Joint Webinar Presentation

Concepts and Controversy: Dietary Recommendations for Cardiovascular Disease

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Presented by Penny Kris-Etherton, PhD, RD, FAHA, FNLA, FASN, CLS

Thursday, September 28, 2:00-3:30pm ET

Learning Objectives

After completing this continuing education course, nutrition professionals should be able to:

1. Understand why there are some misunderstandings (controversies) about the current Dietary Guidelines for SFA, PUFA, cholesterol and sodium.
2. Address these controversies in practice using food-based recommendations.

Outline

- The controversies about the dietary guidance for:
  - Saturated fat
  - PUFA
  - Dietary cholesterol
  - Sodium
- RDNs can use food-based recommendations to address these controversies and still plan healthful dietary patterns
- Summary

The Saturated Fat Controversy

Recommendations for Saturated Fat and Evidence Grades

- 2013 AHA/ACC: A (Strong)
  - Reduce percent of calories from saturated fat.
  - Aim for a dietary pattern that achieves 5% to 6% of calories from saturated fat.
- DGAC 2015: Strong
  - Replacing SFA with PUFA reduces total and LDL-C and the risk of CVD events and coronary mortality
- 2015 National Lipid Association (NLA): A (Strong)
  - Dietary saturated fat may be partially replaced with unsaturated fats (mono- and polyunsaturated fats), as well as proteins, to reach a goal of < 7% of energy from saturated fats

Circulation

Dietary Fats and Cardiovascular Disease:

A Presidential Advisory From the American Heart Association

ABSTRACT: Cardiovascular disease (CVD) is the leading global cause of death, accounting for 17.3 million deaths per year. Preventive treatment that reduces CVD by even a small percentage can substantially reduce, nationally and globally, the number of people who develop CVD and the costs of caring for them. This American Heart Association presidential advisory on dietary fats and CVD reviews and discusses the scientific evidence, including the most recent studies, on the effects of dietary saturated fat intake and its replacement by other types of fats and carbohydrates on CVD. In summary, randomized controlled trials that lowered intake of dietary saturated fat and replaced it with polyunsaturated vegetable oil reduced CVD by ≈30%, similar to the reduction achieved by statin treatment. Prospective observational studies in many populations showed that lower intake of saturated fat coupled with higher intake of polyunsaturated and monounsaturated fat is associated with lower rates of CVD and of other major causes of death and all-cause mortality. In contrast, replacement of saturated fat with mostly refined carbohydrates and sugars is not associated with lower rates of CVD and did not reduce CVD in clinical trials. Replacement of saturated with unsaturated fats lowers low-density lipoprotein cholesterol, a cause of atherosclerosis, linking biological evidence with incidence of CVD in populations and in clinical trials. Taking into consideration the totality of the scientific evidence, satisfying rigorous criteria for causality, we conclude strongly that lowering intake of saturated fat and replacing it with unsaturated fats, especially polyunsaturated fats, will lower the incidence of CVD. This recommended shift from saturated to unsaturated fats should occur simultaneously in an overall healthful dietary pattern such as DASH (Dietary Approaches to Stop Hypertension) or the Mediterranean diet as emphasized by the 2013 American Heart Association/American College of Cardiology lifestyle guidelines and the 2015 to 2020 Dietary Guidelines for Americans.

"Taking into consideration the totality of the scientific evidence, satisfying rigorous criteria for causality, we conclude strongly that lowering intake of saturated fat and replacing it with unsaturated fats, especially polyunsaturated fats, will lower the incidence of CVD."

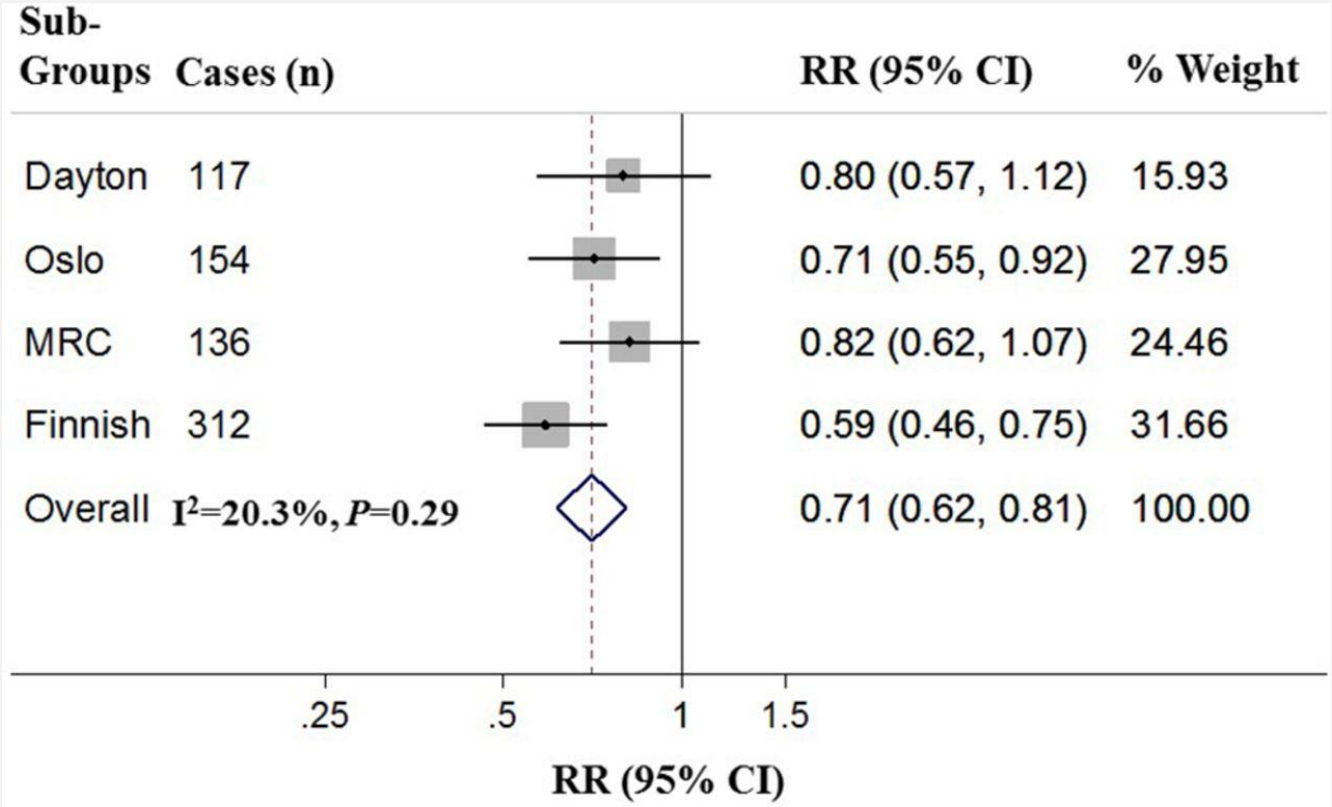
Frank M. Sacks et al. Circulation. 2017;136:e1-e23

KEY POINTS: Randomized Clinical Trials on Replacement of Dietary Saturated Fat With PUFA

- Four core randomized trials replacing SFA with PUFA had at least 2 years' duration, good adherence proven by blood or tissue levels of cholesterol and/or PUFA, and standard outcome ascertainment. Meta-analysis showed a 29% reduction in CHD events.
- Six additional trials were not considered core trials because of short duration, low adherence, or nonstandard outcome ascertainment. However, meta-analyses that included several of these trials along with some or all of the core trials also found a significant reduction in CHD events on the PUFA diet.

Sacks FM et al. Circulation. 2017 Jul 18;136(3):e1-e23.

SaturateMeta-Analysis of Core Trials on Replacing Saturated with Polyunsaturated Fat:



Frank M. Sacks et al. Circulation. 2017;136:e1-e23

KEY POINTS: Randomized Clinical Trials on Replacement of Dietary Saturated Fat With PUFA or Carbohydrates

- The Sydney Diet Heart Study showed that using a margarine rich in trans unsaturated fat to replace saturated fat increased CHD events, confirming the adverse effects of trans fatty acids.
- The Minnesota Coronary Survey had a very high discharge rate of participants in a mental hospital and the average duration of study was only one year vs 3.6 years planned. Also, some lightly hydrogenated corn oil margarine was used.
- Several trials that replaced saturated fat with carbohydrates did not show reduced CHD. Adherence was much less than expected in these trials.

Sacks FM et al. Circulation. 2017 Jul 18;136(3):e1-e23.

Saturated Fats and CVD:

AHA Convicts, We Say Acquit

- **"The diet-heart hypothesis has never been tested in a clinical trial."**
  - *Reality - There is clinical trial evidence that substituting PUFA for SFA decreases CVD events.*
- **"The AHA Presidential Advisory cherry picked studies to include."**
  - *Reality - The Advisory defined the criteria for the studies included in the review.*
- ***"Much data refute the diet-heart hypothesis, including dietary data in the U.S., which have shown that Americans have cut intake of animal fats by 27%, while increasing consumption of vegetable oils by 90% and still CVD is a leading cause of death."***
  - *Reality - Current findings, albeit from observational studies, show that substituting PUFA (and MUFA, CHO from whole grains and plant protein) for SFA decreases CVD risk. Also, there have been many changes in the U.S. diet over the years. Importantly, CVD has decreased.*
- ***"Long standing AHA conflicts with funding sources creates a bias."***
  - *AHA has the highest ethical standards for private sector interactions.*

Clearing up the Controversy

SFA are not associated with CVD??

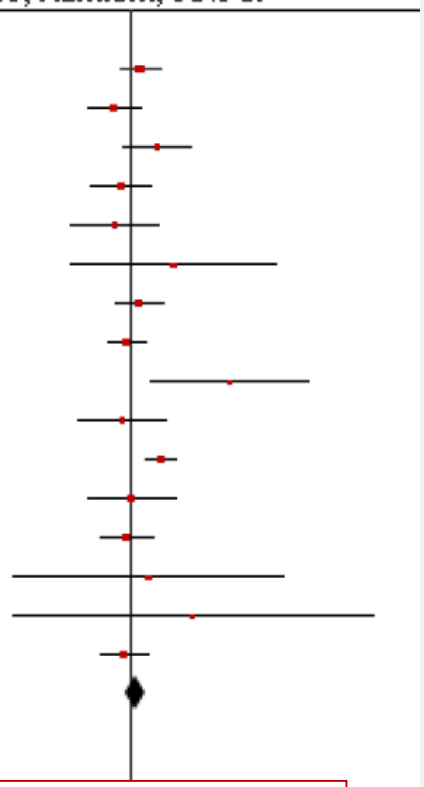
- Some of the early epidemiologic studies (e.g., Siri-Tarino et al., 2010) did not find an association with SFA and CAD. However, these studies did not consider the nutrient substituted for SFA, which was most likely refined CHO and added sugars. Based on this, the correct conclusion from these studies is that SFA and refined CHO & added sugars are equally bad for CHD risk.

Saturated Fat and Heart Disease Events

Study or Subgroup	Risk Ratio IV, Random, 95% CI	Year
Coronary Heart Disease		
Shekelle et al(17)	1.11 [0.91, 1.36]	1981
McGee et al(9)[1]	0.86 [0.67, 1.12]	1984
Kushi et al(13)	1.33 [0.95, 1.87]	1985
Posner et al(16)	0.92 [0.68, 1.24]	1991
Goldbourt et al(35)[1]	0.86 [0.56, 1.35]	1993
Fehily et al(28)	1.57 [0.56, 4.42]	1994
Ascherio et al(4)[1]	1.11 [0.87, 1.42]	1996
Esrey et al(6)	0.97 [0.80, 1.18]	1996
Mann et al(32)	2.77 [1.25, 6.13]	1997
Pietinen et al(15)	0.93 [0.60, 1.44]	1997
Boniface et al(5)[1]	1.37 [1.17, 1.60]	2002
Jakobsen et al(8)[1]	1.03 [0.66, 1.60]	2004
Oh et al(33)	0.97 [0.74, 1.27]	2005
Tucker et al(18)[1]	1.22 [0.31, 4.77]	2005
Xu et al(10)	1.91 [0.31, 11.84]	2006
Leosdottir et al(14)	0.95 [0.74, 1.21]	2007
Subtotal (95% CI)	**1.07 [0.96, 1.19]**	

Heterogeneity: $Tau^2 = 0.02$; $Chi^2 = 25.54$, df = 15 (P = 0.04); $I^2 = 41\%$

Test for overall effect: Z = 1.22 (P = 0.22)



No Significant Relationship

Siri-Tarino et al., Am. J. Clin. Nutr. 2010; 91(3):502-509

The Lancet

Associations of fats and carbohydrate intake with cardiovascular disease and mortality in 18 countries from five continents (PURE): a prospective cohort study

18 Countries (≈ 135,000 subjects) – Focused on Middle East, South America, Africa and South Asia.

Finding: "Intake of total fat and each type of fat was associated with lower risk of total mortality. Higher SFA intake was associated with lower risk of stroke. Total fat & SFA & unsaturated fats were not associated with risk of MI or CVD mortality."

Research in context: "Removing current restrictions on fat intake but limiting carbohydrate intake (when high) might improve health. Dietary guidelines might need to be reconsidered…."

www.thelancet.com Published online August 29, 2017 http://dx.doi.org/10.1016/S0140-6736(17)32252-3.

Association between estimated percentage energy from nutrients and total mortality and major cardiovascular diesease

Figure 1: **Association between estimated percentage energy from nutrients and total mortality and major cardiovascular disease (n=135 335)**
Adjusted for age, sex, education, waist-to-hip ratio, smoking, physical activity, diabetes, urban or rural location, centre, geographical regions, and energy intake. Major cardiovascular disease=fatal cardiovascular disease+myocardial infarction+stroke+heart failure.

www.thelancet.com Published online August 29, 2017 http://dx.doi.org/10.1016/S0140-6736(17)32252-3.

Problems with the PURE Study
From David Katz, MD, MPH

- Total fat intake ranged from 18% to 30% of calories – values lower than current average intake in the U.S. and Australia.
- The lowest total fat intake group had the lowest protein intake. This group had an inadequate food and nutrient intake. Non-CVD mortality decreased as protein intake increased.
- Saturated fat intake ranged from 6% to 11% of calories. The upper intake is less than that in the U.S. and Australia. It is close to recommended amounts. There is no basis for recommending that people in affluent countries increase fat and saturated fat intake.
- The findings actually suggest that intake of carbohydrate was highest where there was most poverty, least access to medical care and the greatest risk of dying from trauma, infectious diseases, etc.
- A more appropriate conclusion is: Very poor people with barely anything to eat get sick and die more often than affluent people with access to both ample diets and health care.

Huffington Post. August 31, 2017.

