model 2	1	1.19 (0.84, 1.68)	0.87 (0.60, 1.27)	1.17 (0.78, 1.76)	1.09 (0.68, 1.74)	0.651
Model 3	1	1.22 (0.86, 1.73)	0.92 (0.63, 1.34)	1.23 (0.82, 1.85)	1.15 (0.72, 1.84)	0.759

4,307 CHD pts from the Alpha-Omega Trial, 60-80 yrs at baseline, 10 yrs follow-up

Sijstma FPC et al, Am J Clin Nutr, 2015

Healthy eating and mortality in a cohort of CHD patients whit state-of-the-art drug treatment

Multivariable adjusted HRs for all-cause and CVD mortality across quintiles of the DHNaFS and the DUNaFS[1]

	Q1	Q2	Q3	Q4	Q5	*P*-trend
All cause mortality						
DHNaFS						
Model 1	1	0.89 (0.72, 1.10)	0.74 (0.61, 0.90)	0.67 (0.54, 0.84)	0.57 (0.45, 0.71)	<0.0001
Model 2	1	0.97 (0.78, 1.20)	0.81 (0.66, 0.99)	0.78 (0.62, 0.99)	0.72 (0.56, 0.93)	0.0015
Model 3	1	0.95 (0.76, 1.18)	0.77 (0.63, 0.95)	0.76 (0.60, 0.97)	0.70 (0.55, 0.91)	0.0006
DUNaFS						
Model 1	1	1.12 (0.90, 1.39)	1.03 (0.83, 1.27)	1.09 (0.87, 1.36)	0.95 (0.75, 1.20)	0.552
Model 2	1	1.19 (0.94, 1.49)	1.10 (0.87, 1.39)	1.24 (0.95, 1.62)	1.08 (0.79, 1.48)	0.857
Model 3	1	1.22 (0.97, 1.54)	1.14 (0.89, 1.45)	1.28 (0.98, 1.68)	1.15 (0.84, 1.58)	0.702
Cardiovascular mortality						
DHNaFS						
Model 1	1	0.84 (0.60, 1.16)	0.62 (0.46, 0.84)	0.59 (0.41, 0.83)	0.61 (0.44, 0.85)	<0.0001
Model 2	1	0.88 (0.63, 1.23)	0.63 (0.46, 0.87)	0.65 (0.45, 0.94)	0.72 (0.50, 1.03)	0.008
Model 3	1	0.88 (0.63, 1.23)	0.59 (0.43, 0.82)	0.59 (0.41, 0.87)	0.68 (0.47, 0.99)	0.0002
DUNaFS						
Model 1	1	1.17 (0.83, 1.63)	0.90 (0.64, 1.26)	1.14 (0.81, 1.61)	1.05 (0.74, 1.48)	0.99
Model 2	1	1.19 (0.84, 1.68)	0.87 (0.60, 1.27)	1.17 (0.78, 1.76)	1.09 (0.68, 1.74)	0.651
Model 3	1	1.22 (0.86, 1.73)	0.92 (0.63, 1.34)	1.23 (0.82, 1.85)	1.15 (0.72, 1.84)	0.759

4,307 CHD pts from the Alpha-Omega Trial, 60-80 yrs at baseline, 10 yrs follow-up

Sijstma FPC et al, Am J Clin Nutr, 2015

In sintesi:

- La correlazione tra saturi e CHD e/o mortalità per tutte le cause viene messa in dubbio, o grandemente ridimensionata, dalle metanalisi e dagli studi più recenti
- E' possibile (ma non è certo) che tale effetto "neutro" dei saturi possa dipendere dall'aumento sia di LDL-c e sia di HDL-c che essi inducono
- Questo effetto "bilanciato" su HDL ed LDL è condiviso anche dall'olio di palma
- La riduzione del consumo di saturi nel nostro Paese, pur rimanendo per ora tra le indicazioni generali cui fare riferimento, non sembra essere una delle principali priorità in prevenzione CV

Più in generale:

- Il ruolo dei grassi nel mantenere lo stato di salute è cambiato profondamente
- Latte e latticini hanno effetti di salute prevalentemente positivi
- PUFA n-3 ed n-6, in apporto adeguato, sono importanti per il benessere CV (e non solo)
- Gli alimenti e le bevande ricchi di polifenoli (caffè, tè, cioccolato, frutti rossi, frutta a guscio, olio di oliva EV) hanno importanti effetti favorevoli di salute

Più in generale:

- Il ruolo dei grassi nel mantenere lo stato di salute è cambiato profondamente
- Latte e latticini hanno effetti di salute prevalentemente positivi
- PUFA n-3 ed n-6, in apporto adeguato, sono importanti per il benessere CV (e non solo)
- Gli alimenti e le bevande ricchi di polifenoli (caffè, tè, cioccolato, frutti rossi, frutta a guscio, olio di oliva EV) hanno importanti effetti favorevoli di salute
- ***Forse dobbiamo occuparci più della promozione degli alimenti favorevoli che del controllo degli alimenti meno favorevoli***