



April 2010: Natural Ways to Manage Inflammation...Simple "How's" and Scientific "Why's"

The body's inflammatory response is vital for survival. It is always on guard and comes to our defense against foreign bacteria, viruses, and other invaders. It also goes to work immediately to help us recover from injury and traumas. Through natural selection, we are genetically prone to inflammation since before the days of antibiotics and modern medicine a strong inflammatory response was necessary in order to survive.

Even though inflammation safeguards our health and wellbeing, in modern times it has acquired a bad reputation. Science tells us to blame inflammation anytime we feel pain, since pain is a sign of inflammation. And, we also know that inflammation, the subtle *ongoing* "silent" kind that we do not feel, plays an important role in most, if not all chronic disease—heart disease, type 2 diabetes, cancer, Alzheimer's, arthritis and joint pain, auto-immune disorders, and allergic diseases—to name a few.

If inflammation helped our forebears to survive in a hostile world, why is it now seen as such a health threat? The answer again comes from the science lab. Research tells us that our modern diet and inactive lifestyle are the two factors most to blame for silent inflammation and chronic disease.

In my mind, the diet part of the inflammation story has two sides:

1. *The shift that has happened in just a few decades away from grass-fed animal products and other foods with healthy omega-3 fats toward processed foods rich in inflammatory omega-6 refined vegetable oils:* Today, we consume 25 times more pro-inflammatory refined liquid vegetable oils than a century ago, but only a third as much stable, nutrient-dense butter.
2. *The transition over the same period away from whole grains and other antioxidant-rich whole foods toward sugars and refined flour products that provide calories but are stripped of vital nutrients.* It is really the simple matter of refined products...oils, sugars, and grains...both "crowding out" the traditional whole foods that we are genetically programmed to eat, as well as the massive quantities of fractured products in the modern diet that overwhelm the modest levels of good nutrition that we still take in.

Like diet, our lack of exercise also plays a role in the inflammation/chronic disease story. This is because exercise is necessary to moderate insulin, contain abdominal fat,¹ and control the body's natural

¹"Inflammation and abdominal fat accumulation are inextricably linked," Shawn Talbot, *The Cortisol Connection*, 35.

inflammatory response. Moderate daily exercise and a healthy diet are two of the most powerful anti-inflammatory strategies of all.

Just think. There is so much that we alone can do to manage and even reverse pain and inflammation without having to rely upon medications. Medications, while sometimes required, work by interfering with the body's normal processes and their synthetic nature makes them foreign and, to varying degrees, toxic. In contrast, whole foods, with their vital force energy intact, are ideally suited to nourish the human body, cleanse it, and restore it to health.

Because I see inflammation as an underlying factor in many people's health concerns, I want to use this newsletter to share some thoughts on inflammation. My goal is to keep things simple. Then for those of you who are interested in science, to support these ideas with some underlying concepts related to insulin, "belly" fat, cortisol, and oxidative stress—and the role they play in the inflammatory process (see, page 8).

Balancing the Inflammatory Response: A Few Simple Steps You Can Take

It is true that inflammation is a complex topic, but we do not have to understand it and its underlying dynamics to take actions to overcome its dark side. As mentioned, many scientists have been at work to unravel its mysteries and then guide us in what we should do. Perhaps none is more famous than Dr. Barry Sears. I am indebted to him, as well as to the pioneering work of Mary Enig, Paul Pitchford, Mark Hyman, and a host of others for helping me shape my own thoughts into the following list. While I do not intend to tell you what to eat (we each need different foods), if you are concerned about inflammation, the following measures can be helpful. [Supporting reasons begin on page 5.]

