

Free-range eggs cooked in pastured butter are richer sources of omega-3 fatty acids than factory-farm fare.



# FAT MATTERS

## *Understanding the Science*

“Eat low-fat” advice has been wrong for more than 40 years! New evidence reveals the crucial role that healthful fats play in your well-being.

By Richard Manning

Omega-3 fats are getting a lot of attention these days, but they're not a panacea. No miracle cure exists for what ails us. Nonetheless, omega-3s do have a unique place in the evolving discussion of which foods to eat. Think of omega-3s as a gateway fat—a portal into a bigger, fuller, richer story of fats in general.

Fats are complicated, a fact we must embrace. It was, after all, an oversimplification that persuaded experts to recommend avoiding them for the past 40 years. Consider, for example, how the popular mantra “You get fat because you eat fat” relates to a cornerstone of contemporary medicine: “Cholesterol in our blood derives from eating certain fats, and causes the heart disease that kills us.”

*None of this is true.* Despite prominent critiques over the past decade by writers such as Mary Enig, Ph.D., Gary Taubes, and Nina Teicholz, these anti-fat articles of faith spawned legions of unctuous fat nags, cholesterol screenings, skin-trimmed chicken breasts, Egg Beaters, and margarine. *All of this was wrong*, yet, until recently, the medical industry has stuck by its low-fat guns.

## How Bad Advice Brought Bad Health

The long-recommended health guidelines that demonized all fat ultimately increased the amount of recommended carbohydrates in our diets. Unlike fats, carbohydrates are simple. Some carbohydrates are called “complex”—such as whole-wheat flour and potato starch—but all carbohydrates eventually reduce to sugars, which then reduce to glycogen. An overload of carbohydrates triggers an insulin response, leading eventually to insulin resistance—one of the markers associated with metabolic syndrome, which underpins obesity, diabetes, heart disease and the related inflammation.

Our bodies run on combustion, so we eat carbohydrates with the belief that glycogen is the fuel of life—but fat is fuel, too. Fats burn just fine. They just don’t reduce to a single, simple molecule. Your body will use fats in all of their rich variety—monounsaturated, polyunsaturated and saturated.

## Eat Less Omega-6 and More Omega-3

Because of the ubiquitous use of high-omega-6 corn and soy to feed livestock and produce cheap, processed foods, the average contemporary diet is four times higher in omega-6 fatty acids than it should be for optimal health. This elevated level of omega-6 intake interferes with the essential functions of omega-3 fatty acids.

**Current omega-6 to omega-3 ratio in the Standard American Diet: 15 to 1\***

**Optimal omega-6 to omega-3 ratio: 4 (or lower) to 1\*\***

**Recommended omega-3 consumption with elevated omega-6: 3,600 mg/day\*\***

**Recommended omega-3 consumption with reduced omega-6: 360 mg/day\*\***

\*Source: USDA

\*\*Source: Dr. Joseph Hibbeln, NIH

Fats perform many tasks in your body: They provide energy, wire brain neurons, allow bones to absorb calcium, prevent blood clots, mediate inflammation, and speed nervous-system response—to name a few. At the same time, fats provide the medium for a whole array of micronutrients to per-

form their specialized jobs; that is, fats assist in bioavailability.

For example, a person short on one simple vitamin or nutrient often can’t correct the deficiency by taking a vitamin supplement. If the other components of basic transport and chemical reactions aren’t present to allow the body to use that vitamin, that person won’t absorb its benefits. Fats enable bioavailability for a variety of nutrients, including carotenoids and the fat-soluble vitamins A, D, E and K.

On some fat-related issues, mainstream consensus has emerged on what is actually good versus bad. Trans fats, for instance, are now understood to be the original Frankenfood. Trans fats derive their name from a simple transposition in molecular structure, a rejiggering that creates a molecular geometry without evolutionary precedent. While some trans fats are naturally occurring, artificial trans fats are found in industrially processed, hydrogenated vegetable oils. Whipped up as a cheaper alternative to lard in the early 20th century, artificial trans fats are the core of shortening and margarine; both are thinly disguised vegetable oils previously touted as healthful substitutes for allegedly harmful animal fats.