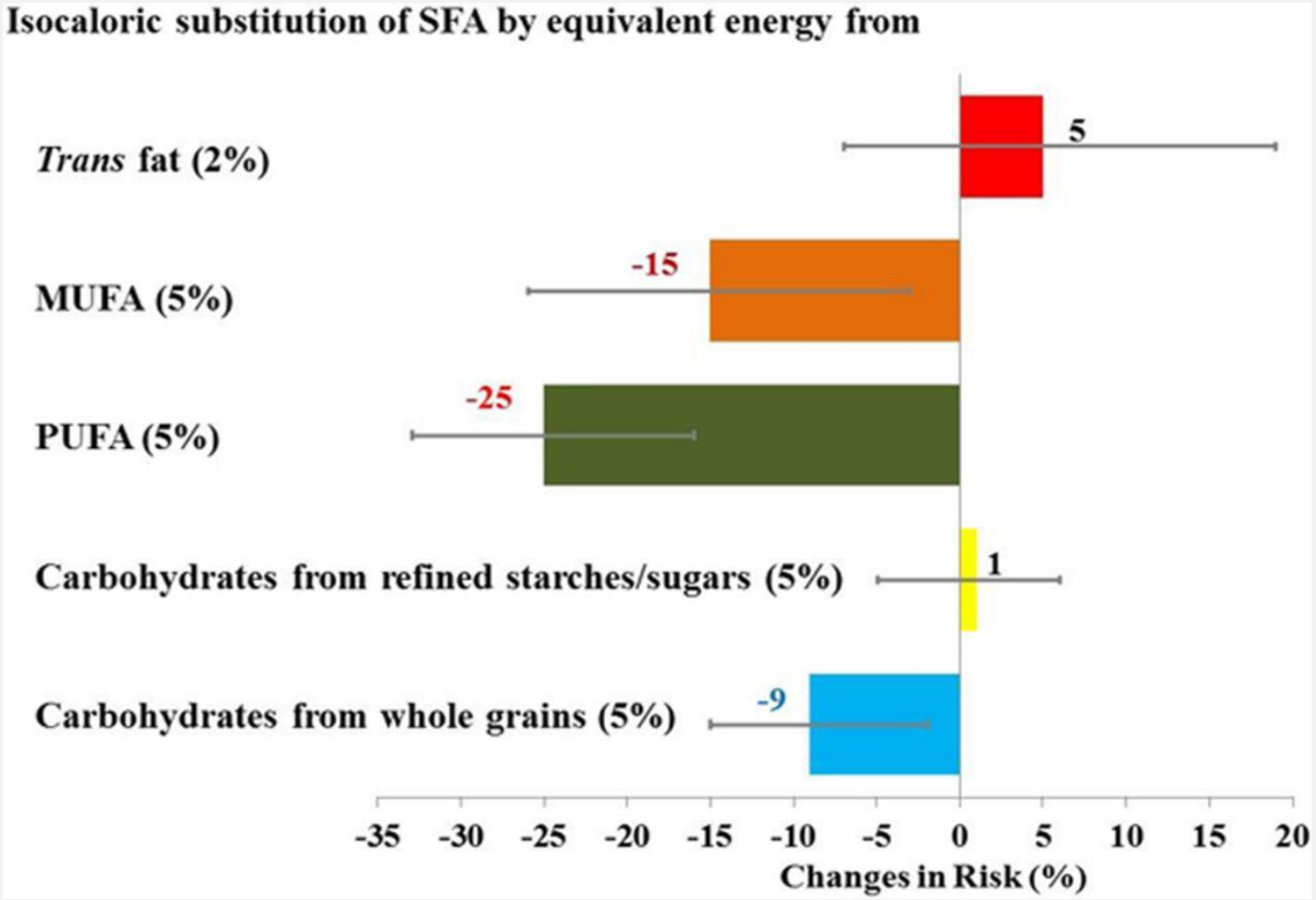
New Evidence Supports Reducing Dietary SFA

- Replacing SFA with other macronutrients benefits CVD risk. (Li et al., J Am Coll Cardiol. 2015;66:1538-1548; Zong et al., BMJ. 2016;355:i5796. doi: 10.1136/bmj.i5796; Wang et al., JAMA Intern Med. 2016;176:1134-1145.)

- Replacing SFA with other macronutrients decreases LDL-C.

- LDL-C is a causal factor for atherosclerotic CVD. (A consensus statement from the European Atherosclerosis Society Consensus Panel, Ference et al., Eur Heart J. 2017 Apr 24. doi: 10.1093)

Replacement of Saturated Fat with other Types of Fat or Carbohydrates and Risk of CHD



Frank M. Sacks et al. Circulation. 2017;136:e1-e23

Li et al. J Am Coll Cardiol. 2015;66(14):1538-1548.

Intake of individual saturated fatty acids and risk of coronary heart disease in US men and women:

two prospective longitudinal cohort studies

Abstract

Objectives To investigate the association between long term intake of individual saturated fatty acids (SFAs) and the risk of coronary heart disease, in two large cohort studies.

Design Prospective, longitudinal cohort study.

Setting Health professionals in the United States.

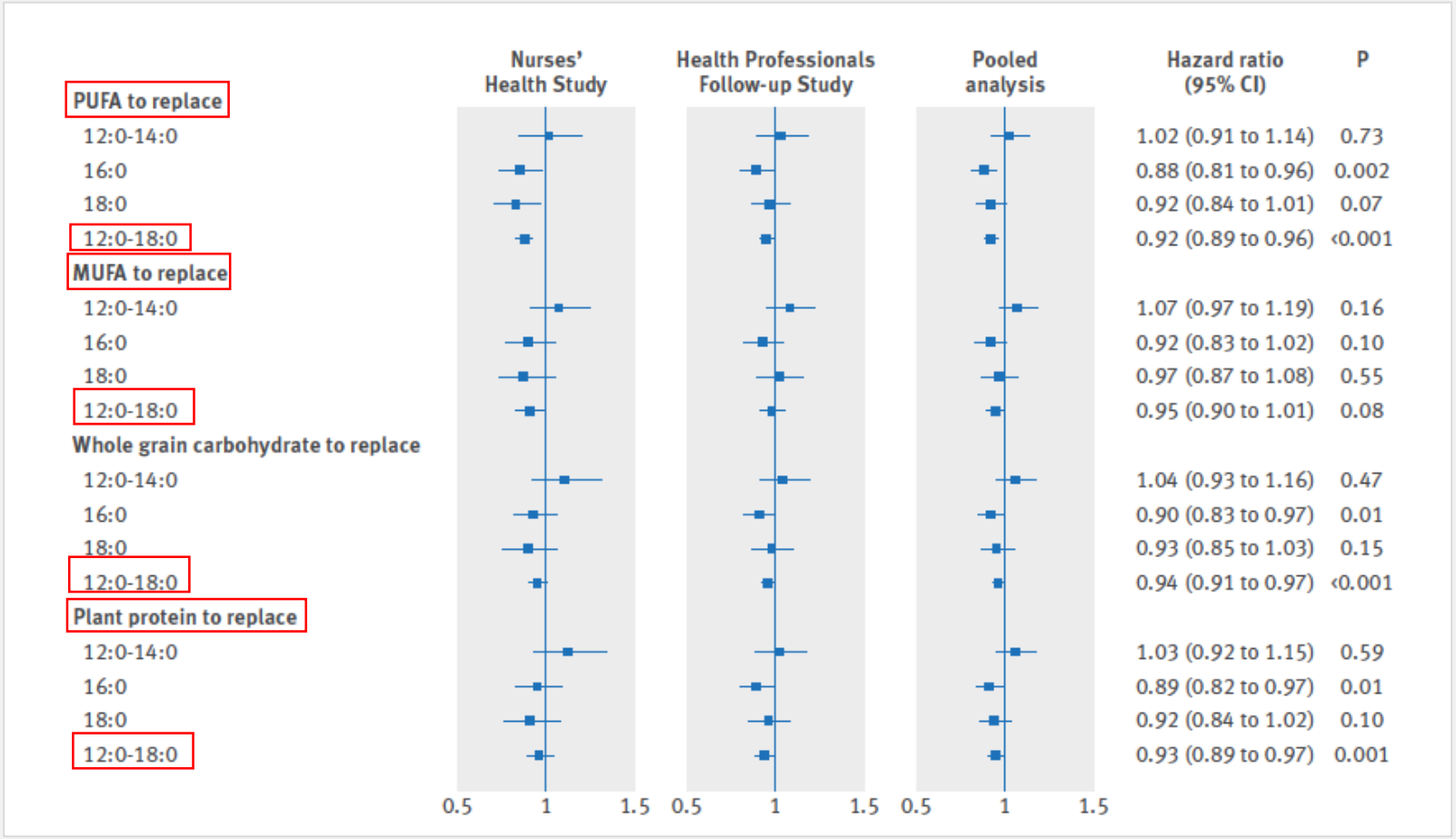
Participants 73 147 women in the Nurses' Health Study (1984-2012) and 42 635 men in the Health Professionals Follow-up Study (1986-2010), who were free of major chronic diseases at baseline.

Main outcome measure Incidence of coronary heart disease (n=7035) was self-reported, and related deaths were identified by searching National Death Index or through report of next of kin or postal authority. Cases were confirmed by medical records review.

Zong et al. BMJ. 2016 Nov 23;355:i5796. doi: 10.1136/bmj.i5796.

Zong

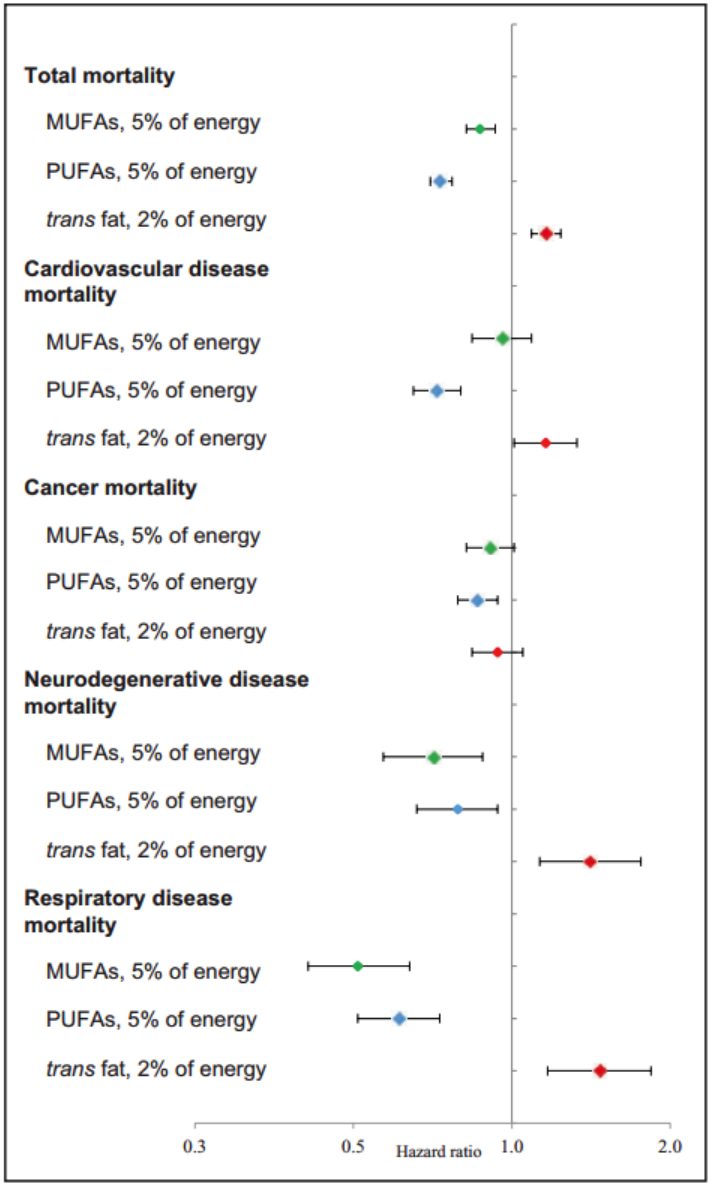
Current Evidence to Reduce SFA Supports a Macronutrient Replacement Message for PUFA, MUFA, Whole Grain CHO & Plant Protein



Zong et al. BMJ. 2016 Nov 23;355:i5796. doi: 10.1136/bmj.i5796.

Replacement of Saturated Fat with other Dietary Fats

- Total and cause-specific mortality for substituting energy from saturated fat by the same energy from specific types of fat.
- Data from the Nurses' Health Study and Health Professionals Follow-up Study.

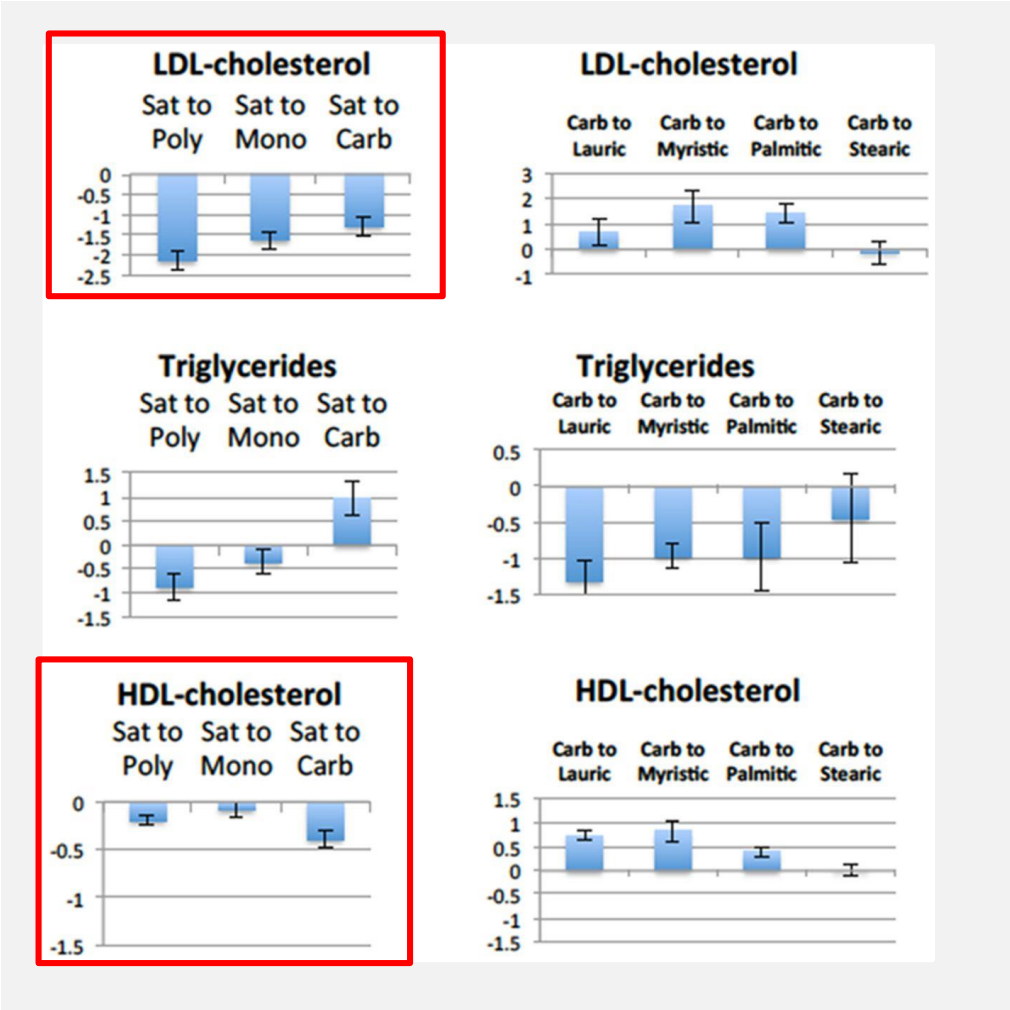


Sacks FM. Et al. Circulation. 2017 Jul 18;136(3):e1-e23.

Types of Fats and Mortality

Wang et al. JAMA Intern Med. 2016;176:1134-1145.

Effects of dietary fat and carbohydrates on LDL cholesterol, triglycerides, and HDL cholesterol (mg/dL) in meta-regression analysis



Frank M. Sacks et al. Circulation. 2017;136:e1-e23

European Heart Journal

Low-density lipoproteins cause atherosclerotic cardiovascular disease.

1. Evidence from genetic, epidemiologic, and clinical studies. A consensus statement from the European Atherosclerosis Society Consensus Panel

Both the naturally randomized genetic studies and the randomized intervention trials consistently demonstrate that any mechanism of lowering plasma LDL particle concentration should reduce the risk of ASCVD events proportional to the absolute reduction in LDL-C and the cumulative duration of exposure to lower LDL-C, provided that the achieved reduction in LDL-C is concordant with the reduction in LDL particle number and that there are no competing deleterious off-target effects.

Ference et al., Eur Heart J. 2017 Apr 24. doi: 10.1093/

The Wall Street Journal

There Is Coconut Everywhere

Consumers lap up the tropical plant in water, milk, flour, oil, and snacks.

