



The Cholesterol Myth

Dietary Fats and Heart Disease

That diet might play a part as a cause of CHD was hypothesized by another American doctor, Ancel Keys, in 1953. Using data from seven countries in his 'Seven Countries Study', Keys compared the death rates from CHD and the amounts of fats eaten in those countries to demonstrate that heart disease mortality was higher in the countries that consumed more fat than it was in those countries that consumed less. (At that time, data from many more countries was available, 22, to be exact. It is clear that Keys ignored the data from those that did not support his hypothesis.) And so the 'diet/heart' hypothesis was born.

But how do we know it is true? It is all very well having a theory, what you have to do then is prove it. In medicine, the usual way is to select two groups of people, as identical for sex, age, and lifestyle as possible. One group called the control group carries on as normal while the other, called the intervention group, tries the new diet, drug or whatever. After a suitable time, the two groups are compared and differences noted.

Keys' fat-diet/heart disease hypothesis was persuasive so, to test it, several large-scale, long-term, human intervention studies were set up in many parts of the world. These involved hundreds of thousands of subjects and hundreds of doctors and scientists and cost billions of dollars in an attempt to prove that a fatty diet caused heart disease.

Framingham Heart Study

The most influential and respected investigation of the causes of heart disease is the Framingham Heart Study. This study was set up in the town of Framingham, Massachusetts by Harvard University Medical School in 1948 and is still going on today. It was this study that gave rise to the dietary 'risk factors' with which we all are so familiar today. The Framingham researchers thought that they knew exactly why some people had more cholesterol than others - they ate more in their diet. To prove the link, they measured cholesterol intake and compared it with blood cholesterol. As Table I shows, although subjects consumed cholesterol over a wide range, there was little or no difference in the levels of cholesterol in their blood and, thus, no relationship between the amount of cholesterol eaten and levels of blood cholesterol was found. (Although it is interesting that women who had the highest levels of cholesterol in their blood were ones who had eaten the least cholesterol.)

Table I: Cholesterol intake - The Framingham Heart Study			
		Blood Cholesterol in Those	
	Cholesterol Intake	Below Median Intake	Above Median Intake
	mg/day	mmol/l	mmol/l
Men	704 ± 220.9	6.16	6.16
Women	492 ± 170.0	6.37	6.26

Next, the scientists studied intakes of saturated fats but again they could find no relation. There was still no relation when they studied total calorie intake. They then considered the possibility that something was masking the effects of diet, but no other factor made the slightest difference.

After twenty-two years of research, the researchers concluded:

"There is, in short, no suggestion of any relation between diet and the subsequent development of CHD in the study group."

On Christmas Eve, 1997, after a further twenty-seven years, the *Journal of the American Medical Association* (JAMA) carried a follow-up report that showed that dietary saturated fat reduced strokes. As these tend to affect older men than CHD, they wondered if a fatty diet was causing those in the trial to die of CHD before they had a stroke. But the researchers discount this, saying:

"This hypothesis, however, depends on the presence of a strong direct association of fat intake with coronary heart disease. Since we found no such association, competing mortality from coronary heart disease is very unlikely to explain our results."

In other words, after forty-nine years of research, they are still saying that they can find no relation between a fatty diet and heart disease.

Multiple Risk Factor Intervention Trial

One of the largest and most demanding medical studies ever performed on humans, The Multiple Risk Factor Intervention Trial (known in the medical world, by its initials, as MR. FIT) involved 28 medical centres and 250 researchers and cost \$115,000,000. The researchers screened 361,662 men and deliberately chose subjects who were at very high risk to ensure that they achieved a statistically significant result. They cut cholesterol consumption by forty-two percent, saturated fat consumption by twenty-eight percent and total calories by twenty-one percent. Yet even then they didn't succeed. Blood cholesterol levels did fall, but by only a modest amount and, more importantly, coronary heart disease was unaffected. Its originators refer to the results as "disappointing" and say in their conclusions:

"The overall results do not show a beneficial effect on Coronary Heart Disease or total mortality from this multifactor intervention."

