

Fixing Metabolic Health 9 October 2023

# Nutritional guidelines and their impact on Metabolic Health

**By, Nina Teicholz**

**Author, Science journalist  
Founder, Nutrition Coalition**

# Disclosures

- **I am an independent journalist. Receive no funds from any industry or interest group.**



# Dietary Guidelines for Americans

Fats, Oils & Sweets  
**USE SPARINGLY**

Sugars (added)

Added sugars in foods.



U.S. DEPARTMENT OF AGRICULTURE

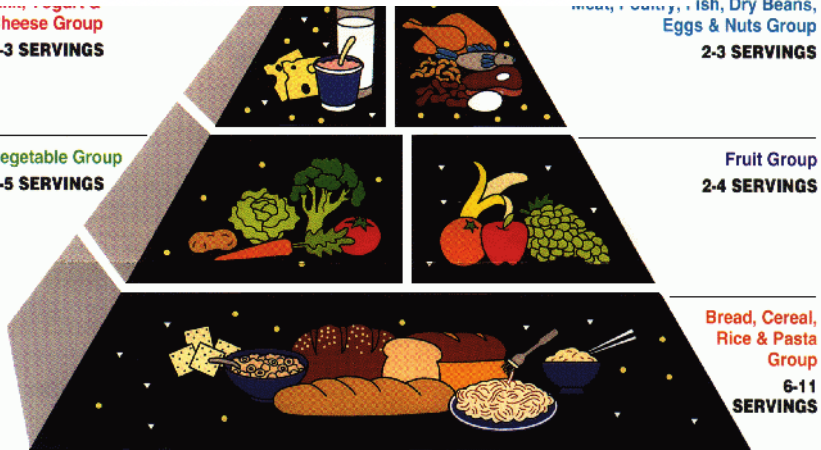
**2-3 SERVINGS**

**3-5 SERVINGS**

**2-3 SERVINGS**

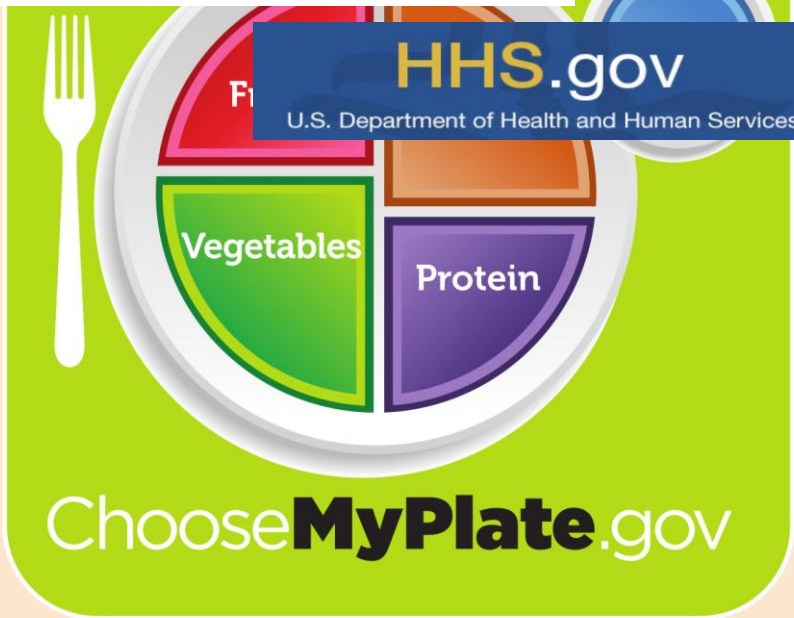
**2-4 SERVINGS**

**6-11 SERVINGS**



**HHS.gov**

U.S. Department of Health and Human Services



## Eat a variety of healthy foods each day

Have plenty of  
vegetables and fruits

Eat protein foods

Make water  
your drink  
of choice

Choose  
whole grain  
foods

**Canadian Dietary Guidelines**

# Nordic Nutrition Guidelines

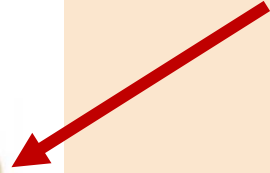
## MORE

Vegetables, fruit and berries  
fish and shellfish  
nuts and seeds  
exercise



## SWITCH TO

wholegrain  
healthy fats  
low-fat dairy products



## LESS

red and processed meat  
salt  
sugar  
alcohol





USDA-US-HHS  
**Dietary Guidelines for Americans**  
 These Guidelines have a *vast* influence over America's food choices—and health



**USDA Feeding Programs**

*1/4 of Americans eat one of these meals/month*

Special Nutritional Program for Women, Infants & Children (WIC)  
 Feeding Programs for Elderly  
 School Lunch Program



14.5% of toddlers in WIC are obese  
 Life expectancy in U.S. is declining: obesity is partially to blame  
 18.5% of kids are obese

**Department of Education**

Teaches the Dietary Guidelines



**Health Professional Associations**

American Academy of Pediatrics  
 American Diabetes Association  
 American Dietetic Association  
 Academy of Nutrition and Dietetics

Medical Offices

Hospitals

All Doctors  
 All Nutritionists  
 All Dieticians

Nearly 40 YEARS of the Dietary Guidelines



More than 2/3 of Americans are now overweight/obese; More than 1/2 are pre-diabetic or diabetic