Many biochemical processes in your body work by pairing shapes of molecules to receptors, like keys fitting into locks. When your body doesn’t recognize a molecular shape, it treats the stranger as an invader, and fights it with the immune response of inflammation. Trans fats have

## Why Grass-Fed Is Better

Products from grass-fed animals have superior omega-6 to omega-3 ratios than their factory-farmed counterparts. The lower the omega-6 to omega-3 ratio, the better. (Values are per 100 grams, about 3½ ounces, unless noted.)

Product	Omega-6	Omega-3	Ratio
Industrial chicken	3,090 mg	205 mg	15 to 1
Pastured chicken	1,170 mg	230 mg	5 to 1
Industrial beef, ribeye	240 mg	10 mg	24 to 1
Grass-fed beef, ribeye	175 mg	88 mg	2 to 1
Industrial pork	1,250 mg	100 mg	12.5 to 1
Pastured pork	2,625 mg	505 mg	5 to 1
Industrial eggs (2 eggs)	1,150 mg	75 mg	15.5 to 1
Pastured eggs (2 eggs)	4,600 mg	660 mg	7 to 1
Eggs with added omega-3s (2 eggs)	1,320 mg	1,320 mg	1 to 1
Farm-raised trout	710 mg	965 mg	1 to 1.5
Farm-raised salmon	980 mg	2,505 mg	1 to 2.5
Wild-caught salmon	170 mg	2,020 mg	1 to 12
Wild-caught tuna (bluefin)	55 mg	1,300 mg	1 to 23.5

Data from USDA and other sources. Published values for all products vary considerably by diets the animals were fed, especially the percentage of soy and corn feeds included.

an unrecognizable shape, which is why the U.S. Food and Drug Administration now officially lists trans fats as unsafe to eat. Yet they remain the lubricant in much of fast and processed food.

An advisory committee that guides federal nutrition policy signaled an even bigger shift in February 2015 by reversing long-standing advice to avoid foods high in saturated fats, such as butter and lard, and those high in cholesterol, such as eggs.

## Omega-3s and Omega-6s

Many of the fats labeled “essential fatty acids” perform particular, unique, and, yes, essential tasks to keep our bodies running. These fatty acids have no substitutes, and for the most part can’t be made within our bodies. The litany of essential fats is a daunting string of polysyllabic nomenclature only a chemist could love, and you can’t boil it down. Our health and intelligence depend on filling every gap on the list.

Here’s where omega-3s enter the story: The damage wrought by removing them from our bodies is easy to spot, well-



Grass-fed beef is richer in essential omega-3 fatty acids than factory-farmed beef is.

researched and frightening. A lack of a particular omega-3—docosahexaenoic acid, or DHA—*undermines the function of our brains*. As the British journalist Graham Rose famously wrote, we are in danger of creating “a race of morons” because of the omega-3 deficiency in contemporary diets.

The research is clear.

Here’s the scary news: Most of us eating modern diets aren’t getting enough of these crucial omega-3 fats.

Omega-3 is not the name of a single kind of fat molecule, but rather is an

umbrella term for a set of five similar fat molecules.

Like omega-3, omega-6 is an umbrella term for a number of fatty acids, and the key one is linoleic acid. Linoleic acid is the primary fat in corn, soy, cottonseed, safflower and sunflower oils. Modern industrial agriculture and food processing have replaced the DHA we once consumed with linoleic acids from vegetable oils. On average, since the late 1960s, U.S. diets have risen from 1 percent linoleic acids to 8 percent because of direct consumption of these oils coupled with indirect consumption via factory-farmed meat, eggs, dairy and fish.