Dietary Ways to Manage Inflammation:

- Cut out inflammatory foods. These include *processed refined sugars, grains, and flours; high fructose corn syrup (HFCS); products from grain-fed animals; trans fats; and refined "white" vegetable oils*—especially those derived from corn, soybean, and cottonseed. These and other "cheap, stripped" oils are often found in commercial salad dressings and processed foods and are loaded with omega-6 inflammatory fatty acids (Tables 1 and 2, pp. 5-6). Limit consumption of the nightshade vegetables—potatoes, tomatoes, eggplant, peppers, tobacco—which have an alkaloid, solanine, which can exacerbate pain caused by inflammation.
- Eat whole foods, especially *colorful, nutrient-dense plant-based foods rich in anti-oxidant phytonutrients* (to contain oxidative stress) *and with a low glycemic index* (to control insulin). Or, combine higher glycemic color-rich personal favorites with good fats and proteins, which also work to control blood sugar and insulin. [October07 Newsletter]
- When possible, choose grass-fed animal products, which have an ideal 1:1 ratio of omega-3/omega-6 fatty acids. This healthy balance of omega-3 and -6 fatty acids means that grass-fed animal products are "neutral" with respect to inflammation. [September09 Newsletter]
- Use good fats and oils. For the dinner table choose *extra-virgin olive oil*—low in omega-6 fatty acids, it is essentially "neutral" concerning inflammation. Also at the table consider *flax oil* and

flax meal [See recipes, page 12]. For cooking, try stable fats like *butter or ghee* from grass-fed animals, as well as *unrefined coconut oil*. Coconut oil is high in lauric acid, an anti-microbial that fights bacteria and viruses that can lead to inflammation.² (*Table 2, page 6*)

- Consider a daily fish oil supplement. Fish oil is the most powerful and efficient way to reduce inflammation. Supplementing with fish oil is important because you cannot get enough by eating fish. This is because most beneficial fish oil is in the skin and is lost in cooking; and, of course, the skin is often not eaten. I prefer fermented cod liver oil³ as a rich source of vitamin A, vitamin D, EPA and DHA. EPA inhibits enzymes that foster inflammation, while DHA is vital for brain function. Fish oil is the only direct source of EPA and DHA. For specific tips on using fish oil, see p. 11. [Flax oil is not a comparable substitute for fish oil since it must be converted to EPA. This requires healthy functioning cells and adequate levels of vitamins B3, B6, and C, and magnesium and zinc—which cannot be counted on.]
- Cook with anti-inflammatory herbs, and spices such as turmeric and ginger. These inhibit the enzyme that makes arachidonic acid (AA), the precursor for inflammatory hormones. Turmeric, ginger, and rosemary are also powerful antioxidants.
- Eliminate any potential food allergens (e.g., wheat, corn, soy, egg *whites*, gluten, dairy, yeast, peanuts) in order to support and restore both intestinal health and immunity (see Probiotics, below).
- Try to buy organic produce, especially when purchasing fruits and vegetables with very high pesticide levels (see Table 3, p. 7). Pesticides and toxins disrupt good intestinal flora and weaken the immune system. Both of these factors create inflammation.
- Consider probiotics (e.g., fermented foods [*July09*] or a high-grade probiotic supplement) to maintain and/or to restore good intestinal bacteria. Inflammation is tied to “gut” health in several ways: First, because “good” intestinal bacteria are the backbone of the immune system;⁴ and a healthy immune system is important to manage the inflammatory response. And second, because good bacteria are essential to protect the delicate intestinal wall. The intestine works as a sentry—no food enters the blood stream without passing through the mucosal lining of the digestive system. Nothing “gets into” the body without passing through this barrier. But, this lining is fragile; it is only one cell in depth, and stretched out, spans the size of a tennis court. If the barrier is damaged, toxins and undigested foods can enter the blood stream (“leaky-gut syndrome”⁵) to create allergic reactions and autoimmune disorders.
- Eat adequate protein with each meal to balance blood sugar. The concept of a Barry Sear’s “Zone Diet” is to have every meal include moderate portions of protein, carbohydrate, and fat, where a protein serving is defined as 3-4 ounces. This balance curbs insulin (the nutrient/fat

² Enig.

³ Available from Green Pastures and Radiant Life. See January2010 Shopping Guide.

⁴ See Natasha Campbell-McBride, Gut and Psychology Syndrome, 25-30.