**The Military**

The Guidelines determine all rations in mess halls



7% of troops are now obese

**U.S. Food Supply**

via FDA

Food producers

Farmers

Nutrition Facts Panel

Claims

Influences food industry

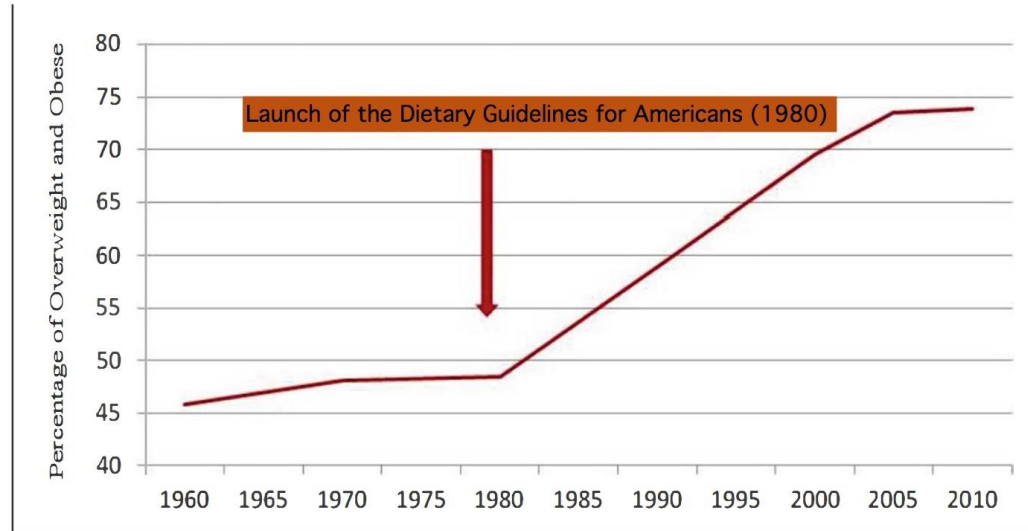


lean pork & beef  
 low-fat dairy  
 low-fat, processed foods

© The Nutrition Coalition

Since the introduction of the Dietary Guidelines in 1980, the health of Americans has sharply declined.

## Rise in U.S. Overweight/Obesity Coincides with Beginning of Dietary Guidelines



Source: Centers for Disease Control and Prevention



# Journal of the American College of Cardiology

Volume 80, Issue 2, 12 July 2022, Pages 138-151



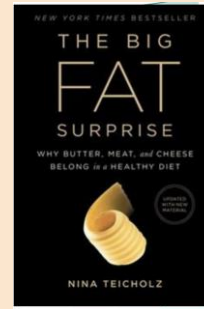
Original Investigation

## Trends and Disparities in Cardiometabolic Health Among U.S. Adults, 1999-2018

Meghan O'Hearn MS<sup>a</sup>   , Brianna N. Lauren MS<sup>a</sup>, John B. Wong MD<sup>b c</sup>,  
David D. Kim PhD<sup>c</sup>, Dariush Mozaffarian MD, DrPH<sup>a b</sup>

# Concern Goes Back... to the Beginning of the Guidelines (1980)

- A report, *Toward Healthful Diets*, by the National Academy of Sciences in 1980
  - the proposed diet had “generally unimpressive results”
- The Director of the National Heart, Lung and Blood Institute urged restraint
- The American Society for Nutrition was concerned and assigned a special panel to address the adequacy of evidence for the guidelines—outcome was split.



# When you start questioning the Guidelines, there are many defenses.

## #1 No one even knows about them

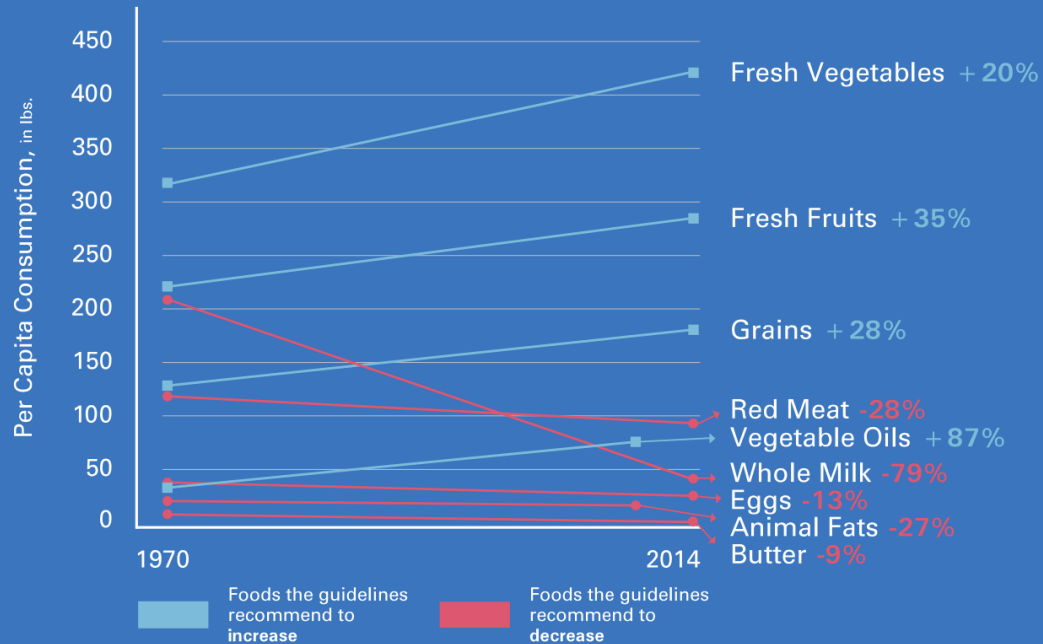
- **More fruits and vegetables**
- **Eat whole grains**
- **Low-fat dairy, lean meat**
- **Use vegetable oils, not butter**
- **Emphasize legumes, beans, peas, nuts and seeds**

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## #2 People don't *follow* the Dietary Guidelines

