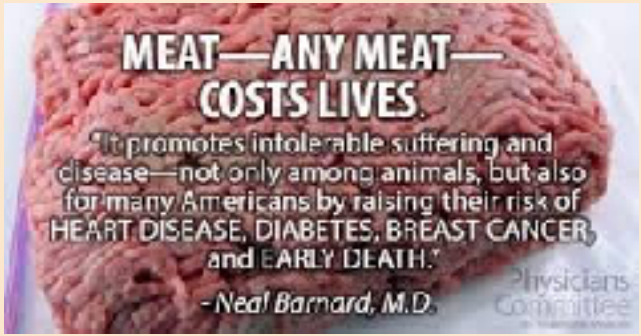
Red Meat and Health

BY,
NINA TEICHOLZ
SCIENCE JOURNALIST AND AUTHOR

Red Meat: the Third Rail of Nutrition



the bmj

BMJ 2017;357:j2190 doi: 10.1136/bmj.j2190 (Published 2017 May 09) Page 1 of 2

EDITORIALS

Red and processed meat, and human and planetary health

Contemporary meat consumption harms human health and is equally bad for the planet

John D Potter professor of epidemiology

Centre for Public Health Research, Massey University, Wellington, New Zealand (correspond)

Immediate past-president of the American College of Cardiology, recommends a vegan diet to prevent heart disease

HARVARD T.H. CHAN SCHOOL OF PUBLIC HEALTH

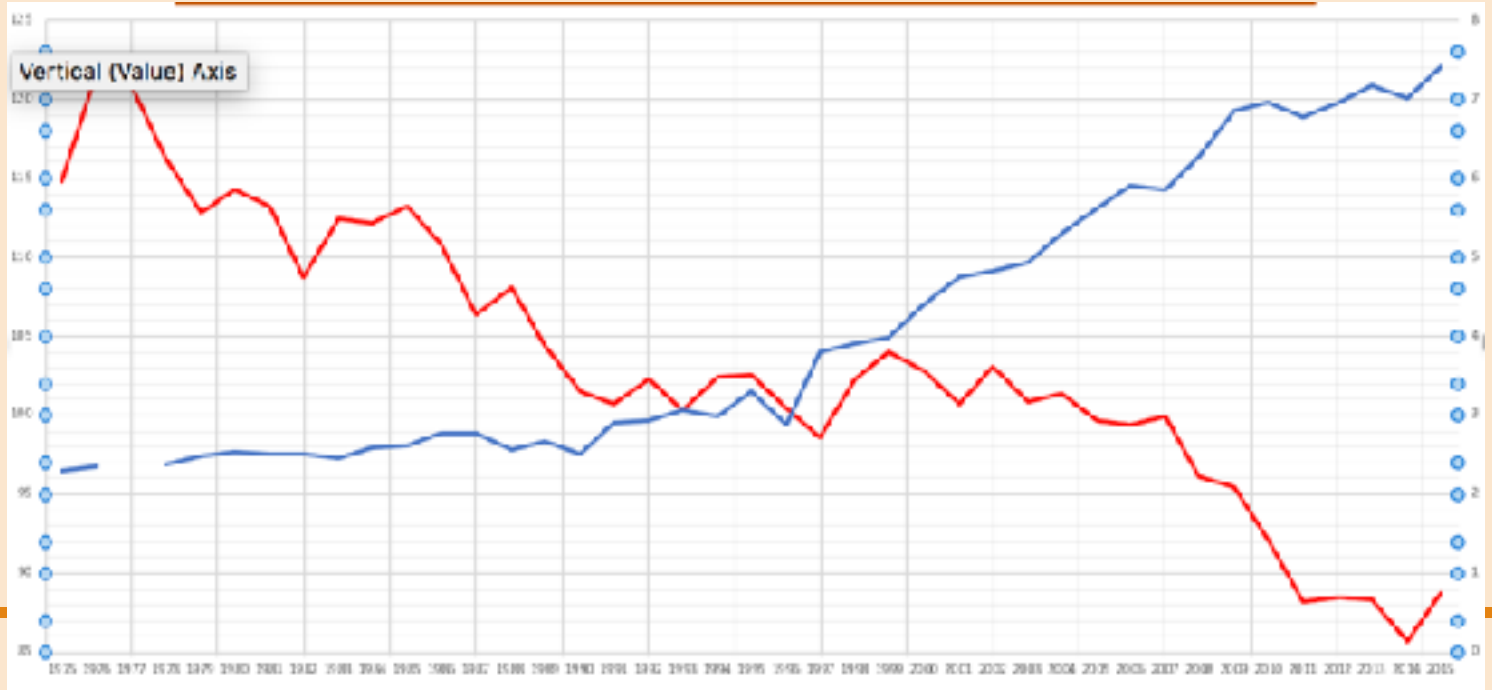
Healthy plant-based diet linked with substantially lower type 2 diabetes risk

Red meat and disease outcomes

- Diabetes
- Cancer
- Heart disease

Red Meat and Diabetes

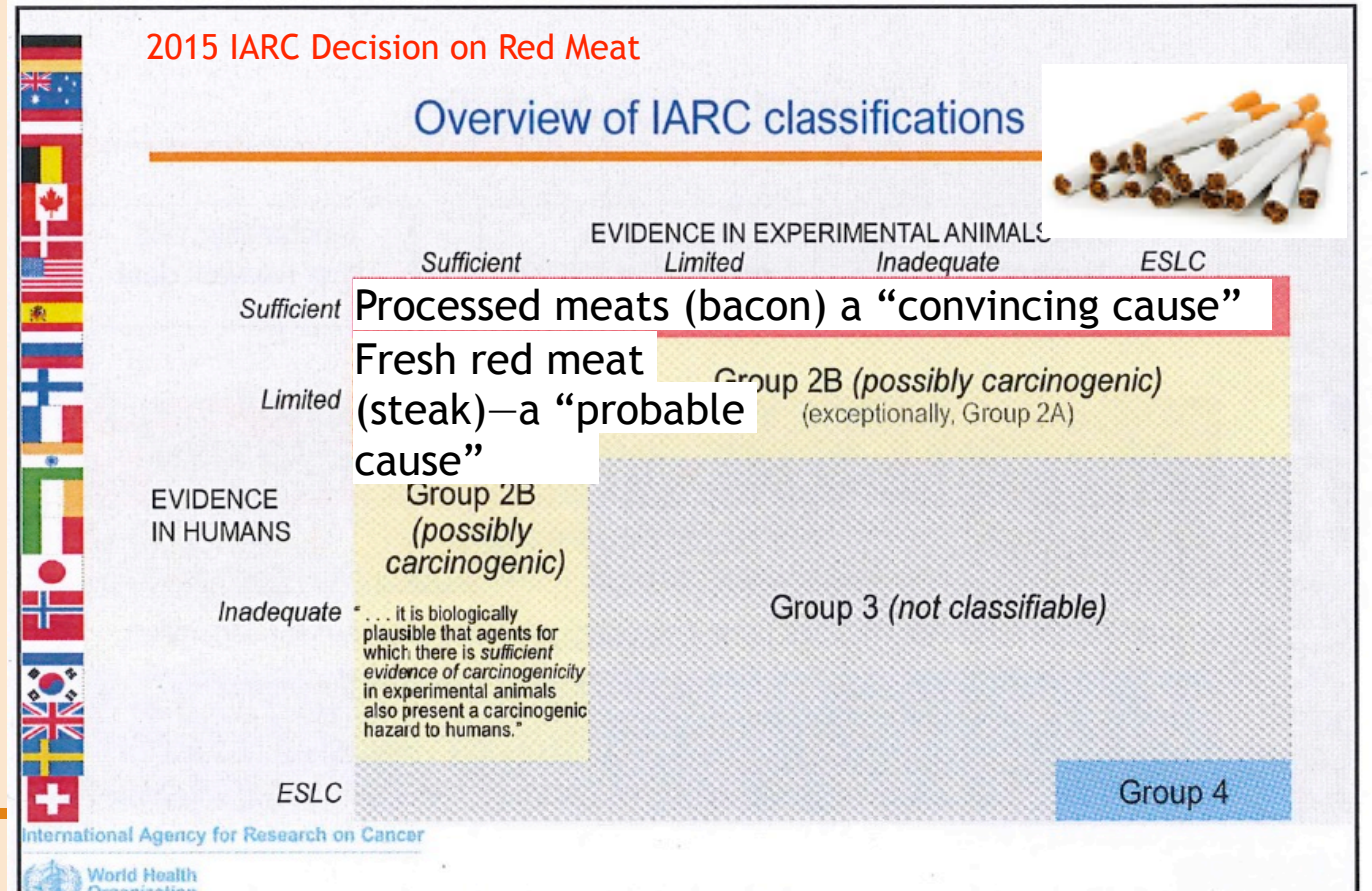
Red meat availability (g/day/per capita) vs Incidence of Diabetes
USA 1975 - 2015



Rate of diabetes

Red meat availability

Red Meat and Colorectal Cancer



What was the evidence?