The world is going coconuts. Following the popularity of coconut water, a broad spectrum of foods now add coconut oil and coconut flour. WSJ's Ann-Marie Chaker and Tanya Rivero Discuss the popularity of coconut as well as its actual and perceived healthful benefits.

The Surprising Health Benefits of Coconut Oil

Dr. Mehmet Oz

The world famous Dr. Oz says: Conventional thought used to consider fats like coconut oil to be unhealthy and contribute to heart disease. We now know that this isn't true. In fact, coconut oil is actually a heart-healthy food that keeps your body running smoother in a few different ways.

http://www.noble-house.tk/en/products/food/grasas-tradicionales/extra-virgin-organic-coconut-oil/dr-oz-recommends-extra-virgin-coconut-oil

Coconut oil consumption and cardiovascular risk factors in humans

- Purpose: To assess the literature on the effect of coconut consumption on cardiovascular risk factors and outcomes.
- Methods: 21 studies were included in the analyses (8 clinical trials and 13 observational studies).
- Conclusion: Coconut oil generally raised total and LDL-C to a greater extent than unsaturated plant oils, but to a lesser extent than butter.

Overall, the weight of the evidence from intervention studies to date suggests that replacing coconut oil with unsaturated fats would decrease blood lipids consistent with a reduction in CVD risk factors.

This review does not support popular claims that coconut oil is a healthy oil to reduce CVD risk.

Eyres et al. Nutr Rev. 2016;74(4):267-280.

Coconut Oil Research ≠ Medium-Chain Triglyceride (MCT) Research

- Coconut oil claims are based on reported benefits of MCTs.
- Coconut oil cannot be assumed to have the same health effects as MCTs because it contains primarily lauric rather than caprylic or capric acid, and does not have 100% MCTs.
  - Only about 58% of the fatty acids in coconut oil are MCTs—caprylic (7.4%), capric (5.9%) and lauric acid (44%).
- Lauric acid behaves more like a long-chain saturated fatty acid than an MCT in terms of digestion and metabolism.
  - 70%–75% of lauric acid is absorbed with chylomicrons.

Eyres L, et al. *Nutrition Reviews.* 2016;74(4):267–280.
Vannice G, Rasmussen H. *J Acad Nutr Diet.* 2014;114:136-153.

National Lipid Association Recommendations for Patient-Centered Management of Dyslipidemia: Part 2 - Coconut Oil

- The NLA Expert Panel consensus view is that, **if coconut oil is used as part of a daily eating plan, it is recommended that it be used within the context of a healthy dietary pattern. HOWEVER, this is very hard to do because it so high in SFA.**
- One tablespoon of coconut oil contains 11.7 g of saturated fat and 1 tablespoon of virgin coconut oil contains 13.6 g of saturated fat. Either would contribute a significant portion of the recommended total daily saturated fat limit of <7% of energy (15.5 g/day of saturated fat would constitute 7% of energy on a 2000 kcal/day diet).

Jacobson et al. *J Clin Lipidol.* 2015;9(6 Suppl):S1-S122.

Heart Doctor Says Eat Butter and Cheese But Avoid Low-Fat Yogurt

A St. Louis cardiologist says the government guidelines warning us to stay away from saturated fat are just plain wrong…

http://www1.cbn.com/healthyliving/archive/2017/08/11/heart-doctor-says-eat-butter-and-cheese-but-avoid-low-fat-yogurt

Dairy Fat and CVD

- Recent reviews and meta-analyses examining dairy fat intake and CVD risk are inconclusive.
- Conclusions state that there is a “trend” toward benefit or dairy fat “may” have a cardioprotective effect.
- Authors state that additional research is warranted.
  - Emphasize the need to examine dose-response patterns and replacement nutrient effects
  - Influence of other nutrients in dairy foods in addition to the types of fatty acids

Milk and dairy consumption and risk of cardiovascular diseases and all-cause mortality: dose–response meta-analysis of prospective cohort studies

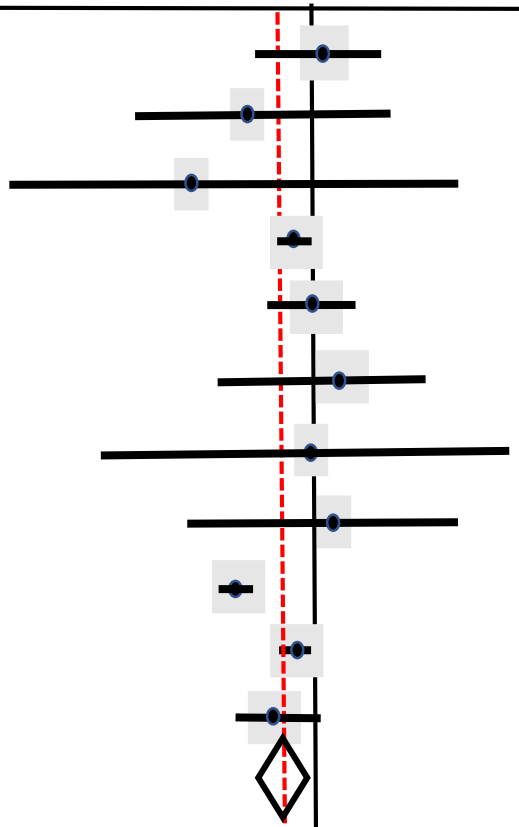
- Dose–response data were performed for total (high-fat/low-fat) dairy, milk, fermented dairy, cheese and yogurt.
- A total of 29 cohort studies were included, with 938,465 participants and 93,158 mortality, 28,419 CHD and 25,416 CVD cases.
- No associations were found for total (high-fat/low-fat) dairy, and milk with the health outcomes of mortality, CHD or CVD.
- Inverse associations were found between total fermented dairy (included sour milk products, cheese or yogurt; per 20 g/day) with mortality and CVD risk.
- However, all marginally inverse associations of fermented dairy and cheese were attenuated in sensitivity analyses by removing one large Swedish study

Guo J et al. Eur J Epidemiol. 2017 Apr 3. doi: 10.1007/s10654-017-0243-1. [Epub ahead of print]

Guo J

Relative risk of CVD for an increment of 20 g/day of fermented dairy intake

Author	Year	Exposure	Gender	Relative Risk (95% CI)	% Weight
Engberink	2009	Cheese	Women/Men	1.01 (0.96, 1.06)	10.85
Panagiotakos	2009	Cheese	Women/Men	0.95 (0.83, 1.08)	3.20
Bonthuis	2010	Full-fat cheese	Women/Men	0.86 (0.65, 1.15)	0.78
Sonestedt	2011	Cheese	Women/Men	0.99 (0.97, 1.00)	17.13
Dalmeijer	2012	Cheese	Women/Men	1.00 (0.97, 1.04)	12.94
Van Aerde	2013	Cheese	Women/Men	1.02 (0.91, 1.15)	3.88
Ruesten	2013	Low-fat cheese	Women/Men	1.00 (0.77, 1.29)	0.96
Ruesten	2013	High-fat cheese	Women/Men	1.02 (0.85, 1.22)	1.82
Michaelsson	2014	Cheese	Women	0.93 (0.92, 0.94)	17.65
Michaelsson	2014	Cheese	Men	0.99 (0.97, 1.00)	17.76
Praagman	2015	Cheese	Women/Men	0.96 (0.93, 1.00)	13.04
Overall (I-squared = 82.6%, p=0.000)				0.98 (0.95, 1.00)	100.00



NOTE: Weights are from random effects analysis

0.6 1 1.5

Relative risk

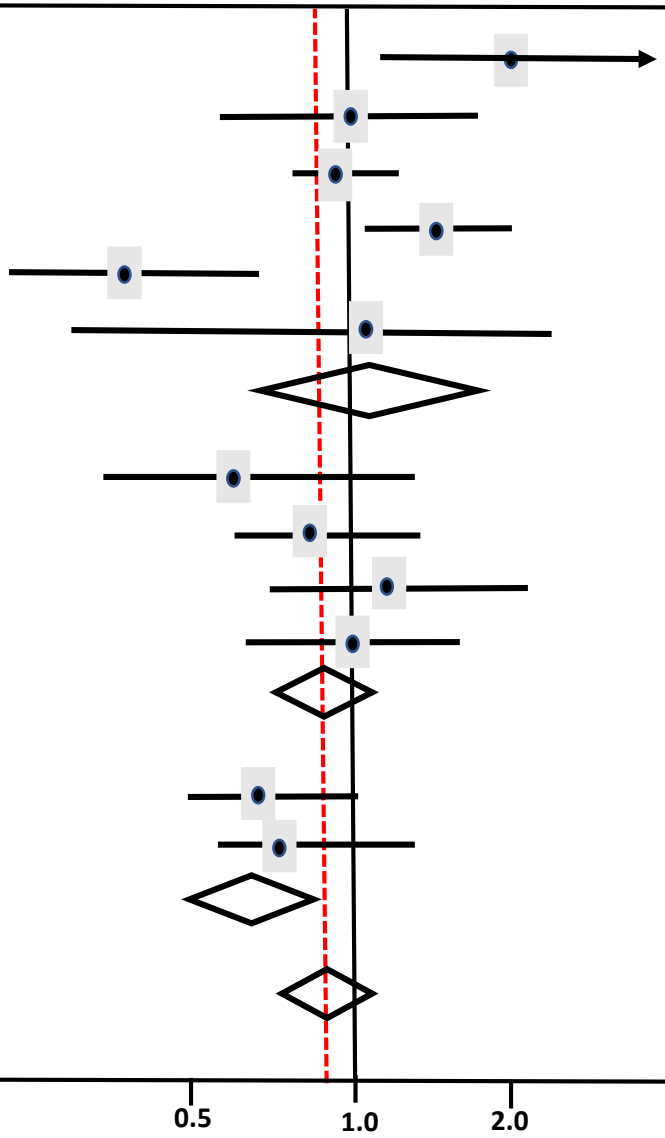
Guo J et al. Eur J Epidemiol. 2017

Biomarkers of Dairy Fat Intake and Risk of CVD: A Systematic Review and Meta Analysis of Prospective Studies

Liang J

Risk estimates for subtypes and total CVD associated with greater circulating level of 17:0.

Study ID	N (Cases)	Study Design	RR (95%CI)	% Weight[a]	% Weight[b]
CHD					
Sun (2007)	166	NCC	2.36 (1.16, 4.79)	14.48	5.46
Warensjö (2010)	444	NCC	1.00 (0.52, 1.92)	15.52	6.08
Khaw (2012)	2424	NCC	0.96 (0.77, 1.19)	23.75	13.57
Malik (2012)	459	NCC	1.61 (1.07, 2.43)	20.29	9.72
Otto (2013)	146	PC	0.44 (0.25, 0.77)	17.22	7.22
Matthan (2014)	1224	NCC	1.04 (0.34, 3.23)	8.73	2.72
Subtotal (I-squared=73.7%, P=0.002)			1.08 (0.71, 1.62)	100.00	44.77
Stroke					
Warensjö (2009)	108	NCC	0.63 (0.33, 1.22)	11.26	6.05
Yamagishi (2013)	168	PC	0.90 (0.64, 1.27)	41.00	11.04
Yaemsiri (2013)	964	NCC	1.16 (0.74, 1.82)	23.49	8.95
Yakoob (2014)	594	NCC	1.00 (0.64, 1.56)	24.25	9.08
Subtotal (I-squared=0.0%, P=0.493)			0.94 (0.76, 1.17)	100.00	35.11
Heart Failure					
Yamagishi (2008)	195	PC	0.69 (0.47, 1.01)	52.51	10.25
Matsumoto (2013)	788	NCC	0.76 (0.51, 1.14)	47.49	9.87
Subtotal (I-squared=0.0%, P=0.733)			0.72 (0.55, 0.95)	100.00	20.12
CVD					
Overall (I-Squared=58.0%, P=0.006)			**0.94 (0.77, 1.15)**	-----	**100.00**
NOTE: Weights are from random effects analysis					



Liang J et al., Crit Rev Food Sci Nutr. 2016

Circulating Biomarkers of Dairy Fat and Risk of Incident Diabetes Mellitus Among Men and Women in the United States in Two Large Prospective Cohorts

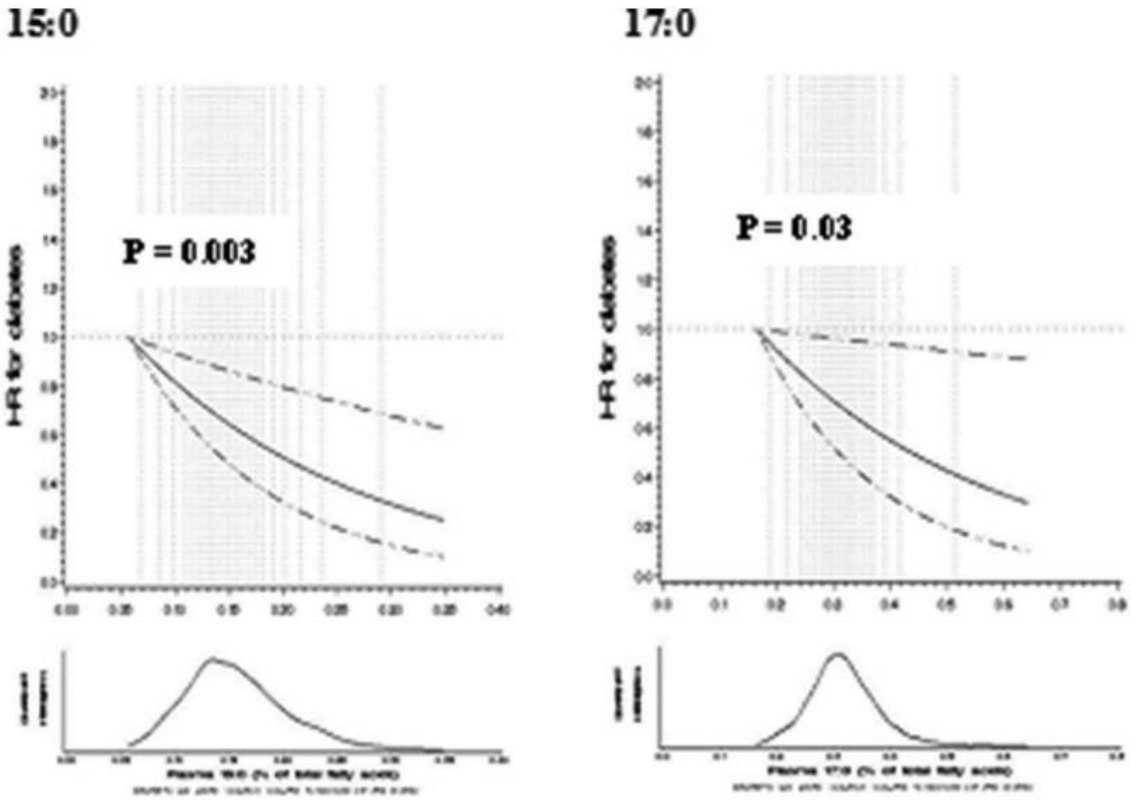
- **Hypothesis:** circulating fatty acid biomarkers of dairy fat, 15:0, 17:0, and t-16:1n-7, are associated with lower incident diabetes mellitus.

- **Methods:** 3333 participants from 2 large US cohorts (the Health Professionals Follow-Up Study and the Nurses' Health Study) were included. Incident diabetes through 2010 was confirmed by a validated supplementary questionnaire based on symptoms, diagnostic tests, and medications

- **Conclusion:** In 2 prospective cohorts, higher plasma dairy fatty acid concentrations were associated with lower incident diabetes. **These findings highlight the need to better understand the potential health effects of dairy fat,** and the dietary and metabolic determinants of these fatty acids.

Yakoob et al. Circulation. 2016;133:1645-1654.