# AMERICANS HAVE FOLLOWED THE U.S. DIETARY GUIDELINES

Food Availability  
1970-2014



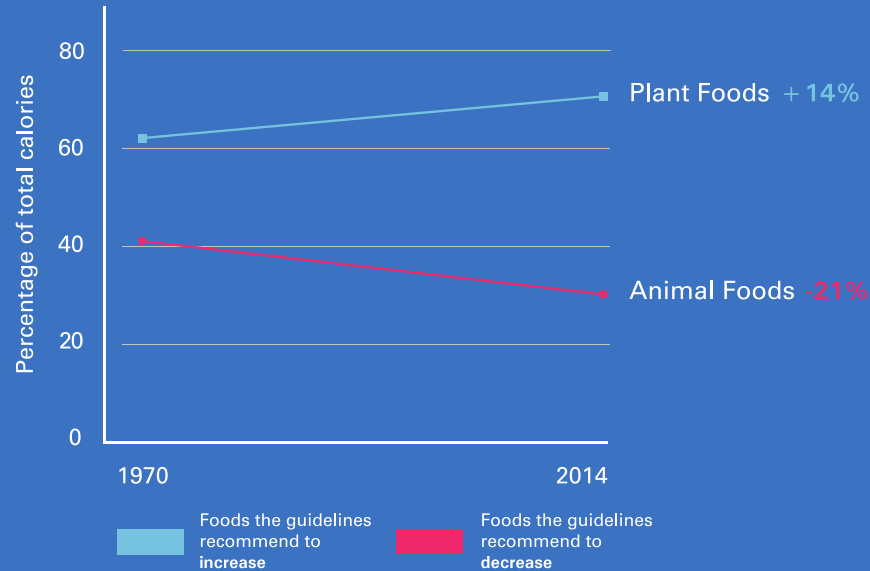
NOTES: The latest data on animal fats and vegetable oils are reported from 2010, not 2014; Food consumption (food availability minus loss) is also calculated in this report, and the trends track closely with those of food availability. This chart has been constructed with availability data because the units of measurement are consistent across food categories, whereas they differ with consumption data, making that information hard to chart altogether.

SOURCE: Jeanine Bentley, U.S. Trends in Food Availability and a Dietary Assessment of Loss-Adjusted Food Availability, 1970-2014, EIB-166, U.S. Department of Agriculture, Economic Research Service, January 2017; chart by Nina Teicholz.

# FOOD CONSUMPTION IN U.S.

Plant-based vs. animal-based as % of total calories

1970-2014

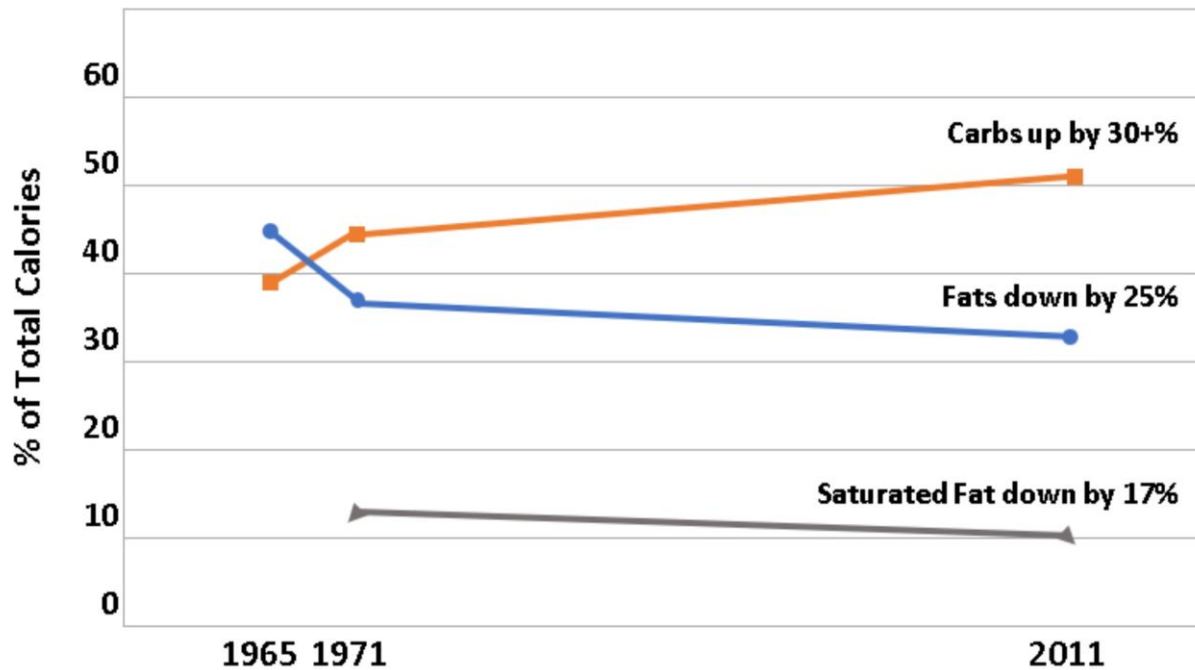


NOTES: Loss-Adjusted Food Availability data serve as a proxy for food consumption. Data on added fats and oils and rice were unavailable after 2010. Added fats and oils and added sugars are added to foods during processing or preparation. They do not include naturally occurring fats and sugars in food (e.g., fats in meat or sugars in fruits).

"Animal foods" include fish, meat, dairy, eggs, and animal fats; "Plant foods" include grains, fruits, vegetables, oils from plants, nuts, and added sugars. These are all the categories reported by the USDA in the ERS report (See source).

SOURCE: Jeanine Bentley, U.S. Trends in Food Availability and a Dietary Assessment of Loss-Adjusted Food Availability, 1970-2014, EIB-166, U.S. Department of Agriculture, Economic Research Service, January 2017; chart by Nina Teicholz.

## Macronutrient Shift in the U.S. 1965-2011



Source: Cohen et. al., *Nutrition*, 2015; chart by Nina Teicholz.