THE LANCET
Oncology

Carcinogenicity of consumption of red and processed meat

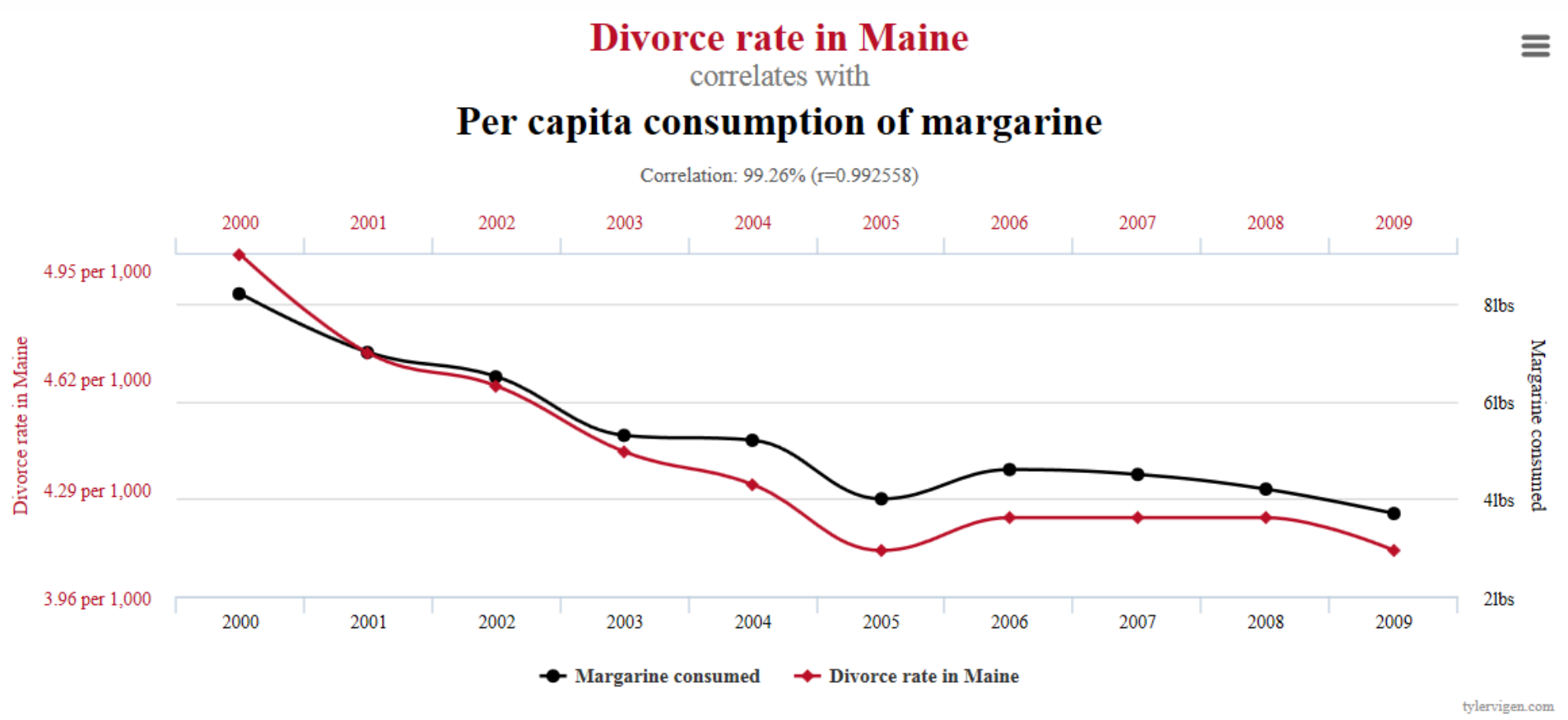
2 page paper
(full report still not published)

"A meta-analysis of colorectal cancer in ten cohort studies reported a statistically significant dose–response relationship, with a 17% increased risk (95% CI 1·05–1·31) per 100 g per day of red meat and an 18% increase (95% CI 1·10–1·28) per 50 g per day of processed meat."

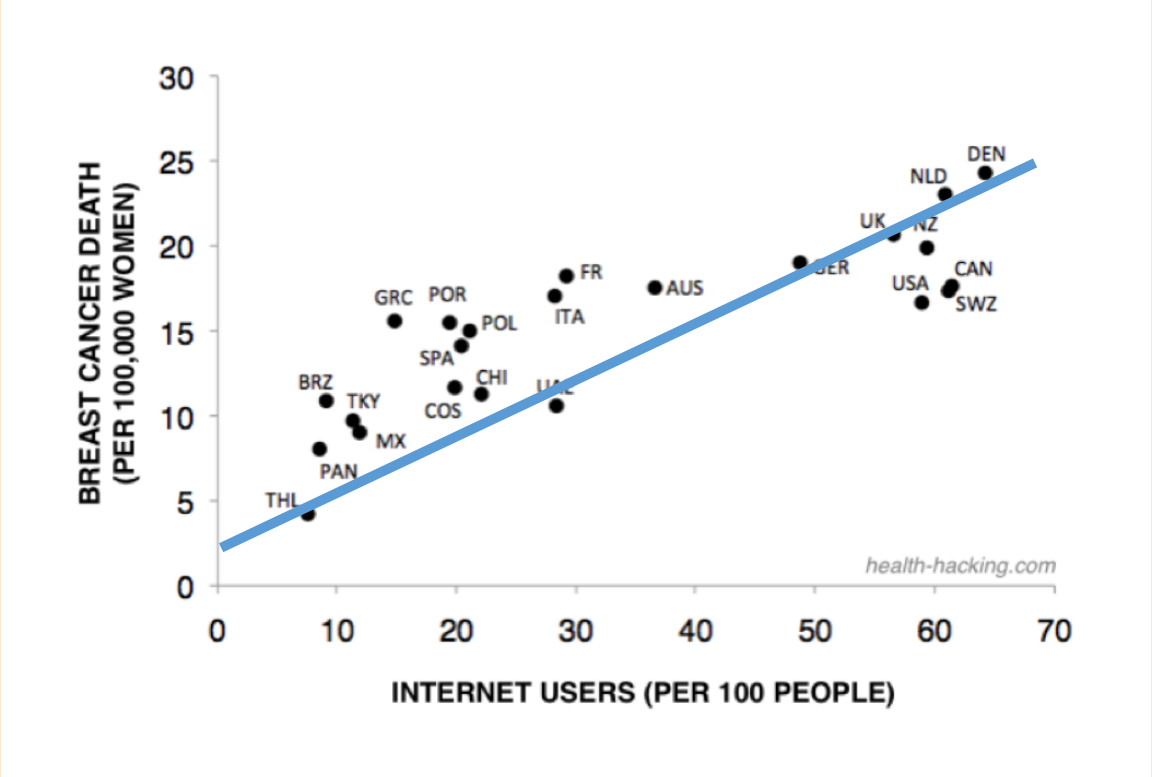
Limitations of this data

- Based on epidemiology, which is a very weak kind of science that can only show *association*, not *causation*

Inevitability of False Positives



Inevitability of False Positives



Limitations of this data

- Based on epidemiology, which is a very weak kind of science that can only show *association*, not *causation*
- An association in epidemiology *can* be considered as "cause and effect" if it meets certain criteria, the most important of which is the *strength* of the association

What is a "strong association?"

