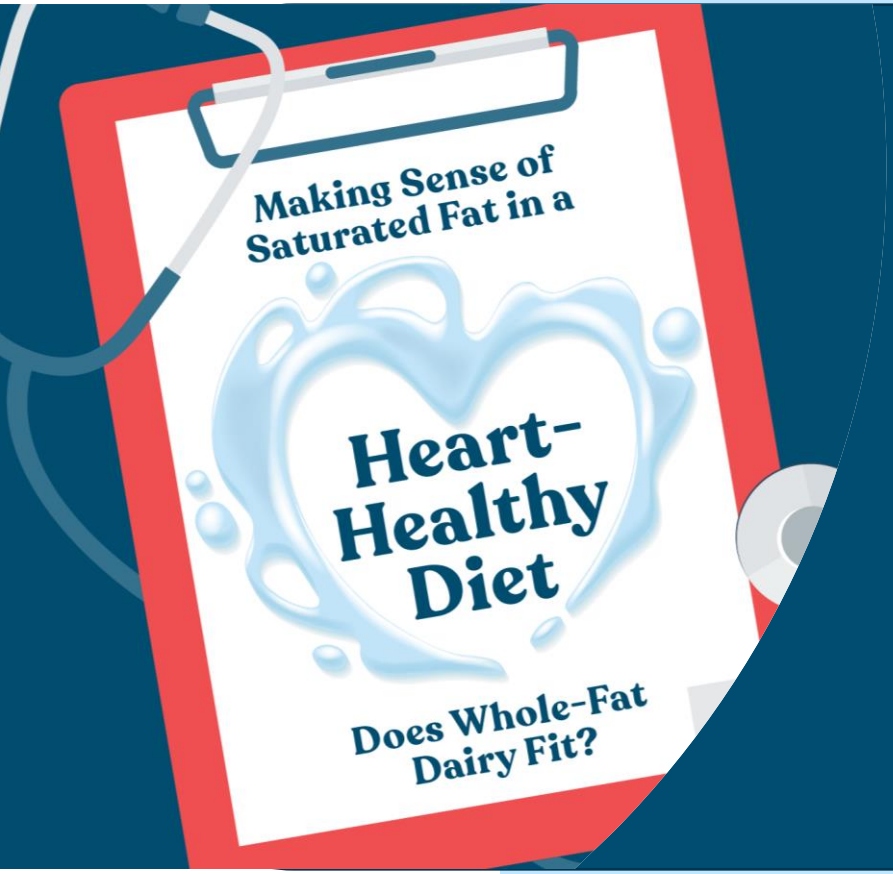

AMERICAN DAIRY ASSOCIATION
YOUR MILK COMES
FROM A GOOD PLACE
NORTH EAST



Housekeeping

- You are muted and your camera is turned off
- Write questions in Q&A section
- Continuing Education* and Zoom recording will be available on AmericanDairy.com

CPEU & CME credit provided by New Jersey Academy of Nutrition & Dietetics and New Jersey American Academy of Pediatrics

***Accreditation Statement for 2/16/22 Webinar:** This activity has been planned and implemented in accordance with the accreditation requirements and policies of the Medical Society of New Jersey through the joint providership of Atlantic Health System and the American Academy of Pediatrics, New Jersey Chapter. Atlantic Health System is accredited by the Medical Society of New Jersey to provide continuing medical education for physicians.

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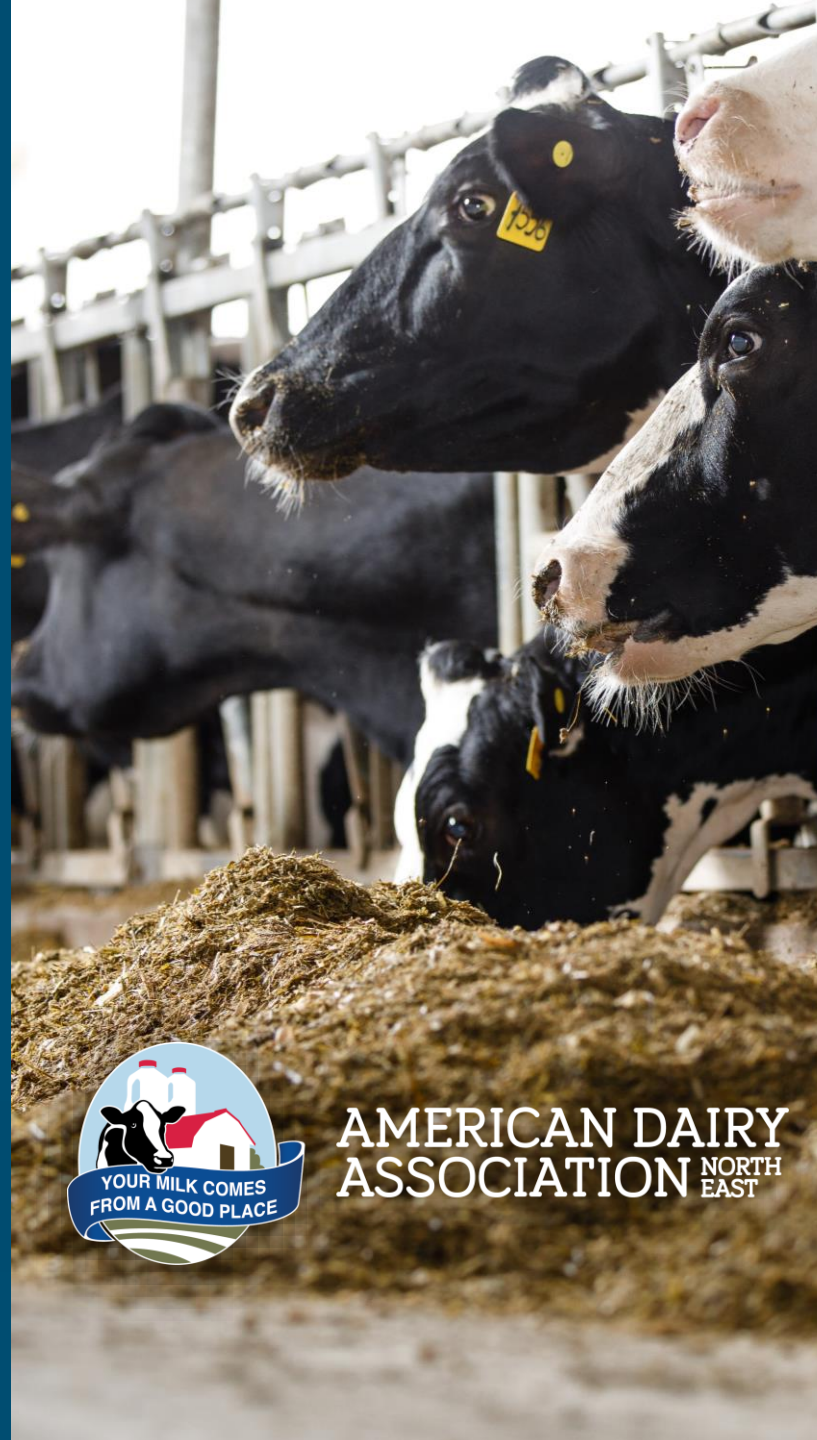
Making Sense of Saturated Fat in a Heart-Healthy Diet: Does Whole-Fat Dairy Fit?

Dr. Jim Painter PhD, RDN
University of Texas – Houston, School of Public Health
@DrJimPainter