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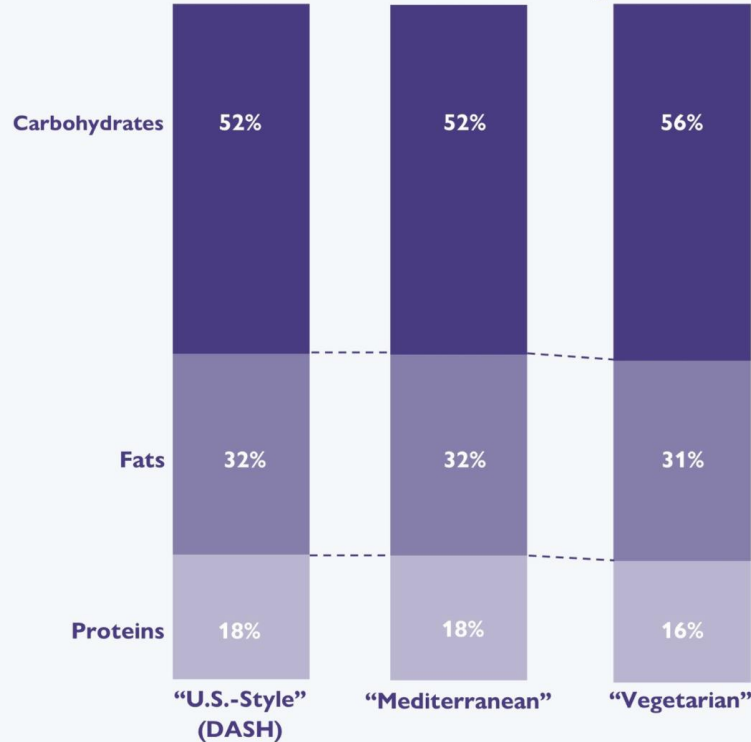
So, yes, Americans have followed the  
US Dietary Guidelines



**Dietary  
Guidelines  
for Americans**

- “Mediterranean-style”
- “US-style”
- Vegetarian

# USDA-HHS's 3 "Dietary Patterns"



Source: CNPP, Food and Nutrition Services, U.S. Department of Agriculture, "Food Pattern Modeling: Ages 2 Years and Older: 2020 Dietary Guidelines Advisory Committee Food Pattern Modeling Report," July 15, 2020, Tables 5.1, 5.10, 5.11. Available at: [https://www.dietaryguidelines.gov/sites/default/files/2020-07/FoodPatternModeling\\_Report\\_2YearsandOlder.pdf](https://www.dietaryguidelines.gov/sites/default/files/2020-07/FoodPatternModeling_Report_2YearsandOlder.pdf)



# **Scientific Report of the 2015 Dietary Guidelines Advisory Committee**

Advisory Report to the Secretary of Health and Human Services  
and the Secretary of Agriculture

26 September 2015  
ISSN: 0959-8122 | DOI: 10.1136/bmj

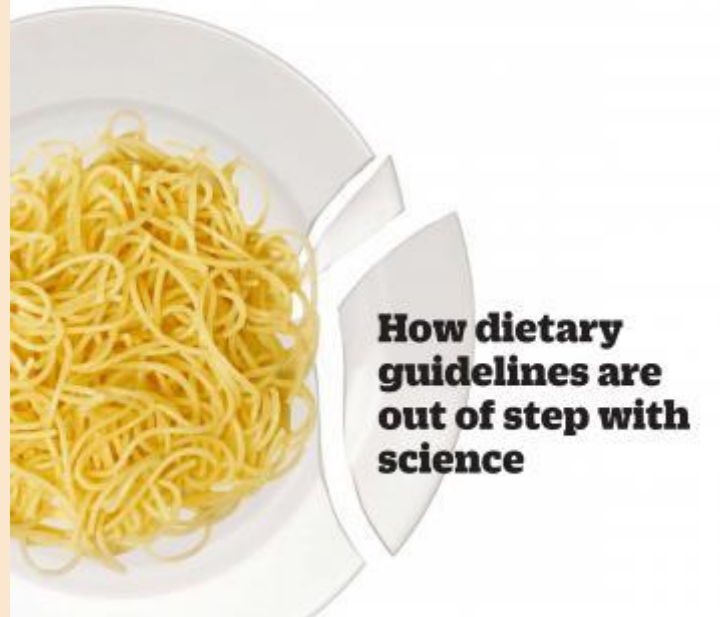


Problems with  
the new contract  
for junior doctors

Knee arthroscopy:  
why do rates differ  
across the UK?

Inflammatory  
bowel disease  
CPD/CME hours

Bisphosphonates  
and osteoporosis  
CPD/CME hours





## Scientific Report of the 2015 Dietary Guidelines Advisory Committee

Advisory Report to the Secretary of Health and Human Services  
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297

298 **Question 1: What is the relationship between dietary patterns and risk of**  
299 **cardiovascular disease?**

300 **Source of evidence:** Existing reports

301

1. PREDIMED trial
2. DASH trials

# PREDIMED

## *The* NEW ENGLAND JOURNAL *of* MEDICINE

ESTABLISHED IN 1812

APRIL 4, 2013

VOL. 368 NO. 14

### Primary Prevention of Cardiovascular Disease with a Mediterranean Diet

Ramón Estruch, M.D., Ph.D., Emilio Ros, M.D., Ph.D., Jordi Salas-Salvadó, M.D., Ph.D.,  
María-Isabel Covas, D.Pharm., Ph.D., Dolores Corella, D.Pharm., Ph.D., Fernando Arós, M.D., Ph.D.,  
Enrique Gómez-Gracia, M.D., Ph.D., Valentina Ruiz-Gutiérrez, Ph.D., Miquel Fiol, M.D., Ph.D.,  
José Lapetra, M.D., Ph.D., Rosa Maria Lamuela-Raventos, D.Pharm., Ph.D., Lluís Serra-Majem, M.D., Ph.D.,  
Xavier Pintó, M.D., Ph.D., Josep Basora, M.D., Ph.D., Miguel Angel Muñoz, M.D., Ph.D., José V. Sorlí, M.D., Ph.D.,  
José Alfredo Martínez, D.Pharm., M.D., Ph.D., and Miguel Angel Martínez-González, M.D., Ph.D.,  
for the PREDIMED Study Investigators\*

# DASH or “US-Style” Diet

- Tested on no more than 1,200 people
- (Mainly on hypertensive, middle-aged men)
- Only one trial has lasted longer than 8 weeks (that trial was 5 mo)
- While LDL-C usually drops, so does HDL-C.
- Overall, arguably equivocal data regarding CVD risk improvement



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297

298

299

300

301

**Question 1: What is the relationship between dietary patterns and risk of cardiovascular diseases?**

**Source of evidence:** Existing reports

**Not Strong**

1. PREDIMED trial
2. DASH trials



## Scientific Report of the 2015 Dietary Guidelines Advisory Committee

Advisory Report to the Secretary of Health and Human Services  
and the Secretary of Agriculture

531 **DIETARY PATTERNS AND BODY WEIGHT**

532 **Question 2: What is the relationship between dietary patterns and measures of**  
533 **body weight or obesity?**

534 **Source of evidence:** Ex

535

**Not Strong**

A single trial: 180 subjects with metabolic syndrome, 2 years.

