




# The Latest Research on Fats and Cholesterol

Richard Collins, MD  
Susan Buckley, RDN, CDE  
South Denver Cardiology

- It's time to end the low-fat myth.
- For decades, a low-fat diet was touted as a way to lose weight and prevent or control heart disease and other chronic conditions
- Food companies re-engineered products to be reduced-fat or fat-free, and then compensated for differences in flavor and texture **by increasing amounts of salt, sugar, or refined grains.**
- However, as a nation, following a low-fat diet **hasn't helped us control weight or become healthier.**

- 
- **In the 1960s, fats and oils supplied Americans with about 45%** of calories and about 13% of adults were obese and under 1% had type 2 diabetes
  - **Today, Americans take in less fat, getting about 33% of calories** from fats and oils; yet 34% of adults are obese and 11% have diabetes, most with type 2 diabetes.

- 
- Why hasn't cutting fat from the diet paid off as expected?
  - Detailed research shows that the total amount of fat in the diet isn't really linked with weight or disease.
  - What really matters is the **type of fat and the total calories in the diet.**
  - Bad fats, meaning trans and saturated fats, **increase the risk for certain diseases.**
  - Good fats, meaning monounsaturated and polyunsaturated fats, do just the opposite. They are **good for the heart and most other parts of the body.**

- ▶ One problem with a generic lower fat diet is that it **prompts most people to stop eating fats that are good for the heart along with those that are bad for it.**
- ▶ Another problem is that when people cut back on fat, they often switch to **foods full of easily digested carbohydrates—white bread, white rice, potatoes, sugary drinks, and the like—or to fat-free products that replace healthful fats with sugar and refined carbohydrates.**
- ▶ The body digests these carbohydrates very quickly, causing **blood sugar and insulin levels to spike.**


- ▶ Over time, eating lots of “fast carbs” can raise the risk of heart disease and diabetes **as much as—or more than—eating too much saturated fat.**
- ▶ That’s why it’s important to replace foods high in bad fats with foods high in good **fats—not with refined carbohydrate**



- Almost all foods contain some fat
- Even quintessential fat-free foods like carrots and lettuce contain small amounts of this nutrient.
- That's how important fats are for life.
- Fat provides a good source of energy
- It is **an important part of cell membranes**, helping govern what gets into cells and what comes out.
- The body uses cholesterol as the starting point to make **estrogen, testosterone, vitamin D, and other vital compounds.**


- Fats are also biologically active molecules that can **influence how muscles respond to insulin's "open up for sugar" signal**
- Different types of fats can also fire up or cool down **inflammation.**



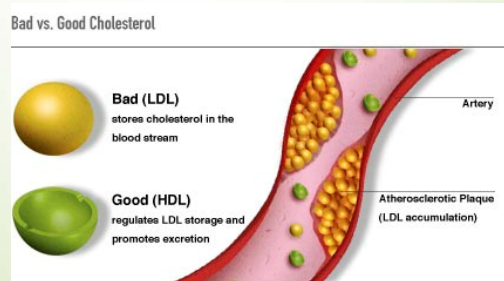


## What is High Cholesterol?

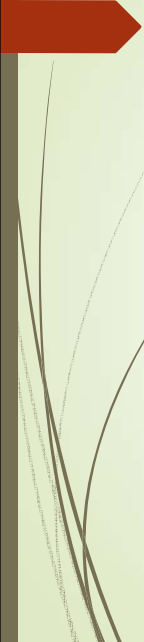
- High cholesterol is a well-known **risk factor for heart disease**.
- Cholesterol itself is a waxy, fat-like substance that is **primarily made by the liver**, although some comes from the **diet**.
- It is an essential component of cell membranes and is used by the body to produce **hormones and vitamin D**.

- 
- Fat and cholesterol can't dissolve in water or blood
  - The body gets around this basic chemistry problem by packaging fat and cholesterol into tiny, protein-covered particles called **lipoproteins**.
  - Although lipoproteins can carry quite a bit of fat, they mix easily with blood and flow with it.
  - Some of these particles are big and fluffy, others small and dense.
  - The most important ones are **low-density lipoproteins (LDL)** **high-density lipoproteins (HDL)** and triglycerides.

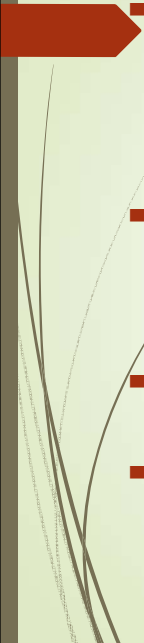
- LDL is commonly known as the "bad" cholesterol because it transports cholesterol from the liver throughout the body, and potentially allows it to be deposited in artery walls.
- HDL, known as the "good cholesterol," picks up cholesterol from the blood and delivers it to cells that use it, or takes it back to the liver to be recycled or eliminated from the body.



