

Fixing Metabolic Health 9 October 2023

Seed Oils: History and Mechanisms

By Nina Teicholz

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

Investigative science journalist

Disclosures

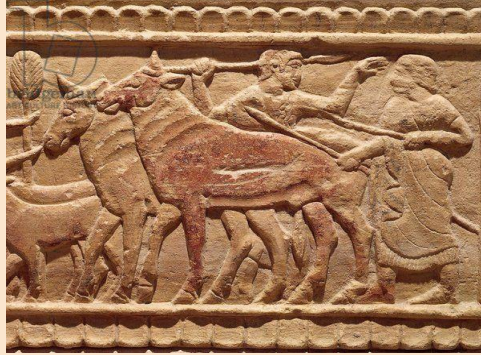
- **I am an independent journalist. Receive no funds from any industry or interest group.**

What are Seed Oils?



- *Corn oil*
- *Cottonseed oil*
- *Soybean oil*
- *Safflower oil*
- *Peanut oil*
- *Canola oil*

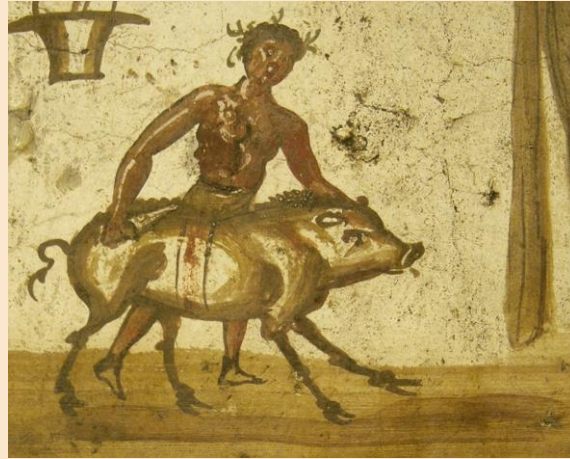
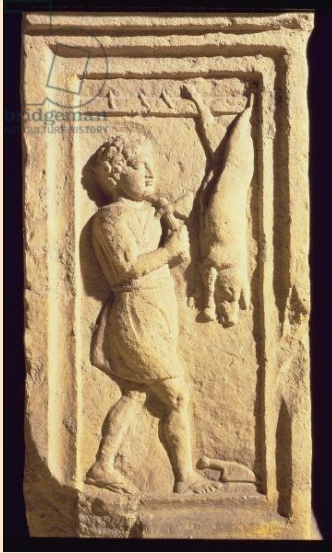
The original, natural fats



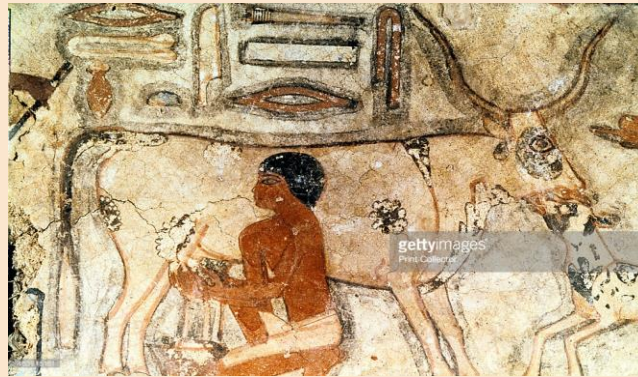
Tallow



Suet



Lard



Butter



They're young... They're in love...
They eat LARD

©1957. Issued by The British Lard Marketing Board in conjunction with the Department of Health.



**British Lard
Marketing Board**

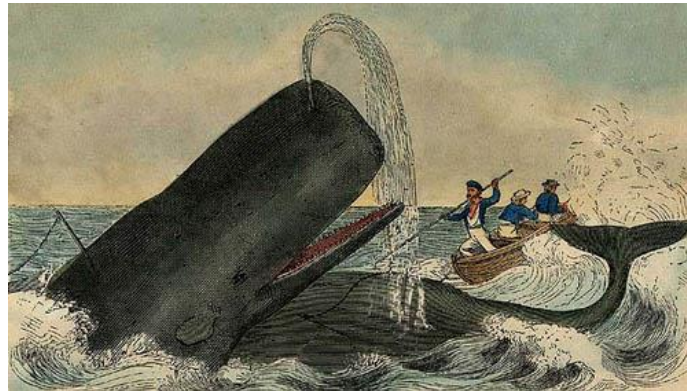
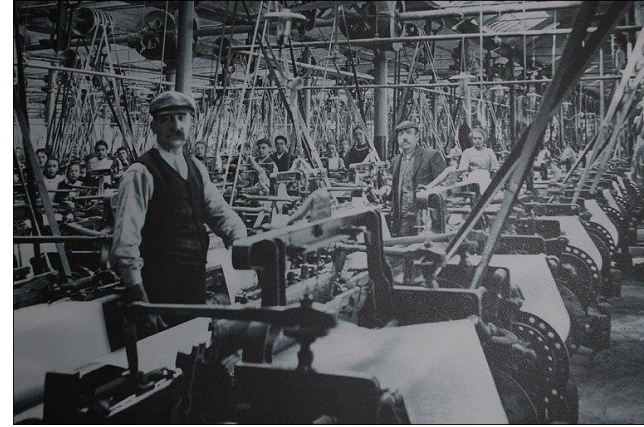
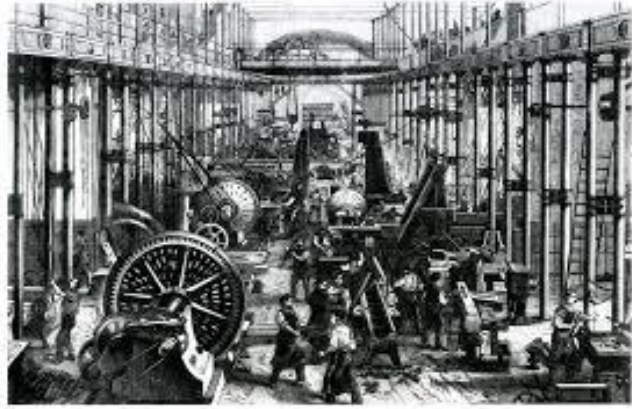
Olive oil