The Tecumseh Study

The Tecumseh Study attempted to correlate blood cholesterol levels measured one day with the amounts of fats eaten the previous day - but found none. Interestingly, Table II demonstrates that the people who ate the *least* cholesterol had the *highest* levels of blood cholesterol. Although not looking for it, this study also found that blood cholesterol levels were quite independent of whether the dietary fats were saturated or unsaturated. Thus another 'diet-heart' hypothesis, that only saturated fats are to blame, was invalidated.

Table II : Fat intake and blood lipids - The Tecumseh Study			
	Blood Cholesterol in Thirds		
Daily Intake:	Lower	Middle	Upper
Fat - total (g)	128	134	133
Fat Saturated (g)	52	54	54
Polyunsat/Sat ratio	0.51	0.51	0.51
Cholesterol (mg)	554	566	533

WHO European Coronary Prevention Study

The results of the World Health Organization's European Coronary Prevention Study were called "depressing" because once again no correlation between fats and heart disease was found. They had cut saturated fats down to only eight percent of calorie intake daily, yet in the UK section there were more deaths in the intervention group than in the control group.

The North Karelia Project

North Karelia, which had Finland's highest rates of heart disease, was compared with neighboring Kuopio in The North Karelia Project. In North Karelia, risk factors were cut by seventeen percent over the period of the study. As Table III shows, in North Karelia there was a reduction in both CHD mortality and total mortality. Table III also shows, however, that in Kuopio, the control group, where there were no restrictions, there was an even bigger decline in both CHD and total mortality.

Table III: Age Adjusted Rates/1,000. Age Group 30-64 years - The North Karelia Project.

		1970/1	1976/7	Decline
Total Mortality				
Men	N Karelia	13.8	11.6	16%
	Kuopio	13.6	11.4	16%
Women	N Karelia	4.8	3.9	19%
	Kuopio	5.0	3.8	24%
CHD Mortality				
Men	N Karelia	7.7	6.3	18%
	Kuopio	7.7	5.8	25%
Women	N Karelia	2.5	1.7	32%
	Kuopio	2.5	1.6	36%

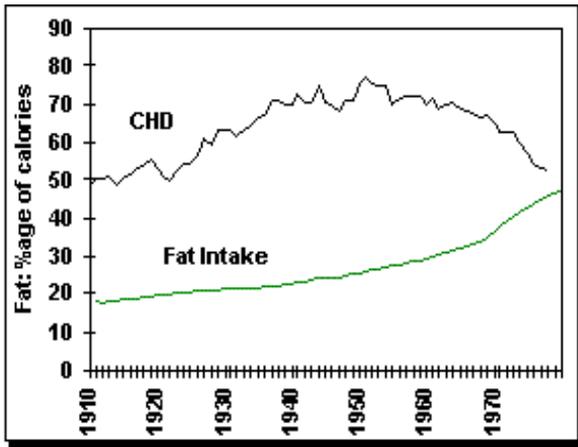
These figures suggest that adopting a 'healthy' lifestyle may actually have inhibited the decline in heart disease. They certainly give it no support.

There are more, minor studies on this topic, but a review of twenty-six studies published in 1992 concluded that:

"Lowering serum cholesterol concentrations does not reduce mortality and is unlikely to prevent coronary heart disease. Claims of the opposite are based on preferential citation of supportive trials."