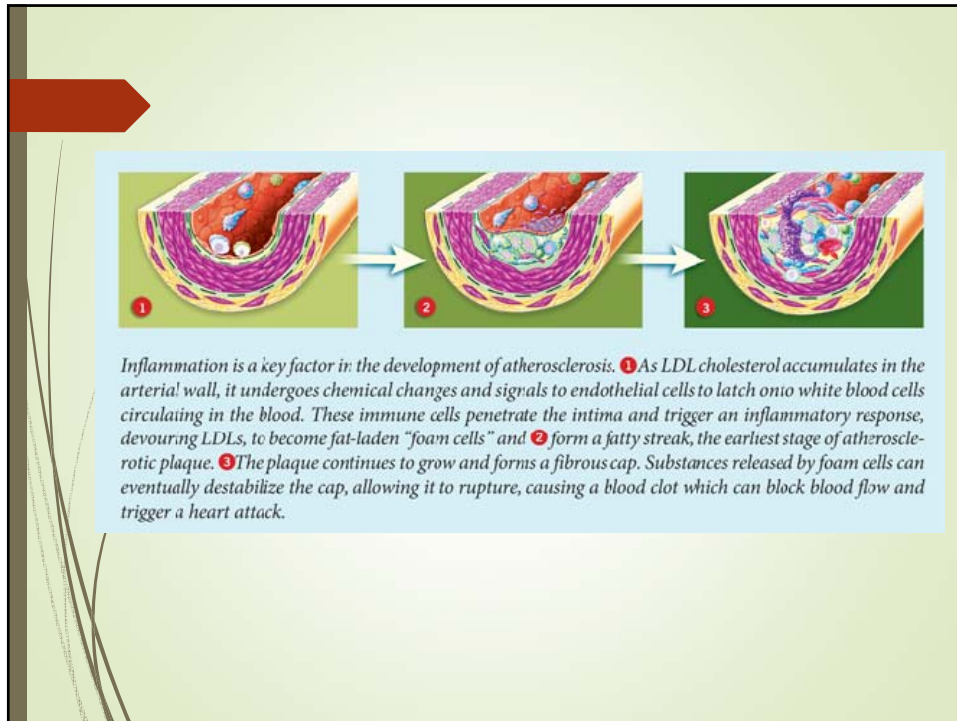
- Too much cholesterol in the blood builds up on artery walls causing **hardening of the arteries (atherosclerosis)**.
- The buildup of cholesterol **narrows arteries, slowing or blocking the flow of oxygen-carrying blood to the heart**, which can manifest as **chest pain**.
- If blood flow to the heart is cut off because of clogged arteries, the result is damage to the heart muscle - a **heart attack**.



- The tendency toward high cholesterol is partly **genetic although diet also influences cholesterol levels.**
- Other factors that can influence cholesterol levels include **being overweight and being physically inactive.**
- The **older you get, the more likely your cholesterol levels are to rise.**
- Before menopause, women tend to have lower cholesterol levels than men of the same age, but **after menopause, women's LDL levels often increase.**





- There is controversy over whether high cholesterol is in itself a cause of heart disease (the lipid hypothesis), or a symptom of an **inflammatory condition** that is the true cause of heart disease (the inflammation hypothesis).
- Chronically high levels of **inflammation** can create small lesions on arterial walls; the body sends LDL to heal those lesions, but it ultimately **accumulates and oxidizes, causing blockages.**
- **Both LDL and inflammation** have an impact on heart disease
- The best lifestyle approach to lower cardiovascular disease risk is to **lower inflammation in the body** as well as LDL.




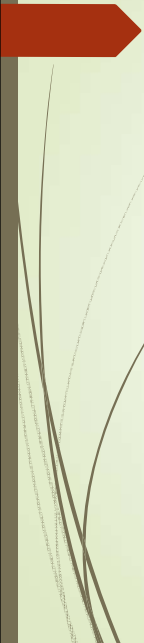
- **Inflammation** is key contributor to heart disease.
- A major study done at Harvard found that people with high levels of a marker called **C-reactive protein (CRP)** had **higher risks of heart disease** than people with high cholesterol.
- Normal cholesterol levels were **NOT protective** to those with high CRP.
- The risks were greatest for those with high levels of both CRP and cholesterol.



- 
- Your cholesterol levels can be measured by a blood test done after you've fasted for 8 to 12 hours.
  - Results will reveal your total cholesterol level, your LDL and HDL levels as well as levels of triglycerides, the most common type of fat in the body.
  - Some doctors also obtain tests for **LDL particle size and number**.
  - Desirable levels of total cholesterol are 200 mg per deciliter of blood or less; levels between **200 mg/dL and 239 mg/dL** are considered **borderline high**; **240 mg/dL or higher** is considered **high cholesterol** and raises your risk of heart disease to twice what it would be if your total cholesterol were 200 mg/dL or lower.

- 
- But - 75% of people who have heart attacks have **normal cholesterol**
  - In fact, people with the **lowest cholesterol as they age** are **at highest risk of death**.
  - Under certain circumstances, higher cholesterol can actually **help to increase life span**.

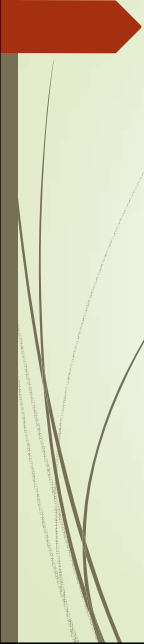
- 
- A 2009 study in *American Heart Journal* of approximately 137,000 patients hospitalized for coronary artery disease found that almost one-half had **LDL cholesterol levels below 100 mg/dL at admission**
  - Notably, more than one-half of the patients had **HDL levels below 40 mg/dL**, showing the importance of this marker
  - Levels of HDL – the good cholesterol – should be **above 50 in women and above 40 in men**

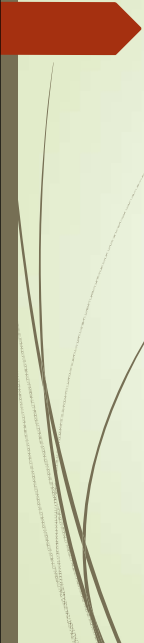
- 
- **Total cholesterol is not as critical** as the following:
  - Your levels of HDL “good” cholesterol vs. LDL “bad” cholesterol
  - Your triglyceride levels
  - Your ratio of triglycerides to HDL
  - Your ratio of total cholesterol to HDL

- A desirable level of heart protective HDL cholesterol is 60 mg/dL or higher; **levels below 40 mg/dL for men and less than 50 mg/dL for women increase the risk of heart disease.**



- A desirable level of **LDL ("bad")** cholesterol is **less than 100 mg/dL** - the lower your LDL, the better in terms of heart disease risk.
- Levels between **139 and 150 mg/dL** are **borderline high** and those between **160 to 189 mg/dL** are considered **high**, while LDL levels **above 190 mg/dL** are **classed as very high**.