Greek archaeologist Yannis Hamilakis:

“despite conventional wisdom, there is almost no evidence which could indicate with certainty” that olive oil was made for “culinary use” in Greece until the 19th century.

Oils used as lubricants for machinery in industrial revolution



Cottonseed oil

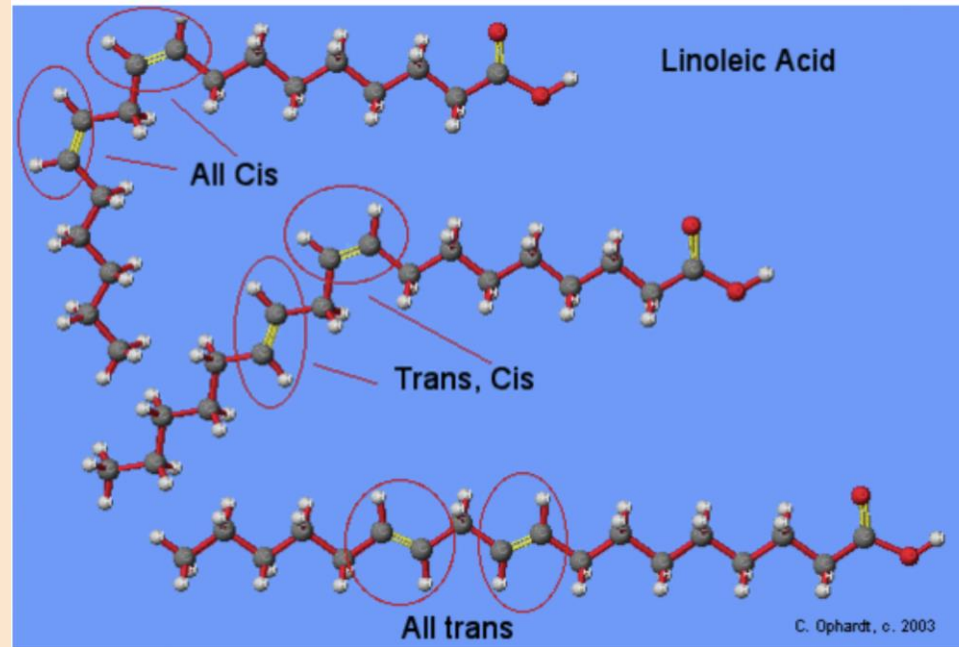


THE AMERICAN COTTON OIL CO.
Manufacturers of Refined
COTTON SEED OIL
Principal Office
29 BROADWAY
NEW YORK.

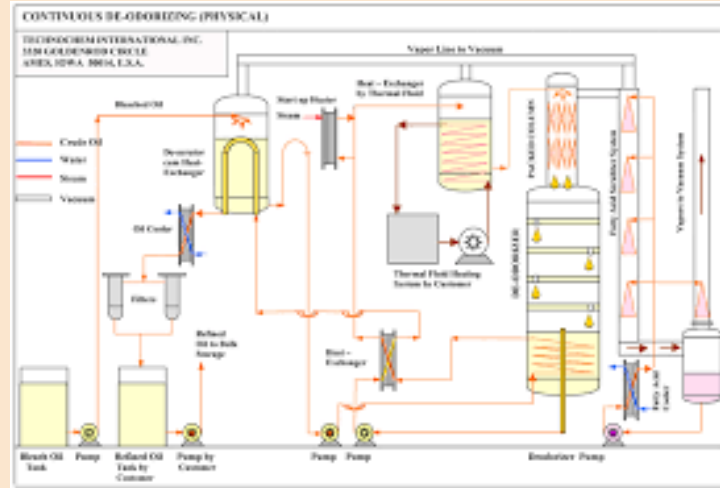
WINTER & SUMMER WHITE OILS,
WINTER & SUMMER YELLOW OILS,
SALAD, COOKING & MINERS' OILS,
COTTOLENE,
A VEGETABLE COOKING FAT.

