PLANT NUTRITION AND THE HEART: IMPORTANT NEW DATA

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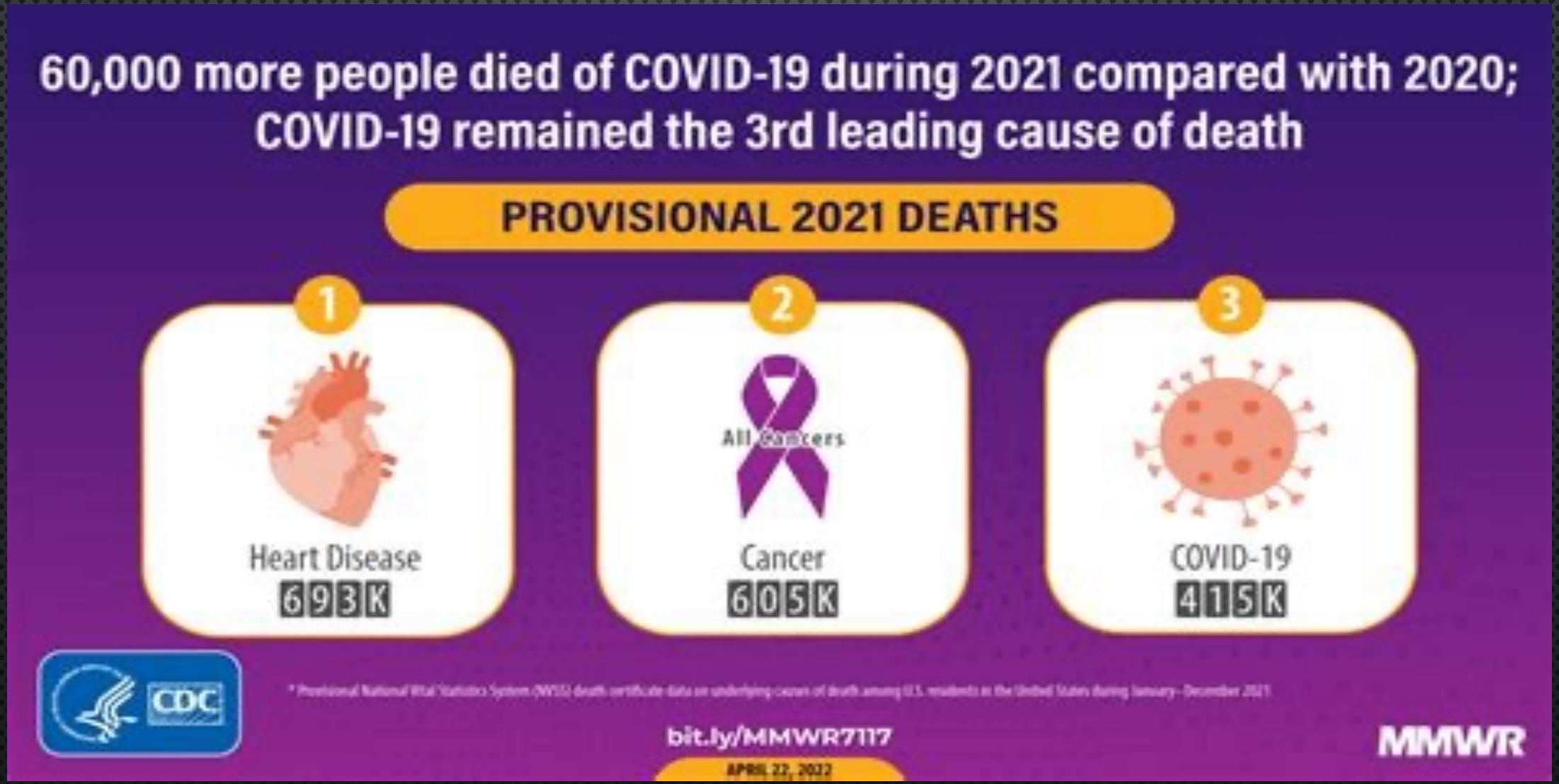
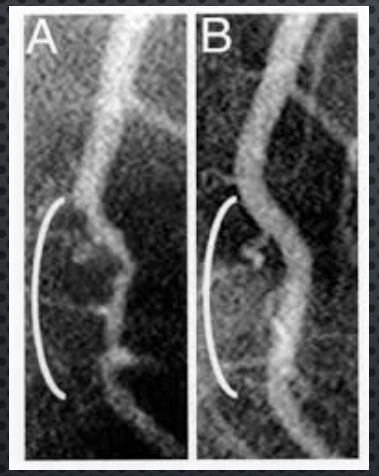
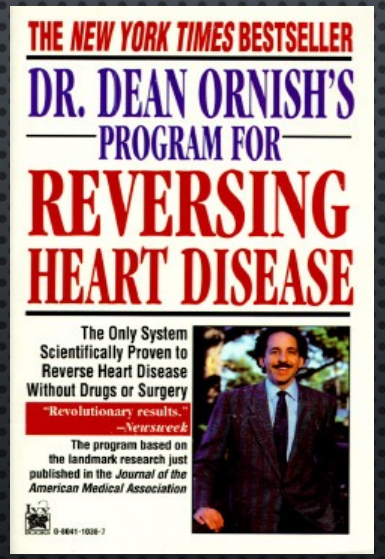
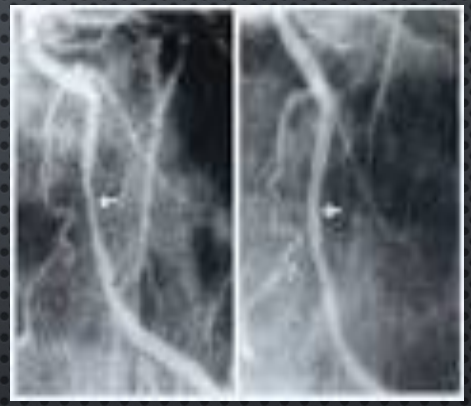
HEART DISEASE DEATHS



HEART DISEASE IS REVERSIBLE WITH DIET & LIFESTYLE: THE DATA?







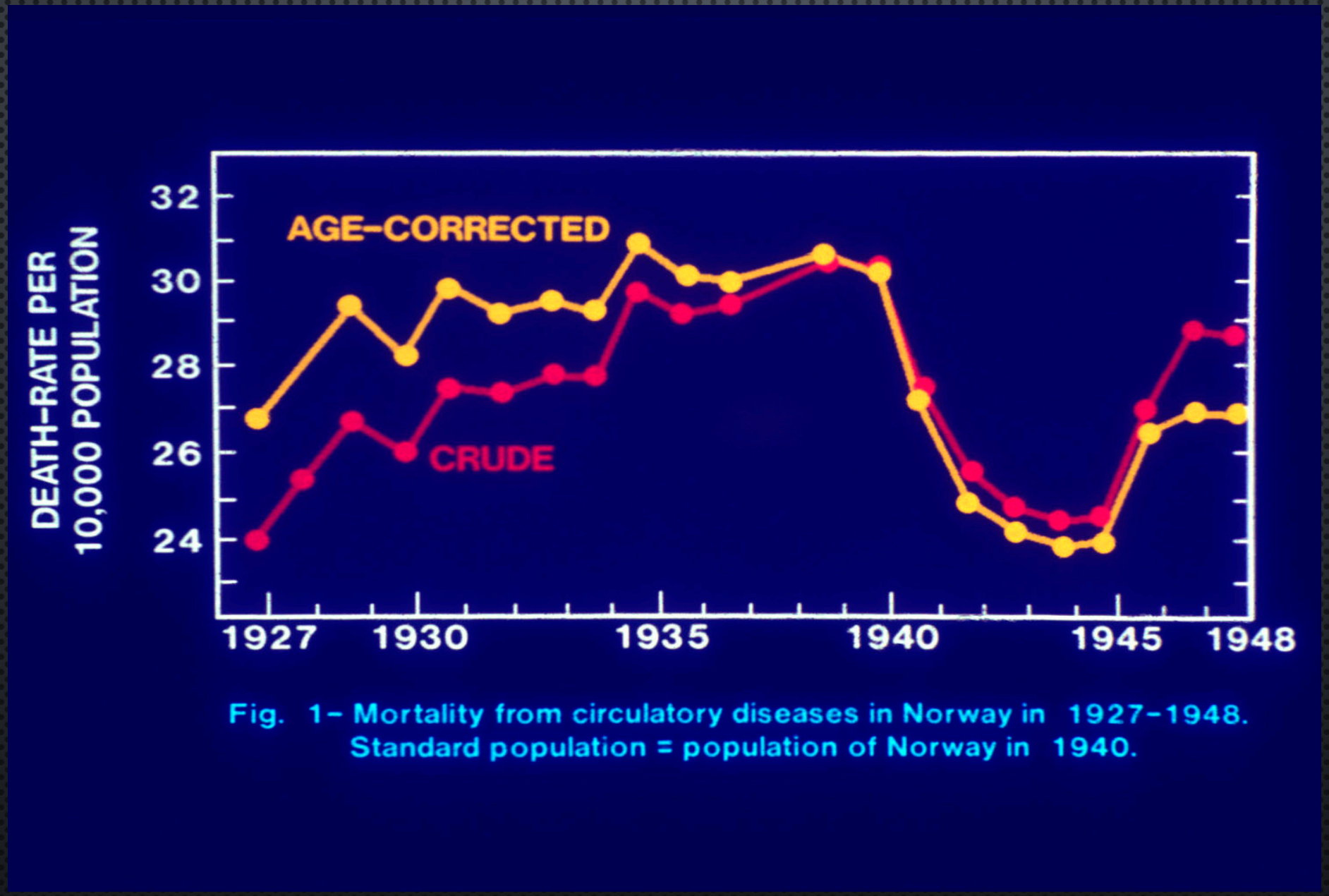
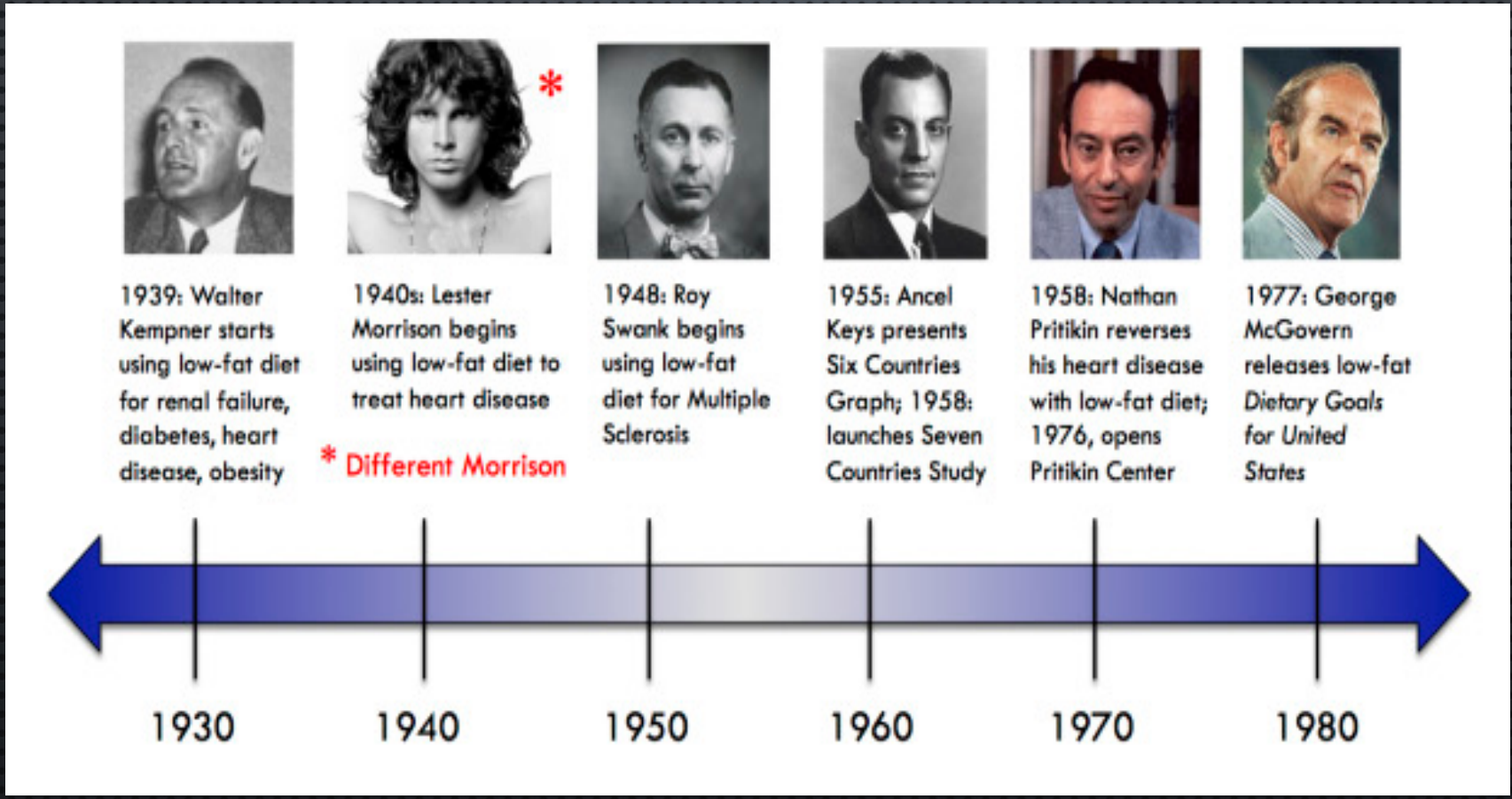


Fig. 1- Mortality from circulatory diseases in Norway in 1927-1948.
Standard population = population of Norway in 1940.

EARLY RESEARCHERS OF DIET-HEALTH



LESTER MORRISON, MD

Foods To Be Avoided

SOUPS: Cream Soups.

MEATS: All glandular organs, as liver, brains, kidney, sweetbreads; pork and very fat meats, fat fish, fish roe.

MILK AND MILK PRODUCTS: Whole milk, cream, cheddar, Swiss and all rich cheese and cheese spreads; excessive butter and butter substitutes.

EGGS: Egg yolks.

BREADS: Hot breads, pancakes, waffles, coffee cakes, muffins, doughnuts.

DESSERTS: Any made with cream and egg yolks; pies, frozen creams, rich cakes and cookies.

CONCENTRATED FATS: The excessive use of fats in any form, as salad dressings, olive or vegetable oils, suet, chicken or pork fat.

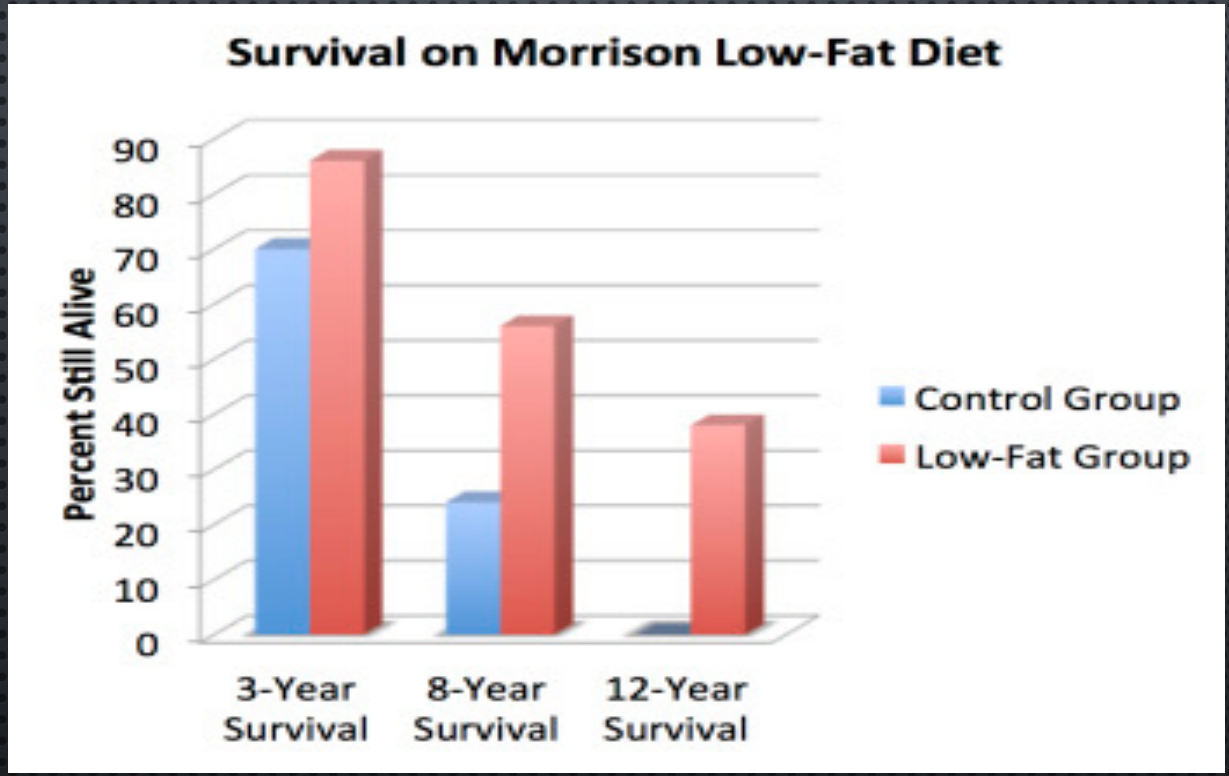
MISCELLANEOUS: Rich gravies, olives, nuts and avocados.