- 
- **Triglycerides make up most of the fat** that you eat and that travels through the bloodstream.
  - As the body's **main vehicle for transporting fats to cells**, triglycerides are important for good health.
  - But as is the case for so many things, an **excess of triglycerides can be unhealthy.**

- 
- Normal triglyceride levels are considered **150 mg/dL or lower**;
  - those from **150 to 199 mg/dL** are considered **borderline high**
  - those from **200-499 mg/dL** are considered **high**
  - those above **500 mg/dL** are deemed **very high.**



## What Should My Numbers Be?

- Your **ratio of total cholesterol to HDL** should be less than 3.0.
- Your **ratio of triglycerides to HDL** should be no greater than 4, which can indicate insulin resistance if elevated.
- **Cardio C-reactive protein.** This is a marker of inflammation in the body that is essential to understand in the context of overall risk. **Your C-reactive protein level should be less than 1**(if you have an inflammatory disease it will be higher)

- 
- There are different sizes of **cholesterol particles**.
  - There are small and large particles of LDL, HDL, and triglycerides.
  - The **most dangerous** are the small, dense particles that act like BB pellets, easily penetrating your arteries.
  - Large, fluffy cholesterol particles are **practically harmless**—even if your total cholesterol is high.
  - They function like beach balls and bounce off the arteries, causing no harm.

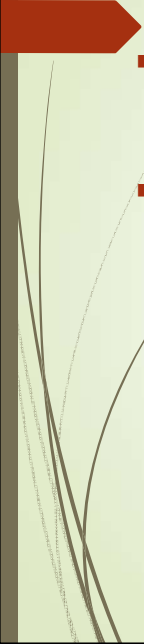
- In general, the lower your LDL and the higher your HDL, the better your chances of preventing heart disease and other chronic conditions.
- The **types of fat in the diet** determine to a large extent the amount of total, HDL, and LDL cholesterol in the bloodstream.
- The **types and amount of carbohydrate in the diet also play a role.**
- Cholesterol in food matters, too, but **not nearly as much as the type of fat and the type of carbohydrates you eat**


- Unsaturated fats are called good fats because they can **improve blood cholesterol levels, ease inflammation, stabilize heart rhythms,** and play a number of other beneficial roles.
- Unsaturated fats are predominantly found in foods from plants, such as **avocados, vegetable oils, nuts, and seeds.**



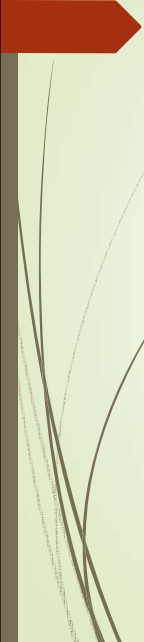
- There are two types of unsaturated fats:
- **Monounsaturated fats** are found in high concentrations in **olive, peanut, and canola oils; avocados; nuts such as almonds, hazelnuts, and pecans; and seeds such as pumpkin and sesame seeds.**
- **Polyunsaturated fats** are found in high concentrations in **sunflower, soybean, and flaxseed oils, and also in foods such as walnuts, flax seeds, and fish;** canola oil, though higher in monounsaturated fat, is also a good source of polyunsaturated fat.
- **Omega-3** fats are an important type of polyunsaturated fat.
- The body can't make these, so they must come from food. An excellent way to get omega-3 fats is by **eating fish two or three times a week.**
- Good plant sources of omega-3 fats include **chia seeds, flax seeds, walnuts, and oils such as flaxseed, canola, and soybean.**

- Dutch researchers conducted an analysis of 60 trials that examined the effects of carbohydrates and various fats on blood lipid levels.
- In trials in which polyunsaturated and monounsaturated fats were eaten **in place of carbohydrates**, these **good fats decreased levels of harmful LDL and increased protective HDL.**
- More recently, a randomized trial known as the Optimal Macronutrient Intake Trial for Heart Health (OmniHeart) showed that **replacing a carbohydrate-rich diet with one rich in unsaturated fat, predominantly monounsaturated fats, lowers blood pressure, improves lipid levels, and reduces the estimated cardiovascular risk.**

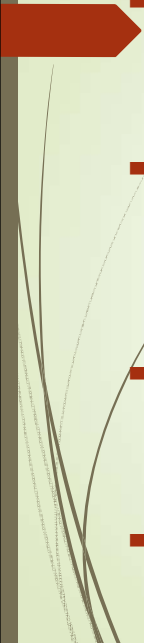
- 
- There's been controversy brewing over the past decade about just how bad saturated fat is for health.
  - Recently, several studies seemed to suggest that eating diets high in saturated fat **did not** raise the risk of heart disease—a finding that ran counter to decades of dietary advice. (Meta-analysis of prospective cohort studies evaluating the association of saturated fat with cardiovascular disease. [\*Am J Clin Nutr.\* 2010;91:535-46.](#))

- 
- This highly-publicized report analyzed the findings of **21 studies that followed 350,000 people for up to 23 years.**
  - Investigators looked at the relationship between saturated fat intake and coronary heart disease (CHD), stroke, and cardiovascular disease (CVD).
  - Their controversial conclusion: ***"There is insufficient evidence from prospective epidemiologic studies to conclude that dietary saturated fat is associated with an increased risk of CHD, stroke, or CVD."***

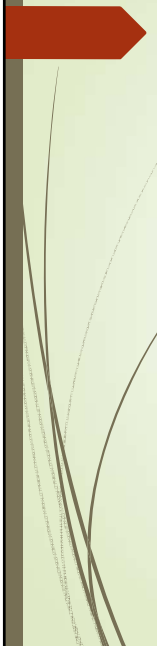




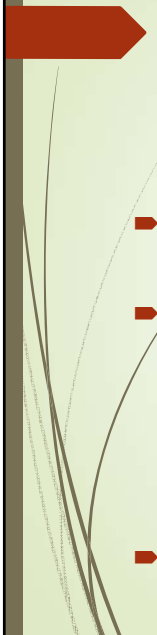
- Another review and meta-analysis published in March 2014 in *Annals of Internal Medicine* from the University of Cambridge was led by Rajiv Chowdhury, MD and a team of international researchers
- Their review concluded that there **wasn't** *"clearly supportive evidence for current cardiovascular guidelines that encourage high consumption of polyunsaturated fatty acids and low consumption of saturated fats."*





- Chowdhury's controversial review included 27 randomized, controlled trials and 49 observational studies, which involved more than 600,000 participants in 18 countries.
- The studies used measures of fatty acid biomarkers and food frequency and diet history questionnaires to assess fatty acid exposure, with varying methods based on study type.
- Shortly after Chowdhury's meta-analysis was released, some corrections were published, although these didn't affect the primary author's conclusions.
- Other experts, however, strongly disagreed with the conclusions.