⁵ Primary causes of “leaky-gut” syndrome include low-fiber, high-sugar, refined-flour, and processed foods; overuse of medications, such as NSAIS, antibiotics, acid blockers, hormones, steroids, and birth control pills; toxins such as mercury and molds; low-grade imbalances, such as yeasts, parasites, and bad bacteria; and stress...Mark Hyman.

storage hormone that responds to blood sugar spikes from carbohydrates) and stimulates the secretion of glucagon (the hormone that assures the flow of glucose for the brain by causing the release of glycogen from the liver).

Lifestyle Approaches to Manage Inflammation:

- Moderate aerobic exercise 5-6 days a week helps prevent insulin resistance. A brisk 45-60 minute walk is perfect. [Excessive exercise, no matter how good the diet, is inflammatory and does more harm than good.⁶] Moderate aerobic exercise raises your heart rate and stress level, which forces your cells to become more responsive to taking up glucose from the bloodstream. When this happens, it relieves the pancreas, allowing it to secrete less insulin into the bloodstream. It is important to keep insulin at bay, because insulin boosts arachidonic acid (AA), a precursor of inflammatory hormones.⁷
- Weight training several days a week can help reduce insulin levels and strengthen immunity. Unlike aerobic exercise which burns fat, strength training burns glucose so it does not directly melt away fat stores. But, by building muscle, what it does do is to make it easier for the body to gobble up glucose from the bloodstream, so less insulin is required. Greater muscle mass also boosts immunity because the body stores amino acids in the muscles, including glutamine, which is a major building block of specialized immune cells.⁸
- Avoiding “visceral” (belly) fat curbs chronic inflammation. This is because the body uses visceral fat as a place to store excess AA (a precursor of inflammatory hormones) in order to prevent high AA levels and inflammation from affecting vital cells. Visceral fat is metabolically active and allows for the steady release of stored AA into the bloodstream, where it can then be taken up by the cells.⁹ In short, belly fat fosters inflammation, which leads to more fat deposits, which creates more inflammation.
- A regular relaxation strategy helps lower cortisol levels. Cortisol is an anti-stress hormone whose job it is to turn off the inflammatory response, but constant stress and chronic inflammation keep it elevated. Meditation, yoga, deep breathing or any quiet relaxation for 20-30 minutes a day can help normalize cortisol. And, deep breathing helps to expel toxins, free radicals, and inflammatory agents from the body.
- An early bedtime and enough sleep honors the body’s natural biorhythms. The hours before midnight are the most efficient for restoring the body. Sleep is the body’s own form of natural mediation. Sufficient nighttime sleep allows cortisol to follow its natural cyclical ebb and flow, dropping off around midnight and peaking about sunrise.¹⁰

⁶ Dr. Barry Sears, *The Anti-Inflammation Zone*.

⁷ Sears, 24.

⁸ Sears, 106.

⁹ Sears, 238.

¹⁰ See Bruce McEwen, *The End of Stress as We Know It*.

And now, for a few "Why's"...

Balancing Anti-Inflammatory Omega-3 and Pro-Inflammatory Omega-6 Essential Fatty Acids

If you are a regular reader of this newsletter, you may recall that our forebears consumed a diet that was balanced with respect to omega-6 and omega-3 fatty acids., something around 1:1 or 2:1. But today, for the typical American, this ratio is now is around 20:1, weighted toward inflammatory omega-6 oils. Our modern diet of processed, convenience foods is one factor that explains this shift, since food companies rely upon refined, white vegetable oils like corn, soy, and cottonseed because they are cheap and have a long shelf life (there is nothing left to go rancid). Another aspect is that many modern households have grown to fear healthy saturated fats like butter and unrefined coconut oil and have switched to inexpensive vegetable oils, often believing that they are a healthier choice, and perhaps, too, because they have a long shelf life. Looking at the table below, which outlines the omega-6/omega-3 ratios of a variety of oils, we can easily see how this omega-6/-3 ratio could soar to 20:1. Corn, safflower, and cottonseed oils are frequent ingredients in salad dressings and other prepared foods, and their omega-6/-3 ratios range from 72:1 for corn to 234:1 for cottonseed oil (Table 1, below).