Associations of plasma fatty acids with incident diabetes among 3333 US men and women in 2 separate cohorts

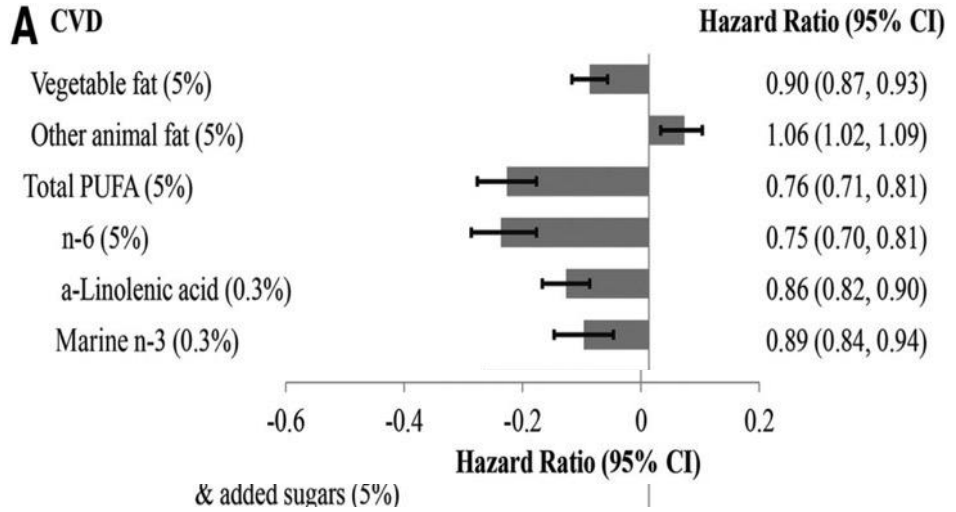


Solid and dashed lines represent hazard ratios (HRs) and 95% confidence intervals

Yakoob et al. Circulation. 2016;133:1645-1654.

Dairy Fat and Risk 0f Cardiovascular Disease in 3 Cohorts of US Adults

Replacement of Dairy Fat with other Fat Sources:



Conclusions:

- Dairy fat was not associated with risk of total CVD (RR was 1.02; 95% CI: 0.98, 1.05 for a 5% increase in energy from dairy fat) or CHD (RR was 1.03; 95% CI: 0.98, 1.09) or stroke (RR was 0.99; 95% CI: 0.93, 1.05).
- However, the replacement of dairy fat with vegetable sources of fat or PUFA was associated with significantly lower risk of CVD, whereas the replacement of dairy fat with other animal sources of fat was associated with slightly higher risk of CVD.

Chen et al., Am J Clin Nutr. 2016 Nov;104(5):1209-1217.

Comparison of the impact of SFAs from cheese and butter on cardiometabolic risk factors: a randomized controlled trial

- A multicenter, crossover, randomized controlled trial, 92 men and women aged 18-65 years with abdominal obesity and HDL-C concentrations below the age- and sex-specific 75th percentiles were assigned to 5 predetermined isoenergetic diets of 4 wk each separated by 4-wk washouts:
  - 2 diets rich in SFAs from either cheese or butter
  - A MUFA–rich diet
  - A PUFA–rich diet
  - A low-fat, high-carbohydrate diet

Brassard D, et al. Am J Clin Nutr. 2017 Apr;105(4):800-809.

Nutrient composition of the 5 test diets

	Cheese	Butter	MUFA	PUFA	CHO
Energy, kcal	2654 ± 567	2615 ± 537	2647 ± 550	2649 ± 576	2618 ± 561
Cheese, g/2500 kcal	90.0	0	0	0	0
Butter, g/2500 kcal	0	48.9	0	0	0
Lipids, %	32.0	32.0	32.0	32.0	**25.0**
SFAs	**12.6**	**12.4**	**5.8**	**5.8**	**5.8**
MUFAs	**12.5**	**12.3**	**19.6**	**12.6**	**12.6**
PUFAs	**4.8**	**4.8**	**4.8**	**11.5**	**4.8**
CHOs, %	51.9	52.0	51.9	51.9	**58.9**
Protein, %	16.0	16.0	16.0	16.0	16.0
Calcium, mg/2500 kcal	1261.0	811.1	812.2	811.7	841.6
Total fibers, g/2500 kcal	30.7	30.6	30.6	30.6	30.5
Cholesterol, mg/2500 kcal	272.1	272.4	271.5	272.2	272.4
Sodium, mg/2500 kcal	2482	2480	2479	2479	2485

Brassard D, et al. Am J Clin Nutr. 2017 Apr;105(4):800-809.

Cardiometabolic risk profiles after each diet

	Cheese	Butter	MUFA	PUFA	CHO	*P*-between diets
Waist circumference, cm	100.8 ± 14.4	101.1 ± 14.0	100.3 ± 14.0	100.7 ± 14.5	100.6 ± 13.0	0.29
BMI,[2] kg/m^2	30.6 ± 6.2	30.6 ± 6.2	30.4 ± 6.1	30.6 ± 6.3	30.3 ± 5.5	0.93
Total cholesterol, mmol/L	5.00 ± 0.94	5.10 ± 0.95	4.82 ± 0.89[3,4]	4.60 ± 0.81[3,4]	4.89 ± 0.92[3,4]	<0.0001
LDL cholesterol, mmol/L	**3.19 ± 0.81**	**3.30 ± 0.84[3]**	**3.03 ± 0.78[3,4]**	**2.84 ± 0.69[3,4]**	**3.11 ± 0.79[3,4]**	<0.0001
HDL cholesterol, mmol/L	1.10 ± 0.19	1.11 ± 0.21	1.10 ± 0.19	1.10 ± 0.20	1.06 ± 0.19[3,4]	0.0051
TG,[2] mmol/L	**1.43 ± 0.70**	**1.36 ± 0.73[3]**	**1.38 ± 0.67**	**1.30 ± 0.62[3]**	**1.46 ± 0.71[4]**	0.0007
Cholesterol:HDL cholesterol	4.67 ± 1.04	4.73 ± 1.18	4.50 ± 1.08[3,4]	4.28 ± 1.01[3,4]	4.71 ± 1.08	<0.0001
apo B, g/L	1.72 ± 0.50	1.74 ± 0.58	1.65 ± 0.50[3,4]	1.53 ± 0.50[3,4]	1.68 ± 0.50[4]	<0.0001

Brassard D, et al. Am J Clin Nutr. 2017 Apr;105(4):800-809.

[2]Analyses were performed on log-transformed data.
[3]Significantly different from cheese, $P < 0.05$.
[4]Significantly different from butter, $P < 0.05$.

Fatty Acid Profile of Butter

Value per 100 g

	Saturated Fatty Acids					MUFA	PUFA	
	Capric Acid C10:0	Lauric Acid C12:0	Myristic Acid C14:0	Palmitic Acid C16:0	Stearic Acid C18:0	Oleic Acid C18:1	Linoleic Acid (ω6) C18:2	Alpha Linolenic Acid (ω3) C18:3
Butterfat	3	3	7	22	10	20	3	<1

Other fatty acids:
C15:0 (pentadecylic acid) = 1.4 g/100 g, C17:0 (margaric acid) = 0.56 g/100 g.
Trans C16:1n-7 = 0.2-0.4 g/100 g.

Stefanov et al. J Agric Food Chem. 2010;58:10804-10811.

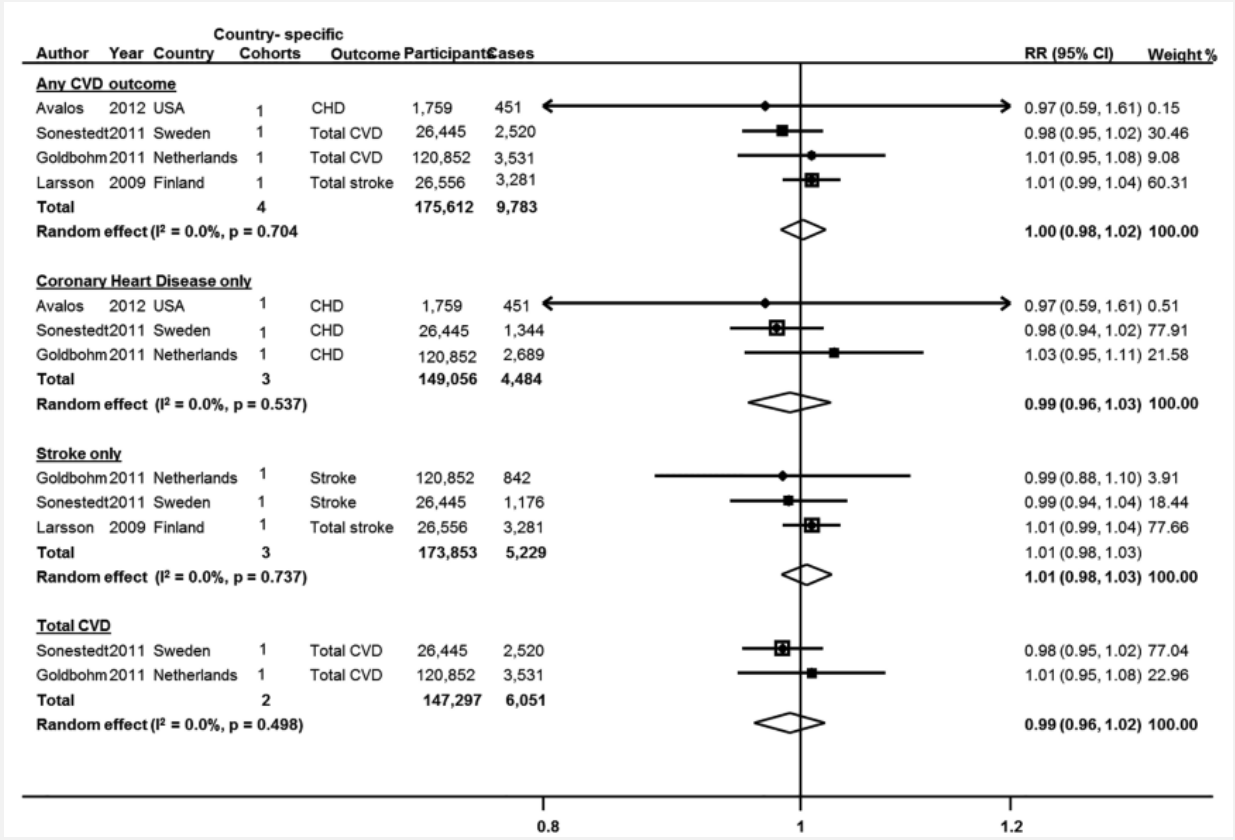
National Nutrient Database for Standard Reference; Release 28 Software v.2.3.8. The National Agricultural Library

The Case For Eating Butter Just Got Stronger

A new study found no link between eating butter and heart disease

Pimpin et al. PLoS One. 2016 Jun 29;11(6):e0158118.

Butter consumption and risk of any and total cardiovascular disease, stroke only and CHD only



Data from 4 prospective cohorts with 175,612 participants and 9,783 cases for CVD, 3 cohorts of 173,853 participants and 5,299 events for stroke, and 3 studies of 149,056 participants and 4,484 cases of CHD

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

Pimpin et al. PLoS One. 2016 Jun 29;11(6):e0158118.

The Nutrition Source

We repeat: Butter is Not Back

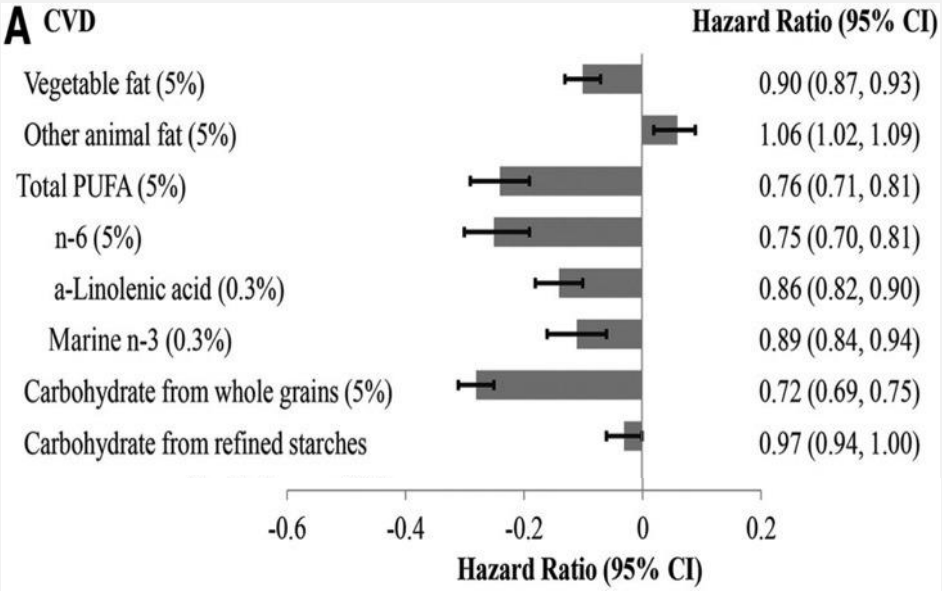
Yesterday, a systematic review and meta-analysis looking at the association of butter consumption with chronic disease and all-cause mortality made headlines that sound strikingly familiar. TIME, for example, reported that "the case for eating butter just got stronger" saying "butter may, in fact, be back."

Butter is not "back," and the study authors didn't find this either. In a press release on the study, senior author Dariush Mozaffarian noted that "overall, our results suggest that butter should neither be demonized nor considered 'back' as a route to good health."

"In a meta-analysis such as this, there is no specific comparison (i.e. butter vs. olive oil), so the default comparison becomes butter vs. the rest of the diet. That means butter is being compared to a largely unhealthy mix of refined grains, soda, other sources of sugar, potatoes, and red meat (for reference, less than five percent of the US population meet the Dietary Guidelines for Americans). Partially hydrogenated oils—a source of trans fat—were also in the mix, as they would have been high in the food supply during much of the time period of the studies included."

https://www.hsph.harvard.edu/nutritionsource/2016/06/30/we-repeat-butter-is-not-back/

Dairy Fat and Risk 0f Cardiovascular Disease in 3 Cohorts of US Adults



Conclusions:

- Dairy fat was not associated with risk of CVD.
- However, the replacement of dairy fat with vegetable sources of fat or PUFA was associated with significantly lower risk of CVD, whereas the replacement of dairy fat with other animal sources of fat was associated with slightly higher risk of CVD.
- These associations were similar for CHD and stroke.

