FATS THAT HEAL
FATS THAT HARM

Discover the Healthy Fats You Need to Shed Pounds and Guard against Disease (PLUS: The Health Harming Fats to Avoid!)

- ✓ *The Right Ratio for Optimum Health*
- ✓ *Three Fats to Fight Cancer & Beat Diabetes*
- ✓ *Two Fats that Melt Pounds*

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HEALING Gourmet®
Your Recipe for Health™

Fats That Heal, Fats That Harm

By Kelley Herring & the Editors of Healing Gourmet®

DISCLAIMER: This publication does not provide medical advice. Always consult your doctor.

Contents

"Human-like creatures have existed on this planet for as long as four million years, and for roughly 99% of this time, they were hunters and gatherers....This means that when we're sitting down to lunch, our stone-age bodies "expect" to be fed the same types and ratios of fat that nourished our cave-dwelling ancestors. When we eat French fries cooked in partially hydrogenated vegetable oil instead of wild plants; or wolf down a fat-laden hamburger heaped with mayonnaise in- stead of meat from a lean, free-ranging game animal, our bodies register the insult."

-Artemis P. Simopoulos and Jo Robinson, The Omega Diet

Fats: The Metabolic Messengers in Your Meals

With the nuts you nosh, the wild salmon you savor and the potato chips you crunch, you determine your future health.

That's because fats are building blocks for cell membranes, precursors for a variety of hormones and hormone-like substances, and are required to absorb vital nutrients.

But arguably most important, fats have the power to directly affect your genes. Surprised?

The type of fat you eat affects every part of your body - your mood and level of mental clarity, your circadian rhythms, the constriction or dilation of your blood vessels, whether you store calories as fat or burn them for fuel, the fluidity or stiffness of your joints, the tone and texture of your skin, and even if your genes are primed to fight cancer…or promote it.

Sound like too much for a little molecule to do? Think again.

In fact, just one fast food meal containing unhealthy fat can increase free radical levels and dangerously constrict your blood vessels for more than 2 hours!

That's why it's important to be mindful of every mouthful. Each bite you take sends powerful signals to your body to heal…or to harm.

In this book, we'll show you why it is essential to get back to our native origins - to enjoying the fats our bodies were *designed* to consume. You'll learn:

- ✓ How fats send important instructions to your genes
- ✓ The fats that generate free radicals and promote aging (and how to avoid them)
- ✓ The specific ratios of fats in common oils
- ✓ The danger of some "essential" fats
- ✓ How to get the right ratio of fats for optimum health through the foods you love
- ✓ Why certain fats promote inflammation—the cornerstone of chronic disease
- ✓ The fats you should be enjoying to fight cancer, prevent Alzheimer's and reverse diabetes
- ✓ Why vegetarians are missing out on the fat that's critical for well-being
- ✓ The cancer-fighting, tummy-trimming fat you need...in beef!
- ✓ Much more!

Foreword on Fats

In ***Your Guide to Living a Low Glycemic Lifestyle***, you learned that the best carbohydrates to choose are those that have the least effect on your blood sugar. Using a simple table (which includes the glycemic index and glycemic load) you can easily pick the foods that will have the least glycemic impact.

But choosing healthy fats is more complex. That's because there are a mix of different fats in foods and also because fats have more chemistry involved.

In p. 6-9 you can learn all of that chemistry. Or, if you prefer, you can skip it and just read this short synopsis to learn the basic facts on fats.

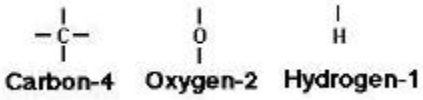
Here's the "Cliff notes" version of fats:

- **Single Bonds = More Stability**
- **Stability Levels**: Saturated > Monounsaturated > Polyunsaturated
- **Pick Stable Fats for Your Health**: Unstable fats lead to free radical attacks.
- **Dangerous Man-Made Fats**: Trans Fat, Olestra. *Avoid at all costs.*
- **Two Types of Polyunsaturated (Essential) Fats**: Omega-6 & Omega-3
- **Three Types of Omega-3**: ALA, EPA and DHA
- **Get Essentials, But In The Right Ratio**: The human body can't make poly-unsaturated fats (omega-6 and omega-3). So we have to get them from our food. But we get too many omega-6s and too few omega 3s. See p. 17.
- **Where They're Found**:
  - **Saturated Fats**: Solid at room temperature and include animals fats (whole milk, butter, cheese, red meat), chocolate, coconuts, coconut milk, coconut oil, palm oil. *Highly stable. Healthful when derived from the proper sources (see p. 30)*
  - **Monounsaturated Fats (MUFAs)**: Liquid at room temperature and in- clude olives, olive oil, avocado, cashews, almonds, peanuts, macadamia and most other nuts. *Stable and heath-promoting (see p. 28).*
  - **Omega-6**: Liquid at room temperature and include corn oil, soybean oil, safflower oil, cottonseed oil, sesame oil, grapeseed oil, pumpkinseed oil, grain-fed meats, farmed fish, conventional eggs. Unstable and overused in the diet. *Inflammatory. Limit use (see p. 13).*
  - **Omega-3 (ALA):** Liquid at room temperature and include flaxseed, chia, hemp, walnuts. *Healthful but delicate; do not heat.*
  - **Omega-3 (EPA/DHA):** Liquid at room temperature and include wild fish, fish oil, grass-fed beef, cage-free eggs. Stable and lacking in our diet. *Highly anti-inflammatory. Aim for at least 1 gram daily.*
  - **Trans Fats**: Solid at room temperature and include margarines, shortening, "partially hydrogenated" oil, deep-fried chips, fast foods, commercial baked goods and any omega-6 oil cooked at high temperature. *Avoid at all costs.*

Classifying Fats: Bonds & Beyond

Fats – or lipids – are a class of organic substances that are insoluble in water. All fats – regardless of their source – have 9 calories per gram (or 120 calories per tablespoon), and contain three elements - carbon, hydrogen and oxygen.

While it might seem pretty simple, think of all of the ways these elements can be arranged! And the way fats behave in the body comes down to two things: *bonds and chain length.*



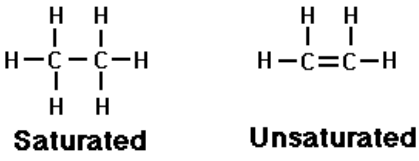
First, let's take a look at bonds.

More Bonds, Less Free Radicals

The type of bond determines the stability of the fat. And this is really important for your health. That's because *unstable fats lead to free radical attacks.*

Bonds determine the number of hydrogens each carbon can hold. You can see the two carbons in the picture on the left are held together by a single bond. This molecule is said to be 'saturated' because it's holding all the hydrogens it can.

Now look at the molecule on the right. The two carbons there are connected by a double bond. It's 'unsaturated' because each carbon could possibly hold one more hydrogen if they weren't so tightly attached to one another by the double bond.

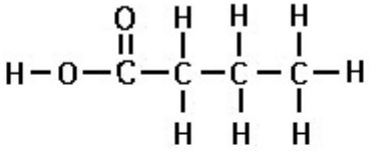


Fatty acids with only single bonds tend to form straight chains that are more stable than those with double bonds. Their single bonds allow them to pack tightly, "huddle up", and evade free radical attack. That's why saturated fats like butter, coconut oil and lard are solid at room temperature, and why they are less prone to oxidation (you'll learn more about the dangers of rancid and oxidized fats later in this book and also in ***Smart Cooks Age Better***).

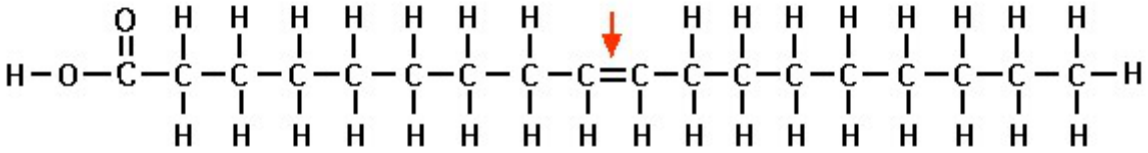
Vegetable oils, on the other hand, are unsaturated. Their kinks prevent them from packing together closely and are liquid at room temperature. Because the unsaturated fats can't "huddle up" like the saturated fats do, their carbons are exposed to attack, making them more unstable.

All fats are made up of building blocks called ***fatty acids***. Simply put, they're chains of carbon atoms connected like beads on a string, with hydrogen atoms on each carbon and an acid (carboxyl) group on one end.

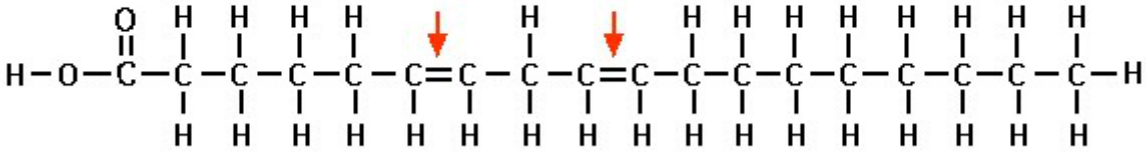
The number of carbon atoms in each fatty acid chain, the type of bonds between the carbons, and how many hydrogens the carbons are holding on to, all determine the type of fat and its characteristics. Fatty acids with one double bond in the chain are called **monounsaturated**. Those with two or more are called ***polyunsaturated***.