**Outcome:** 2.7 kg more weight loss for patients on Mediterranean diet vs. low-fat controls.



**Scientific Report of the  
2015 Dietary Guidelines Advisory Committee**

Advisory Report to the Secretary of Health and Human Services  
and the Secretary of Agriculture

877

878 **DIETARY PATTERNS AND TYPE 2 DIABETES**

879 **Question 3: What is the evidence between dietary patterns and risk of type 2**  
880 **diabetes?**

881 **Source of evidence:** Existing reports

882

**Not Strong**

**Zero** clinical trials presented to show that any of the USDA Dietary Patterns can prevent or reverse Type 2 diabetes.

# Vegetarian Diet

- The US Dietary Guidelines advisory committee review could find **no randomized, controlled trials** to support this diet.
- The government's review of the "Healthy Vegetarian" diet concluded that the evidence for any disease-fighting powers of this diet was **"limited" — the lowest rank given for available data.**



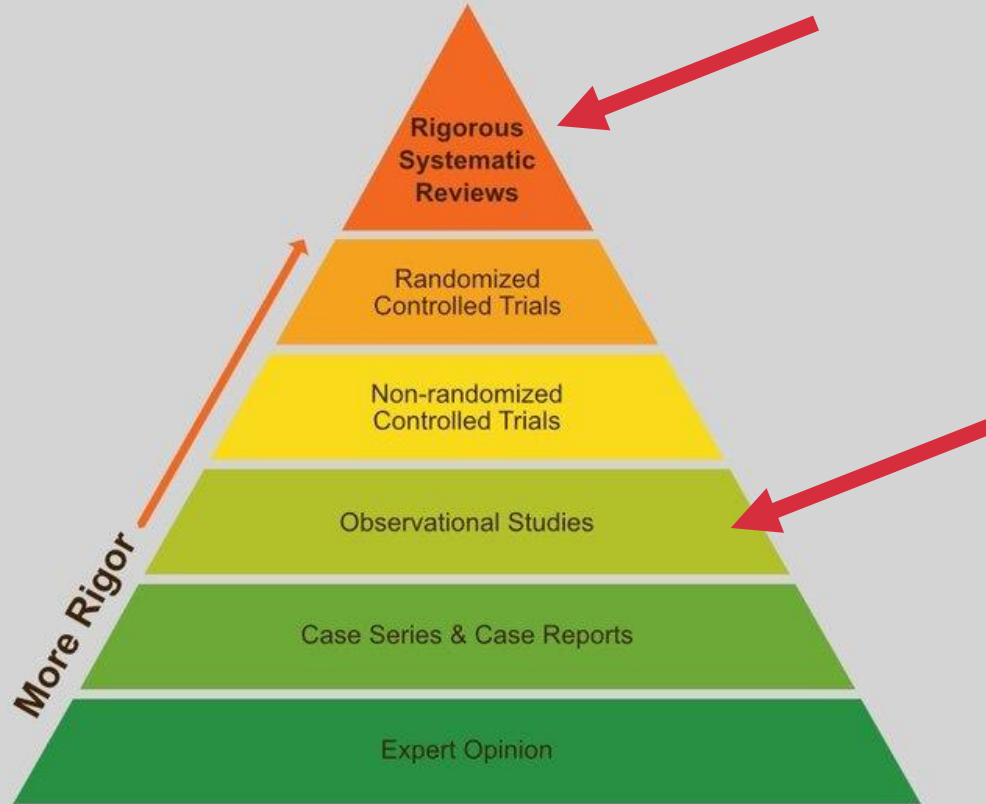
**Scientific Report of the  
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and the Secretary of Agriculture

If not clinical trials, then what  
*is* the evidence for the  
US Dietary Guidelines?

**It is all epidemiological.**

# Pyramid of Evidence



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Is that really *all* the major clinical trials  
that have been conducted on diet?

# Trials on the Low-Fat Diet

- **Women's Health Initiative, 2006**

Multi-center, NIH-funded trial, on ~49,00 women, for avg of 8 years

**Conclusions:** the low-fat diet did not help fight obesity, cardiovascular disease or any type of cancer. (This trial looked at hard endpoints).

Source: Howard BV, Van Horn L, Hsia J, et al. Low-fat dietary pattern and risk of cardiovascular disease: the Women's Health Initiative Randomized Controlled Dietary Modification Trial. JAMA 2006;295:655–66.

- **“Boeing trials”, 1990s**

On a 1,230 men and women, tested on the USDA diet.

**Conclusions:** No benefit for weight loss, blood sugar control (diabetes), and mixed outcomes for heart disease (LDL-C dropped, but so did HDL-C and triglycerides went up)

Knopp, R.H., et al., Journal of the American Medical Association 278, no. 18 (1997): 1509-15; Walden, C. et al, Arteriosclerosis, Thrombosis, and Vascular Biology 20, no. 6 (June 2000): 1580–1587.

# Randomized Controlled Trials on Saturated Fats

- There were actually a large number of government-funded, randomized, controlled clinical trials. The “Core Trials”
- On altogether at least 67,000 men and women, in experiments lasting 1 to 8 *years*
- Most in in-patient settings; therefore highly controlled.
- **RESULTS:** No Effect of saturated fats on cardiovascular mortality or total mortality.
- No Effect on myocardial infarction, stroke, total coronary heart disease (CHD) events, major CHD events.