- The one great success story of epidemiology: Smoking and lung cancer
- Heavy smokers had a 15-30 times greater risk of dying of lung cancer vs. "never smokers."

- Compare that number to:
  - 1.17 "relative risk" for fresh meat and cancer
  - 1.18 "relative risk" for processed meat and cancer

Relative risks < 2 are not reliable

•"In adequately designed studies we can be reasonably confident about *big* relative risks, sometimes; we can be only guardedly confident about relative risks estimates of the order of 2.0, occasionally; **we can hardly ever be confident about estimates of less than 2.0**, and when estimates are much below 2.0, we are simply out of business. Epidemiologists have only primitive tools, which for small relative risks are too crude to enable us to distinguish between bias, confounding and causation."

S. Shapiro, Pharmacoepidemiology & Drug Safety, 13:257-265 (2004)

…Due to bias and confounding. What confounds studies on red meat?

People who eat red meat are also more likely to have other unhealthy behaviors

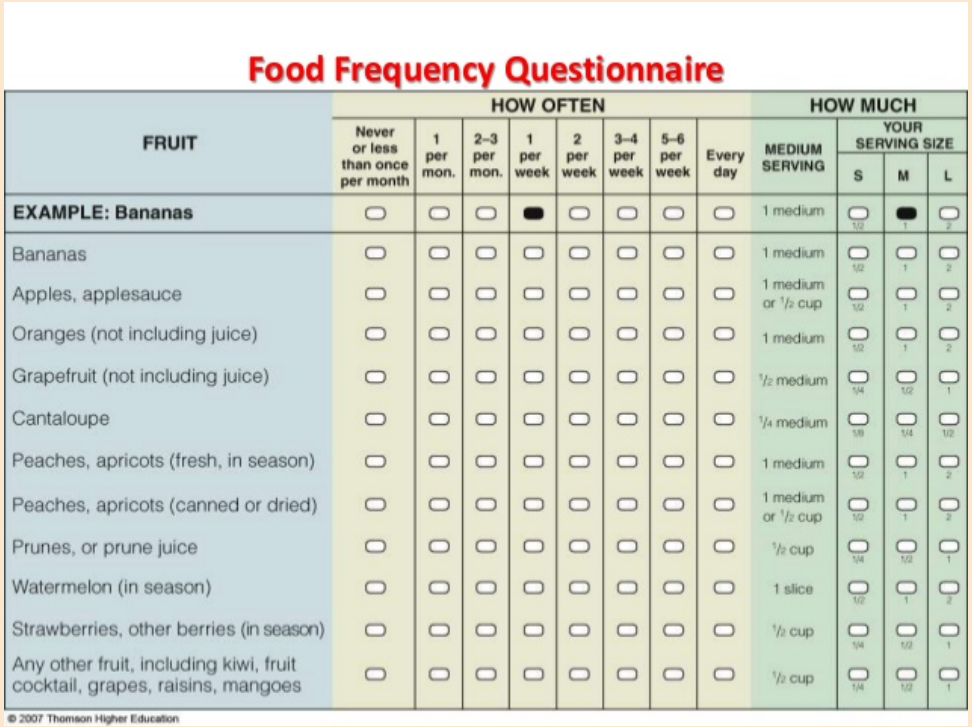
- Higher body fat percentage
- Higher waist circumference
- Higher BMI (body mass index)
- Lower education
- More physical inactivity
- More cigarette smoking
- More alcohol drinking


Eur J Clin Nutr. 2015 Sep;69(9):1030-5. doi: 10.1038/ejcn.2015.63. Epub 2015 May 13.

Association between red and processed meat consumption and chronic diseases: the confounding role of other dietary factors.

Fagherazzi G[1], Vercambre MN[2,3], Mesrine S[3].