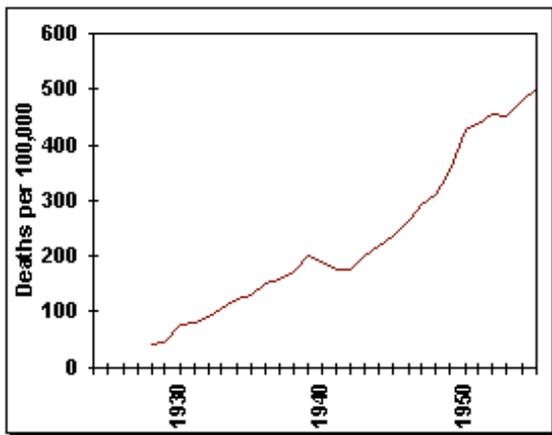
One that seemed to support the 'healthy' recommendations was a Finnish trial published in 1975. In the five years that the trial ran, cholesterol levels were lowered significantly, and the study was hailed as a success. But in December 1991 the results of a 10-year follow-up to that trial found that those people who continued to follow the carefully controlled, cholesterol-lowering diet were *twice* as likely to die of heart disease as those who didn't — some success! Professor Michael Oliver, writing in the *British Medical Journal* commenting on the results, writes:

"As multiple intervention against risk factors for coronary heart disease in middle aged men at only moderate risk seem to have failed to reduce both morbidity and mortality such interventions become increasingly difficult to justify. This runs counter to the recommendations of many national and international advisory bodies which must now take the recent findings from Finland into consideration. Not to do so may be ethically unacceptable."



Despite this wealth of evidence, nutritionists and the media continue to mislead us. They tell us, for example, that the recent fall in the numbers of heart deaths in the USA is because Americans are eating less fat. The graph below, however, shows clearly that while CHD in the USA peaked in the 1950s and has fallen consistently since, this is against a background of *rising* fat intake.

It is difficult to understand how the fat hypothesis gained such credibility in the USA as its history, more than most, does not support it. The North American continent had been opened up by explorers and trappers who lived, very healthily, as did the American Indians, almost entirely on fresh meat and pemmican. As real pemmican is half dried lean meat and half rendered animal fat, and as fat has over twice the calorific value of protein, more than seventy percent of the energy in their diet came from fat.



Dieticians also say that the British had less CHD in the 1940s when fat was rationed. However, the decade of rationing went on into the early 1950s with fat being the last food to come off ration in 1954. Again the graph shows clearly that the most rapid *rise* in CHD occurred during that period.

Also, during the period of rationing, British farmers had a very low incidence of heart disease when one would have expected their intake of fats, particularly animal fats, to have been higher than most.

Experience in other countries

Keys based his fat-causes-heart disease hypothesis on a comparison between countries. When we are told that we are 'the sick man of Europe', we are also compared to other countries. So let us do a similar comparison.

1. In Japan, intakes of animal fat have more than doubled since the end of the Second World War. Over the same period their incidence of coronary heart disease has fallen consistently. In Israel too an increased consumption of saturated fats was followed by a fall in coronary deaths.
2. The dietary changes in Sweden parallel those in the USA, yet heart disease mortality in Sweden was rising while American rates were falling.
3. There is also a threefold variation in rates of heart disease between France and Finland even though fat intake in those two countries is very similar.
4. Among south Asians in Britain there is an unusually high incidence of heart disease, yet living on largely vegetarian diets, they have low levels of blood cholesterol and eat diets that are low in saturated fat.
5. Indians in South Africa have probably the highest rates of coronary disease in the world yet there is no apparent reason why they should based on the current dietary hypotheses.
6. Until recently, Indians in India had a very low incidence of heart disease while using ghee (clarified butter) and coconut oil, which are highly saturated, and mustard seed oil which is largely monounsaturated. The epidemic of heart disease in India began only after these were replaced with peanut, safflower, sunflower, sesame and soybean oils, all of which are high in polyunsaturated oils.
7. Lastly, the World Health Organisation is apparently in ignorance of epidemiological data that do not support its recommendation to reduce dietary saturated fat. While it talks of coronary heart disease being responsible for most deaths in Caribbean countries, fat intake there is remarkably low.