COPYRIGHT, 1893, BY DONALDSON BROTHERS.

Hydrogenation



Process of Hydrogenation



Pressure, heat, hexane (solvent) + a metal catalyst.

Resulting rancid mixture must be **steamed** to eliminate bad odors, b, bleached to remove the gray color, **“winterized”** for stability and enhanced **artificial colors** and **synthetic vitamins**

105,415.

TRADE-MARK FOR VEGETABLE FATS.
Registered July 20, 1915.
Application filed March 13, 1915. Serial No. 55,129.

STATEMENT.

To all whom it may concern:

Be it known that BERLIN MILLS COMPANY, a corporation duly organized and existing under the laws of the State of Maine, and located in Berlin, in the county of Coos and State of New Hampshire, and doing business in said Berlin, has adopted and used the trade-mark shown in the accompanying drawing, for vegetable fats, in Class No. 46, Foods and ingredients of foods.

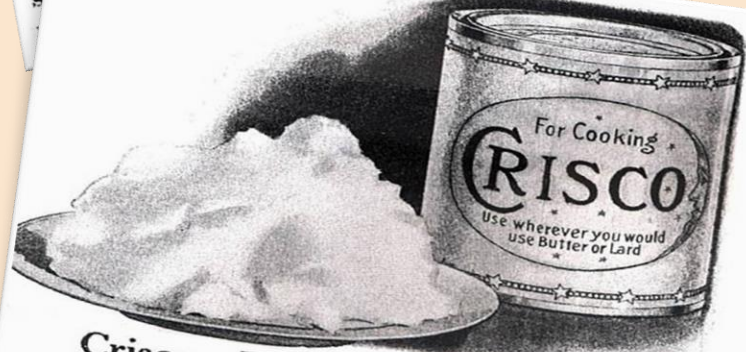
The trade-mark has been continuously used in the business of said corporation since on or about August 1, 1913.
The trade-mark is printed or otherwise displayed upon paper wrappers or labels affixed to metal cans or other packages containing the goods.

BERLIN MILLS COMPANY,
By O. B. BROWN, *Treas.*

KREAM KRISP

DECLARATION.

I, O. B. BROWN, of Coos County, New Hampshire, do hereby declare that the trade-mark represented by the drawing presented to me by the applicant named in the foregoing is used by said corporation in commerce among the several States of the United States; that the drawing presented to me by the applicant named in the foregoing represents the trade-mark sought to be registered.



Crisco—Better than butter for cooking

117,704.

THE PROCTER & GAMBLE COMPANY, OF CINCINNATI, OHIO.
TRADE-MARK FOR COOKING-FAT.

Registered July 24, 1917.
Application filed December 15, 1914. Serial No. 55,305.

STATEMENT.

To all whom it may concern:

Be it known that THE PROCTER & GAMBLE COMPANY, a corporation duly organized under the laws of the State of Ohio, and located in the city of Cincinnati, in the county of Hamilton and State of Ohio, whose principal office is located in the county of Hamilton, northeast corner of the Gwynne Building, Cincinnati, Ohio, has adopted and used the trade-mark shown in the accompanying drawing, for cooking-fat, in Class No. 46, Foods and ingredients of foods.

The trade-mark has been continuously used in the business of said corporation since June 1st, 1911.

The trade-mark is applied or affixed to the goods, or to the packages containing the same, by placing thereon a printed label on which the trade-mark is shown.

THE PROCTER & GAMBLE COMPANY,
By H. L. FRENCH, *Secretary.*

CRISCO

DECLARATION.

I, H. L. FRENCH, of Ohio, county of Hamilton, do hereby declare that the trade-mark represented by the drawing presented to me by the applicant named in the foregoing is used by said corporation in commerce among the several States of the United States; that the description and drawing presented to me by the applicant named in the foregoing represents the trade-mark sought to be registered.

is used by said corporation in commerce among the several States of the United States; that the description and drawing presented to me by the applicant named in the foregoing represents the trade-mark sought to be registered.

Vegetable Oils enter the food supply - 1911

The marketing of Crisco



Margarine



Vegetable cooking oils



1961: American Heart Association recommends polyunsaturated oil to fight heart disease

Circulation
JOURNAL OF THE AMERICAN HEART ASSOCIATION



Dietary Fat and Its Relation to Heart Attacks and Strokes
Irvine H. Page, Edgar V. Allen, Francis L. Chamberlain, Ancel Keys, Jeremiah
Stamler and Fredrick J. Stare

Circulation. 1961;23:133-136

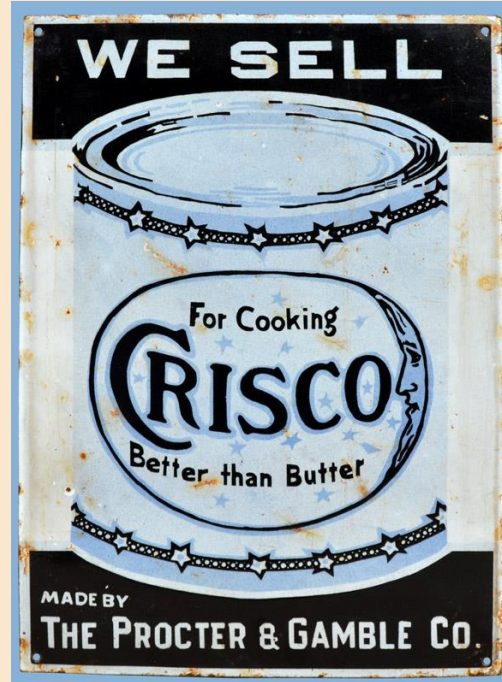
doi: 10.1161/01.CIR.23.1.133

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75231

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AHA alliance with P&G



Procter & Gamble and the American Heart Association



1948.