26 September 2015  
ISSN: 0959-8029 | DOI: 10.1136/bmj



Problems with  
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Bisphosphonates  
and osteoporosis  
CPD/CME hours



**How dietary  
guidelines are  
out of step with  
science**

None of these trials, on the low-fat diet or on saturated fat, have ever been directly reviewed by any US Dietary Guidelines Advisory Committee

# Randomized controlled clinical trial (2018) USDA Diet (DGA) vs "typical American diet" (TAD)



VS.



Source: Krishnan, Sridevi et al. "A randomized controlled-feeding trial based on the Dietary Guidelines for Americans on cardiometabolic health indexes." *The American journal of clinical nutrition* vol. 108,2 (2018): 266-278. doi:10.1093/ajcn/nqy113

- **52 women over 8 weeks**
- **All food provided**
- **TAD:** higher in refined grains, saturated fat, and sugar
  - 3 ½ additional servings of refined grains per day, including lemon cheesecake, and “all day condiments” that included candy and “Jelly Bellies”
  - **DGA:** had more fruits, vegetables, and whole grains

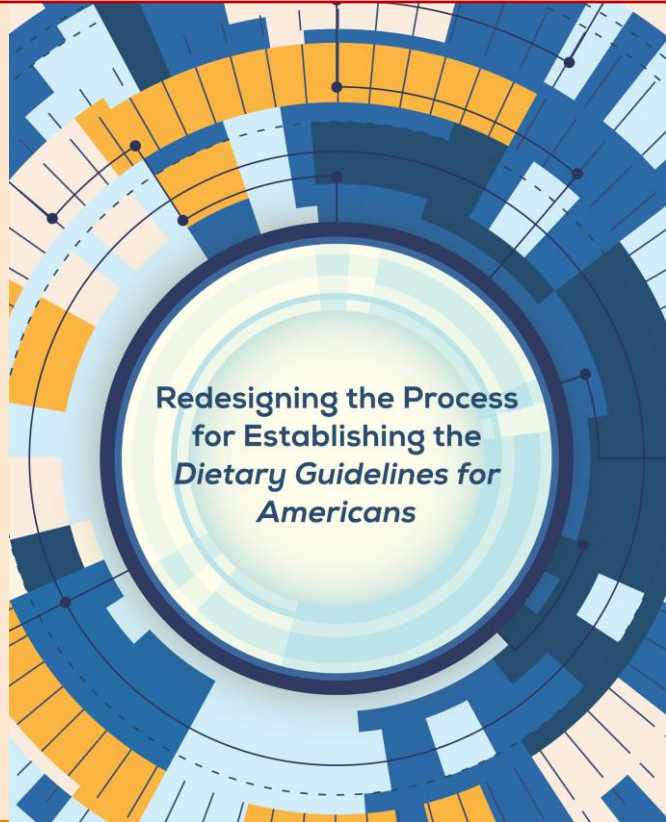
# Results?

- DGA women scored 98/100 on “Healthy Eating Index”
- TAD women scored 65-69
- Outcomes measured: markers for diabetes and heart disease
  - Except: systolic blood pressure slightly better for the DGA women

# What can we learn from these clinical trials?

- They do not support our current official dietary guidance
- Their findings were ignored or suppressed
- Our guidelines can therefore be seen, on key issues, as being non-evidence-based.

## First-ever outside peer-review of the Guidelines process



“The current DGA process for reviewing the science **falls short of meeting the best practices for conducting systematic reviews.**

“**Methodological approaches and scientific rigor** for evaluating the scientific evidence **need to be strengthened....**

...require increases rigor to better meet current standards of practice.

**To develop a trustworthy DGA, the process needs to be redesigned.”**

The National Academies issued 11 recommendations to the USDA on how to improve the Guidelines' process

## USDA Fails to Fully Implement National Academies' Advice for Bringing "Transparency," "Rigor" to the Dietary Guidelines

February 2, 2023

Source: <https://www.nutritioncoalition.us/news/usda-fails-to-fully-implement-natl-academies-recs-for-transparency>

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# Resistance to change...



United S



**2020 - 2025**

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## **Types of Dietary Fat and Cardiovascular Disease: A Systematic Review**

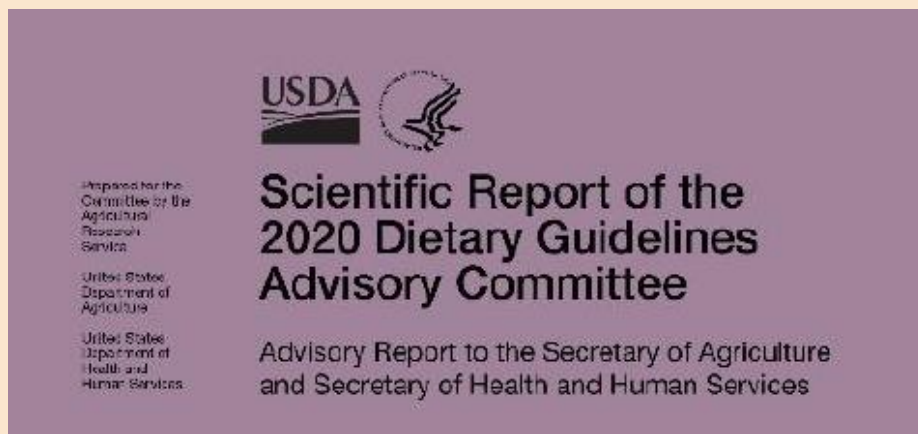
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2020 Dietary Guidelines Advisory Committee, Dietary  
Fats and Seafood Subcommittee