- The researchers looked at variation in the intake of specific fatty acid categories (e.g., saturated, monounsaturated, polyunsaturated, trans), sub-categories (e.g., omega-3 and omega-6 polyunsaturates), and specific fatty acids within those sub-categories and corresponding variation in coronary heart disease.
- They asked: what are the differences in rates of coronary heart disease in observational studies when the top third of intake is compared to the bottom third of intake for some particular class of fatty acid?



- Representing over 500,000 people, the investigators found **more coronary heart disease in the highest intake of trans fat** compared to the lowest; and **less heart disease in the highest intake of omega-3 fat** compared to the lowest.
- There was a hint of benefit for higher monounsaturated fat intake.
- And then the part about saturated fats: there was **no appreciable difference in coronary heart disease rates seen comparing the top to bottom third of saturated fat intake**, although there was in fact a suggestion of more heart disease with more saturated fat consumption.
- There was no difference when comparing the top to bottom third of omega-6 fat intake either.

- 
 "Chowdhury's analysis was deeply flawed due to omission of important studies, extraction of incorrect data from some studies, incorrect interpretation of their own findings, and failure to mention results of other, superior analyses," says Walter Willett, MD, DrPH, chair of the department of nutrition at Harvard School of Public Health, who recommended a retraction of the study.
- 
 "The analysis missed the important benefits from both omega-3 and omega-6 polyunsaturated fats due to those problems, and therefore also missed **the important benefits of replacing saturated fat with polyunsaturated fats.**"

- 
 According to David Katz, MD, MPH, FACPM, FACP, director of the Yale-Griffin Prevention Research Center, *"All the Chowdhury meta-analysis showed is that if you look over time in the United States, we had a very high rate of heart disease when our saturated fat intake was a bit higher, and we have the same very high rate of heart disease now that our intake of saturated fat is a little bit lower.*"
- 
 "There are two important points here: one, **our intake of saturated fat is only a bit lower,** and two, **we've replaced it with sugars and starch, not with kale and broccoli.**
- 
 There is **no evidence here even hinting at the notion that saturated fat is good for us."**

- Some experts also contend that **there are many different saturated fatty acids**, which may have individual effects on health—saying it's not black and white or an "all good" or "all bad" situation
- **Lauric acid, myristic acid, and palmitic acid increase LDL cholesterol**, whereas **stearic acid**, which makes up more than one-half of the saturated fat in cocoa, is thought to have a **neutral effect on total and LDL cholesterol levels**



## Coconut Oil

- Despite the popularity of coconut oil, this highly saturated oil is **44% lauric acid and 16% myristic acid, which are both hypercholesterolemic**.
- "We do know that **coconut oil raises LDL cholesterol, but it raises HDL cholesterol even more**. Does that make a difference? We don't know," says Dariush Mozaffarian, MD, DrPH, dean of the Friedman School of Nutrition Science & Policy at Tufts University. **"There's no strong data or evidence that coconut oil is better or worse for you than any other source of saturated fat,"** he explains.

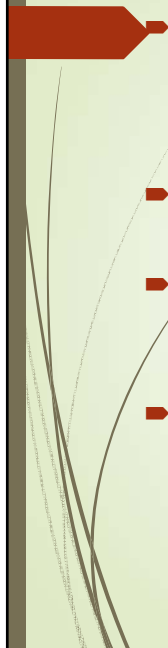
- So why is there such positive buzz about coconut oil?
- "Most of the claims being made for coconut oil are based on research using **medium chain triglycerides**, which are **not** the predominant fatty acids in coconut oil," Vannice says. "Some of the saturated fats in coconut oil may be metabolized differently and lead to less fat production, but the impact of replacing lard with coconut oil is unknown. In fact, **coconut oil has much more saturated fat than both lard and beef tallow**," she adds.




## Coconut Oil

- If you choose to consume coconut oil, **moderation is key**, and using the less processed (virgin) oils is a better choice, as the fatty acids will be closer to their original form, and the oil will contain more phytonutrients.

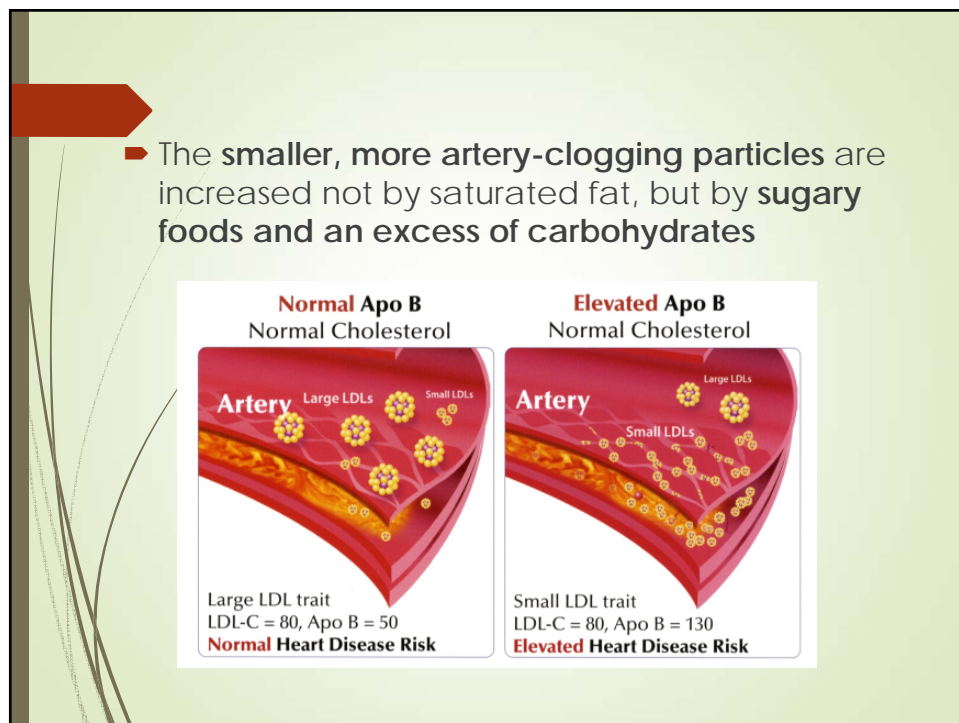




- The primary reason saturated fat has historically had a bad reputation is that it **increases low-density lipoprotein cholesterol, or LDL, the kind that raises the risk for heart attacks.**
- But the relationship between saturated fat and LDL is complex.
- In addition to raising LDL cholesterol, **saturated fat also increases high-density lipoprotein, or HDL, the so-called good cholesterol.**
- And the **LDL that it raises is a subtype of big, fluffy particles that are generally benign.** Doctors refer to a preponderance of these particles as LDL pattern A.