\$1,740,000, or 17 million in today's dollars.

"suddenly the coffers were filled...."

It was the "bang of big bucks" that "launched" the group.

Polyunsaturated fats as medicine

TAKE THIS AD TO YOUR DOCTOR.

If you're concerned about a cholesterol and your family's eating habits, here's something you can do: take action. It's your doctor. It's you. It's Mazola. It's the support of a total dietary program.

Studies have shown that a diet rich in polyunsaturated cholesterol can reduce a single artery's cholesterol by 20% and lower blood pressure, reduce cholesterol, and lower triglycerides. Mazola pure corn oil:

- Helps lower cholesterol by an average of 17 percent.
- Can help lower blood pressure from a total dietary program by including Mazola Pure Corn Oil.

Mazola: THE ONLY LEADING BRAND THAT'S PURE CORN OIL.

See also panel for NUTRIENT COMPARISON Chart.

Mazola PURE CORN OIL
32 FL. OZ. (1 QT)

CHOLESTEROL LOWERING DIET

©1997, TOPFUNK BRANDS. This company's products are not intended for medical use. Consult your doctor for more information. See also panel for NUTRIENT COMPARISON Chart.

Should an 8-year-old worry about cholesterol?

He can't worry about something he doesn't know about. But *you* should. Cholesterol can start building up in a kid. Up and up until he grows up with a real health risk.

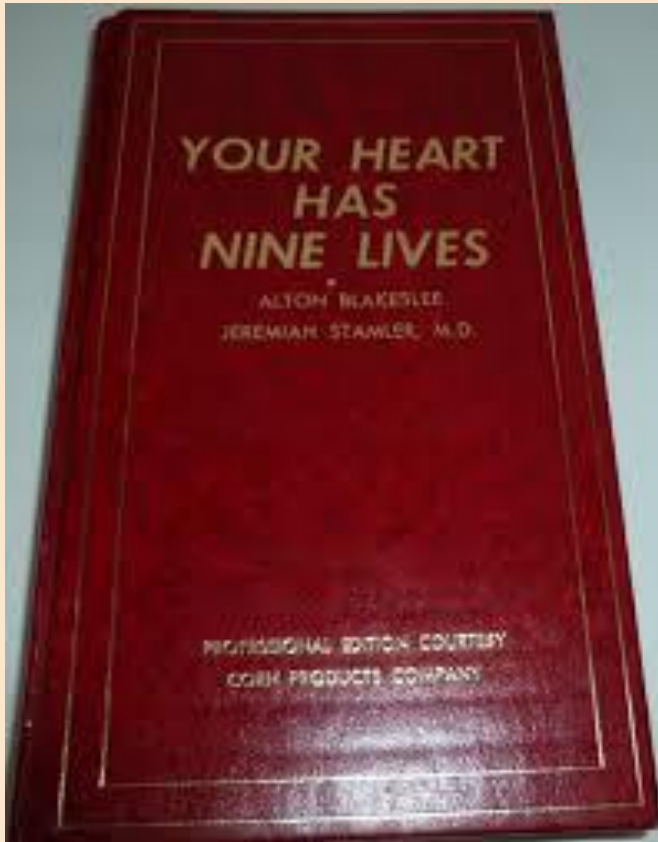
Heart specialists recommend reducing one important risk of coronary disease tomorrow by starting your family on low cholesterol meals today. Foods low in saturated fat,

high in polyunsaturates... to help reduce serum cholesterol.

Foods like Fleischmann's® Margarine. It's made from 100% corn oil. And there's no better oil to help lower cholesterol levels.

And no better tasting margarine. Fleischmann's—the corn oil margarine doctors name most... and people like best.