Butyric Acid-Saturated Fatty Acid



Oleic Acid- Monounsaturated Fatty Acid



Linoleic Acid- Polyunsaturated Fatty Acid

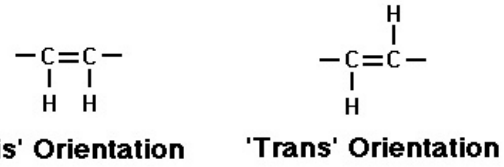
> ***"As for butter versus margarine, I trust cows more than chemists."***
>
> ***- Joan Gussow***

Monounsaturated fatty acids (MUFAs) have only one double bond. They don't pack together as easily as saturated fats and tend to be liquid at room temperature. Like saturated fats, they are relatively stable and don't oxidize easily. The main monounsaturated fat in our diet is oleic acid.

Polyunsaturated fatty acids (PUFAs), have two or more pairs of double bonds. And as you learned earlier, more double bonds = less stability. The two types of polyunsaturated fats in our diet include:

- ✓ **Omega-6**: linoleic acid (LA)
- ✓ **Omega-3**: alpha-linolenic acid (ALA), eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA)

The final note on bonds has to do with which side of the double bond the hydrogens end up. When the hydrogens are both on the same side, it is called a '**cis'** configuration. When the hydrogens are on opposite sides, it is a '**trans'** orientation.



Now that you understand how fats behave, see Table 1 for the ratio of specific fatty acids in common oils and fats.

Table 1: Percentage of Specific Types of Fat in Common Oils and Fats

Oils & Fats	Saturated	Monounsaturated	Polyunsaturated	Trans
Canola	7	58	29	0
Safflower	9	12	74	0
Sunflower	10	20	66	0
Corn	13	24	60	0
Olive	13	72	8	0
Soybean	16	44	37	0
Peanut	17	49	32	0
Palm	50	37	10	0
Coconut	87	6	2	0
Shortening	22	29	29	18
Lard	39	44	11	1
Butter	60	26	5	5
70% Soybean Oil, Stick	18	2	29	23

Chain Length: Picking Fats on Their Best Behavior

Now that we've covered bonds, let's take a look at the other factor that affects how a fat behaves in your body: *chain length*.

Fats come in three lengths: short-chain, medium-chain, and long-chain. Chan length affects the speed at which the fat is utilized by the body, as well as other biochemical properties.

1. **Short-chain fatty acids (SCFAs)** have less than eight carbon atoms. These fats are produced by fermentation in the colon (as you learned in ***Your Digestive Ecosystem***). They are also found in butterfat (from cows and goats) and coconut oil. They are always saturated, have anti-microbial and immune boosting properties and are absorbed directly for quick energy.

2. **Medium-chain fatty acids (MCFAs)** have eight to twelve carbon atoms and are found mostly in coconut oil and butterfat. Like the short-chain fatty acids, these fats have anti-microbial properties, are absorbed directly for quick energy, and contribute to the health of the immune system. Medium chain fatty acids (MCFAs) include caproic acid, caprylic acid, capric acid and lauric acid.

3. **Long-chain fatty acids (LCFAs)** have 16 carbons atoms or more and can be either saturated, monounsaturated or polyunsaturated. Long chain fatty acids participate in numerous biochemical processes in the body (including inflammation and gene regulation) and vary in their properties. They are the most common dietary fats and are found in a wide range of foods from beef to evening primrose oil. The most common LCFAs include: stearic acid, palmitoleic acid, palmitic acid, gamma-linolenic acid (GLA), arachadonic acid (AA), alpha-linolenic acid, eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA)

Now that you have an understanding of the chemistry of fats, let's take a look at how each of the dietary fats affects our health.

Are You Cooking Up Free Radicals? After reading this first section, you may be concerned about the polyunsaturated fats you use in your cooking. And if you're concerned about your health, you should be! Later in this book (see *The Problem with Processing*) you'll learn more about the dangers that lurk in the bottle and the best types to choose. And in ***Smart Cooks Age Better***, you'll learn the "flash points" - the temperature at which an oil begins to degrade and oxidize—so you can enjoy your sauté and guard against free radicals too.

Fats: Separating Fact from Fiction

For years, dietary fats were shrouded by an ominous gray cloud cast by "health" agencies like the American Dietetic Association, the American Diabetes Association, and the American Heart Association.

The recommendations by these groups to limit fat intake to 30% or less of total calories put the population on a fast track to weight gain, as we gobbled up fat-free, sugar-laden snacks by the boxful.

Not only did those foods expand our waistline, but they left us hungry for more (learn why in ***Your Guide to Living a Low Glycemic Lifestyle***).

Today, we know that it's not the amount of fat in the diet, but rather the *type of fat* consumed that's the key to optimal health and wellness.

In the next section, we'll discuss each type of fat, its physiological role in the body, food sources and ideal ratio for optimum wellness.

Polyunsaturated Fats: A Double-Edged Sword

Chances are you've heard that polyunsaturated fats are the "good" fats and essential to your health.

This fat fact is only *partially* true.

PUFAs are "essential" fatty acids. That just means the body cannot make them on its own. Therefore, it is necessary to get them from the foods we eat.

But PUFAs –including omega-3 and omega-6 fatty acids – are a double-edged sword and pose their own set of problems as well.

1. **PUFAs are highly unstable**. Because of their weak bond structure, PUFAs are prone to rancidity and oxidation which cause free radical damage to our bodies. While we must get them in our diet, it's important to be aware of the fragile nature of these essential fats.
2. **The human body requires a specific ratio of PUFAs**. When there is an imbalance – as there is in 99% of the population today – PUFAs become one of the most dangerous elements in our diet – promoting the inflammation that deteriorates our health.

Let's rewind a few million years...

Omega-6: The Oil That Doesn't Fit in Our Genes

As you remember from ***Your Digestive Ecosystem***, our genes haven't changed much since the days of our Paleolithic ancestors (In fact, 99.9% of our genetic profile is still Paleolithic!). But our diets – including the *amount and ratio of polyunsaturated fats* – have.

Over millions of years, we evolved eating a diet rich in seafood, where omega-3 fats were the main source of fat in the diet. Even the small animals on the Paleo "plate" were higher in omega-3s than those we eat today.

And while our Paleo ancestors enjoyed an abundance of plant foods (greens, roots, tubers, berries, fruits and nuts) the predominant source of omega-6 in the modern diet (seed oils) – were not on the menu.

In fact, it wasn't until about 150 years ago with the Industrial Revolution (the same movement that brought us milled grains and refined sugar) that seed oils came to market.

And the result was the same slippery slope for human health.

Today most of the fats in the diet are polyunsaturated vegetable oils including soy, corn, safflower and canola.

In fact, it is estimated that as much as 80% of the fats consumed in the United States are linoleic, with as much as 20% of our total calories come from soybean oil alone!

And remember, these fats are inherently unstable. That's a recipe for oxidation and free radical generation.

Even in their unrefined, native form (raw seeds, for example) the omega-6 fats readily deteriorate and generate free radicals. But it is very difficult to consume large quantities of these fats when they are still contained in their natural form. It is the processing, extracting and concentrating of these oils that has made them so dangerous.

When we cook with these unstable fats, they become denatured and generate even *more free radicals*.

Omega-6: Fueling Oxidation & Inflammation

In ***Your Guide to Antioxidant Superfoods***, you learned how rogue free radicals:

- Attack cells and damage DNA
- Cause premature aging and wrinkles
- Wreak havoc on tissues and organs creating a cellular cascade that promotes cancer
- Ravage lipoproteins and blood vessels encouraging the buildup of unstable plaque in the arteries that leads to heart attack and stroke

But the damage doesn't end there. In fact, free radicals have been found to be associated with everything from autoimmune diseases to Parkinson's disease, Lou Gehrig's disease, Alzheimer's, cataracts and a host of other conditions.

But omega-6's don't just contribute to *oxidation*. They promote *inflammation* as well.

Linolenic acid (LA) competes with alpha-linolenic acid (ALA) for enzymes in the body. These enzymes convert shorter chain fats into longer ones our body needs including arachadonic acid (AA) and EPA, respectively.

When there is an excess of omega-6 in the diet, more arachadonic acid (AA) than EPA is formed. And that's a bad thing because AA acid promotes inflammation, blood vessel constriction and blood clotting.

While our bodies have amazing capabilities to adapt and repair, asking them to leapfrog hundreds of centuries in just 100 years is unreasonable. And when we feed our ancestral genes "modernized" foods there are dire consequences.

In the next section, we'll take a look at the how fats affect your body's metabolic signaling (and even your genes!) and why getting the right ratio is vital to your health.