Epidemiology relies on self-reported data, which is notoriously unreliable



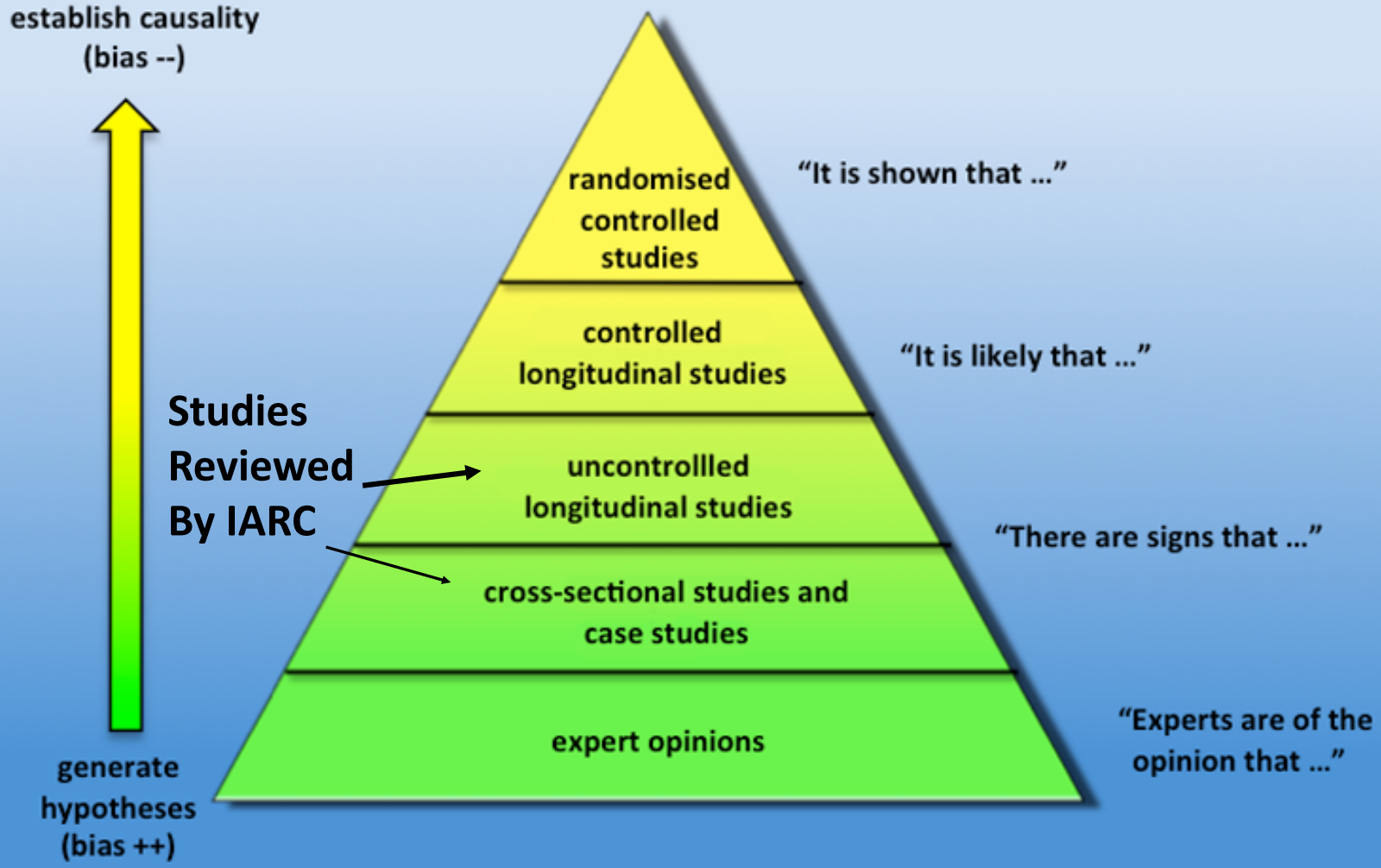
Food Frequency Questionnaire

FRUIT	HOW OFTEN								HOW MUCH			
	Never or less than once per month	1 per mon.	2–3 per mon.	1 per week	2 per week	3–4 per week	5–6 per week	Every day	MEDIUM SERVING	YOUR SERVING SIZE		
										S	M	L
EXAMPLE: Bananas	○	○	○	●	○	○	○	○	1 medium	○ 1/2	● 1	○ 2
Bananas	○	○	○	○	○	○	○	○	1 medium	○ 1/2	○ 1	○ 2
Apples, applesauce	○	○	○	○	○	○	○	○	1 medium or 1/2 cup	○ 1/2	○ 1	○ 2
Oranges (not including juice)	○	○	○	○	○	○	○	○	1 medium	○ 1/2	○ 1	○ 2
Grapefruit (not including juice)	○	○	○	○	○	○	○	○	1/2 medium	○ 1/4	○ 1/2	○ 1
Cantaloupe	○	○	○	○	○	○	○	○	1/4 medium	○ 1/8	○ 1/4	○ 1/2
Peaches, apricots (fresh, in season)	○	○	○	○	○	○	○	○	1 medium	○ 1/2	○ 1	○ 2
Peaches, apricots (canned or dried)	○	○	○	○	○	○	○	○	1 medium or 1/2 cup	○ 1/2	○ 1	○ 2
Prunes, or prune juice	○	○	○	○	○	○	○	○	1/2 cup	○ 1/4	○ 1/2	○ 1
Watermelon (in season)	○	○	○	○	○	○	○	○	1 slice	○ 1/2	○ 1	○ 2
Strawberries, other berries (in season)	○	○	○	○	○	○	○	○	1/2 cup	○ 1/4	○ 1/2	○ 1
Any other fruit, including kiwi, fruit cocktail, grapes, raisins, mangoes	○	○	○	○	○	○	○	○	1/2 cup	○ 1/4	○ 1/2	○ 1

Some spectacular failures in epidemiology

Policies based on epidemiological findings that, when properly tested in clinical trials, had to be reversed:

- Anti-oxidant vitamins
- Caps on dietary cholesterol (avoiding eggs, shellfish, liver for so many years)
- The idea that fat causes cancer
- Hormone Replacement Therapy


establish causality
(bias --)
generate
hypotheses
(bias ++)
Studies
Reviewed
By IARC
randomised
controlled
studies
"It is shown that ..."
controlled
longitudinal studies
"It is likely that ..."
uncontrollled
longitudinal studies
"There are signs that ..."
cross-sectional studies and
case studies
expert opinions
"Experts are of the
opinion that ..."

What about *clinical trials* on red meat and cancer?

Polyp Prevention Trial

Funded by the National Institutes of Health

Designed to look specifically at colorectal cancer

2,079 people for 4 years, 8 yr follow-up

Significant decrease in red and processed meats

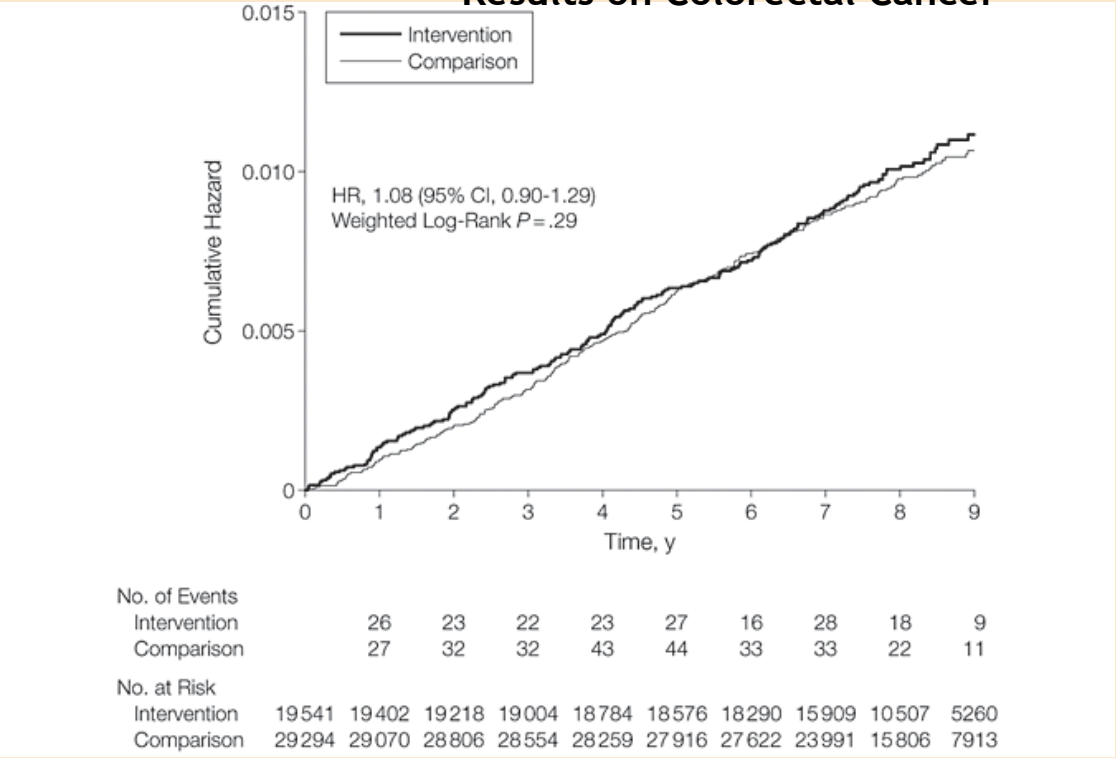
Results: NO effect on recurrence of cancerous polyps

Relative risk of 1.00 (0.90-1.12)

Women's Health Initiative

- NIH-funded
- *Designed* as a cancer trial
- On nearly 49,000 women
- Average of 8 years on the diet
- Red meat reduced by 20%
    - Statistically significant

Results on Colorectal Cancer



Limitations of the process: Report from one of the IARC panel participants

- The IARC panel only looked at 23 papers (not 800 as claimed).
- The majority of the IARC panel had spent the past 20+ years publishing papers against red meat. This is bias.
- The IARC staff leaders and some on the panel were vegetarians who did not disclose this as a conflict of interest. This is bias.

What were the proposed mechanisms for red meat causing cancer?

- Heme iron
  - 80% blood
  - Only observe damaging effects on calcium deficient diets
  - Two other papers by same researcher found that rats fed bacon had significantly fewer of damaging compounds, but he did not submit these papers and would not talk about them.
- N-nitroso compounds

When is a carcinogen not a carcinogen?

Lancet Oncology editorial, June 2016

A month rarely passes by without something being declared unhealthy or carcinogenic. Often, the WHO International Agency for Research on Cancer (IARC) is at the centre of such pronouncements and is duly rounded on to explain the consequences. IARC, however, is not the only agency with responsibility for determining carcinogenicity of products, compounds, or lifestyles,

These latest disputes regarding carcinogen classification highlight the problem of determining reliable findings when data are equivocal and where there are vested interests. They also highlight the difficulties of translating carcinogenicity research into appropriate health policies and recommendations for risk management. Furthermore, there is an equally clear need for a standardised, internationally agreed methodology for carcinogen assessment, alongside ways of presenting results that are easily understood and accepted by all interested parties. Until these objectives are met, carcinogen definition and regulation will continue to be the poor relation to other cancer preventative measures. ■ *The Lancet Oncology*

NEWS RELEASE June 21, 2017

AMA Passes Resolution: Hospitals Should Provide Plant-Based Meals and Remove Cancer-Causing Processed Meats