<u>Oil</u>	<u>Ratio of Omega-6 to Omega-3</u> (Ideal is around 1:1 or 2:1)
Flaxseed	¼ :1
Butter, Grass-fed animals	1:1
Walnut	5:1
Soybean	7:1
Butter, Commercial	9:1
Olive	11:1
Sunflower	19:1
Palm	46:1
Corn	72:1
Safflower	186:1
Cottonseed	234:1

Source: Pathways4Health, Derived from Mary Enig's Know Your Fats

Note: These simply reflect omega-6 versus omega-3s. For a more complete picture and overview, see Table 2 that follows.

Table 2 provides a broader profile of nut and seed oils. It shows omega-3s and -6s fatty acids within the context of other fat components. Note that most oils are a composite of a variety of types of fatty acids. Try to avoid those where the majority of the oil is pro-inflammatory omega-6 such as safflower, sunflower, corn, and soybean—between half to three-quarters of these oils are inflammatory omega-6s, with little to no anti-inflammatory omega-3 offset. Olive oil and saturated fats such as butter and coconut oil have very little omega-6s, and are therefore thought to be “neutral” with respect to inflammation. [Most experts believe saturated fats like butter from grass-fed animals and unrefined coconut oil are good choices unless chronic inflammatory conditions are deeply rooted.¹¹]

<u>Unsaturated:</u> <u>Name</u>	<u>Super-</u> <u>Omega-3</u>	<u>Poly-</u> <u>Omega-6</u>	<u>Mono-</u> <u>Omega-9</u>	<u>Saturated</u>	<u>Lauric</u>
Use:	(Table Use)	(Table Use)	(Low-temp).	(Cooking)	Acid
Flax	58%	14%	19%	9%	0
Olive	0	8	76	16	0
Coconut, unrefined	0	3	6	91	44
Palm Kernel	0	2	13	85	47
Sesame	0	45	42	13	0
Peanut	0	29	47	18	0
Rape (Canola)	7	30	54	7	0
Almond	0	17	78	5	0
Avocado	0	10	70	20	0
Safflower	0	75	13	12	0
Sunflower	0	65	23	12	0
Corn	0	59	24	17	0
Soybean	7	50	26	15	0
Wheat Germ	5	50	25	18	0
Pecan	0	20	63	7	0
Cashew	0	6	70	18	0
Butter (grass-fed)	1.5	2.3	29	63	2.8

Source: Udo Erasmus and Pathways4Health

¹¹ Art Akers, PhD, “Cooling Inflammation;” and Mary Enig.

Refined Flour, Blood Sugar, and Insulin

The chart at right suggests that whole grains are a better choice than refined flour products for controlling blood sugar. Fracturing a grain raises its blood sugar impact: for example, instant oatmeal (a fractured product) has a glycemic index (GI) of 82 about twice that of steel cut oats (42). If we do choose to eat refined flour products like white bread we can reduce the insulin effect by combining these with low-glycemic proteins/fats (e.g., turkey, eggs, and nut butter). Refined flour is, of course, not eaten alone. It is often baked with ingredients such as eggs, fats, nuts, which lower its GI—a sweetened whole-grain muffin can have less impact on blood sugar than a serving of soaked, whole grain brown rice! This may sound strange but I learned this from research on grains and blood sugar by my friend Ellen Arian, a teacher, consultant, and professional whole foods chef.