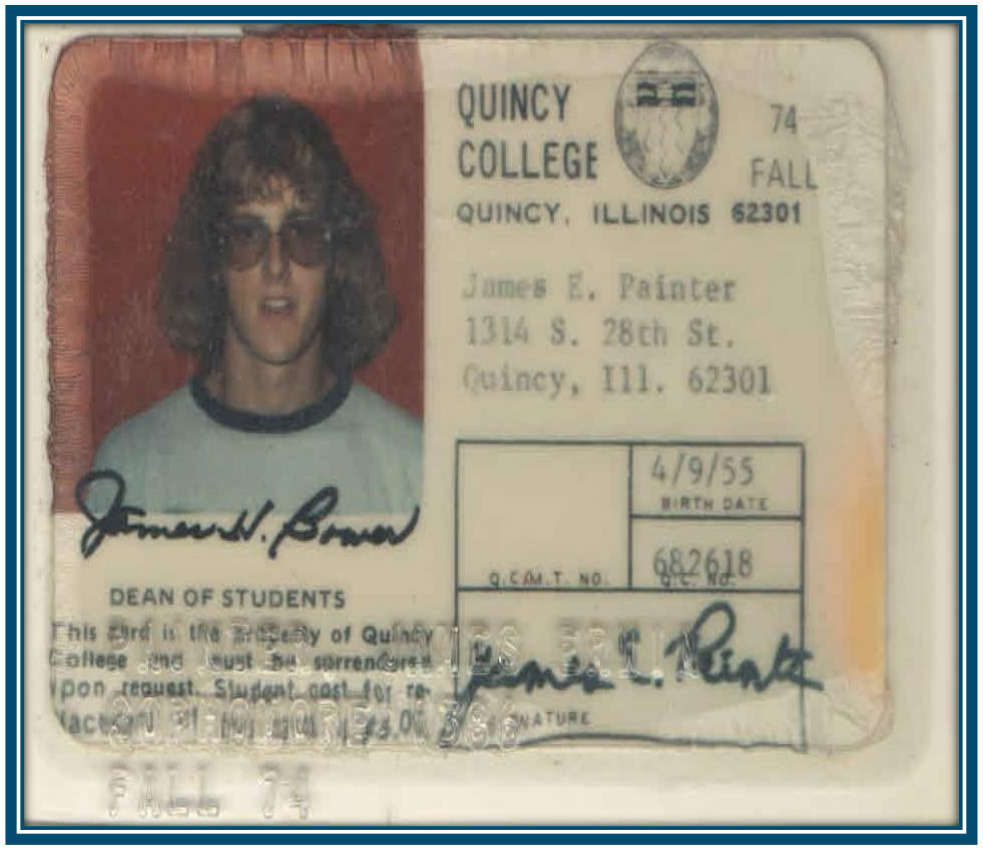
Chef Julie Harrington, RDN
Registered Dietitian & Culinary Consultant
@chefjulie_RD



Jim Painter, PhD, RDN Speaker Disclosure

- **Board Member/Advisory Panel/Consultant**
  - **Present**
    - University of Texas, National Dairy Council, United Sorghum Checkoff Board, Atkins, Sugarwise.
  - **Past**
    - Eastern Illinois University, University of Illinois –Champaign, Chic-fil-A, American Heart Association Eat Well Task Force, California Raisin Marketing Board, Wonderful Pistachios, White Wave Foods, Davidson's Safest Choice Eggs, Tree Top Apples, Bush's Beans,
- **Honoraria**
  - Honorarium underwritten by American Dairy Association North East
  - Dietitians of Canada, Exxon Mobil, Frito Lay, Midwest Dairy Council, Pennsylvania Nutrition Network, California Raisin Marketing Board, Alaska Tanker Company, Dairy Max, Texas AND, California AND, Florida AND, MINK, NY AND, South Carolina AND, Iowa AND, Nebraska AND, Manitoba Dairy Farmers, Dairy Farmers of Canada, Davidsons Safest Choice Eggs, National Dairy Council, New Products Conference, the Flavor Experience, BNP Media, and Cooper Vision.

Speaker Credentials



Dairy Misunderstood?

- Although high in nutrients, dairy has been criticized for being:
  - High in total dietary fat
  - High in cholesterol
  - High in saturated fat

- Which were all mistakenly associated with heart disease
- Why dairy fat is good for you?

Lipids (2010) 45:893–905
DOI 10.1007/s11745-010-3393-4

REVIEW

Saturated Fat and Cardiometabolic Risk Factors, Coronary Heart Disease, Stroke, and Diabetes: a Fresh Look at the Evidence

Renata Micha · Dariush Mozaffarian

Received: 3 December 2009 / Accepted: 27 January 2010 / Published online: 31 March 2010

Changes in Total Cholesterol: HDL- Ratio for Consumption of SFA, MUFA, PUFA, and TFA

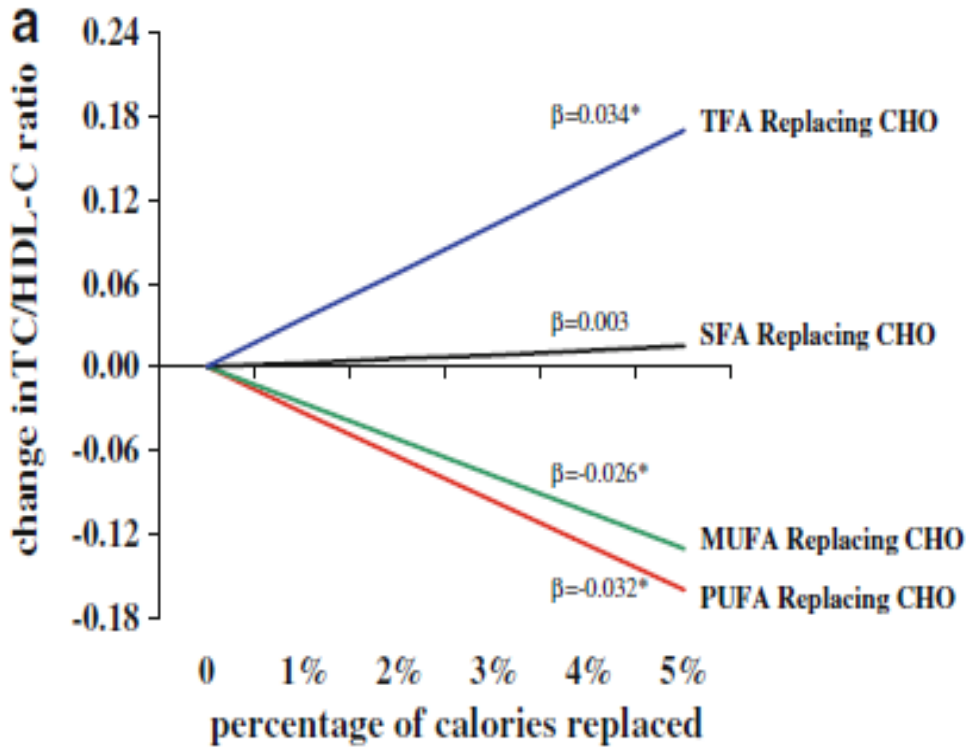


Fig. 2 Changes in blood lipid levels for consumption of saturated fatty acids (SFA), monounsaturated fatty acids (MUFA), polyunsaturated fatty acids (PUFA), or trans fatty acids (TFA) as an isocaloric replacement for carbohydrate (CHO) as a reference, based on two meta-analyses of randomized controlled feeding trials [5, 6]. β reflects the change for each 1% energy isocaloric replacement; $^{*}P < 0.05$

Meta-analysis of prospective cohort studies evaluating the association of saturated fat with cardiovascular disease[1–5]

Patty W Siri-Tarino, Qi Sun, Frank B Hu, and Ronald M Krauss

"More Data are needed to elucidate whether CVD risks are likely to be influenced by the specific nutrients used to replace saturated fat."

"In conclusion, our meta-analysis showed that there is insufficient evidence from prospective epidemiologic studies to conclude that dietary saturated fat is associated with an increased risk of CHD, stroke or CVD."

Design: Twenty-one studies identified by searching MEDLINE and EMBASE databases and secondary referencing qualified for inclusion in this study. A random-effects model was used to derive composite relative risk estimates for CHD, stroke, and CVD.

likely to be influenced by the specific nutrients used to replace saturated fat. *Am J Clin Nutr* 2010;91:535–46.

INTRODUCTION

Early animal studies showed that high dietary saturated fat and cholesterol intakes led to increased plasma cholesterol concen-

cohort studies can provide statistical power to adjust for covariates, thereby enabling the evaluation of the effects of a specific nutrient on disease risk. However, such studies have caveats, including a reliance on nutritional assessment methods whose validity and reliability may vary (25), the assumption that diets