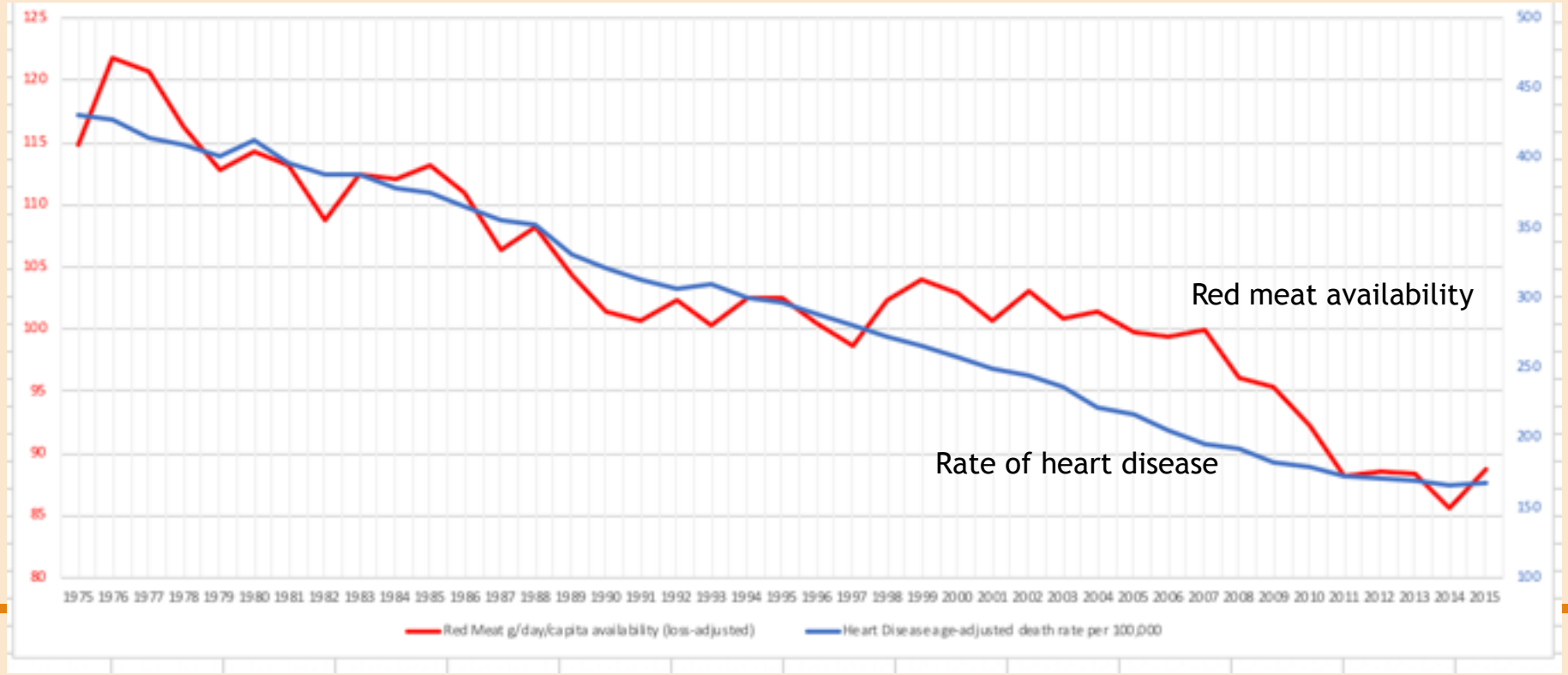
WASHINGTON—The American Medical Association's House of Delegates has adopted a resolution calling on hospitals to provide plant-based meals and remove processed meats from menus.

CBS NEWS

HEALTHDAY / *April 14, 2017, 10:27 AM*

Lawsuit aims to ban hot dogs, processed meats in L.A. schools

Red meat and heart disease



Saturated fat and cholesterol were the original reason that red meat was thought to cause heart disease

- The hypothesis that saturated fats and dietary cholesterol cause heart disease (the "diet heart hypothesis") has been tested on some 75,655 men and women, in experiments lasting 1 to 12 *years*
  - Most trials were in in-patient settings; therefore highly controlled;
  - Most were government funded

- RESULTS: No effect of saturated fats on cardiovascular mortality or total mortality

Red meat and heart disease

J Clin Lipidol. 2012 Jul-Aug;6(4):352-61. doi: 10.1016/j.jacl.2012.01.001. Epub 2012 Jan 21.

A meta-analysis of randomized controlled trials that compare the lipid effects of beef versus poultry and/or fish consumption.

Maki KC[1], Van Elswyk ME, Alexander DD, Rains TM, Sohn EL, McNeill S.

CONCLUSION: Changes in the fasting lipid profile were not significantly different with beef consumption compared with those with poultry and/or fish consumption. Inclusion of lean beef in the diet increases the variety of available food choices, which may improve long-term adherence with dietary recommendations for lipid management.

Red meat and heart disease

Am J Clin Nutr. 2017 Jan;105(1):57-69. doi: 10.3945/ajcn.116.142621. Epub 2016 Nov 23.

Total red meat intake of ≥0.5 servings/d does not negatively influence cardiovascular disease risk factors: a systemically searched meta-analysis of randomized controlled trials.

O'Connor LE[1], Kim JE[1], Campbell WW[2].

CONCLUSIONS: The results from this systematically searched meta-analysis of RCTs support the idea that the consumption of ≥0.5 servings of total red meat/d does not influence blood lipids and lipoproteins or blood pressures.

AGRICULTURE & LIFE SCIENCES
TEXAS A&M UNIVERSITY

← All People

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Professor, Meat Science

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Red meat and death

Mortality from different causes associated with meat, heme iron, nitrates, and nitrites in the NIH-AARP Diet and Health Study: population based cohort study

Arash Etemadi, Rashmi Sinha, Mary H Ward, Barry I Graubard, Maki Inoue-Choi, Sanford M Dawsey, Christian C Abnet

Conclusions: The results show **increased risks of all cause mortality and death** due to nine different causes associated with both processed and unprocessed red meat, accounted for, in part, by heme iron and nitrate/nitrite from processed meat. They also show reduced risks associated with substituting white meat, particularly unprocessed white meat.

PubMed.gov
US National Library of Medicine
National Institutes of Health

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Rashmi Sinha, Ph.D.
Senior Investigator
Metabolic Epidemiology Branch
NCI/DCEG

67 papers since 1995

One of the IARC committee members

Well-done, grilled **red meat** increases the risk of colorectal adenomas.
62. **Sinha R**, Chow WH, Kulldorff M, Denobile J, Butler J, Garcia-Closas M, Weil R, Hoover RN, Rothman N.
Cancer Res. 1999 Sep 1;59(17):4320-4.
PMID: 10485479 Free Article
Similar articles

Fried, well-done **red meat** and risk of lung cancer in women (United States).
63. **Sinha R**, Kulldorff M, Curtin J, Brown CC, Alavanja MC, Swanson CA.
Cancer Causes Control. 1998 Dec;9(6):621-30.
PMID: 10189048
Similar articles

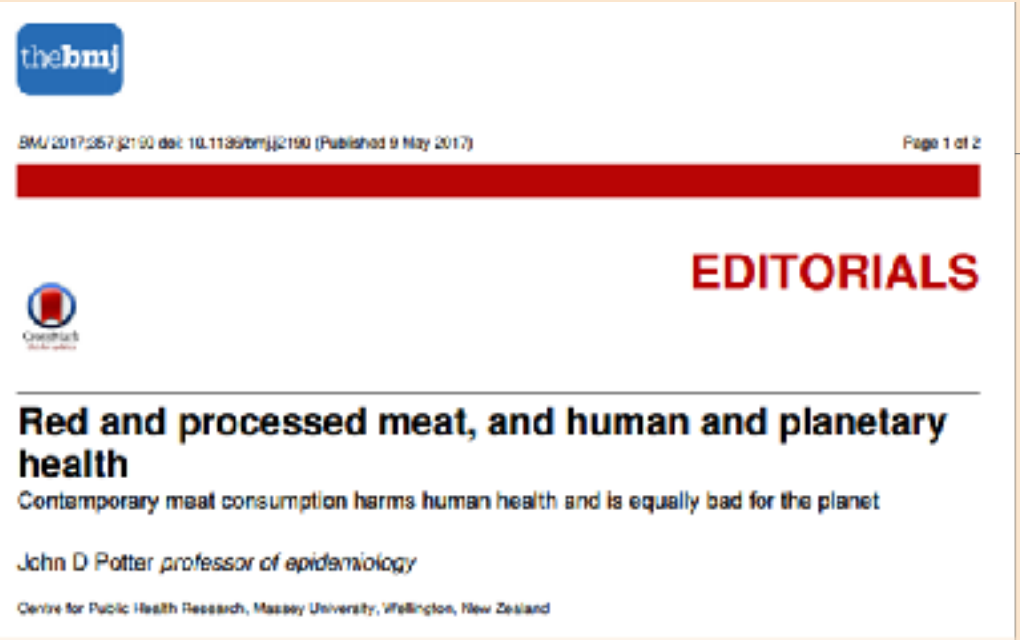
Mortality from different causes associated with meat, heme iron, nitrates, and nitrites in the NIH-AARP Diet and Health Study: population based cohort study

Arash Etemadi, Rashmi Sinha, Mary H Ward, Barry I Graubard, Maki Inoue-Choi, Sanford M Dawsey, Christian C Abnet

Nitrate/nitrite are from meat?