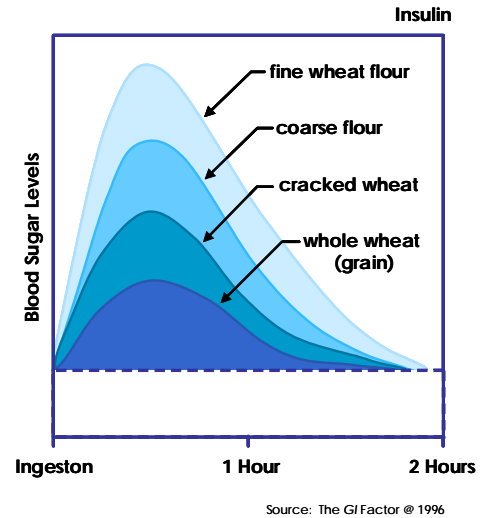


Table 3: Produce to Buy Organic to Avoid Pesticide/Herbicides

<u>Worst in Pesticide Load:</u> <u>(Try to Buy Organic)</u>		<u>Least Pesticide Load:</u> <u>(Buy Conventional to Save Money)</u>	
Peaches	100 (highest pesticide load)	Onions	1 (lowest load)
Apples	96	Avocados	1
Peppers	86	Corn, frozen	2
Celery	85	Pineapple	7
Nectarines	84	Mango	9
Strawberries	83	Peas, frozen	11
Cherries	75	Asparagus	11
Lettuce	69	Kiwi	14
Grapes	68	Bananas	16
Pears	65	Cabbage	17
Spinach	60	Broccoli	18
Potatoes	58	Eggplant	19
Carrots	57	Papaya	21
Gr. Beans	55	Blueberries	24
Hot Peppers	53	Watermelon	25

The Test: The data used to construct the list considered how people normally wash, peel, and prepare the specific produce before eating. The results are compiled from some 42,000 tests for pesticides on produce gathered between 2000 and 2004.

A Segue to Science...For a Few Underlying Concepts and “Why’s”

Insulin’s Tie to Inflammation: *Insulin controls the metabolism and uptake of nutrients by the cells—so it is really a storage hormone, both for fat and for nutrients.* A high carbohydrate diet of refined grains/flours and sugars forces the pancreas to speed up insulin production to contain blood sugar levels. Also, with the aging process, people tend to become more resistant to insulin, so the pancreas must produce more insulin to assure that nutrients are taken up by vital cells. *When chronically elevated, insulin increases AA levels,¹² and AA is a building block of pro-inflammatory hormones.* [High insulin levels do not allow the burning of fat since insulin (a storage hormone) prevents the release of fat into the bloodstream. Eating sufficient protein can be helpful for weight loss, both by controlling blood sugar and by stimulating the production of glucagon (Glossary, p. 9).]

Abdominal Fat’s Role in Inflammation: Through natural selection, we are genetically prone to produce large quantities of insulin—a necessary trait for survival when the efficient storage of calories was critical in times of food scarcity. Now, of course, we live in an environment with readily available refined carbohydrates and sugars and where this traditional fat-storage survival mechanism can easily work against good health, through the accumulation of excess, active fat.

Inflammation and belly fat are closely related because insulin increases AA levels. When this happens, abdominal fat cells are programmed to sequester AA in order to protect vital cells from excessive AA, the precursor of pro-inflammatory hormones. *But, when AA accumulates and becomes heavily concentrated in “belly fat” (the body’s dumping ground for AA), this visceral fat can begin to actively produce pro-inflammatory hormones, which then leads to the production of pro-inflammatory cytokines, which can enter the blood stream and fuel inflammation.* As Barry Sears explains: “Fat cells can work like immune cells, releasing cytokines as you gain weight. Cytokines make cells resistant to insulin, so the body pumps out more and more insulin, which increases the production of more and more cytokines.”¹³

Cortisol’s Tie to Inflammation: *Cortisol leads to insulin resistance and lowered immune function.* Cortisol is the major anti-inflammatory/anti-stress hormone assigned to turn off excess inflammation and the “fight-to-flight” response. But, under the conditions of chronic inflammation or chronic stress—either emotional or physical—quite the opposite happens. Stress causes cells to produce pro-inflammatory hormones—and, in response, the adrenals pump out more cortisol to try to extinguish the fire. The constant fires that result from chronic stress (stress can stem from excessive exercise, overeating, missing meals, caffeine and other stimulants, excessive weight, etc.) forces the body to counter with more and more cortisol. Thus, chronic stress leads to persistent high cortisol levels—and as your body adapts, you become more cortisol resistant and you need more cortisol. More cortisol leads to more abdominal fat (since high cortisol fosters insulin resistance), as well as a depressed immune system (since cortisol’s job is to shut off the immune system). Persistently elevated cortisol levels pose a variety of risks, including muscle and bone loss, fat gain, elevated blood sugar, high blood pressure, weakened immune function, loss of memory, and mood swings.¹⁴ Mediation and other forms of relaxation help to reduce cortisol

¹² Sears, 24.

¹³ Sears, 18.