- The **smallest and densest form of LDL is more dangerous.**
- These particles are **easily oxidized** and are more likely to set off inflammation and contribute to the buildup of **artery-narrowing plaque.**
- An LDL profile that consists mostly of these particles, known as **pattern B**, usually coincides with high triglycerides and low levels of HDL, both **risk factors for heart attacks and stroke.**





## Sugar


- Sugar in any form, or refined carbohydrates (white food) **drives the good cholesterol down, cause triglycerides to go up, creates small damaging cholesterol particles, and causes metabolic syndrome or pre-diabetes.**




## Sugar

- People **eating less saturated fat** don't simply stop eating a nutrient and leave a big hole in their diets.
- When we started cutting back on saturated fat, **we started eating more refined starch and added sugar.**
- We also know that **excess intake of sugar, starch, and calories is associated with obesity, diabetes, and coronary disease.**



- 
- So if eating less saturated fat means eating more sugar, it would at best be a lateral move in terms of health- and probably worse than that.
  - The latest study on saturated fat simply ignored this consideration.
  - **What are people replacing saturated fat with??**
  - Does the study show that saturated fat is unrelated to coronary disease? No.
  - No matter what the headlines say.

- 
- Basically, this study showed that if you vary your intake of saturated fat or omega-6 fat **without altering the overall quality of your diet**, you are not likely to alter your health much either.
  - That's not much of a revelation- and unlikely to make any headlines expressed as such.
  - But the headlines like, "No link found between saturated fat and heart disease," and "Butter is Back!" while much more exciting, are entirely misleading.
  - **There was no suggestion at all of any health benefits of saturated fat, and some hint of harmful effects despite the important study limitations.**

- Basically, the study showed that if you vary your intake of saturated fat or omega-6 fat **without altering the overall quality of your diet, you are not likely to alter your health much either.**
- That's not much of a revelation- and unlikely to make any sensational headlines.



## Dairy Products

- There's a lot of emerging science indicating there **may be some important components of dairy fats that may be good for our health**
- For example, dairy is the predominant dietary source of odd-chain saturated fatty acids that have been associated with **reduced risk of diabetes in several studies, including an August 2014 study published in *The Lancet Diabetes & Endocrinology***



## Dairy Products

- That study followed more than 340,000 people across eight European countries and measured plasma levels of saturated fatty acids.
- The researchers found that fatty acid chains found in **dairy products** were linked with a **lower incidence of type 2 diabetes**, whereas saturated fatty acids found in **meats** were linked with an **increased incidence of type 2 diabetes**.



## Dairy Products

- More research is needed to determine whether dairy fatty acids have direct benefits in the body or whether other substances in dairy products are providing the cardiovascular benefits.
- For example, the **probiotics** or fermentation of dairy products may deserve some credit for the protective benefits.



## Red Meat

- Many people shun red meat for its so-called artery-clogging saturated fat content.
- "Although many have picked on the saturated fat in red meat, almost 50% of the fatty acids in red meat are oleic acid—the same healthful fat in olive oil," says James DiNicolantonio, PharmD, a cardiovascular research scientist at Saint Luke's Mid America Heart Institute in Kansas City.
- Moreover, about one-third of the saturated fat in beef and pork is stearic acid, which isn't thought to raise cholesterol.




## Red Meat

- Other factors beyond saturated fatty acids in red meat, including iron, may be of greater concern.
- Beef has more iron than chicken or fish, and this **heme iron** from animal sources can lead to **increased oxidation** in the body.
- That oxidation can impact free radical formation and may **damage cells**



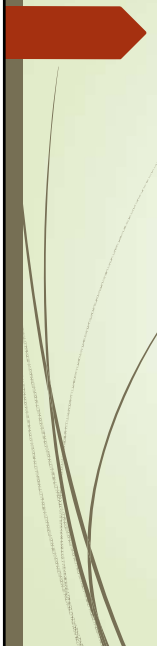
➤ Cutting back on saturated fat can be good for health *if people **replace saturated fat with good fats**, especially, polyunsaturated fats*


- Eating good fats in place of saturated fat lowers the “bad” LDL cholesterol, and it improves the ratio of total cholesterol to “good” HDL cholesterol, lowering the risk of heart disease.
- Eating good fats in place of saturated fat can also help **prevent insulin resistance**, a precursor to diabetes

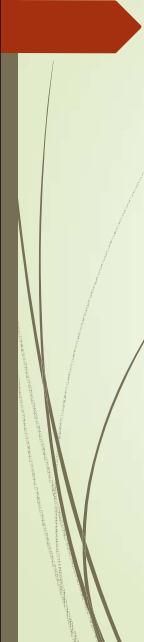


➤ Cutting back on saturated fat will likely have **no benefit**, however, if people replace saturated fat with **refined carbohydrates**—white bread, white rice, mashed potatoes, sugary drinks, and the like.

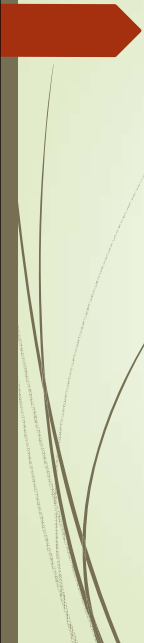
- Eating refined carbs in place of saturated fat does lower “bad” LDL cholesterol—but it **also lowers the “good” HDL cholesterol and increases triglycerides**
- The net effect is as bad for the heart as eating too much saturated fat—and perhaps even **worse** for people who have insulin resistance because they are overweight or inactive.