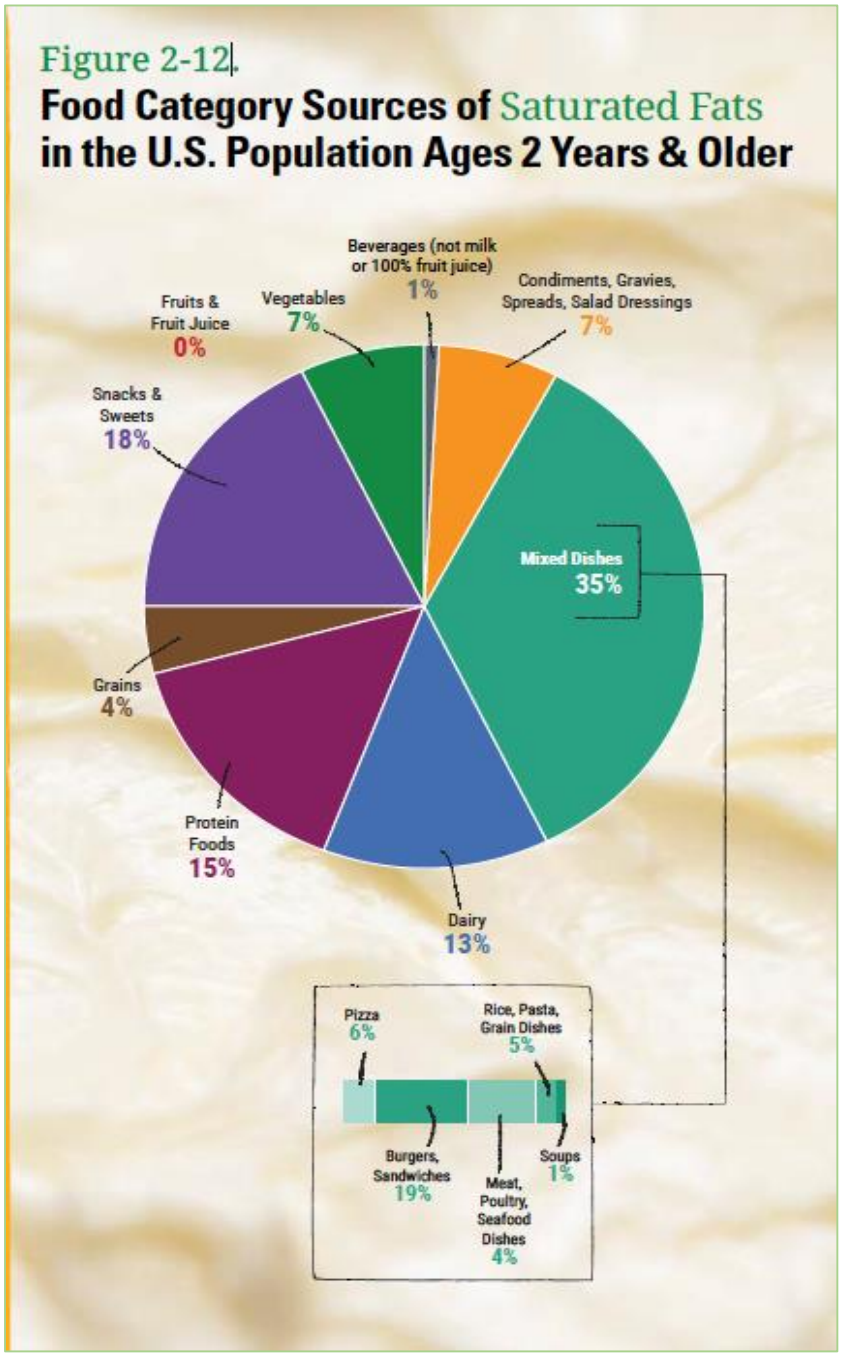
Chen et al., Am J Clin Nutr. 2016;104(5):1209-1217.

How to Address the SFA Controversy in Practice

A Food-Based Approach

Figure 2-12.

Food Category Sources of Saturated Fats in the U.S. Population Ages 2 Years & Older



2015-2020 Dietary Guidelines for Americans.

Healthy U.S.-Style Eating Pattern (2000 Calories)

Food Group[a]	Amount[b] in the 2,000-Calorie-Level Pattern
Vegetables	**2½ c-eq/day**
Dark Green	1½ c-eq/wk
Red & Orange	5½ c-eq/wk
Legumes (Beans & Peas)	1½ c-eq/wk
Starchy	5 c-eq/wk
Other	4 c-eq/wk
Fruits	**2 c-eq/day**
Grains	**6 oz-eq/day**
Whole Grains	≥ 3 oz-eq/day
Refined Grains	≤ 3 oz-eq/day
Dairy	**3 c-eq/day**
Protein Foods	**5½ oz-eq/day**
Seafood	8 oz-eq/wk
Meats, Poultry, Eggs	26 oz-eq/wk
Nuts, Seeds, Soy Products	5 oz-eq/wk
Oils	**27 g/day**
Limit on Calories for Other Uses (% of Calories)[c]	**270 kcal/day (14%)**

2015-2020 Dietary Guidelines for Americans

Table D1.32. Composition of three USDA Food Patterns (Healthy U.S.-Style, Healthy Vegetarian, and Healthy Mediterranean-style) at the 2000 calorie level. Daily or weekly amounts from selected food groups, subgroups, and components.

Food group	Healthy US-style Pattern	Healthy Vegetarian Pattern	Healthy Med-style Pattern
Fruit	2 c per day	2 c per day	2 ½ c per day
Vegetables	2 ½ c per day	2 ½ c per day	2 ½ c per day
-Legumes	1 ½ c per wk	3 c per wk	1 ½ c per wk
Whole Grains	3 oz eq per day	3 oz eq per day	3 oz eq per day
Dairy	3 c per day	3 c per day	2 c per day
Protein Foods	5 ½ oz eq per day	3 ½ oz eq per day	6 ½ oz eq per day
--Meat	12 ½ oz eq/wk	--	12 ½ oz eq/wk
--Poultry	10 ½ oz eq/wk	--	10 ½ oz eq/wk
--Seafood	8 oz eq/wk	--	15 oz eq/wk
--Eggs	3 oz eq/wk	3 oz eq/wk	3 oz eq/wk
--Nuts/seeds	4 oz eq/wk	7 oz eq/wk	4 oz eq/wk
--Processed soy	½ oz eq/wk	8 oz eq/wk	½ oz eq/wk
Oils	27 g per day	27 g per day	27 g per day

https://ods.od.nih.gov/pubs/2015_DGAC_Scientific_Report.pdf

Recommend Whole Milk Over Non-Fat Milk?

1 Cup	Kcals	SFA, g
Milk, whole	150	4.6
Milk, non-fat	83	0.1

DGAs recommend 3 C-eq/day.

- Milk, whole would contribute 450 Kcals/day and 13.8 g SFA/day.
- Milk, non-fat would contribute 249 Kcals/day and 0.3 g SFA/day.
- 201 extra Kcals/day come from milk fat
- Given that 270 Kcals/day is the limit for “calories for other uses” in the DGA Healthy U.S.-Style Eating Pattern (2000 Kcals/day), there are only 69 calories for other discretionary foods.
- Using whole milk adds 13.5 g of SFA/day resulting in 33.5 of SFA consumed/day = 15% of calories from SFA.

Recommend Fatty Red Meat Over Lean Meat?

1 Oz.	Kcals	SFA, g
Hamburger, 20% fat	77	1.9
Lean beef (sirloin)	61	1.1

DGAs recommend 5.5 oz-eq/day

- Fatty red meat could contribute 385 Kcals/day and 9.5 g SFA/day.
- Lean beef would contribute 336 Kcals/day and 6 g SFA/day.
- 49 extra Kcals/day come from beef fat
- Given that 270 Kcals/day is the limit for “calories for other uses” in the DGA Healthy U.S.-Style Eating Pattern (2000 Kcals/day), there are 221 calories for other discretionary foods.
- Using fatty red meat adds 3.5 g of SFA/day resulting in 23.5 of SFA consumed/day = 10.6% of calories from SFA.

Chicken Alfredo with a Twist

EAT THIS WAY

Calories > 400
Fat > 25 g
SFA > 15 g

Calories 345
Fat 8 g
SFA 4 g

https://ndb.nal.usda.gov/ndb/search/list https://whatscooking.fns.usda.gov/sites/default/files/featuredlinks/cookbook-homes.pdf

A Way to Eat Beef

EAT THIS WAY

Calories > 1000
Fat > 60 g
SFA > 25 g

Calories > 327
Fat > 3 g
SFA > 1 g

https://ndb.nal.usda.gov/ndb/search/list https://whatscooking.fns.usda.gov/sites/default/files/featuredlinks/HarvestofRecipes.pdf

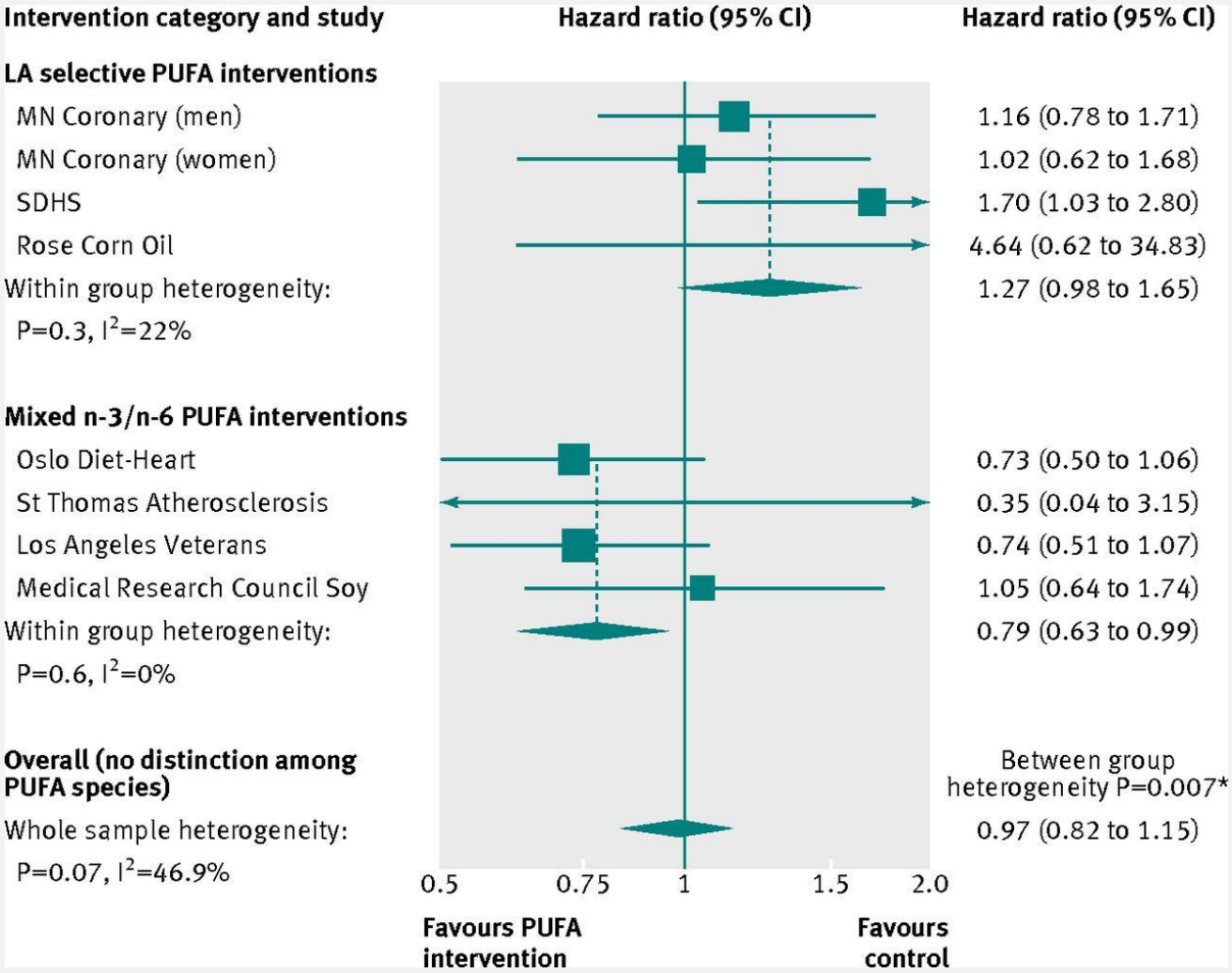
Questions about PUFA?

Do they adversely affect CVD events and markers of inflammation?

Effects of LA selective interventions and mixed n-3/n-6 PUFA interventions on risk of death from *CVD*

Short study duration; high dropout rate

Trans fat margarine used



Dietary Fat and Risk of Cardiovascular Disease:

Recent Controversies and Advances

"There is no clinical evidence that increasing intake of n-6 PUFA leads to increased pro-inflammatory cytokines in humans. Higher intake of n-6 PUFA was not associated with inflammatory biomarkers such as C-reactive protein, interleukin-6, and soluble TNF receptors 1 and 2 in our previous study, whereas plasma n-6 PUFA concentration was inversely associated with the level of pro-inflammatory interleukin-1Ra and positively associated with the level of anti-inflammatory transforming growth factor-β."

Annu. Rev. Nutr. 2017. 37:19.1–19.23.

How to Address the PUFA Controversy in Practice

A Food-Based Approach

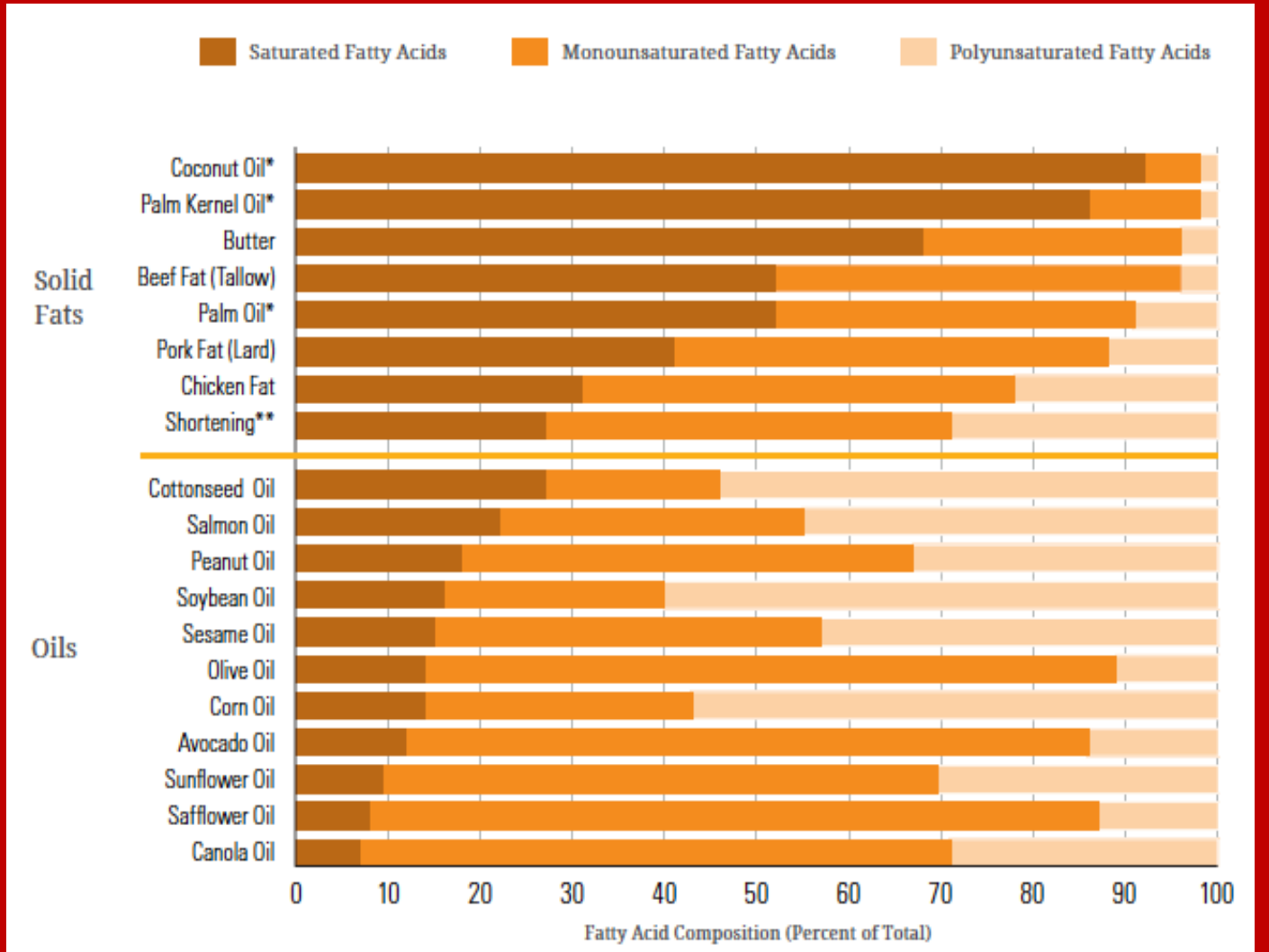
PUFA Oil?

OR

MUFA Oil?