¹⁴ Talbott, 41.

levels and give the body some breathing time to normalize. A helpful tip when you are unavoidably stressed is to increase your intake of fish oil, as a natural way to help cool and curb inflammation.

Oxidative Stress and Inflammation. Diet is a key underlying factor of oxidative stress and weight gain. A diet centered on sugars and refined carbohydrates and without sufficient antioxidants from whole vegetables and fruits allows free radical damage, known as “oxidative stress.” Oxidation is a normal process: an apple slice browns when exposed to oxygen, but if dipped in lemon juice, its antioxidants keep an apple slice looking fresh. Oxidation like this also happens inside the body if antioxidants are not sufficient. *Oxidation disrupts metabolism, making it less efficient, setting the stage for weight gain.* Weight gain and inflammation are, thus, set in motion (see comments about abdominal fat, above).

Plant Foods for Inflammation. Plants are the leading adaptagens. Plants are at the forefront of nutritional innovation, adapting to new environmental conditions and creating the anti-oxidants and phyto-nutrients to survive change. Eating plant foods, especially from our local area, helps us to adapt to the seasons and to longer-term climate shifts. *Choosing a wide variety of plant foods across the color spectrum also helps prevent free-radical damage and inflammation.* (Table 4, page 10; and July08 Newsletter for complete discussion.)

Glossary of Terms

EPA...eicosapentaenoic acid, a prominent ingredient of fish oil, it inhibits the enzyme that converts by-products of omega-6 oils into arachidonic acid (AA), a precursor of inflammation.

DHA...dihomo-gamma-linolenic acid, found in fish oil, is vital for normal brain function and can be converted to EPA, so it also plays a role in fighting inflammation.

AA...arachidonic acid, is a building block of inflammatory hormones. Excessive dietary levels of omega-6 oils (linoleic acid) relative to EPA and GLA (found in evening primrose oil) fosters AA and inflammation.

ALA...alpha-linolenic acid...in flaxseed oil, which inhibits the delta-6-desaturase enzymes that decreases both anti- and pro-inflammatory hormones but does little to disarm AA.

Insulin...the nutrient/fat storage hormone that responds to spikes in blood sugar. It has an indirect affect on inflammation by increasing AA levels.

Cortisol...an anti-stress, anti-inflammation hormone produced by the adrenals. Its job is to turn off the inflammatory response (the immune system) when it is no longer needed.

Glucagon...the major hormone that controls the flow of glucose energy to the brain by signaling the liver to release glycogen.

For a comprehensive scientific explanation of these terms and a thorough discussion of inflammation dynamics, see Barry Sear's The Anti-Inflammation Zone.

Table 4: A Color Spectrum of Fruits and Vegetables

Red

Apples (red)
 Bell peppers (red)
 Cherries
 Cranberries
 Grapefruit (pink)
 Grapes (red)
 Plums (red)
 Radishes
 Raspberries
 Strawberries
 Tomatoes
 Watermelon

Dark Green

Artichoke
 Asparagus
 Bell peppers (green)
 Broccoli
 Brussels sprouts
 Chard
 Collard greens
 Grapes (green)
 Green beans
 Honeydew melons
 Kale
 Leeks
 Lettuce (dark green types)
 Peas
 Spinach
 Turnip greens

Yellow/Light Green

Apples (yellow)
 Apples (green)
 Avocado
 Banana
 Bell peppers (yellow)
 Bok choy
 Cabbage
 Cauliflower
 Celery
 Fennel
 Kiwi
 Lemons
 Onions
 Pears
 Pineapple
 Squash (yellow)
 Zucchini (yellow)

Orange

Apricots
 Bell peppers (orange)
 Butternut squash
 Cantaloupe
 Carrots
 Mangoes
 Oranges
 Papaya
 Pumpkin
 Sweet potatoes
 Yams

Purple

Beets
 Blackberries
 Blueberries
 Cabbage (purple)
 Cherries
 Currants
 Eggplant
 Grapes (purple)
 Onions (red)
 Pears (red)
 Plums (purple)
 Radishes

Source: Textbook of Natural Medicine, J. Pizzorno Jr. and Michael T. Murray

Summary Guidelines...

