

Reducing Inflammation Through the Anti-Inflammatory Diet

The Pain Practitioner

Vol. 15, No. 4, Winter 2005

David Leopold, MD

FROM ABSTRACT:

Inflammation is now considered to be at the core of many chronic disease states, and not just limited to musculoskeletal pain and dysfunction.

These other disease entities include:

Alzheimer's Disease

Coronary Artery Disease

Colon Cancer

Many Autoimmune Diseases

Rheumatoid Arthritis

Inflammatory Bowel Disease

The standard American diet has changed significantly over the past 100 years, including:

Increased consumption of animal products

Increased consumption of processed foods

High consumption of trans-fatty acids

High ratio of omega-6 fatty acids

Refined carbohydrates with a high glycemic index

All of these factors stimulate inflammation and result in increased levels of arachidonic acid.

Changes in omega-3 and omega-6 ratios have resulted in a shift out of balance to a pro-inflammatory physiological state.

THIS AUTHOR NOTES:

"The goal of an anti-inflammatory diet is to decrease the influx of pre-formed pro-inflammatory mediators and substances that cause an increase in free radicals and antigenic stressors." **[Important]**

The primary offender is foods high in arachidonic acid, a direct precursor to pro-inflammatory molecules [prostaglandin E2].

High glycemic index foods stimulate a pro-inflammatory cytokine cascade (IL-1, IL-6, TNF-alpha).

The anti-inflammatory diet is low in arachidonic mediators, trans-fatty acids, animal products high in saturated fats, and antigenic stressors.

The anti-inflammatory diet is high in natural anti-inflammatories and antioxidants, including the phyto-anti-inflammatories: carotenoids, flavonoids, and isoflavones.

The anti-inflammatory diet has the proper ratio of omega-6/omega-3 essential fatty acids.

Humans must consume essential fatty acids from the diet.

Essential fatty acids are important components of cell membranes, influencing the integrity and biochemical properties of the membrane, which controls the mobility and function of cell membrane proteins. This affects cellular, tissue and organ function.

Essential fatty acids are in all cells, especially the nervous system and vascular cells.

Essential fatty acids are critical for oxygen transport and energy production.

[Important]

There are three primary types of fat:

- 1) Saturated fats
These include most of the fats from animal products.
- 2) Mono-unsaturated fats
These are omega-9 fats. They include olive oil and canola oil.
- 3) Poly-unsaturated fats
 - A) Omega-6 fatty acids
Linoleic Acid (LA) [corn, safflower, cottonseed, sunflower, soybean oils]
Gamma Linolenic Acid (GLA)
Arachidonic Acid (AA)
 - B) Omega-3 fatty acids
Alpha Linolenic Acid (ALA) [primarily flax seed oil]
Eicosapentaenoic Acid (EPA)
Docosahexaenoic Acid (DHA)

Trans-fatty acids are omega-6 fats that have been hydrogenated, producing a more stable and solid product.

The metabolism of trans-fatty acids releases significantly higher amounts of free radicals. **[Very Important]**

The increased release of free radicals from metabolism of trans-fats increases the release of arachidonic acid from cell membranes [by activating the enzyme phospholipase A2], causing even more inflammation and more free radicals. **[A positive feedback loop]**

Trans-fatty acids are known to:

- Raise cholesterol
- Raise LDL cholesterol
- Lower HDL cholesterol
- Have adverse effects on cell membranes
- Have adverse effects on the immune system

Since both Linoleic Acid (omega-6) [from corn, safflower, cottonseed, sunflower, soybean oils] and Alpha Linolenic Acid (omega-3) [primarily flax seed oil] compete for the delta-6 desaturase enzyme to make either pro-inflammatory prostaglandin E2 (omega-6) or anti-inflammatory prostaglandin E3 (omega-3), corn, safflower, cottonseed, sunflower, and soybean oils should be balanced with flax seed oil. [This means that if we are supplementing with omega-3 fish oils, we should not forget to supplement with flax seed oil. Nutri-West incorporates flax seed oil with their fish oil].