"Human exposure to nitrate is mainly exogenous through the consumption of vegetables, and to a lesser extent water and other foods. Nitrate is also formed endogenously. In contrast exposure to its metabolite nitrite is mainly from endogenous nitrate conversion"

European Food Safety Authority, "Nitrate in vegetables: Scientific Opinion of the Panel on Contaminants in the Food chain," The EFSA Journal (2008) 689, 1-79



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Contemporary meat consumption harms human health and is equally bad for the planet

John D Potter *professor of epidemiology*

Centre for Public Health Research, Massey University, Wellington, New Zealand

"The research community collectively understands the problem—overconsumption of meat is bad for our health and for the health of our planet"

This weak science promoted by activist groups and special interests

Animal welfare groups

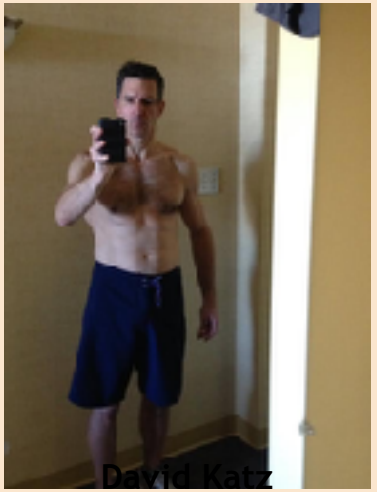
Environmental Groups

Vegan/vegetarian Diet Doctors

Neal Barnard

John McDougall

Michael Gregor



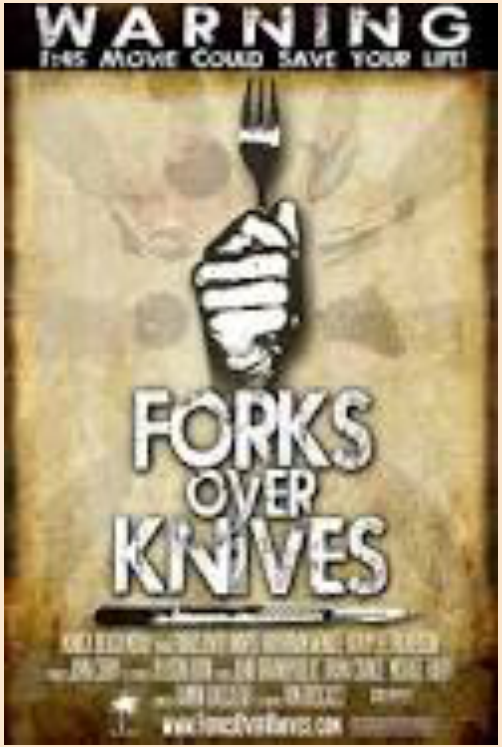
David Katz

Dean Ornish

“The ketogenic diet, sure, it will cause you to lose weight in the short term. **So would cholera, or a cocaine binge, but that doesn’t mean it’s a good idea”** ,
—Comments to the 7th International Congress on Vegetarian Nutrition

Dr. David Katz “of” Yale

Plant based diet is best for ALL.



Analysis on www.dietdoctor.com

The good and bad news

Good News for meat:

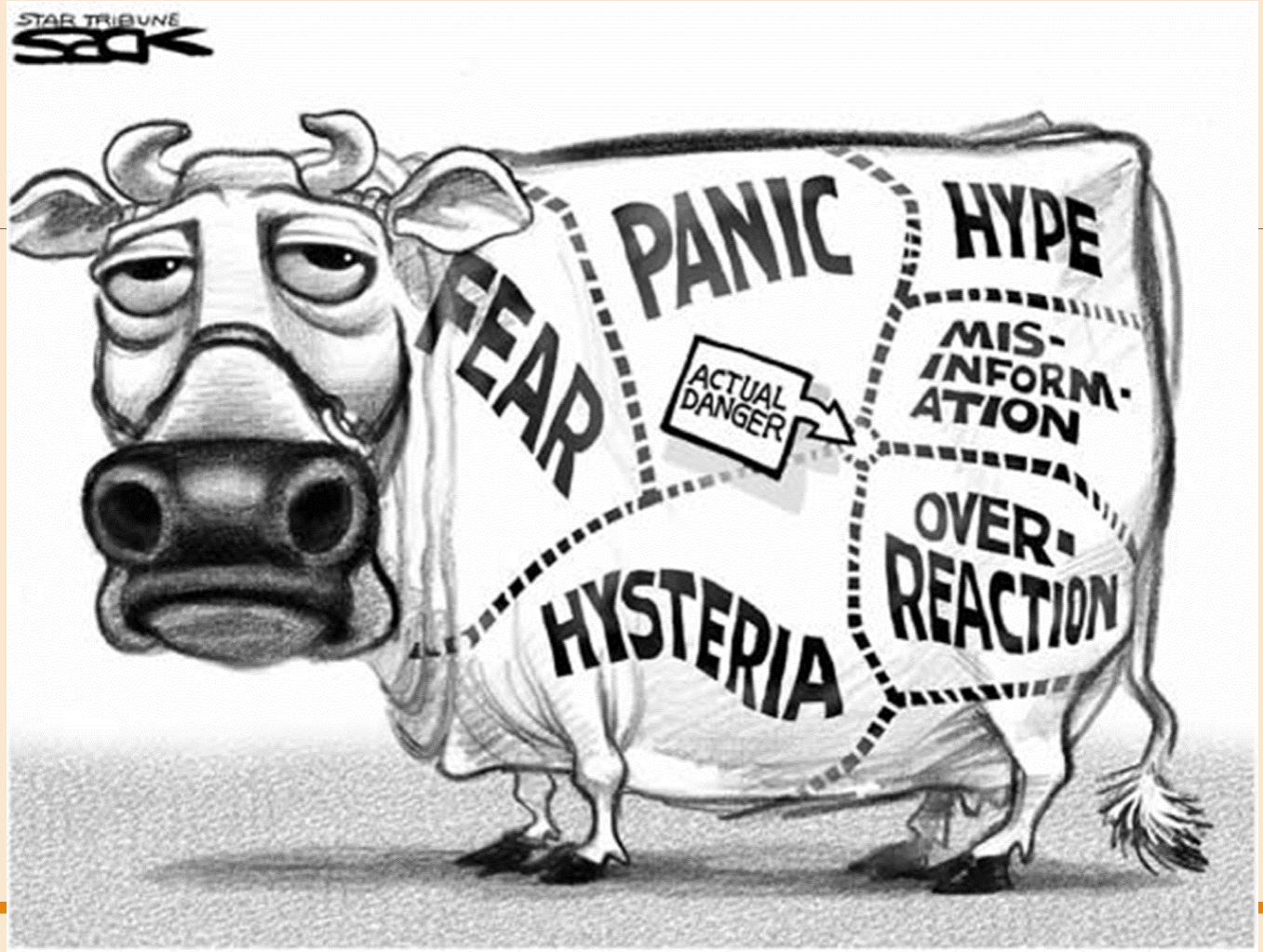
- **No evidence that red meat is bad for health**

Bad News for science:

- **Weak science is being repeated and promoted**
- **Driven by ideological, activist agendas and bias among academics**
- **"Consensus and repetition do not make weak evidence strong"**

Paul Rosenbaum "Observation and Experiment: An Introduction to Causal Inference"
p. 134

(p.s. I am not "pro red meat." I am pro *science*.)