Reduction of Mortality Rate in Coronary Disease by a Low Cholesterol-Low Fat Diet

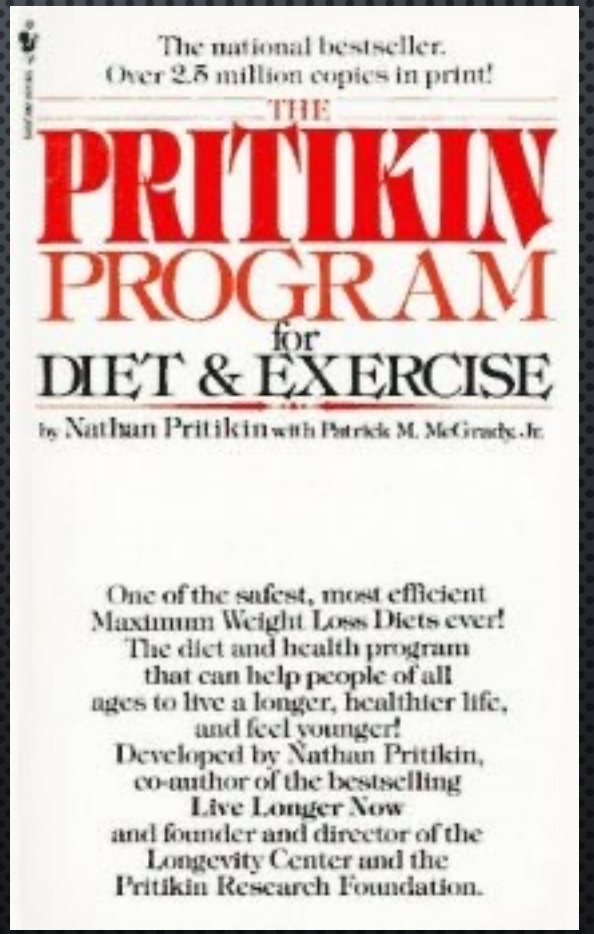
(1951) Am. Heart J. 42: 538-545.

- 100 cases 6 months post-infarction to either a low-cholesterol, low-fat diet or alternately to a control group.
- After 3 years the test group reduced 166 lbs in men and 141 lbs in women to 145 lbs and 124 lbs and cholesterol fell from 312 mg % to 220 in the diet group.
- A sense of optimism, feelings of well-being and good spirits, increased exercise tolerance, increased working capacity, and decreased angina symptoms.

MORRISON LOW-FAT DIET RESULTS



NATHAN PRITIKIN



PRITIKIN LIFESTYLE PROGRAM

- 3-week residential program with exercise and ad libitum low fat (<10% of calories) plantbased diet
- 4566 men and woman
- Mean LDL-C reduction 25% in men and 20% in woman
- Significant reductions in TG and HDL-C
- Significant 3.2% reduction in body weight

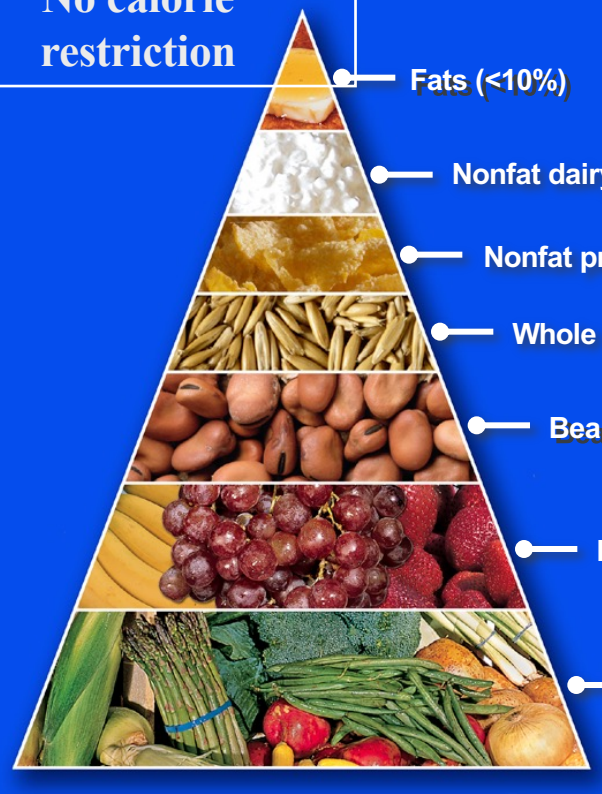
Barnard et al. *Arch Intern Med* 1991;151:1389-1394.

DEAN ORNISH, MD

Original Ornish Plan

No calorie restriction

2) Moderate exercise
3) Stress reduction
4) Smoking cessation



Fats (<10%)

Nonfat dairy products – yogurt, cheese, egg whites

Nonfat products – cereal, soups, tofu, crackers, egg beaters

Whole grain – corn, rice, oats, wheat, etc

Beans and legumes

Fruits

Vegetables

Excluded

All oils
All meats
Olives
Avocados
Nuts – seeds
High or low fat products
Sugar – syrup – honey
Alcohol

CP1095424-1

Intensive Lifestyle Changes for Reversal of Coronary Heart Disease

Dean Ornish, MD; Larry W. Scherwitz, PhD; James H. Billings, PhD, MPH; K. Lance Gould, MD; Terri A. Merritt, MS; Stephen Sparler, MA; William T. Armstrong, MD; Thomas A. Ports, MD; Richard L. Kirkeeide, PhD; Charissa Hogeboom, PhD; Richard J. Brand, PhD

Context.—The Lifestyle Heart Trial demonstrated that intensive lifestyle changes may lead to regression of coronary atherosclerosis after 1 year.

Objectives.—To determine the feasibility of patients to sustain intensive lifestyle changes for a total of 5 years and the effects of these lifestyle changes (without lipid-lowering drugs) on coronary heart disease.

Design.—Randomized controlled trial conducted from 1986 to 1992 using a randomized invitational design.

Patients.—Forty-eight patients with moderate to severe coronary heart disease were randomized to an intensive lifestyle change group or to a usual-care control group, and 35 completed the 5-year follow-up quantitative coronary arteriography.

Setting.—Two tertiary care university medical centers.

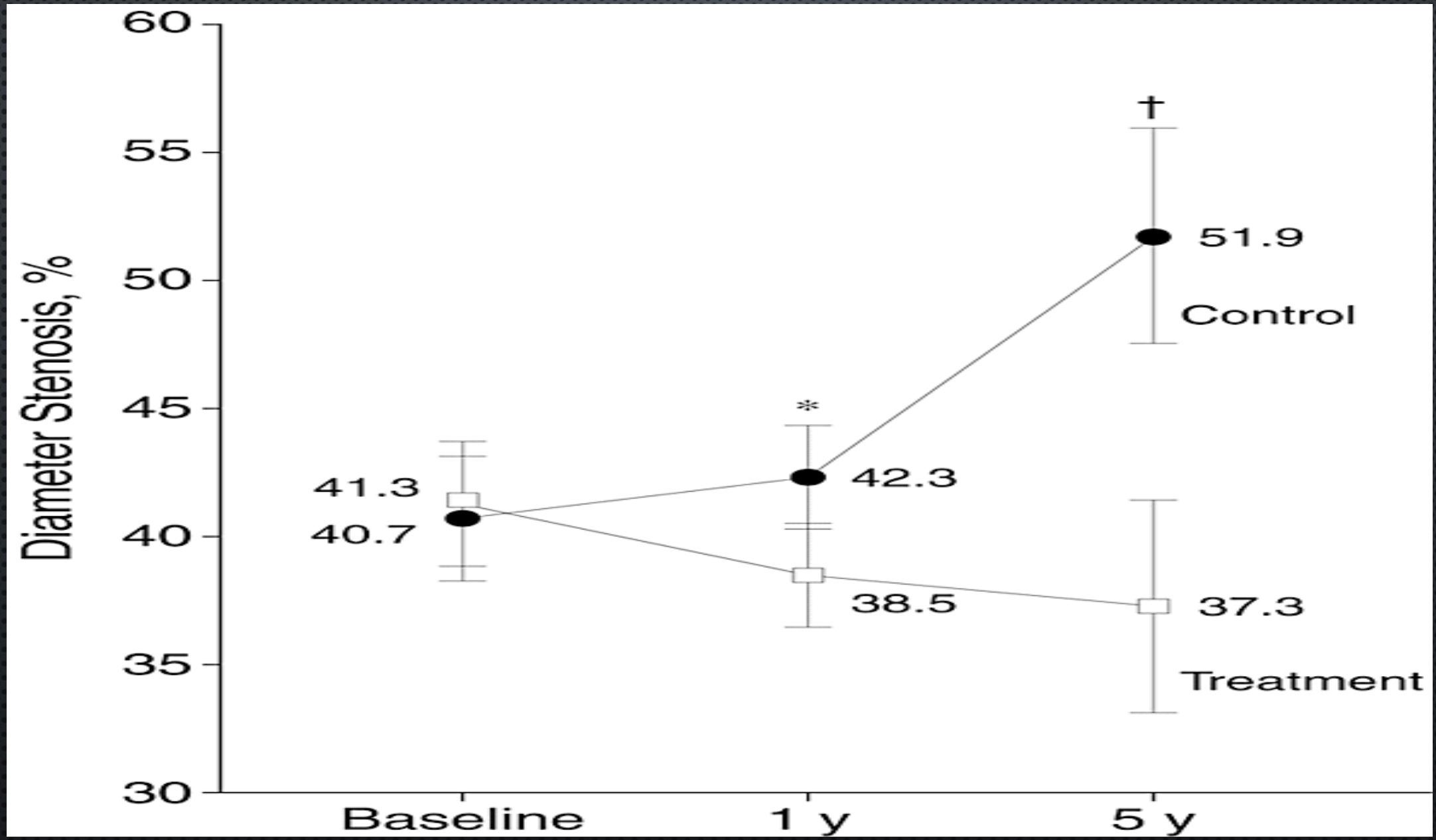
Intervention.—Intensive lifestyle changes (10% fat whole foods vegetarian diet, aerobic exercise, stress management training, smoking cessation, group psychosocial support) for 5 years.

Main Outcome Measures.—Adherence to intensive lifestyle changes, changes in coronary artery percent diameter stenosis, and cardiac events.

THE LIFESTYLE Heart Trial was the first randomized clinical trial to investigate whether ambulatory patients could be motivated to make and sustain comprehensive lifestyle changes and, if so, whether the progression of coronary atherosclerosis could be stopped or reversed without using lipid-lowering drugs as measured by computer-assisted quantitative coronary arteriography. This study derived from earlier studies that used noninvasive measures.[1,2]

After 1 year, we found that experimental group participants were able to make and maintain intensive lifestyle changes and had a 37.2% reduction in low-density lipoprotein (LDL) choles-

Ornish, D. et al. (1998). JAMA, 280, 2001–2007


Diameter Stenosis, %
60
55
50
45
40
35
30
Baseline
1 y
5 y
†
51.9
Control
*
41.3
40.7
42.3
38.5
37.3
Treatment

Ornish and Pritikin Programs Approved by CMS

In August 2010, the Centers for Medicare and Medicaid Services (CMS) approved the Ornish Program for Reversing Heart Disease and the Pritikin Program for inclusion in the list of approved intensive cardiac rehabilitation (ICR) programs for Medicaid and Medicare reimbursement.

The Ornish Program for Reversing Heart Disease (also known as the Multisite Cardiac Lifestyle Intervention Program, Multicenter Cardiac Lifestyle Intervention Program, and the Lifestyle Heart Trial program) was initially described in the 1970s and incorporates comprehensive lifestyle modifications, including exercise, a low-fat diet, smoking cessation, stress management training, and group support sessions. Extensive research has continued over the past 30 years, although the focus of the intervention (lifestyle modifications) did not change.

The Pritikin Program (also known as the Pritikin Longevity Program) originated in the 1950s and is a comprehensive program that is provided in a physician's office and incorporates a specific diet (10-15 percent of calories from fat, 15-20 percent from protein, 65-75 percent from complex carbohydrates), exercise, and counseling lasting 21-26 days. An optional residential component is also available for participants.

To qualify for reimbursement, the Ornish and Pritikin programs had to meet the ICR program requirements set forth by Congress in the Social Security Act and in CMS regulations. As required by the Social Security Act, an ICR program must show, in peer-reviewed published research, that it improves patients' cardiovascular disease through specific outcomes. The program must also demonstrate through peer-reviewed, published research that it has accomplished one or more of the following for its patients: (1) positively affected the progression of coronary heart disease, (2) reduced the need for coronary bypass surgery, and (3) reduced the need for percutaneous coronary interventions. Additionally, the program must show that it accomplished a statistically significant reduction in five or more of the following measures for patients from their levels before cardiac rehabilitation services to after cardiac rehabilitation services: (1) low density lipoprotein, (2) triglycerides, (3) body mass index, (4) systolic blood pressure, (5) diastolic blood pressure, and (6) the need for cholesterol, blood pressure, and diabetes medications. Intensive cardiac rehabilitation programs must be approved through the NCD process to ensure that they demonstrate these accomplishments; ICR sessions are limited to 72 one-hour sessions, up to six sessions per day, over a period of up to 18 weeks.

CMS staff reviewed six studies of the Pritikin program and nine on the Ornish version appearing in peer-reviewed publications. Ornish's most recent study—"The Effectiveness and Efficacy of an Intensive Cardiac Rehabilitation Program in 24 Sites"—was published in the March/April issue of *The Science of Health Promotion*. This study summarizes the experience of almost 3,000 patients who went through 24 different hospital programs that the Preventive Medicine Research Institute trained in various parts of the country. In brief, the investigators found significant improvements in all metrics and that these were sustained for at least one year.

Individual hospitals and clinics wishing to provide the Ornish program for the Medicare and Medicaid patients should go tohttp://www.pmri.org/certified_programs.html for further information. Additional information and the official CMS approval is listed at: http://www.cms.gov/MedicareApprovedFacilitie/07_ICR.asp#TopOfPage.

Bravewell Seeks Best Practices

The Bravewell Collaborative has launched a new program to recognize and highlight best practices from integrative medicine centers and programs throughout the United States. The submission process is open to anyone. Best practices are reviewed by a committee of experts and, if approved, posted on the Bravewell Web site to share with the field.

"By documenting best practices and making them easily available to those working within health care, we hope to bring attention to how integrative medicine can improve patient care," said Teresa Bonner, vice president of programs for the Bravewell Collaborative.

Best practices should be submitted to: info@bravewell.org. Please put "Best Practices" in the subject line.