A growing number of researchers focus on one specific omega-3 fatty acid, DHA. This unique essential fat is fundamentally important to humans and all life, and it is critical to brain function. A shortage of DHA is linked to a wide range of brain malfunctions, including:

- Attention-deficit disorder
- Dementia
- Depression
- Low IQ
- Manic depression
- Memory loss
- Schizophrenia
- Violent behavior

The brain runs on fat, but this is not a brain issue alone.

The prevailing advice, to choose vegetable oils rather than animal fats, may also have raised obesity rates by lowering DHA concentrations in red blood cells. It’s important to realize that while other omega-3s have particular functions, they can’t substitute for DHA. Eating more

## Fats in Your Kitchen

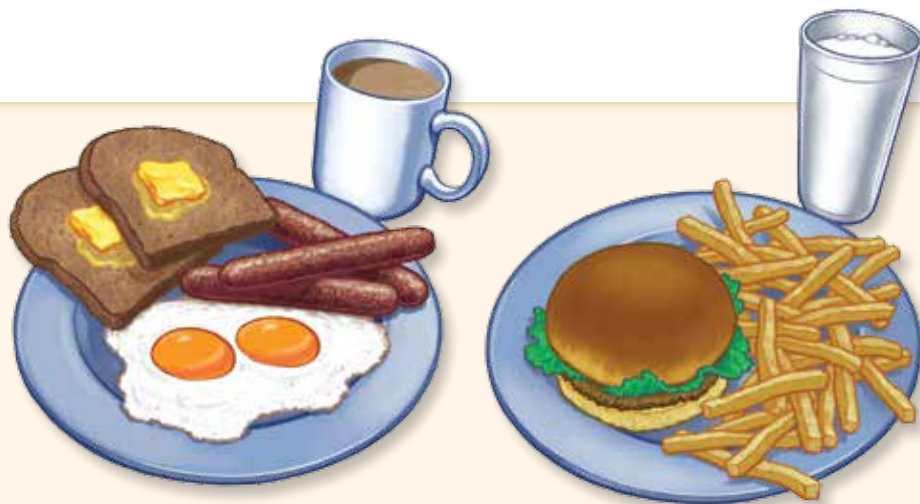
The more you can reduce your consumption of corn, soybean and other vegetable oils that are high in omega-6s, the better. The lower the ratio of omega-6 to omega-3, the better. While soybean oil has a more desirable ratio than olive oil and lard, soybean oil has five times more omega-6 than olive oil or lard. (Values are per 100-gram sample, about 3½ ounces.)

Product	Omega-6	Omega-3	Ratio
Butter (industrial)	2,730 mg	315 mg	8.5 to 1
Butter (pastured)	1,800 mg	1,200 mg	1.5 to 1
Lard	10,200 mg	1,000 mg	10 to 1
Olive oil	9,765 mg	760 mg	13 to 1
Flaxseed oil	12,700 mg	53,305 mg	1 to 4
Camelina oil	21,430 mg	35,715 mg	1 to 1.5
Soybean oil	50,420 mg	6,790 mg	7.5 to 1
Corn oil	53,510 mg	1,160 mg	46 to 1
Canola oil	18,760 mg	7,635 mg	2.5 to 1
Sunflower oil	28,925 mg	40 mg	723 to 1

Data from USDA and various other sources.

## Small Changes, Big Results

These charts show how choosing pastured versions of foods you're already eating can improve your intake of omega fatty acids to ideal levels. A ratio of 4 to 1 is a good target.



### BREAKFAST

	Omega-6	Omega-3	Ratio
2 industrial eggs	1,150 mg	75 mg	15 to 1
4 ounces industrial pork sausage	3,740 mg	150 mg	25 to 1
2 slices toast w/ 2 tbsp margarine	1,230 mg	85 mg	14 to 1
<b>Industrial Choices TOTAL</b>	<b>6,120 mg</b>	<b>310 mg</b>	<b>20 to 1</b>

2 omega-3-enriched eggs	1,320 mg	1,320 mg	1 to 1
4 ounces pastured pork sausage	2,945 mg	565 mg	5 to 1
2 slices toast w/ 2 tbsp pastured butter	860 mg	350 mg	2.5 to 1
<b>Pastured Choices TOTAL</b>	<b>5,125 mg</b>	<b>2,235 mg</b>	<b>2.5 to 1</b>

