

## How to Reduce Inflammation with Diet and Supplementation

The choice of diet is the most important aspect that an individual can control in the process of inflammation and disease. Interestingly, most of the inflammation process in the body is caused by dietary choices. This is poorly understood by most people and many health care providers as well. The following pages will give you an understanding of what pro-inflammatory foods are, how they affect the disease process, and how you can improve your diet.

### **And.... The Pro-inflammatory foods are:**

- All grains and grain products including white bread, whole wheat bread, pasta, cereal, pretzels, crackers and any other product made with grains or flours from grains. This also includes most desserts and packaged goods.
- Partially hydrogenated oils (trans fats) found in margarine, deep fried foods (French fries, etc.) and most packaged foods.
- Corn oil, safflower oil, sunflower oil, cottonseed oil and foods made with these oils such as mayonnaise, tartar sauce, margarine, salad dressing and many packaged foods
- Sodas
- Dairy
- Soy
- Sugar
- Meat from grain fed animals
- Eggs from grain fed fowl

The inflammation and chronic disease expression biochemically is the intensity of macrophage/microglial activation as related to a spectrum of inflammatory mediators generated by a variety of local cells. The known spectrum of inflammatory mediators generated by a variety of local cells. The known spectrum includes, but is not limited to, prostaglandins, pentraxins, anaphylotoxins, cytokines, chemokines, proteases, protease inhibitors, adhesion molecules, Nuclear factor kappa B and free radicals.

This spectrum, when chronically sustained at high levels secondary to excessive intake of pro-inflammatory foods, results in autotoxicity, seriously damaging viable host tissues and manifesting in a broad spectrum of chronic disease expression.

### **Health vs Disease**

It can be frustrating and depressing to discover that so many foods are pro-inflammatory, leaving you wondering what to eat. More depressing is suffering from many of the numerous diseases and conditions associated with inflammation. These include chronic pain, arthritis, fibromyalgia, chronic fatigue syndrome, sinusitis, allergies, acne, asthma, digestive conditions, flu symptoms, dysmenorrhea, endometriosis, Alzheimer's disease, Parkinson's disease, multiple sclerosis, cancer, heart disease, osteoporosis, hypertension, depression, insulin resistance syndrome (pre-diabetes) and diabetes.

In reality, "everything in moderation" is a poor term to use when referring to a diet. With every bite or sip, we are either de-flaming or in-flaming. If you are fortunate and have "good" genes, you may be able to handle more pro-inflammatory foods than some of your family members or friends.

The problem is most inflammatory diseases develop slowly and without symptoms, until it is too late. We need to be careful about consuming pro-inflammatory foods and not take for granted what appears to be our current good health. The fewer inflammatory foods we eat, the less inflammation we will have and feel.

### **A Basil Plan for Health**

You will have to make a choice regarding foods you eat: will they be pro-inflammatory foods? If you do not have symptoms and feel wonderful, you need to decide if you want to risk regularly consuming pro-inflammatory foods that are known to cause significant health problems and disease in many humans. If you do suffer from any of the conditions previously mentioned, you may wish to see if grains/legumes and the other pro-inflammatory foods are a cause. After coming to a decision, you need to commit to discovering how your health is influenced by the consumption of pro-inflammatory foods. You need to commit for at least 1 month to a “deflaming diet”. Within a week you are likely to feel a difference. By the end of 1 month you will know for sure how food affects your health. *If you are very inflamed you need 2-3 months.*

In addition to diet, nutritional supplements can be helpful. In this paper you will find supplement recommendations that address the major issue of inflammation. In addition, supplements that are effective antioxidants, support cell health, and limit nutrient deficiencies are discussed. Supplement recommendations are also listed for more specific health issues.

In a nutshell, your basic deflaming plan is to eat mostly fruits, vegetables, nuts, fish, chicken, and healthy meat. Add in the key supplements to augment your healthy eating, drink plenty of clean water and moderately exercise as much as you can. The following pages describe anti-inflammatory foods and supplements to help with the deflaming process. It really is very easy to deflame and feel 10 years younger.

### **Why Grains Inflamm**

Historically, consider the fact that grains have been consumed as a food for a short period of men’s time on earth. The use of grain products for foods existed for a brief few thousand years out of the history of early and modern man. Grains, refined sugar, partially hydrogenated fats, vegetable and seed oils, as well as other foods were not consumed by our earliest ancestors. Our genetic code is not that different from our predecessors, but our food definitely is. Humans are genetically adapted to eat fruit, vegetables, nuts, fish, fowl and meat. These foods are not related to any chronic disease. The same cannot be said of grains. Throughout history, when grains were adopted as a staple food that replaced animal proteins a number of negative health outcomes occurred including the following:

- Increased infant mortality
- Reduced lifespan
- Increased infectious diseases
- Increases in iron deficiency
- Increases in osteoporosis, osteomalacia and other bone mineral disorders
- Increase in the number of dental cavities and enamel defects

### **The Consequences of Grains**

#### **Gluten**

Many different biochemical components and properties make grains an inflammatory food. The most notorious is a protein called gluten. Celiac disease is a disabling digestive disease caused by gluten. The most notorious gluten containing grain is wheat. Other gluten containing grains include couscous, spelt, kaput, rye, barley, and oats. The grains that do not include gluten are rice,

wild rice, millet and corn. More information about gluten containing foods can be found at the Celiac Sprue Association's website at [www.csaceliacs.org](http://www.csaceliacs.org)

It is not only those suffering from celiac disease who need to avoid grains. Gluten may cause many other symptoms and conditions ranging from schizophrenia to more common conditions such as headaches. For example, researchers randomly selected 200 disease free individuals to assess anti-gluten antibody levels. This is a medical test to measure a person's sensitivity to gluten. A comparison was made of the health complaints of the individuals with the highest antibody levels (more sensitive to gluten) to those with the lowest antibody levels (less sensitive to gluten). The results showed 15% of the subjects who had the higher levels of antibodies (more sensitive) suffered from headaches, chronic fatigue, regular digestive complaints, anemic changes and showed no signs of celiac disease. This means that healthy individuals without celiac disease were severely affected by gluten and showed three of the most common symptoms patients reported to their doctors.

### **Lectins**

All grains and legumes (beans, lentils, soy) also contain sugar proteins known as lectins. Lectins are difficult to digest and cook. Before they are absorbed in the digestive tract, lectins are known to cause digestive system inflammation. After lectins are absorbed through digestion they bind to the surface of many different types of cells throughout the body. While the details are not known, researchers state "there is now abundant evidence that lectins can cause disease in man and animals." Research suggests arthritis, glomerulonephritis, psoriasis, multiple sclerosis, retinitis, cataracts as well as congenital malformations. Infertility, allergies and autoimmune problems are lectin related.

### **Other Problems with Grains**

As you may know, calcium is important for bone health. Grains contain a substance called phytic acid and which is known to reduce the absorption of calcium, magnesium and zinc. Grains also promote the pH of our body to become more acidic which is known to be inflammatory. Finally, grains contain higher amounts of fatty acid biochemical called omega-6 fatty acids which are prevalent in fish and green vegetables and reduce inflammation.

### **Two Sides to a "Health Food"**

Are you wondering why grains are so heavily promoted as good for us? First, whole grains do contain nutrients and fiber, which are healthy and anti-inflammatory. Unfortunately, these benefits do not outweigh the problems with grains previously discussed. We can obtain the nutrients and fiber required by eating good meats, fruits, vegetables, nuts and using supplements wisely. Second, from an economic standpoint, grains are inexpensive and profitable to store and easy to manufacture a wide variety of food types from. This is why they are found everywhere in fast foods, snacks, easy to prepare meals, packaged foods, etc.

### **Additional Supplemental Recommendation**

#### **Antioxidant and Anti-aging**

Modern science points to the following antioxidants as our best choice for supplements for maintaining the health of our cells and increasing energy production. These are alpha-lipoic acid, bioflavonoids, and high ORAC fruits and vegetable extracts. Alpha-lipoic acid is a small, nutritional molecule required for life and, like vitamins C & E glutathione and coenzyme Q10, alpha-lipoic acid is your first line of defense against cell damage from free radical oxidation. The high ORAC fruits and vegetable extracts are other forms of antioxidant nutrients that help control cell damage.

## **Acetyl L-Carnitine and Alpha-lipoic Acid**

These nutrients play an important function specific to burning fatty acids and producing energy. Humans deficient in carnitine exhibit low muscle energy, along with generalized aches and pains and may develop a variety of chronic diseases.

## **Bone Support**

Calcium is beneficial for increasing bone mineral density when combined with the anti-inflammatory diet and increased magnesium and vitamin D3.

## **Essential Fatty Acids**

The subject of fats and oils tends to be generally confusing. Accordingly, taking fatty acid supplements is also confusing. This short piece on fatty acids is designed to provide a basic introduction to lipids and an approach to supplementing the diet with fatty acids. Fats and oils are both made up of fatty acids. Triglycerides are lipid molecules that contain three fatty acids attached to the glycerol. When triglycerides contain mostly saturated fatty acids, the lipid is solid or semi-solid at room temperature, and is referred to as fat. Butter and margarine are fats. In contrast, when triglycerides contain mostly unsaturated fatty acids, the lipid will be liquid at room temperature and referred to as an oil. Olive oil, flaxseed oil, borage oil and fish oil are clearly examples of oil. Fatty acids are made up of carbon, hydrogen and oxygen molecules, and as alluded to above, fatty acids can be saturated, monounsaturated, or polyunsaturated. Saturated fats have no double bonds, and their carbon atoms are fully saturated with hydrogen. Saturated fatty acids are found in animal products, vegetables and seeds. About 40-50% of animal lipid is saturated, while about 10% of seed oils are saturated. Unlike what many are led to believe, naturally occurring saturated fatty acids are known to have anti-inflammatory, anti-viral and anti-microbial functions.