> ***"Foods rich in omega-3 fatty acids can stop arrhythmia before it triggers sudden death from heart attacks. That makes fish such as salmon as potentially potent as any high tech heart drug and considerably cheaper to stock up on."***
>
> ***- Dr. Alexander Leaf, M.D.Professor Emeritus, Harvard University***

The Information for Inflammation

Fats, like all food you eat, don't just provide your body with calories. They provide your body with information too.

Here's a quick refresher on where polyunsaturated fats are found:

Polyunsaturated Fats (PUFAs)	
Omega-6: Linoleic Acid (LA)	Corn oil, soybean oil, safflower oil, cottonseed oil, sesame oil, grapeseed oil, pumpkinseed oil, grain-fed meats, farmed fish, conventional eggs
Omega 3: Alpha-Linolenic Acid (ALA)	Flaxseed, chia, hemp, walnuts, leafy greens
Omega 3: EPA/DHA	Wild fish, fish oil, grass-fed beef, cage-free eggs

When you eat a polyunsaturated fat, that information is delivered in the form of powerful signaling compounds called ***eicosanoids***.

Eicosanoids exert complex control over many bodily systems, but their biggest role is in modulating inflammation and immunity. They also act as messengers in the central nervous system.

There are four families of eicosanoids—the prostaglandins, prostacyclins, the thromboxanes and the leukotrienes.

Your eicosanoid "information" comes *solely* from the essential fats you eat. The omega-6 derived eicosanoids primarily promote inflammation while the omega-3 derived eicosanoids reduce inflammation (you'll learn more about these in *Omega-3's: Getting the Right Ratio*).

> ***"By far, the best type of omega-3 fats are those found in fish. Omega-3s in fish are pivotal in preventing heart disease, cancer, and many other diseases. Maintaining high DHA levels can help deter depression, schizophrenia, memory loss, and Alzheimer's."***
>
> ***-Dr. Joseph Mercola, D.O.***

The Inflammation-Fighting Power of Omega-3s

Now that you know how omega-3's reduce inflammation, let's take a quick look at the research that proves it:

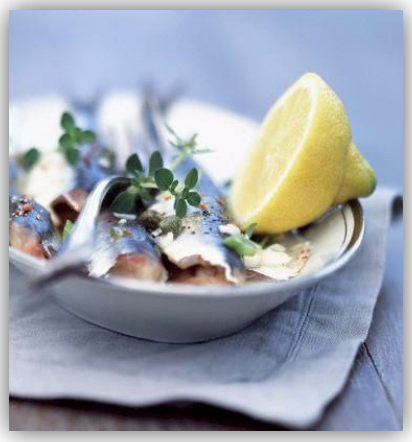
- ✓ Clinical trials found that increasing ALA in the diet (found in flaxseed, chia, walnuts and hemp) reduces concentrations of C-reactive protein (CRP) - a marker of inflammation that is strongly associated with the risk heart attack and stroke.
- ✓ A University of British Columbia study found that supplementing with EPA (found in cold water fish like wild salmon) inhibited inflammation in the brain protected against memory impairment.
- ✓ A Swedish study found that DHA (found in cold-water fish like wild salmon and fish oil) reduced the release of inflammatory compounds (called cytokines) from cells in Alzheimer's patients.
- ✓ A study conducted by a team from Kronos Longevity Research Institute (KLRI) evaluated the effects of omega-3 fats on the health of older adults. For six weeks, participants consumed a control diet. Then they followed an eight-week intervention diet that included 720 g/week fatty fish plus 15 ml/d sardine oil. After the omega-3 intervention, participants significantly improved insulin sensitivity, reduced triglycerides in women and reduced free fatty acids in men. Serum C-reactive protein (CRP), a marker of inflammation, was also reduced with the high omega-3 diet.
- ✓ A study published in the *Journal Nutrition* evaluated data from the Nurses' Health Study. Researchers looked at intake of omega-3's and three specific markers of inflammation – c-reactive protein, interleukin-6 and E-selectin. They found that C-reactive protein and interleukin-6 were 29% and 23% lower, respectively, and e-selectin was 10% lower among those getting the most omega-3 fats compared with those getting the least.

Are You Inflamed? Many of the important markers of inflammation — including C-reactive protein (CRP) and homocysteine (Hcy) — can be measured with a simple blood test.

And as you've learned throughout the series, reducing inflammation is paramount to your good health and longevity.

Learn more about these tests in ***20 Lifesaving Tests Your Doctor Hasn't Performed (And Should!)*** and visit our ***Anti-Inflammatory Diet*** center online for more information and delicious inflammation-fighting recipes.

Healthy Fats = Healthy Cell Communication



Your body communicates through an intricate web, where metabolic messages are transmitted in a fraction of a second.

And every message conveyed relies on cells, or more specifically *cell membranes*.

Cell membranes, the outer covering of cells, allow information to pass from one cell to the next. But when our cell membranes aren't healthy, our cells can't communicate.

The health of your cell membranes is completely dependent upon your diet. That's because your cell membranes are made up of the fats you consume.

When you optimize your levels of omega-3 fats, your cell membranes are fluid and information passes from one cell to the next effectively.

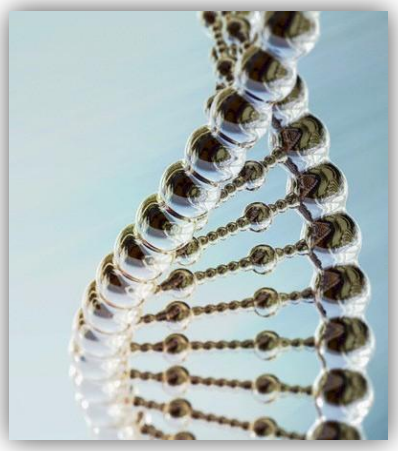
Without enough omega-3, the body's cellular communication breaks down and basic biological processes are hindered.

Along with omega-3 fatty acids, your cell membranes require three additional ingredients — phospholipids, cholesterol and protein.

Here's a quick list of the foods you should be enjoying to ensure healthy cell communication:

- ✓ **Omega-3s**: Wild salmon, sardines, herring, wild Alaskan halibut, fish oil (try Carlson's), flaxseed, chia seed, hemp seed, walnuts
- ✓ **Phospholipids:**
  - Choline from omega-3 egg yolks, wild seafood, non-GMO soy-beans, peanuts, lentils, sesame seeds
  - Phosphatidylserine (PS) from supplements (or from the liver from clean, pasture-raised animals)
  - Phosphatidlycholine (PC) from omega-3 eggs, sardines, peanuts, nuts and non-GMO soybeans
- ✓ **Cholesterol:** Omega-3 eggs, wild shrimp and other animal foods raised on their natural diet
- ✓ **Protein:** From wild seafood, grass-fed beef, pastured poultry and pork, omega-3 eggs, grass-fed dairy (preferably raw) and legumes

Your Genes: How Fats Flip The Switch



Just like your finger can switch on a light, the fatty acids in your diet have the power to turn your genes on… or off.

It's true! Polyunsaturated fats affect gene transcription, or the copying of DNA, and they also bind to receptors in the body that activate specific genes.

By "up-regulating" and "down-regulating" genes, fatty acids have a profound affect cellular metabolism.

Yong Q. Chen, Ph.D., a professor of cancer biology and senior researcher at Wake Forest University Baptist Medical Center says:

> ***"If you have a gene that makes you susceptible to prostate cancer, your diet can tip the balance. Our data demonstrate the importance of gene-diet interactions, and that genetic cancer risk can be modified favorably by omega-3."***

Morten Bryhn, M.D., Ph.D., director of research and development for EPAX® Omega-3 EPA/DHA concentrates says:

> ***"Being overweight is not only a problem of too much food and too little exercise, but also a problem of bombarding genes with signals leading to fat accumulation… Genes are constantly programmed to a situation of starvation and they need to be reprogrammed. Omega-3 fatty acids from seafood seem to do exactly that."***

In recent years, researchers have begun to understand the mechanisms that link the types of fats in our body with obesity, diabetes, cardiovascular diseases, and cancer.

> ***"The deviation of man from the state in which he was originally placed by nature seems to have proved to him a prolific source of disease."***
>
> ***-Edward Jenner***

Omega-3's: Getting the Right Ratio

Our Paleolithic ancestors evolved on a diet with a ratio of omega-6 to omega-3 of 1:1. Our current ratio is estimated to be greater than 20:1!

This unnatural abundance of omega-6 in the diet creates a dangerous imbalance that interferes with production of important prostaglandins. Most "diseases of Westernization" can be attributed to this imbalance.

That's because prostaglandins are the fundamental regulating molecules in most forms of life. They do not travel in the blood like hormones, but are created inside of cells and serve as catalysts for a large number of biological processes including:

- ✓ The movement of calcium and other substances in and out of cells
- ✓ Dilation and contraction
- ✓ Inhibition and promotion of clotting
- ✓ Regulation of secretions, including digestive juices and hormones
- ✓ Control of fertility
- ✓ Cell division and growth

Let's take a look at the very different roles of prostaglandins derived from omega-6's versus those from omega-3's:

Table 3: Biological Effects of Prostaglandins

Series 3 Prostaglandins (from Omega-3)	Series 2 Prostaglandins (from Omega-6)
Decreased platelet aggregation (blood clotting)	Increased platelet aggregation (blood clotting)
Vasodilation (widening of blood vessels)	Vasoconstriction (narrowing of vessels)
Anti-inflammatory effect	Pro-inflammatory effect
Immune system enhancement	Immune system suppression
Increased oxygen flow	Decreased oxygen flow Decreased cell proliferation
Increased cell proliferation, decreased pain	Increased pain
Widening of respiratory passages	Narrowing of respiratory passages
Increased endurance	Lowered endurance

Not only is the Western diet filled with an excess of inflammatory omega-6 fatty acids, it is also critically deficient in omega-3's. In fact, modern agricultural and industrial practices have all but eliminated omega-3s from our food supply.