A healthy ratio of omega-6 to omega-3 is about 4/1. The ratio in the standard American diet is about 25/1.

This author cites 11 studies that show that the anti-inflammatory diet actually reduces markers of inflammation and improves health.

Obesity itself promotes inflammation.

Adipocytes, especially central [visceral or abdominal fat], sequester and release arachidonic acid, the precursor to pro-inflammatory prostaglandin E2. [This means that your abdominal fat is full of the worse kind of fat, pro-inflammatory arachidonic acid.]

Adipose tissue also produces pro-inflammatory cytokines, which systemically inflame the body as they travel throughout the circulation.

"Pain is not the only outcome of a pro-inflammatory diet."

Diets high in margarine and fried vegetable oils [trans-fatty acid omega-6 oils] "double the risk for asthma in pre-school-aged children."

Omega-3 supplementation reduces prostate cancer, decreases sudden cardiac death, decreases overall cardiac events, and decreases overall mortality.

The anti-inflammatory diet recommendations made by this author include:

- 1) Whole foods are generally better than supplements.
 - 2) The primary focus is eating whole grains, fruits, and vegetables.
 - 3) Protein is primarily from eating beans, lentils, fish and poultry.
 - 4) There is minimal ingestion of red meat.
 - 5) The principle dietary fat is olive oil.
 - 6) Eat no more than 4 eggs per week (egg whites are okay because they do not contain arachidonic acid).
 - 7) For dessert use fresh fruit.
 - 8) Do not eat trans-fatty acids.
 - 9) Decrease consumption of omega-6 fats, including margarine, corn oil, shortenings, etc.
 - 10) Inflammation can be caused by immunoglobulins that are produced from food sensitivities. Common food triggers to immunoglobulin inflammation include wheat, gluten, dairy, refined sugars, corn, soy, shellfish, nuts, seeds, yeast, and caffeine.
 - 11) Oxidative stress [the damage caused by free radicals] causes inflammation, which is nullified by anti-oxidants. Consume foods or supplement with vitamin C, vitamin E, carotenoids, zinc, copper, selenium, and polyphenols.
- POLYPHENOLS are found in teas, fruits, dark chocolate, vegetables, and legumes.
- ISOFLAVONES are found in soy, including tempeh, tofu, and miso.
- CAROTENOIDS (carotene, lycopene, leutin) are found in orange fruits and vegetables (tomatoes, spinach, kale).
- FLAVONOIDS (quercetin and anthocyanidins) are found in green tea, dark berries, citrus fruits, tomatoes and greens.
- 12) Increase omega-3 fatty acid consumption for fish and flax oils. "Caution must be used to limit exposure to mercury." "Recommended dosages for the omega-3 fatty acids are 1000 - 2000 mg daily."

13) Supplementation of omega-3 fatty acids greater than 1000 – 2000 mg per day must be coupled with appropriate supplementation of anti-oxidants. [Patients must take at least the Omega-3 Co-factors from Nutri-West].

14) Probiotics neutralize harmful pro-inflammatory gastrointestinal flora. Supplementation should include a daily dose of 3 billion live active freeze-dried or living bacteria.

15) Increase fiber from whole grains, fruits, vegetables, legumes, and soy.

The following foods should be avoided in the anti-inflammatory diet.

- 1) Foods high in arachidonic acid: red meats, pork, saturated animal fats, egg yolks.
- 2) Any more than one alcoholic drink per day stimulated inflammation.
- 3) More than one cup of caffeinated beverage (coffee, tea, cocoa, and cola drinks) increases several inflammatory markers.
- 4) "Sunflower, safflower, cottonseed, and corn oils should be avoided," especially in processed foods.
- 5) No Trans-Fats or hydrogenated oils, which are found in processed foods with a long shelf life, such as snack foods, cookies and chips.
- 6) No high fructose corn syrup, found in many processed foods, including salad dressings, ketchup, and sugary drinks. They are very pro-inflammatory.
- 7) Some people should not eat nightshade foods (colored peppers, tomatoes, potatoes and eggplant) because they are antigenic proinflammatory, an "inhibit normal collagen repair or increase joint degeneration." [This is a central theme of the 2000 book by physician Sherry Rodgers, Pain Free In Six Weeks.]