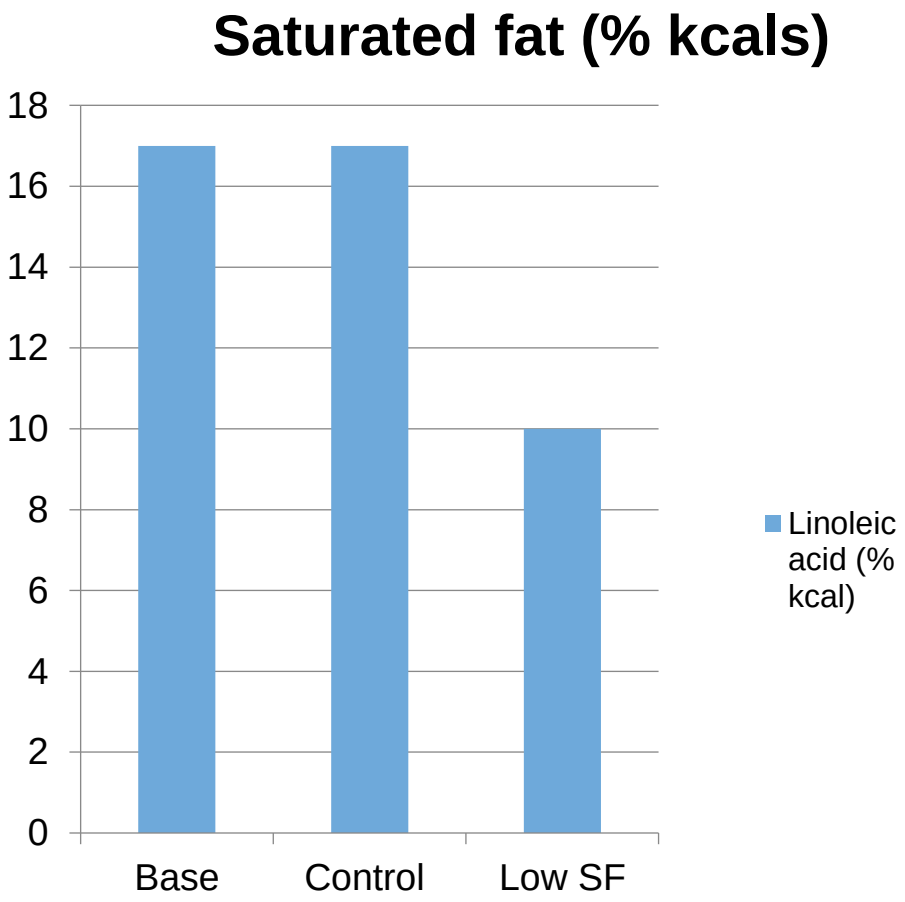
nlm.nih.gov/pubmed/) and EMBASE (http://www.embase.com) databases through 17 September 2009 by using the following search terms: ("saturated fat" or "dietary fat") and ("coronary" or "cardiovascular" or "stroke") and ("cohort" or "follow up").

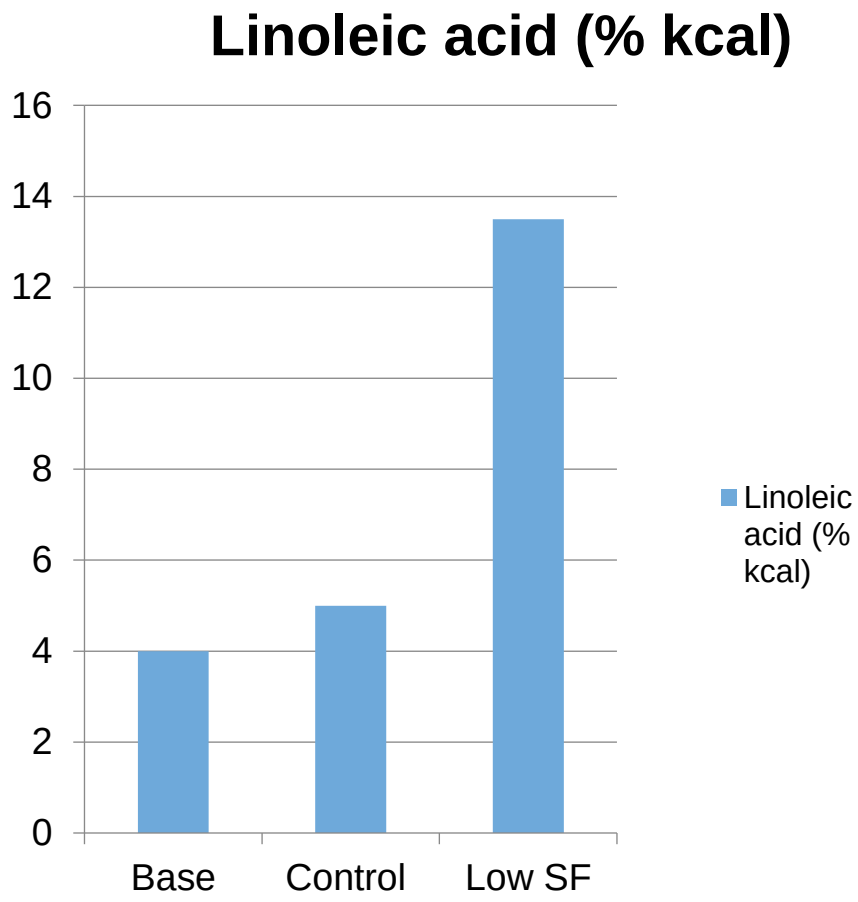
[1] From the Children's Hospital Oakland Research Institute, Oakland, CA (PWS-T and RMK), and the Departments of Nutrition (QS and FBH) and Epidemiology (FBH), Harvard School of Public Health, Boston, MA

Re-evaluation of the traditional diet-heart hypothesis: analysis of recovered data from Minnesota Coronary Experiment (1968-73)

Christopher E Ramsden,[1,2] Daisy Zamora,[3] Sharon Majchrzak-Hong,[1] Keturah R Faurot,[2] Steven K Broste,[4] Robert P Frantz,[5] John M Davis,[3,6] Amit Ringel,[1] Chirayath M Suchindran,[7] Joseph R Hibbeln[1]

Linoleic Acid and Saturated Fat Composition of MCE Control and Intervention Group Diets





Changes in Serum Cholesterol in Intervention and Control

Table 2 | Predicted and observed changes in serum cholesterol in intervention and control groups

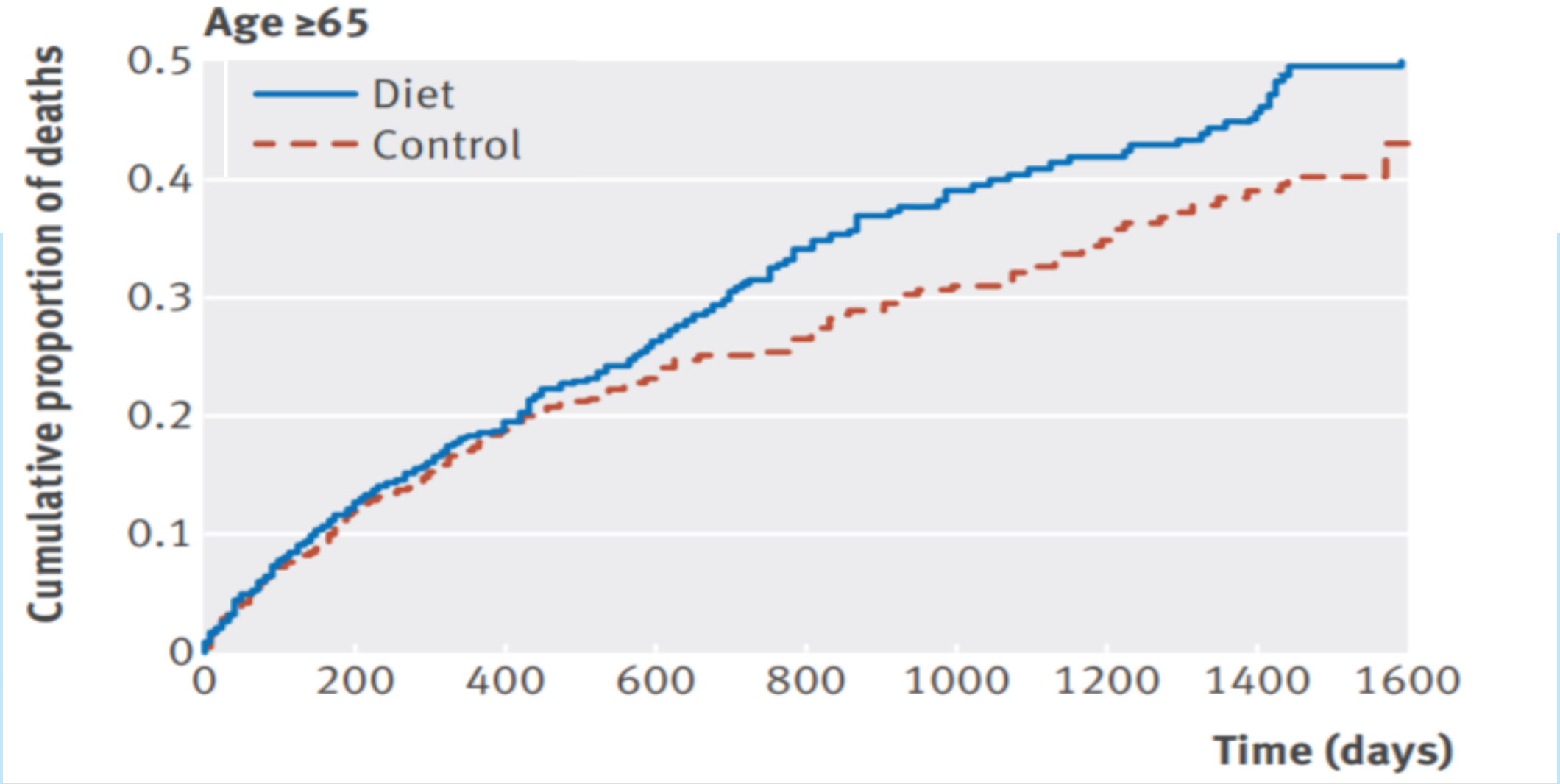
	Observed dietary changes*		Serum cholesterol % changes	
	LA (% change)	SFA (% change)	Predicted based on Keys equation†	Observed in MCE (n=2355)‡
Intervention diet	288	−51	−18.1%	−13.8% (SD 13.0%), P<0.001
Control diet	38	−1	−1.1%	−1.0% (SD 14.5%), P<0.001

LA=linoleic acid; SFA=saturated fat.