Criteria

To be considered a best practice, the model, program, or intervention must have been in use for the more than three years and be based on documented patient outcomes. Please include information on the following in the submission:

- name and contact information of author
- name and description of clinic, center, or hospital where the practice is in use
- what health challenge is being treated
- a complete description of the model of care, program, or practice
- what type of healthcare providers deliver the best practice and how they are credentialed
- how patients are recruited or selected for the practice
- patient intake and assessment forms used
- patient outcomes data
- any cost-effectiveness data
- a description of how the program or practice interfaces with the larger organization

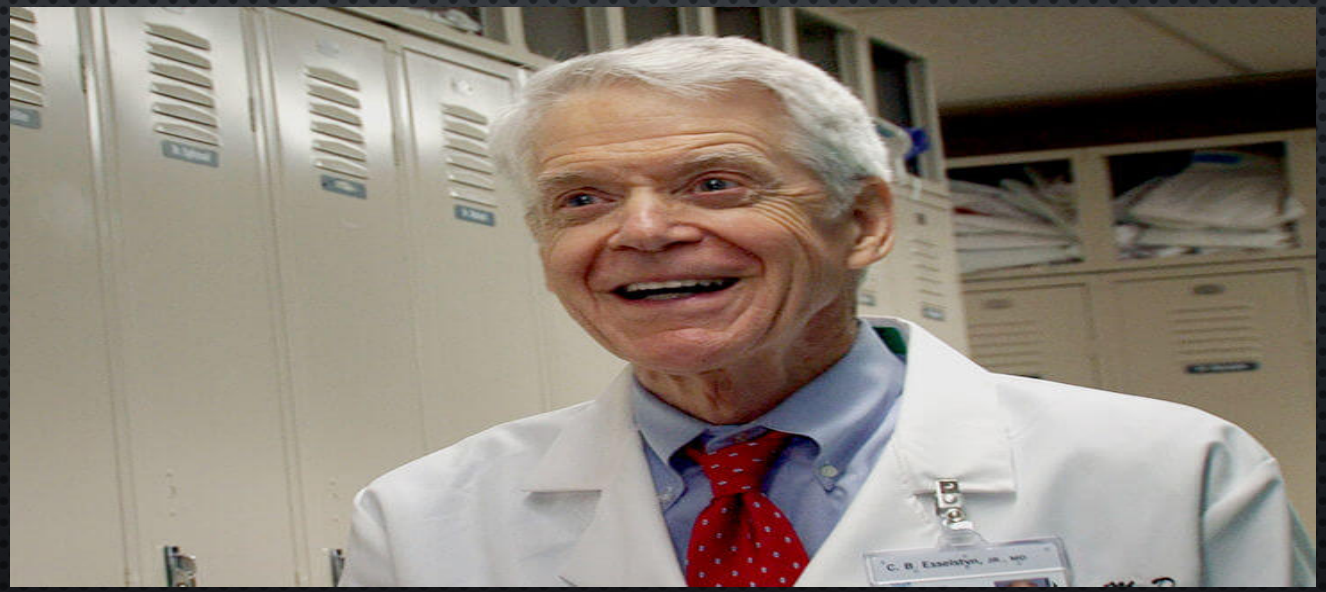
George Family Foundation Integrative Nursing Fellowship

The George Family Foundation recently awarded a grant of $556,000 to the Center for Spirituality & Healing at the University of Minnesota to create a fellowship and cocurricular program that will prepare nurse leaders in integrative health and healing.

Over the next six years, the fellowship program will provide unprecedented clin-

A STRATEGY TO ARREST AND REVERSE CORONARY ARTERY DISEASE: A 12-YEAR LONGITUDINAL STUDY OF A SINGLE PHYSICIAN'S PRACTICE

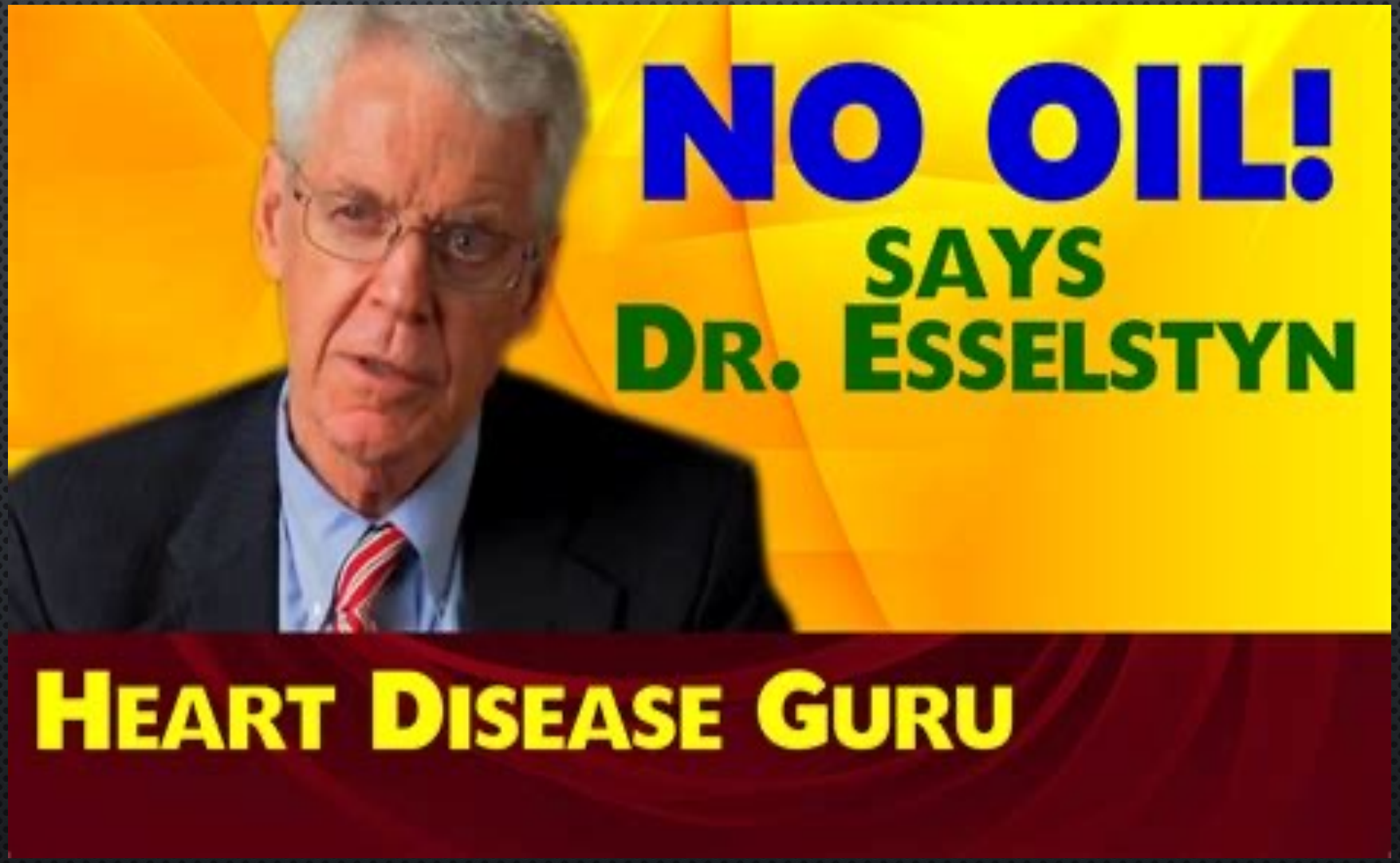
Caldwell B. Esselstyn, Jr., MD



EXCLUDED

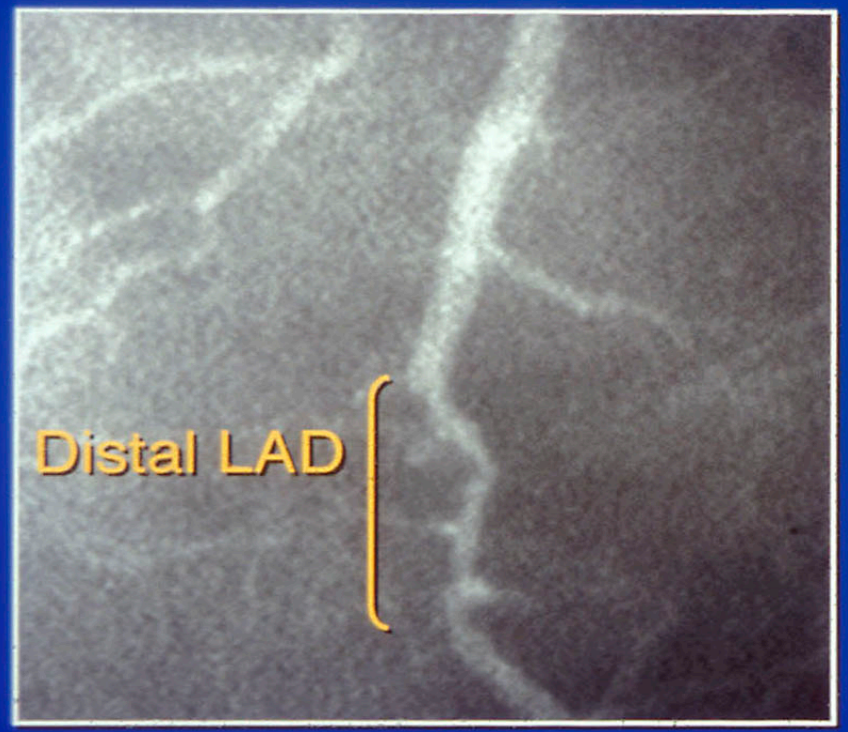
- **ADDED OILS**
- FISH
- FOWL
- MEAT
- ALL DAIRY

Diet – 11% fat – plant based
Cholesterol lowering medication
Unstructured exercise

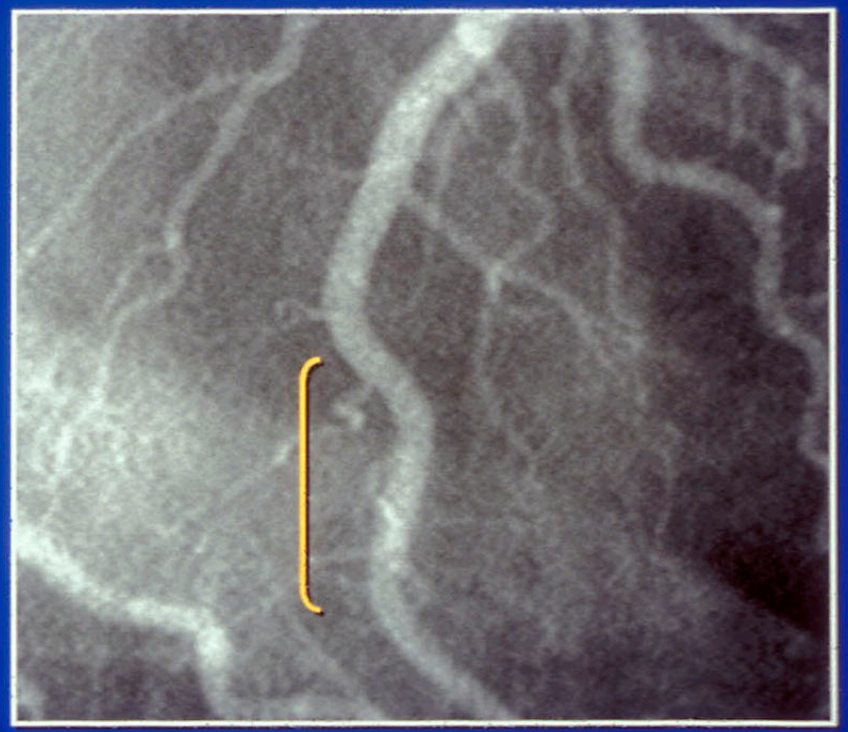

NO OIL!
SAYS
DR. ESSELSTYN
HEART DISEASE GURU

Reversal of Coronary Disease

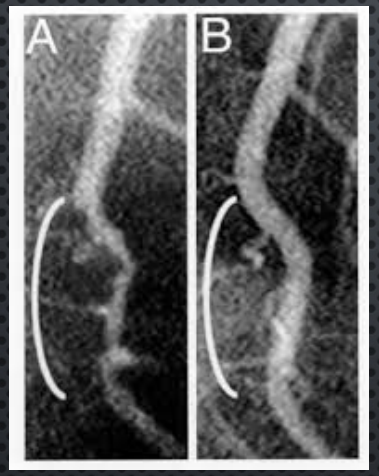
November 27,1996

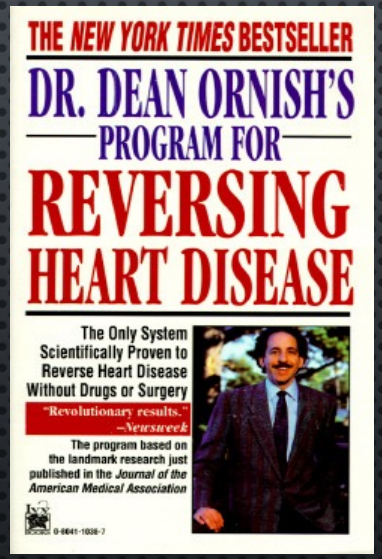


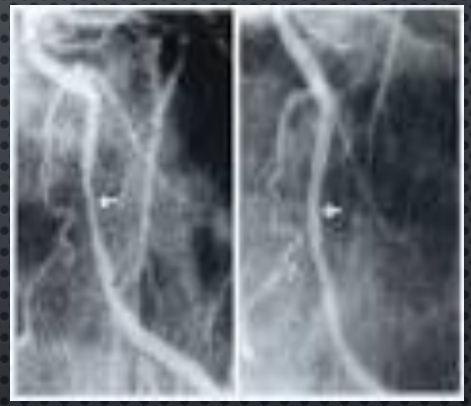
July 22, 1999



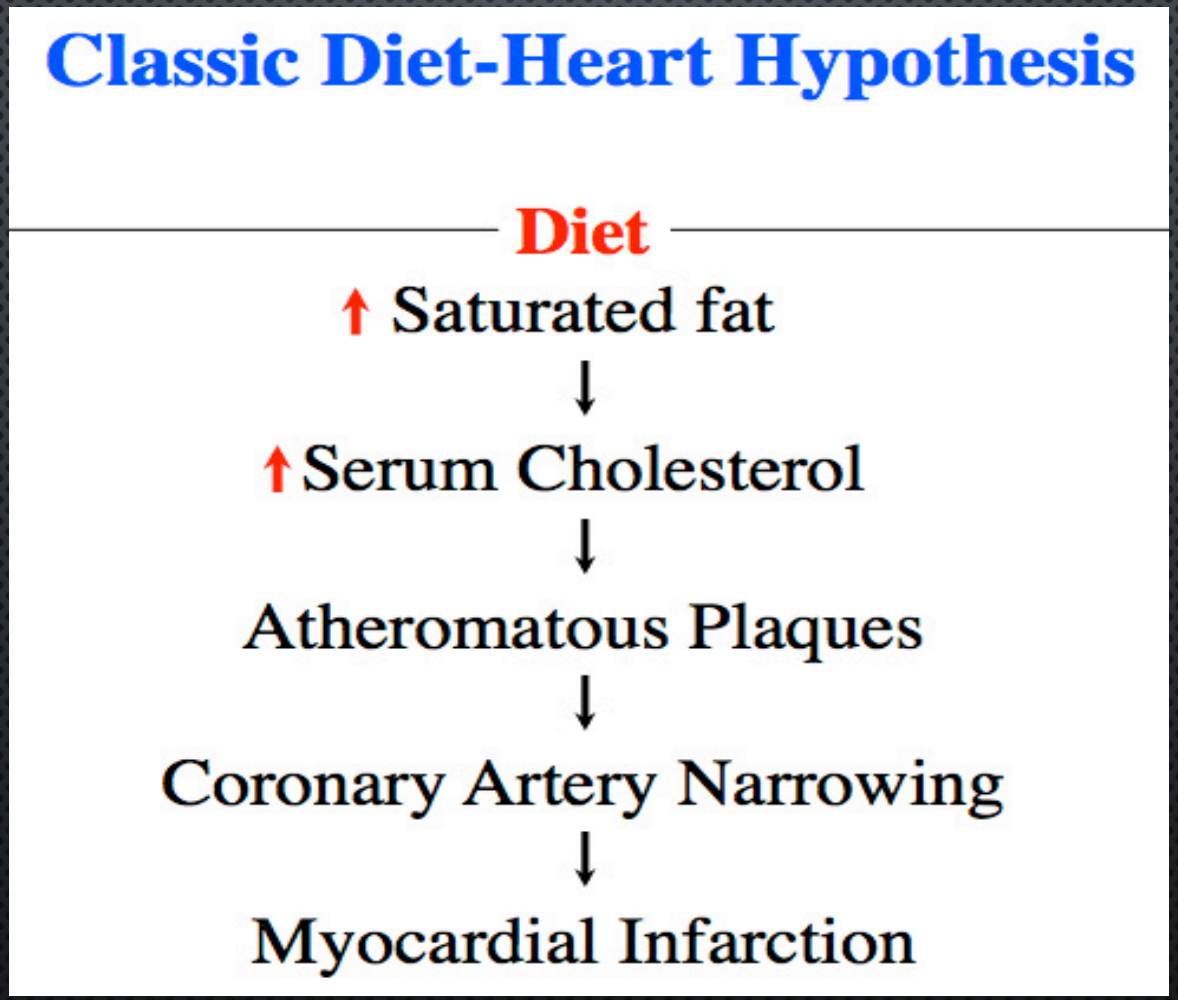
HEART DISEASE IS REVERSIBLE WITH DIET & LIFESTYLE!