STAR TRIBUNE
SACK
FEAR
PANIC
HYPE
ACTUAL DANGER
MIS-INFORM-ATION
HYSTERIA
OVER-REACTION

NUTRITION COALITION

For evidence-based nutrition policy

A 501(C)(3) NON-PROFIT, NON-PARTISAN
EDUCATIONAL ORGANIZATION

Washington, D.C.

USDA-US-HHS

Dietary Guidelines for Americans

USDA Feeding Programs

XX% of Americans eat one of these meals/month

- Feeding Programs for Elderly
- Special Nutritional Program for Women, Infants & Children (WIC)
- Supplemental Nutrition Assistance Program (SNAP)
- School Lunch Program

Health Professional Associations

American Academy of Pediatrics — DEDICATED TO THE HEALTH OF ALL CHILDREN™

American Diabetes Association.

eat right. Academy of Nutrition and Dietetics

AMA — AMERICAN MEDICAL ASSOCIATION

All Doctors

All Nutritionists | All Dieticians

The Military

Advice

Rations advice in mess halls

U.S. Food Supply

via FDA

Farmers

Nutrition Facts Panel

Influences food industry

The Elderly

People in Poverty

Women & Babies

Kids

Life expectancy in U.S. declaring obesity is partly to blame

XX% kids are obese

Nearly 40 YEARS of the Dietary Guidelines

2/3 of Americans are now overweight/obese

Soldiers

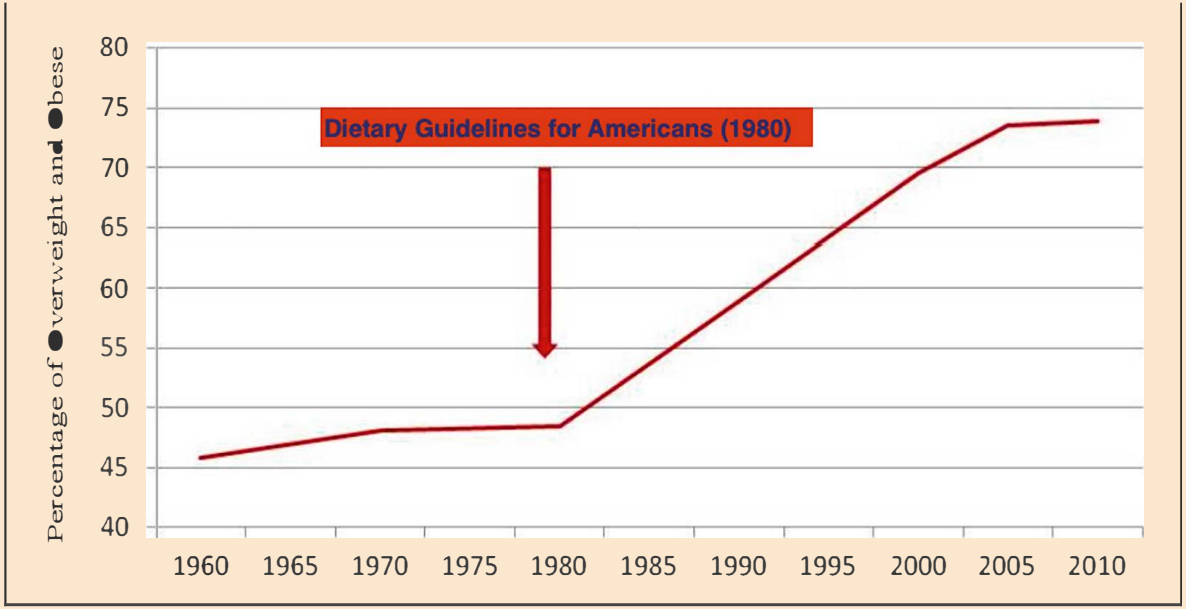
XX% of soldiers are obese

leaner pork & beef

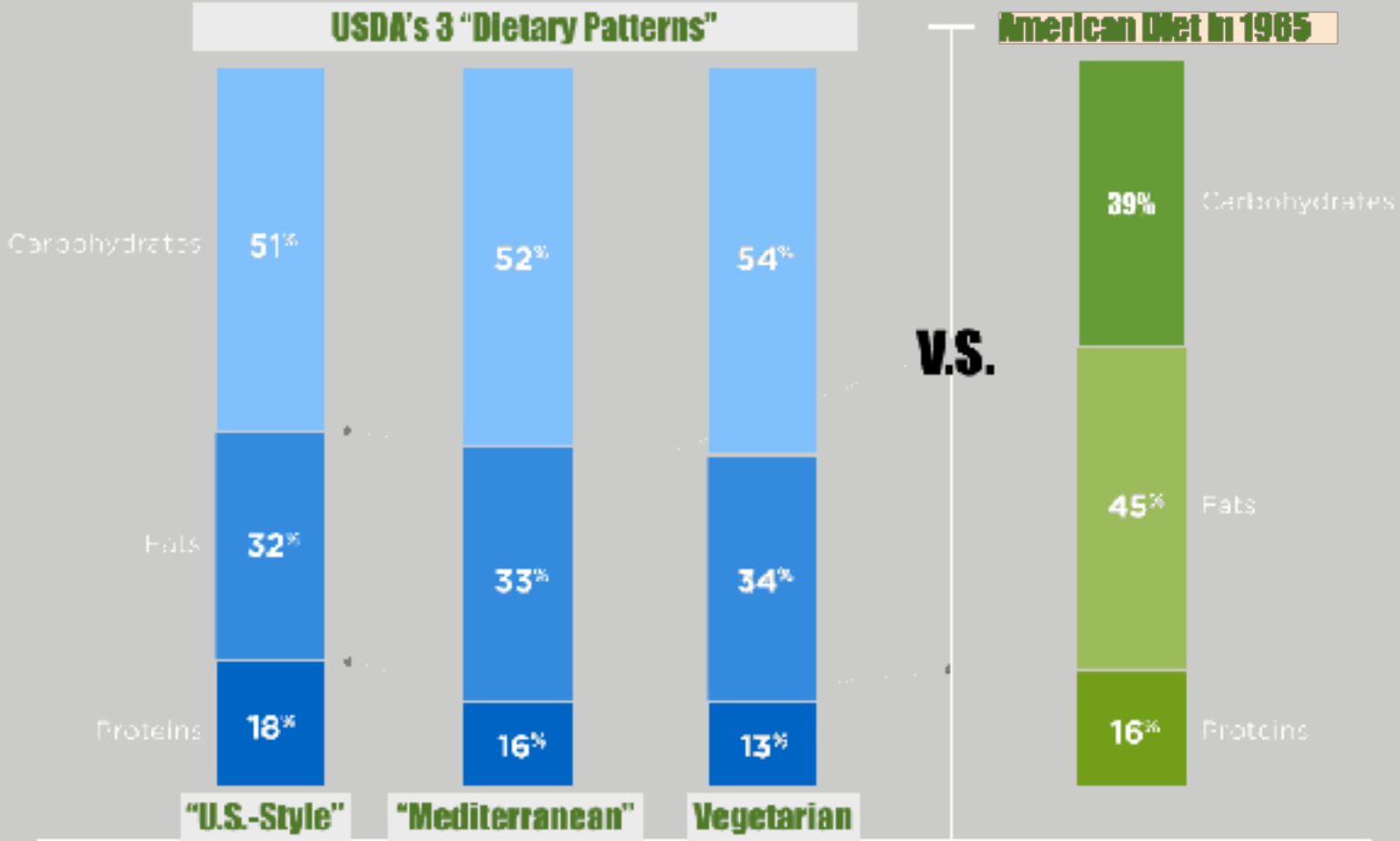
low-fat dairy

low-fat, high-grains foods

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



The HIGH-CARDOHYDRATE USDA DIETS



Other Ways the Guidelines are Wrong

- They are nutritionally insufficient

"The nutrients for which adequacy goals are not met in almost all [recommended dietary patterns] are potassium, vitamin D, vitamin E, and choline." — Scientific Report of the 2015 Dietary Guidelines Advisory Committee, (Part D, Ch 1, p. 22, lines 827-828) (Appendix E-3.1, Text and Figure 4).