*Changes from baseline hospital diet calculated from 1975 abstract, with LA estimated by multiplying total polyunsaturated fatty acids by 0.9.

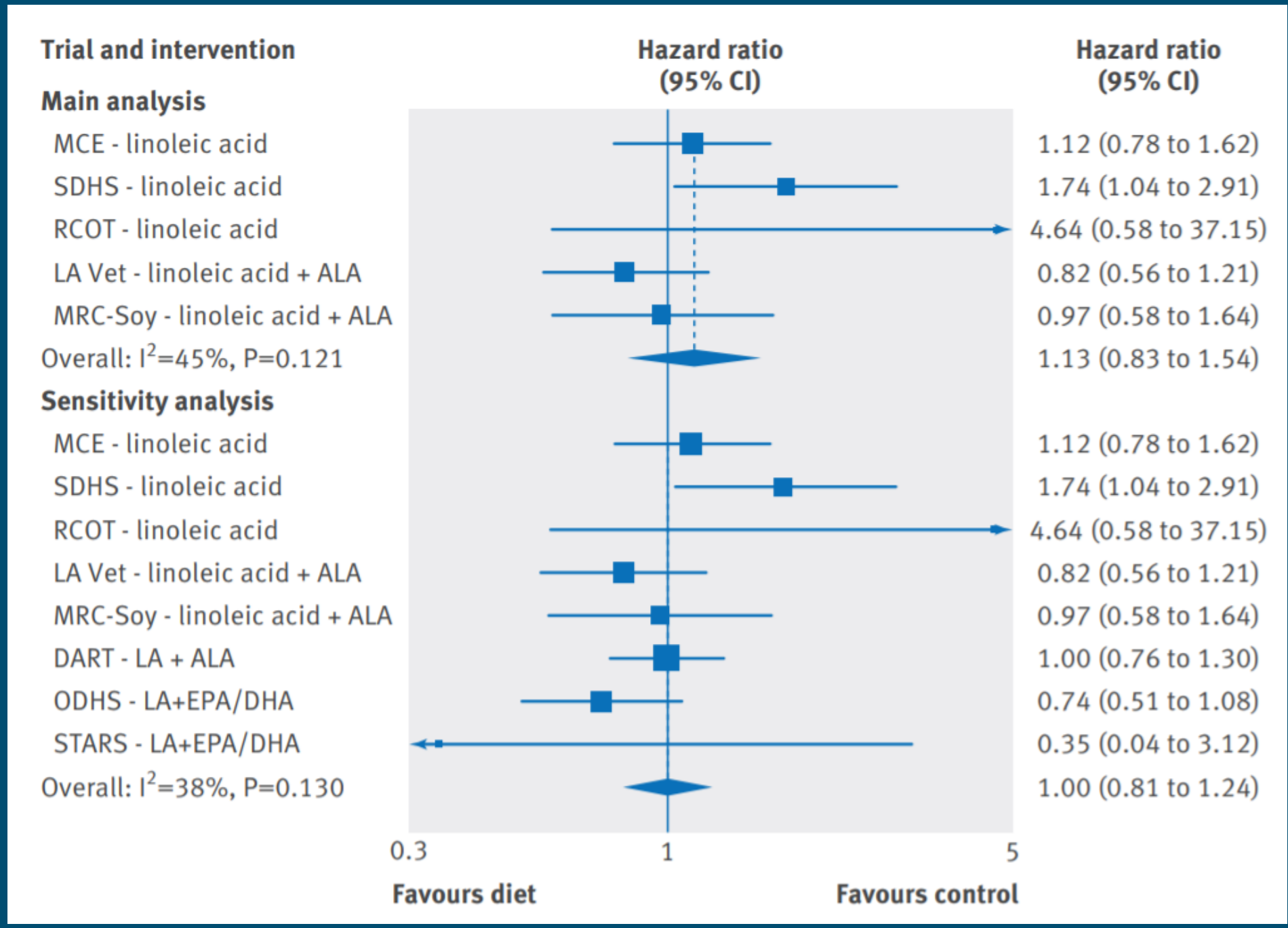
†$\Delta Chol = 1.3(2\Delta S - \Delta P)$ where S and P are percentage of calories from saturated and polyunsaturated fatty acids, respectively.

‡Percent change in serum cholesterol concentration calculated for each individual in cohort that received diet for one year or more. P values from paired *t* test comparing concentrations before and after randomization.



Time (days) Time (days)

Fig 5 | Risk of death from any cause by diet assignment in full MCE cohort and prespecified subgroups (Kaplan Meier life table graphs of cumulative mortality). Graphical depiction of cumulative mortality in full MCE cohort (n=9423) and prespecified subgroups in 1981 Broste thesis[7] showed no indication of benefit and suggested possibility of unfavorable effects of serum cholesterol lowering intervention among participants aged ≥65. Patient level data needed to repeat this analysis were not recovered


Trial and intervention
Hazard ratio (95% CI)
Hazard ratio (95% CI)
Main analysis
MCE - linoleic acid
1.12 (0.78 to 1.62)
SDHS - linoleic acid
1.74 (1.04 to 2.91)
RCOT - linoleic acid
4.64 (0.58 to 37.15)
LA Vet - linoleic acid + ALA
0.82 (0.56 to 1.21)
MRC-Soy - linoleic acid + ALA
0.97 (0.58 to 1.64)
Overall: I2=45%, P=0.121
1.13 (0.83 to 1.54)
Sensitivity analysis
MCE - linoleic acid
1.12 (0.78 to 1.62)
SDHS - linoleic acid
1.74 (1.04 to 2.91)
RCOT - linoleic acid
4.64 (0.58 to 37.15)
LA Vet - linoleic acid + ALA
0.82 (0.56 to 1.21)
MRC-Soy - linoleic acid + ALA
0.97 (0.58 to 1.64)
DART - LA + ALA
1.00 (0.76 to 1.30)
ODHS - LA+EPA/DHA
0.74 (0.51 to 1.08)
STARS - LA+EPA/DHA
0.35 (0.04 to 3.12)
Overall: I2=38%, P=0.130
1.00 (0.81 to 1.24)
0.3
1
5
Favours diet
Favours control

Is Saturated Fat in the Dairy Food Matrix a Risk for Heart Disease?

Saturated Fats Versus Polyunsaturated Fats Versus Carbohydrates for Cardiovascular Disease Prevention and Treatment

Patty W. Siri-Tarino,[1] Sally Chiu,[1] Nathalie Bergeron,[1,2] and Ronald M. Krauss[1]

[1]Atherosclerosis Research Program, Children's Hospital Oakland Research Institute, Oakland, California 94609; email: psiri@chori.org, rkrauss@chori.org

[2]College of Pharmacy, Touro University California, Vallejo, California 94594

Conclusion: There is growing evidence that saturated fatty acids in the context of dairy foods, particularly fermented dairy products, have neutral or inverse associations with CVD.