Monounsaturated fatty acids, such as oleic acid, contain one double bond between adjacent carbon atoms. Oleic acid is known to be a healthy fatty acid that has anti-inflammatory qualities, and is found in many common foods such as olive oil, avocados, nuts, eggs, chicken and meat. Up to 50% of animal fatty acids can be monounsaturated, which should lead to the conclusion that referring to animal fats as "saturated" is inaccurate. Polyunsaturated fatty acids contain two or more double bonds, and are classified as either omega-6 (n6) or omega-3 (n3) fatty acids. Linoleic acid, which is an omega-6 fatty acid, contains 2 double bonds and is the primary fatty acid in grains and commonly consumed oils, such as corn, sunflower, safflower, and soybean oils. When animals, including humans, consume linoleic acid, it is converted into dhomo-gamma-linolenic acid (ALA), which is an omega-3 (n3) fatty acid, contains 2 double bonds and is the primary fatty acid found in green vegetables and flaxseed. Animals, including humans, convert ALA into eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA), which contains 5 and 6 double bonds, respectively. Like ALA acid, both EPA and DHA are n-3 fatty acids.

As described above, arachidonic acid, DGLA, EPA and DHA are formed from either linoleic acid or ALA. After formation, these fatty acids are inserted into the membranes of our cells, where they function to regulate local tissue biochemistry. If we have an equal balance of arachidonic acid, DGLA, EPA and DHA, it is not difficult to envision a response that leads to the resolution of inflammation and tissue healing. Unfortunately, the average American consumes an excessive amount of linoleic acid, from grains and seed oils, and arachidonic acid from grain/seed oil-fed animals, which leads to a pro-inflammatory state.

Research has demonstrated that humans need a dietary ratio of n-6 to n-3 fatty acids of 1:1, however, modern man consumes a balance that averages 20:1 or greater. This imbalance leads to an increase in the concentration of arachidonic acid in our cell membranes, which favors the development of inflammation and pain.

The consumption of trans fatty acids adds to the pro-inflammatory state. Trans fatty acids, also called partially hydrogenated fatty acids, are found in margarine and nearly every packaged food in the supermarket. Trans fats promote inflammation in many ways, such as by raising LDL cholesterol, lowering HDL cholesterol, increasing insulin levels, stimulating release of pro-inflammatory cytokines, and lead to an increased concentration of arachidonic acid in cell membranes. Clearly trans fats need to be avoided. Grains and seed oils should also be avoided due to their high linoleic acid (n-6) content.

Olive oil should be used for salad dressing, and we should try to eat fresh fish and grass-fed meat products. We can also supplement with certain oils to increase the levels of anti-inflammatory fatty acids in our cell membranes. Borage oil and evening primrose oil contain pre-formed DGLA which allows for the synthesis of anti-inflammatory EPA/DHA. The best way to increase cell membrane levels of EPA/DHA is to simply supplement with EPA/DHA. Concentrated EPA/DHA supplements are available, which allows for the consumption of fewer capsules to achieve the desired supplemental level.

### **Fruit and Vegetable Supplements**

Eating fruits and vegetables greatly contributes to promoting your health and preventing disease. Dehydrated fruit and vegetables powder mixes can help make up for deficits in these foods in your diet.

### **Joint Support**

Glucosamine & Chondroitin are two nutritional products with a body of research for improving the health of joints. Glucosamine & Chondroitin Sulfate are the primary building blocks of joint and connective tissues. Research supports the benefits of taking glucosamine to maintain healthy joint tissues and prevent osteoarthritis. Chondroitin, when combined with glucosamine and vitamin C has also been shown to be effective for lower back pain relief.

### **Iron vs Iron-free Multivitamins**

Iron is an important nutrient required for oxygen transport in the blood. Many American children have below desired levels of iron in their blood, resulting in anemia. Growing children, young women, pregnant women, and those with anemia have special iron needs. However, adult men and post-menopausal women do not usually need extra iron to supplement their diet. Iron is an oxidizing mineral and excess can cause free-radical damage in the arterial walls. Men's iron stores increase geometrically after age 20, whereas women's stores rise very little until their late 40's. The close parallel between Coronary Heart Disease (CHD) incidence and iron storage level in both sexes is surprising. The rate of CHD among men begins to increase in their 30's, a decade after physical growth stops and iron stores soar. On the other hand, women rarely develop heart disease until their 50's, several years after menopause.