Fleischmann's
100% Polyunsaturated
Margarine

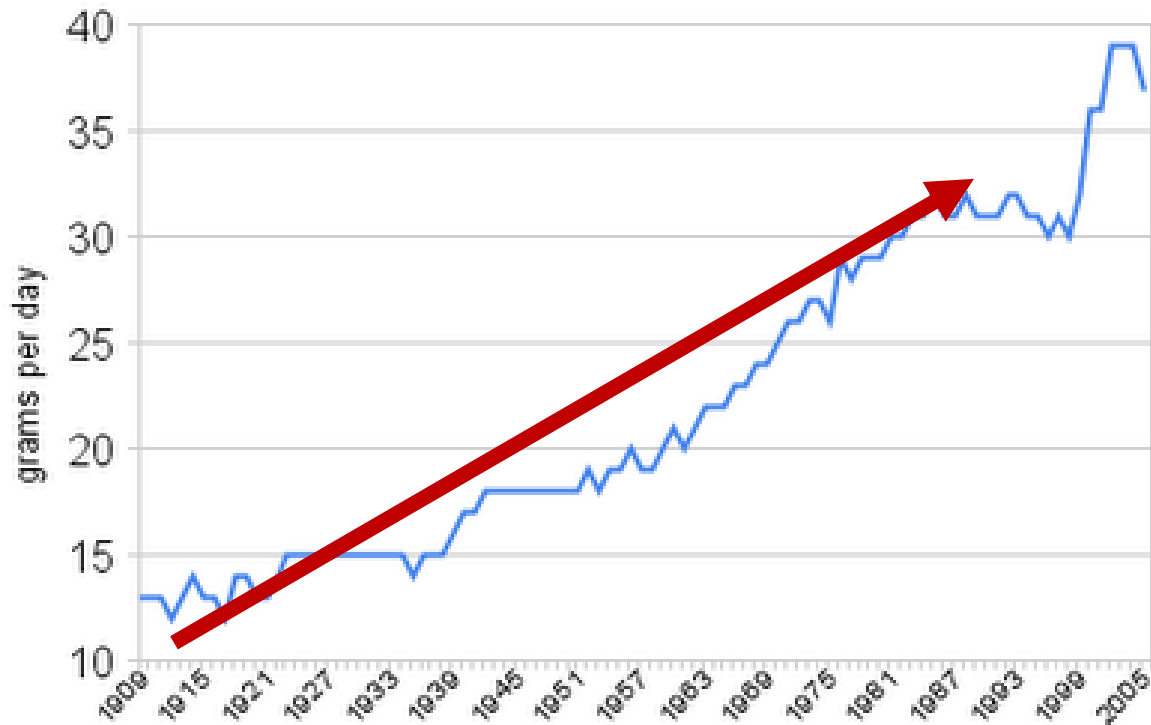


Distributed *free of charge* to thousands of doctors.

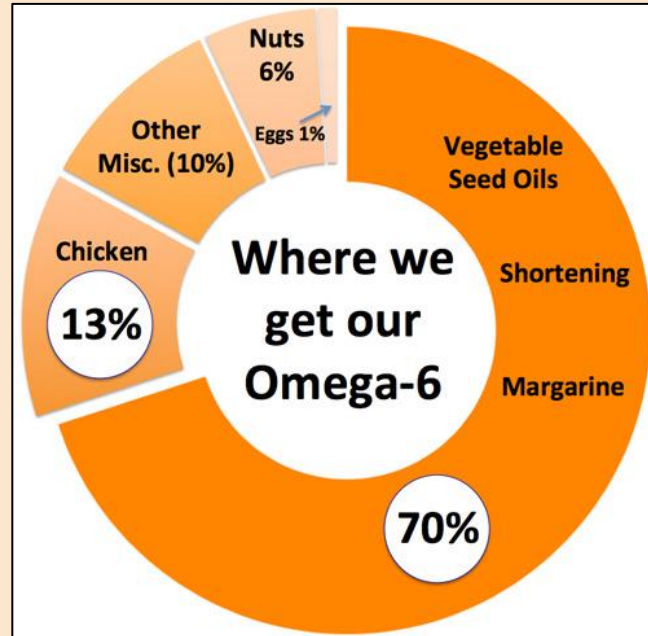
Dr. Stamler thanks **The Corn Products Co.** and **the Wesson Fund for Medical Research** for “significant” research support.

Stamler in an interview: **“Scientists in public health *must* make alliances with industry...it’s tough.**