This article's doi:
10.1146/annurev-nutr-071714-034449

Abstract

The effects of saturated fatty acids (SFAs) on cardiovascular disease (CVD) risk are modulated by the nutrients that replace them and their food matrices. Replacement of SFAs with polyunsaturated fatty acids has been associated with reduced CVD risk, although there is heterogeneity in both fatty acid

nutrients

MDPI

Review

Regular-Fat Dairy and Human Health: A Synopsis of Symposia Presented in Europe and North America (2014–2015)

Arne Astrup [1], Beth H. Rice Bradley [2,*], J. Thomas Brenna [3], Bernadette Delplanque [4], Monique Ferry [5] and Moises Torres-Gonzalez [6]

1 Department of Nutrition, Exercise and Sports, University of Copenhagen, Frederiksberg C DK-1958, Denmark; ast@nexs.ku.dk
2 Foodsense, LLC, 167 Lyman Ave., Burlington, VT 05401, USA
3 Division of Nutritional Sciences, Cornell University, Savage Hall, Ithaca, NY 14853, USA; jtb4@cornell.edu
4 Institut des Neurosciences Paris-Saclay (Neuro-PSI), Universite Paris-Sud, Bat 447, Orsay 91405, France; Bernadette.delplanque@u-psud.fr
5 Sorbonne Paris-Cité, 190 Avenue de France, Paris 75013, France; monique.ferry@club-internet.fr
6 National Dairy Council, 10255 West Higgins Road, Suite 900, Rosemont, IL 60018, USA; Moises.Torres-Gonzalez@Dairy.org
* Correspondence: Beth.H.Rice@gmail.com; Tel.: +1-631-804-4274

Received: 25 April 2016; Accepted: 26 July 2016; Published: 29 July 2016

Symposia of:

- Eurofed Lipids Congress (2014 –France)
- Dairy Nutrition Annual Symposium (2014- Canada)
- American Society for Nutrition (2015 –USA)
- Experimental Biology (2015 –USA)
- Federation of European Nutrition Societies (2015 – Germany)

“The emerging scientific evidence indicates that the consumption of regular fat dairy foods is not associated with an increased risk of cardiovascular disease”

Dairy Fat Inversely Associated with Metabolic Syndrome

Total and Full-Fat, but Not Low-Fat, Dairy Product Intakes are Inversely Associated with Metabolic Syndrome in Adults FREE

Michele Drehmer ✉, Mark A Pereira, Maria Inês Schmidt, Sheila Alvim, Paulo A Lotufo, Vivian C Luft, Bruce B Duncan

The Journal of Nutrition, Volume 146, Issue 1, 1 January 2016, Pages 81–89,
https://doi.org/10.3945/jn.115.220699
Published: 27 October 2015 **Article history** ▾

Conclusions: Total and especially full-fat dairy food intakes are inversely and independently associated with metabolic syndrome in middle-aged and older adults, associations that seem to be mediated by dairy saturated fatty acids. Dietary recommendations to avoid full-fat dairy intake are not supported by our findings.

Effects of Full-Fat and Fermented Dairy Products on Cardiometabolic Disease: Food Is More Than the Sum of Its Parts

Arne Astrup ✉, Nina Rica Wium Geiker, Faidon Magkos

Advances in Nutrition, Volume 10, Issue 5, September 2019, Pages 924S–930S,
https://doi.org/10.1093/advances/nmz069
Published: 13 September 2019 **Article history** ▾

"Therefore, the suggestion to restrict or eliminate full-fat dairy from the diet may not be the optimal strategy for reducing cardiometabolic disease risk and should be re-evaluated in light of recent evidence."

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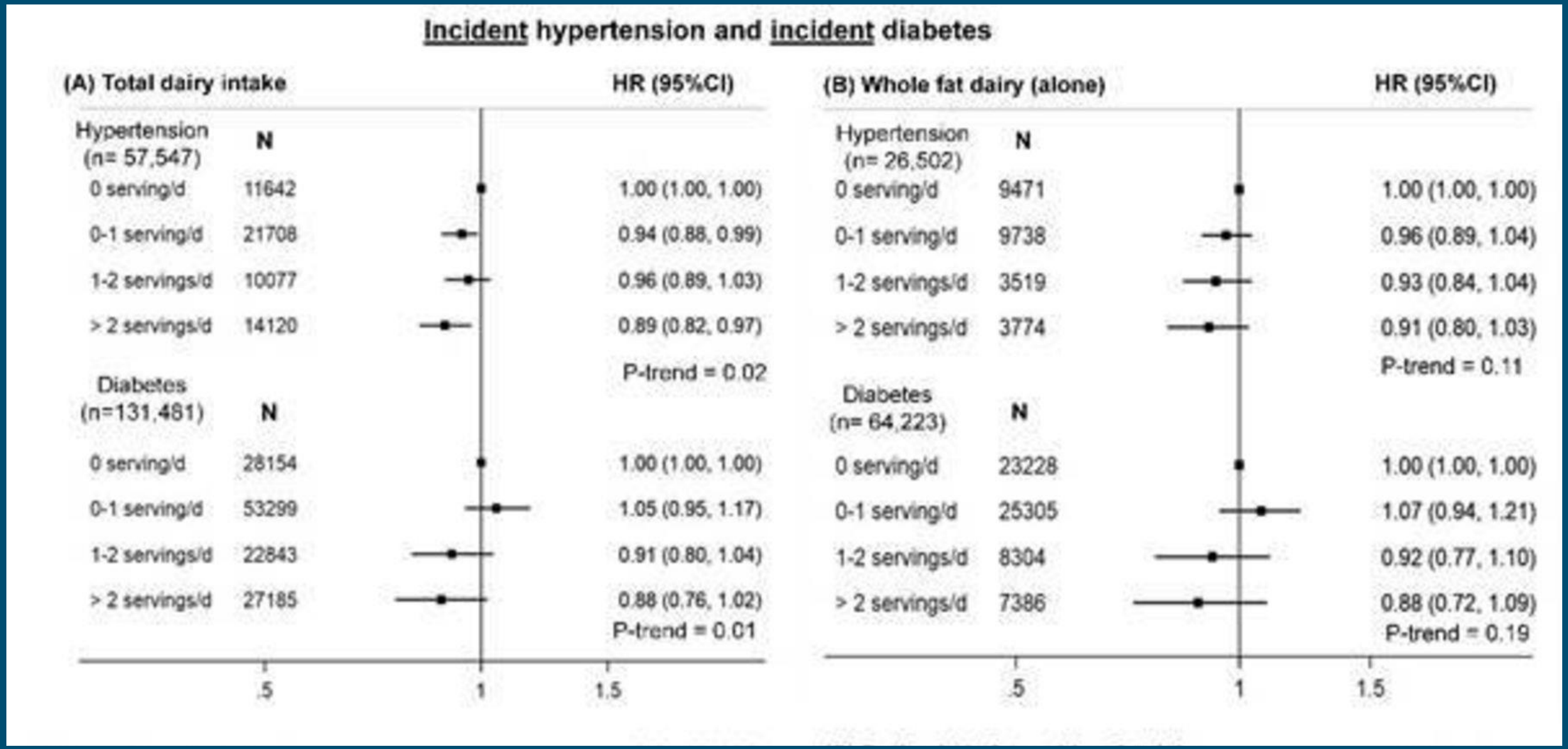
Association of dairy consumption with metabolic syndrome, hypertension and diabetes in 147 812 individuals from 21 countries

PDF

PDF + Supplementary Material

Balaji Bhavadharini[1], Mahshid Dehghan[1], Andrew Mente[1, 2], Sumathy Rangarajan[1], Patrick Sheridan[1], Viswanathan Mohan[3, 4], Romaina Iqbal[5], Rajeev Gupta[6], Scott Lear[7], Edelweiss Wentzel-Viljoen[8], Alvaro Avezum[9], Patricio Lopez-Jaramillo[10], Prem Mony[11], Ravi Prasad Varma[12], Rajesh Kumar[13], Jephat Chifamba[14], Khalid F Alhabib[15], Noushin Mohammadifard[16], Aytekin Oguz[17], Fernando Lanas[18], Dorota Rozanska[19], Kristina Bengtsson Bostrom[20], Khalid Yusoff[21], Lungiswa P Tsolkile[22], Antonio Dans[23], Afzalhussein Yusufali[24], Andres Orlandini[25], Paul Poirier[26], Rasha Khatib[27], Bo Hu[28], Li Wei[29], Lu Yin[28], Ai Deeraili[30], Karen Yeates[31], Rita Yusuf[32], Noorhassim Ismail[33], Dariush Mozaffarian[34], Koon Teo[1, 2, 35], Sonia S Anand[1, 2, 35], Salim Yusuf[1, 2, 35]

"Conclusions: Higher intake of whole fat (but not low fat) dairy was associated with a lower prevalence of MetS and most of its component factors, and with a lower incidence of hypertension and diabetes."