Polyunsaturated fats

The arguments for the polyunsaturated fat hypothesis are no more convincing than those for the cholesterol theory. The claim is that unsaturated fats have a protective or preventative effect on CHD. But in Israel, when consumption of polyunsaturated fats was about twice that of most Western countries, there was a very high incidence of CHD. Those given high polyunsaturated diets in a trial in New South Wales fared significantly worse than those on a free diet. And this is the finding in most trials that have increased the ratio of polyunsaturated fats.

From as early as 1971, an excess of cancer deaths has been reported in trials using diets that were high in polyunsaturated fats. Polyunsaturated fats are also blamed for a doubling the incidence of gallstones in the general public.

One of the pioneers of the polyunsaturated-fat-prevents-CHD hypothesis was the American cardiologist E. H. Ahrens Jr.. After twenty-five years of further research, however, he concluded that it was "irresponsible" to continue to press the polyunsaturated fat recommendations on the general public. He went on:

"If the public's diet is going to be decided by popularity polls and with diminishing regard for the scientific evidence, I fear that future generations will be left in ignorance of the real merits, as well as the possible faults in any dietary regimen aimed at prevention of coronary heart disease."

Another of the original proponents of the low-fat, low-cholesterol hypothesis, and a member of the Norwegian Council for Diseases of the Heart and Arteries, Professor Jens Dedichen of Oslo, also changed his mind. In the 1950s Norway launched a cholesterol-lowering regimen in which soy margarine, that is

high in polyunsaturated fatty acids, replaced butter, and soy oil was used extensively. During the subsequent 20 years the increase in the use of soy-based products was accompanied by a steep and continuing rise in deaths from coronary thrombosis. Professor Dedichen drew attention to the failure of the programme - and received a very hostile reaction from his colleagues.

Also castigated were members of the National Academy of Sciences and the National Research Council of America when in a report of May 1980, they stated that prevention of heart disease could not be achieved by reducing blood cholesterol using either diet or drugs, and said that such measures should be abandoned.

Margarine - a natural food?

The polyunsaturated fats used to make margarine are generally obtained from vegetable sources such as sunflower seed, cottonseed, and soybean. As such they might be thought of as natural foods. Usually, however, they are pressed on the public in the form of highly processed margarines, spreads and oils and, as such, they are anything but natural.

In 1989, the petroleum-based solvent, benzene, that is known to cause cancer, was found in Perrier mineral water at a mean concentration of fourteen parts per billion. This was enough to cause Perrier to be removed from supermarket shelves. The first process in the manufacture of margarine is the extraction of the oils from the seeds, and this is usually done using similar petroleum-based solvents. Although these are then boiled off, this stage of the process still leaves about ten parts per million of the solvents in the product. That is 700 times as much as fourteen parts per billion.

The oils then go through more than ten other processes: degumming, bleaching, hydrogenation, neutralization, fractionation, deodorisation, emulsification, interesterification, . . . that include heat treatment at 140 ° -160 ° with a solution of caustic soda; the use of nickel, a metal that is known to cause cancer, as a catalyst, with up to fifty parts per million of the nickel left in the product; the addition of antioxidants such as butylated hydroxyanisole (E320). These antioxidants are again usually petroleum based and are widely believed to cause cancer.

The hydrogenation process, that solidifies the oils so that they are spreadable, produces *trans* -fatty acids that rarely occur in nature.

The heat treatment alone is enough to render these margarines nutritionally inadequate. When the massive chemical treatment and unnatural fats are added, the end product can hardly be called either natural or healthy.

Recent United States studies showed that heart disease worsened in those who switched from butter to polyunsaturate-rich margarine. Research published in March 1993, confirmed this. [In a study that involved 85,000 nurses, women who ate just four teaspoons of polyunsaturated margarine a day had a sixty-six percent increased risk of CHD compared to those who ate none.](#) A review of men's experience in the Framingham Study published in 1995 also found that 6 teaspoons a day (mean of lowest intake vs mean of highest), increased risk by nearly a third. The authors conclude:

"Intake of margarine may predispose to development of CHD in men." — and CHD is the one disease eating this sort of margarine was supposed to reduce!