Fatty Acid Profiles of Common Fats & Oils

Concerned about PUFA? Use High MUFA Oils

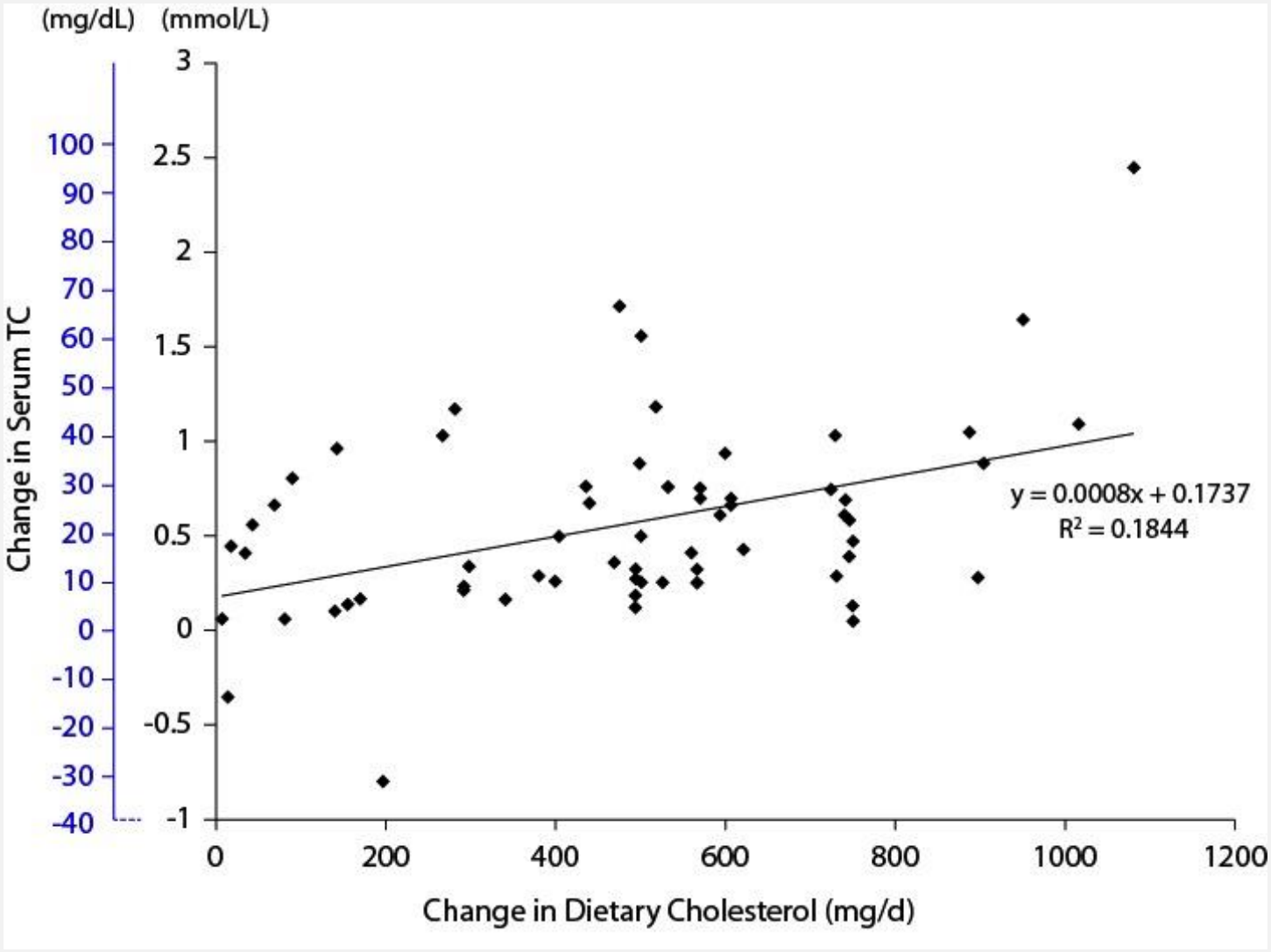


2015-2020 Dietary Guidelines for Americans

The Dietary Cholesterol Controversy

Dietary Cholesterol Recommendations

- 2013 AHA/ACC: Insufficient
  - There is insufficient evidence to determine whether lowering dietary cholesterol reduces LDL-C.
- DGAC 2015: Insufficient
  - Previously, the Dietary Guidelines for Americans recommended that cholesterol intake be limited to no more than 300 mg/day. The 2015 DGAC will not bring forward this recommendation because available evidence shows no appreciable relationship between consumption of dietary cholesterol and serum cholesterol, consistent with the conclusions of the AHA/ACC report.
- 2015 National Lipid Association (NLA): B=Moderate recommendation
  - The cardioprotective eating pattern should limit cholesterol intake to <200 mg/day to lower levels of atherogenic cholesterol (LDL-C and non-HDL-C).
- 2015-2020 Dietary Guidelines for Americans
  - The Key Recommendation from the 2010 Dietary Guidelines to limit consumption of dietary cholesterol to 300 mg per day is not included in the 2015 edition, but this change does not suggest that dietary cholesterol is no longer important to consider when building healthy eating patterns. As recommended by the IOM, individuals should eat as little dietary cholesterol as possible while consuming a healthy eating pattern.



Food and Nutrition Board, Institute of Medicine. *Dietary Reference Intakes for Energy, Carbohydrate, Fiber, Fat, Fatty Acids, Cholesterol, Protein, and Amino Acids*. Washington, DC: National Academies Press; 2002/2005.

Institute of Medicine

↑ Dietary cholesterol → ↑ LDL ≈ 2 mg/dL

100 mg/d (0.05 mmol/L)

- Food and Nutrition Board, Institute of Medicine. *Dietary Reference Intakes for Energy, Carbohydrate, Fiber, Fat, Fatty Acids, Cholesterol, Protein, and Amino Acids*. Washington, DC: National Academies Press; 2002/2005.

Dietary Cholesterol and Cardiovascular Disease:

A Systematic Review and Meta-Analysis

Forty studies (17 cohorts in 19 publications with 361,923 subjects and 19 trials in 21 publications with 632 subjects) published between 1979 and 2013 were included.

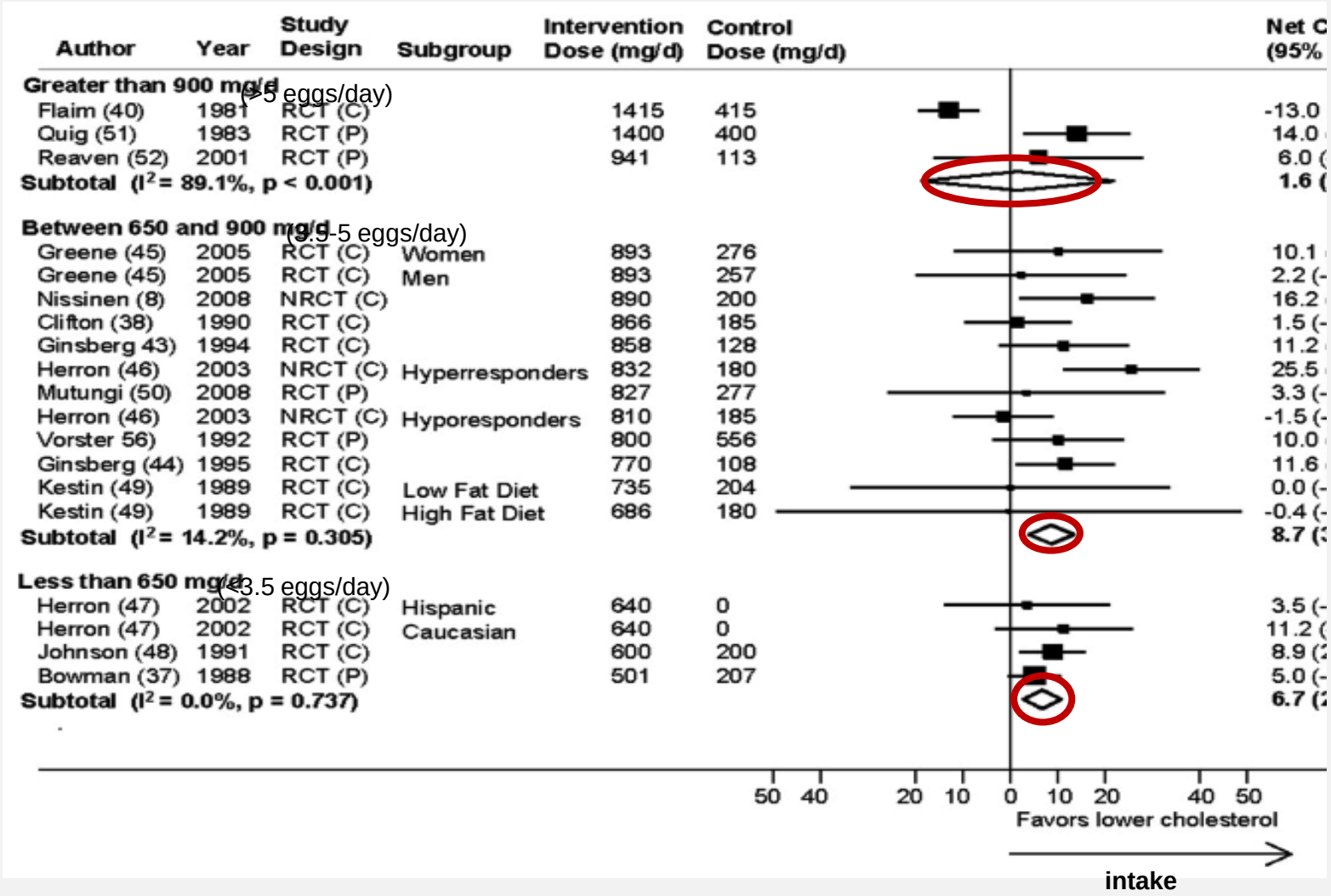
Dietary cholesterol was not significantly associated with coronary artery disease, ischemic or hemorrhagic strokes.

Dietary cholesterol significantly increased both serum total cholesterol and LDL-C.

Reviewed studies were heterogeneous and lacked the methodological rigor to draw any conclusion regarding the effects of dietary cholesterol on CVD risk.

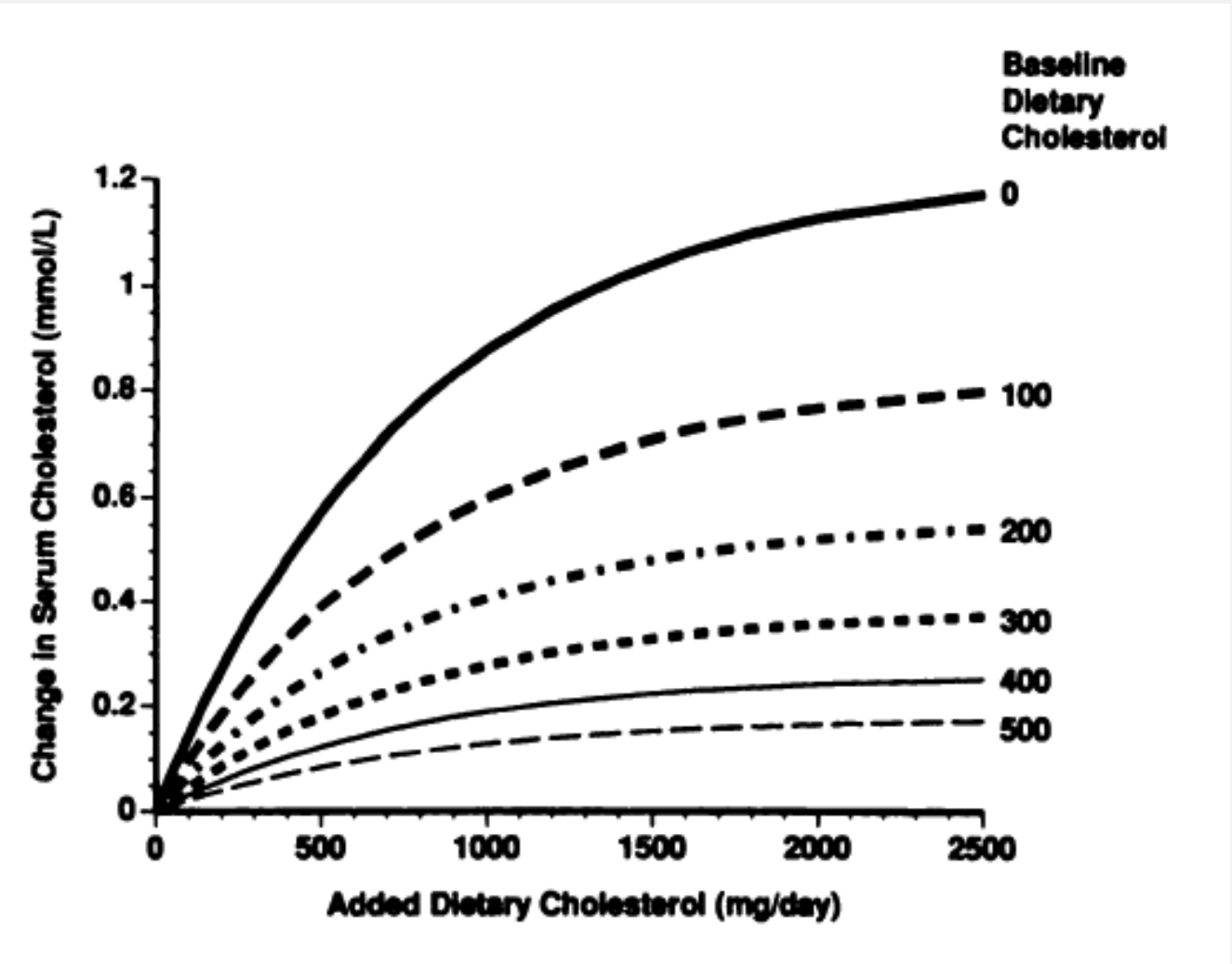
Berger et al. Am J Clin Nutr. 2015;102:276-294.

Dietary Cholesterol – LDL-C



Berger et al. Am J Clin Nutr. 2015;102:276-294.

Meta-analysis: 27 Studies using Prepared Diets (Hopkins 1992)



Hopkins PN. Effects of dietary cholesterol on serum cholesterol: a meta-analysis and review. *Am J Clin Nutr*. 1992;55:1060-1070.