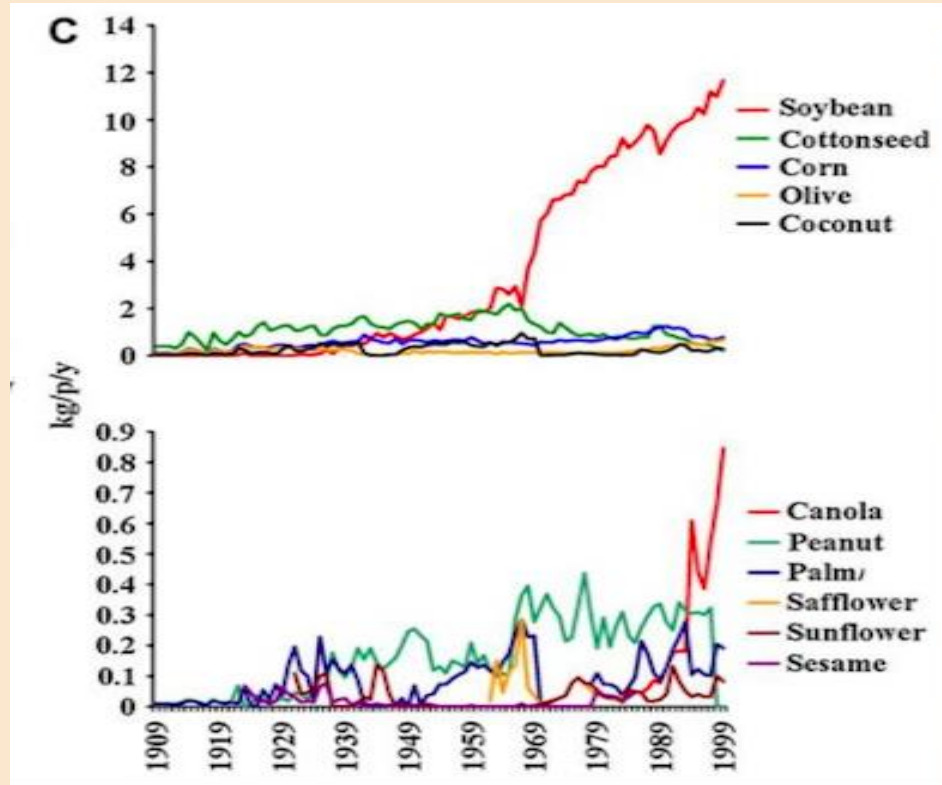
U.S. PUFA Consumption, 1909-2005



Sources of omega-6 fatty acids in our diet

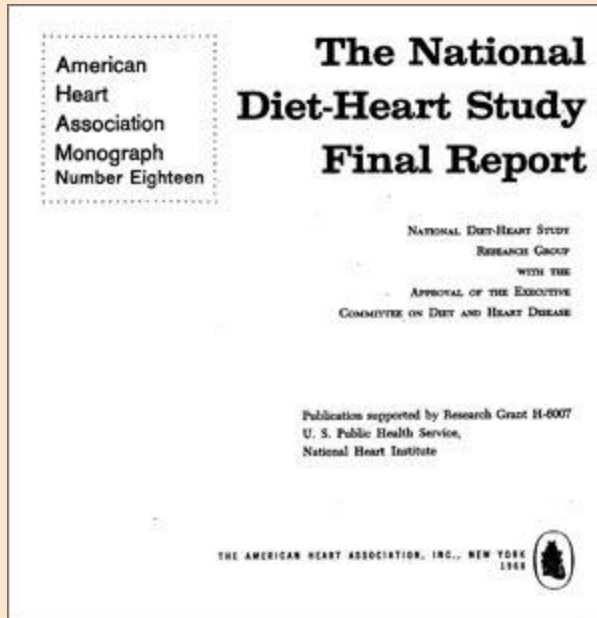


Changes in Fat Consumption in U.S. 1909-1999



What are the health effects?

In nearly a dozen of the “Core Trials” studies...



L.A. Veterans Trial

NIH-funded

Editors, “Diet and Atherosclerosis” 1969, 940

Oslo study

Leren 1966, 88

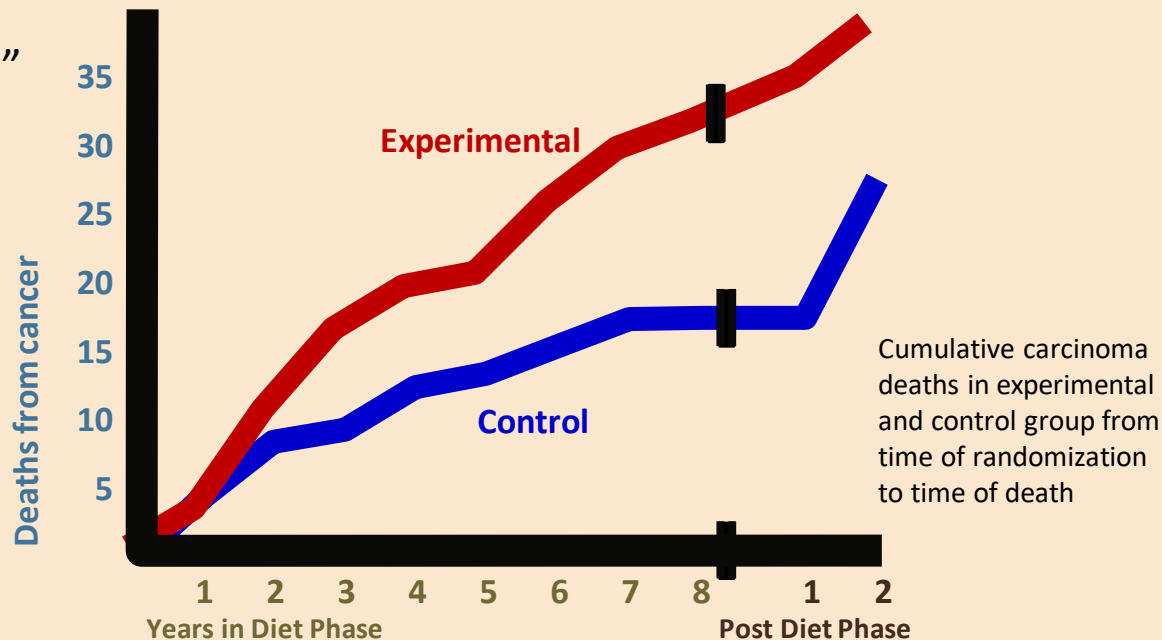
“MRFIT” Trial

NIH-funded

*Multiple Risk Factor Intervention Trial Research Group,
Journal of the American Medical Association, 1982*

“Side effect” of death from cancer

“L.A. Veteran’s Study”





National Heart, Lung,
and Blood Institute

Workshops: 1981, 1982, 1983, 1985

Conclusion:

Vegetable oils ...