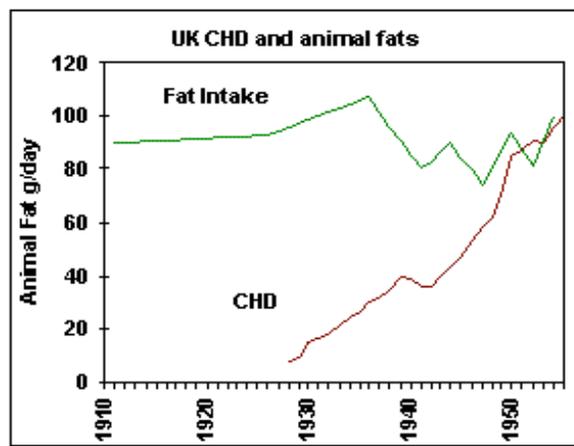
You may be interested in a list of the ingredients that may be present in butter and margarine:

Butter: milk fat (cream), a little salt	Margarine: Edible oils, edible fats, salt or potassium chloride, ascorbyl palmitate, butylated hydroxyanisole, phospholipids, tert-butylhydroquinone, mono- and di-glycerides of fat-forming fatty acids, disodium guanylate, diacetyltartaric and fatty acid esters of glycerol, Propyl, octyl or dodecyl gallate (or mixtures thereof), tocopherols, propylene glycol mono- and di-esters, sucrose esters of fatty acids, curcumin, annatto extracts, tartaric acid, 3,5,trimethylhexanal, β -apo-carotenoic acid methyl or ethyl ester, skim milk powder, xanthophylls, canthaxanthin, vitamins A and D.
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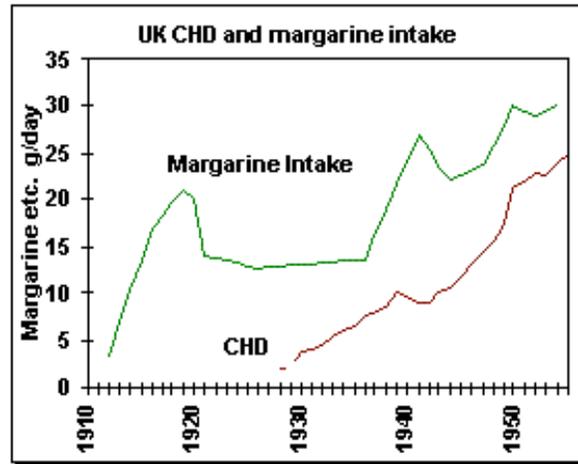
Dietary fat patterns

The total amount of fats in our diet today, according to the MAFF National Food Survey, is almost the same as it was at the beginning of this century. What has changed, to some extent, is the type of fats eaten. At the turn of the century we ate mainly animal fats that are largely saturated and monounsaturated. Now we are tending to eat more polyunsaturated fats - it's what we are advised to do.

It is interesting to compare the growth of heart disease in this country with intakes of different fats. The next graph illustrates the birth of CHD in Britain together with the intake of animal fat since the beginning of the century. When compared with the CHD curve, it is clear that there is no obvious relationship



If we plot CHD together with intakes of margarines and vegetable shortenings, however, we find a different curve.