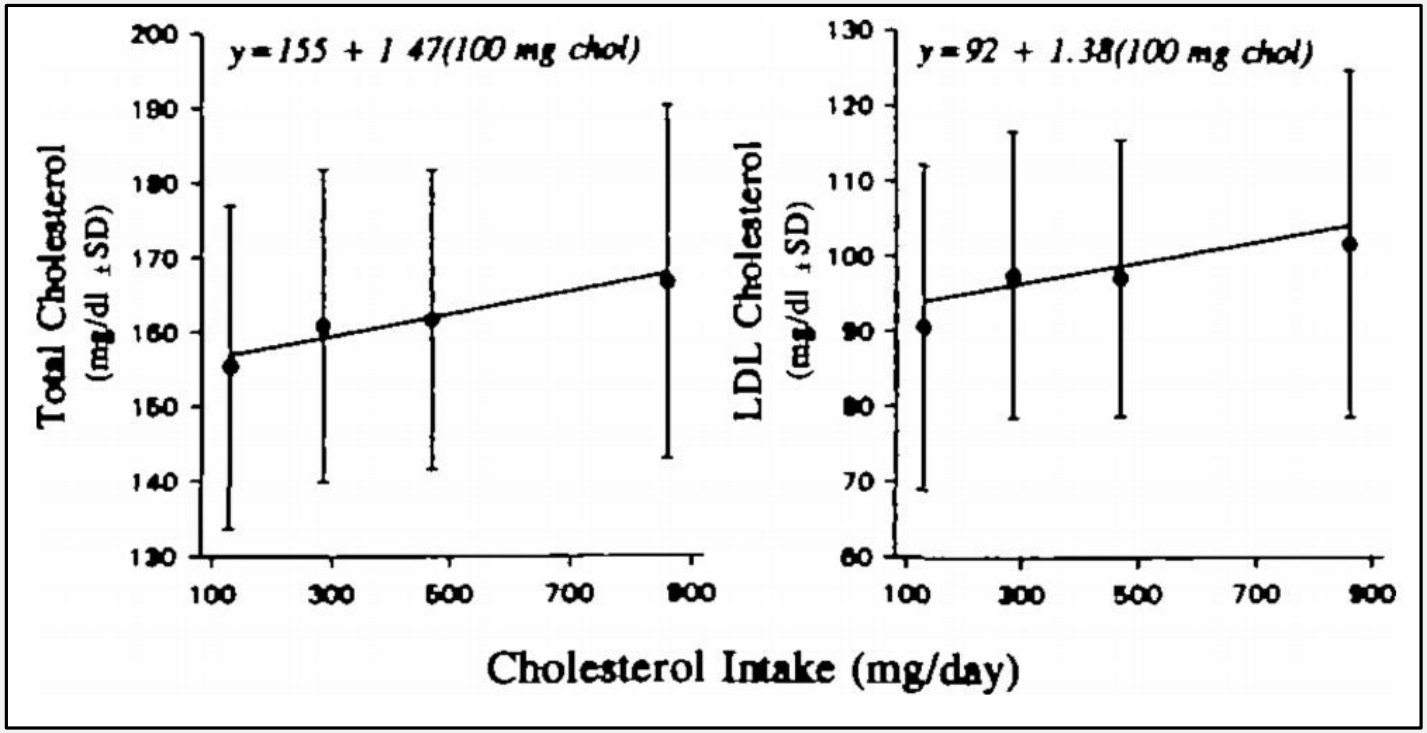
A Dose-Response Study of the Effects of Dietary Cholesterol on Fasting and Postprandial Lipid and Lipoprotein Metabolism in Healthy Young Men

Volume 14:576-586, April 1994

Increases in Dietary Cholesterol Are Associated With Modest Increases in Both LDL and HDL Cholesterol in

Volume 15:169-178, February 1995

Responses of Plasma Total (Left) and LDL-C (Right) to Increasing Dietary Cholesterol in Men



- 4 period controlled feeding crossover study of 20 healthy men
- Average total-C and LDL-C increased by 1.47 mg/dL and 1.38 mg/dL, respectively, for each 100 mg/day increase in dietary cholesterol.
- HDL-C also increased by 0.29 mg/dL per 100 mg/day of dietary cholesterol

Ginsberg et al. Arterioscler Thromb. 1994;14:576-86.

How to Address the Cholesterol Controversy in Practice

A Food-Based Approach

Limit!

No Limit!

Top Food Sources of Dietary Cholesterol based on NHANES, 2005-2006

Food Item	Contribution to intake (%)	Cumulative Contribution
Eggs and egg mixed dishes	24.6	24.6
Chicken and chicken mixed dishes	12.5	37.1
Beef and beef mixed dishes	6.4	43.6
Burgers	4.6	48.2
Regular cheese	4.2	52.4
Sausage, franks, bacon, and ribs	3.9	56.3
Other fish and fish mixed dishes	3.4	59.7
Grain-based desserts	3.3	63.0
Dairy desserts	3.2	66.3
Pasta and pasta dishes	3.1	69.3
Pizza	2.9	72.2
Mexican mixed dishes	2.9	75.1
Cold cuts	2.7	77.8

http://appliedresearch.cancer.gov/diet/foodsources/cholesterol/table1.html

Table D1.32. Composition of three USDA Food Patterns (Healthy U.S.-Style, Healthy Vegetarian, and Healthy Mediterranean-style) at the 2000 calorie level. Daily or weekly amounts from selected food groups, subgroups, and components.

Food group	Healthy US-style Pattern	Healthy Vegetarian Pattern	Healthy Med-style Pattern
Fruit	2 c per day	2 c per day	2 ½ c per day
Vegetables	2 ½ c per day	2 ½ c per day	2 ½ c per day
-Legumes	1 ½ c per wk	3 c per wk	1 ½ c per wk
Whole Grains	3 oz eq per day	3 oz eq per day	3 oz eq per day
Dairy	3 c per day	3 c per day	2 c per day
Protein Foods	5 ½ oz eq per day	3 ½ oz eq per day	6 ½ oz eq per day
--Meat	12 ½ oz eq/wk	--	12 ½ oz eq/wk
--Poultry	10 ½ oz eq/wk	--	10 ½ oz eq/wk
--Seafood	8 oz eq/wk	--	15 oz eq/wk
● --Eggs	3 oz eq/wk	3 oz eq/wk	3 oz eq/wk
--Nuts/seeds	4 oz eq/wk	7 oz eq/wk	4 oz eq/wk
--Processed soy	½ oz eq/wk	8 oz eq/wk	½ oz eq/wk
Oils	27 g per day	27 g per day	27 g per day

https://ods.od.nih.gov/pubs/2015_DGAC_Scientific_Report.pdf

Recommend 5.5 oz-eq/day from Eggs?

1 egg ≈ 200 mg of dietary cholesterol

5.5 oz-eq = 1100 mg of dietary cholesterol

Health Implications:

- This amount (> 1000 mg of dietary cholesterol/day) would elicit adverse effects on blood cholesterol levels.
- More realistically, if two eggs/day were included in the diet, then only 3.5 oz-eq of meat and poultry are available for the rest of the diet according to DGA food-based dietary recommendations.

The Sodium Controversy

Sodium and Blood Pressure: Evidence Grades

- AHA/ACC: Strong
  - In adults 25 to 80 years of age with BP 120–159/80–95 mm Hg, reducing sodium intake lowers BP.
- DGAC 2015: Strong
  - The DGAC concurs that adults who would benefit from blood pressure lowering should “lower sodium intake.”

High Blood Pressure in the United States

- Having high blood pressure puts you at risk for heart disease and stroke, which are leading causes of death in the United States.
- **About 75 million** American adults (32%) have high blood pressure—that's **1 in every 3 adults**.
- About **1 in 3 American adults** has **prehypertension**
- Only **about half (54%)** of people with high blood pressure have their condition under control.
- High blood pressure was a primary or contributing cause of death for more than **410,000 Americans** in 2014—that's more than **1,100 deaths each day**.
- High blood pressure costs the nation **$48.6 billion** each year. This total includes the cost of health care services, medications to treat high blood pressure, and missed days of work.

https://www.cdc.gov/dhdsp/data_statistics/fact_sheets/fs_bloodpressure.htm

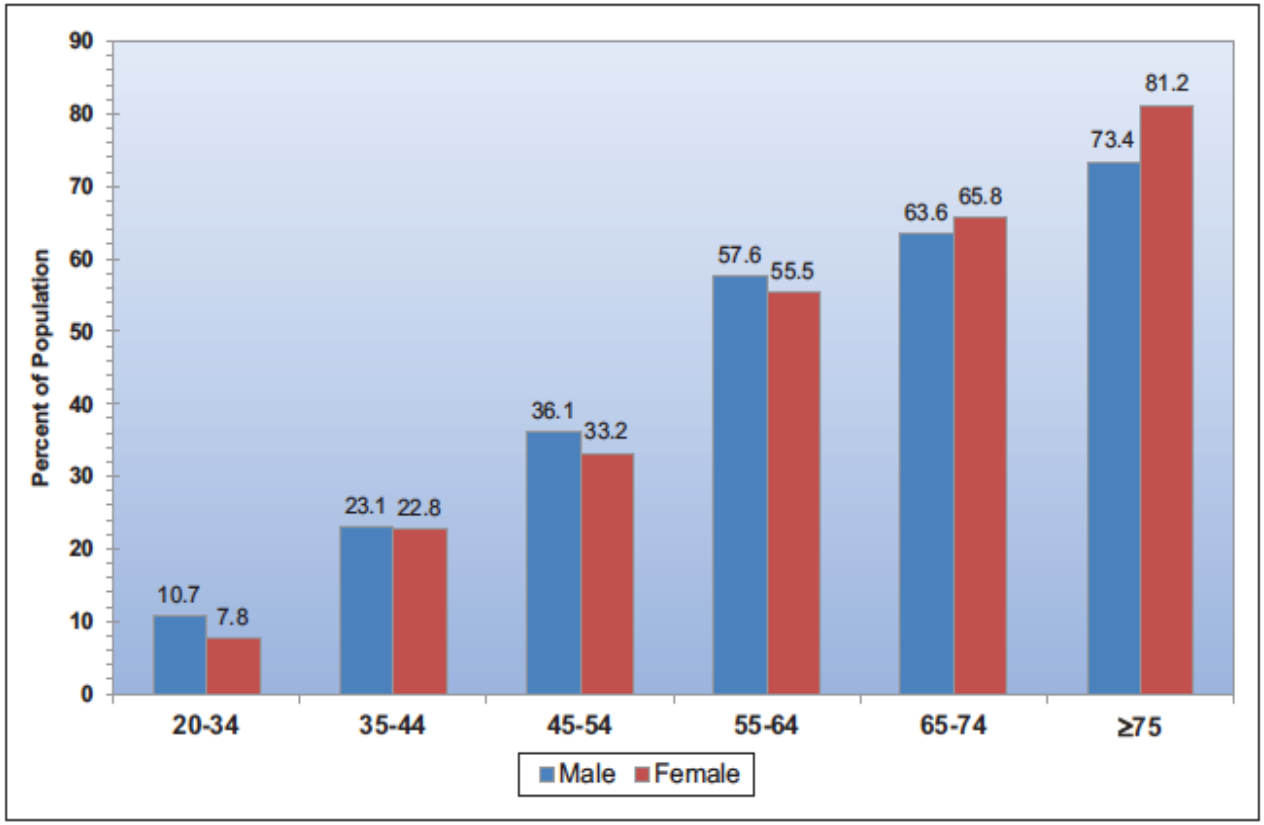


Chart 9-1. Prevalence of high blood pressure in adults ≥20 years of age by sex and age (NHANES 2011–2014).
Hypertension is defined as systolic blood pressure ≥140 mm Hg or diastolic blood pressure ≥90 mm Hg, if the subject said "yes" to taking antihypertensive medication, or if the subject was told on 2 occasions that he or she had hypertension.
NHANES indicates National Health and Nutrition Examination Survey.
Source: National Center for Health Statistics and National Heart, Lung, and Blood Institute.

Benjamin et al. Circulation. 2017;135:e146–e603.

Is Dietary Sodium Really Harmful?

A complex debate heats up

The 2015-2020 *Dietary Guidelines* recommends consuming less than 2,300 milligrams of sodium per day, and no more than 1,500 milligrams per day for individuals with prehypertension and hypertension.

The Institute of Medicine agrees that limiting sodium improves high blood pressure but states there is insufficient evidence to recommend the entire population go low-sodium — pointing to a link to adverse health outcomes in some individuals.

And currently, the American Heart Association recommends everyone consume no more than 1,500 milligrams of sodium per day.

http://www.foodandnutrition.org/March-April-2016/A-Big-Sodium-Debate/

Early Dietary Sodium Research

- A series of studies from the 1980s and 1990s, called Trials of Hypertension Prevention (or TOHP) provided data in favor of limiting sodium in prehypertensive populations.
- A TOHP follow-up study in the early 2000s found a significant correlation between sodium intake and cardiovascular disease, suggesting a 17% increased risk for every 1,000 mg of sodium consumed daily.
- The TOHP researchers concluded there were “overall health benefits of reducing sodium to 1,500 to 2,300 milligrams per day in the majority of the population”.

http://www.foodandnutrition. arch-April-2016/A-Big-Sodium-Debate/

More Recent Research Challenges the TOHP Study and Shows a U-Shaped Relationship between Sodium Intake and Risk of CVD

- The Prospective Urban Rural Epidemiology Study (PURE) reported that those who had a higher or lower level of sodium excretion to compared to those with a moderate level of sodium excretion had an increased risk of CVD outcomes. A higher estimated sodium excretion (≥ 7 g/day) was associated with an increased risk of CVD events. An estimated sodium excretion below 3 g/day was associated with an increased risk of CVD events.
  - Participants with the lowest mortality and cardiovascular risk consumed between 3,000 mg and 6,000 mg of sodium per day, and greater than 1,500 mg of potassium per day.

O'Donnell et al., N Engl J Med. 2014;371:612-623

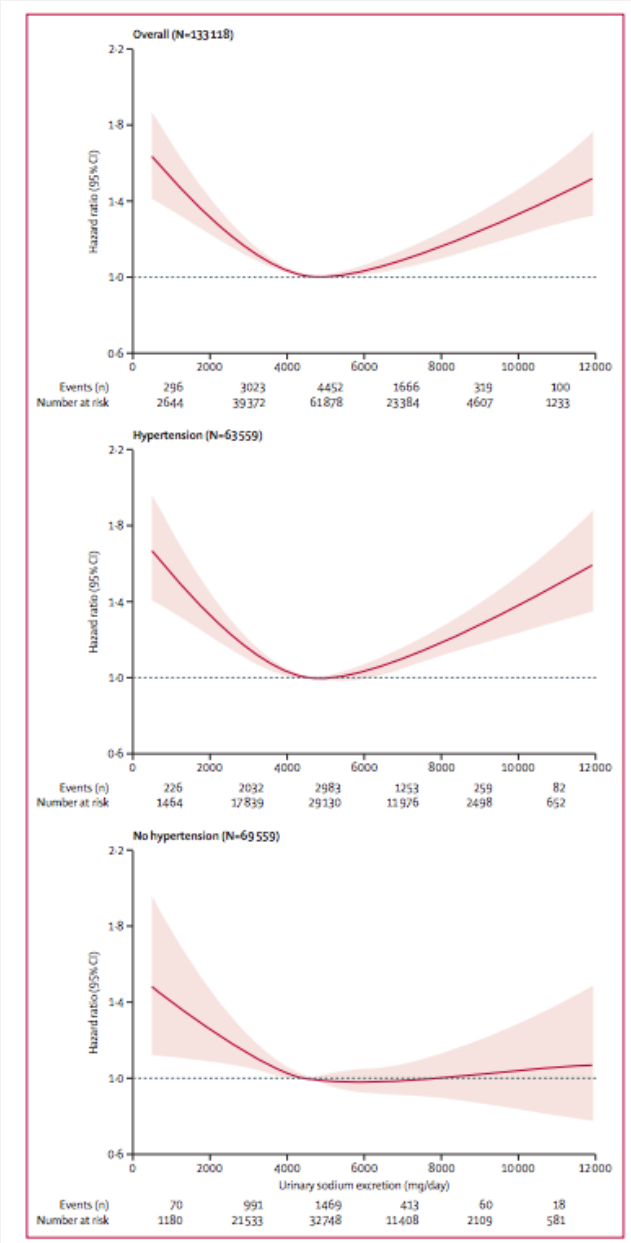
Associations of urinary sodium excretion with cardiovascular events in individuals with and without hypertension:

A pooled analysis of data from four studies.

Interpretation

The results showed that CVD and death are increased with low sodium intake (compared with moderate intake) irrespective of hypertension status, whereas there is a higher risk of CVD and death only in individuals with hypertension (not in the normotensive population) consuming more than 6 g of sodium per day (representing only 10% of the population studied). These data indicate that lowering sodium is best targeted at individuals with hypertension who also have a high sodium intake.

Mente et al., Lancet. 2016;388(10043):465-475.