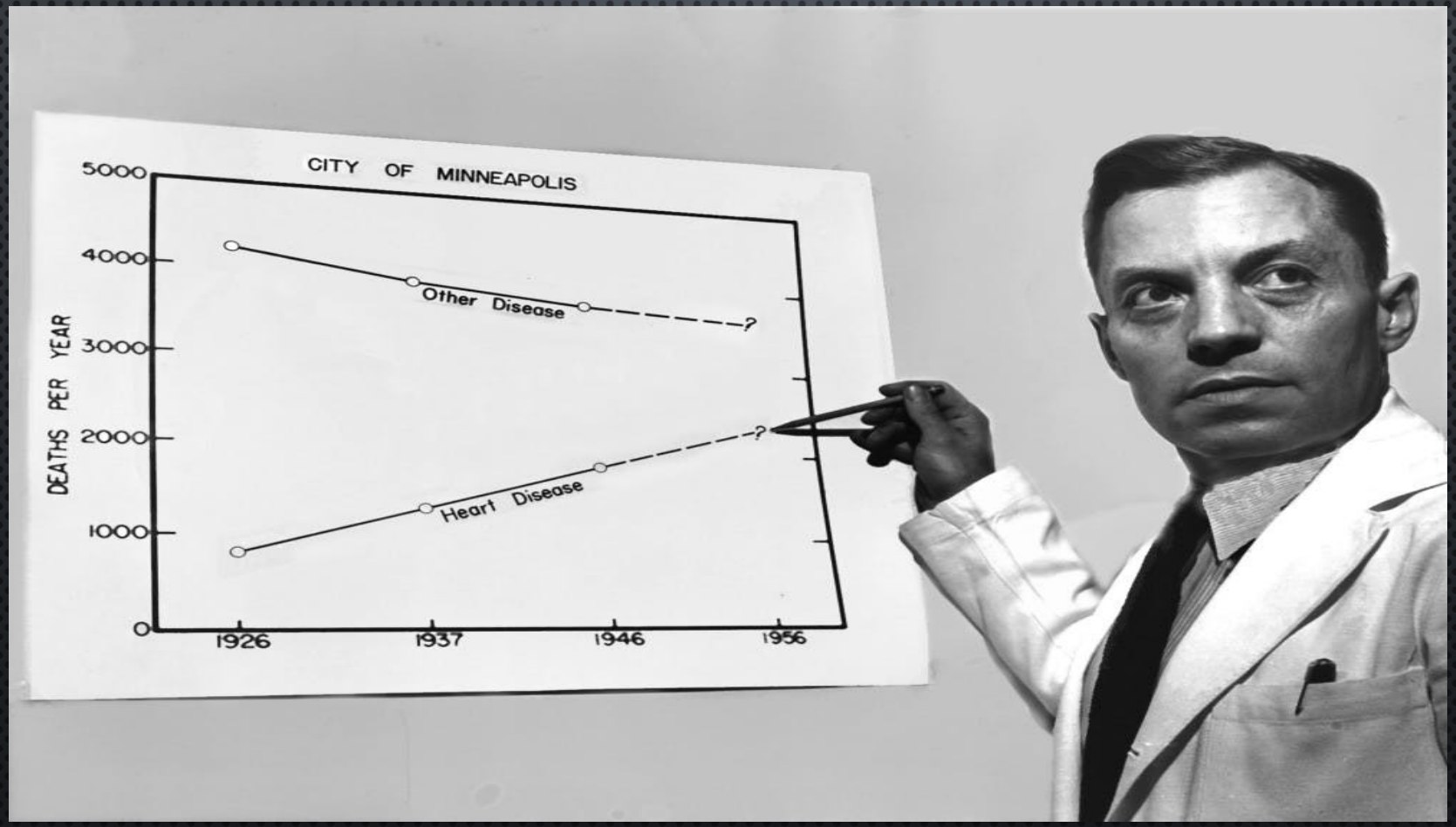




Diet and Heart Disease: More Details

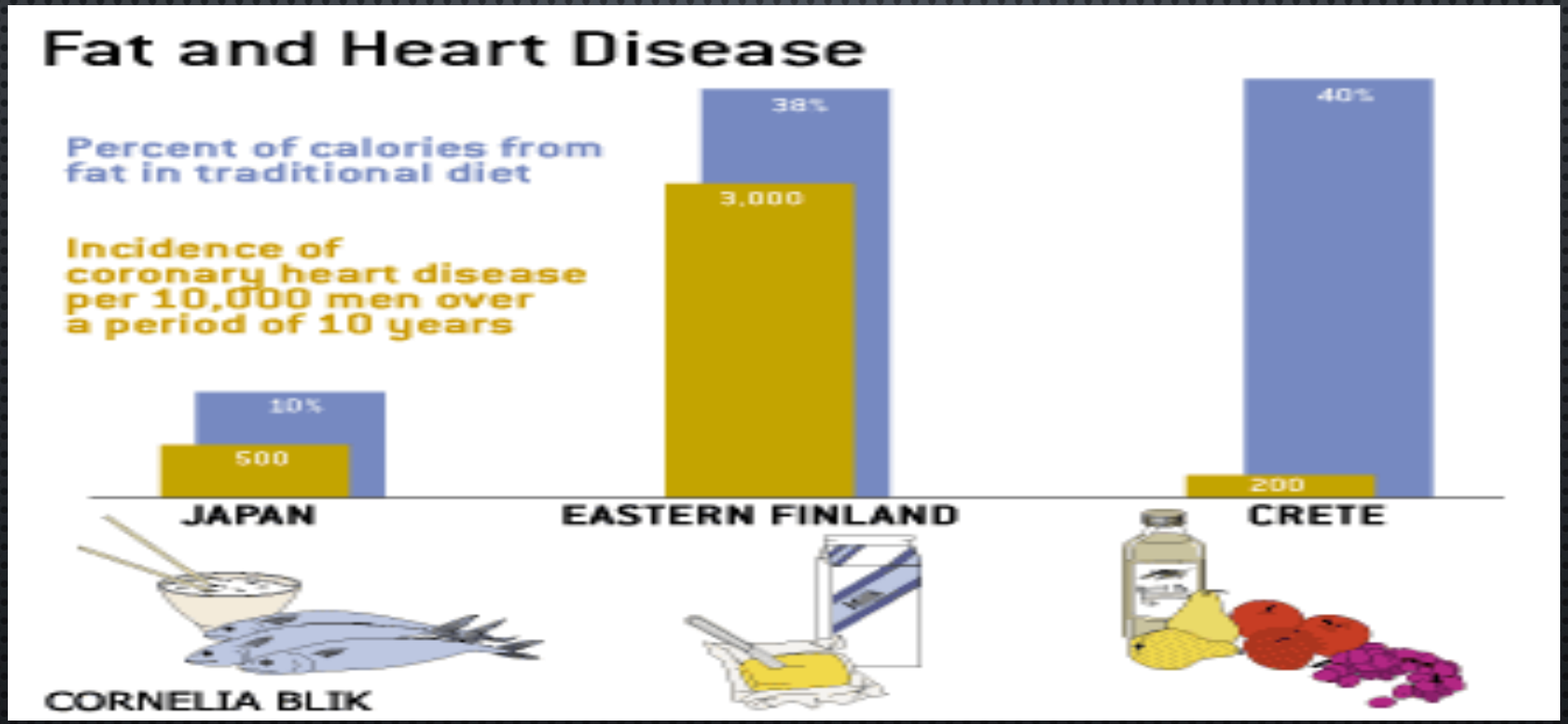


THE RISE IN HEART ATTACKS IN THE USA

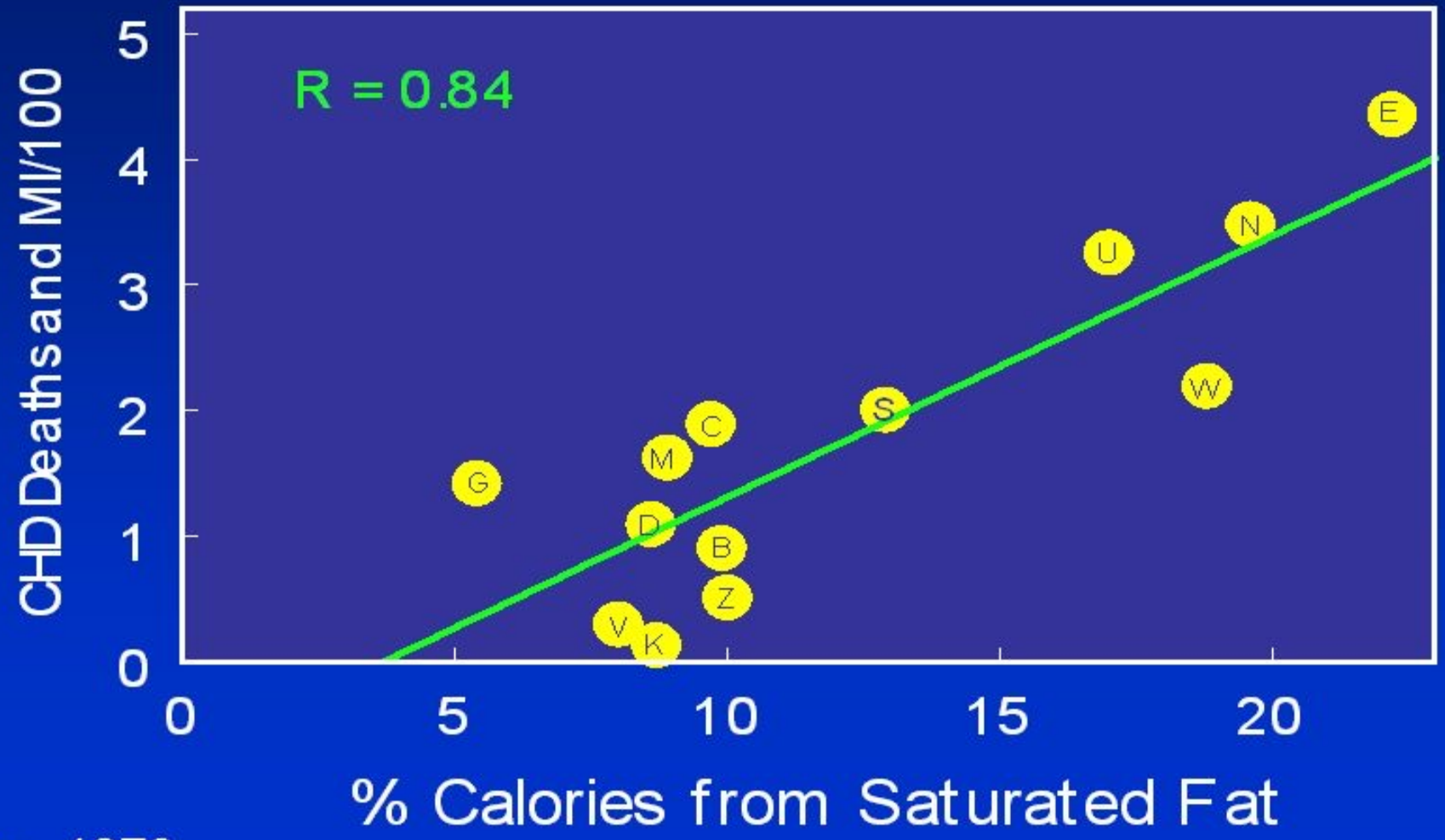


The 7 Seven Countries Study

NOT ALL FATS WERE THE SAME RISK OF CAD

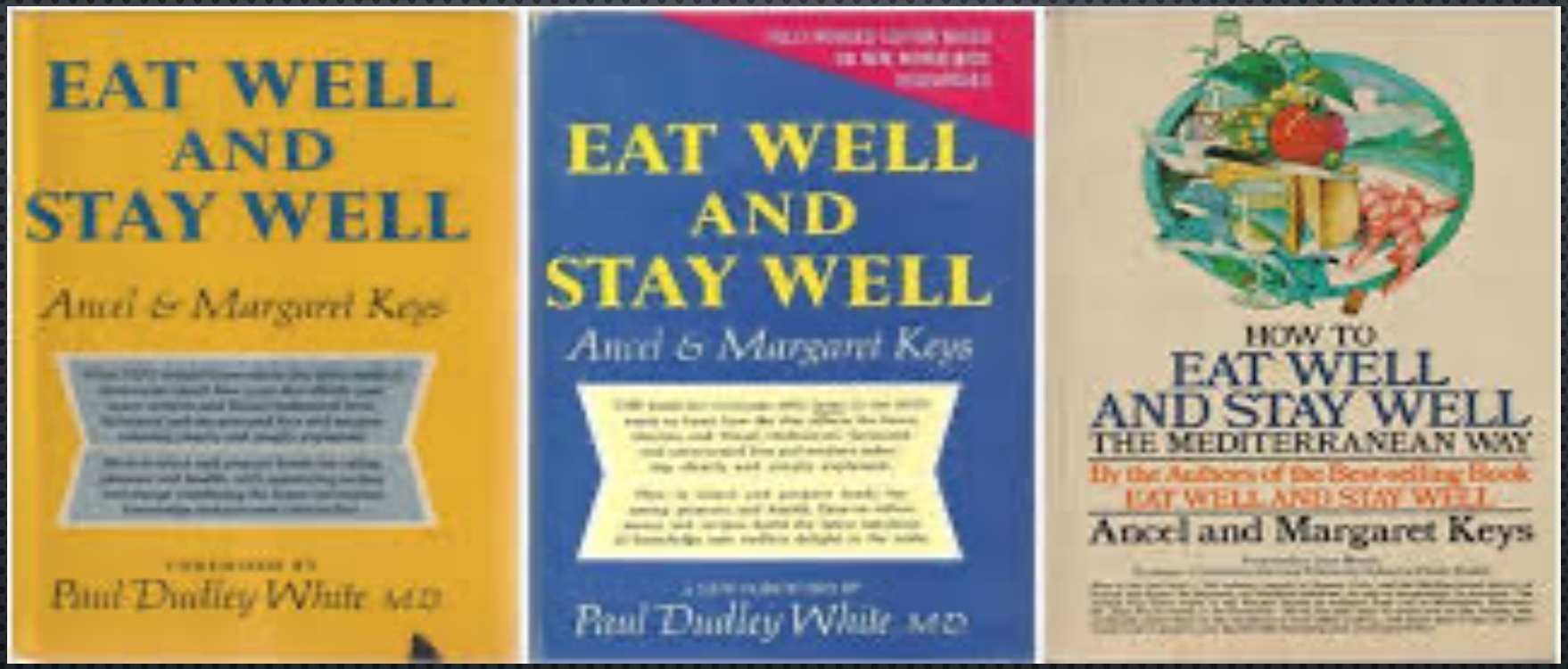


Seven Countries Study: CHD Events are Better Correlated with Saturated Fat

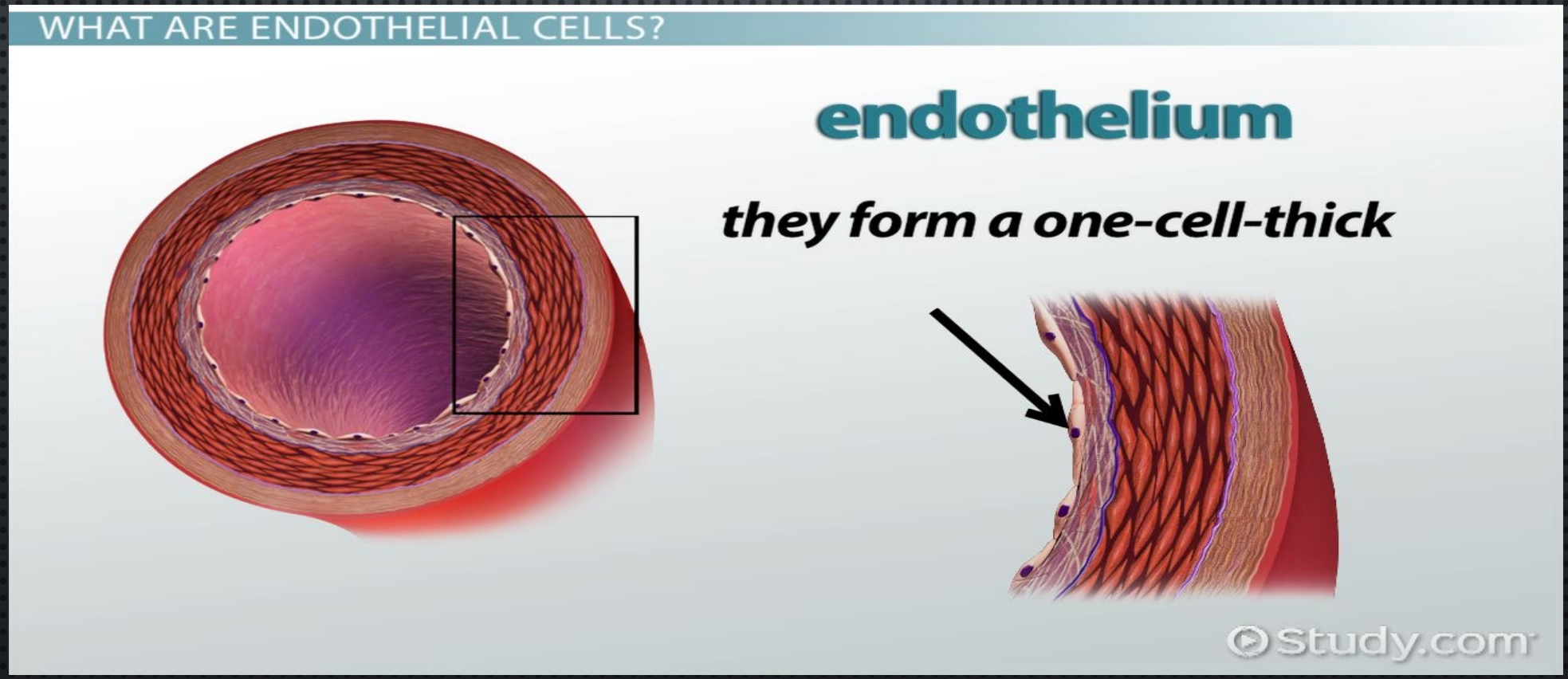