- They recommend 27 grams (5 teaspoons) of vegetable oils/day
- They continue the 10% (of calories) limit on saturated fats
- They recommend "lean meat" and "low-fat dairy"

Our successes so far

REPORT EXCERPTS:

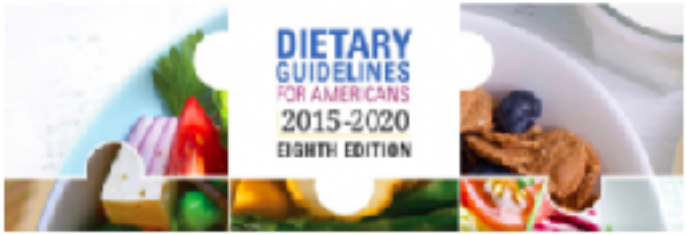
"To develop a trustworthy DGA, the process needs to be redesigned."

"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."

"The adoption and widespread translation of the DGA requires that they be universally viewed as valid, evidence-based, and free of bias and conflicts of interest to the extent possible. This has not routinely been the case."

"The methodological approaches to evaluating the scientific evidence require increased rigor to better meet current standards of practice."



USDA Aims To Add Transparency To The Dietary Guidelines

The Nutrition Coalition will submit public comments, and we encourage you to make your voices heard in this important process.

Read the Article Here »

What is the relationship between specific dietary patterns (Dietary Guidelines-related, Mediterranean-style, Dietary Approaches to Stop Hypertension (DASH), vegetarian/vegan, and low-carbohydrate diets) consumed during adulthood and 1) body weight or obesity; 2) risk of cardiovascular disease; 3) risk of type 2 diabetes; and 4) risk of certain types of cancer?

Are changes to the USDA Food Patterns needed based on the relationships identified? If so, how well do USDA Food Pattern variations meet nutrient recommendations for adults?

Saturated fats

What is the relationship between saturated fats consumption (types and amounts) during adulthood and risk of cardiovascular disease?

What can *you do?*

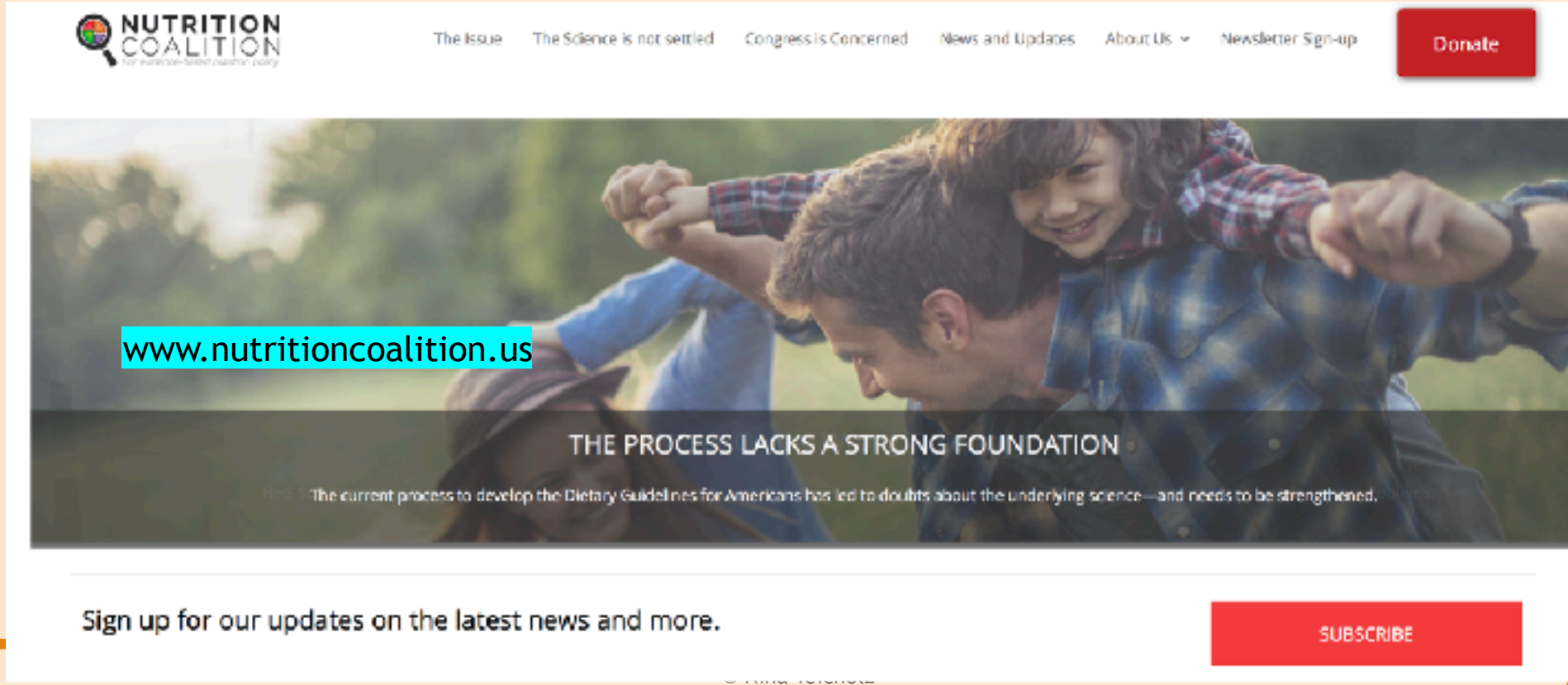
At least DO NO HARM

Petition to ROLL BACK recommendations that are NOT EVIDENCE-BASED:

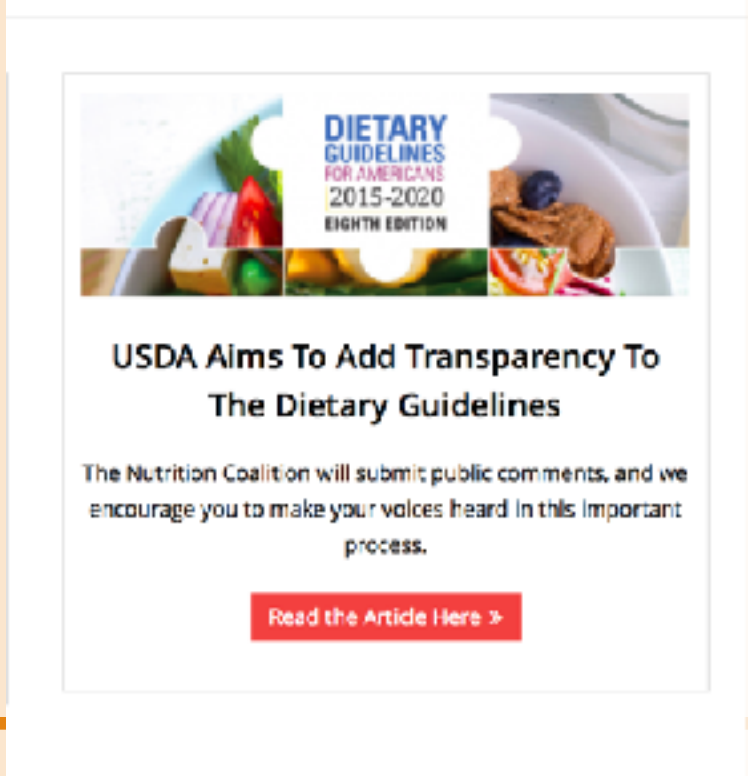
SIGN THE PETITION

www.forbetterdietaryguidelines.org

Sign up for our newsletter/donate



Submit a comment to USDA Deadline is March 30



www.nutritioncoalition.us

Host a screening of the Magic Pill film

Washington DC
Midland, TX
San Angelo, TX
Decatur, IL
New York
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Los Angeles
Philadelphia