### LUNCH

	Omega-6	Omega-3	Ratio
Quarter-pound industrial burger	10,190 mg	1,225 mg	8.5 to 1
Medium fries cooked in vegetable oil	4,960 mg	415 mg	12 to 1
8 ounces industrial whole milk	295 mg	185 mg	1.5 to 1
<b>Industrial Choices TOTAL</b>	<b>15,445 mg</b>	<b>1,825 mg</b>	<b>8.5 to 1</b>

Quarter-pound pastured burger	10,355 mg	4,865 mg	2 to 1
Medium fries cooked in tallow	845 mg	170 mg	5 to 1
8 ounces pastured whole milk	70 mg	30 mg	2.5 to 1
<b>Pastured Choices TOTAL</b>	<b>11,270 mg</b>	<b>5,065 mg</b>	<b>2 to 1</b>

omega-3s will not stave off these problems unless an adequate amount of DHA is in the mix.

For instance, omega-3 alpha *linolenic* acid (distinct from omega-6 *linoleic* acid), the omega-3 found mostly in plants, is the precursor of DHA (hence the “alpha”). Your body can convert alpha *linolenic* acid to DHA, but only in a slow and inadequate manner.

The best contemporary source of DHA is cold-water fish, such as salmon and tuna. Can we solve these urgent health problems simply by eating more fish? J.T. Winkler, a British researcher of nutrition policy, provided a blunt answer to another key question: “Are there enough fish in the sea to provide the amounts we need? No.” It seems our species has overpopulated its habitat to the point of severe malnutrition, in addition to the significant harm we’ve done to other species.

The industrial solution to overfishing seems to be aquaculture, or farmed fish. But that “solution” is a dead end, and the reason is illuminated by the term some apply to farmed fish: “floating vegetables.” Farmed fish would ideally

get omega-3s mostly by eating fish meal and fish oils, but they don’t. Farmed fish become “floating vegetables” simply because aquaculture worldwide feeds vegetable oils to farmed fish, a practice that has left them with an unnatural and unhealthful omega-6 to omega-3 ratio—the same defect of all factory-farmed foods.

Research reveals that animals raised on pasture provide well-balanced essential fatty acids.

The problem is that foods high in omega-6—notably soy and corn oils, as well as factory-farmed meat and dairy—produce such a surplus of omega-6 fatty acids that the beneficial omega-3 fats can’t compete. When omega-6s flood your system, they use up all the molecular sockets needed by omega-3s, so the latter are blocked from doing

their jobs. The modern U.S. diet has an omega-6 to omega-3 ratio of more than 10 to 1. Research shows we evolved with a ratio closer to 1 to 1, and would be a lot healthier if we could achieve that again.

A Norwegian researcher looking at diets fed to farmed fish and lab animals found that the simple switch in concentrations of these two key fatty acids to favor omega-6s provoked obesity and inflammation. Restoring the ratio to a more natural balance reversed both obesity and inflammation.

### Finding the Real Solution

Oddly, studies of omega-3 sources have focused almost exclusively on fish, and were this the end of the story, humanity would be in a terrible jam. Red meat from beef and pork, as well as poultry meat, has been generally ignored, simply because grain-fed animals face exactly the same problem as farmed fish: They’re fed corn and soy, which are so high in the wrong kind of fats. Almost all the beef, pork and poultry raised in the United States comes from animals fed such a diet, which is cheap in more ways



Choose olive oil and pastured butter, and avoid high-omega-6 sources, such as corn and soybean oil.