Incident hypertension and incident diabetes
(A) Total dairy intake
HR (95%CI)
Hypertension (n= 57,547)
N
0 serving/d 11642 1.00 (1.00, 1.00)
0-1 serving/d 21708 0.94 (0.88, 0.99)
1-2 servings/d 10077 0.96 (0.89, 1.03)
> 2 servings/d 14120 0.89 (0.82, 0.97)
P-trend = 0.02
Diabetes (n=131,481)
N
0 serving/d 28154 1.00 (1.00, 1.00)
0-1 serving/d 53299 1.05 (0.95, 1.17)
1-2 servings/d 22843 0.91 (0.80, 1.04)
> 2 servings/d 27185 0.88 (0.76, 1.02)
P-trend = 0.01
.5
1
1.5
(B) Whole fat dairy (alone)
HR (95%CI)
Hypertension (n= 26,502)
N
0 serving/d 9471 1.00 (1.00, 1.00)
0-1 serving/d 9738 0.96 (0.89, 1.04)
1-2 servings/d 3519 0.93 (0.84, 1.04)
> 2 servings/d 3774 0.91 (0.80, 1.03)
P-trend = 0.11
Diabetes (n= 64,223)
N
0 serving/d 23228 1.00 (1.00, 1.00)
0-1 serving/d 25305 1.07 (0.94, 1.21)
1-2 servings/d 8304 0.92 (0.77, 1.10)
> 2 servings/d 7386 0.88 (0.72, 1.09)
P-trend = 0.19
.5
1
1.5

Potential Cardiometabolic Health Benefits of Full-Fat Dairy: The Evidence Base

Kristin M Hirahatake, Arne Astrup, James O Hill, Joanne L Slavin, David B Allison, Kevin C Maki ✉

Advances in Nutrition, Volume 11, Issue 3, May 2020, Pages 533–547,
https://doi.org/10.1093/advances/nmz132
Published: 06 January 2020 **Article history** ▾

"Emerging evidence shows that the consumption of full-fat dairy foods has a neutral or inverse association… cardiometabolic health outcomes…including atherosclerotic cardiovascular disease, type 2 diabetes, and associated risk factors. …

Saturated Fat in Dairy and Heart Disease

Why isn’t dairy fat a risk factor for heart disease when it’s high in saturated fat?

We will look at 2 reasons

- Odd chain saturated fat
- Good trans fat

CVD Risk and High Dairy Fat Intake

Biomarkers of dairy fat intake and risk of cardiovascular disease: A systematic review and meta analysis of prospective studies

Jingjing Liang, Quan Zhou, William Kwame Amakye, **Yixiang Su**, MD, MS, Professor & **Zheqing Zhang**, PhD, MD, Lecturer

Accepted author version posted online: 21 Dec 2016, Published online: 05 Jul 2017

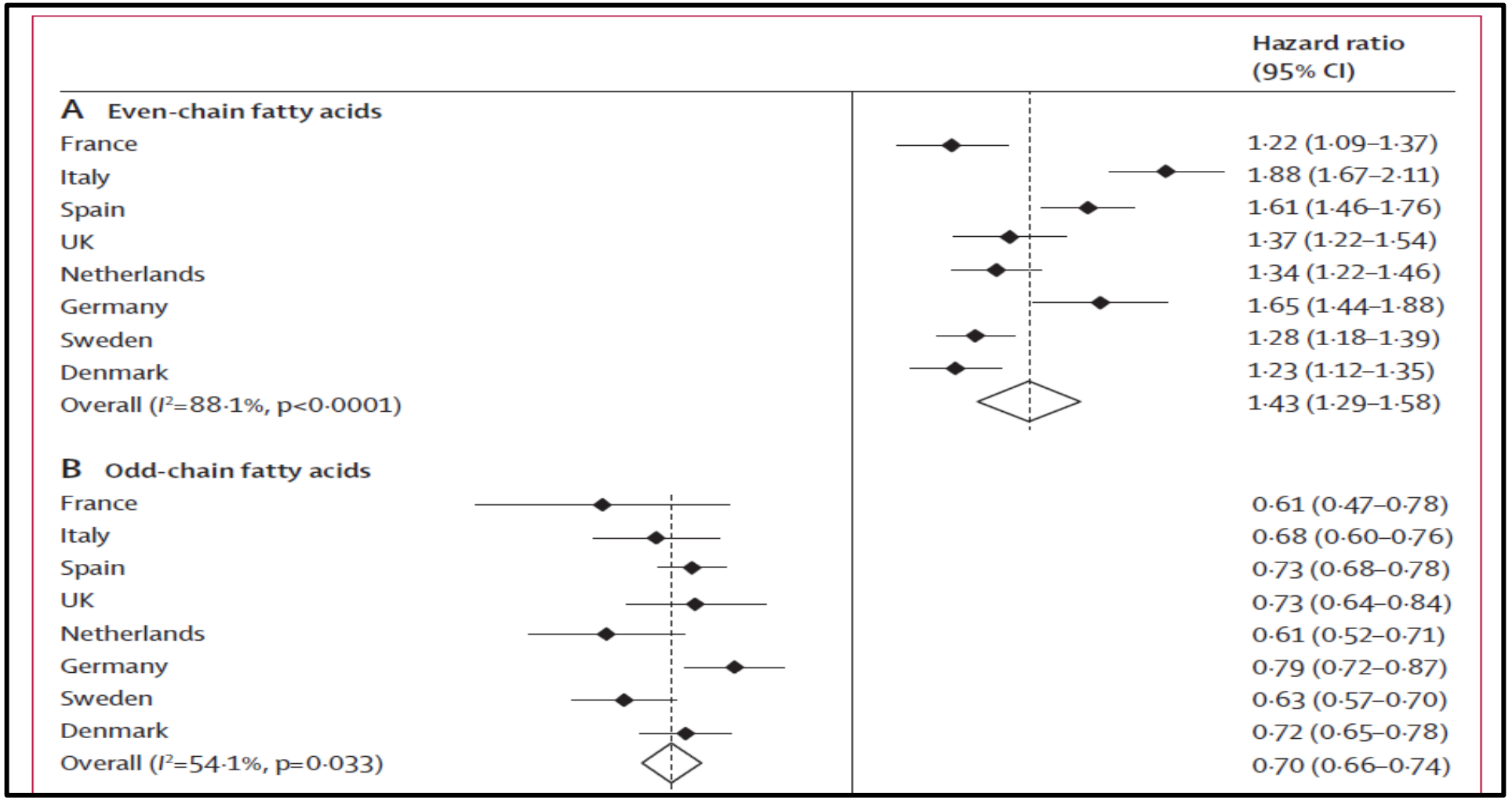
Conclusions: Higher dairy fat exposure is not associated with an increased risk of CVD.

Pooled Relative Risks of CVD for Top Third vs. Bottom Third

Fatty Acids	Pool Relative Risks
Pentadecanoic acid (15:0)	**0.94**
heptadecanoic acid (17:0)	**0.82**
trans-palmitoleic acid (trans-16:1n-7)	**0.82**

Liang, Jingjing, et al. Critical reviews in food science and nutrition (2017): 1-9.

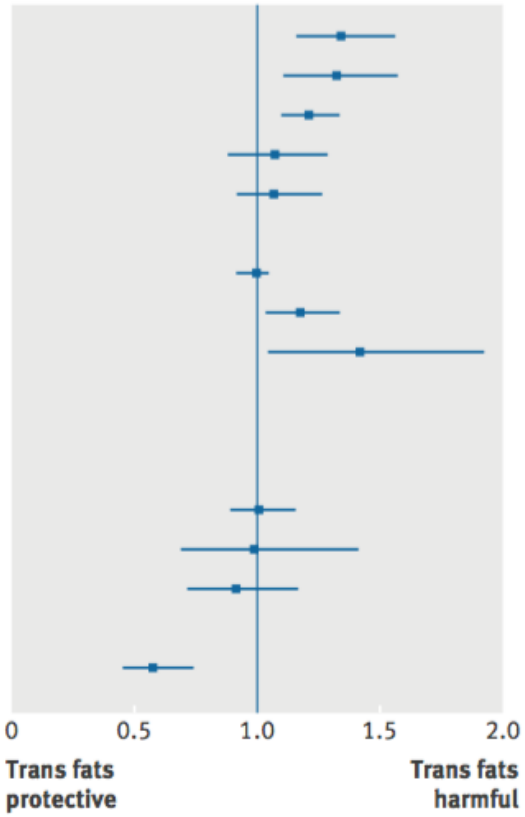
Intake of Saturated Fat and Type 2 Diabetes



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

Russell J de Souza,[1,2,3,4] Andrew Mente,[1,2,5] Adriana Maroleanu,[2] Adrian I Cozma,[3,4] Vanessa Ha,[1,3,4] Teruko Kishibe,[6] Elizabeth Uleryk,[7] Patrick Budylowski,[4] Holger Schünemann,[1,8]