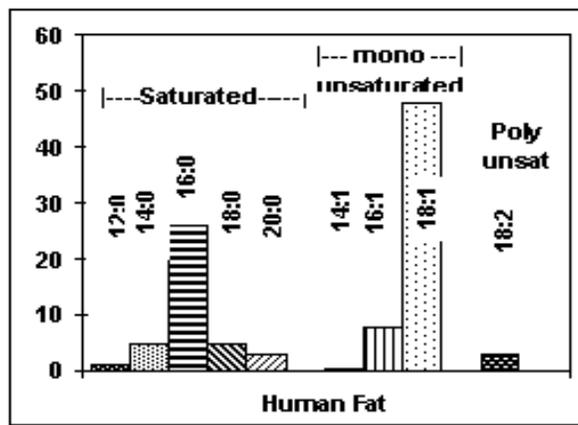


Margarine use began around the turn of the century. Butter was expensive. The poor bought margarine as a substitute for butter and sales were brisk. The rapid rise in margarine consumption was followed a couple of decades later by that dramatic rise in heart disease deaths.

If there is a causal relationship between fat intake and heart disease, these two graphs suggest to me that it is the margarines that are the more likely candidates for suspicion.

Polyunsaturated fats and Cancer

Body cell membranes are made of cholesterol. The graph below demonstrates that the human body's fat make-up is largely of saturated and monounsaturated fatty acids. We contain very little polyunsaturated fat. Cell membranes have to allow the various nutrients that body cells need from the blood, but stop harmful pathogens. They must be stable. An intake of large quantities of polyunsaturated fatty acids changes the constituency of cholesterol and body fat. Cell membranes become softer and more unstable.



Many laboratories have shown that diets high in polyunsaturates promote tumors. It has been known since the early 1970s that it is linoleic acid that is the major culprit. As Professor Raymond Kearney of Sydney University put it in 1987:

"Vegetable oils (eg Corn oil and sunflower oil) which are rich in linoleic acid are potent promoters of tumor growth."

Carcinogens — background radiation, ultraviolet radiation from the sun, particles in the air we breathe and the food we eat — continually attack us all. Normally, the immune system deals with any small focus of cancer cells so formed and that is the end of it. But linoleic acid suppresses the immune system. Indeed, it is so good at this that in the 1970s sunflower oil was given to kidney transplant patients to prevent kidneys being rejected - until an excess of cancer deaths was reported. With a high intake of margarine, therefore, a tumor may grow too rapidly for the weakened immune system to cope thus increasing our risk of a cancer.

Since 1974, the increase of polyunsaturated fats has been blamed for the alarming increase in malignant melanoma (skin cancer) in Australia. We are all told that the sun causes it. Are Australians going out in the sun any more now than they were fifty years ago? They are certainly eating more polyunsaturated oils; even milk has its cream removed and replaced with vegetable oil. Victims of the disease have been found to have polyunsaturated oils in their skin cells. Polyunsaturated oils are oxidized readily by ultraviolet radiation from the sun and form harmful 'free radicals'. These are known to damage the cell's DNA and this can lead to the deregulation we call cancer. Saturated fats are stable. They do not oxidize and form free radicals.

Malignant melanoma is also said to be increasing in this country. Does the sun cause this? In Britain, the number of sufferers is so small as to be relatively insignificant. Even so, it is not likely that the sun is to blame since all the significant increase is in the over-seventy-five-year-olds. People in this age group tend to get very little sun.

Melanoma occurs ten times as often in Orkney and Shetland than it does on Mediterranean islands. It also occurs more frequently on areas that are *not* exposed to the sun. In Scotland, for example, there are five times as many melanomas on the feet as on the hands; and in Japan, forty per cent of pedal melanomas are on the soles of the feet.

In 1991, two studies, from USA and Canada, found that linoleic acid, the major polyunsaturated fatty acid found in vegetable oils, increased the risk of breast tumors. This, it seems, was responsible for the rise in the cancers noted in previous studies. Experiments with a variety of fats showed that saturated fats did not cause tumors but, when small amounts of polyunsaturated vegetable oil or linoleic acid itself was added, this greatly increased the promotion of breast cancer.

A study of 61,471 women aged forty to seventy-six, conducted in Sweden, looked into the relation of different fats and breast cancer. The results were published in January 1998. This study found an inverse association with monounsaturated fat and a positive association with polyunsaturated fat. In other words, monounsaturated fats protected against breast cancer and polyunsaturated fats increased the risk. Saturated fats were neutral.