For example, organic eggs from hens allowed to feed on insects and green plants contain omega-6 and omega-3 fatty acids in the beneficial ratio of approximately one-to-one. Commercial supermarket eggs can contain as much as nineteen times more omega-6 than omega-3!

So what is the right ratio?

The National Institute of Health Workshop on the Essentiality of and Recommended Dietary Intakes for Omega-6 and Omega-3 Fatty Acids proposes the following daily intake:

- 650 mg of EPA and DHA
- 2.22 g/day of alpha-linolenic acid
- 4.44 g/day of linoleic acid (with an upper limit of 6.67)

It's important to note that many long-living, seafood-eating cultures consume more than 10 grams of EPA/DHA daily. That's over fifteen times the amount recently recommended by the NIH. Studies have shown therapeutic benefits of up to 3 g of EPA/DHA daily.

What's more, the recommended daily intake for omega-6 is extremely low compared to the current average annual consumption, per capita of 13 grams/day. Just 1 Tbsp. of corn, cottonseed, soybean oil (or vegetable oil blend) will exceed the intake recommended by the National Institute of Health.

Why Flax Won't Cut It!

It's important to note that while ALA from flaxseed is beneficial, it's not a substitute for the long-chain EPA and DHA found in fish.

The body can convert ALA to EPA, but the process isn't efficient. In fact only 8% of ALA is converted to EPA in men (with 0-4% converting to DHA) and 21% of ALA is converted to EPA in women (with 9% converting to DHA).

To get the EPA + DHA you need, enjoy wild omega-3 rich fish (like salmon and halibut) several times a week and take a high quality fish oil supplement like Carlson's.

Omega-3's: The Fats You Need to Fight Disease

If you're not frequently enjoying wild salmon and sardines and taking a high quality fish oil supplement (like Carlson's), it's time to "reel-ize" how necessary these fats are for your health.

In this section, you'll learn how omega-3's promote heart health, protect your brain, balance your blood sugar, encourage weight loss, fight cancer, preserve vision, foster healthy pregnancies … and even make for smarter kids!

A Stronger, Healthier Heart

Omega-3's are vital to the health of your heart too. They maintain the elasticity of artery walls, prevent blood clotting, reduce blood pressure, slow the growth of atherosclerotic plaque, decrease inflammation and stabilize heart rhythm.

An adequate daily intake (about 1 gram) of EPA and DHA daily is essential to maintain a healthy heart. Let's take a look at the research:

- A large Harvard study found that getting 1 gram per day of omega-3 fatty acids over a 3.5 year period in people who had survived a heart attack lowered their risk of dying from heart disease by 25%.
- Patients who survived a first heart attack were assigned to "usual care" or a high omega-3 (and low omega-6) Mediterranean diet. After almost 4 years, those on the Mediterranean diet had a 38% lower risk of heart attack and death than the group that was assigned to "usual care".
- In a study of more than 76,000 US women followed for 10 years, those with the highest ALA intakes (~1.4 g/day) had a risk of fatal heart disease that was 45% lower than women with the lowest intakes (~0.7 g/day).
- A study in China that followed more than 18,000 men for 10 years found that those who consumed more than 7 oz of fish or shellfish weekly had a risk of fatal heart attack that was 59% lower than men who consumed less than 2 oz weekly.
- In the Nurses' Health Study, which followed more than 84,000 women for 16 years, death from heart disease was 29-34% lower in women who ate fish at least once a week compared to women who ate fish less than once a month.

- In a study that followed more than 79,000 women for 14 years, those who ate fish at least twice weekly had a risk of thrombotic (ischemic) stroke that was 52% lower than those who ate fish less than once monthly.
- In a study that followed more than 43,000 men for 12 years, those who ate fish at least once monthly had a risk of ischemic stroke that was 43% lower than those who ate fish less than once monthly.
- Researchers at the University of Cincinnati have found that supplementing with as little as 2 grams/day of fish oil (410 mg of EPA plus 285 mg of DHA) can lower diastolic pressure by 4.4 mm Hg and systolic pressure by 6.5 mm Hg in people with elevated blood pressure.
- Researchers from the University of Southampton randomly assigned 188 patients to receive either omega-3 fatty acids from fish oil, omega-6 fatty acids from sunflower oil or placebo until surgery. Researchers found fewer plaques and less inflammation in patients being treated with fish oil compared with plaques in patients in the control and sunflower oil groups.

A Sharp & Happy Brain

The human brain is one of the largest "consumers" of DHA, with the average adult brain containing more than 20 grams. It is an absolutely essential nutrient that supports electrical signaling and ultimately brain functioning, including the ability to learn and remember.

DHA is also involved in the production of hormones and neurotransmitters. This is why low levels have been linked to low brain serotonin levels and an increased risk of depression.

- A recent study published in *Archives of Neurology* found that those eating fish once a week or more had 60% less risk of Alzheimer's disease compared with those who rarely or never ate fish.
- Several population studies have shown that countries with a high level of fish consumption – including Finland and Japan – have fewer cases of depression.
- A recent study published in *Psychiatry Research* found that higher levels of DHA and EPA were associated with an overall reduced risk of depression. What's more, higher levels of DHA and EPA were associated with lower scores for neurotic behavior; and higher levels of DHA were associated with better scoring for 'agreeableness'.
- A study published in the *European Journal of Clinical Nutrition* found that supplementation with 800 mg of DHA plus 1600 mg of EPA for a 35 day period was associated with an improvement in mood, as measured by the POMS (Profile of Mood Stage) analysis. The analysis also showed an increase of vigor and a decrease in anger, anxiety, fatigue and depression.

Better Blood Sugar Control (and a Trimmer Tummy Too!)

Omega-3's offer numerous benefits to those with diabetes including improving the control of blood sugar, lowering triglycerides, reducing inflammation and reducing risk of cardiovascular disease – the leading cause of death among individuals with diabetes.

- A recent review pooled the results of 18 trials which included more than 800 diabetic patients. Researchers found that fish oil supplementation significantly lowered serum triglycerides.
- A prospective study followed 5,103 women with type-2 diabetes, who were free of cardiovascular disease or cancer. Researchers found that higher fish intakes were associated with decreased risks of heart disease over a 16-year follow up period.
- Recent research published in the journal *Lipids* found that marine omega-3 polyunsaturated fatty acids (PUFAs) may help reduce the accumulation of body fat by promoting fat-burning and reducing the number of cells in adipose tissue. When researchers induced weight gain with a high-fat, high-calorie diet, they found that those animals whose omega-3 consumption was increased from 1 percent to 12 percent of total fat gained significantly less fat, particularly in the abdominal region. Favorable changes in genetic expression were also observed.

Healthy Pregnancy & Smarter Kids

Getting enough DHA and EPA during pregnancy and lactation is critical for the long term health of the child. In fact, the high levels of DHA in the brain and nervous system are actively deposited during the last trimester of pregnancy, during the first two months of infancy and throughout the very early years of a child's life.

DHA makes up 15-20% of the cerebral cortex and 30 to 60% of the retina, so it is absolutely essential for the normal development of the fetus and baby. Experts recommend that women get a minimum of 500-600 mg of DHA every day during pregnancy and lactation. Daily intakes of DHA up to 1,000 mg/day and EPA up to 1,700 mg/day have been shown to be beneficial and result in no adverse effects. Ensure you're getting enough by taking a high quality fish oil, daily.

- In European women with high risk pregnancies, fish oil supplementation of 2,700 mg/day of EPA+DHA during the last trimester lowered the risk of premature delivery from 33% to 21%.
- Researchers at the University of Sydney found that children who regularly eat fresh, oily fish have a four times lower risk of developing asthma than children who rarely eat such fish. They speculate that EPA may prevent the development and reduce the severity of asthma by reducing airway inflammation and responsiveness.
- In Norway, children born to mothers who were supplemented with cod liver oil (2,000 mg/day of EPA+DHA) during pregnancy and the first 3 months of lactation scored higher on mental processing tests at 4 years of age when compared to the children whose mothers did not take the supplement.
- Higher intakes of DHA and EPA during pregnancy (even levels as low as 150 mg/day) have been shown to correspond with increased birth weight and reduced risk of premature delivery.

Tipping the Scales in Favor of Liquid: The processing and packaging of fish oil is crucial to its quality. Low-quality oils can be unstable and contain significant amounts undesirable oxidation products and cancer-causing PCBs (learn more about PCBs in ***Organics: Beyond Green***).