Published date: July 15, 2020

# Studies on saturated fats reviewed for the 2020 US Dietary Guidelines

Studies with Direct Associations					
		Total	% support of Guidelines policy	% do not support Guidelines policy	
<b>Findings of associations between saturated fats and various endpoints</b>					
Total CVD Endpoints, incl. mortality		15	7%	93%	
CHD, CAD, MI, or PAD Endpoints		15	27%	73%	
Stroke		11	0%	100%	
		<b>Total</b>	<b>41</b>	<b>12%</b>	<b>88%</b> Total
<b>Findings of associations between foods and CVD/CHD endpoints (Stroke n/a)</b>					
Meat		9	<b>44%</b>	<b>56%</b>	Meat
CVD endpoints		2	50%	50%	
CHD etc endpoints		7	43%	57%	
Dairy		9	<b>0%</b>	<b>100%</b>	Dairy
CVD endpoints		2	0%	100%	
CHD etc endpoints		7	0%	100%	
Butter		<b>8</b>	<b>13%</b>	<b>88%</b>	Buter
CVD endpoints		3	0%	100%	
CHD etc endpoints		5	20%	80%	
Dairy + butter		<b>17</b>	<b>6%</b>	<b>94%</b>	



### ***Cardiovascular Disease Endpoint Outcomes: Adults***

Strong evidence demonstrates that replacing saturated fatty acids with polyunsaturated fatty acids in adults reduces the risk of coronary heart disease events and cardiovascular disease mortality. Grade: **Strong**

# Dietary Cholesterol



# No more cholesterol caps

- **Dropped by the American Heart Association in 2013**

- **“Insufficient evidence”**

Source: <https://doi.org/10.1161/01.cir.0000437740.48606.d1> Circulation. 2014;129:S76–S99

- **Dropped by the US Dietary Guidelines for Americans in 2015**

- **“no appreciable relationship between consumption of dietary cholesterol and serum cholesterol”**

Source: Report by the 2015 Dietary Guidelines Advisory Committee, USDA-HHS, .2015.

# No more cholesterol caps

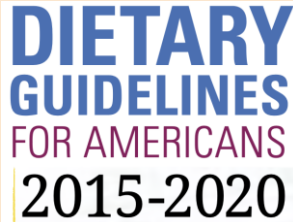
- **Reviewed again by the US Dietary Guidelines in 2020**
  - **-> “insufficient evidence” to link dietary cholesterol with blood cholesterol.**



**2020 - 2025**

**US Recommended Dietary Patterns  
“are...lower in cholesterol”**

# On low-carbohydrate diets



**From:** Essery, Eve - CNPP [mailto:Eve.Essery@fns.usda.gov]  
**Sent:** Wednesday, November 26, 2014 8:51 AM  
**To:** 'Siega-Riz, Anna Maria'; 'alice.lichtenstein@tufts.edu'; 'c1anderson@ucsd.edu'; 'jtb4@cornell.edu'; 'steven.clinton@osumc.edu'; 'rafael.perez-escamilla@yale.edu'; Millen, Barbara E; 'Frank Hu'; 'Neuhouser, Marian L'  
**Cc:** Obbagy, Julie - CNPP; Casavale, Kellie (OS/OASH)  
**Subject:** DGAC SC2: Chapter follow-up

**“Hi SC2 members,  
As you all know, there has been a continued, and perhaps growing, interest in low-carbohydrate diets, and we have been asked on numerous occasions why the Dietary Guidelines do not recommend low-carbohydrate diets as the dietary pattern *of choice* to the general public....”**

**From:** Siega-riz, Anna Maria [mailto:am\_siegariz@unc.edu]  
**Sent:** Sunday, November 30, 2014 8:21 AM  
**To:** Neuhouser, Marian L; Frank Hu; Essery, Eve - CNPP  
**Cc:** Millen, Barbara E; Lichtenstein, Alice; c1anderson@ucsd.edu; jtb4@cornell.edu; steven.clinton@osumc.edu; rafael.perez-escamilla@yale.edu; Obbagy, Julie - CNPP; Casavale, Kellie (OS/OASH)  
**Subject:** Re: DGAC SC2: Chapter follow-up

**Folks,**  
**[The USDA] did conduct a review on low carb for us though we are not adding it as a formal question...[and we are putting the results in the Methodology section]**

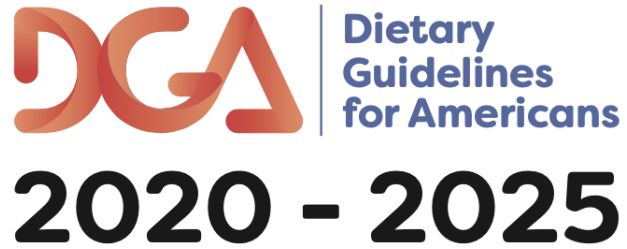
11.20.14

**Systematic Review Question(s): What is the relationship between low carbohydrate diets and health?**

**43 studies, including 30 clinical trials**

**Frank Hu**, Professor at Harvard Dept. of Nutrition, Member of the 2015 Dietary Guidelines Advisory Committee

“People who are familiar with the field may complain that we gloss over recent evidence and don’t give low-carb diets...sufficient attention that they deserve.”



Expert committee could find NO studies on a low-carbohydrate diets



## 2025 DIETARY GUIDELINES ADVISORY COMMITTEE

There are no questions on low-carbohydrate diets



Accepted manuscript

## Conflicts of interest for members of the U.S. 2020 Dietary Guidelines Advisory Committee

Published online by Cambridge University Press: 21 March 2022

Mélissa Mialon , Paulo Serodio, Eric Crosbie , Nina Teicholz, Ashka Naik and Angela Carriedo 