Outcome	No of studies /comparisons	No of events /participants	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
Industrial trans fats						
All cause mortality	1/2	11 890/71 464	0.98 (0.92 to 1.04)	0.52	0.52	0
CHD mortality	2/2	3018/93 394	1.18 (1.04 to 1.33)	0.009	0.68	0
CHD total	2/2	454/69 848	1.42 (1.05 to 1.92)	0.02	0.22	34
Ischemic stroke	0	0/0	-	-	-	-
Type 2 diabetes	0	0/0	-	-	-	-
Ruminant trans fats						
All cause mortality	1/2	11 890/71 464	1.04 (0.92 to 1.18)	0.51	0.31	4
CHD mortality	2/3	3018/93 394	1.01 (0.71 to 1.43)	0.95	0.01	79
CHD total	3/4	828/73 546	0.93 (0.73 to 1.18)	0.55	0.13	46
Ischemic stroke	0	0/0	-	-	-	-
Type 2 diabetes	5/5	1153/12 942	0.58 (0.46 to 0.74)	<0.001	0.22	30



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[2]Chanchlan
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[3]Departme
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[4]Clinical Nu
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[5]Populatio
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Sciences, H
[6]Scotiaban
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[7]Hospital L
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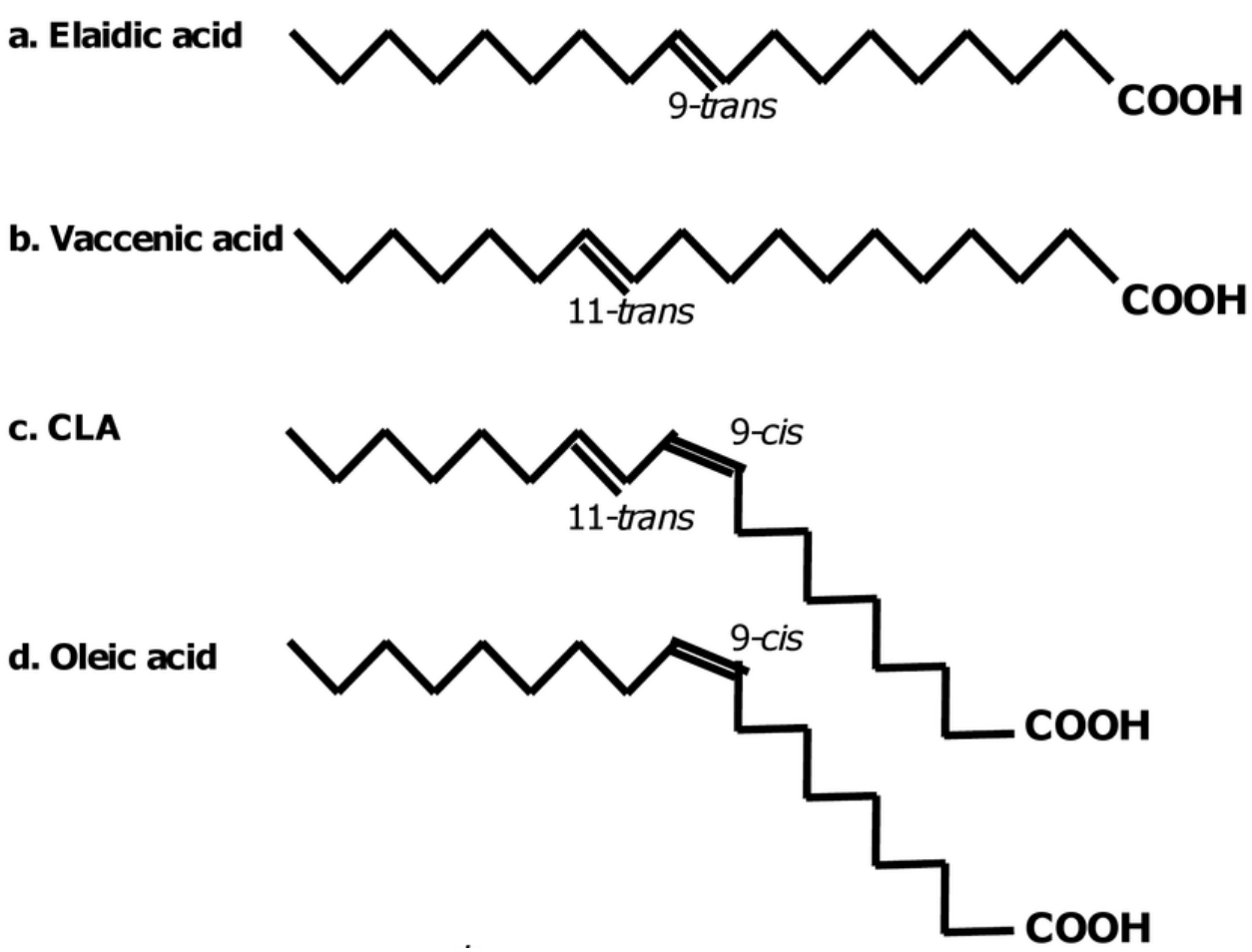
Fatty Acid Structures

Industrial

Ruminant

Ruminant



Journal of the American College of Cardiology

Available online 17 June 2020

In Press, Journal Pre-proof

JACC State-of-the-Art Review

Saturated Fats and Health: A Reassessment and Proposal for Food-based Recommendations: JACC State-of -the-Art Review

Arne Astrup MD, DMSc [a], Faidon Magkos PhD [a], Dennis M. Bier MD [b], J. Thomas Brenna PhD [c], Marcia C. de Oliveira Otto PhD [d], James O. Hill PhD [e], Janet C. King PhD [f], Andrew Mente PhD [g], Jose M. Ordovas PhD [h], Jeff S. Volek PhD, RD [i], Salim Yusuf DPhil [g], Ronald M. Krauss MD [j]

“The recommendation to limit dietary saturated fatty acid (SFA) intake has persisted despite mounting evidence to the contrary… Whole-fat dairy, unprocessed meat, eggs and dark chocolate are SFA-rich foods with a complex matrix that are not associated with increased risk of CVD.”

Previous Advice: Restrict SFA intake to reduce risk of CVD

Current Evidence Base: Health effects of SFAs depend on the interacting effects from naturally occurring food components and from unhealthy compounds introduced by processing

Whole-Fat Dairy

Unprocessed Red Meat

Dark Chocolate

=

Complex food matrix with high SFA content but also other nutrients and non-nutritive components (e.g. proteins, micronutrients, phospholipids, probiotics)

=

No increased CVD or diabetes risk

New recommendations should emphasize food-based strategies that translate for the public into understandable, consistent, and robust recommendations for healthy dietary pattens