- 
- "When you consume a **very low-carb** diet, your body preferentially burns saturated fat," said Jeff Volek, a professor of human science at The Ohio State University, in a press release for a study he conducted.
  - "We had people eat two times more saturated fat than they had been eating before entering the study, yet when we measured saturated fat in their blood, it went down in the majority of people. Other traditional risk markers improved, as well."

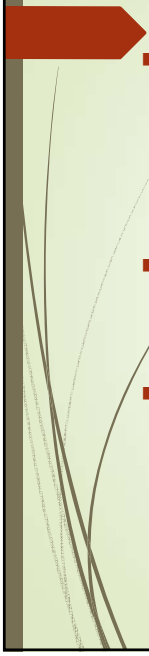
- 
- It's worth noting Volek's study was done on a small scale, involving only 16 overweight or obese men and women between the ages of 30 and 66, with one participant dropping out of the study after developing high blood pressure.
- And while a larger meta-analysis on saturated fat published in the *American Journal of Clinical Nutrition* echoed Volek's findings, researchers conceded "the available data were not adequate for determining whether there are CHD or stroke associations with saturated fat in specific age and sex subgroups."
  - But resources such as the AHA have acknowledged that **full-on avoiding saturated fat is misguided; they now propose it can be part of a healthy diet.**

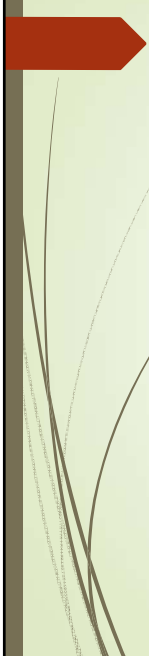


- Studies have shown increased meat consumption may increase risk for heart disease, breast cancer, and type 2 diabetes.
- However, if you enjoy a **lean cut of organic, grass-fed hamburger, paired with vegetable-heavy sides and whole grains**, the nutritional quality of the dish suddenly improves.
- Saturated fat, cholesterol, and other nutrients of concern will impact us differently depending on **how they're sourced and served. A balanced diet is essential!**



- While the new research showed **no relationship overall between saturated or polyunsaturated fat intake and cardiac events**, there are numerous unique fatty acids within these two groups, and there was some indication that **they are not all equal**.

- 
- When the researchers looked at fatty acids in the bloodstream, for example, they found that **margaric acid, a saturated fat in milk and dairy products**, was associated with **lower cardiovascular risk**.
  - Two types of **omega-3 fatty acids, the polyunsaturated fats found in fish**, were also **protective**.
  - But a number of the **omega-6 polyunsaturated fatty acids, commonly found in vegetable oils and processed foods**, may **pose risks, the findings suggested**.

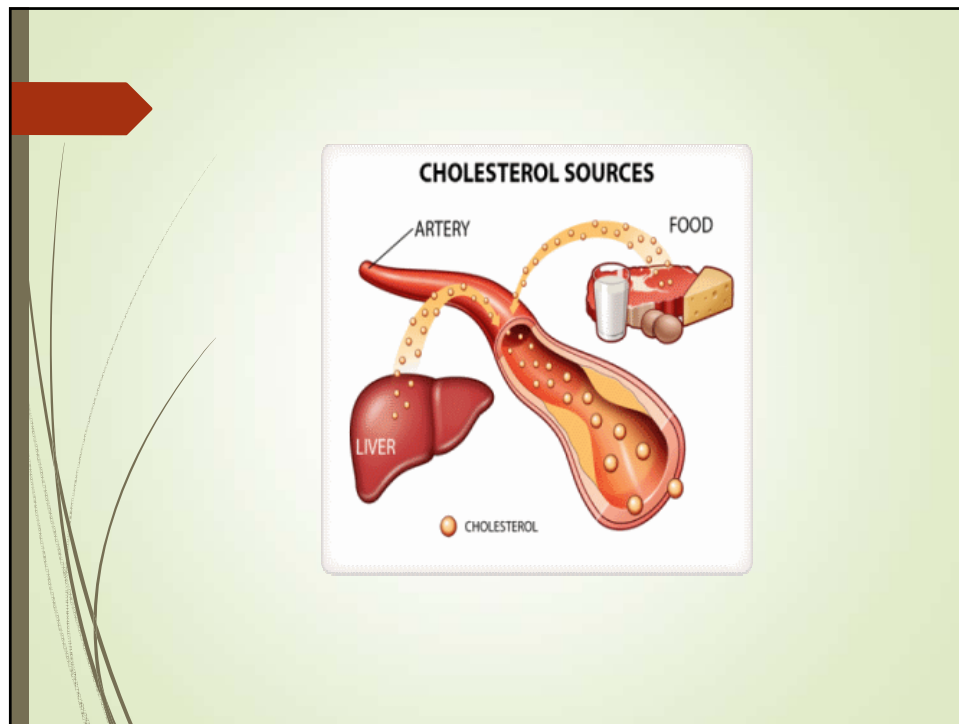
- 
- The researchers then looked at data from the randomized trials to see if taking supplements like fish oil produced any cardiovascular benefits.
  - It did not.
  - But Dr. Chowdhury said there might be a good explanation for this discrepancy.
  - The supplement trials mostly involved **people who had pre-existing heart disease or were at high risk of developing it**, while the other studies involved generally healthy populations.



- So it is possible that the benefits of omega-3 fatty acids lie in **preventing heart disease**, rather than treating or reversing it.
- At least two large clinical trials designed to see if this is the case are currently underway.



- The discovery half a century ago that high blood cholesterol levels were strongly associated with an increased risk for heart disease triggered numerous warnings to avoid foods that contain cholesterol, especially eggs and liver.
- As it turns out, **most people make more cholesterol than they absorb from their food.**
- A body of scientific studies shows **only a weak relationship between the amount of cholesterol a person consumes and his or her blood cholesterol levels** (weak but still important for heart disease).