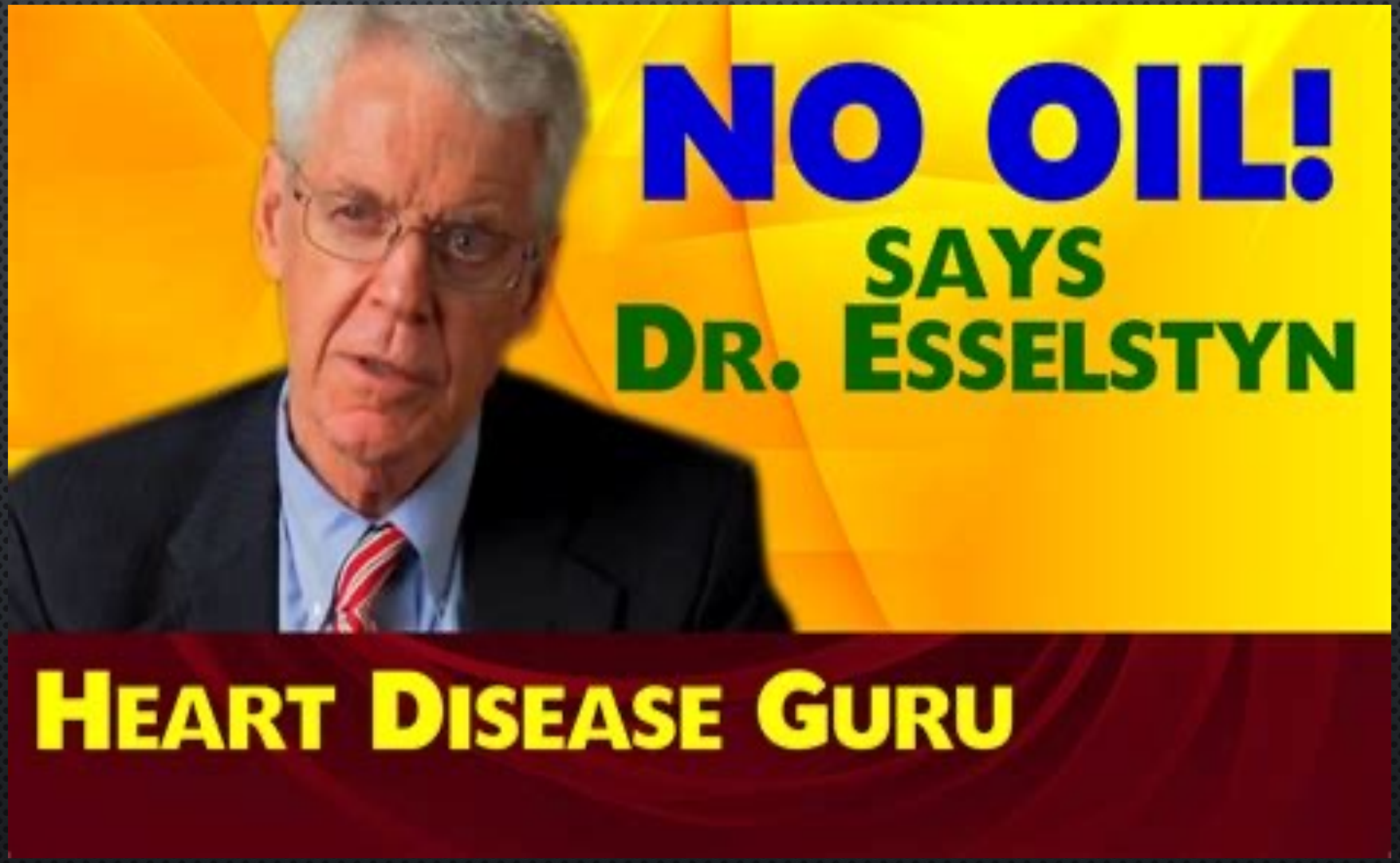
Keys, 1970

KEYS: SCIENTIST AND AUTHOR

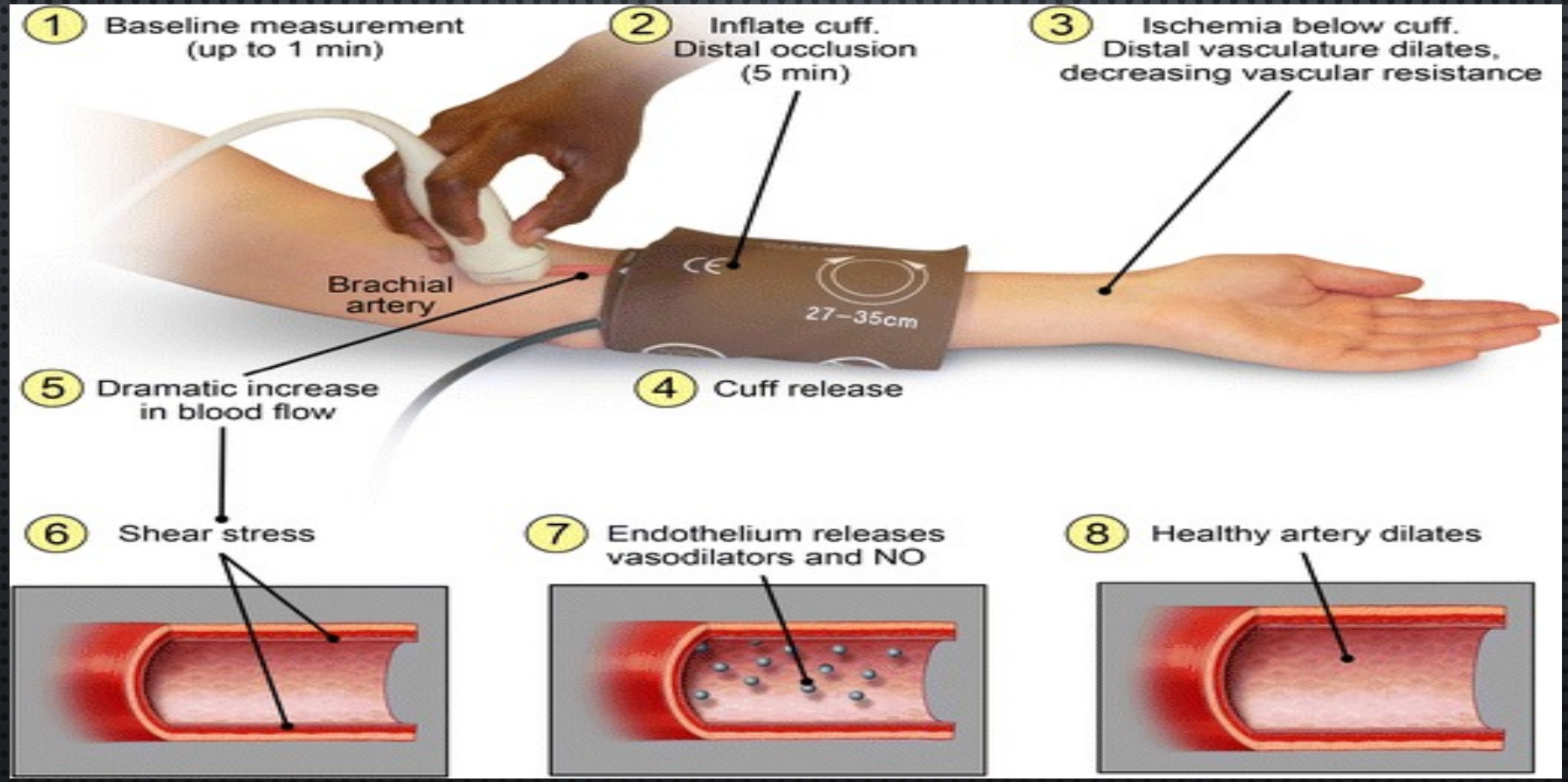


DOES OLIVE OIL HARM ARTERIES?




NO OIL!
SAYS
DR. ESSELSTYN
HEART DISEASE GURU

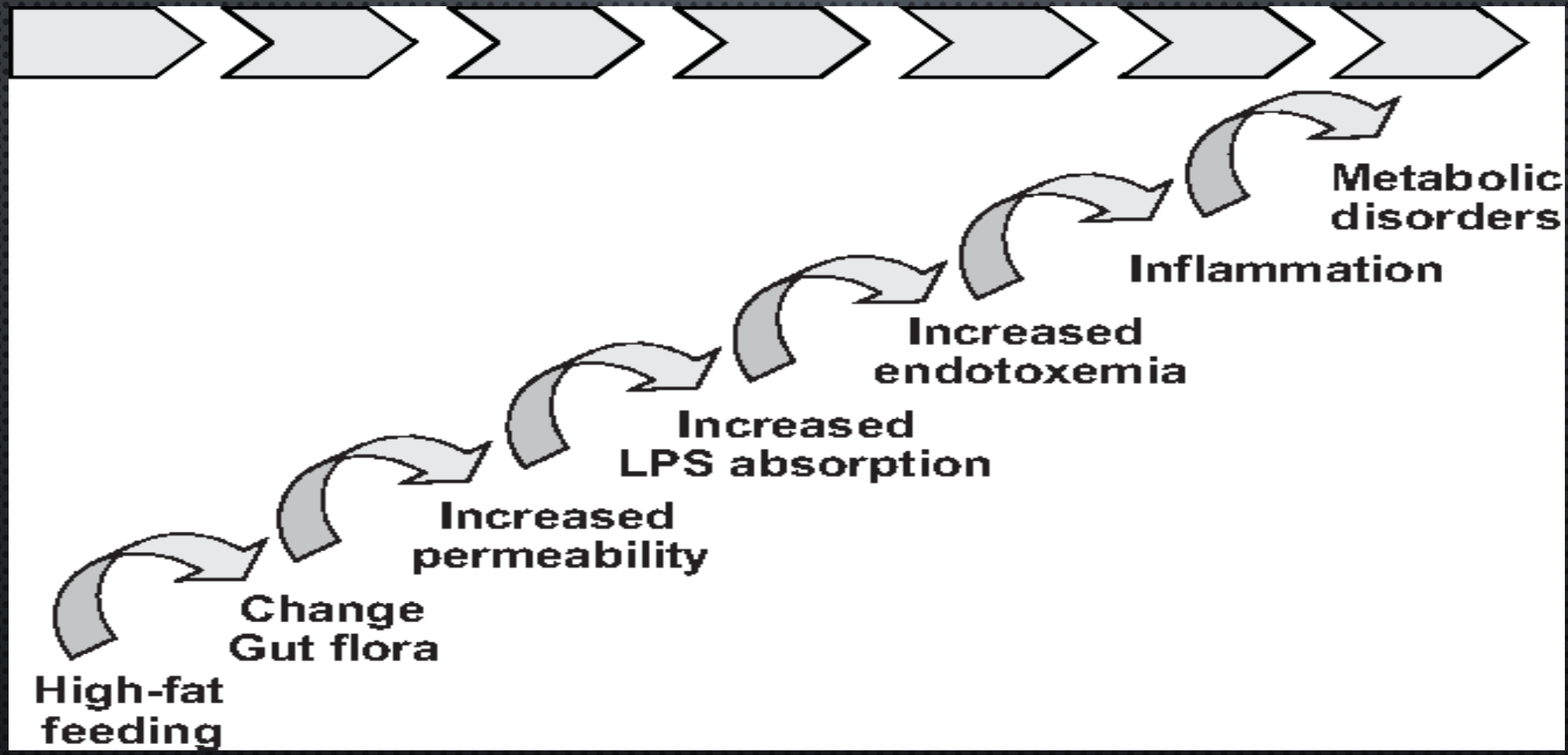
FLOW MEDIATED DILATION FMD



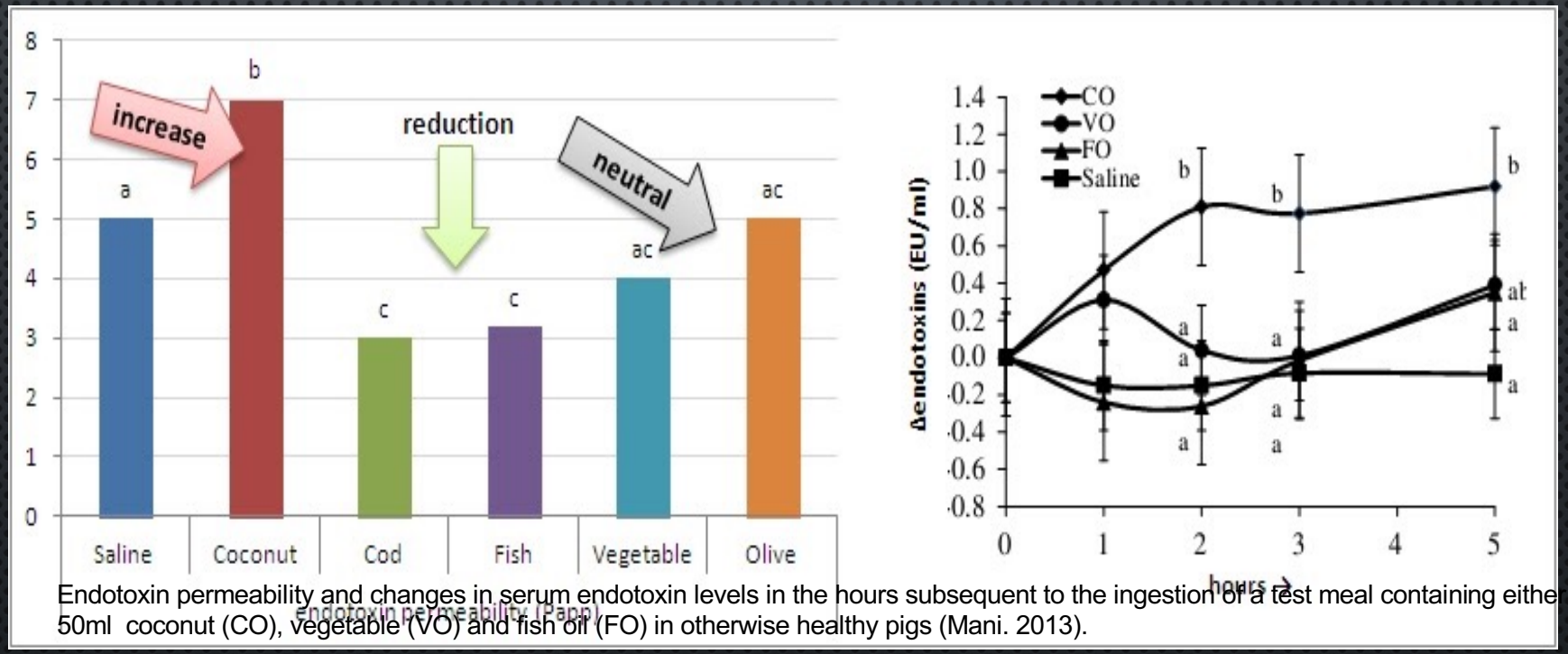
Olive, soybean and palm oils intake have similar acute detrimental effect over the endothelial function in healthy young subjects