High quality oils are stabilized with adequate amounts of vitamin E and are packaged in packaging that reduces exposure to light and oxygen.

While fish oil capsules from reputable companies (see below) may be easier for some people to take, recent research conducted at the University of Minnesota found that emulsified fish oils are much better absorbed than the straight oils in gelatin capsules.

- **Carlson Laboratories**: Very Finest Fish Oil, Cod Liver Oil Softgels, Salmon Oil, Carlson for Kids
- **Nordic Naturals**: Children's DHA, Ultimate Omega, Cod Liver Oil
- **Jarrow Formulas**: Max DHA softgels, Max DHA liquid, EPA-DHA Balance

A One-Two Punch against Cancer

Omega-3's help to prevent and fight cancer due to their ability to reduce inflammation. But their biggest influence is in how they affect genes.

While omega-3 polyunsaturated fats have been found to reduce cancer cell growth, omega-6 polyunsaturated fats actually promote cancer growth.

Let's take a look at the research:

- A recent study published in the *American Journal of Epidemiology* found that the risk for colorectal cancer was 12% lower for people eating the most fish compared with those eating the least. The researchers calculated that for each additional serving of fish per week, the risk dropped 4% further!
- Studies have found a significant inverse association between omega-3 rich foods in the diet and the risk for breast cancer. When human breast cancer cells are exposed to omega-3 fats in the lab, the cancer cells undergo *apoptosis*—or programmed self-destruction. Researchers think this happens by two mechanisms:
    - Omega-3 fats inhibit an inflammatory enzyme called cyclooxygenase 2 (COX 2), which promotes breast cancer.
    - Omega-3 fats activate a type of receptor in cell membranes called peroxisome proliferator-activated receptor (PPAR). This receptor is not only a key regulator of fat metabolism; it is also capable of shutting down the proliferation of a variety of cells (including breast cells).
- A recent study published in *American Journal of Epidemiology* evaluated the consumption of omega-3 fats from fish and the risk of non-Hodgkin's Lymphoma (NHL). Researchers found a highly-significant inverse relationship between the intake of DHA and EPA and the risk of NHL. What's more, they found that those who got the most omega-3s reduced the risk of NHL by a 40% com- pared to those consuming the least.
- Another study in the *American Journal of Epidemiology* found a highly significant dose-dependent relationship between the intake of total omega-3 fatty acids and the risk of colorectal cancer. Higher intakes were associated with a progressively lower risk (up to 41% overall) of colorectal cancer. The researchers found no protective relationship associated with higher intakes of ALA (alpha-linolenic acid), the plant-derived form of omega-3 that is found in flax seed, for example.
- The Physician's Health Study examined 20,167 men who were free of cancer in 1983. Researchers found that among the men later diagnosed with prostate cancer, those consuming fish five times a week had a 48% lower risk of death from the cancer than did men consuming fish less than once weekly.
- Researchers from Wake Forest University evaluated the influence of fatty acids on prostate cancer risk. Animals fed a diet rich in omega-3s (in a 1:1 ratio with omega-6) had reduced prostate tumor growth and slower progression of the disease, as well as increased survival. Diets high in omega-6 fats had the opposite effect.

Deep "See" Protection

DHA comprises 60% of the polyunsaturated fatty acids in the retina. In fact, the highest concentrations of DHA in the body are found right in the outer segments of this important sight structure. And the pigment necessary for visual sensation—called rhodopsin — also relies on DHA in the retinal membranes.

Omega-3 fats guard your vision by offering powerful protection against free-radical, inflammatory, and age-related retinal damage. Let's take a look:

- A study published in *Archives of Opthamalogy* found that dietary omega-3's were inversely associated with the risk for developing macular degeneration. The study also found that higher consumption of omega-6 was associated with a higher risk for age-related macular degeneration (AMD).

- An analysis published in *Archives of Ophthalmology* enrolled a total of 88,974 people, including 3,203 cases of AMD. People with a high intake of omega-3's had a 38% reduction in the risk of AMD. Researchers found that eating fish at least twice a week was associated with a decreased risk for both early AMD and late AMD.

Beware of Dangers in the Deep! Do you think you're boosting your levels of beneficial EPA and DHA fats with farmed salmon? What you're actually doing is increasing your exposure to cancer-causing chemicals called *dioxins*. This group of chemicals (whose use was banned in 1976) is still found in high concentrations in conventionally-raised animals and is especially high in farmed fish.

That's because when fish are corralled and fed, their diet is very different than in the wild. Farmed salmon eat corn and soybean meal as well as toxin-concentrated fish meal. This makes their flesh higher in omega-6s, and off the charts in terms of PCBs.

In fact, the Environmental Working Group evaluated farmed salmon from local grocery stores and found that seven out of 10 fish were so contaminated with PCBs that they exceeded the standards of "safe" set by US health agencies 100 times over. When it comes to seafood, the ONLY kind you should be eating is wild. Learn more in ***Organics: Beyond Green***.

Getting the Most Omega "Bang" Per Bite

When it comes to omega-3s, all fish are not created equal.

You can learn about the many hazards of farmed fish and how to be a savvy seafood selector in ***Organics: Beyond Green.***

Use this chart as a guide to amounts of specific fats in common seafood and see the legend below for the culinary cautions. And remember, only clean, sustainable, wild seafood are featured as ingredients at the *Healing Gourmet* website. So be sure to visit us online to learn more about the seafood that's safe for your health... and our oceans too.

Table 4: Fat Composition of Common Seafood

Seafood	EPA	DHA	ALA	LA (Omega-6)
Salmon, Atlantic farmed (3 oz)	0.7	0.9	0.13	0.8
Sablefish (3 oz)	0.6	0.6	0.08	0.2
Fish oil, salmon (1 tsp)	0.59	0.8	0.05	0.07
Anchovy (3 oz)	0.5	0.8	0	0.08
Sardines, Pacific (3 oz)	0.5	0.7	0.2	0.1
Oysters, Pacific (3 oz)	0.4	0.2	0.03	0.03
Salmon, Coho, wild (3 oz)	0.4	0.6	0.13	0.18
Salmon, Sockeye, wild (3 oz)	0.4	0.6	0.08	0.3
Fish oil, cod liver (1 tsp)	0.3	0.5	0.04	0.04
Mussels, green (3 oz)	0.2	0.2	0.02	0.02
Shrimp, wild (3 oz)	0.2	0.2	0	0
Trout, farmed (3 oz)	0.2	0.6	0.05	0.6
Crab, blue (3 oz)	0.15	0.13	0	0
Flounder (3 oz)	0.08	0.09	0	0
Catfish, farmed (3 oz)	0.06	0.18	0.08	0.7
Halibut, Pacific (3 oz)	0.06	0.25	0.05	0.03
Cod, Atlantic (3 oz)	0.05	0.1	0	0
Tuna, light (3 oz)	0.04	0.2	0	0
Mahi mahi, U.S. Atlantic, troll/poll (3 oz)	0.02	0.08	0	0.03
Tilapia, farmed (3 oz)	0	0.1	0.04	0.2

1. **Farmed Fish:** Fish raised on farms live in cramped quarters, are administered high levels of antibiotics and are fed toxic fishmeal (a corn/fish byproduct mix). This makes them high in contaminants like PCBs and omega-6. Learn more ***in Organics: Beyond Green.***
2. **Sustainability Issues:** In general, these fish are not sustainable, and are not considered ingredients at Healing Gourmet. Certain fisheries are certified sustainable. Look for the Marine Stewardship Council Certification. See ***in Organics: Beyond Green.***
3. **Mercury Warning:** Mercury is the second most toxic substance known to man. Learn more in ***20 Lifesaving Tests Your Doctor Hasn't Performed, And Should!***

The Problem with Processing

When it comes to processing any food, the result is usually the same: a refined product that's stripped of vital nutrients that promote health.

That's why *Healing Gourmet* recommends you choose foods as close to their natural state as possible. And fats are no exception.

Before we delve into chemical processing of oils, let's visit the more desirable method of "pressing" first.

"Expeller-pressing" is a chemical-free, mechanical process that extracts oil from seeds and nuts. The temperature reached during pressing depends on the hardness of the nut or seed. The harder the nut or seed, the more pressure that is required and therefore the higher heat generated in the process.

"Cold-pressing" is simply expeller-pressing in a heat-controlled environment. Temperatures stay below 120°F. This is the most beneficial method of processing oils, as it reduces the risk of oxidation during the process.

But most oils are neither "cold-pressed" nor "expeller-pressed". They are processed chemically. Here is how it works:

First, the oil-bearing seeds are crushed and heated to 230°F. The oil is then squeezed out at pressures from 10 to 20 tons per inch, generating more heat and creating free radical byproducts.

But there is still some oil to be extracted. In order to squeeze out the last 10% or so from crushed seeds, processors treat the pulp with one of a number of solvents —usually hexane. While the solvent is boiled off, up to 100 parts per million may remain in the oil. The solvents themselves are toxic, but this final process also extracts the toxic pesticides that adhere to the seeds and grains and incorporates them into the oil product.