The most important step you can take is to know where your food comes from. This is the best way to avoid excessive pro-inflammatory omega-6 oils and trans fats—and to limit the consumption of refined flours, sugars, and high fructose corn syrup. More specifically:

1. Eat good protein (e.g., from grass-fed land animals) with meals to help control blood sugar and insulin;
2. Know the “good” fats and oils. Consider a high-quality fish oil supplement. Use omega-3s and omega-9s (at the table) and saturated fats (for cooking) while you limit pro-inflammatory omega-6s fatty acids.
3. Rely on whole grains and fruits and vegetables as carbohydrate sources, rather than sugars and refined flour products, to control blood sugar and insulin as well as oxidative stress.
4. Get Moderate Daily Exercise: Do aerobics 5-6 times and strength training 3 times a week, to control insulin and inflammation.
5. Get enough sleep to synchronize cortisol and to curb cravings for sugar and refined carbohydrates. The most efficient sleep hours are those before midnight.
6. If you take a fish oil supplement, quality matters. Fish oil is best absorbed when taken with other foods. Orange juice or sucking an orange slice helps to dissipate the taste. I believe reliable sources of cod liver oil to be Green Pastures and Radiant Life; and for fish oil, Vital Choice, Omax3, and Pharmax (orange flavored). You may want to research these and others on your own.
7. If you are concerned about inflammation, ask your doctor for a C-reactive protein (CRP) blood test.

Reading Resources:

Natasha Campbell-McBride, *Gut and Psychology Syndrome*

Mary Enig, *Know Your Fats*

Udo Erasmus, *Fats that Heal, Fats that Kill*

Mark Hyman, *UltraMetabolism*

Bruce McEwen, *The End of Stress As We Know It*

Paul Pitchford, *Healing with Whole Foods*

Joseph Pizzorno, Jr. and Michael T. Murray, *Textbook of Natural Medicine*

Barry Sears, *The Anti-Inflammation Zone*

Shawn Talbott, *The Cortisol Connection*

Omega-3 Recipes¹⁵

Flax is the richest source of omega-3 fatty acids, but its conversion to EPA and anti-inflammatory prostaglandins requires the presence of vitamins B3, B6, and C, as well as zinc and magnesium. It is useful for the treatment of a variety of issues including inflammatory conditions, cancer, diabetes, high blood pressure and heart disease, immunity, and weight loss (since supports energy metabolism).¹⁶

Omega Pesto Sauce [*Omega3: Omega-6 Ratio* 1.0 to 0.8]

3 cloves garlic
3 T. chopped walnuts
1 T. flax meal
2 cups fresh basil leaves
1/3 cup extra-virgin olive oil
3 T. flaxseed oil
2 T. balsamic vinegar
½ cup grated Parmesan cheese

In a food processor or blender, add ingredient on at a time, blending after each addition until smooth. Pesto can be stored in an air-tight container in the refrigerator for use within a couple of days. Can be served as a garnish with fish.

Flax-Olive Oil Vinaigrette [*Omega-3 to -6 ratio* 1.0 to 0.4]

2 T. flaxseed oil
2 T. extra-virgin olive oil
¼ cup balsamic vinegar

Whisk together. Use on salads and steamed vegetables.

Omega Mixed Green Salad [*Omega-3 to -6 ratio* 1.0 to 1.5]

8 cups romaine lettuce
4 cups baby spinach
1 cup chopped fresh basil
1 cup chopped fresh parsley
2 medium cucumbers
½ cup grated carrots
2 T. chopped walnuts
4 T. flax meal

In a large bowl, toss together the romaine, spinach, basil, parsley, cucumbers, and carrots. Scatter walnuts and flax meal over the salad.

Copyright 2010 Pathways4Heath.org

¹⁵ Source: Evelyn Tribole, *The Ultimate Omega-3 Diet*

¹⁶ Udo Eramus, *Fats the Heal, Fats that Kill*, 282-3.

Carol B Kenney
Natural Health and Wellness
MS, HHC AADP

Pathways4Heath@aol.com
www.Pathways4Health.org

pathways for health