- 10 healthy young volunteers
- Potato soup with 60 cc of one of three vegetable oils fresh or fried
- Flow mediated dilatation (FMD) measured 1 and 3 hours
- All meals dropped FMD equally, 32%
- No Oil Free Soup group
- Rueda-Clausen CF Nutri Metab CVD 2007 17:50-57

METABOLIC ENDOTOXEMIA: DANGEROUS DOMINO EFFECT



TYPES OF DIETARY FATS AND ENDOTOXEMIA



Endotoxin permeability and changes in serum endotoxin levels in the hours subsequent to the ingestion of a test meal containing either 50ml coconut (CO), vegetable (VO) and fish oil (FO) in otherwise healthy pigs (Mani. 2013).

*Nutrition & Metabolism*2013**10**:6 https://doi.org/10.1186/1743-7075-10-6

THE FAMOUS "VOGEL" STUDY

Journal of the American College of Cardiology
© 2000 by the American College of Cardiology
Published by Elsevier Science Inc.

Vol. 36, No. 5, 2000
ISSN 0735-1097/00/$20.00
PII S0735-1097(00)00896-2

The Postprandial Effect of Components of the Mediterranean Diet on Endothelial Function

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Baltimore, Maryland

OBJECTIVES This study investigated the postprandial effect of components of the Mediterranean diet on endothelial function, which may be an atherogenic factor.

BACKGROUND The Mediterranean diet, containing olive oil, pasta, fruits, vegetables, fish, and wine, is associated with an unexpectedly low rate of cardiovascular events. The Lyon Diet Heart Study found that a Mediterranean diet, which substituted omega-3-fatty-acid-enriched canola oil for the traditionally consumed omega-9 fatty-acid-rich olive oil, reduced cardiovascular events.

METHODS We fed 10 healthy, normolipidemic subjects five meals containing 900 kcal and 50 g fat. Three meals contained different fat sources: olive oil, canola oil, and salmon. Two olive oil meals also contained antioxidant vitamins (C and E) or foods (balsamic vinegar and salad). We measured serum lipoproteins and glucose and brachial artery flow-mediated vasodilation (FMD), an index of endothelial function, before and 3 h after each meal.

RESULTS All five meals significantly raised serum triglycerides, but did not change other lipoproteins or glucose 3 h postprandially. The olive oil meal reduced FMD 31% (14.3 ± 4.2% to 9.9 ± 4.5%, $p = 0.008$). An inverse correlation was observed between postprandial changes in serum triglycerides and FMD ($r = -0.47$, $p < 0.05$). The remaining four meals did not significantly reduce FMD.

CONCLUSIONS In terms of their postprandial effect on endothelial function, the beneficial components of the Mediterranean and Lyon Diet Heart Study diets appear to be antioxidant-rich foods, including vegetables, fruits, and their derivatives such as vinegar, and omega-3-rich fish and canola oils. (J Am Coll Cardiol 2000;36:1455–60) © 2000 by the American College of Cardiology

The Mediterranean diet, comprised largely of olive oil, pasta, fruits, vegetables, fish, and wine, is associated with a low rate of cardiovascular events (1,2). This observation is unexpected because this diet is associated with a serum cholesterol level similar to that of other countries with higher prevalences of heart disease. Other observational studies have found inverse correlations between coronary disease prevalence and the intake of fish, fruits, and vegetables (3–6). The Lyon Diet Heart Study reported a reduction in cardiovascular events in coronary heart disease (CHD) subjects randomized to a Mediterranean diet that substituted α-linolenic acid (omega-3 fatty acid) enriched canola oil for the traditionally consumed predominately omega-9 olive oil (7,8). This diet did not change serum lipoproteins, suggesting an alternative beneficial mechanism. Other prospective diet trials have found reductions in cardiovascular events in heart disease subjects advised to eat more fruits and vegetables, eat more fish, or take omega-3 fish oil supplements (9–12).

High-saturated fat diets are potentially atherogenic because they elevate serum cholesterol, increase coagulation, and impair endothelial function. Endothelial dysfunction may be an atherogenic factor (13). A high–saturated fat diet impairs endothelial function, possibly because of oxidative stress (14–18). Intravenously administered fat emulsions also produce endothelial dysfunction (19,20). Because the Mediterranean and Lyon Diet Heart Study diets are not associated with low serum cholesterol levels, we hypothesized that olive, fish, and canola oils have other vasoprotective properties, specifically, that they do not impair endothelial function postprandially. To evaluate this hypothesis, we measured brachial artery flow-mediated vasodilation (FMD) (21) before and 3 h after five high-fat meals, three of which contained olive, canola, or fish oils, and two that added antioxidant vitamins or foods to olive oil.

METHODS

Study population. We studied 10 healthy hospital volunteers (5 men, 5 women) ages 28 to 56 years with serum cholesterol and triglyeride levels <200 mg/dl. No subjects had coronary risk factors other than age and gender. All subjects were on ad libitum diets, and none was taking supplemental vitamins or medications, except one male subject who had been on an HMG-CoA reductase inhibitor for two years. All purposely refrained from exercise on the days of the study and fasted for 12 h overnight before being studied. All subjects gave written informed consent, and the

From the Division of Cardiology, Department of Medicine, University of Maryland School of Medicine, Baltimore, Maryland

This study was supported by funds from the Center for Vascular Biology and Hypertension, University of Maryland School of Medicine, Baltimore, Maryland.

Manuscript received August 25, 1999; revised manuscript received April 27, 2000, accepted June 21, 2000.

THE QUICK READ

- THE OLIVE OIL MEAL REDUCED FMD 31%
- THE REMAINING FOUR MEALS DID NOT REDUCE FMD

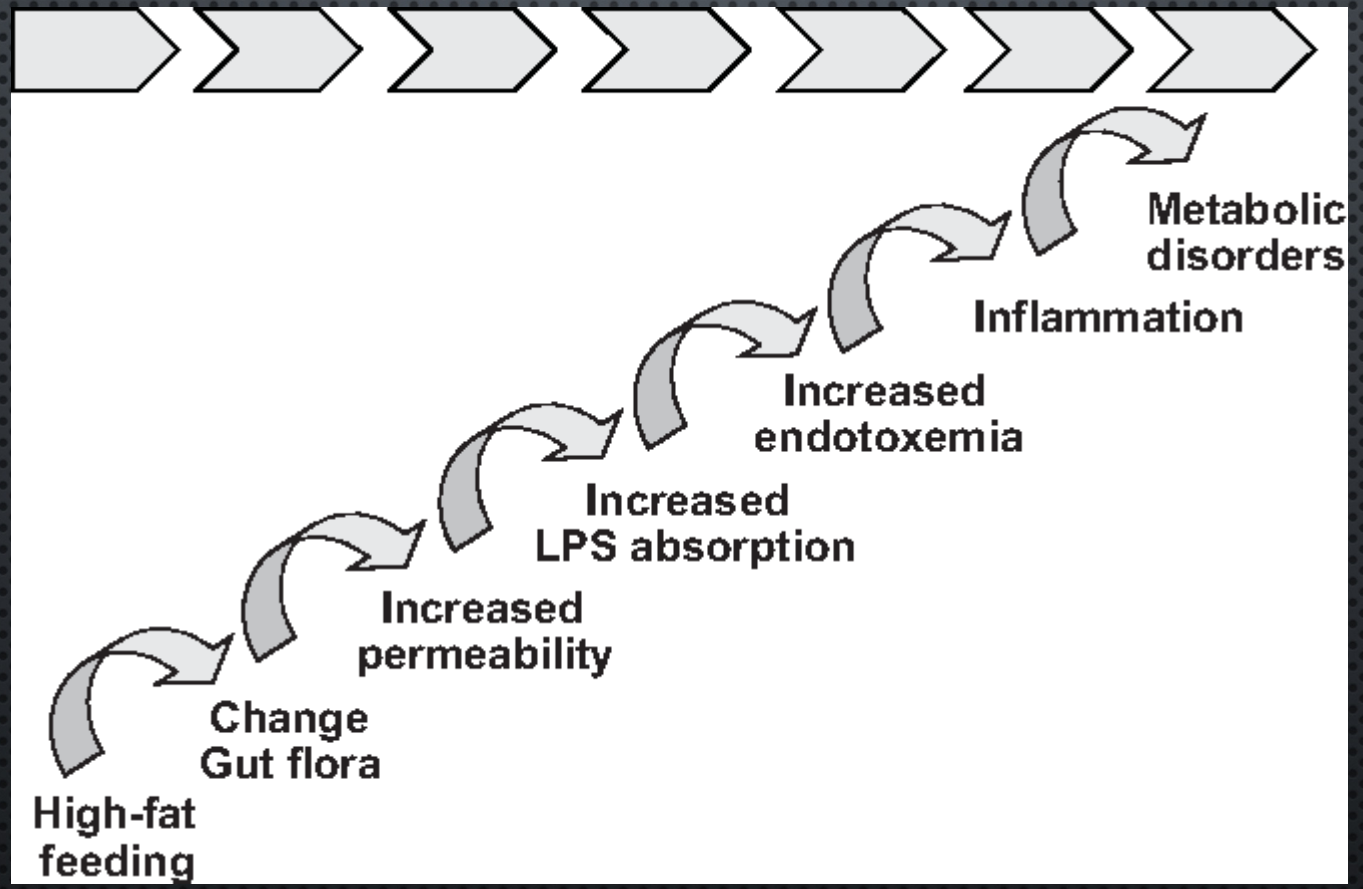
THE COMPLETE DATA

Table 2. Heart Rate, Blood Pressure, and Brachial Artery Blood Flow, Diameter, and Flow-Mediated Vasodilation Before and After Five High-Fat Meals in 10 Healthy Subjects

	Olive Oil and Bread	Canola Oil and Bread	Salmon and Crackers	Olive Oil, Bread, and Vits C/E	Olive Oil, Bread, Salad, and Vinegar
Preprandial					
Heart rate$_B$ (beats/min)	60 ± 7	64 ± 7	57 ± 7	62 ± 8	57 ± 7
Heart rate$_{PO}$ (beats/min)	59 ± 6	61 ± 7	58 ± 7	63 ± 8	59 ± 9
BP$_B$ (mm Hg)	110/70 ± 9/5	116/74 ± 7/6	109/69 ± 7/4	111/71 ± 10/8	107/72 ± 8/8
BP$_{PO}$ (mm Hg)	111/69 ± 12/6	115/71 ± 8/7	111/64 ± 8/8	112/69 ± 9/8	110/68 ± 10/7
Blood flow$_B$ (ml/min)	129 ± 82	119 ± 68	143 ± 96	145 ± 94	105 ± 47
Blood flow$_{PO}$ (ml/min)	810 ± 325	839 ± 360	924 ± 433	847 ± 365	900 ± 342
Arterial diam$_B$ (mm)	3.27 ± 0.62	3.29 ± 0.60	3.31 ± 0.66	3.34 ± 0.61	3.28 ± 0.57
FMD (%)	14.3 ± 4.2	13.0 ± 3.4	13.1 ± 5.2	13.3 ± 6.8	13.5 ± 3.5
Postprandial					
Heart rate$_B$ (beats/min)	63 ± 10	62 ± 7	58 ± 7	63 ± 12	59 ± 6
Heart rate $_{PO}$ (beats/min)	64 ± 9	63 ± 11	57 ± 7	65 ± 10	59 ± 8
BP$_B$ (mm Hg)	112/71 ± 9/5	116/70 ± 11/7	110/69 ± 11/6	108/69 ± 12/6	108/70 ± 13/6
BP$_{PO}$ (mm Hg)	110/70 ± 9/9	115/68 ± 9/8	109/64 ± 12/5	109/67 ± 12/6	110/72 ± 11/7
Blood flow$_B$ (ml/min)	124 ± 65	129 ± 87	122 ± 64	127 ± 77	122 ± 72
Blood flow$_{PO}$ (ml/min)	792 ± 328	856 ± 385	924 ± 318	856 ± 363	880 ± 336
Arterial diam$_B$ (mm)	3.33 ± 0.63	3.32 ± 0.68	3.32 ± 0.67	3.37 ± 0.68	3.31 ± 0.63
FMD (%)	9.9 ± 4.5*	11.6 ± 4.4	12.8 ± 5.1	12.1 ± 5.7	12.1 ± 3.5

Subscript B = baseline; BP = blood pressure; diam = diameter; FMD = flow-mediated vasodilation; subscript PO = postocclusion.
*$p = 0.008$.

METABOLIC ENDOTOXEMIA WITH ALL MEALS



MAYBE IT IS OK TO EAT A PANZANELLA SALAD WITH EVOO?

LIMITATIONS OF THE "VOGEL" STUDY

- Small study size
- Brief study (3 hours)
- 10 Normal volunteers not heart patients
- No "olive oil only" group
- Evoo but brand not reported
- High polyphenol EVOO not studied
- Not studied in VEGANS

CORDIOPREV STUDY: CORONARY DIET INTERVENTION WITH OLIVE OIL AND CARDIOVASCULAR PREVENTION

PLOS MEDICINE

OPEN ACCESS PEER-REVIEWED

RESEARCH ARTICLE

Mediterranean diet and endothelial function in patients with coronary heart disease: An analysis of the CORDIOPREV randomized controlled trial

Elena M. Yubero-Serrano, Carolina Fernandez-Gandara, Antonio Garcia-Rios, Oriol A. Rangel-Zuñiga, Francisco M. Gutierrez-Mariscal, Jose D. Torres-Peña, Carmen Marin, Javier Lopez-Moreno, Justo P. Castaño, Javier Delgado-Lista, Jose M. Ordovas, Pablo Perez-Martinez, Jose Lopez-Miranda

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- Randomized clinical trial involving **1002 patients** with **coronary disease** that are undergoing one of two diets in a randomized design (two groups; Mediterranean Diet 502 patients, Low Fat 500 patients) for **7 years**.
- The two diets are: a) **Low fat diet: <30% fat** (12-14% monounsaturated fatty acids (MUFA); 6-8% polyunsaturated fatty acid (PUFA) ; **<10% SAT**) and
- b) **Mediterranean Diet**: >35% fat (22% MUFA; 6% PUFA ; **<10% SAT**).