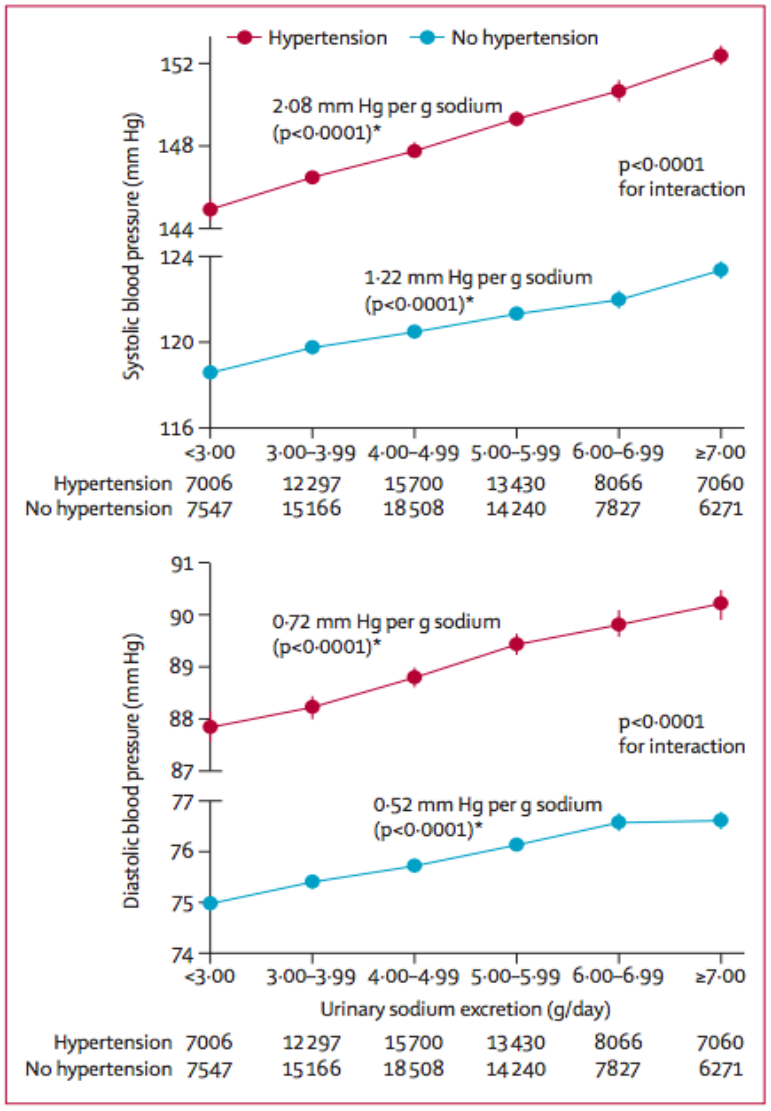


Sodium Excretion versus Composite Outcome Events

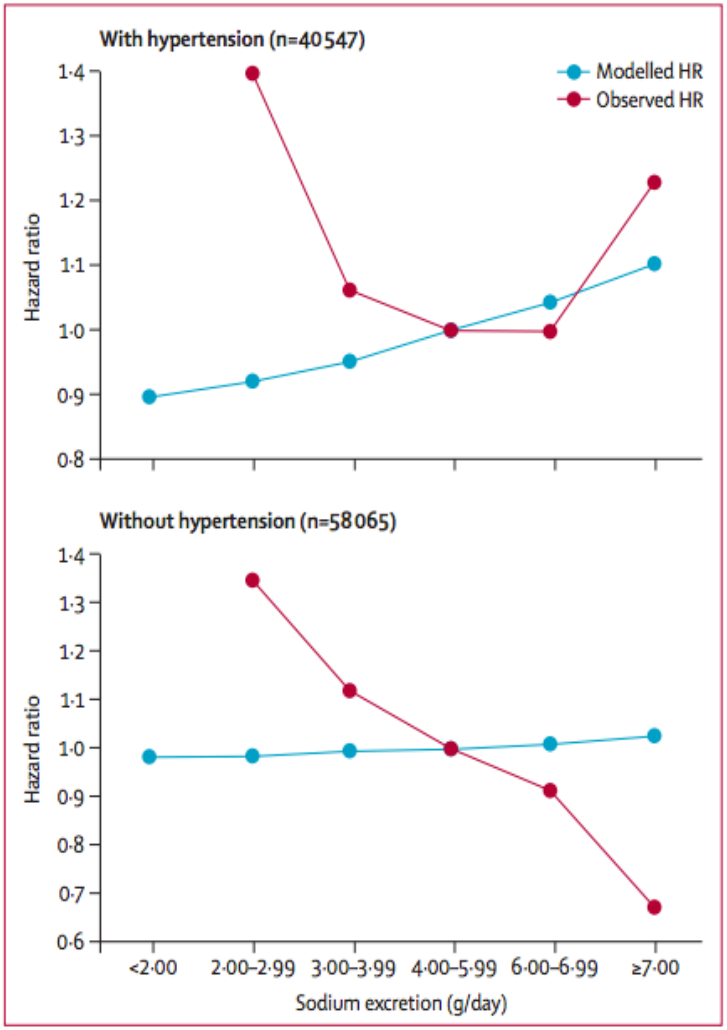
Cubic splines for the association between sodium excretion and composite outcome events (risk of death and major cardiovascular events), overall and by hypertension status in four studies (n = 133,118). The analyses were adjusted for age, sex, ancestry (Asian versus non-Asian), BMI, education level, alcohol intake, current smoking, physical activity, diabetes status, history of cardiovascular events, medication treatment.

Mente et al., Lancet. 2016;388(10043):465-475.

Blood Pressure by Sodium Excretion



Sodium Excretion & CVD Events



Mente et al., Lancet. 2016;388(10043):465-475.

American Heart Association News

Experts Criticize New Study About Salt Consumption

Problems with this Study:

It is difficult to track sodium intake over time and accurately correlate it to health. Mente et al. used a single urine test at the start of the study to extrapolate long-term dietary habits and health outcomes. Sodium intake varies markedly from day to day.

http://news.heart.org/experts-criticize-new-study-about-salt-consumption/

Methodological Issues in Cohort Studies That Relate Sodium Intake to Cardiovascular Disease Outcomes

A Science Advisory From the American Heart Association

Conclusions

Methodological issues may account for the inconsistent findings in currently available observational studies relating Na to CVD

- Errors in Na assessment
- Potential for reverse causality (when sick individuals are included in a study and have reduced Na intake because of a medical issue)
- Potential for residual confounding (incomplete adjustment for confounding factors)
- Insufficient power

Circulation. 2014;129:1173-1186.

Use of a Single Baseline Versus Multiyear 24-Hour Urine Collection for Estimation of Long-Term Sodium Intake and Associated Cardiovascular and Renal Risk

Conclusions:

Relative to a single baseline 24-hour sodium measurement, the use of subsequent 24-hour urine samples resulted in different estimations of an individual's sodium intake, whereas population averages remained similar. This finding had significant consequences for the association between sodium intake and long-term cardiovascular and renal outcomes.

"Use of a single baseline 24-hour urine sodium measurement to estimate an individual's long-term sodium intake is not accurate."

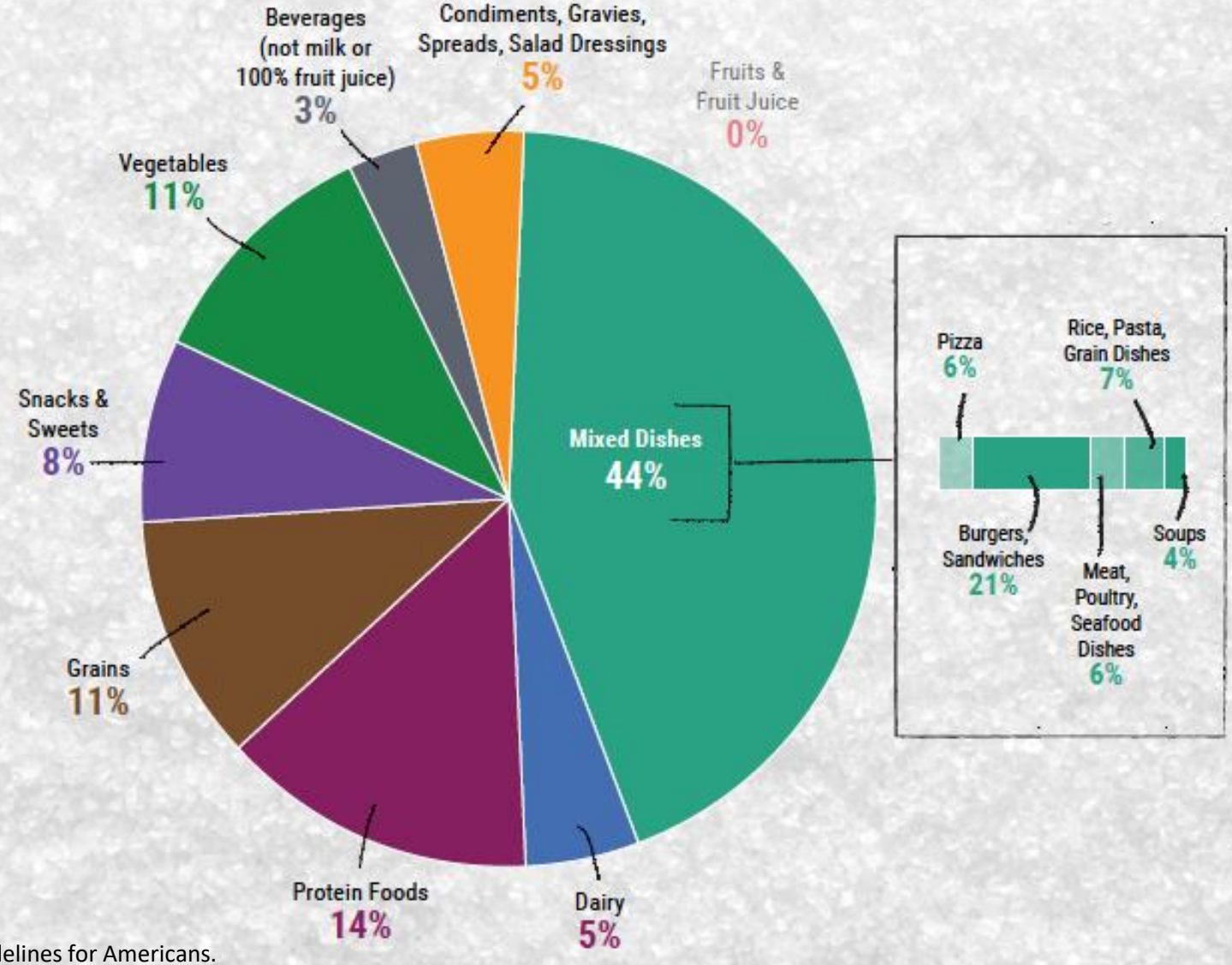
Circulation. 2017;136:917-926.

How to Address the Sodium Controversy in Practice

A Food-Based Approach

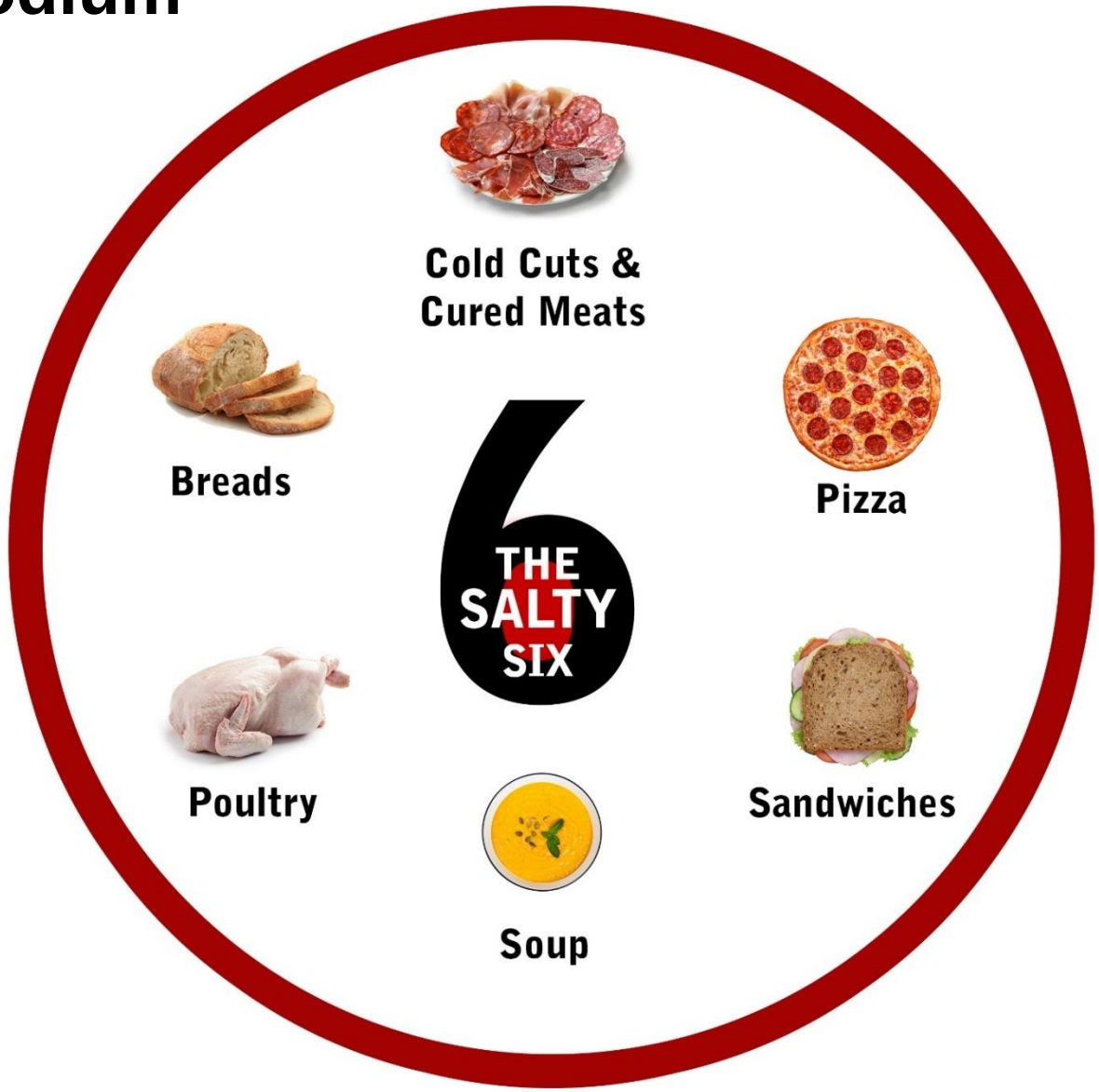
Figure 2-14.

Food Category Sources of Sodium in the U.S. Population Ages 2 Years & Older



2015-2020 Dietary Guidelines for Americans.

Common Foods Loaded with Excess Sodium



"The Salty Six Infographic." *American Heart Association*, healthyforgood.heart.org/eat-smart/infographics/salty-six-infographic.

Get the Facts:
Sodium's Role in Processed Food

More than 75% of the sodium Americans consume comes from processed and restaurant foods-not the salt shaker.

https://www.cdc.gov/salt/pdfs/sodium_role_processed.pdf

Summary

While there are dietary guidelines for saturated fat, unsaturated fat and sodium, and some for cholesterol, too, there is some skepticism about these recommendations even among healthcare professionals.

RDNs have the expertise to address these controversies using food-based dietary recommendations in practice to create healthy dietary patterns that meet all of the nutrient needs of individuals and populations.

A Valuable New Resource on Dietary Fats and Fatty Acids from the American Heart Association

The ***"AHA Facts on Fats CME"*** will be launched at the Academy of Nutrition and Dietetics Food & Nutrition Conference & Expo™, October 21-24 in Chicago. Please stop at the AHA booth to learn about this exciting new program.

With Heartfelt Thanks!

Credit Claiming

You must complete a brief evaluation of the program in order to obtain your certificate. The evaluation will be available for one year; you do not need to complete it on September 28, 2017.

Credit Claiming Instructions:

1. Go to www.CE.TodaysDietitian.com/CVD **OR** Log on to www.CE.TodaysDietitian.com, go to “My Courses” and click on the webinar title.
2. Click “Take Course” on the webinar description page.
3. Select “Start/Resume Course” to complete and submit the evaluation.
4. Download and print your certificate.

Please Note: If you access the Evaluation between 3-4 pm ET on 9/28, you may experience a slow connection due to a high volume of users.