Fatty Acid Content

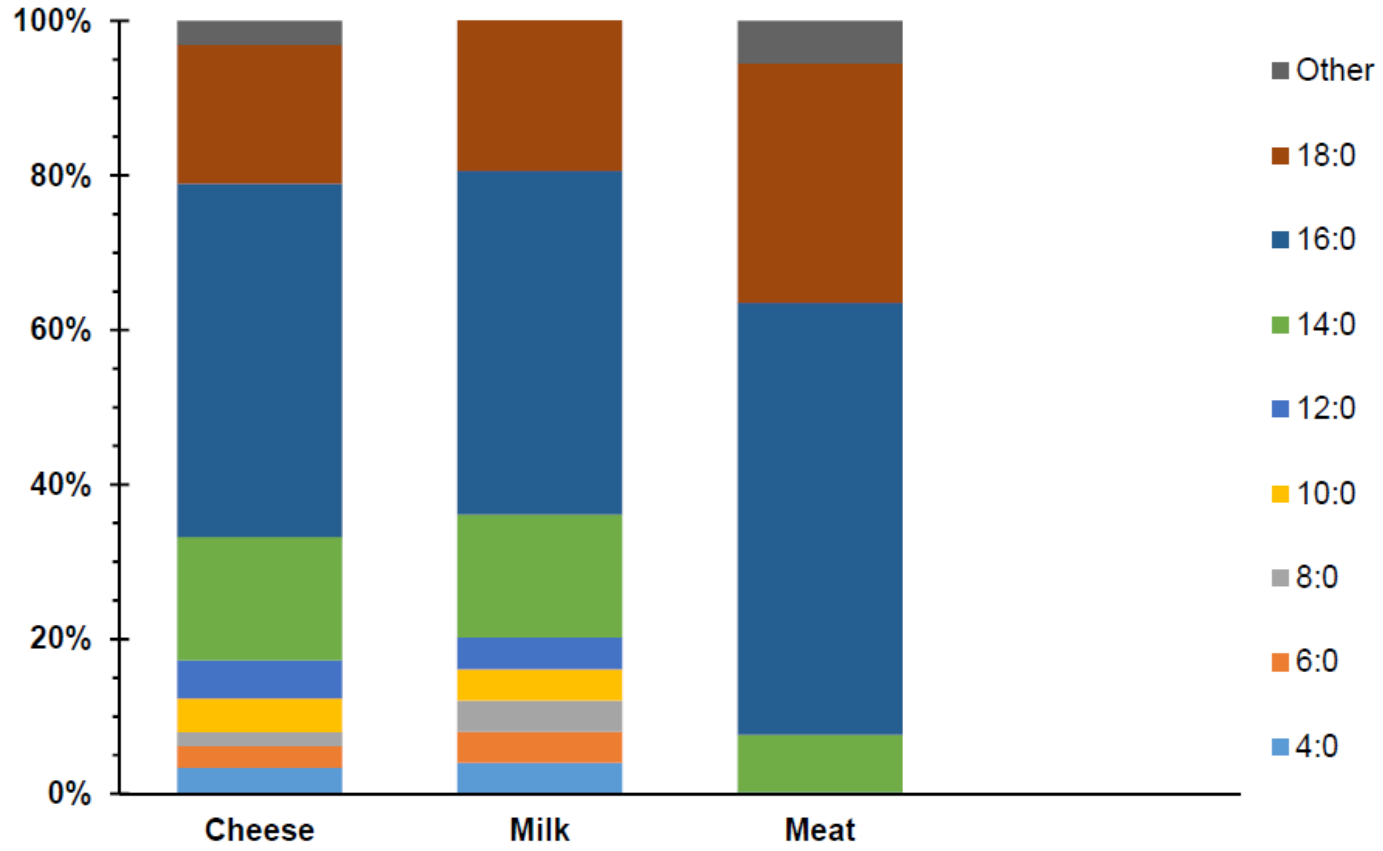


Table 1. Major naturally occurring saturated fatty acids.

Abbreviation	Common or systematic name	Carbon chain length	Major dietary sources
4:0	Butyric	Short	Dairy foods
6:0	Caproic	Short	Dairy foods
8:0	Caprylic	Medium	Dairy foods, coconut and palm kernel oils
10:0	Capric	Medium	Dairy foods
12:0	Lauric	Medium	Coconut milk and oil
14:0	Myristic	Long	Dairy foods
15:0	Pentadecanoic	Long	Red meat, dairy foods, oils
16:0	Palmitic	Long	Red meat, dairy foods, palm oil
17:0	Heptadecanoic	Long	Red meat, dairy foods
18:0	Stearic	Long	Dairy foods, meat, chocolate

C15:0 and C17:0 are predominantly obtained from foods sources, whereas circulating levels of all other saturated fatty acids are influenced by both dietary intake and endogenous metabolism.

EDITOR'S CHOICE

Whole milk compared with reduced-fat milk and childhood overweight: a systematic review and meta-analysis FREE

Shelley M Vanderhout, Mary Aglipay, Nazi Torabi, Peter Jüni, Bruno R da Costa, Catherine S Birken, Deborah L O'Connor, Kevin E Thorpe, Jonathon L Maguire ✉

The American Journal of Clinical Nutrition, Volume 111, Issue 2, February 2020, Pages 266–279, https://doi.org/10.1093/ajcn/nqz276

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“Findings from the present study suggest that cow-milk fat, which has not been examined in previous meta-analyses, could play a role in the development of childhood overweight or obesity … One theory involves the replacement of calories from less healthy foods, such as sugar-sweetened beverages, with cow-milk fat (67).”

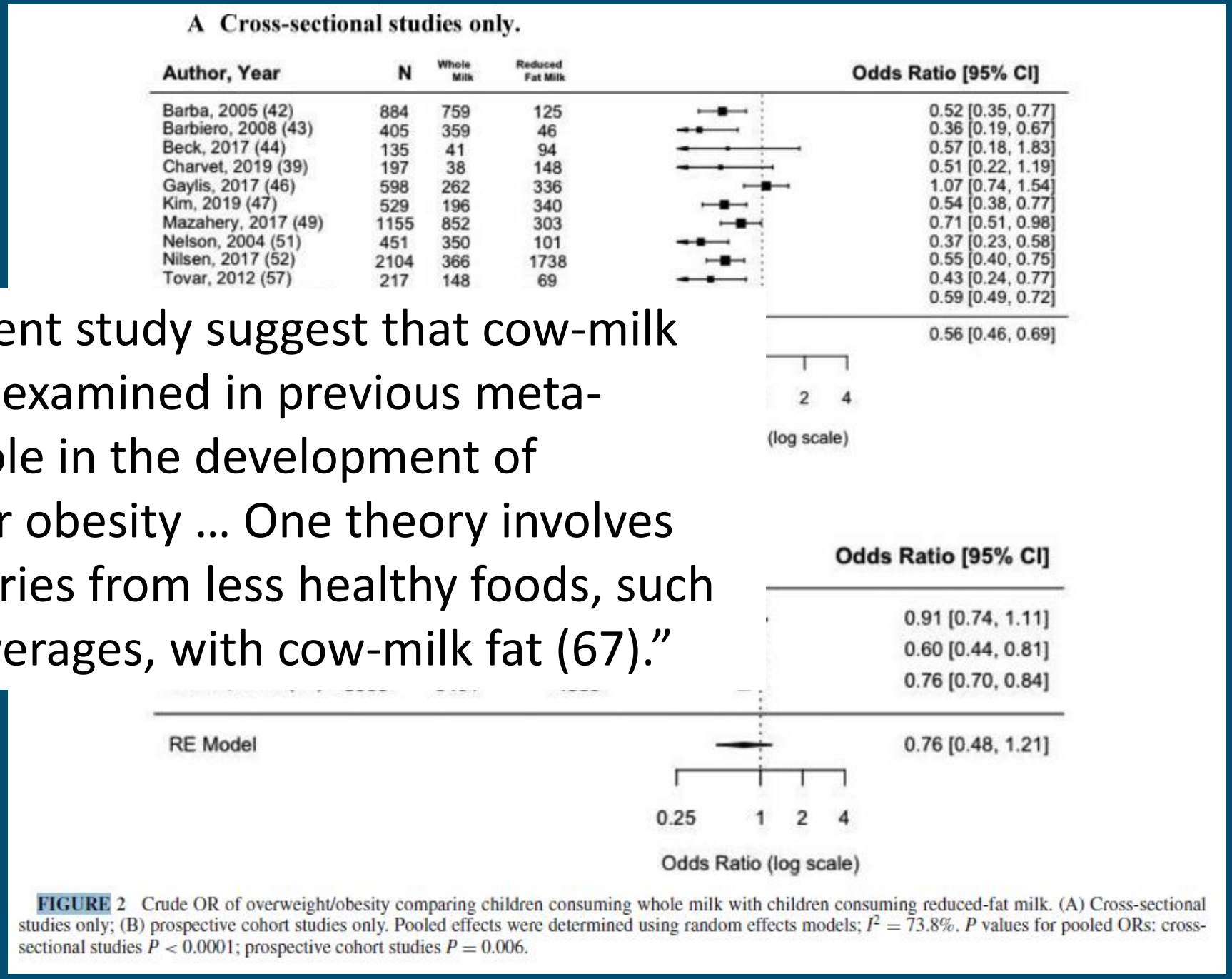

FIGURE 2 Crude OR of overweight/obesity comparing children consuming whole milk with children consuming reduced-fat milk. (A) Cross-sectional studies only; (B) prospective cohort studies only. Pooled effects were determined using random effects models; $I^2 = 73.8\%$. P values for pooled ORs: cross-sectional studies $P < 0.0001$; prospective cohort studies $P = 0.006$.

What Does This All Mean?

You can encourage full-fat dairy along side low-fat dairy!

- Whole milk is back!
- Full-fat dairy need not be avoided.
- Sauces made with whole milk may be added to the diet without feeling guilty.
- Sauces have a new lease on life, so use them without apology.
- Use fatty foods like avocados, nuts, and seeds to add *taste* and *texture*.

Julie Harrington, RDN Speaker Disclosure

- **Owner**
  - Julie Harrington Consulting LLC, Culinary Nutrition Studio LLC
- **Consultant**
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- **Board Member**
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    - NJAND – Nominating Committee, Sponsorship Committee
  - *Past*
    - Nutrition Entrepreneurs DPG – newsletter editor

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