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MEDITERRANEAN DIET WERE GIVEN EXTRA VIRGIN OLIVE OIL (1 LITER/WEEK). THIS AMOUNT WAS NOT INTENDED TO BE FOR THE EXCLUSIVE USE OF THE PARTICIPANT, BUT FOR THE FAMILY TO USE AT HOME IF NEEDED.

THE PARTICIPANTS RANDOMIZED TO THE LOW-FAT DIET RECEIVED RECOMMENDATIONS FOCUSED ON LIMITING ALL TYPES OF FAT, FROM BOTH ANIMAL AND VEGETABLE SOURCES, AND ON INCREASING THE INTAKE OF COMPLEX CARBOHYDRATES.

PLOS MEDICINE

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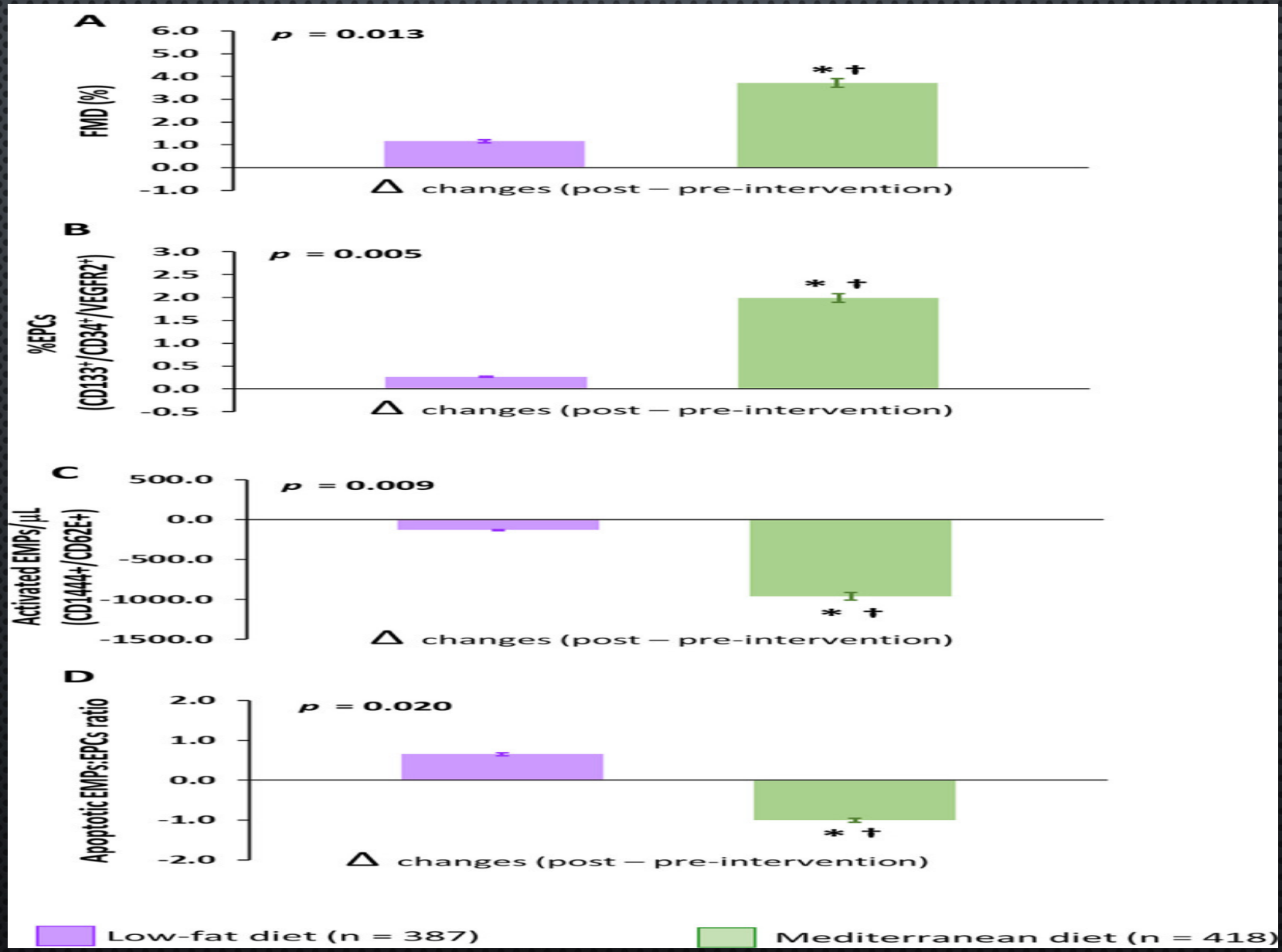
OUR RESULTS SUGGEST THAT THE MEDITERRANEAN DIET BETTER MODULATES ENDOTHELIAL FUNCTION COMPARED WITH A LOW-FAT DIET AND IS ASSOCIATED WITH A BETTER BALANCE OF VASCULAR HOMEOSTASIS IN CHD PATIENTS, EVEN IN THOSE WITH SEVERE ENDOTHELIAL DYSFUNCTION.

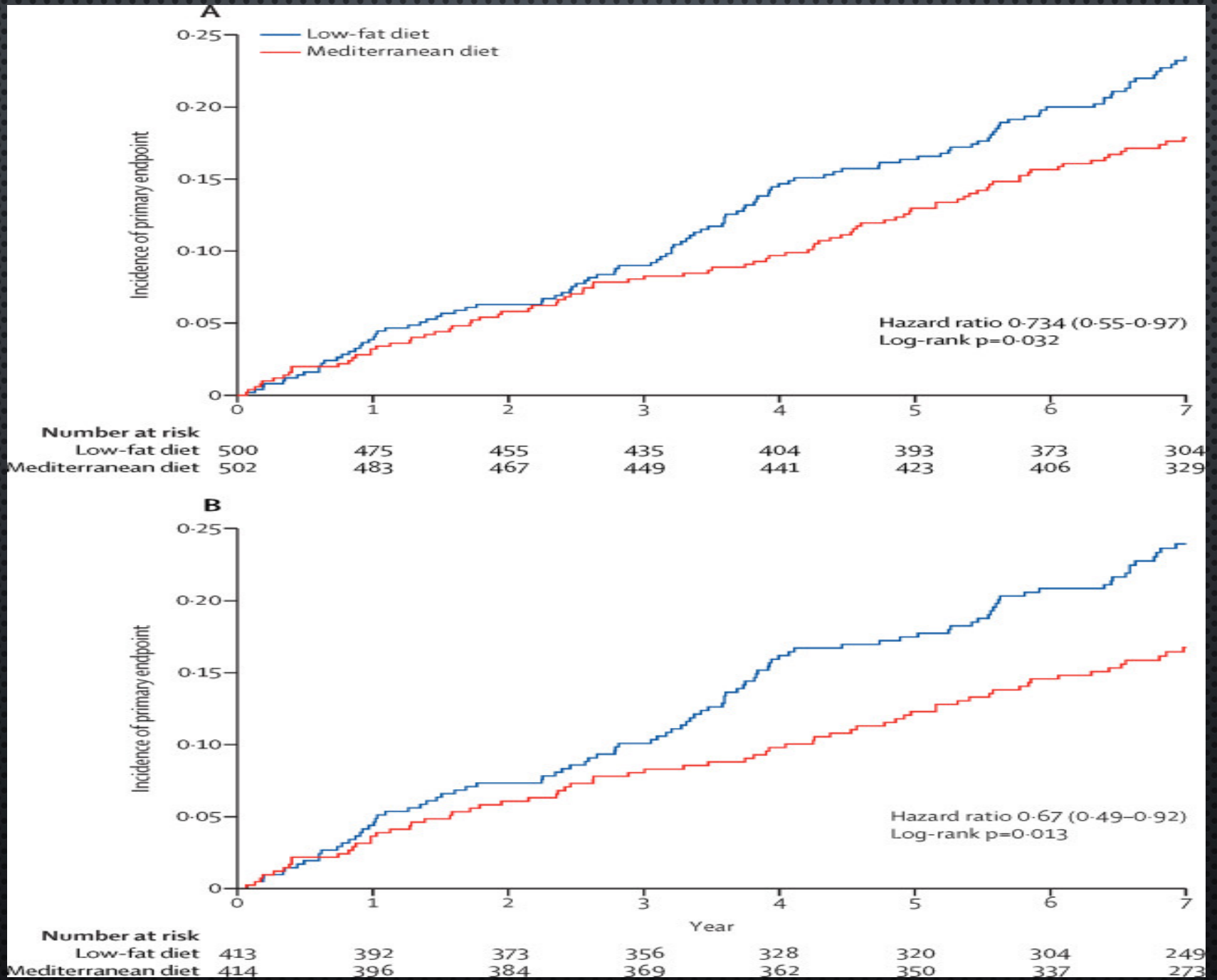

A
p = 0.013
FMD (%)
6.0
5.0
4.0
3.0
2.0
1.0
0.0
-1.0
* †
Δ changes (post — pre-intervention)
B
p = 0.005
%EPCs
(CD133+/CD34+/VEGFR2+)
3.0
2.5
2.0
1.5
1.0
0.5
0.0
-0.5
* †
Δ changes (post — pre-intervention)
C
p = 0.009
Activated EMPs/μL
(CD144+/CD62E+)
500.0
0.0
-500.0
-1000.0
-1500.0
* †
Δ changes (post — pre-intervention)
D
p = 0.020
Apoptotic EMPs:EPCs ratio
2.0
1.0
0.0
-1.0
-2.0
* †
Δ changes (post — pre-intervention)
Low-fat diet (n = 387)
Mediterranean diet (n = 418)

Long-term consumption of a Mediterranean diet or a low-fat diet on kidney function in coronary heart disease patients: the CORDIOPREV randomized controlled trial

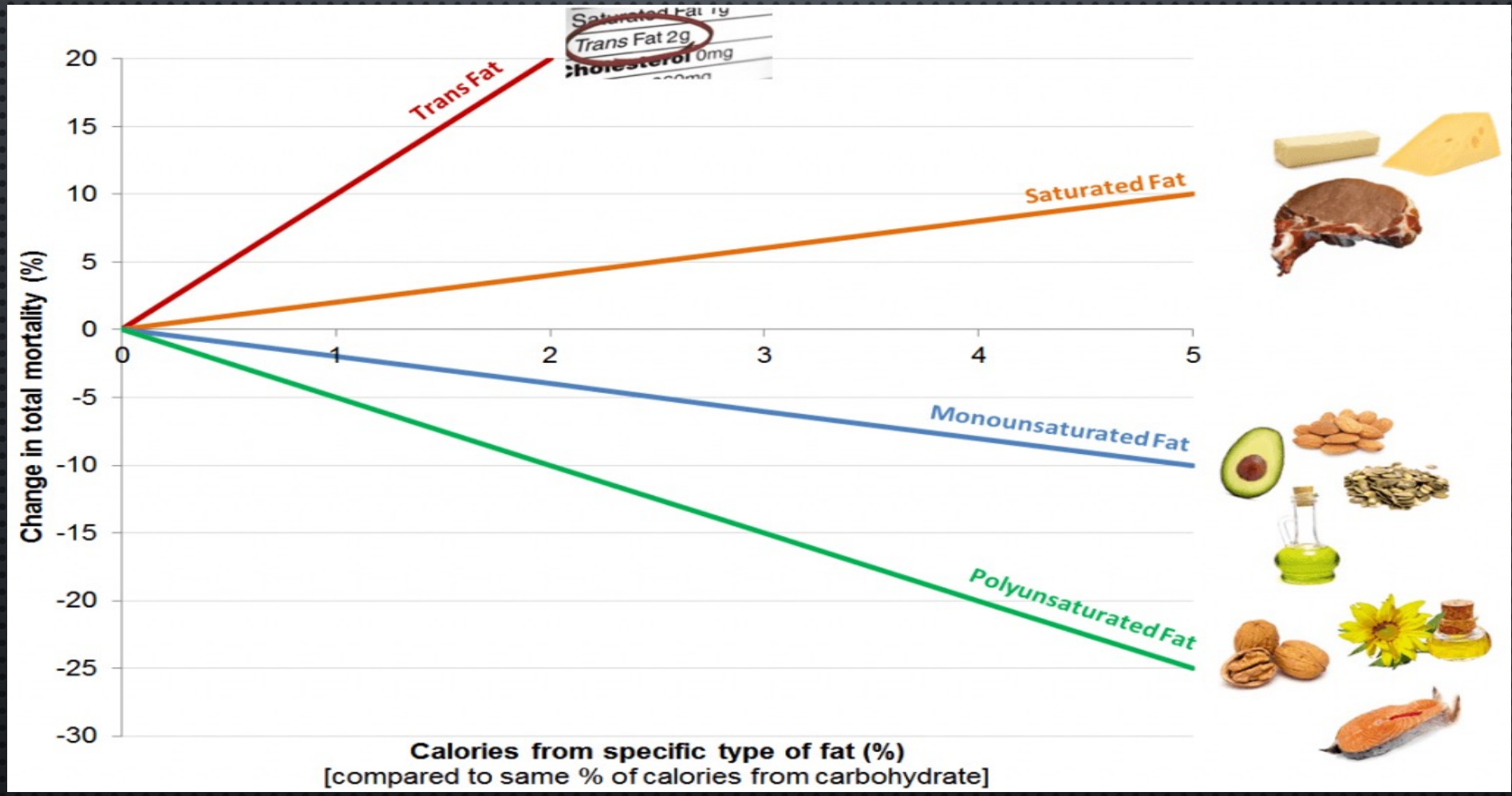
- The long-term consumption of a Mediterranean diet rich in EVOO, when compared to a low-fat diet, may preserve kidney function, as shown by a reduced decline in eGFR in CHD patients with T2DM.
- These findings reinforce the clinical benefits of the Mediterranean diet in the context of secondary cardiovascular disease prevention.

Mediterranean diet reduces atherosclerosis progression in coronary heart disease: an analysis of the CORDIOPREV randomized controlled trial

- The Mediterranean diet decreased IMT-CC at 5 years maintained at 7 years compared to baseline. The low-fat diet did not modify IMT-CC.
- Long-term consumption of a Mediterranean diet rich in extravirgin olive oil, if compared to a low-fat diet, was associated with decreased atherosclerosis progression, as shown by reduced IMT-CC and carotid plaque height.
- Stroke 2021 Nov;52(11):3440-3449.