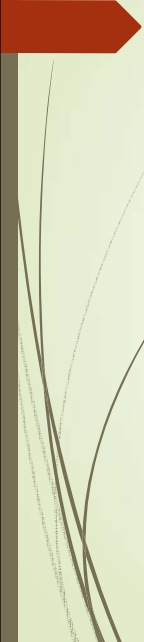


- In studies of more than 80,000 female nurses, Harvard researchers found that **consuming about an egg a day was not associated with higher risk of heart disease** (too few women in the study were eating more than an egg a day to evaluate the effects of higher egg intakes)
- One reason for the lack of association is that eggs are a good source of many nutrients that may counterbalance a slight increase in risk of heart disease.
- Also, eggs can take the place of other breakfast foods that have adverse effects, such as white toast with butter.
- One note of caution: Among women in this study with **diabetes** and in another study of men with diabetes, **higher egg consumption has been associated with increased risks of heart disease.**

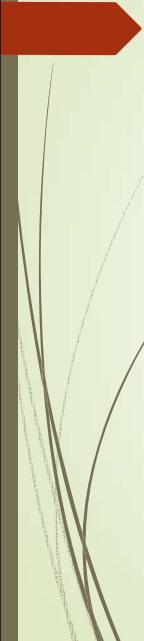
- Research suggests that moderate egg consumption can be part of a healthy diet.
- But this research **doesn't give the green light to daily three-egg omelets**, especially for people who already have heart disease or diabetes.
- For most people, the amount of cholesterol eaten has only a modest impact on the amount of cholesterol circulating in the blood



- For some people, though, blood cholesterol levels rise and fall **very strongly in relation to the amount of cholesterol eaten**.
- For these "responders," avoiding cholesterol-rich foods can have a substantial effect on blood cholesterol levels.
- Unfortunately, at this point there is **no way other than by trial and error to identify responders from non-responders to dietary cholesterol**.



- Women's Health Initiative Dietary Modification Trial, published in the February 8, 2006, *Journal of the American Medical Association*
- This eight-year trial, which included almost 49,000 women, found virtually **identical rates of heart attack, stroke, and other forms of cardiovascular disease in women who followed a low-fat diet and in those women who didn't**
- What's more, women on the low-fat diet didn't lose—or gain—any more weight than women who followed their usual diets

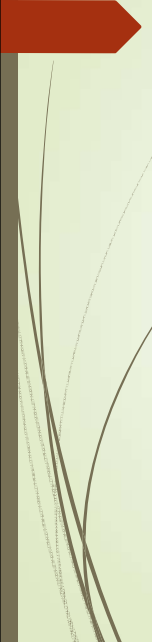


- This randomized trial supports prior findings from the Nurses' Health Study and the Health Professionals Follow-up Study
- In both of these, **no link** was seen between the overall percentage of calories from fat and any important health outcome, including cancer, heart disease, and weight gain.
- What was important in these studies was the **type of fat** in the diet

- As research grows on diet and heart disease, it's becoming clearer that **looking at a single nutrient in isolation cannot tell us the whole story about a person's heart disease risk.**
- **People eat foods, not nutrients**, and they eat them in an overall dietary pattern.
- The so-called **"Western" diet** pattern—high in red meat and processed meat, refined grains, potatoes, and sugary drinks, and low in fruits, vegetables, whole grains, and healthy **fats**—is **associated with higher risk of heart disease.**

- The traditional **Mediterranean Diet pattern**, in contrast, appears to **lower the risk of heart disease, stroke, and metabolic syndrome**, a constellation of factors that increases the chances of developing heart disease and diabetes.





- The Mediterranean-style diet is high in fat, but most of that fat comes from **olive oil or plant sources, such as nuts and seeds**, and **saturated fat intakes are low**
- Mediterranean-style diets are also characterized by **bountiful intakes of vegetables, fruits, beans, nuts, and whole grains, as well as some cheese and yogurt**
- So if you are concerned about heart health, pay attention to your **overall diet**, not just to the type of fat.



- We need to move on from the **one-nutrient-at-a-time preoccupations**,
- It's not about just fish oil, or olive oil, or lard.
- Dietary guidance must be about **the whole diet**, and should be **directed at foods rather than nutrients**
- If we get the foods right, the nutrients take care of themselves.
- We know what **dietary patterns** are associated with the longest, and most vital lives among peoples in the Blue Zones.

- We know what **dietary patterns** are associated with dramatic reductions in the lifetime risk of all chronic diseases.
- We know what **dietary patterns** are associated with reductions in the rate of heart attack in intervention studies.




- Are such diets low in saturated fat? Yes, but as a by-product of the foods that are eaten.
- A diet that is made up mostly of **vegetables, fruits, beans, lentils, nuts, seeds, and whole grains, with or without fish, seafood, lean meats, eggs and dairy** simply has less room for saturated fat, let alone trans fat.
- Such a diet is **naturally high in omega-3 and monounsaturated fat, and balanced in terms of polyunsaturates**.
- Just as important, such a diet is relatively **low in refined starch and added sugar**, and is rich in fiber, vitamins, minerals, and antioxidants.
- Attend to the forest, in other words, and the trees thrive.






- Our **one-nutrient-at-a-time** approach to diet and health isn't working any longer
- Our penchant to talk about nutrients rather than food is having a devastating effect on our health
- There is saturated fat in salmon, and salami. There is carbohydrate in lentils, and lollipops.
- Lumping foods together across such a wide spectrum as "saturated fat" or "carbohydrates" misses the forest for the trees
- Looking at variation in saturated fat while ignoring sugar is an exercise in futility.
- This new study shows we can vary our intake of any given fatty acid and not alter the **quality of our diet or health**