What's more, the natural antioxidants that are naturally found in the seeds themselves (such as fat-soluble vitamin E) are neutralized or destroyed by these high-temperature, high-pressure, chemically intensive process.

So what is an oil baron to do?

Add even more chemicals (BHT and BHA) as preservatives, to replace vitamin E and other natural preservatives that were destroyed in the processing.

While these chemicals may extend the shelf life of the oil (and boost profitability for the manufacturers) they pose a health hazard to you. BHT (butylated hydroxy-toluene) is toxic to the liver and kidneys. And BHA (butylated hydroxyanisole) is a *xenoestrogen* – an agent that mimics the hormone estrogen and has been shown to turn on cancer genes. BHA has been correlated with breast cancer. See ***Your Kitchen Makeover*** for the other chemicals you need to kick out of your kitchen.

What Are You Eating? BHT and BHA are only two of the many harmful chemicals considered "safe" by the government. But they're not. To learn more about the chemicals contaminating your food, visit us online and check out our **Encyclopedias** including Contaminants, Additives & Preservatives and many more.

Don't Meddle With Milk!

The perils of processing aren't relegated to oils. Most dairy products also undergo processing - homogenization and pasteurization - which pose their own set of risks.

Through homogenization, the fat particles of cream are strained through tiny pores under intense pressure. The resulting fat particles are so miniscule that they stay in suspension rather than rise to the top of the milk. In making the fat particles smaller, more surface area is exposed to the elements, making the natural fat and cholesterol in the dairy more susceptible to damaging oxidation.

The process of pasteurizing is another "advancement" that has set us back in terms of health.

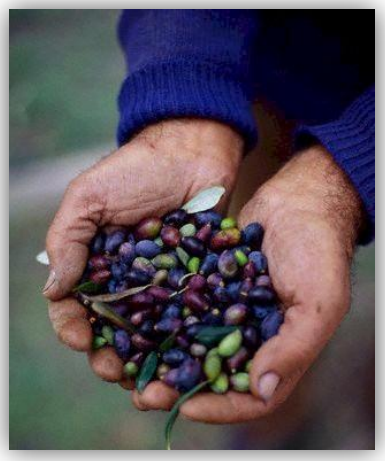
Since the 1920's, pasteurization has been required by the U.S. government, with the stated purpose of reducing the spread of harmful bacteria. But if dairies were kept clean and cows grazed on their natural diet of grass (rather than disease-promoting grain) bacterial contamination would not be a concern.

Pasteurization alters the quality and structure of milk. It destroys vital nutrients including enzymes which are vital for digestion (you learned about this in ***Your Digestive Ecosystem***).

It also transforms the milk sugar (lactose) into a form that is significantly more allergenic (beta-lactose). We recently heard a story of a Swiss woman who had grown up on raw dairy and consumed it her whole life. It wasn't until she moved to the United States as a young adult and began consuming pasteurized milk and cheese that she realized she had a "lactose intolerance." What she is "intolerant" to are the damaged constituents of processed milk.

And that's not all. Pasteurizing also creates advanced glycation endproducts (AGEs) – harmful compounds that speed the aging process and promote disease (see ***Smart Cooks Age Better*** for more).

Monounsaturated Fats: Health from the Mediterranean



You've probably heard the buzz in recent years about the many benefits of the Mediterranean diet.

It promises to balance blood sugar, trim the tummy, reduce cravings, protect the heart and even guard against cancer. All by enjoying rich foods like olive oil, nuts and avocados.

Sound too good to be true? It's not.

In fact, the Mediterranean diet is one of the healthiest around. But all the credit can't go to the monounsaturated fatty acids (MUFAS). This is the fat that is particularly abundant in olive oil and avocados.

There's another reason why the Mediterranean diet is protective: it is exceptionally low in omega-6 fatty acids. In fact, omega-6s comprise only about 4% of calories in the Mediterranean diet (about 7 grams/day). That is equivalent to the amount in one tablespoon of soybean oil.

Compare that to the 87 grams of vegetable oil consumed by the average American each day, not to mention consumption of conventionally-raised meats, which are also very high in omega-6 fats.

But let's get back to those MUFAs. Here are some reasons why they are so beneficial to your health:

- **MUFAs Don't Readily Oxidize:** As you learned earlier, MUFAs have only one double bond. This makes them much less prone to oxidation than their omega-6 cousins. See ***Smart Cooks Age Better*** for the flash points of 20 oils.
- **MUFAs are Packaged with Potent Antioxidants:** The foods rich in MUFAS also tend to be rich in antioxidants, minerals and phytonutrients, including magnesium, selenium, vitamin E and phenolic compounds, as well as lutein and zeaxanthin.
- **MUFAs Reduce Inflammation:** A study published in the *American Journal of Clinical Nutrition* examined data from 690 women in the Nurses' Health Study. Researchers found that higher "diet quality" scores – particularly on the Mediterranean Diet Index – were associated with lower concentrations of markers for endothelial dysfunction (endothelial cells are those that line the interior surface of blood vessels) and inflammation.

MUFAs Reduce the Risk of Heart Disease

- The Mediterranean diet, rich in monounsaturated fatty acids was found to have the greatest positive effect on blood vessels dilation as well as reducing plasma levels of vascular cell-adhesion molecule.
- In 2005, Greek scientists studying more than 3,000 men and women found those eating a diet closest to the traditional Mediterranean diet (rich in MUFAs) had 19% lower oxidized LDL levels than those with the lowest adherence to the diet. (Learn more about the importance of oxidized LDL levels and why this test is more important than standard cholesterol tests in ***20 Lifesaving Tests Your Doctor Hasn't Performed, And Should!***)
- A recent review in the journal *Nutrition* found that consumption of 50 –100 g/d of various nuts—including almonds, peanuts, pecans and walnuts – can significantly decrease total cholesterol and LDL.

MUFAs Fight Cancer

- A recent study published in *Public Health Nutrition* found that women getting the most monounsaturated fat had a significantly lower risk of breast cancer than those getting the least.
- A study published in *Cancer Causes and Control* found that men getting eating a MUFA rich diet had less chance of prostate cancer. And the more MUFA in the diet, the greater reduction in prostate cancer risk.

MUFAs Balance Blood Sugar & Promote Weight Loss

- According to a study in *Diabetes Care*, a diet rich in monounsaturated fats helps reduce abdominal fat better than a carbohydrate-rich diet. When test subjects ate a carbohydrate enriched diet, they accumulated fat in the abdomen. When they ate a diet that had more MUFA, abdominal fat decreased (even without exercise).
- A recent study published in the *American Journal of Clinical Nutrition* found that MUFAs have a profound effect on blood sugar. After six months on a MUFA-rich diet, fasting glucose dropped by 3%, insulin was reduced by 9.4% and the insulin resistance score was reduced by 12.1%.
- A recent study published in the *Journal of the American College of Nutrition* found that a MUFA-rich diet improves fasting insulin levels in insulin- resistant subjects. What's more, eating a breakfast rich in virgin olive oil decreased the post-meal rise in blood sugar and insulin, while increasing the beneficial HDL cholesterol compared to a carb-rich breakfast.

Are Those Hazelnuts…or Corn Nuts You're Eating? You're doing a good thing for your health by snacking on MUFA-rich nuts. But companies like Diamond are undermining your efforts. Take a look at the label – corn oil! But it gets worse. They're preserved with BHT and BHA that we discussed earlier. Always read labels and choose raw (corn-oil-free!) organic nuts for your best health.

Maximize Your MUFAs!

Now that you know how important monounsaturated fats are, use this list to get more of these healthy fats into your diet… deliciously!

And don't forget to visit us online and use our Personalized Recipe Search to find recipes highest in MUFAs.

Fat Composition of Common Nuts & Oils			
Food	**SAT**	**MUFA**	**PUFA**
Macadamia nuts (1 oz)	3 g	16 g	0 g
Avocado (1 cup)	3 g	15 g	3 g
Hazelnuts (1 oz)	1 g	13 g	2 g
Pecans (1 oz)	2 g	11 g	6 g
Almonds (1 oz)	1 g	9 g	3.4 g
Brazil nuts (1 oz)	4 g	7 g	6 g
Cashews (1 oz)	2 g	7 g	2 g
Peanuts (1 oz)	2 g	7 g	4 g
Pistachios (1 oz)	1.5 g	6.5 g	4 g
Pine nuts (1 oz)	3 g	6 g	7 g
Olive oil (1 tsp)	0.7 g	4 g	0.5 g
Hazelnut oil (1 tsp)	0.3 g	3.5 g	0.5 g
Almond oil (1 tsp)	0.4 g	3 g	0.8g
Apricot Kernel Oil (1 tsp)	0.3 g	3 g	1 g
Avocado oil (1 tsp)	0.5 g	3 g	0.6 g
Canola oil (1 tsp)	0.4 g	3 g	1 g
Walnuts (1 oz)	2 g	2.5 g	13 g
Sesame oil (1 tsp)	0.6 g	1.8 g	1.8 g
Coconut (1 oz)	16 g	1 g	0 g
Walnut oil (1 tsp)	0.4 g	1 g	3 g
Grapeseed oil (1 tsp)	0.5 g	0.8 g	3.5 g
Flaxseed oil (1 tsp)	0.3 g	0.7 g	2.2 g
Palm oil (1 tsp)	3 g	0.4 g	0 g
Coconut oil (1 tsp)	4.3 g	0.3 g	0 g
Olives (1 large)	0 g	0.3 g	0 g

The Healthy Surprise of Saturated Fats

You may be surprised to hear that saturated fats are actually good for you. In fact, these traditional fats enjoyed by our ancestors play a number of essential biological roles.