All polyunsaturated margarines, from the brand leader to shops' 'own brands' are around thirty-nine percent linoleic acid. Of cooking oils, sunflower oil is fifty percent and safflower oil seventy-two percent linoleic acid. Butter, on the other hand, has only a mere two percent and lard is just nine percent linoleic acid. Linoleic acid is one of the essential fatty acids. We must eat some to live, but we do not need much. The amount found in animal fats is quite sufficient.

Because of the heart disease risk, in 1994 the manufacturers of Flora changed its formula to cut out the trans fats and other manufacturers have since followed. But that still leaves the linoleic acid.

The anti-cancer fat

Linoleic acid is one of the essential fatty acids that our bodies need but cannot synthesize. We must eat some to survive. Fortunately there is one form of linoleic acid that is beneficial. Conjugated linoleic acid (CLA) differs from the normal form of linoleic acid only in the position of two of the bonds that join its atoms. But this small difference has been shown to give it powerful anti-cancer properties. Scientists at the Department of Surgical Oncology, Roswell Park Cancer Institute, New York and the Department of Biochemistry and Molecular Biology, New Jersey Medical School, showed that even at concentrations of less than one percent, CLA in the diet is protective against several cancers including breast cancer, colorectal cancer and malignant melanoma.

Conjugated linoleic acid has one other difference from the usual form - it is not found in vegetables but in the fat of ruminant animals. The best sources are dairy products like butter, and the fat on red meat. It is another good reason not to give up eating red meat or to cut the fat off.

Scientists at the University of Wisconsin also believe that CLA has a slimming action. They put the dramatic increase in obesity in the USA down to Americans not eating beef fat.

Monounsaturated fats

Several populations in the world, Eskimos and those in the Mediterranean countries for example, eat high-fat diets yet have very low incidences of heart disease. This realization has led to research scientists switching their attentions to monounsaturated fats found in fish oils and olive oil.

Although the supposed virtues of monounsaturated fats are being talked of in the press as possible saviors of Western man, the monounsaturated theory is not new. It was first demonstrated over thirty years ago that giving people more unsaturated fats could lower blood cholesterol. However, surveys of countries with different tastes in fats and oils have failed to show that this protects against heart disease. For example, Norwegians, who eat a lot of saturated fats, have lower rates of the disease than New Zealanders who eat a similar amount. But if, as has been suggested, the Norwegians are protected by the monounsaturated oils in the fish that they eat, then why is it that in Aberdeen, where a lot of fish is also consumed, the heart disease rate is double that of Oslo? Proponents also forget that many other people, such as the Maasai tribes of Africa, who don't eat either fish or olive oil, also have a low incidence of heart disease.

There is also no evidence that either mono- or polyunsaturated oils are of benefit to those who have already suffered a heart attack. As long ago as 1965 survival rates were studied in patients eating different oils. Splitting patients into three groups, who were given polyunsaturated corn oil, monounsaturated olive oil and saturated animal fats respectively, it was found that only the corn oil lowered blood cholesterol levels. At first sight, therefore, it seemed that men in the polyunsaturated group had the best chance of survival. However, at the end of the two-year trial only fifty-two percent of the polyunsaturated corn oil group were still alive and free of a fresh heart attack. Those on the monounsaturated olive oil fared little better: fifty-seven percent survived and had no further attack. Those eating the saturated animal fats, however, fared much better with seventy-five percent surviving and without a further attack.

Breast Cancer

The Swedish study by Alicia Wolk and colleagues mentioned above did find, however, that monounsaturated fats were protective against breast cancer.

Animal fats such as lard are around 43% Saturated, 47% Mono-unsaturated and 10% Polyunsaturated - which the evidence suggests is just about ideal.

There is an explanation of the different types of fat at <http://www.second-opinions.co.uk/fats.html>

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