Show a

**95% of the expert committee had at least one potential conflict of interest with a food or pharmaceutical company**

**60% had 20 such conflicts or more**

**One woman had 152 conflicts**

# USDA Strategic Partners

USDA's Center for Nutrition Policy & Promotion

Office that produces the US Dietary Guidelines for Americans

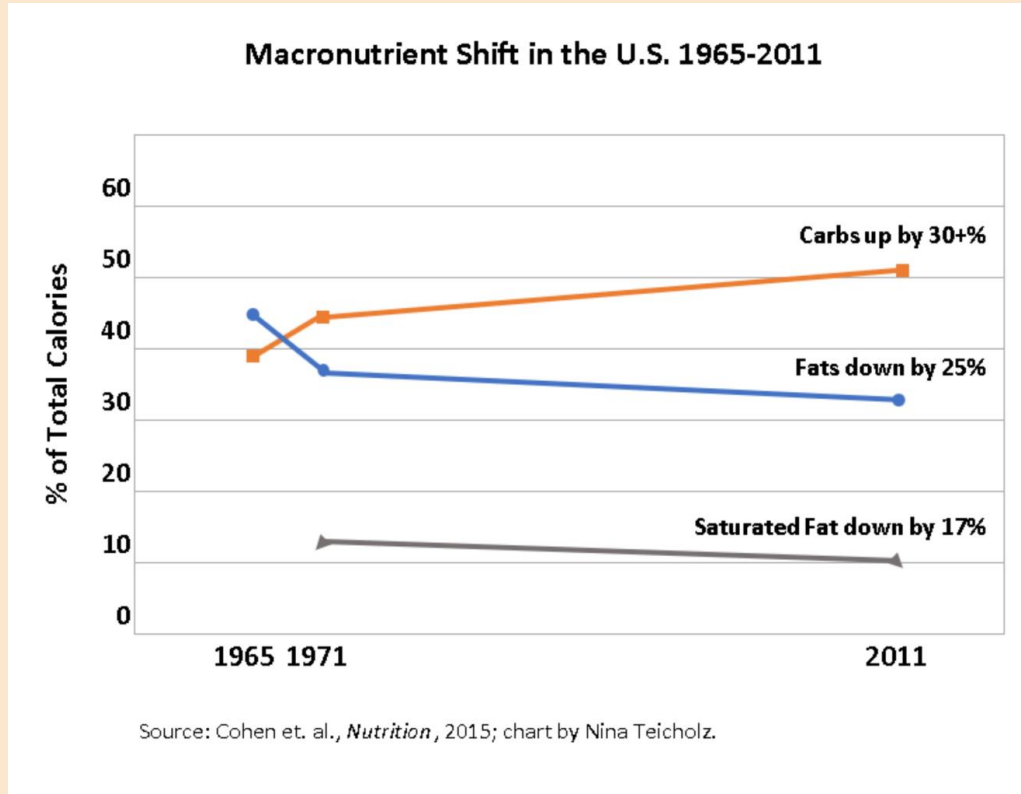


Note: Not all of USDA's more than 100 food-related corporate partners listed here  
 Source: <https://www.myplate.gov/professionals/partner-us/national-strategic-partners>

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# Have the US Dietary Guidelines caused harm?

# Law of Unintended Consequences



## An analysis of the recent U.S. dietary guidelines process in light of its federal mandate and a National Academies report

Cheryl Achterberg, Arne Astrup, Dennis M Bier , Janet C King, Ronald M Krauss, Nina Teicholz, Jeff S Volek

PNAS Nexus, pgac107, <https://doi.org/10.1093/pnasnexus/pgac107>

**Published:** 20 July 2022

In 2000, expert committee for the Guidelines expressed concern that the government’s low-fat advice...

“could engender an overconsumption of total calories in the form of carbohydrates, resulting in the adverse metabolic consequences of high-carbohydrate diets.”

“Further, the possibility that overconsumption of carbohydrates may contribute to obesity cannot be ignored”

## An analysis of the recent U.S. dietary guidelines process in light of its federal mandate and a National Academies report

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PNAS Nexus, pgac107, <https://doi.org/10.1093/pnasnexus/pgac107>

Published: 20 July 2022

2015 Expert Committee (Dietary Guidelines Advisory Committee:

Low-fat “diets are generally associated with dyslipidemia (hyper-triglyceridemia and low HDL-C concentrations)” which are indicators of increased risk for heart disease.

# Metabolic Health

Tackling wellbeing from the inside out



Review

> [Open Heart](#). 2021 Jul;8(2):e001680. doi: 10.1136/openhrt-2021-001680.

# **Hiding unhealthy heart outcomes in a low-fat diet trial: the Women's Health Initiative Randomized Controlled Dietary Modification Trial finds that postmenopausal women with established coronary heart disease were at increased risk of an adverse outcome if they consumed a low-fat 'heart-healthy' diet**

Timothy David Noakes <sup>1</sup>

# Findings:

- Postmenopausal women with heart disease put on a low-fat 'heart-healthy' diet were **at 26% greater risk of developing additional CHD events** compared with women with heart disease eating the control diet.
- A later publication (2017) from the Women's Health Initiative, with 5 years of follow-up data found heart disease (CHD) risk among postmenopausal women **had increased further to 47%-61%.**

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Cheryl Achterberg, Arne Astrup, Dennis M Bier, Janet C King, Ronald M Krauss, Nina Teicholz, Jeff S Volek

PNAS Nexus, pgac107, <https://doi.org/10.1093/pnasnexus/pgac107>

Published: 20 July 2022

- In the past 15 years, scientists including at least **7 members** of previous expert committees overseeing the science for the Dietary Guidelines, have raised serious concerns about the guidelines' methodology and/or the resulting recommendations.
- A 2010 DGAC member wrote, “Despite our evidence-based review lens where we say that food policies are “science based,” in reality we often let our personal biases override the scientific evidence”

# In sum, Some myths dispelled

- When people say the Dietary Guidelines are not to blame...
- In fact:
  - People *are* very aware of the Guidelines
  - People *have followed* the Guidelines
- When people say clinical trials are too high a standard, in fact...
  - There's no lack of clinical trials that the Guidelines could (and *should*) have drawn upon for evidence

# Summary

- The Guidelines were based on weak evidence from the outset
- Have since ignored many important clinical trials that refute their efficacy
- The evidence base for the Guidelines is most epidemiological (weak science)
- The Guidelines therefore cannot be considered a trustworthy, reliable document
- I think we can see demonstrable harm from the US Guidelines, in obesity, diabetes, and heart disease.
- We should therefore be open to alternative ideas about nutrition 😊

# Thank you!

**Nina Teicholz**

**Science journalist, Researcher  
Founder, The Nutrition Coalition**



@bigfatsurprise



ninateicholz



ninateicholz



**Unsettledscience.substack.com**