They make up half or more of our cell walls, they bolster our immune systems, nourish our heart muscle, carry important fat-soluble vitamins and antioxidants, and (in the case of grass-fed butter and coconut oil) contain powerful anti-fungal, anti-microbial and anti-cancer properties.

But for decades we've been cautioned against eating saturated fat. We've been warned that a steak dinner is certain, over time, to lead to a heart attack or stroke.

The truth is heart disease started to climb in the 1920's, a time when the consumption of animal fats (in terms of total calories consumed) began to decline. In fact, heart disease was virtually unknown prior to the 1920s and caused probably no more than 10% of U.S. deaths. By the 1950s, death due to heart disease had risen to 30%. Today heart disease accounts for 35% of all deaths.

So if animal fat wasn't increasing in the diet at a time when heart disease began to rise… what did increase in our diets? It was the consumption of omega-6 rich seed oils and refined carbohydrates.

But something else happened too. At the same time, farmers began moving their operations from the fields to the feedlot. Instead of consuming their natural diet of grass, cows were crowded into concentrated areas and fed a steady diet of grain.

Corn replaced grass and the beneficial fatty acid profile in the meat changed. We effectively morphed our sources of saturated fat into polyunsaturated fat with the mass-production of meat and dairy. Formerly healthy beef and dairy products became yet another source of inflammatory omega-6 in the diet (You can learn about the benefits of grass-fed beef in ***Organics, Beyond Green***).

In the next section we'll take a look at the role of saturated fats in the body and in populations across the globe.

Is That a Corn Burger? At the beginning of 1900, there were almost no vegetable oils in our diet. Today, the average American consumes 70 lbs. of vegetable fat. What's more, the profile of our meats has changed dramatically due to corn and grain-rich diets fed to animals in feedlots. In fact, the ratio of omega-6 to omega-3 in grain-fed beef is more than 14 to 1. In grass-fed beef, it is approximately 2 to 1. Learn more about the benefits of grass-fed beef in ***Organics: Beyond Green***.

Native Fats for Natural Health

The native fats our ancestors enjoyed had a purpose. And this still rings true. Here are some of the reasons why getting saturated fat from clean, grass-fed and pastured animal sources is important to your health.

1. **Cell Structure**: Saturated fatty acids constitute at least 50% of the membranes of cells. They are what give our cells their structural integrity.
2. **Bone Health**: They play a vital role in the health of our bones. Saturated fat is necessary for proper absorption of calcium.
3. **Heart Health**: Saturated 18-carbon stearic acid and 16-carbon palmitic acid are the preferred foods for the heart. This is why the fat around the heart muscle is highly saturated. The evaluation of fat in clogged arteries reveals that it is only about 26% saturated. The rest is unsaturated, of which more than half is polyunsaturated.
4. **Immune Health**: Saturated fats—especially the short chain fatty acids from butter and coconut oil—enhance the immune system.
5. **Omega-3 Absorption**: They are needed for the proper utilization of essential fatty acids. Elongated omega-3 fatty acids are better retained in the tissues when the diet is rich in saturated fats.
6. **Digestive Health**: Short- and medium-chain saturated fatty acids have important anti-microbial properties and protect us against harmful microorganisms in the digestive tract.
7. **Brain Development**: Breast milk provides a higher proportion of cholesterol than almost any other food. It also contains over 50% of its calories as fat, much of which is saturated. Both cholesterol and saturated fat are essential for growth in babies and children, especially the development of the brain.

The Carnivore-Cancer Dilemma: Studies show a positive association between consuming red meat and the incidence of cancer. So why red meat and not white meat, like chicken? Here's some food for thought:

1. **Heme Iron:** Some experts believe that the amount of iron in red meat, specifically, a type of iron called "heme" iron, is part of the problem. Red meat has considerably more heme iron than its paler counterparts. Heme iron can irritate the lining of the colon and set up the preconditions for cancer.
2. **Heterocyclic Amines (HCAs):** Another issue to consider the formation of cancer-causing compounds called heterocyclic amines (HCAs) that are formed when cooking meats at high temperatures.
3. **Omega-6s:** Finally, conventionally-raised beef has a higher ratio of omega-6 than its grass-fed counterparts. Not only is omega-6 unstable, but it has been found to promote cancer too.

The solution? Choose only grass-fed red meat (beef and buffalo) that provides higher levels of cancer-fighters (like CLA and beta-carotene) and less cancer-promoting omega-6. Enjoy in moderation (3-4 ounces per serving, a few times a week, for example). And cook at lower temperatures to avoid creating HCAs.

Cholesterol Confusion

Cholesterol is a high molecular weight alcohol (yes, alcohol) that is manufactured in the liver as well as most of our cells. Despite what you might have heard, it is absolutely vital to our health.

You have certainly heard about two types of cholesterol – low density lipoprotein (LDL) and high density lipoprotein (HDL). But there are actually three types of cholesterol:

1. **High-density lipoproteins (HDL)** carry cholesterol from the blood back to the liver, which processes the cholesterol for elimination from the body.
2. **Low-density lipoproteins (LDL)** carry cholesterol from the liver to the rest of the body. We've also included VLDL (very low density lipoproteins) in this group.
3. **Oxidized lipoproteins** are lipoproteins that have been damaged by oxidation and glycation from a diet high in sugar and "unstable" fats.

When it comes to the health of your cardiovascular system, it's not high levels of LDL (often referred to as "bad" cholesterol) that are to blame for an increased health risk. Rather it is damaged cholesterol that is the menace.

Let's examine the two false concepts about cholesterol:

1. Cholesterol in food equals cholesterol in the blood
2. High cholesterol levels in your blood promote heart disease

You might remember when the USDA advised people to limit their egg consumption due to their high level of cholesterol. The truth is cholesterol in food does not translate into cholesterol in the blood. In fact, in most people about 75% of cholesterol in the body is made in the liver. Only about 25% is absorbed from food.

The second false concept about cholesterol is that cholesterol in the blood causes heart disease. It is not cholesterol itself that is to blame, but oxidized cholesterol!

And there are three ways in which cholesterol gets oxidized:

1. A high-glycemic diet (which you learned about in ***Your Guide to Living a Low Glycemic Lifestyle***)
2. The consumption of unstable, inflammatory omega-6 fats
3. Too few antioxidants and too many free radicals

Oxidized cholesterol injures arterial cells and contributes to the buildup of plaque in the arteries. The body treats this as if it is a wound. And in its efforts to heal the damage, inflammation ensues. Inflammation is the real cause of heart disease.

Now let's take a look at the role of cholesterol in the body:

- **Healthy Cell Membranes**: Coupled with saturated fats, cholesterol in cell membranes provides our cells with the necessary stiffness and stability. When the diet contains an excess of polyunsaturated fatty acids (omega-6), these fats replace saturated fatty acids in the cell membrane, so that the cell walls actually become flabby. When this happens, cholesterol from the blood is "driven" into the tissues to give them structural integrity. This is why serum cholesterol levels may go down temporarily when we replace saturated fats with polyunsaturated oils in the diet.
- **Hormone Regulation**: Cholesterol acts as a precursor to vital corticosteroids. These are hormones that help us deal with stress and protect the body against heart disease and cancer. Cholesterol is also a precursor to the sex hormones like androgen, testosterone, estrogen and progesterone. Furthermore, it is a precursor to vitamin D – a vital fat-soluble hormone-like vitamin that is needed for healthy bones and nervous system, mineral metabolism, cancer prevention, muscle tone, insulin production, reproduction and immune system function.
- **Healthy Digestion**: Bile salts are made from cholesterol. Bile is vital for digestion and assimilation of fats in the diet. Without cholesterol, we could not absorb fats. Dietary cholesterol also plays an important role in maintaining the health of the intestinal wall. This is why low-cholesterol vegetarian diets can lead to leaky gut syndrome and other intestinal disorders (you'll learn more about those in ***Your Digestive Ecosystem***)
- **Antioxidant Ability**: Recent research shows that cholesterol acts as an antioxidant. This is the likely explanation for the fact that cholesterol levels go up with age. As an antioxidant, cholesterol protects us against free radical damage that leads to heart disease and cancer.
- **Natural Anti-Depressant**: Cholesterol is needed for proper function of serotonin receptors in the brain. Serotonin is the body's natural "feel-good" chemical. Low cholesterol levels have been linked to aggressive and violent behavior, depression and suicidal tendencies.