A
Low-fat diet
Mediterranean diet
Incidence of primary endpoint
0·25
0·20
0·15
0·10
0·05
0
Hazard ratio 0·734 (0·55–0·97)
Log-rank p=0·032
0
1
2
3
4
5
6
7
Number at risk
Low-fat diet 500 475 455 435 404 393 373 304
Mediterranean diet 502 483 467 449 441 423 406 329
B
Incidence of primary endpoint
0·25
0·20
0·15
0·10
0·05
0
Hazard ratio 0·67 (0·49–0·92)
Log-rank p=0·013
0
1
2
3
4
5
6
7
Year
Number at risk
Low-fat diet 413 392 373 356 328 320 304 249
Mediterranean diet 414 396 384 369 362 350 337 273

HARVARD SCHOOL OF PUBLIC HEALTH

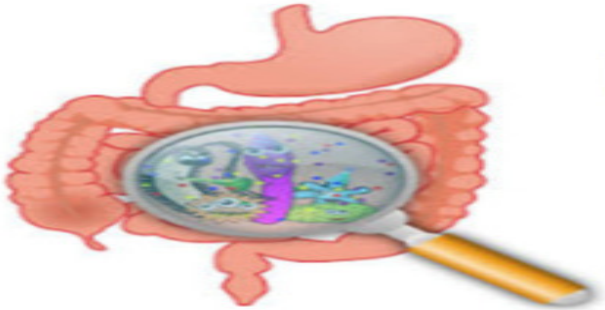


CONCLUSIONS: EVOO AND WFPB DIETS

- THERE ARE NO TRIALS OF PLANT PERFECT (NO SOS) DIETS VS SIMILAR DIETS WITH ADDED EVOO
- EVOO IS WITHOUT DOUBT A HEALTHY DIETARY FAT AND HIGH POLYPHENOL EVOO MAY BE OF EVEN MORE BENEFIT
- A DIET HIGH IN EVOO IS COMPATIBLE WITH HEALTHY ARTERIES AND DISEASE REVERSAL IN CAD PATIENTS
- IT REMAINS UNKNOWN IF EVOO DIMINISHES OR ENHANCES THE HEALTH BENEFITS OF A WFPB DIET

WESTERN DIET

PLANT-BASED DIET



Physiological Response

- ↑ Opportunistic Bacteria and Bacterial Metabolites
- ↑ LPS and Inflammatory Cytokines
- ↓ Beneficial Bacteria and SCFA

Increased risk of nutrition related chronic diseases

Physiological Response

- ↓ Opportunistic Bacteria and Bacterial Metabolites
- ↓ LPS and Inflammatory Cytokines
- ↑ Beneficial Bacteria and SCFA

Decreased risk of nutrition related chronic diseases


HEALTHY

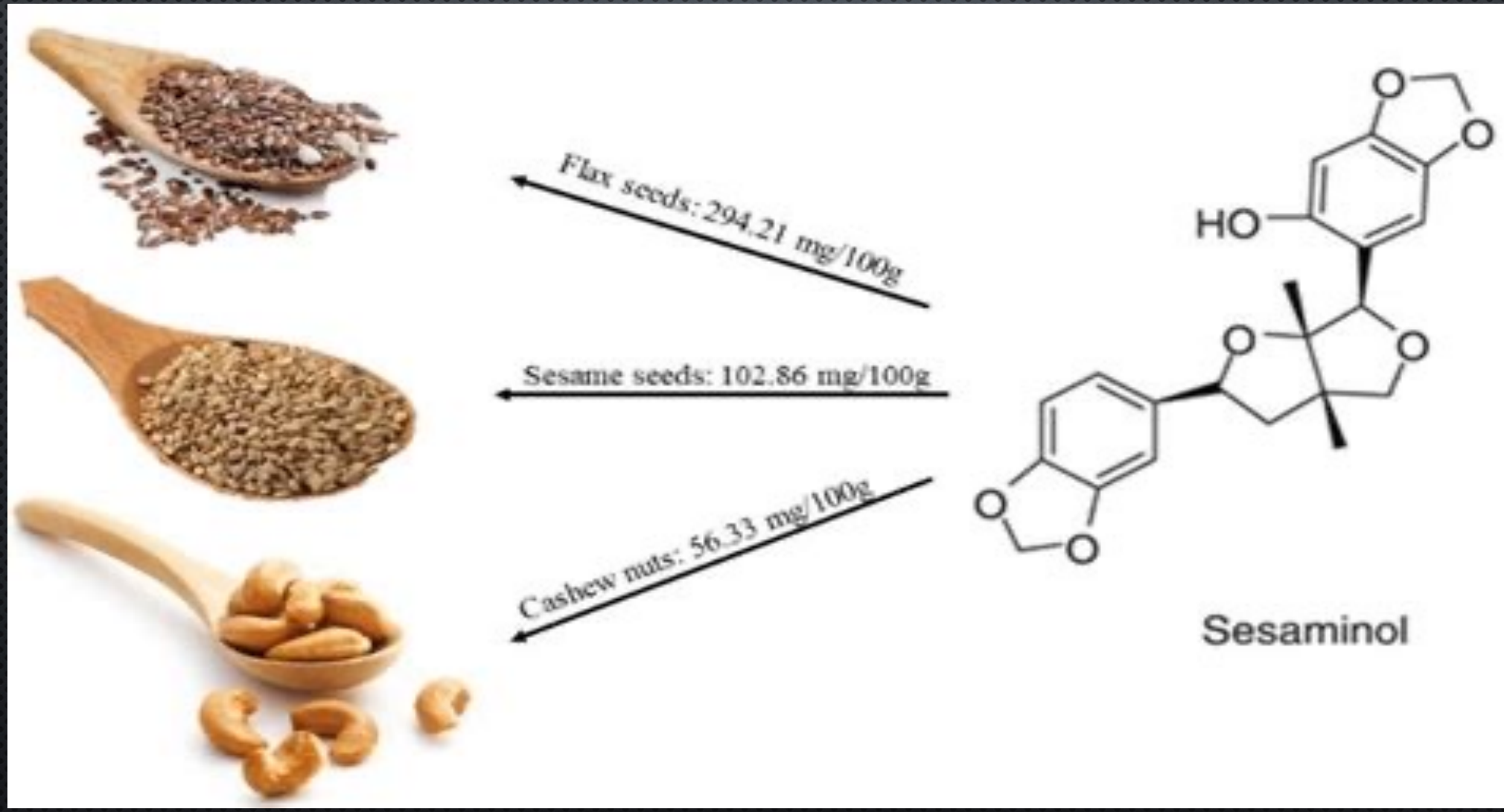
Lignans

- Flax is richest source of lignans: having approximately 800 times more lignan than other plant source.
- They have estrogen like action in human.
- Flax rich in: *secoisolariciresinol diglucoside (SDG)*
- Flax contain other lignan such as : metairesional, pinoresinol, lariciresional, isolariciresional and secoisolariciresinol (SECO)

- Plant lignans are converted by bacteria to mammalian lignan : enterodiol and enterolactone

smeds et al., 2007

TOP THREE SOURCES OF LIGNANS IN FOOD



Lignan intake and risk of coronary heart disease

- Prospective study followed 214,108 men and women in 3 cohorts who did not have cardiovascular disease or cancer at baseline.
- Increased long-term intake of lignans was associated with a significantly lower risk of total CHD in both men and women.
- J Am Coll Cardiol 2021 Aug 17;78(7):666-678

AVOCADOS: YES OR NO?

Foods To Be Avoided

SOUPS: Cream Soups.

MEATS: All glandular organs, as liver, brains, kidney, sweetbreads; pork and very fat meats, fat fish, fish roe.

MILK AND MILK PRODUCTS: Whole milk, cream, cheddar, Swiss and all rich cheese and cheese spreads; excessive butter and butter substitutes.

EGGS: Egg yolks.

BREADS: Hot breads, pancakes, waffles, coffee cakes, muffins, doughnuts.

DESSERTS: Any made with cream and egg yolks; pies, frozen creams, rich cakes and cookies.

CONCENTRATED FATS: The excessive use of fats in any form, as salad dressings, olive or vegetable oils, suet, chicken or pork fat.

MISCELLANEOUS: Rich gravies, olives, nuts and avocados.

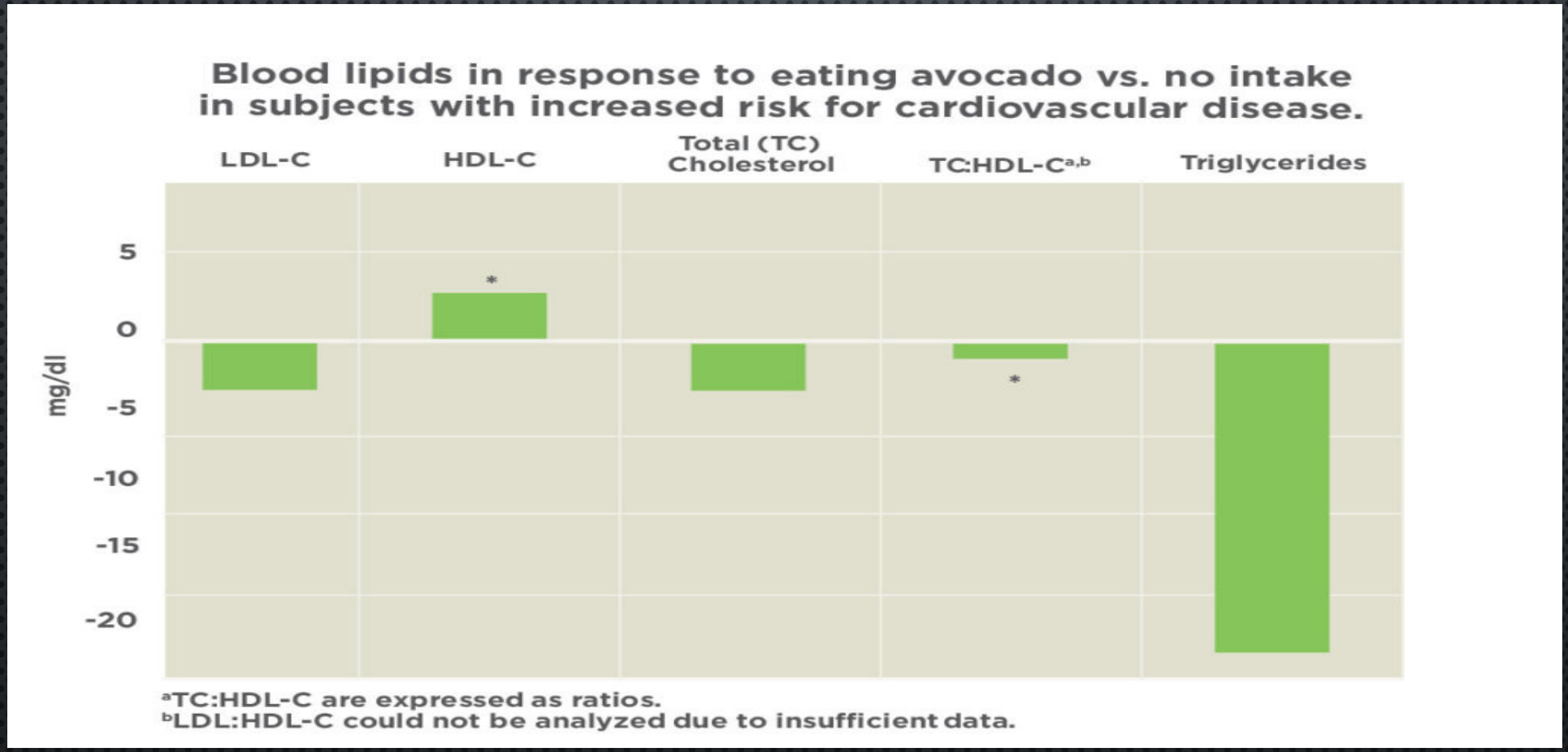
ARE THERE ANY NEW DATA?

VS

AVOCADO CONSUMPTION AND RISK OF CARDIOVASCULAR DISEASE IN US ADULTS

- This study included 68,786 women from the NHS (Nurses' Health Study) and 41,701 men from the HPFS (Health Professionals Follow-up Study; 1986-2016)
- those with analysis-specific higher avocado intake (≥2 servings/week) had a 16% lower risk of CVD and a 21% lower risk of coronary heart disease
- Replacing half a serving/day of margarine, butter, egg, yogurt, cheese, or processed meats with the equivalent amount of avocado was associated with a 16% to 22% lower risk of CVD
- Higher avocado intake was associated with lower risk of CVD and coronary heart disease in 2 large prospective cohorts of US men and women
- J Am Heart Assoc. 2022 Mar 30;e024014

AVOCADOS AND CHOLESTEROL MEASURES



Mahmassani, H., Avendano, E., Gowri, R. and E.J. Johnson. Avocado consumption increases and risk factors for heart disease: A systematic review and meta-analysis. AJCN 2018

THREE TOP FOODS FOR LIFE EXPECTANCY

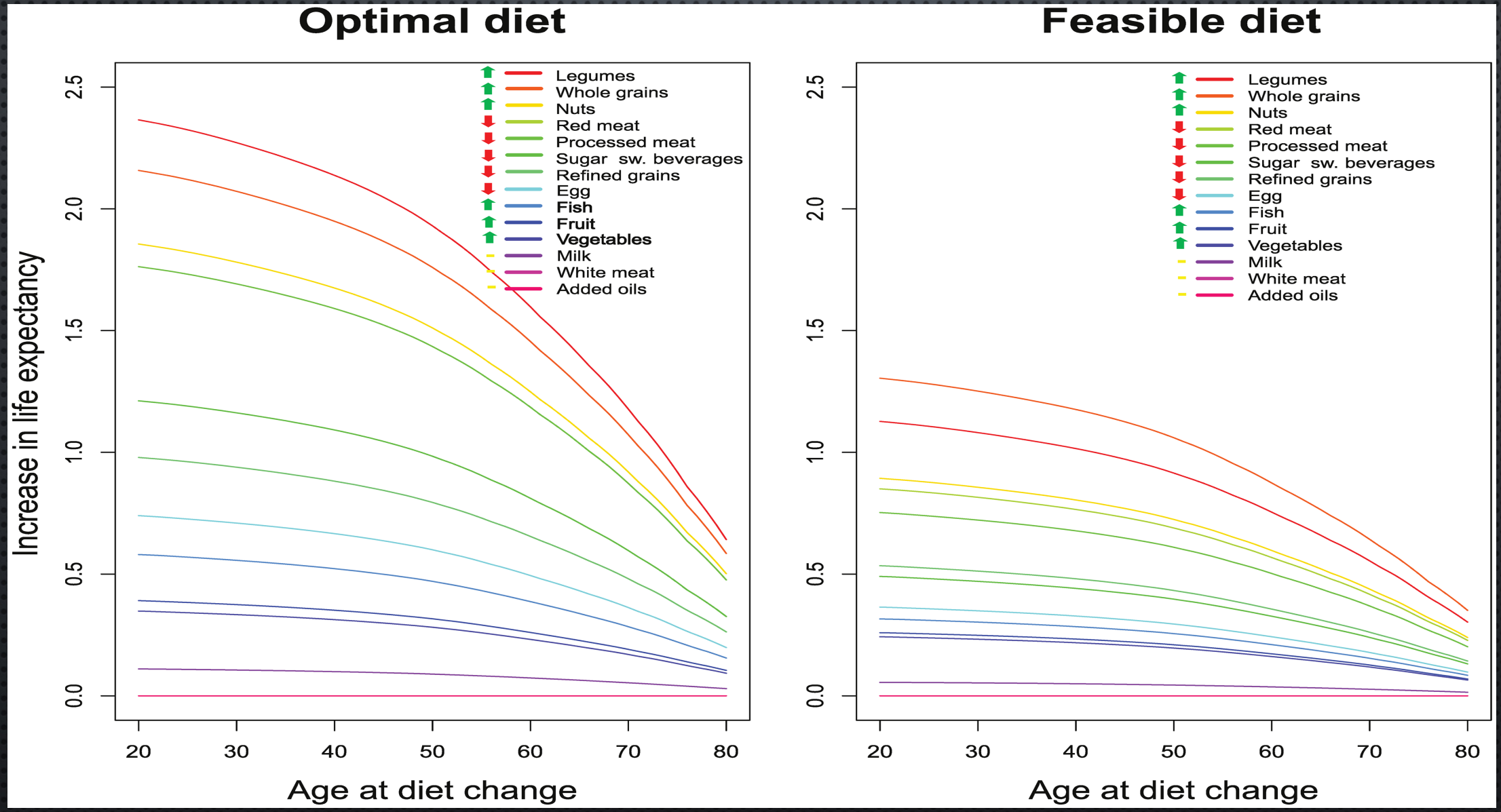
Estimating Impact of Food Choices on Life Expectancy: A Modeling Study

Based on meta-analyses and data from the Global Burden of Disease study (2019), we used life table methodology to estimate how LE changes with sustained changes in the intake of fruits, vegetables, whole grains, refined grains, nuts, legumes, fish, eggs, milk/dairy, red meat, processed meat, and sugar-sweetened beverages.

A sustained dietary change may give substantial health gains for people of all ages both for optimized and feasible changes. Gains are predicted to be larger the earlier the dietary changes are initiated in life.

ESTIMATING IMPACT OF FOOD CHOICES ON LIFE EXPECTANCY: A MODELING STUDY

- The largest gains would be made by eating more: **legumes** (females: 2.2, males: 2.5)
- **whole grains** (females: 2.0, males: 2.3)
- **nuts** (females: 1.7 males: 2.0)
- **less red meat** (females: 1.6 males: 1.9) and
- **Less processed meat** females: 1.6 males: 1.9


Optimal diet
Feasible diet
Increase in life expectancy
0.0
0.5
1.0
1.5
2.0
2.5
20
30
40
50
60
70
80
Age at diet change
Legumes
Whole grains
Nuts
Red meat
Processed meat
Sugar sw. beverages
Refined grains
Egg
Fish
Fruit
Vegetables
Milk
White meat
Added oils

CONCLUSIONS: EAT PLANTS!