It takes 8 weeks to 6 months for these dietary changes to produce great results, but good results are often observed after 4 weeks.

Usually the patient can begin a slow reduction of pain drugs while on this diet, including "NSAIDs, COX-2s, muscle relaxers, steroids, and even opioids."

"Adaptation of the anti-inflammatory diet has a high dose of patient satisfaction."

"Patients like this approach because it is perceived as a natural approach and does not involve further pharmacological intervention."

The anti-inflammatory diet “also provides additional health benefits such as a potentially lowered risk of cancer, cardiovascular disease and other chronic diseases such as atherosclerosis and diabetes.” **[Very Important]**

This diet “lightens the patient’s overall health maintenance load, as opposed to simply adding another pill, and plays an active role in the health of the patient.”

KEY POINTS FROM DAN MURPHY

- 1) Inflammation is at the core of many chronic disease states, and not just limited to musculoskeletal pain and dysfunction.
- 2) Other diseases known to be related to inflammation include, Alzheimer’s Disease, Coronary Artery Disease, Colon Cancer, and many Autoimmune Diseases including Rheumatoid Arthritis and Inflammatory Bowel Disease.
- 3) The standard American diet has changed significantly over the past 100 years, including:
 - Increased consumption of animal products
 - Increased consumption of processed foods
 - High consumption of trans-fatty acids
 - High ratio of omega-6 fatty acids
 - High consumption of Refined carbohydrates
- 4) The primary reason for inflammation in our bodies is increased levels of arachidonic acid, which is the precursor to the proinflammatory prostaglandin E2 (PGE2).
- 5) Changes in omega-3 and omega-6 ratios have resulted in a shift out of balance to a pro-inflammatory physiological state.
- 6) The anti-inflammatory diet is low in arachidonic mediators, trans-fatty acids, animal products high in saturated fats, and antigenic stressors.
- 7) The anti-inflammatory diet is high in natural anti-inflammatories and anti-oxidants, including the phyto-anti-inflammatories carotenoids, flavonoids, and isoflavones.
- 8) The anti-inflammatory diet has the proper ratio of omega-6/omega-3 essential fatty acids.
- 9) Obesity itself promotes inflammation because abdominal visceral fat stores and releases arachidonic acid, the precursor to pro-inflammatory prostaglandin E2.
- 10) The standard American diet is pro-inflammatory, which promotes pain and other health problems.

- 11) Diets high in margarine and fried vegetable oils [trans-fatty acid omega-6 oils] “double the risk for asthma in pre-school-aged children.”
- 12) Omega-3 supplementation reduces prostate cancer, decreases sudden cardiac death, decreases overall cardiac events, and decreases overall mortality.
- 13) The principle dietary fat is olive oil [It is omega-6/omega-3 neutral and it is full of antioxidants].
- 14) Do not eat more than 4 eggs per week (too much arachidonic acid).
- 15) Inflammation can be caused by immunoglobulins that are produced from food sensitivities. Common food triggers to immunoglobulin inflammation include wheat, gluten, dairy, refined sugars, corn, soy, shellfish, nuts, seeds, yeast, and caffeine.
- 16) Supplementation of omega-3 fatty acids greater than 1000 – 2000 mg per day must be coupled with appropriate supplementation of anti-oxidants.
[Patients must take at least the Complete Omega-3 Co-factors from Nutri-West: (800) 443-3333].
- 17) It takes 8 weeks to 6 months for these dietary changes to produce great results, but good results are often observed after 4 weeks.
- 18) The anti-inflammatory diet “also provides additional health benefits such as a potentially lowered risk of cancer, cardiovascular disease and other chronic diseases such as atherosclerosis and diabetes.” **[Very Important]**