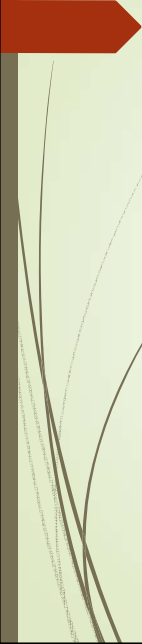


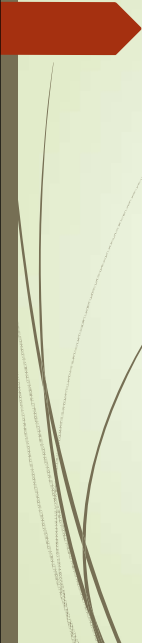



## What About Fat and Weight Loss?

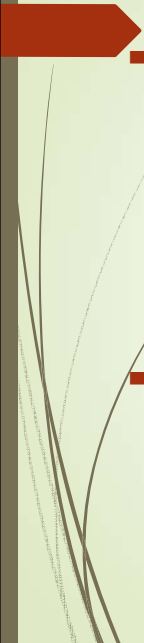
- It is a common belief that the more fat you eat, the more weight and body fat you gain.
- This belief has been bolstered by much of the nutrition advice given to people over the past few decades, which has focused on lowering total fat intake while increasing carbohydrate intake.
- But the notion that food fat equals body fat isn't completely true, and the advice has been misguided.

- 
- Over the short term, following a low-fat diet can lead to a small weight loss.
  - But so does following a high-fat, low-carbohydrate diet.
  - Or a high-protein, low-carbohydrate diet
  - Actually, almost any diet that helps you take in fewer calories works over the short term.
  - In other words, **for most people low-fat diets offer no apparent advantages over diets with fat levels close to the national average**
  - This was demonstrated in the Women's Health Initiative Dietary Modification Trial.

- 
- Women in this trial who were assigned to a low-fat diet in the long run did not lose, or gain, more weight than women eating a “usual” diet
  - More recently, a two-year head-to-head trial comparing different weight loss strategies found that low-carb, low-fat, and Mediterranean-style diets **worked equally well**, and that there was no speed advantage for one diet over another
  - In another trial, a **Mediterranean diet was superior to a low-fat diet**

- 
- Just as overall diet quality is important for preventing heart disease, **diet quality seems to be an important factor in weight gain.**
  - A recent study from the Harvard School of Public Health tracked the diet and lifestyle habits of 120,000 men and women for up to 20 years, looking at how small changes contributed to weight gain over time
  - People who ate more **nuts, a high-fat food that was traditionally taboo for dieters, gained less weight over the course of the study**—about a half pound less every four years.
  - People who ate **more vegetables, whole grains, and fruits also gained less weight.**

- 
- In contrast, people who ate more **red and processed meat** over the course of the study **gained more weight**—about a pound extra every four years.
  - So did people who ate more French fries, potatoes and potato chips, sugary drinks, and refined grains—gaining an extra 3.4, 1.3, 1.0, and 0.6 pounds every four years, respectively.
  - Of course, the calories from nuts, whole grains, fruits, and vegetables don't disappear.
  - What's likely happening is that **when people increase their intake of these foods, they cut back on calories from other foods.**

- 
- Although more research is needed, a prudent recommendation for losing weight or maintaining a healthy weight is to **choose an overall healthy diet, such as the Mediterranean Diet and the Healthy Eating Plate, and be mindful of the amount of food you eat** in relation to the amount of calories you burn in a day.
  - A moderate intake of fats, with an emphasis on healthful unsaturated fats, fits in fine with a weight-loss or weight-maintaining diet.

## The Bottom Line: Recommendations for Fat Intake

- Eliminate trans fats from **partially hydrogenated oils**.
- Food labels should say "0" (zero) on the line for trans fat; also scan the ingredient list to make sure it **does not contain partially hydrogenated oils** (food labeling laws allow food makers to have up to 0.5 grams of trans fat in a product but still list "0" on the line for trans fats).
- Fortunately, most food manufacturers have removed trans fats from their products.

- In restaurants, steer clear of fried foods, biscuits, and other baked goods which use damaged oils



Limit your intake of saturated fats by cutting back on red meat and full-fat dairy foods.

- Try replacing red meat with **beans, nuts, poultry, and fish** whenever possible and eating smaller amounts of full-fat dairy products, such as cheese.
- Don't replace red meat with refined carbohydrates (white bread, white rice, potatoes, and the like).



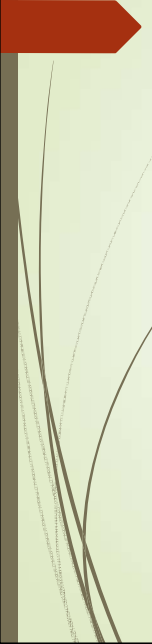
- In place of butter, use liquid vegetable oils rich in polyunsaturated and monounsaturated fats, in cooking and at the table.
- Extra virgin olive oil is a great source of healthy fat, as are nuts and seeds and avocados
- If you really like butter, use **small amounts** of organic grass fed butter




- Eat one or more good sources of omega-3 fats every day.
- Fish, walnuts, canola oil, ground flax seeds or flaxseed oil are excellent sources of omega-3 fats.



- As you choose foods with healthy fat, and limit the amount of trans and saturated fats in your diet, keep in mind that **replacing saturated fat with refined carbohydrates *will not* protect you against heart disease and may even raise your risk.**
- But there is solid proof that **replacing saturated fat with unsaturated fats will help lower your heart disease risk.**

- 
- An increasingly consistent message from cardiovascular researchers and health experts is that **overall dietary patterns—rather** than individual nutrients—hold the key to better health.
  - David Katz, MD, who coauthored a 2014 review of dietary patterns that are best for health in *Annual Review of Public Health*,<sup>14</sup> says:

- 
- "There is no one nutrient that's responsible for all health ills, and there is no one nutrient that will make us healthy. It really is the **overall dietary pattern**. Dietary patterns consistently associated with good health tend to be low in saturated fat—but not because they focus on saturated fat—rather, it's because they're made up of the most nutritious foods preferentially. Those foods tend to be low in saturated fat just as they are low in salt and sugar and free of trans fat and so forth. Those foods are also minimally processed and close to nature, including vegetables, fruits, beans, lentils, nuts, seeds, and whole grains. **There is no pixie dust involved. There is no magic formula, and there is no scapegoat.** Wholesome foods in sensible combinations could be our salvation."

# Let's Get Cooking!