- did “not present a public health challenge”
- did not “contradict” the more urgent, “commonsense” public health message for everyone to lower their cholesterol.

Sources: multiple papers, see: Teicholz, N., *The Big Fat Surprise*, (Simon & Schuster) 2014.

Other possible health effects

- Gallstones

- 2x higher in the L.A. Veterans trial
- Also found in cholesterol-lowering drug trial

Source: Report from the Committee of Principal Investigators," *Heart* 40, no. 10 (1978), 1069–1118

- Strokes

- Japanese with low cholesterol (<180mg/dL) had 2-3 times higher rates of stroke

Source: Hirotsuga Ueshima, Minoru Iida, and Yoshio Komachi, "Letter to the Editor: Is It Desirable to Reduce Total Serum Cholesterol Level as Low as Possible?" *Preventive Medicine* 8, no. 1 (1979): 104–105

- Corn oil and possible cirrhosis of the liver

Arthur J. Patek et al., "Cirrhosis-Enhancing Effect of Corn Oil," *Archives of Pathology* 82, no. 6 (1966): 596–601

Late 1970s-1990s: Partially hydrogenated soybean oils found to contain damaging trans fats

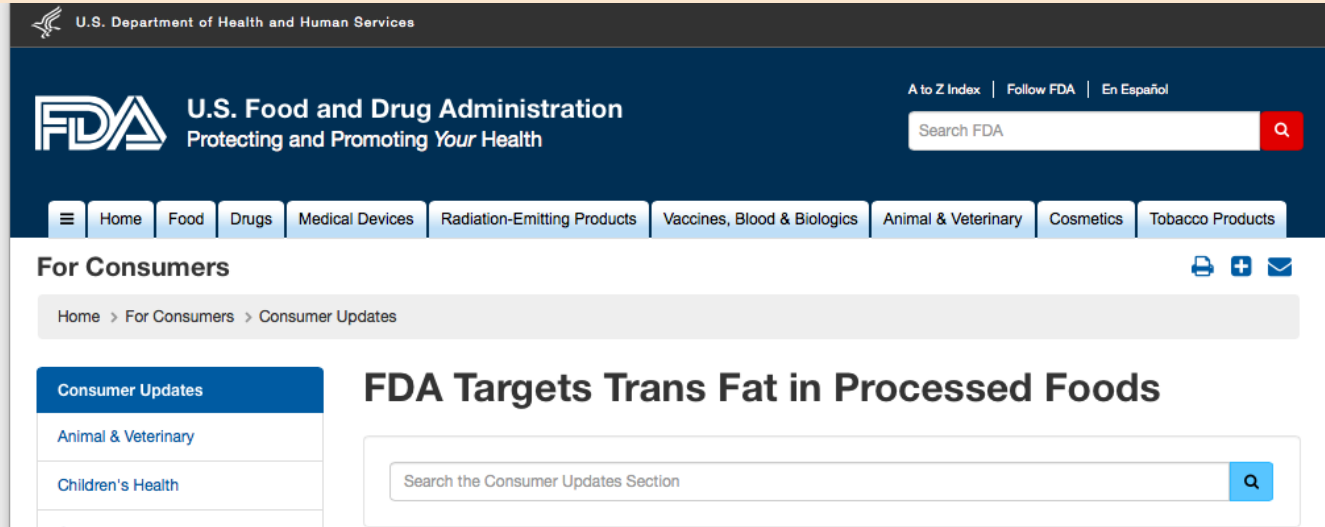


Mary Enig, University of
Maryland



Fred Kummerow, University of Illinois

FDA Bans Trans Fats, effective Jan, 2020

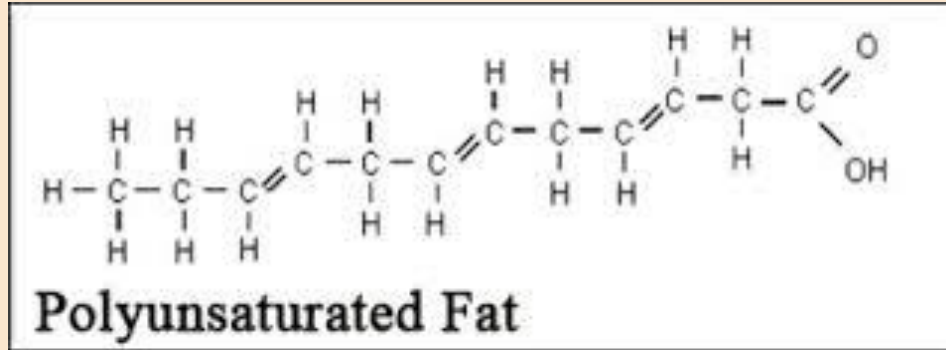


The screenshot shows the FDA website's 'For Consumers' section. At the top, the FDA logo and 'U.S. Food and Drug Administration' are displayed, along with the tagline 'Protecting and Promoting Your Health'. A search bar and navigation links for 'A to Z Index', 'Follow FDA', and 'En Español' are visible. Below the navigation bar, a menu includes 'Home', 'Food', 'Drugs', 'Medical Devices', 'Radiation-Emitting Products', 'Vaccines, Blood & Biologics', 'Animal & Veterinary', 'Cosmetics', and 'Tobacco Products'. The main content area features a breadcrumb trail: 'Home > For Consumers > Consumer Updates'. A sidebar on the left lists 'Consumer Updates', 'Animal & Veterinary', and 'Children's Health'. The main headline reads 'FDA Targets Trans Fat in Processed Foods'. Below the headline is a search bar for the 'Consumer Updates Section'.



What Replaces Trans Fats?

Basic instability of polyunsaturated fats



Trans fat replacements

1. Genetically modified soybeans



2. Sunflower oil



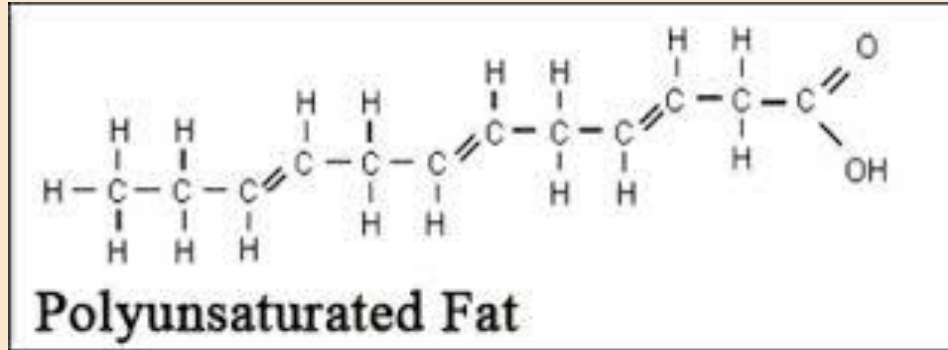
Mainly: Back to Regular Oils (non-hydrogenated)



Toxic Oxidation Products