Is Your Cholesterol Oxidized? For years you've been getting your cholesterol checked. *Right*? Turns out, it may have been for naught. That's because standard cholesterol tests only provide information on the levels and ratios of cholesterol in your blood. But what's really important to your health...is the health of your cholesterol. Damaged, or oxidized, cholesterol is the real culprit of heart disease. Learn about how you can get this important measure of heart health checked in ***20 Lifesaving Tests Your Doctor Hasn't Performed (And Should!)*** and protect your cholesterol from oxidation by enjoying the low-glycemic, antioxidant-rich diet we promote at *Healing Gourmet*.

The REAL Cause of Heart Disease

Healthy dietary fat no more "clogs up the arteries" than it sticks to your thighs and belly.

The real cause of heart disease, as you've learned throughout this series is due to:

1. **An Omega-6/Omega-3 Imbalance**
2. **Trans Fat**
3. **A High-Glycemic Diet**
4. **A Mineral Deficient Diet** (magnesium, potassium, selenium and others)
5. **Insufficient Antioxidant Protection**
6. **High Levels of Inflammatory Factors** (like homocysteine and CRP)

To learn more about doctors and organizations that are recommending saturated fats in their native form as part of a healthy diet visit:

- Dr. Al Sears, MD (www.alsearsmd.com)
- Dr. Joseph Mercola, DO (www.mercola.com)
- Dr. Dwight Lundell, MD (http://thecholesterollie.com)
- Weston A. Price Foundation (www.westonaprice.org)

> ***"Grass-fed beef and wild game is higher in omega-3, CoQ10, beta-carotene and vitamin E. This reduces your risk of heart disease, certain cancers, depression, high blood pressure, and diabetes. What's more, grass-fed beef is five times higher in CLA than in feedlot beef. CLA helps convert fat to lean muscle."***
>
> ***- Dr. Al Sears, M.D.***

CLA: The "Bonus" Fat in Grass-Fed

Conjugated linoleic acid (CLA) is a healthy fat found in the meat and milk of grass-grazing ruminants. It is produced in the rumen of these animals with the help of a bacteria called *Butyrivibrio fibrisolvens* that "biohydrogenate" linoleic and linolenic acids.

Interestingly, CLA is both a trans fatty acid and a cis fatty acid.

The cis bond causes a lower melting point and ostensibly also the observed beneficial health effects. But unlike other trans fatty acids (which we'll discuss in the next section) CLA is not harmful, but quite beneficial to your health.

In recent years, CLA has come into focus. And with good reason. Its health benefits range from blasting body fat to reducing the risk of cancer, heart disease and diabetes.

But CLA isn't a "new" fat. It's a *traditional* fat that has all but disappeared from the 21st century plate due to grain-feeding as opposed to grass-feeding. In fact, when ruminants are raised on fresh pasture alone, their meat and milk products contain three to five times more CLA than products from animals fed "conventional" diets of grain.

This is yet another instance of how modern technologies have interfered with nourishing our ancient genes.

Let's take a look at the many benefits of CLA:

CLA Fights Cancer: CLA is a powerful antioxidant that offers potent defense against cancer.

- In animal studies, very small amounts of CLA have blocked all three stages of cancer: 1) initiation, 2) promotion, and 3) metastasis. Most anti-cancer agents block only one of these stages, and come with a host of side-effects, of course.
- What's more, in laboratory studies, CLA has been shown to slow the growth of an unusually wide variety of tumors, including cancers of the skin, breast, prostate, and colon.
- CLA is such a potent a cancer fighter that animal studies show as little as 0.5 percent CLA in the diet could reduce tumors by over 50 percent.
- In a Finnish study, women who had the highest levels of CLA in their diet had a 60 percent lower risk of breast cancer than those with the lowest levels.

CLA and Diabetes: CLA beneficially affects multiple biochemical processes that benefit diabetes. After an eight-week study, diabetics who had added CLA to their diets not only had lower body mass and blood sugar levels, but lower levels of leptin, a hormone that regulates fat levels.

CLA and Weight Loss: A study published in the *American Journal of Clinical Nutrition* found that CLA inhibits the body's formation of fat. Not only does it appear to reduce body fat, it also preserves muscle tissue. In the study, an average reduction of six pounds of body fat was found in the group that took CLA, compared to a placebo group. The study found that approximately 3.4 grams of CLA per day is the level needed to obtain the beneficial effects of CLA on body fat.

CLA, Inflammation and Heart Health: CLA not only has antioxidant properties, but it reduces inflammation too. CLA reduces prostaglandin E 2 (PGE2) in much of the same way that omega-3's do. But the anti-inflammatory properties of CLA don't end there. It has also been shown to reduce three other important markers of inflammation including IL-2, tumor necrosis factor-alpha and Cox–2.

Pick Pastures Not Pills: It's important to note that the natural CLA found in foods is far superior to the man-made version in pill form. What's more, these supplements could do more harm than good.

Studies have shown the type of CLA used in supplements has been associated with an array of side effects, which include: promoting insulin resistance, raising glucose levels, reducing HDL (good cholesterol) and stomach upset.

But CLA from organically raised grass-fed meat packs a powerful and delicious punch. You can find high-quality, grass-fed meat by visiting the following websites:

- **U.S. Wellness Meats**
- **Eat Wild**

And don't forget to visit us online for delicious grass-fed beef and buffalo recipes like:

- *Buffalo Cherry Burgers*
- *Grass-Fed Beef & Guinness Stew*
- *Grass Fed Beef Satay with Peanut Sauce*
- *Grass Fed Filet Mignon with Crimini-Cabernet Sauce*
- *Wine-Braised Grass-Fed Beef*

Trans Fats: The Demon in the Diet

Eating trans fats is a surefire way to destroy your health. All experts agree on this one.

Unfortunately, many have succumbed to its ills long before the truth of trans surfaced.

Heart attacks and strokes, cancers and reproductive ails, diabetes and metabolic syndrome, depression and Alzheimer's disease can irrefutably be traced back to this man-made atrocity.

Quite simply, trans fat is not food. It is poison.

In 1897, Nobel Prize winner Paul Sabatier (1854-1941) fathered the process of hydrogenation. He discovered that nickel, catalyzes, or facilitates, the attachment of hydrogen to carbon compounds. Little did he know what suffering his discovery would cause for humankind.

In the hydrogenation process, oil is heated to very high temperatures and hydrogen gas is added in the presence of nickel or some other catalytic metal. Since the vegetable oils are unsaturated, they can take on a few more hydrogens.

When they do, the molecule stiffens, and the fat is now closer to a solid. Manufacturers control how firm the fat gets by how long they pump the gas through. That's why you'll sometimes see the term 'partially hydrogenated' on ingredient labels.

The result: molecules so strangely configured they are completely unsuitable for use in our bodies.

What's more, the already unstable omega-6 fats have just been bludgeoned with processing, making the end-result a free-radical factory.

The Institute of Medicine has stated that "***there is NO safe level of trans fats in the diet.***"

If you shop at a grocery store (other than Whole Foods and other health and nutrition stores with stringent standards) the internal aisles are jam-packed with trans fats (as well as omega-6s and refined carbohydrates). In fact, trans fats were previously added to nearly every box of crackers, cookies and chips to extend shelf life.

And while the FDA finally mandated that the grams of trans fats must be disclosed on labels, they allowed any amount less than half a gram per serving to be labeled as zero. This loophole allowed devious food manufactures to modify their serving size and claim "zero trans fats" in a product that might contain a significant amount of this poison.

The healthiest bet (and the only one we advocate at *Healing Gourmet*) is to buy no packaged foods. For the most part, you should shop the perimeter aisles of the store only. But if you do choose to buy boxed or packaged food, make sure it does not contain the word "hydrogenated" anywhere on the nutrition label (even if it says "Zero Grams Trans Fats").

The amount of research on the detrimental effects of trans fats is overwhelming. Here are some of the research highlights:

- In the Nurses' Health Study, researchers analyzed data from 900 coronary events over the course of the 14 years of follow up. Researchers determined that heart disease risk roughly doubled for each 2% increase in trans fat calories consumed.
- A study of over 700 nurses showed that those in the highest quartile of trans fat consumption had blood levels of inflammatory C-reactive Protein (CRP) that were 73% higher than those in the lowest quartile.
- A study published in *Archives of Neurology* in February 2003 suggested that the intake of both trans fats and saturated fats promote the development of Alzheimer's disease.
- Results from the French part of the European Prospective Investigation into Cancer and Nutrition found that an increased intake of trans-fatty acids may raise the risk of breast cancer by up to 75%.
- Research shows that trans fat may increase weight gain and abdominal fat in particular. A 6-year study revealed that animals fed a trans-fat diet gained 7.2% of their body weight, as compared to 1.8% for animals on a monounsaturated fat diet.
- A 2007 study published in *American Journal of Clinical Nutrition* found that each 2% increase in the intake of energy from trans fats (as opposed to that from carbohydrates) was associated with a 73% greater risk of ovulatory infertility.
- The trans fats we eat get incorporated into brain cell membranes, including the myelin sheath that insulates neurons. When this happens, trans fats replace the natural DHA in the membrane, which affects the electrical activity of the neuron. Trans fats disrupt communication, setting the stage for cellular degeneration and diminished mental performance.

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