## DINNER

	Omega-6	Omega-3	Ratio
2 industrial chicken thighs	5,810 mg	390 mg	15 to 1
Tossed salad w/ 2 tbsp soybean oil and vinegar	13,615 mg	1,835 mg	7.5 to 1
Baked potato w/ 1 tbsp margarine	455 mg	75 mg	6 to 1
Commercial apple pie	2,585 mg	155 mg	17 to 1
<b>Industrial Choices TOTAL</b>	<b>22,465 mg</b>	<b>2,455 mg</b>	<b>9 to 1</b>

2 pastured chicken thighs	2,810 mg	1,390 mg	2 to 1
Tossed salad w/ 2 tbsp olive oil and vinegar	2,635 mg	205 mg	13 to 1
Baked potato w/ 1 tbsp pastured butter	270 mg	175 mg	1.5 to 1
Apple pie w/ lard crust	2,600 mg	255 mg	10 to 1
<b>Pastured Choices TOTAL</b>	<b>8,315 mg</b>	<b>2,025 mg</b>	<b>4 to 1</b>

than one, and fattens them up quickly. Their meat, milk and eggs are significantly different from products that come from animals raised on their original, pastured diets. (See chart on Page 47.)

As is the case with wild fish, products provided by pasture-raised animals deliver the DHA we require. While grass-fed beef, eggs and dairy products are not as rich in DHA, pound for pound, as wild, cold-water fish, they still have it in abundance.

Besides DHA, there are four other discrete omega-3s, and each has a role to play. Compared with feedlot products, milk and meat from pasture-raised animals also have 300 to 500 percent more *conjugated* linoleic acid, or CLA—another omega-3 fatty acid (dis-

You can boost omega-3 levels in homegrown meat, eggs and dairy by using special feeds, such as this Purina product for laying hens.



tinct from *omega-6* linoleic acid). This CLA offers benefits for brain health different from those of DHA. In addition to linoleic acid, there are three other omega-6s, each with vital functions, especially in our immune systems—and this only accounts for two groups of the polyunsaturated fats.

Taken together, all of this evidence drives a “steak” in the heart of fat-phobic advice and warnings about

high cholesterol. The widespread and unanimous evidence correlates reduced omega-3 fats with reduced brain function, especially the long-term, corrosive effects that lead to dementia and Alzheimer’s disease. Research even shows a connection between the widely prescribed statin drugs that lower blood cholesterol, such as Lipitor, and reduced brain function. This is not a side effect of the drugs, but a pri-

mary effect—statins reduce cholesterol. Now, consider that while your brain is about 2 percent of your body’s weight, it holds about 25 percent of your body’s cholesterol, and is composed of approximately 60 percent fat. In short, your brain *must* have cholesterol.

All of this is widely variable depending not just on food source, but also on season, storage conditions, integrity of suppliers, and the perishability of some of these fats. There are no guarantees, but this story hangs together: The complexity itself is what we need to seek, not just *this* fat or *that* wonder micronutrient.

The following, simple rules will point us in the right direction:

**Avoid processed foods.** They’re loaded with soy- and corn-based ingredients, and are too high in sugars, as well as preservatives and other dubious additives.

**Embrace variability.** Don’t take all of your eggs out of one basket. Seek rich sources of omega-3s, especially DHA, and the rest of the essential fatty acids will come with the package.

**Don’t rely on supplements.** Even the best have serious drawbacks with perishability and bioavailability. At its worst, the industry is riddled with snake oil and fraud.

**Choose wisely and eat well.** The best sources of healthful fats and the whole array of micronutrients are wild, cold-water fish; wild game; and meat, dairy and eggs from grass-fed animals. Complement those with the abundant micronutrients and fats in fresh, unprocessed foods, nuts, fruits and vegetables—and see what you think. Or, more accurately, see *how* you think, and how you move and feel. 🌱

Read more about this topic on Page 4 and at [www.EFAEducation.org](http://www.EFAEducation.org), a website maintained by scientists at the National Institutes of Health. —MOTHER

Richard Manning is the author of *Against the Grain: How Agriculture Has Hijacked Civilization*, and, with Dr. John Ratey, of *Go Wild*. Find both at [www.MotherEarthNews.com/Shopping](http://www.MotherEarthNews.com/Shopping).