Basic instability of polyunsaturated fats





Toxic Substances Produced by Heated Oils

Aldehydes

- 4-hydroxynonenal (HNE)
 - HNEs are a formal marker for cancer
 - “rapid cell death,” interfering with DNA and RNA and disturbing basic cell functioning
 - extreme oxidative stress
 - Implicated in neurodegenerative diseases like Alzheimer’s
- **Acrolein**
 - In mice: inflammation, acute infection
 - Injuries to their gastrointestinal tracts as well as a whole-body response called “acute phase response,” a dramatic attempt by the body to avoid septic shock

*Hundreds of oxidation products
are absorbed by food and into our bodies, brains*



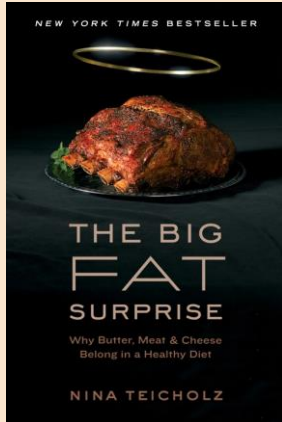
Conclusion: Frequently consumed foods containing considerable amounts of HNE, a toxic aldehyde, may be a public health concern since HNE toxicity is related to a number of common pathological conditions.

Source: Csallany A., et al., "4-Hydroxynonenal (HNE), a Toxic Aldehyde in French Fries from Fast Food Restaurants," J Am Oil Chem Soc (2015) 92:1413–1419

McDonald's used to fry their French fries in...tallow



Where to find summary of studies on inflammation, oxidation



[Health Topics](#) > [Know Your Fats](#) > The Big Fat Surprise: Toxic Heated Oils

ConfSlider

The Big Fat Surprise: Toxic Heated Oils

JULY 9, 2014 BY NINA TEICHOLZ

30 COMMENTS

What we know and *don't* know about seed oils

- Cancer
 - There is evidence from multiple RCTs showing that they cause cancer
 - Supported by mechanistic evidence (aldehydes)
- Heart disease
 - Some support by the RCT evidence (Minnesota Survey, MARGARIN).
 - Strokes consistently higher in diets low in saturated fat
 - Seed oils clearly cause inflammation

What we know and *don't* know about seed oils

- Gallstones—could be vegetable oils or low cholesterol
- Obesity
 - Evidence from at least 3 RCTs (incl. MARGARIN Trial)
 - At least one mechanistic hypothesis (M. Eades)
- Diabetes
 - Not supported by the RCT evidence (?)

Take-away lessons about oils

- Avoid omega-6 polyunsaturated fats
- For salad dressings, use olive or avocado oil
- For cooking, use stable fats (lard, tallow, coconut oil, ghee, suet)
- Avoid fried food in restaurants

Thank you!

Nina Teicholz

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



@bigfatsurprise



ninateicholz



ninateicholz



Unsettledscience.substack.com